

Farm Animal Welfare and Sustainability

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Abstract

This thesis is concerned with acknowledging farm animals and their co-presence in the more-than-human space of the livestock farm, and with accounting for them responsibly in sustainability debates. The enrolment of farm animals as actors in political agendas for environmental sustainability, and farm animal welfare suggests that there are new ways of seeing and being with farm animals that permit their relational presence and recognise their subjectivity. Indeed geographers have in recent years acknowledged animals and their relations with humans, and they have begun to recognise the nature of animal subjectivities. However, within the fundamental rethinking of animals that has been provoked by these discussions, I suggest that farm animals have remained relatively invisible. Occupying ethically confusing terrain, farm animals have nonetheless been visible in a set of philosophical positions regarding their moral status, yet these debates present a rather confusing picture in which the farm animal as an individual is conspicuous by its absence.

In seeking to redress the invisibility of farm animals within these debates, and recast them in relation to humans and the broader farm ecology, this thesis attempts to set out an epistemological and methodological framework through which farm animals might become visible as individual fleshy beings. Drawing on the concept of agricultural stewardship and new agendas in farm animal welfare science, it makes use of new methodological tools that have emerged in the social sciences to conduct a relational study of the livestock farm; a study in which farm animals themselves participate. It also considers how the divisions that have been constructed between humans, farm animals and the environment can be re-configured as a more unified political science of the livestock farm.

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i. Preface

“There is so much life here”



Figure i.i: Touching moments (Authors own image)

“Animals have been so indispensable to the structure of human affairs and so tied up with our visions of progress and the good life that we have been unable to (even try to) fully see them. Their very centrality prompted us to simply look away and ignore their fates....we have an intellectual responsibility as well as ethical duty to consider the lives of animals closely” (Wolch and Emel 1998: xi)

This thesis is about considering the lives of farm animals closely. It is also a thesis about sustainability, not in the wider, macro-social sense of feeding world populations, or sustaining the planet for future generations, rather it is concerned with the sustainability of the livestock farm as a rural space in which the non-human and human co-exist in a shared environment. It is a thesis then which explores the interactions between animals, humans, and physical matter within the context of the livestock farm. The goal is to draw attention to that material world so that we might fully see farm animals in relational, performative, affective and ecological ways which challenge conceptions of sustainability and direct us

towards more generous ways of thinking that are more aware and inclusive of the contributions of farm animals.

Whilst animals have increasingly been the subject of interest within the social sciences, there has been a tendency to focus on human-animal relationships and what animals mean to humans in terms of their socio-economic value, or the contributions they make to ecological, technical and spatial change, particularly with regard to wild, companion and working animals such as dogs and horses (see for example Whatmore and Thorne 1998; Whatmore, 2002; Haraway, 2003). Farm animals that are produced for food alternatively, have been objectified as ‘things’ that have been associated with a rational, modern industrial food supply system (Holloway, 2007). Their bodies have been restructured and reconfigured as units of production and represented as sites of symbolic significance (Yarwood and Evans, 1995; Anderson, 2003), human experience (Holloway, 2001; Wilkie, 2004), capitalist accumulation and gain (Noske, 1997). Many of these representations have ignored or at least struggled to account for farm animals as beings in their own right and have remained largely anthropocentric, even when they have implied or attributed animal subjectivity. More recently however, studies have begun to “*peel back the layers*” (Serpell, 1996:825-826) of objectivity to reveal the lives of the animals “*that lurk within*” (ibid) (for example Sellick, 2005; Holloway, 2007; Hinchliffe et al, 2005; and Lulka, 2009), opening up the possibility for animals to *become* a heterogeneity of subjectivities within different contexts such that animals are now being recognised as individual beings.

Across the academic divide in the animal sciences, there has been a focus on the subjective experience of animals, most notably in the work of Marian Stamp Dawkins (1980) who has pioneered research into the behavioural preferences of animals, providing an insight into behavioural repertoires and species specific needs, whilst the more recent development of Qualitative Behaviour Assessment (QBA) has provided a method for studying and expanding our knowledge of the subjective experience of animals, helping to provide them with what they want and need (Wemelsfelder, 2005; 2007; Wemelsfelder and Rousing, 2006). These behavioural approaches inevitably reduce subjectivities to an animal’s response to its immediate environment and to a series of measurements that are linked to productivity and human expectations. The provision of these choices to provoke animal behaviour may then provide no choice at all from the animal’s point of view. These

investigations of animal subjectivities are therefore too scientific in that they fail to see farm animals as relational beings. New approaches and methods to the study of animals nonetheless bring new understandings of animal lives as embodied within political, socio-economic and spatial processes. Yet the lives and fate of farm animals in contemporary farming systems, and their co-constitution in these systems and the shared environments we inhabit, has remained largely unexplored. This thesis therefore takes up the intellectual challenge to take farm animals seriously and by considering their lives closely, to explore the possibility that as humans, we might partially remove ourselves from the centre of concern in more generous debates of rural sustainability and reposition ourselves in relation, rather than opposition to farm animals and the non-human world.

Over the last four years I have sought in various ways to consider farm animals more closely, and to recognise their lives for what they are to them in the worlds they inhabit, rather than what they are to us in the central position we occupy in ours. I have sought to recognise how our understandings, representations and treatment of farm animals within livestock production are felt to be experienced by the animals themselves. I take this challenge of intellectual responsibility seriously. This comes in part from the vivid memories I have of the livestock market that I frequented as a child. It was a large open complex where animals awaiting sale would be penned in different areas according to their species. Pigs, sheep and calves occupied the top end of the site in parallel, undercover sheds, whilst outdoor cattle pens took up the bulk of space in the lower regions of the market area, with poultry relegated to a small enclosed space full of tiny little cages at one end. I spent hours at the market just watching; watching the animals as they were moved from the cattle trucks to the pens, to the auction ring and back; watching them move around the pens, kicking out and bashing against bars, slipping and sliding on soiled concrete flooring; or as was often the case with pigs, just watching them sleep. There were men in brown overalls with alcatene pipes which they used to protect themselves (or so they said) and to move the animals around. And I remember the incredible noise, not just the noise of animals, but of the workmen and farmers as they hollered and cursed when frightened and agitated animals failed to do what was expected of them, sometimes escaping into the town. On these occasions fear ran through my blood as I feel sure it did through the animals, and it developed into a fear of cattle that I never really overcame until I began researching for my master's degree thesis when I began to see animals in a different way.

The livestock market then was the start of my fascination with farm animals. Over the years my encounters with, fear and enjoyment of livestock grew, partly because I lived in a rural market town surrounded by rolling countryside and fields filled with dairy cattle, beef cattle and sheep, but also partly because my dad was a slaughterman, who was also trying to educate himself at home to become a meat inspector, a job that was much less emotive and had greater social standing. One way or another livestock were a central component of my childhood, particularly as they formed (and still do) the mainstay of my diet. Whilst I have had no qualms about eating farm animals as long as they have had a good life, and I see no reason for them to live otherwise, my experience of livestock markets as a child raised my awareness of the way they are or can be treated, particularly when you move away from the extensive farming systems found in the area where I live. I began then to realise at a very young age that farm animals are never neutral.

This awareness turned into concern for farm animal lives during the BSE crisis back in 1992, when, like many other people, I lost faith in commercial livestock enterprise and reduced my meat consumption, purchasing only from local sources that I knew and could trust to treat the animals well. Whilst this action was primarily to protect my own health, it was also a protest against the way livestock were being fed on animal products that were unsuited to their species specific diet; a practice I blamed on the farming industry and feed merchants trying to turn a quick buck without due consideration for the animals themselves. In 2001 the treatment of farm animals during the Foot and Mouth Disease epidemic caused me increasing concern as smoke fuelled landscapes of burning animal flesh engulfed the local area. This was accompanied by vivid pictures on local television, which brought the fate of farm animals into the homes of consumers, raising questions about the movement of livestock, the conditions animals endured during what essentially could be seen as unnecessary transportation, and the performance of mass animal slaughter of epidemic proportions.

These politicised experiences of livestock fed into my Masters Degree as I began to think about Society-Nature relations and about why we treat animals in the ways that we do. Following a theoretical exploration of human-animal relations, I came to appreciate how our treatment of animals had over time been embedded in various religious beliefs, in which humans and animals had been constructed as separate and bounded entities, with

animals seen as God's creatures and a resource for (wise) human use. I was also able to see the influence of science where the rational and objective view of animals led to their construction as lesser beings than ourselves, thereby paving the way for numerous forms of animal experimentation and exploitation. Finally I became aware of philosophical arguments for the liberation (Singer, 1973) or equality (Regan, 1983) of animals as sentient beings that have a right to life, forcing the argument that we have no right to kill or eat animals, but a duty to protect them. Unable to reconcile my own feelings towards animals with any of the above I was drawn towards more naturalistic views such as those of Benton (1993), Dickens, (1996) and Ingold (1994), and the social anthropologists and moral philosophers who regard the boundaries between humans and animals as problematic, seeing each as embedded within communities and relations rather than bound into the Cartesian dualism engrained within our sociological imaginations. As my appreciation of these positions grew my attention turned towards animal geographies, where I found that animals were being constructed as just another marginalised group in need of political recognition, often being seen as analogous to marginalised 'others' within Society, or as hybrid constructions which challenged the Society-Nature, human-animal divide. Whilst this may have enabled political comments to be made about the treatment of animals and about the role of animals within the socio-economic processes of Society, there seemed to be little interest in engaging with the animals themselves. Therein lies the birth of my intellectual responsibility.

This lack of engagement with animals resounded loudly as I undertook my Masters Degree thesis. During this time my fascination for watching animals was rekindled at my kitchen window where I spent hours watching cattle in the fields that surround my home, and tracking badgers in the landscape by the traces they left behind. Coupled with an understanding of Bovine Tuberculosis (BTb) and the way Tb microbes thrive, I was concerned in so doing to find out how these animals lived their lives and how they used the spaces of the farm. How for example did the conceptual boundaries delineating the managed and the unmanaged, the wild and the domestic impact on the animals and how they were treated? How were these boundaries enforced? And crucially how were cattle and badgers engaged in fluid relational arrangements that lead to the transfer of Tb microbes that perpetuate zoonotic disease?

Each of these encounters then has in its own way helped to shape this research, and serves as a reminder that whilst animals have been and continue to be an important part of our lives, that they also have lives of their own that are affected by what we do and how we treat them. They also serve as a reminder that we live in a world of relations in which nothing is fixed and bound or can be seen in isolation. And this is what I find troubling. For if we can know that we live in a world with other beings that contribute to that world in whatever form that may be, (and I do not see why that is so difficult to accept) why then do we persist in imposing these conceptual boundaries that provoke certain practices that are disruptive and harmful to those other beings, to the animals and the environment with whom we share our lives; practices that obscure the harms that we do to the non-human 'others' as we congratulate ourselves for our achievements. Such modes of ordering may appear easier to work, but at what cost to farm animals? This thesis then is for me at least an intellectual challenge to awaken interest in farm animals as beings in their own right, to recognise and accept them for what they are and what they contribute to the world, and to find a way of working with rather than against the relationality that exists between them and us, and the shared environments we inhabit.

i.i. Key Research Themes

What then happens when we hide those practices that are harmful to animals and the environment behind our own achievements and our own concerns? In what follows I look closely at the lives of farm animals, and through the eyes of those people that work with them explore this issue further. I do this within a broader framework of ideas through which four key research themes emerge. Before this however, I want to clarify my use and understanding of the term nature.

Throughout the chapters of this thesis I use the term Nature in a foundational sense to refer to an ontological category that is distinctly separate from Society. It is this definition of Nature, conceived by human societies as naturally occurring and authentic, that has been constructed as the 'norm', and it is against this understanding that the social practices of livestock farming are seen to interfere, disrupt and deviate. Alongside this, and in the context of the livestock farm, which builds on foundational Nature, naturally occurring

resources, physical, biological and ecological processes, that the Natural and the Social interact to create different forms of ‘nature’ which are not given but co-produced. I therefore make a distinction within this thesis between Nature as foundational and ‘nature’ as co-produced. It is from this latter use of the term ‘nature’, which relates to a myriad of co-constructed environments, processes, practices and behaviours, that I begin to develop a less anthropocentric politics of the livestock farm; a politics that recognises humans, non-humans and physical matter as a relational achievement in which farm animals matter.

The first key research theme to emerge in this thesis then, situates the lives of farm animals within the context of the biotic community. This is an attempt to realise holistic accounts of the land that register the lived relations between humans, animals and the environment, (Leopold, 1966) and to trouble the conceptual boundaries that are imposed between them. I want to acknowledge then that boundaries which separate Nature from Society, wild animals from domestic, are challenged by livestock farming practices which are built around and dependant on the biological and physical processes of animals and the environment. I also want to argue that from within these very practices farm animals should emerge as “*distinct subjects, worthy of epistemological, political and ethical distinction*” (Jones, 2003:293) and show how they are all too often ignored within wider political discussion regarding human desires and achievements, such as the protection of rural landscapes, specific forms of biodiversity, access to the countryside and financial gain. What I wish to do then is to re-situate farm animals within the biotic community and embed their contribution to livestock farming and the environment into wider societal concerns about rural sustainability.

The second key theme exercised through this thesis is concerned with modes of ordering. These are essential organisational practices that facilitate farm operations and are used to manage farm animals and land within livestock production. This theme is important because it is through these modes of ordering that a variety of performances and networks are created; performances which embody farm animals in multiple ways. It is also through these modes of ordering that we hear of the performance of distribution, ranking and hierarchy, as animals are organised into groups which have greater or lesser importance within the production system; groups in which they are enacted through a wide range of machinery and equipment, routine practices and procedures. Whilst these modes of

ordering are a necessary part of organisational life, they also create boundaries which do not always fit with what happens for, or is experienced by the animals in practice. This creates a gap between what is and what ought to be, in which the lives of farm animals are often obscured. Through an examination of the modes of ordering employed in livestock farming, I want to make visible the practices through which livestock are hidden, so that farm animals can be brought back in to the purview of ethical and political concern.

The third theme to emerge in this thesis is that of *care*. As Annmarie Mol (2009: 23) suggests, “*care is concerned with the specific problems of specific individuals in specific circumstances*”. This theme therefore has strong links with the science and objectives of animal welfare which links the quality of life experienced to an individual’s ability to cope in the environment in which it is kept (Webster, 2001: Appleby, 1999). It is concerned then with an animal’s immediate condition and the care it receives on a day to day basis throughout the production process and the animal’s entire life. On a much broader level, care is also wrapped up in the management of the land. This theme is also important, because “[t]he ideal of good care is silently incorporated in practices and does not speak for itself” (Mol, 2009:2). It therefore becomes necessary to unravel the specificities of caring for farm animals and the environment in the course of everyday life, as this makes it possible to disentangle the practices of caring from the immediate associations these have with production. This is essential despite an obvious overlap between care, or the needs of the environment to sustain biodiversity, and what is required to maintain productivity. It is through the theme of care then that I explore how farmers express and perform their sense of care for the animals in the broader context of caring for the land and/or the environment. In this way I can reveal the circumstances in which animals are treated as individuals, and draw out the conditions of individualisation, along with the sites and situations in which this occurs.

The fourth and final theme is *multiplicity*. This theme is concerned with the recognition of difference in livestock farming, and the simultaneous enactment of ‘things’, both human and non-human within different practices and across a range of spatial scales (community, group, individual), which otherwise construct them as the same. Multiplicity then is used as a dialogue to open up the ways in which ‘things’ have been constructed within a single set of processes that make up the livestock farm, creating a singular reality that fails to

account for individual difference; as a plurality of different processes that exist side by side, with relations being regulated to secure their independence. The theme of multiplicity therefore links to ontological politics in that it suggests various possible reasons for enacting one kind of reality over another. It also suggests that there are grounds for debate about the way power relations are played out, and invites new ways of attending to farm animal lives and the Natural world; ways in which they are not directly subsumed within anthropocentric notions of livestock farming and rural sustainability.

i.ii. Research Questions

The outcome of this collection of themes is formalised through the following key research questions:

1. What does it take to make farm animals worthy of social and geographical study?
2. Can farm animals be reconceptualised in relation to humans and the environments they inhabit without recourse to representations that are partial and selective?
3. How can they be recognised as individual fleshy beings with their own subjectivities, welfare experiences and specific needs for care?
4. What must we do to account for them responsibly within the livestock farming system?
5. How might this contribute to rural sustainability?

i.iii. Towards the making of the thesis

As I hope is becoming clear, this thesis is concerned with watching farm animals closely and with questioning the people who work with them. In doing this I hope to establish how the practices, spatial relations and ethical encounters that take place within the livestock

farm challenge existing political arrangements through which farm animal welfare, social and ecological sustainability policies are made. In drawing this preface to an end, I want to give some indication of how the thoughts, feelings and ideas outlined in the preceding section have shaped the emergence and progression of this thesis.

In Chapter 1 I journey through the theoretical developments in contemporary debates of Society-Nature and human-animal relations that have contributed to my thinking around animals and the environment, and consider how these have helped me to develop my understanding of farm animals in the current context of the theses. My journey begins with the critical consideration of divergent views, attitudes and approaches to the study of animals within geography, philosophy, the social and physical sciences. These debates are key to understanding the way farm animals have been constructed within dominant discourses which situate them as ‘other’ in contrast to human lives, and to the lives of wild animals that are seen as part of Nature, embedded in the Natural world. They are key also to understanding the value that is attached to farm animals within contemporary livestock production systems. By drawing attention to the visibility and invisibility of farm animals within these debates, Chapter 1 aims to re-situate their lives in relation to human Society and Nature within the space of the livestock farm.

I use the sections in Chapter 2 to consider the place and role of farm animals within agriculture, and explore how their materiality can be incorporated into broader notions of sustainability. Within the context of agriculture, sustainability focuses on notions of inter-generationality in that it seeks a balance between the needs of the future with the demands of today. It also seeks to militate against externality costs, which once ignored under productivism, are now integrated into management practices, paving the way for new forms of ‘naturally’ embedded value. A key component of sustainability in this context is the concept of stewardship, through which farm animals have been embodied within an ethic of use, and/or an ethic of preservation. It is through this concept of stewardship that I consider how traditional livestock farming practices have valued and respected farm animals as individual beings that are in relation with humans and the environment. Coupled with new agendas in farm animal welfare science that recognise the subjective experiences of individual animals, the concept of stewardship provides an opportunity to recognise animal

welfare as a relational achievement, whilst also placing farm animals in the wider sustainability debate.

Chapter 3 focuses on the methodological approach to this thesis as the conceptual and philosophical meanderings I have engaged with have led me towards a responsible strategy for researching both ‘with’ and ‘for’ farm animals to discover what a relational rather than anthropocentric approach to sustainability might look like. This has not been a straightforward task as the reality of livestock farming cannot be understood as “*a set of fairly specific, determinate, and more or less identifiable processes*” (Law, 2004:5), rather it is complex, diffuse, unpredictable and messy, which makes it difficult to capture. My aim throughout has been to find research methodologies that do not make assumptions about what will take place or what might be found, but will cautiously find a way of exploring and describing elusive realities. It is in this chapter that I set out the research methodologies that have been incorporated into this thesis, as I have tried to open up space for the indefinite, uncertain forces and relations that contribute to the production of particular realities. It is with these thoughts in mind that the chapters which follow take a different theoretical approach to the study of farm animals and livestock farming as they are played out over three different spatial scales. The first of these scales is the dynamic and bounded space of the farm which, with its own assembled ecology is the site of sustainability. The second, the scale of the field is the site at which the assembled ecology of the farm is rationally organised and ordered into groups to facilitate production. Whilst the third, is the site of the individual, the site at which the practices generated at other organisational scales are experienced by the animal.

In Chapter 4 then, *The Ecology of the Livestock Farm*, focus shifts to the empirical work of the thesis as I begin to unravel some of the complex relations between humans, animals and the environment within the context of the whole farm – the natural unit of sustainability. Organised around three key aspects of livestock farming that occur at the level of the farming system, including the ‘Nature’ of Livestock Farming, Feeding the System and Aesthetic Representations of the Livestock Farm, the chapter endeavours to explore and describe some of the materials and practices that make a difference to farm animal lives, whilst simultaneously drawing out the contributions that are made to the farming system by the animals themselves, as they help to shape the environments, habitats, places and

landscapes through these materials and practices to which they are exposed, and through their species specific behaviours and ways of being in the world. The chapter thus reveals how farm animals are enacted at the level of the farming system; embodied within important practices and procedures that are vital to the sustainability of the farm, making contributions which are often obscured within other practices performed at different spatial scales.

Following on from this, Chapter 5 explores the organisation and management of livestock at the level of the field - the site where modes of ordering are generated. In this chapter I am concerned with the way farm animals are categorised into groups through which specific ordering arrangements facilitate the production process. I am also concerned with the effect these arrangements have on the animals themselves in terms of the treatment they receive in pursuit of productivity, and also as they negotiate these arrangements and strive to live out their own animalian lives. Importantly, this draws on interviews with farmers to establish the modes of ordering that take place within livestock production and on my own empirical observations of livestock as they negotiate their relations with each other, and with the various practices and procedures they encounter within the context of the herd, flock and field.

In Chapter 6, the last of my empirical chapters, I turn my attention to the micro level of the farm and the individual animal – the site of welfare experience. It is here that an animal's experience of pleasure, pain and suffering, is often hidden behind the materialities and practices that take place at other spatial scales both within and across the different spaces of the farm. I am concerned in this chapter then, with the sort of care animals receive within different farming systems, and outlining three types of care that farm animals experience; selective, routine and mechanised forms of care, I explore the affects of different caring practices on the welfare of individuals. This opens up questions about what it means to be a farm animal in different farming systems, and what it might mean to be of a different species, age or sex within those systems, and the implications this might have on the rural environment.

Finally in Chapter 7, I attempt to bring the complex realities of livestock farming seen in the previous three chapters together by moving towards the recognition of multiple

ontologies which challenge current political arrangements in which they are discursively constructed as the same singular form, with separate yet parallel interests within a unified whole. Recognising that farm animals are often obscured or deleted within existing farming practices played out across a range of spatial scales, and remain absent in political discussions about the future of livestock farming, this chapter aims to recast farm animals to reflect their relationality within the ecology of the livestock farm. Finally, as a means to resituate farm animals within the rural sustainability debate, the chapter explores the possibility of a cosmopolitical arrangement in which humans, non-humans and physical matter can speak out and be heard as they communicate and engage each other in a multiplicity of relations that are always in process.

Chapter 1

Placing Farm Animals

1.1. Introduction

Farm animals occupy a liminal space. They are, as Buller and Morris (2003, p.217) point out ‘quintessential hybrids’. They are neither wild, nor tamed. They are sentient, yet they are slaughtered in their millions for human consumption. They occupy a confused and in many ways contradictory ethical terrain. They live in confinement yet are associated, in the eyes of many casual observers, with notions of countryside and out-door space. Our encounters with them are predominantly alimentary - and thereby post-mortem - yet, as living beings they occupy a key symbolic place in cultural evocations of the rural. They are chattels, owned as commodities by those who raise, transport and slaughter them, yet they are independent beings with their own life-worlds and subjectivities. As such, farm animals confuse our science, our ethics, our behaviour even our humanity. They are both visible and invisible.

This thesis is all about the visibility and the invisibility of farm animals. Despite the recent growth in animal geographies (Anderson, 1997; Emel, 1995; Elder et al, 1998; Wolch and Emel, 1995; 1998; Philo, 1998; 2000; Wilbert, 2000; Philo and Wilbert, 2000; Holloway, 2005; 2007; Howell, 2000; Whatmore and Thorne, 1998; Whatmore, 2002; Davies, 2000; Matless, 1994; Lynn, 2000; Jones 2000; Risan, 2005) and the increasing attention to ‘more-than-human’ worlds within the social sciences in general (Latour, 1987, 1988, 1999a; 1999b; Latour and Woolgar, 1979; Law, 1999; Callon, 1986; Haraway, 1989; 1991; 1997; 2003; 2008), the ambiguity of farm animals within both post-human and radical ecological rhetoric has led to them remaining largely ignored within contemporary accounting. As Tovey (2003) has pointed out, the invisibility of animals is particularly apparent within the rural social sciences despite the fact that the ‘*organically embedded presence of animals in a larger than human world*’ is one of the elements that distinguishes rural from urban life (Tovey, 2003:197).

My aim in this thesis is, to borrow from Wolch and Emel (1995:632), to “*bring the [farm] animals back in*”, to acknowledge their co-presence in ‘more than human’ worlds and spaces and to understand how such co-presence affects those in regular, every-day contact with them.

My argument is that farm animals have, over the last two decades, become newly enrolled as actors in two distinct agendas, where their co-presence as more than simply units of meat or animal production, is both acknowledged and encouraged. The first of these agendas is that of environmental sustainability in which they have come to play a complex - and in certain ways - contradictory role (Buller and Morris, 2007). The second is farm animal welfare which has emerged, in recent years as a major concern, not only for animal-product consumers but also, and increasingly, for food chain actors, regulators and, one might claim, society at large (Miele and Evans, 2010)

My contention is that this enrolment throws up innovative ways of ‘seeing’ and of ‘being with’ farm animals, permitting both new visibilities and new scales of engagement and relational presence, albeit and of course, still within the finite and bounded context of animal husbandry. Moreover, these new enrolments offer a ‘being-in-the-world’ counterpart to the more academic and philosophical engagements with animals that have characterised recent writings in animal geographies and in animal ethics. They also offer new epistemological and ethno-methodological pathways into the understanding of the relations between farm animal and farm animal ‘keeper’.

The focus in this thesis is therefore with the interplay of farm animal welfare and sustainability as objectives, as practices, as frames of relational encounter, as policy arenas played out on the farm and yet also the various issues that arise when the lives of farm animals are considered in relation to the anthropocentric value systems which prioritise benefits for human over those for other non-human animal species (Singer, 1974; Dryzek, 1997). I am interested in finding ways to reconceptualise the ecologies of human-animal relations within the context of livestock farming, as the traditional functionality of farm animals, predominantly in terms of a source of food for humans and as symbolic referentials of rural life, are actively re-configured through concern for animal welfare,

environmental and social sustainability, concerns that have arisen partly as a consequence of modern livestock production systems.

Hence, in this thesis, I bring together and make sense of important fields of debate in philosophy, geography, the social and physical sciences; contemporary debates that are concerned with placing animals with respect to human Society and Nature. Geographers, social theorists and philosophers have, in their own distinctive ways, sought to highlight the importance of animals in Society through diverse classificatory systems. The resulting definitions and typologies have usefully been deployed to confirm what an animal is and to show how animals (collectively) have been situated within the Natural or the Social realm, as a particular species and breed for example, as wild animals for rural sports, as part of Nature Conservation, as working animals or pets. Bound up in relations with both humans and the Natural world however, as a source of meat for human consumption, as contributors to the environment or as aesthetically pleasing landscape figures, as well as beings-in-their-own-right, farm animals do not fit neatly into these fixed classifications, neither can they be separated from the naming and categorising processes. Rather, farm animals are common objects that transcend these simplistic boundaries, and as they cross the disciplinary divide between the hard and the social sciences, between ecology, biology, ethology and veterinary medicine, everyday farming practices and the economics of production, they become interesting, worthy and important subjects of study. For it is in their moments of conflict or convergence in the different worlds they inhabit that farm animals can help us to break down the existing divisions of thought which have separated the Natural from the Social, humans from animals, and wild species from domestic, and help us to see the relations between things as they really are.

To begin, I set out the broad conceptual social science framework for this study by considering the invisibility and visibility of farm animals through the two approaches of animal geographies and animal ethics. Animal geographies have, with a few notable exceptions, largely excluded consideration of farm animals while animal ethics, though to a large extent founded upon a concern for the treatment of farm animals, have nonetheless presented a rather confusing picture of their visibility.

Before that, however, it is worth pausing a moment to acknowledge that behind these analytical, epistemological and conceptual frameworks, there is a very real material reality within the ‘more-than-human’ space that is the countryside; one comprised, in the UK of over 8 million pigs, over 1.8 million dairy cows, some 30 million sheep and lamb, 2 million beef cattle and around 840 million chickens. In total, over 900 million farm animals are reared every year in the UK. Here animals are products, central to today’s global agro-food regime just as they have been central, in the past, to human social and economic organisation, from early domestication onwards (Foucault, 2001).

Here lies the paradox of farm animals’ broader invisibility. Despite their numbers, this is a sector that is largely occluded from the public gaze, a sector whose presence is mediated by a careful construction. The iconography and representation of the rural animalia has long been a key component of the British countryside aesthetic and, linked to it, social order (Thomas, 1986). Livestock husbandry and pasturing practices are frequently seen as a key element in maintaining biodiversity and environmental quality and explicit links have been made between the extensive farming practices used in high value farming systems (Hellegers and Godeschalk, 1998), upland farming (Bignall and McCracken, 1993), low intensity farming systems (Beaufroy et al, 1994) or sensitive environmental area management (Evans, 2000). And yet, a report on livestock and the environment, published by the United Nations Food and Agriculture Organisation (UNFAO) in 2006, clearly states that “*the livestock sector emerges as one of the ...most significant contributors to the most serious environmental problems, at every scale from the local to the global*” (UNFAO, 2006 Executive Summary: online) and that livestock are responsible. Farm animals are integral to the materiality and representations of the rural social fabric and critical to the economies of many rural areas (Scruton, 1996; Buller and Morris, 2007), but this is an increasingly contested integrity. Moreover, it is accompanied by a physical invisibility not only through the preponderance of indoor housing and feeding systems, currently reaching an apogee in zero-grazing dairy farms, but also the hidden components of the farm animal production chain such as slaughter, stunning and the various interventions that are today routine in modern husbandry.

In both the discourses of production and of rural representation, the animal is ‘objectified’ and essentialised. What is missing is their relational presence as subjects-of-a-life within

multi-occupied spaces. Animal geography, the first consideration in this chapter, has created a new awareness of the animal, yet it has largely ignored farm animals as subject. Contemporary animal geography has begun to celebrate and champion the place of the non-human within what are increasingly seen as inter-subjective assemblages, particularly with respect to companion animals, but again, farm animals are often denied such consideration. Similarly, animal rights, the second domain I shall address in this chapter, has been very successful in creating a new ethical agenda within the human food chain, yet it has famously ignored the specificities of farm animals as individuals. To what extent do the practices of caring for animal health and welfare and of seeking multi-species, multi-space ecological sustainability within the farm offer the possibility of forms of co-practice that places human-animal relations more centrally within the more-than-human sites that are livestock farms? This is what I shall go on to explore in Chapter 2. In what follows in this chapter, however, I explore the primary conceptual lineages that have inspired and underlain this research; animal geographies and animal ethics.

1.2. Farm Animals in Animal Geography

The Emergence of a New Animal Geographies

Geographers have long held an interest in animals, in classifying different species, and in mapping their distribution to establish general laws about their arrangement across the earth's surface, identifying patterns of co-variation between animals and the environment. Under the influence of cultural studies during the 1960s, and more specifically the cultural ecology of Saussure (1952), animal geography extended its focus on the spatialisation and distribution of animals to document the origins of domestication and the characterisation of animals in relation to place, paying specific attention to the role of animal domestications in the transformation of 'Natural' into cultural landscapes. The call for animals to be taken more seriously however came much later during the 1990s, when following geography's entanglements with social theory, cultural studies, selected natural sciences and environmental ethics, Wolch and Emel were moved to address the 'animal question' and called for the animals to be brought back into geographical considerations following a period of 'peculiar silences' and the apparent absence of animals from the various

discourses in which they have been constituted. Suggesting that *“the plight of animals worldwide has never been more serious than it is today”* (1995:xi), Wolch and Emel argued the need for animals to be made visible within geographical research, not just as commodities for consumption, or resources for human use, but as animals in their own right that have bodily and other forms of presence in this world.

“We need another and a wiser and perhaps more mystical concept of animals.....We patronise them for their incompleteness, for their tragic fate of having taken form so far below ourselves. And therein we err and err greatly. For the animal shall not be measured by man. In a world older and more complete than ours they move finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren, they are not underlings; they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth” (1995:xi)

This intellectual challenge to take animals seriously was bound up in the rethinking of culture within social theory and newly emerging strands of cultural research which aroused interest in the role and affect of animals within the social construction of culture, human subjects, and the formation of human identity, both collective and individual. It also aroused interest in the essential qualities of animal subjectivity, leading to a re-evaluation of structural and discursive formations that have shaped animal lives and positioned them in a subordinate role. Geography began then to move beyond anthropocentric discourses of humans and Nature, towards an acceptance of animals as sentient beings, towards recognising the need for the consideration of animals in debates about the environment, the economic and social order, personal relations, justice and morality. This move led geographers to explore a variety of themes involving place based constructions of animals, and their social definition as wild or domestic, as being useful animals that are used for food, which act as our pets or become problematic animals that we classify as pests. Within these investigations interest has been taken in the coeval relationships between humans and animals and the conceptualisation of a more inclusive ethics and politics of the non-human.

The new animal geographies then sought in various ways to reveal how animals have been 'placed' in the material world, and how they have been imagined and represented by different societies at different times and in different places. Philo and Wilbert (2000) argue however, that such representations have a tendency to create animals as passive creatures, or surfaces "*on to which human groups inscribe imaginings and orderings of all kinds*" (Philo and Wilbert, 2000:5). Whilst Bauman (1993) argues that reducing animals to surfaces facilitates and perpetuates their detachment from humans, an accomplishment of social spacing for which there must be spaces in which animals are at their most secure, where their strangeness or difference is by common agreement inconsequential. We are therefore urged "*to give credence to the practices that are folded into the making of representations, and – at the core of the matter – to ask how animals themselves may figure in these practices*" (Philo and Wilbert, 2000:5). As the question of animal agency has been opened out within geography, and interest has been aroused in the extent to which animals cooperate with or resist our social orderings, philosophical speculations have once again emerged about the definition of animals in terms of sentience and the varying capacities they might have to act on their own behalf. Such questions however, have no definitive answer, as they are contextually bound within the time-space and classificatory systems of a particular human society; systems that are also infused with relations of power, as the dominant source of knowledge defines and becomes the legitimate spokesperson for the non-human other.

In modern western societies, the biological sciences have provided expert knowledge on animals and have informed the dominant social view, whilst environmental expertise heralds from the science of ecology, with lay, popular or experiential knowledges bound up in hegemonic struggles for authority to imaginatively position the non-human 'other' in relation to us. With a focus on animal agency however, it becomes obvious that the boundaries of such positioning, which have situated animals in dualistic opposition to humans as separate and subordinated creatures, are commonly transgressed and resisted by the animals themselves in their day to day lives, as they create "*their own 'beastly places' reflective of their own 'beastly ways, ends, doings, joys and sufferings*" (Philo and Wilbert, 2000:14). Such a challenge to the dominant world view of animals as unthinking, unfeeling beings has prompted proponents of anthropomorphism to question how we can

possibly know or interpret the way animals act, or even understand what animal agency is, drawing us back into questions about what constitutes animal.

Accounting for Non-Human Agency: networks, actants and hybrids

Whilst the answer to this question has been largely addressed, in the modern western world at least, by scientific methods, the very foundation of the knowledge this produces has been brought into question by science and technology studies (STS), and the emergence of Actor Network Theory (ANT). Actor Network theorists (Latour, 1987, 1988, 1989, 1999; Latour and Woolgar, 1979; Law, 1997; 1999; 2008; Callon, 1986), reject the view that science takes its power from accuracy based on the direct observation of the way the world really is. Arguing instead that the power of science is seen in its ability to control and manipulate both human and Natural elements in ways that allow scientific facts to be built and disseminated beyond the centres of scientific practice. Central to ANT is the relationship between the laboratory where knowledge is produced, and its external environment, and importantly the means through which the laboratory draws in entities from the outside ('Natural') world, subjects them to various (Social) processes of transformation and subsequently exports them out again, disseminating them as scientific facts. By studying these practices in relation to the constitution of human and non-human entities, it can then be argued that where their characteristics are assumed to be essential, with animals falling way short of human capabilities, that the essentialised characteristics we perceive in those entities are actually the effects of a network into which they have been enrolled. Thus in response to the question: what is animal? ANT points us not towards the animal itself, but to the processes and practices in which animals are engaged, as it is through these processes that animals are combined with other things and disciplined into their specific shape, function and character (Murdoch, 1997).

In its concern with this relationship between laboratories and other external locales, ANT elucidates a variety of mechanisms that tie various locations together across space. In particular it pays attention to the materials, practices and discourses in which relations of power are embedded and transported, and it focuses on the complex symmetrical alignment of heterogeneous entities that allow powerful scientific networks to emerge into the world; networks that link chains of entities in a variety of locations. By examining the way

entities are incorporated into these network chains, ANT indicates how discrete spaces and things, both human and non-human, come to be linked together in a relational arrangement. Within these network assemblages, and contrary to dominant scientific conceptions of the world in which the non-human entity is without thought, feeling and intentionality, all of the entities involved in a network have the capacity to act as they continually come together, combine, take their shape, and function within it. Human and non-human entities are therefore positioned as equals in the process of network construction, and as the networks are consolidated through their relational engagements, so places, knowledge practices and categories become a relatively stable arrangement of heterogeneous things.

For geographers then, ANT offers a framework to breakdown the dualistic boundaries constructed by science and to reconceptualise animals in relation to humans, as actors that are involved and defined by a collective endeavour in which they are intimately bound up and aligned with various Social, Natural and technological resources through which they are mobilised in a common cause (Murdoch, 1997). This makes it possible to account for heterogeneous arrangements of the Social and Natural world, humans and animals without separating and delineating one from the other, each being emergent hybrid effects that settle into and out of stable network configurations. Such an approach allows us to recognise the presence of animals in everyday life, and the heterogeneous relations in which they are constituted. The importance placed on network function however, and the things that come together to create stable relational arrangements, means that the animal body becomes just another node in a network, an empty surface devoid of the animalian qualities which set it apart from the human and other entities involved in the network. We are therefore left wondering just how and why animals come to be enrolled in certain networks, how they forge their own animalian place amongst human cultures and technologies, and what exactly it is that they do within these hybridised networks of socio-material competencies and effects.

Concerned with plugging the gap between Society and Nature through the process of network building, the human and non-human in ANT studies take on an inherently entangled and irredeemably heterogeneous form. As all things are 'flattened out' into equal parts of the network however, the individual gets lost in the relational configuration, raising questions about the balance between individuality and relationality. By bringing Nature

and Society together as equals in relation, ANT therefore seems to lack the ability to recognise individuality and therefore the difference between particular things and beings that are enrolled into a network (Laurier and Philo, 1999); differences that is between individual non-humans, whatever their/its form. It also overplays the enrolment of Natural things into the Social, without full regard to enrolments of the Social into the Natural world, or indeed the Natural into the Natural world, because these are the agencies less easily communicated (Woods, 1998). In doing so, the animal becomes collapsed into the more general category of the non-human which is empowering for humans, but it denies any sense of a non-human individual or indeed any notion that the non-human may be hybrid in itself (Lulka, 2009). As Jones (2006:572) notes:

“within ANT..... other-than-human organisms are lumped together with inanimate objects under the label ‘non-humans’. This raises the question whether inanimate objects and other-than-human organisms can in fact be treated equally when analysing network-building processes, or if this concept implies an unpropitious human-centred perspective, which ANT originally strived to overcome.”

Inspired by ANT, yet dissatisfied with its final outcome, Whatmore (2002) develops the concept of hybridity that emerges from network arrangements, into a non-dualistic ethics through which to extend the attribution of political entitlements and rights to the morally insignificant non-human other. Concerned with *“living fabrics rather than the abstract spaces of social life”* (2002:266), Whatmore draws out the relational configurations between humans, non-humans and technological devices to demonstrate how the physical and Social worlds of dualistic thinking are not separate and bounded, but a mishmash of entanglements, through which things are translated into everything else. From this perspective Society and Nature cannot be separated and fixed into their respective black boxes, as nothing can be isolated and pure. Rather Society and Nature are perpetually combined into a hybridised form. Indeed Whatmore suggests that *“hybridity signals not just the inter-connectedness of pre-given entities but the condition of immanent potentiality that harbours the very possibility of their coming into being”* (Whatmore, 2002:160-161). This conception that every ‘thing’ in the Social and Natural world is a hybridised form, points to a sort of holism in which these ‘things’ that make up the world are emergent properties of a system that are always in the process of being made (Demeritt, 2005). It is

through this focus on the processural nature of networks, in which worldly ‘things’ are continually shaped and formed by the relations in which they are participating, that Whatmore draws on Deleuzian ideas of emergence and becoming, and she is able to avoid the categorisation and fixity that an emphasis on network stability would create. As networks are always in the process of becoming they are engaged in and through the performances of the actors, both human and non-human, that bring the networks into being; actors that also make a difference to the way the network performs. This focus on relationally constituted hybrid beings enables Whatmore to argue that politics can no longer be classified as a purely human domain, thereby extending the realm of ethical considerability to include the non-human subject. As the animal becomes a hybrid with political entitlements however, so the animalness of the animal gets lost in translation, prompting Philo to suggest that they “*remain somewhat shadowy presences*” (Philo, 2005:829), with their differences in terms of species and individuality confined to the margins of ethical and political thought.

There are similarities here with Derrida’s (2002) critique of the animal as a singular form. To use the term animal he argues, is a misrepresentation, as there is not one animal but many, all different with varying needs. This plurality of animals however is assembled by humans into a singular figure of animality, leading Derrida to mobilise the term ‘animot’ in order to have the plural of animals heard in the singular. Articulating the difficulties involved in relational thinking, Castree (2003) also takes up the issue of difference and wonders what might be lost by denying the non-human domain a radical ontological otherness.

“As Massey (1999:74) asks ‘how do you retain alterity, how do you allow autonomy?’ how, that is do we conceive of Haraway’s (1992) ‘in/appropriated others’? To be ‘other’ is not necessarily to be independent, but it is perhaps to be unassimilable (Hailwood, 2000) – what Graham (2002:27) calls ‘the necessary non-consanguinity between humans and things’. To deny this is arguably to risk collapse of wild differences into tamed others.” (Castree, 2003:208).

As well as questions of difference between species and breed of animal, there are also as Jones (2000) suggests, political advantages to be gained when the non-individual nature of

individuals is denied; advantages that tend to favour collectives, populations and species for example over the different needs of the individuals that comprise them, particularly as the treatment of individuals is commonly driven by and embedded within relationships with those collectives and populations in the particular spaces they occupy. Indeed Serpell states that “...*in the field of nature conservation, it is common to ignore or subordinate the interests of individual animals for the perceived good of their own or other species.*” (Serpell, 1995, cited Jones, 2000:277). In these situations greater importance is assigned to wild animals living ‘naturally’ than to domestic animals in artificial environments, whilst humans remain dominant over animals as a whole. Interestingly Lulka (2009:379) contends that “*the geographical literature on hybridity is still embedded with a residual humanism*”, arguing that under the influence of STS, humanity has been portrayed as central to hybridity, with power relations skewed against the non-human. As a consequence, the use of hybridity as a conceptual tool within geography and the social sciences, has ignored the possibility that animals live in the world despite our human presence, and therefore fails to account for all of the agencies that exist.

Lulka suggests then that we need to move away from this idea that hybridity refers to humans more than it does to other entities and borrow from the emergent theories of the biological sciences, where hybridity is seen to take place outside of Society. This allows the animal to be considered as a hybrid being in itself, as occurs for example when it moves into and out of complex multidimensional performances of interaction which bring about unexpected hybridities; hybridities arising perhaps from the presence of multiple beings, or from a shift in performance from play to self defence. These material performances he suggests, communicate certain functional meanings, and they enable the animal to know and learn through the body without humans in their midst, without human interference or participation. This is not meant to deny human-non-human hybridity as currently validated in the geographic field, but to add thickness to the world by accepting that it has not been entirely appropriated by humans (Lulka, 2009). Adopting a biological notion of hybridity then provides a way to bring the animals back in to geographical research as beings in their own right, whilst also accepting existing interdependencies between humans and animals.

Acknowledging (Farm) Animal Subjectivities

“It is not a question of anti-humanism, but a question of whether subjectivity is produced solely by internal faculties of the soul, interpersonal relations, and intra-familial complexes, or whether non-human machines such as social, cultural, environmental assemblages enter into the very production of subjectivity itself.” (Goodchild, 1996, cited Murdoch, 2006:184)

There has been a tendency in early geographic and social theory for animals to be represented primarily as objects. Such objectification has been founded on philosophical arguments surrounding the limited mental capacity of animals, their perceived lack of sentience and their inability to communicate with the higher human subject through some form of shared language. It is through these perceptions that animals have been constructed as distinct from and inferior to humans, and they have prevented us from seeing animals as they actually are, from knowing what they might think, feel, want and need. In calling for animals to be taken more seriously, Wolch (1998) has argued that a necessary first step to understanding animals in day to day practice is to grant them subjectivity. In order to achieve this, she suggests that theorists must not only start to “*think like a mountain*”, as Leopold (1966:137) prompts us to do having witnessed the fierce green fire dying in the old wolf’s eyes, and his subsequent realisation that “*only the mountain has lived long enough to listen objectively to the howl of the wolf*” (Leopold, 1966:137), but also to “*think like a bat*”, somehow overcoming Nagel’s (1974) classic objection that it is humanely impossible to answer a questions such as; ‘*what is it like to be a bat?*’, or indeed “*what is it like to be an animal?*” (Wolch, 1998:122); an objection, which based on the bodily differences of humans and animals, and the way we perceive life and the world around us through different sensory experiences, that has been increasingly challenged by research emerging in behavioural and evolutionary science which has drawn attention to the complexity of animal lives, the extent of animal cognition and their ability to communicate in the human and non-human world.

Being dismissive of the language barrier that exists between humans and animals as preventative of mutual understanding, Vinciane Despret (2008) for example, points out that communication between humans and animals should be seen as an exchange of properties

that can be learnt, with meanings constructed in a constant movement of attunement which makes them emerge. Talking she suggests, is not necessarily about the use of a specific dialect or language, rather it involves a back and forth exchange of judgements about intentions. It is a practice between beings that populates those present with perspectival propositions and it involves the translation of behaviour, and a constant adjustment of intentionalities so that each participant becomes aware that “*I know that you know what I intend to do*” (Despret, 2008:134), just as the mountain is aware of the wolf, and the wolf of the mountain. It is through this practice of engagement between humans and animals (or animals and the environment) Despret argues, that the animal is inscribed in the human world of speaking, and I would argue Leopold’s wolf is inscribed in the world of the mountain. As such communication becomes a relational performance of expressive non-verbal action with the performativity of language de-emphasised in favour of performance as affective matter. Interestingly in her recent reflections of the play *War Horse*, Linda Burke (2010) reminds us that relations between humans and animals not only transcend spatial and conceptual boundaries as passionate bonds are formed between them, but that the mere presence of animals can facilitate communication both with and between humans despite barriers to the spoken language.

Linking the cognitive ability of animals to that of humans with autism, Temple Grandin (2006) argues that ‘*normal*’ (her perception of non-autistic) human beings do not see the world as the animal sees it because they are so “*abstractified in their sensory perceptions and [] thoughts*” (2006: 50-51) that they do not see the minute detail as it actually exists. Like humans with autism, Grandin demonstrates that animals perceive the world, not in words expressed in language, but in the pictures and detailed images of what they see before them. She therefore suggests that if ‘*normal*’ (non-autistic) human beings can ignore the abstract, generalised concept of what they see, hear and think, then they would begin to develop a better understanding of animals and why they react to the things they encounter in their day to day lives. Indeed Beckoff (2006) suggests that whilst we can never really know the secrets that lurk within an animals mind, we can interpret their emotional experiences because these are transparent in the way an animal behaves. We can then make quite accurate predictions about what this behaviour means based upon our relationship with the animal, our experience with and knowledge of it. Learning about animal lives by observing their behaviour is essential he suggests, because it can help us to

gain an appreciation of who animals really are, and this in turn can help us understand ourselves and the environments we inhabit.

Research that has emerged in animal social behaviour and evolutionary biology then has drawn attention to the complexity of the way animals think and the way they communicate through different forms of behaviour. Coupled with work in critical social theory that has sought to deconstruct the universal human subject, such work has been instrumental in opening up questions of animal subjectivity, with researchers beginning to recognise that animals, just like humans, can and do communicate, not through a shared language, but through different ways of seeing (Grandin, 2006), through particular forms of behaviour (Beckoff, 2006; Risan, 2005; Hearne, 1994; Porcher, 2007), and through their own animalian systems of communication and organisation (Gullo et al, 1998) which suggests an active participation in rich and complex lives.

Nevertheless, at the end of the day, though the new animal geographies have drawn our attention to relationality and animal subjectivities in general, there has been little academic interest in domestic livestock animals. On the limited occasions where farm animals have been the central focus of study they have commonly been constructed as units of production and economic exchange that have some value to humans (Noske, 1997). Or they have been seen as objects that hold symbolic significance, particularly where traditional breeds such as the Gloucester Old Spot pig has been fixed to specific places that are seen as part of our cultural heritage (Yarwood and Evans, 1998). There has also been some interest in the relationships between humans and farm animals within agricultural production systems, although there has been a tendency here to focus on the human experience of animals and on the practices undertaken in the process of livestock farming, rather than on how the animal itself thinks, feels and experiences life in relation to the humans with which it comes into contact (Gray, 1998). Such studies have continued to construct farm animals as objective things that possess a set of generalised characteristics often based on an essence that is understood to be inherent in their species, and they often fail to account for the personality traits and individualised strategies that an animal develops as it relates to and interacts with humans and the environments that it inhabits.

It is only quite recently that research interests have been aroused around the mutual affect of human-animal relations (Wilkie, 2005; 2010) and the subjectivity of farm animals, with Holloway (2007) for example suggesting that to essentialise the subjectivity of farm animals in the way much previous research has done is to “*negate their potential to become, to be co-constituted as they are entrained within various and changing sets of socioeconomic, ecological, spatial, and technological relationships*” (2007:1041). It ignores he suggests, the complexity of what a farm animal is. Aware of this shortcoming within geographical research, Holloway delved into the constitution of farm animal subjectivities by exploring the impact of automated milking technologies and spatial arrangements of agricultural systems on livestock. Drawing on notions of Foucault’s biopower, which is described as the entrainment of life itself into a “*densely constituted field of knowledge, power and technique*” (Best and Kellner, 1991:50), Holloway argues that “*what farming does to animal bodies, and what it makes them do with their bodies, is important in terms of their subjectivities*” (Holloway, 2007:7).

Foucault’s (1990) notion of biopower has two dimensions, the first focuses on the individual body as a machine which can be disciplined into systems of efficient and economic control. Whilst the second is concerned with regulating the populations within which the individual exists, and involves the techniques for achieving the subjugation of those bodies. Evidence of both dimensions Holloway suggests, can be seen in robotic or automated milking systems (AMS) where individual dairy cattle are chosen for their suitability to the equipment in terms of their body shape, temperament and genetic ability for example, and are then trained in its use. The efficiency of the system and its disciplinary effect he points out is dependant on the capability of the animal to respond to the system, and on the spatial arrangements of the farm, with buildings and equipment for example designed to control how the animals move and what they do. Forced to live and behave in specific ways, the cows internalise the disciplinary authority of the automated system and become constituted as its docile subjects. It is through these strategies of normalisation that, Holloway suggests, particular bovine subjectivities are both expected and produced.

In seeking to broaden understandings of farm animal subjectivity, Holloway goes on to demonstrate that the AMS not only alters the human-animal relation as cows are milked

robotically without human interference, but that it creates new and different forms of bovine (and human) subjectivity that are specific to the system. In old style milking regimes for example, cows are managed and controlled closely when the whole herd is brought in for routine milking two or three times a day, whereas in the new automated systems animals are individualised as they present themselves for milking at a time of their own choosing. In the automated system animals therefore become visible as individual beings as it produces:

“cows whose subjectivity is characterised by the effects of freedom and autonomy which, first are produced by their relationship with particular technologies and management systems, and second, differentiates them from cows in conventional systems whose freedom to follow natural behaviours is withheld.” (Holloway, 2007:10).

Whilst the new AMS affords cows some autonomy in choosing when to be milked, it is still necessary for individual animals to make the right choices and exercise their freedom in accordance with the system. These choices are shaped by the spatial layout of the farm, which commonly guides individual movements through one-way systems, from the milking area to the feeding area and the resting areas beyond. Such control of animal movements has further implications for animal subjectivities and social relations within the herd in that it can trigger effects of social dominance as hierarchies are worked out in accordance to the spaces and associated technologies that the animals come into contact with. Grandin (2006) suggests that controlling animal movements through farming and handling systems can evoke a sense of rage, fear, and panic in individual animals when they are faced with novelties in their environment such as a shadow, drafts, flapping object or high pitched squeak for example; things that might be construed by humans to be mere trivialities, but which to the animal experiencing it, pose a very real and potential threat. These minute details in the technological and spatial layout contribute to the constitution of bovine subjectivity, in that they influence the way an animal thinks, feels and behaves as its movements are structured to the rhythms and flows of the system.

In her study of human-livestock relations Wilkie (2002; 2010) demonstrates that relations and interactions with humans are similarly influential. Describing livestock as ‘*sentient*

commodities', Wilkie has shown that farmers in different systems attach a more or less commodified status to animals depending on a number of factors, such as function, personality, characteristic traits and so on. This commodification status she argues, affects the visibility of animals within the farming system, and the emotional attachment or detachment of stockpersons which has subsequent consequences for interactions and hence the care animals receive. Animals in intensive systems for example are shown to be more commodified in that they are commonly seen as units of production which translate into money over a given period of time. Whilst these animals are well cared for, they are seen as a group that moves through the system, with little interaction from stockpersons on an individual basis as they distance themselves from animals that they know will only have a short life. On smaller less intensive and hobby farming systems alternatively, the financial value of livestock is not as important which means that the animals are less commodified. In these systems the animals stay on the farm much longer and interaction with stockpersons is greater with the animals known as individuals and commonly given names. Wilkie goes on to demonstrate that the status of livestock also varies according to the role the animal plays within the production system, with breeding animals for example, or animals with character commonly seen as less commodified and enjoying greater interaction with stockpersons than animals that are fattened for slaughter. She also demonstrates that the status of an animal is not static, in that it changes at particular stages of production, with breeding stock again by way of an example, becoming more commodified as they come to the end of their productive life and they go off for slaughter. The more commodified livestock become the more they are seen as part of a group and the less visible they are as individual animals. As livestock are decommodified however, animals come into view as individual beings with their own subjectivities and they experience the high levels of interaction with stockpersons that is necessary for understanding who they are and what they need.

Understanding the subjectivity of livestock as an intersubjective process involving technological equipment, human interaction and buildings that shape what an animal can do, has consequences for the way we think about animals and the way they behave. It suggests that the things we subject animals to in the process of production, act on, control and produce a certain type of animal life; one that may or may not be good for welfare or from the animals point of view. Exploring these subjectifying processes in everyday

farming practice, can bring animals into view as individual beings whose “*subjectivity is constituted in particular circumstances, and is associated with concurrent processes of ‘becoming subject to’*” (Holloway, 2006:15). This leads us to an understanding of bovine subjectivities that are contingent upon the farming system and what the animals come into contact with, and it creates heterogeneous subjectivities which challenge previous conceptions of farm animals as dumb mechanical objects whose behaviour is associated with an automated response or the essence of a living thing. To recognise that farm animals are an emergent effect of the systems in which they are kept is to see animals not as isolated objects that are separated from human subjects by a strict conceptual boundary, but rather to see them as relational to the different technologies, economies and social conditions of both the human’s and other animals that they are associated with. We can begin then to see what makes a world for farm animals, what makes them happy, active or frightened, and what makes a good life for them as they participate in their own production. As Vinciane Despret (2008) so rightly suggests in her reflections on ‘The Becomings of Subjectivity in Animal Worlds’, the question of animal subjectivity is not “*what is a [cow], but how does one become a [cow], not only in the [cow] community, not only in the [cow] species, but also how does one become a [cow] in the work of [farmers] constructing what it is to be a [cow].*” (2008: 127)

Thinking Relationally: Intersubjectivity and Relationality

“[T]he idea of subject positions ...precludes the possibility of an inter-subjective perspective that would define the [animal] subject not as purely autonomous and self-present, not as a mere place on intersecting grids, but as constituted through its ongoing relations to others...” (Anderson, 1992:78, cited Whatmore, 2002:153)

In drawing attention to the heterogeneous subject positions that are created within traditional and automated milking systems (AMS) by demonstrating, through notions of biopower how animal subjectivities are constituted in technical devices and interactions with humans, Holloway unsettles the taken-for-granted status of farm animals as material objects and attempts to admit them as radically different kinds of subject into the Social world of the farm. Yet, even here, the removal of the human in automated milking systems problematises the possibility of animal subjectivity, as (contrary to the Kantian figure of the

self-conscious individual) it is now widely held in many sectors of the Social Sciences, that there can be no such thing as the autonomous self (Whatmore, 1997, 2002). In the robotic milking systems Holloway talks about, bovine subjectivity is structured in, through and by the technological devices that the cow learns to use autonomously when it wants to be milked and/or fed. In using this equipment without human interaction however, the cow becomes part of the technological mechanism; an inanimate object that has had all trace of animality expunged (Whatmore, 2002:12).

The turn towards a more relational understanding of the Social world that emerged through poststructuralist and feminist critiques of the autonomous self has been important for researching with and for animals in that many theorists now accept that the material body cannot act alone; it is always in relation with the consciousness of the mind, like the self with other, the inside with outside, the human with animal and Society with Nature. Any distinctions that have been made between them using rational systems of comparison have historically figured the human individual to be different from other species, to be superior to them, with consciousness, mind and soul. This has led to the separation, subjugation and control of animals and Nature from the dominant Social world. And it has positioned them as objects that are marginalised, denying them any status of knowing, thinking, feeling and communicating. If bovine and indeed other animal subjectivities are to become and remain visible in the farming environment, it is necessary to deconstruct this human exceptionalism and break free from conceptions of an autonomous, rational, self-determining individual, to recognise the intersubjective relations and the mutual being together of humans and animals. As Whatmore points out, subjectivity necessarily centres “*on a notion of difference in relation, as inter-subjectively constituted in the context of practical or lived configurations of self and community*” (Whatmore, 2002:153). It is only by thinking about farm animals as material, intersubjective and relational beings that we can begin to

“...understand the discursive construction of [] [livestock] across multiple modalities of difference..... [and] trace the connections between discursive practices and exploitative social orderings of meaning, being and struggle which permit and encode them” (hooks, 1990, in Whatmore, 2002:153).

Attempts at understanding the subjectivity of farm animals as a relational achievement then, reflects theoretical trends in the Social and Technological Sciences to overcome Cartesian mechanistic thinking premised on an a priori separation of Society and Nature, and to recognise the identity of a subject, whether human or non-human, as historically grounded and located in space. This relational way of thinking also reflects ecological accounts of the world as a whole living organism which encompass recognition of human embeddedness in constitutive relations with the non-human world. In the move to embrace a relational ontology, research enquiries have increasingly focused on how humans and non-humans, organisms and technologies inhabit the planet in ways that challenge and disrupt the Nature-culture dichotomy. As discussed above, Latour's (1993) ontology is concerned with the complex alignment of heterogeneous things which he traces through networks that link chains of entities both human and non-human in a relational arrangement across various locations. It is from within these networks that agency is seen to emerge as a circulating effect, achieved through continuous interactions within the heterogeneous arrangements in which entities are immersed. As entities come together, combine, take their shape, and function within the network, so subjectivities emerge which challenge dominant representations of animals and the non-human that have fixed their identities and their place in the Social world. Within a network formation the overarching power of human agencies is thus brought into balance by the power of non-human agencies (Lulka, 2009), putting Society and Nature, humans and animals on an equal rather than hierarchical footing.

Sharing Latour's enthusiasm to disrupt ontological boundaries between Society and Nature, human and animal, Donna Haraway turns our attention to what counts as Nature, and who or what is eligible to occupy the categories that are designated as Natural. Developing hybrid concepts of Society and Nature through 'chimeras', the figure of the cyborg (half man, half machine) (Haraway 1997), primates (Haraway, 1989), dogs (Haraway, 2003) and companion species (2008), Haraway extends the work of ANT as it follows network formations from the 'outside' of a situation to map individual agency, by tracing scientific practice from 'inside' a situation. Arguing that Latour's ontology fails to account for the Social explanations of scientific practice, Haraway maps embodied encounters to explore how enrolment into a network disrupts, deforms and disfigures the identities of actants to create different sets of techno-human hybrid other, like the figure of the cyborg, and

humans who contain other animals within (such as bacteria, and animal organs). In so doing she is able to reconfigure what counts as knowledge and reality in the biological, physiological, animal and techno-sciences, drawing into question what it is to be human and thus the notion of a longstanding inherent right to set humans above animals and the non-human world.

Haraway (2003) goes on to erode the species divide by examining dog-human relations, exploring how changes have occurred in the way we have thought about dogs over time, what we think dogs should be in terms of their genetic composition, the behavioural expectations we have of them and the strategies we adopt in their management and care. In so doing Haraway makes links between history, evolution, institutions and science to show that dog-human relations are interconnected, enmeshed in discourses that are constitutively historical, partial, selective and consequently non-innocent. Animals she suggests have no history of their own. What they have is a history that humans have created for them. Thus far from being separate entities divided by the species boundary, as depicted in enlightened rational thought, Haraway shows us that humans and dogs become instances of ‘speculative fiction’ and that they share joint futures as part of emergent worlds. Not only does this reformulate our notion of the subject as relational and interdependent rather than individual and autonomous, but it enables us to recognise both the human and non-human as subjects-to-be; subjects that, always in relation, are in the process of being made as they come together and interact in their daily performances of living in the world.

In mobilising the concept of ‘companion species’ (Haraway 2003) to depict beings that come into being through a way of being with, Haraway (2008) then draws on experiences of ‘being with’ her dog Cayenne to develop the argument that a new kind of hybrid is brought into being at the moment of their connection; a being that is performed as an extension of the subject and enhanced by the connection (Latimer, 2010). It is in this moment of connection she suggests that neither the subject of the human nor the subject of the dog remain the same. Rather they enact and perform specific cultural practices that create human-animal assemblages which produce something more; *“to knot companion and species together in encounter, in regard and respect, is to enter the world of becoming with, where who and what are, is precisely what is at stake”* (Haraway 2008:19). What

these modes of inquiry suggest is that in dealing with animal subjectivities, we must always think relationally.

Following on from Latour's technical quasi-object hybrids and Haraway's hybrid companion figures, bio-philosophy and the knowledge practices of everyday life (Sellick, 2005:60), Whatmore calls for a more performative notion of animals that attends to the way things are assembled, gathered and mobilised in the everyday worlds of people and animals and the environments they inhabit. In seeking to avoid the simplified notion of hybridity as merely the joining together "*of two (or more) previously separated entities*" (Jones, 2006:188), Whatmore maps the spatial configurations of wildlife to demonstrate how animals are caught up in networks of entertainment, conservation and science matter, as active agents and experiential subjects whose positionalities shift over time, across space, and between the networks in which they are entrenched. Illustrating some of the inconsistencies and contradictions that arise in these configurations, Whatmore draws attention to the difficulty in defining political subjects in a world where the boundaries between the human and non-human are becoming harder to discern. She also

"explicitly criticises the anthropocentric traditions of political reasoning that remain dominant to this day, and argues for a new settlement in which prions, cows, microchips, prosthetics, growth hormones, elephants and other 'actants' might figure as political subjects" (Castree, 2003:204).

Turning to the micro realities of elephants that are kept in captivity at Paignton Zoo, Whatmore goes on to develop a stronger notion than ANT of the individual within a network. By describing the daily routines of elephants Duchess and Gay, Whatmore demonstrates how important the individual is, not just in terms of how or what it contributes to the relational arrangement of the network itself, but also in terms of the practices that emerge from those network collectives and the affect these can have on individual entities. By tracing how Duchess and Gay are tied up in networks of conservation which link them to their wild and nomadic counterparts in other areas of the world, Whatmore and Thorne (2000) show for instance, how the elephants themselves also at the same time have their own individual needs, bonds, experiences and habits that have developed in the context of the zoo.

*“Zoo animals such as Duchess and Gay may be kindred under the taxon *Loxodonta Africana*, but in many other senses they are worlds apart. For all the scrutiny, veterinary intervention and population management, the elephants of Chobe still lead nomadic socially rich and ecologically complex lives. For all the attention to design, stimulation, and care in her new savannah enclosure in Paignton Zoo, Duchess has become habituated to a more impoverished repertoire of sociability, movement, and life skills that will always set her apart”* (Whatmore and Thorne, 2000;201-202)

This seems to point to a sort of collective subjectivity that constitutes the *Loxodonta Africana*; one that defines and determines how the elephants in their ‘natural’ environment would consciously behave, visiting selected feeding sites and watering holes for instance, roaming together and interacting as an autonomous group. This collective subjectivity could be construed as the elephantness of the elephant, what Rollin (2003) might describe as the animals *telos*, which is the ability to pursue life in the environment in their own unique way. Or what Bourdieu (1986) would describe as *habitus*, a concept that denotes the structure of the mind as characterised by a set of schemata, sensibilities, dispositions and taste which influence what the animals do and the way they live in the environments they inhabit. What we think when we encounter elephants or indeed any form of animal, is commonly informed by this collective subjectivity through which the animals see themselves and act as one. As Whatmore and Thorne clearly show us however, when elephants of the same taxon are found in different contexts, they adapt their behaviour to cope with their environment and become habituated to a whole different way of life. In so doing individuals retain some elements of collective subjectivity and combine this with their own adaptive practices so that individual subjectivities emerge; individual subjectivities which are hybrid forms of the collective and the self. In describing the micro realities of elephants at the zoo, Whatmore and Thorne show us that there is a tendency to base morally and ethically acceptable practices towards animals on this collective subjectivity, and that when taken out of context, this can be harmful to the individual.

Whilst the animal collective is made up of many individuals that share species specific subjectivities, behaviours and needs, each contributing in some way to the collective subjectivity of the group, every individual has at the same time its own subjectivity, wants and needs, that require consideration in its own specific context; a context, like subjectivity

that is necessarily relational and always in the process of being made. As Mol (2006) clearly shows in her study of hospital practice, the care required for an individual is quite different to that required for the collective. Individual care is necessarily context specific and changes over time, requiring constant adjustment, although it also remains firmly embedded within the care needed for the collective; one cannot be reduced to the other. To ignore the individual subjectivity of an animal would therefore be to treat it in an unacceptable fashion. Indeed as Whatmore and Thorne seemingly imply in their discussion about Duchess and Gay, to determine if our practices towards animals are acceptable or unacceptable, it is necessary to trace those practices through networked and hybrid relations (Sellick, 2005) as this puts their lives and experiences into the context of their own existence. By re-writing their history, we can begin to reconnect with animals and respond to *their* needs.

It is then through notions of relationality that there is “*a focus on beings and things that are all seen as material, but possess different capacities by virtue of their entanglements with other beings and things.*” (Castree, 2003:207). Relationality thus provides a way of making individual animals visible as subjective beings that are in relation, not only to humans, but also at the same time with non-human organisms in the environments in which they exist. Relational approaches such as those outlined above have nonetheless been criticised for their failure to account for “*the existing social and political terrains over which networks are constructed*” (Woods, 1998:338). As networks are ever expanding, any attempt at tracing a network will necessarily provide only partial and selective accounts of political conflicts. Such difficulties have been overcome in the social sciences through notions of the co-constitution and co-construction of achievements by humans and non-humans, or the anthropological notion of dwelling as reconfigured by Ingold (1993), which “*sees action in the world as the outcome of the ongoing interplay between bodies, materials and spaces*” (Jones, 2006:188). From this dwelling perspective Natural and inanimate things become active participants as “*people’s habitual embodied, engagements with them build up specific materialized formations of meaning through practice*” (Jones, 2006:189). Nature thus becomes a complex, spatial and temporal achievement that is embodied through sensual experiences of physical components, thereby re-embedding human relationships with Nature within “*the continuum of organic life*” (McNaughton and Urry, 1997:249). It is through this notion of dwelling, Ingold argues, that “*the world*

becomes a meaningful environment” (Ingold, 2001:173), with landscape being *“the world as it is known to those who dwell therein”* (Ingold, 2001:193).

Wylie (2003) takes this notion of dwelling further by arguing that there is fuller presence of relational material processes in accounts of everyday life, such as the transitional and fleeting experiences that are activated in our engagements with landscape and our encounters with the ‘Natural’ world. Whilst climbing Glastonbury Tor for instance, Wylie notes that:

“The view is a moment of focus and comparative stillness: you compose yourself by taking in what is around you. And this composure is an essential aspect of the experience of the ascent. Eyes and arms and chest take a position in relation to the landscape below to reach an equilibrium, with hands on hips or head, deep breaths, drinking eyes. The body composes itself by turning to the elements and the levels of the landscape. This composition moreover is intimate with the emergence of an idea of coherence and awareness. One becomes this individual, this locus, this point of view, in the midst of seeing and framing.” (Wylie, 2003:152).

The articulation of this mobile dwelling experience draws attention to specific material configurations of the landscape and Nature, along with a specific, sensed and embodied engagement with it. It demonstrates a form of relatedness that is perceptive, responsive and performative, with the landscape and the ‘Natural’ world emerging as the medium through which performances are enabled and enacted.

Relationality then is not only ecological, in the sense that it involves interrelations between individual organisms, both human and non-human, communities and collectives of those organisms, and the ecosystems in which they all exist, it is also involves transitional and fleeting experiences as the Natural and the Social are engaged in the material performances of everyday life. These interrelationships can be seen most explicitly in the context of livestock farming, which coupled with all of the caveats this may have ethically, highlights the need for a relational study of the farm. With a focus on everyday farming practice, a relational study of the farm could account for both human and animal subjects in the environments they inhabit. This would go some way to overcoming concerns aired by

Birke (2010), who in her recent speculations about research and ‘what’s in it for the animals’, suggests that human animal studies are in danger of becoming too theoretical and too little informed by practice. To be accountable to our animal subjects she suggests we need to effect change in the way animals are treated. To understand how animals are treated we need to study human-animal relations in everyday practices. If humans, farm animals and the environment can be reconfigured as relational assemblages, the work that goes into boundary maintenance will be brought into view, and challenge our present ordering of Social relations.

1.3. The Ethical Status of (Farm) Animals

Within the social sciences and the humanities, farm animals are most clearly visible in a set of philosophical positions associated with ethics. Yet, even here, their status is equivocal, with moral questions, disagreements and ongoing conversations arising about how and why they should count morally (Singer, 1975; Regan, Cohen and Regan, 2001; Varner, 1998; Donovan, 1990; Dawkins, 1980; DeGrazia, 1996; Marcus, 2005; Adams, 2003; Midgley, 1983). Do cows, pigs, and sheep for instance have the capacity to think, feel and suffer, or make decisions about their lives? Should they be considered equal to humans, or have certain rights bestowed on them according to their moral status? Should they be bred, reared and killed for the benefit of humans? And if so, how ought they to then be treated? Whilst these questions connect with the moral status of animals in general, it is farm animals that have been the specific focus of ethical discussions, largely because they have and will continue to form a staple part of many human diets. Indeed virtue ethicists hold that it is our very actions towards these animals that express the kind of people we are, with the relations we have with farm animals telling us something about ourselves. These issues have been the focus of a recent ESRC funded seminar series, *Understanding Human Behaviour through Human Animal Relations* (2010), where many aspects of human-farm animal relations have been explored through a series of collaborative interdisciplinary workshops, alongside human relations with other animals, as a contribution to the knowledge we currently have of our own human behaviour.

There is also an ecological component in these debates as farm animals are dependant on the environment for shelter and for their food. The rearing of stock animals however has been associated with pollution, environmental degradation and the acceleration of climate change (Singer, 2008), whilst at the same time being associated with the conservation of particular ecosystems and habitats that support valued biodiversity. This adds another critical dimension to the moral and ethical debates about farm animals, their place and status in the world as living sentient beings, what they contribute and how they should be treated. All of these things affect the choices that are made in day to day life, from our decision to eat or abstain from eating meat, to the production systems in which livestock are cared for, and the purchasing choices that are made by consumers. In what follows I explore debates about the ethical status of farm animals and try to make sense of the contribution they make to the lives of the animals themselves.

The Question of Equality

Adopting a utilitarian perspective on human-animal relations, Peter Singer first published his views on animals in the New York Review of Books (1973) and then more comprehensively in 'Animal Liberation' (1975), which "*brought questions about the moral status of animals into intellectual respectability*" (DeGrazia, 1996:2). Focusing on the suffering of animals, Singer's primary concern was for the interests of those who are affected by what we (humans) do, no matter who holds the strongest interests. And he urged his readers "*to extend to other species the basic principle of equality that most of us recognise should be extended to all members of our own species*" (1989: 74 – 79).

Following Bentham and Kant, Singer made the claim that as sentient beings, animals have the capacity to experience pleasure and suffer pain. This 'capacity for suffering', he argued is a "*prerequisite for having interests at all, a condition that must be satisfied before we can speak of interests in a meaningful way*" (Singer, 1997: 7) and it is the vital characteristic on which the principle of equal consideration is based. In this hedonistic form of utilitarianism, equality does not depend on intelligence, moral capacity, physical strength or any other matter of fact, rather it is a "*moral ideal*" (Singer, 2002: 82) and it is morally right, Singer argued, for any creature with interests that are equally worthy to the interests of other sentient beings, to have their suffering counted equally with the like suffering of any other being. To do otherwise would amount to speciesism, a form of

immoral and indefensible prejudice by man against other species; a prejudice he likened politically to racial or sexual discrimination.

In seeking to expand moral horizons and extend or at least reinterpret the basic moral principle of equality to include those creatures previously excluded from the moral realm, Singer challenged the moral orthodoxy without having to prove anything other than animal sentience. Distancing himself from feeling and emotion which he argued to be a 'womanish' sentiment that would trivialise the argument (Donovan, 1990: 34), he went on to powerfully demonstrate how animals have historically been the product of unjustifiable prejudice and cruelty through farming practices and the large scale slaughtering of animals for food. Arguing the need to rethink our most fundamental attitudes towards animals to prevent or at least minimise their suffering irrespective of their mental or physical characteristics, Singer advocated the need for radical changes in the way we treat animals, suggesting that it would be morally right to boycott animal products and adopt a vegetarian diet. In principle however, Singer did not consider it wrong to kill animals for food, although he suggested that the wrongness of killing is more complicated than the wrongness of inflicting pain (Varner, 1998: 105).

“As long as a sentient being is conscious, it has an interest in experiencing as much pleasure and as little pain as possible. Sentience suffices to place a being within the sphere of equal consideration of interests; but it does not mean that the being has a personal interest in continuing to live. For a non-self-conscious being, death is the cessation of experiences, in much the same way that birth is the beginning of experiences. Death cannot be contrary to a preference for commencing life... Given that an animal belongs to a species incapable of self-consciousness, it follows that it is not wrong to rear and kill it for food, provided that it lives a pleasant life and, after being killed, will be replaced by another animal which will lead a similarly pleasant life and would not have existed if the first animal had not been killed. This means that vegetarianism is not obligatory for those who can obtain meat from animals that they know to have been reared in this manner (Singer, 2002: 120 - 121).

Singer then appears to acknowledge animal lives in the co-constitutional framework of livestock farming as a valid ethical position that justifies the existence of farm animals for food, and appears to accept that farm animals can be eaten as long as they have had a good life. However, in justifying the killing of animals for food in this way the value of human and animal life is considered unequal which means that the principle of equality cannot be maintained. In considering animal lives to be less valuable however, because they lack the human capacity for self-awareness, abstract thought, complex forms of planning and communication, Singer defends his position against speciesism by arguing that one life is not held to be greater than another on the basis of species. Yet by concentrating entirely or mainly on consequences and obtaining the best possible outcome for welfare, the belief that any wrong doing towards a non-self-conscious being can be put right by conferring benefits onto future non-self-conscious beings, assumes that animal lives are interchangeable in a way that human lives are not, making this a form of preference utilitarianism in which good (pleasure or happiness) may be equated with the satisfaction of wants. It therefore becomes important to quantify suffering otherwise there is nothing to prevent the infliction of extreme or prolonged pain onto a few individual animals, provided that a greater balance of pleasure can be achieved than it would by taking any other available course of action.

Animal Rights

The animal rights position developed by Tom Regan in 'The Case for Animal Rights' (1983) shares animal liberationist concerns for the serious moral consideration of animals, but presents a very different ethical theory that emphasises the rights of animals rather than their suffering. Unlike Singer, whose philosophy is based on various forms of utilitarian consequentialism, Regan adopts a deontological approach to animal welfare in that he considers it natural that some things in life are morally right and others are morally wrong regardless of the consequences. He therefore considers the utilitarian position, which allows the sacrifice of one individual's interests for the benefit of another, to be unjustified and any condition leading to the harm or suffering of animals to be unacceptable.

Rejecting the indirect duty views of Kant and the contractarian positions of Hume and Rawls, Regan holds that justice must involve 'equality of individuals' and he utilises the concept of 'inherent value', where individuals have value in and of themselves, to assert

that species other than humans are morally relevant and therefore possess rights which humans have a duty to respect. 'Inherent value' Regan maintains, is a value that is distinct from and not reducible to 'intrinsic value', which is derived from the different experiences that individual beings have. Unlike 'intrinsic value', all 'subjects of a life' possess 'inherent value' equally, because they each have a unique and irreplaceable life. In the Kantian moral realm however, not all 'subjects of a life' possess the ability to act as a 'moral agent', able to bring impartial moral principles to bear on what should morally be done in a given situation, choose to act according to those moral principles as they conceive of them, and be morally accountable for their actions. 'Subjects of a life' who lack the ability to control their own behaviour or be morally accountable for what they do, are therefore classed as 'moral patients' because they do not know right from wrong and their actions may be detrimental to the welfare of others. 'Moral agents' must therefore act on behalf of 'moral patients' as for example, a parent would act for a child or a farmer his livestock. It is only 'moral agents' who can know and do right or wrong, and this entitles them to legal and moral rights that 'moral patients' do not have. In seeking to extend these moral rights to include animals, Regan argues that if all 'subjects of a life' have equal 'inherent value' then that equal value should be taken into account equally by 'moral agents', when considering the right actions to take on behalf of 'moral patients'.

Regan goes on to describe two categories of 'moral patient', those who are conscious sentient beings that lack other mental abilities, and those who are conscious sentient beings in possession of cognitive and volitional abilities such as belief and memory, but are unable to act with moral intention. He then argues that whilst some animals fit into the first category in that they can only experience pleasure and pain (hedonism), others, such as apes, whales, dolphins, pigs, cattle and sheep, along with human babies, children, the elderly or mentally infirm, also fit into the second category because they have the additional capacity to desire, believe, possess memory and perception, have preferences, welfare interests and a sense of the future (self-consciousness). Animals falling into the second category Regan argues have 'inherent value' that is equal to some humans and therefore have the natural right be treated according to the same moral principles. To do otherwise would amount to speciesism. This right, he regards as a basic 'principle of respect' and it sets forth an egalitarian, non-perfectionist interpretation of formal justice in that it demands the respectful treatment of all who satisfy the 'subject of a life' criterion.

Regan maintains however, that holders of natural rights are not entitled to equal treatment because all beings require different things to maintain their welfare. Additionally he recognises that humans are bound to one another by more diverse and complex patterns of social relations than they are with animals, and that circumstances may arise in which an animal right is overridden, particularly if there are conflicting rights in a given situation, leaving the animal rights theory offering less protection to animals in practice. Recognising that rights are held *prima facie*, Regan therefore asserts that it is only justifiable to override rights on the basis of a valid moral principle such as the 'miniride' principle, where it may be permissible to harm a small number of individuals to save a larger number from harm; the 'worse off' principle, where major harm may not be inflicted upon individuals to save others from less harm; or the 'liberty' principle, where it may be permissible for one individual to harm another to protect themselves. He remains insistent however that animals are treated as individual bearers of 'inherent value' that are not replaceable or seen as a means to an end and he applies these principles to uphold firm conclusions against the rearing and killing of animals for food and scientific experiments. Thus where Singer advocates vegetarianism as the ethical basis on which to reject speciesism and to ensure that the equal consideration of an individuals 'interests' are not violated, Regan cannot justify the use of animals for food or science at all, no matter what the benefits, and he calls for the abolition of practices that cause animals suffering or harm. The animal rights position is therefore an absolutist position that advocates a moral basis for vegetarianism, whereas the animal liberation position is consequentialist in that it seeks to achieve the maximum aggregate balance of welfare for the least suffering or pain.

Like Singer however, Regan devalues, suppresses and denies emotion as he seeks to extend the moral realm to incorporate animals, although his criteria differ in that he considers the moral status of animals independent of the relations that hold between them. This leads him to include all experiencing 'subjects of a life' so that those 'moral patients' who are capable of certain characteristics, have the right to equal treatment. However this limits the scope of rights to those animals with similar characteristics to humans, leaving many creatures outside the moral realm and without any rights at all. Additionally if, as Regan asserts, some animals can be said to have rights, those rights may prove difficult to protect particularly when abuses are often integral to institutionally sustained social practices in which multiple participants each have some form of obligation to uphold. Following Hume

however, contractarians argue that animals cannot be the bearers of rights at all because the concept of right, its force and applicability, is essentially rooted in the human moral world which as amoral beings, animals cannot participate in. This is not to deny that humans have obligations to animals which arise from the rights of others and the moral principles that govern us, although this is something very different from animals having rights in themselves. Singer also denies that animals can have rights because this would assert some form of moral dignity onto the individual bearer which would then justify particular treatment. He therefore maintains that all sentient beings capable of experiencing pleasure and pain should have their interests considered equally and impartially to prevent the continuation of unjust, irresponsible and cruel treatment.

In Defence of Speciesism

Despite considerable differences, the distinction between the two major positions of animal liberation and animal rights theories have not always been clear and the appropriation of rights slogans has often led Singer to be wrongly associated with the rights movement (Garner, 1993). Whilst important in providing a comprehensive portrait of the challenge to modern orthodoxy, these major philosophical positions have been criticized for their formalistic and abstract approach, favoring rules that are universalisable and judgments that are quantifiable, when feminist theorists for example, adopting a more relational approach that emphasizes collectivity, emotional bonding and a holistic concept of life, have argued that situations require a particularised and situational response involving context and history (Donovan, 1990). Developing a non-ideological approach to human animal relations, Mary Midgley, for example, insisted that each issue should be considered in its own historical context, without preconceived ideals or pre-determined principles, so that the possibility of many different sorts of moral claims can be recognised. Following the contractarian views of Hume and Rawles, Midgley considered the concepts of equality and natural rights, moderating the ideals of Singer and Regan to provide a defense against speciesism. She argued for example that animals from different species are not the same because they each have different basic requirements for living, such that a fish needs water, a sheep dry land. It is therefore essential that all of these differences are considered in relation to an animal's welfare. Race alternatively is a concept used to distinguish one human group from another, and unlike members of the same race who each share the same

racial traits and characteristics, animals cannot be seen as equal. To liken species with race Midgley suggests is insulting because it ignores the “*scale of difference between others and oneself*” (Midgley, 1983: 99). It is therefore common sense to deny animal’s equality, as to do otherwise would be detrimental to their health and wellbeing.

The concepts of equality and rights Midgley suggests are a tool for reform, a tool to widen concern and rectify injustices within a particular group. Any being that has to exist outside of a dominant group therefore remains excluded and marginalized, just as they are in racism and sexism. Unlike race and gender however, Midgley argues that species is an important grouping, and preference for ones own species is natural, unlike race or gender preference or prejudice which is a product of culture. Importantly she also claims that preference for ones own family is natural and she rejects Singer’s requirement for complete impartiality when considering the equal interests of animals because this implies that it would be wrong to give special attention to the interests, needs, desires and futures of those closest to us, such as our children. The rights view alternatively, accepts that some humans and animals of equal inherent value require special consideration, and recognises that the treatment of babies or the mentally ill for example will not be the same as it is for animals. Midgley maintains however, that in certain contexts, such as those involving family or species, that impartiality appears contrary to what is relevant and that it is the business of morality to determine when actions are right or wrong. She also suggests however, that morality is not straightforward, particularly when family and species preferences are considered as central elements to human happiness (Midgley, 1983).

Morality, Midgley maintains is closely tied to our natural affections which prompt us as social beings to live together and choose rationally to live by morals which are passed from generation to generation. By nature she argues, we are not self-interested egoists driven by the force of abstract rational argument to widen our concern beyond ourselves. We are “*bond forming creatures, not abstract intellects*” (Midgley, 1983: 102) and we have natural impulses of charity and benevolence, with an interest in others that has developed through reason, to make us good moral citizens. This is not to suggest that our moral upbringing goes unchallenged or unchanged, just that our moral and social education takes place within the partial affections of the familial relationships that Singer and Regan reject as speciesist.

The species bond may be strong she argues, but it is not exclusive and we are not without curiosity, sympathy and compassion which takes us beyond the species barrier.

“It is one of the special powers and graces of our species not to ignore others, but to draw in, domesticate and live with a great variety of other creatures. No other animal does so on anything like so large a scale. Perhaps we should take this peculiar human talent more seriously” (Midgley, 1983: 111)

For Midgley, to avoid speciesism as Singer and Regan propose would not constitute any improvement in the welfare of animals, as it would consign every sentient being to its own fate and to endure their own suffering whilst watching others suffer with equal indifference. The philosophical argument she presents however does not offer an alternative to speciesism, rather it uses the rights language to remind us of the things we already know are crucial to the argument, but which get forgotten about within the debate.

Other feminist theorists have drawn parallels between the oppressive treatment of animals and women, identifying alternative ways of considering humans and non-humans, based on relational and affective as opposed to masculinist, linear and dichotomised modes of thinking. Like Midgley, such approaches have acknowledged variety and difference, and they respect the aliveness of other beings whilst recognising that we all exist and share in the same unified field continuum. Carol Gilligan (1982) for example, a source for women’s psychological and moral development, recognises that *“morality and the preservation of life are contingent upon sustaining connection... [and] keeping the web of relationships intact”* (cited Curtin (1993: 51). And she describes two distinct moral frameworks; justice, which is concerned with abstraction, hierarchy and the application of universal rules, consistency and the fair resolution of conflicting claims and interests; and care, which is characterised by its emphasis on the *“identity of moral interests, contextual decision making, non-adversarial accommodation of diverse interests, personhood as relational and the body as moral agent”* (Curtin, 1991: 65). The subject of care is important and something I return to throughout the thesis, but for now we can see that when considering human-animal relations, Singer and Regan fall firmly within the framework of justice, whilst Feminists opt for the framework of care knowing that we can and do care for animals whether they have rights or not. In order to resist the ideological pressures to conform to

patriarchal standards in which the abuse of animals takes place however, vegetarianism and veganism have become core concepts in the feminist defence of animals. Yet by recognising a plurality of histories and contexts, the ethic of care framework allows for the consideration of different needs and requirements within our daily experiences and whilst moral vegetarianism or veganism are favourable within this perspective, there is no absolute rule that prohibits meat eating under all circumstances.

Ecological Holism

In developing an alternative ecocentric approach to the ethical theory of human-animal relations, J. Baird Callicott, not unlike the holistic feminist positions outlined above, advocates a shift in the locus of intrinsic value from human or non-human individuals to terrestrial Nature and the ecosystem as a whole. Drawing on Aldo Leopold's (1949) widely influential land ethic, which has a firm biological foundation rooted in evolutionary and ecological understandings of Nature, human psychology and behaviour, Callicott's more radical approach goes beyond the utilitarian or moral extensionism proposed by Singer and Regan in that it seeks to "*enlarge the boundaries of the moral community to include soils, water [and] plants as well as animals*" (Callicott, 1989: 16). Being more concerned for the integrity of the species than the welfare of individual animals it also moves beyond Regan's absolutist position and the feminist ethic of care in not objecting to the hunting, slaughter or consumption of animals for food. This reflects Leopold's principle precept for the land ethic which suggests that "*a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.*" (cited Callicott, 1989: 21). Thus it is the good of the biotic community as a whole, rather than the individual that is the standard measure of moral value used to assess the ethical quality of actions, providing the moral realm (as an integrated web of connections) with its own hierarchical system of ranking.

From the land ethic perspective, the biotic community is something to be valued in itself because its component parts are dependant upon it for survival. This demands an obligation that is over and above self-interest; an obligation that requires the extension of social conscience from people to the land. This shift in values creates a biocentric as opposed to anthropocentric value orientation in which people and animals along with

plants, rivers and all the component parts are eligible for moral evaluation in relation to the integrity, stability and beauty of the biotic community as a whole. The moral worth of individuals therefore becomes relative “*to be assessed in accordance with the particular relation of each to the collective entity which Leopold called ‘land’*” (Callicott, 1989: 28). Leopold went on to suggest that the shift in values might be achieved through the reappraisal of things “*unnatural, tame, and confined in terms of things natural, wild and free*” (Leopold, cited Callicott, 1989:29), which led him to distinguish between wild and domesticated beings. Whilst both were seen as living artefacts within the biotic community as whole, wild animals, autonomous and free were considered to be Natural, contributing to the well-being of the biotic community and attracting preferential treatment within the hierarchical value system. Domestic animals alternatively, attracted less value as they were considered to be an extension of mans often insensitive work, frequently contributing to the instability of the biotic community. Domestic animals, suggests Callicott “*have been bred to docility, tractability, stupidity, and dependency*” (1989: 30); without man, their inability to find food and shelter or reproduce naturally and protect their young, would cause them immense suffering and eventual death.

The Leopoldian shift in values that redefines things as wild or domestic also alters the Benthamic perception of pain and pleasure as good and evil, challenging the doctrine that pain should be avoided at all costs. Callicott points out that in ecological biology, pain provides information to the central nervous system about stress, irritation and trauma in the outlying regions of an organism. It is also a desirable indicator of exertion that enables an organism to maintain fitness and prevent or acknowledge injury. Pleasure alternatively is associated with the activities that contribute to organic maintenance, social solidarity and the continuation of the species. Thus whilst it may seem beneficial to promote pleasure, a life without pain would be detrimental to individual well-being because it would suppose optimal fitness at all times with any illness or injury being unrecognised. Additionally and following Darwin, Callicott holds that organisms struggle to maintain their own integrity by appropriating adaptive psychological accompaniments to their organic existence. They have a “*palpable passion for self-preservation*” (Callicott, 1989: 33) that involves desire, pleasure, agony, attending injury, frustration and a chronic dread of death. These experiences he maintains are the psychological substance of living. They are not evil, they

are good and they are part of the natural web of relations within the biotic community; without them the 'Natural' order of things would be upset and destabilised.

Similarly from an ecological perspective, Callicott argues that moral vegetarianism on a universal scale would destabilise the biotic community, as not killing animals for food would lead to a downward shift on the trophic pyramid that would shorten the food chain terminating with man. The availability of food for non-humans would then decrease causing a reduction in non-human populations whilst the availability of food for man along with the human population would increase, placing greater strain on other Natural resources. According to the land ethic it would therefore be more ecologically responsible to kill and eat animal meat than to be totally vegetarian, even though it holds that the transmogrification of an organic being into a mechanical mode of being through processes of selective breeding and factory farming, is ethically wrong. Thus unlike the moral theories of animal liberation and rights which promote vegetarianism to prevent the suffering of individual animals, the land ethic accepts the killing of animals for food but rejects factory farming in all of its manifestations, including the genetic modification of both plants and animals and the use of chemicals to increase their productive yields. Whilst the elimination of mechanical, genetic and chemical processes would undoubtedly lead to a general improvement in the welfare of individual plants and animals, the land ethic is ultimately concerned with the interest of the biotic community as a whole, not in the prevention of cruelty, suffering and death of individual animals. Holistic environmental approaches to human-animal relations along with those that consider the integrity of species over the individual have therefore been considered incompatible with mainstream theories of animal liberation and rights.

Mary Anne Warren has argued however, that in order to account for the full range of moral considerations which guide human-animal relations, holistic environmental ethics and animal ethics need to be combined. Adopting a pluralistic approach Warren therefore maintains that both humans as autonomous beings, and animals as sentient beings have rights, although animal rights are weaker than human rights because they are grounded in different psychological capacities. Additionally she considered that whilst the environment cannot have rights because it lacks sentiency, it should command respect arising from the instrumental value of Natural resources and the intrinsic value we find in different plant and

animal species, the land, rivers and sea. Callicott however challenges this approach from a philosophical standpoint, considering it to be ethically eclectic because it cannot be morally commensurate in all cases (Callicott, 1989).

In seeking an alternative philosophically grounded means to unite animal liberation/rights and environmental ethics, Callicott went on to combine aspects of the Leopoldian land ethic and Midgley's idea of a mixed community in which humans and animals participate as coeval social beings in relationships built on sympathy, compassion, trust and love. Within these two theories he identified the shared influence of Humean ethics and the theory that moral judgments and actions are based on altruistic feelings, and he used this commonality to bridge the gap between holistic and individualistic approaches to animal welfare. In considering this similarity, Callicott was able to demonstrate how in *The Descent of Man*, Darwin had explained the Humean theory by appealing to his principle of natural selection to show that altruism was a necessary part of social amalgamation and integration which provided survival advantages that compensated for the personal sacrifices required by morality. Altruistic feelings were therefore seen to evolve as a social instinct which impelled beings towards socially conducive, moral behaviour, with ethics developing as a means to facilitate cohesion within a social grouping. Callicott then considers the work of Midgley, who suggests that social groupings of humans and domestic animals are determined by the nature and organisation of communities which are nested within different structures of moral requirement. At the centre of the biosocial community would be the immediate family to which there are strong moral requirements of duty to uphold, and whilst having duties to all members of the biosocial community, the level of obligation would decrease for those less intimately related and more distant. Domestic animals would therefore attract the rights and privileges of membership to the bio-social community, but obligations to uphold these rights may be less important than duties towards other more immediate members. Drawing on Leopold, Callicott goes on to show how wild animals are seen as part of the biotic community whose structure is described by ecology, with the obligations of the biotic community being derived from an ecological description of Nature, such as the land ethic. Thus he is able to argue that whilst man as 'moral agent' remains morally obligated towards the biotic community, this obligation remains secondary to the varying levels of obligation we have to our own family and other members of the biosocial community.

This combination of approaches adopted by Callicott demonstrates a commitment to the ethical validity of human animal-relations and appears to provide a theoretical structure to resolve conflicts of interest between humans, animals and the environment through the systematic assignment of priorities and relative weights. However whilst Callicott's holistic approach may recognise our duty and obligation towards animals as members of the biosocial community, it does not define animal suffering or set any standards for the level of care they receive.

1.4. End points

Animal geographies and animal ethics provide the two conceptual touchstones for social science's engagement with animals - that of relationality and biotic community. However, both of these, as I have shown, have had a 'problem' with farm animals. Animal geographies have been prematurely dismissive of the centrality of farm animals to current theoretical debates, particularly in relation to issues of sustainability. And whilst there may have been an interest in promoting animal subjectivity this has not yet been extended to domestic livestock animals. Parallel to this, ethical concerns over the moral status and treatment of farm animals has led to their incorporation into the biosocial community, but these debates have also at the same time lost sight of the individual and its specific welfare needs.

Farm animals are intrinsically bound up in the biotic community as a necessary part of the system, in the environment as a "*mobile landscape feature, a grass nurturing and manuring machine*" (Buller and Morris, 2007: 10), in Society where they forge cultures and human identities and provide a resource for human use, and they are material agents in the various networks of production, making places and creating landscapes in which both the human and non-human perform. Farm animals cross and therefore challenge conceptual boundaries which inform our understanding of the world and the way we act within it. They are complex material beings that perform multiple roles which link together humans, animals and the environment within the spaces of the livestock farm. It is here that through their everyday performances within the practice of livestock production, that farm animals transcend the theoretical boundaries of Society and Nature that have historically delineated

human and animal, wild and domestic, science and practice into a dualistic rationale, to reveal a particular form of co-relationality between things that animal geographies have so far failed to recognise; a spontaneous and processural relationality that takes place between farm animals, humans, the environment, wild plant and animal species, and technological devices which all co-exist in the shared environment of the livestock farm.

Understanding this co-relationality is important and can lead us towards a more open and generous conception of sustainability that is more attentive to and considerate of animals and the non-human realm. We need then to get beyond the theoretical construction of these relations and get to the practice of their 'being with' and 'doing with'. Although farm animals have remained on the margins of contemporary geographical debates, animal geographies nonetheless provide a range of interesting concepts and methodological tools through which the relations between things within the space of the livestock farm can be drawn out and examined. In the first part of the chapter concepts of actant networks, hybridity, intersubjectivity, performativity and dwelling moved us some way towards thinking about humans, animals and environments in ways that foreground relationality. In the second part, ethical debates surrounding the status of animals revealed how the language of animal rights and liberation are clearly embedded within a framework of justice, whilst concepts of mixed, biotic and biosocial communities situated animals within a relational framework and an ethic of care.

Reflecting on these debates ANT breaks down the boundaries between humans and animals by reconfiguring entities within heterogeneous network arrangements. Whilst this draws attention to relations between things it fails to recognise difference, or account for the individual subjectivities of all entities involved, and the contribution they each make to stabilise network configurations. The concept of hybridity alternatively, introduced the idea that society and nature are perpetually combined creating emergent forms that are always in process. Relations between things are not then static and fixed, but fluid and porous, with humans and animals always being and becoming a new hybrid form. What this ignores however is the idea that animals can and do live in the world without our human presence. It therefore denies animal subjectivity and remains too anthropocentric. When coupled with emergent theories in the biological sciences however, we begin to move away from conceptions of hierarchical relations towards an understanding of animals

as subjective beings that can be hybrids in themselves, as well as hybrids that are also in relation with humans. This moves us towards a less anthropocentric view of human-animal relations and the environments in which they co-exist.

In addition to this, concepts of performance, and performative notions of hybridity and dwelling developed in the social sciences enable us to see the communications between things as a series of interactive, affective exchanges. This challenges the philosophical and ethical arguments that construct animals as inferior due to characteristics such as language. It also puts the relations between things into their specific context, and enables us to see animals as part of intersubjective processes involving humans, technologies and physical matter which act on and control individuals to produce a certain type of life. Animals can then be seen as emergent effects of a system – systems in which humans and animals share joint futures as part of emergent worlds. Performativity and enriched notions of hybridity are therefore important in this thesis. They help us to see how animal subjectivities are formed, and how daily performances reflect individual affective experiences. Embodying nature as a complex spatial achievement, the concepts of dwelling, mixed and biotic community are also important here as they re-embed human relationships with nature within the continuum of organic life. They allow us to see that the perceptive and responsive, performative exchanges that take place between humans and animals are enabled and enacted through the environments they inhabit, demonstrating an affectual involvement that requires constant negotiation.

Whilst these theories and concepts of relationality bring a sense of visibility of animals as co-constructed in Natural and Social worlds, farm animals nonetheless remain largely absent from these debates. As this thesis is about the ‘actuality’ of human-animal relations within the context of the livestock farm, and in the politics of those relations, I move on in Chapter 2 to consider how new agendas in animal welfare and in ecological sustainability place farm animals in a new relational context – one that foregrounds notions of care and response-ability.

Chapter 2

Care, Welfare and Response-able Husbandry

“There is still something missing: a sense of animals as animals; as beings with their own needs, and (perhaps) self awareness, rather than merely as entities to be trapped, counted, mapped and analysed; as beings whose lives are indelibly shaped by the mess that humans formulate for them, but whose fates from these taken-for-granted uses (along with the human rationales behind those uses) are almost never subjected to critical scrutiny” (Philo, 1995: 657-658)

“.....animals have no means of challenging our misrepresentations.....we need to learn to see them as they really are, not as we imagine them to be.” (Serpell, 1996: 825-826)

2.1. Introduction

The previous chapter highlighted the relative invisibility of farm animals as individual beings in relation with humans and the environments in which they exist. In their co-edited book *Animal Geographies*, Wolch and Emel (1998) sought to address such issues by drawing attention to the importance of animals and their relations with humans, calling for them to be brought back into clearer focus and back in to our understandings of Social life. Whilst the variously authored chapters of this book contributed to a fundamental rethinking of animals within geographical and social theory through a focus on animals within a variety of different contexts, and generated rich and provocative ideas about human-animal relations within Society-Nature debates, that book and the new animal geographies that it heralded, largely failed to consider farm animals whose lives, I would argue, provide the ultimate challenge to these longstanding, theoretical, dichotomous rationales.

In this chapter I address this shortcoming by approaching our knowledge and understanding of farm animals from a somewhat different set of angles and, in doing so, attempt to set out

an epistemological and methodological framework through which farm animals might become visible as individual fleshy beings. Drawing, first, on conceptions of agricultural stewardship I begin by situating farm animals within livestock production, and suggest that this opens up a place for farm animals in the sustainability debate. I go on to argue that stewardship also offers a way to see farm animals as individual beings in their own right, as farmers come to know them through everyday interactions and practices of care. It is through these caring practices that a more relational approach to welfare begins to unfold, one that is focused on the whole animal in the context of its environment, and concerned with the animals overall quality of life. I then turn, in this second chapter, to the issue of farm animal welfare and explore how contemporary shifts in the essentially scientific concept of animal welfare offers new possibilities for a care-focused and relational engagement with farm animals as sentient co-subjects.

2.2. Sustainability and Stewardship

The concept of stewardship derives from the term ‘sty-ward’, which refers to a person responsible for the care of farm animals (Worrell and Appleby, 1999). It has also been linked with the terms of warden and custodian, which are often used in relation to land use, and with the terms trustee and guardianship which imply due care and protection for the property of others (*ibid*). As such the concept of stewardship brings together the interspecies relations that exist between humans, farm animals and the Natural world and describes management practices that incorporate obligations to sustain these relations over time.

The use of stewardship as a concept can be traced back to the Judaeo-Christian religion and the book of Genesis where it conveyed the idea that humanity was placed at the pinnacle of God’s earthly creation and held responsibility to husband animals and protect Nature against defilement, pollution and decay (Thompson, 1995). In this context the Natural world was entrusted to humanity at the bequest of God with the expectation that it would be maintained in good condition and preserved for the future. This was not to suggest however, that stewardship duties opposed the use of Nature, as the Natural world was also seen as the dominion of humankind, providing a bounty of resources including plants and

animals which could be ordered, managed and transformed to sustain human livelihoods. It is in this latter context that stewardship has been interpreted as an ethic of use that is consistent with the ideals of agricultural production (Thompson, 1995); the careful stewarding of Nature being rewarded with an abundance of food which brings health and prosperity, whilst poor stewardship leads to poverty and hunger as the progressive deterioration of land diminishes productivity.

The religious sanction of stewardship has been important to faith based rural communities as it reinforced the common indigenous wisdom of land and animal management which emerged as necessary to sustain human lives. Historically, such wisdom incorporated a working knowledge of soil and water ecology, which combined with biological knowledge of plant and animal cycles, have advanced the farmers' interests in terms of productive success. Over time the wisdom of ecological and biological cycles has been achieved through everyday farming practices which have been systematised characteristically as lessons have been learnt from past failures and mistakes. In this sense farmers have developed a comprehensive understanding of what they do, about the constraints imposed by Nature on what and how much can be produced and how their practices affect the feedback cycles of soil and water, plants and animals. Working with rather than against Nature, farmers have learnt for example which animals would thrive in particular types of environment and what crops would grow in specific soils, which trees would provide shelter and which weeds would protect crops from insect infestation or would be harmful if consumed by animals. Such ecological and biological wisdom achieved by farmers has been vital to the success of farming practice and forms a major component of agricultural stewardship. That farmland is static makes this particularly important, as such immobility instils a long term interest to maintain the land for the continued production of food both in terms of self interest and in the interests of future generations.

Stewardship then is about using and managing Natural resources in such a way that they endure for the future. This involves loyalty and a commitment to working the land as a means to earn a living from it. As such stewardship is often regarded as a purely anthropocentric, self-regarding norm in which the Natural world is ascribed no value of its own. As we have already seen however, stewardship is also Nature-regarding in the sense that farmers have built up an understanding of the Natural world, working with ecological

and biological ecosystems. For farmers to be successful they need to utilise this wisdom carefully to convert Natural resources into saleable products. Farm animals and ecosystems must also be managed in balance with family and wider community relations that are both instrumental in the production process through the supply of labour, products and other extension services, and are also dependant upon it for the provision of food and economic stability.

In attending to the needs of Nature and all its component parts to provide themselves with food and to earn a living from it, farmers are inextricably bound up in and inseparable from the Natural world and the animals contained within it. Indeed Thompson (1995) suggests that reciprocal relations between Nature, farmer, family and the wider community indicates that stewardship draws on the organising principles of ecology, with humans, animals, plants, soil and water each dependant on the other to replenish and renew relations which maintain the stability of the ecosystem as a whole. This indicates that good stewardship is also other-regarding in that it is concerned with maintaining relations with animals and the Natural world, and with the members of wider society to ensure productive security for future generations. That this is not always successful could be seen to reflect dynamic ecosystems and the ongoing process of practical learning.

A basic tenet of stewardship then is to protect and preserve the Natural world through careful farm management practices, which allow it to be used to sustain human life. On the one hand this appears to reject productionist values which posit increasing agricultural production as a societal good, because there is an acceptance of responsibility to care for Nature as part of the production process. On the other hand however, the instrumental use of Nature stands in opposition to the ideals of environmentalism as it is insufficiently committed to environmental values which seek to preserve Nature for its own sake (Thompson, 1995). Environmental philosophers such as Passmore (1980) and White (1967) for example have argued that accepting the use of Natural resources has placed Nature at the disposal of humankind and this has contributed to a human centred, exploitative relation to Nature which stands in opposition to ideals of preservation. In developing an ecological ethic of the land however, Aldo Leopold points out that humanity is also part of the Natural world to be preserved and is therefore just as entitled to continuance as any other component part. From this view the use of Natural resources to

sustain human life remains consistent with the ideals of stewardship in that it implies a duty of care towards the Natural world as a whole. Indeed the traditional low intensity, largely free ranging and mixed livestock farming practices that have historically been associated with stewardship have been sympathetic to Nature, helping to shape and maintain rural landscapes which incorporate a variety of environments and habitats that support a diversity of plant and animal species.

Traditional conceptions of agricultural stewardship bring farm animals into view as part of the Natural world, as Natural beings that contribute to the ecological cycles which help to maintain soil fertility and environmental quality. Integral to the Natural environment, farm animals are managed in conjunction with the land, not only for the sake of food production to sustain human Societies, but also to ensure that ecological and biological cycles of life are sustained to maintain biodiversity both within the spaces of the farm and the rural environment beyond. Whilst this conception of stewardship resonates with contemporary anthropocentric ideals of sustainability which focus on the environment and the conservation of Natural resources, it also moves us towards a more generous understanding of sustainability that is more inclusive of farm animals; an understanding that also evokes notions of care.

Care

Under traditional forms of stewardship the value of farm animals, ‘wild’ Nature and land are firmly embedded in the ecological and biological cycles of the Natural world. Farm animals for example, have been selected according to the environments in which they have evolved. They have been provided with food, water and shelter, where none is naturally available and offered protection from predation and medical attention when required. As such there has been an awareness of and respect for the species specific ‘nature’ or ‘telos’ of the animals and for their biological, behavioural and psychological needs which the farmer observes and learns through close contact and interaction. These everyday practices follow a basic set of principles through which the farmer both recognises the need, and assumes responsibility for the care of farm animals and for the care of the land. Traditional ideas of stewardship then can be seen to reflect the ideas of Fisher and Tronto (1990), who in suggesting that “*care is both a practice and a disposition*” (Tronto, 1994:104) outline

four activities associated with the practice of ‘care’ and the distinctive moral capacity to ‘care’ (see Figure: 2.1. below).

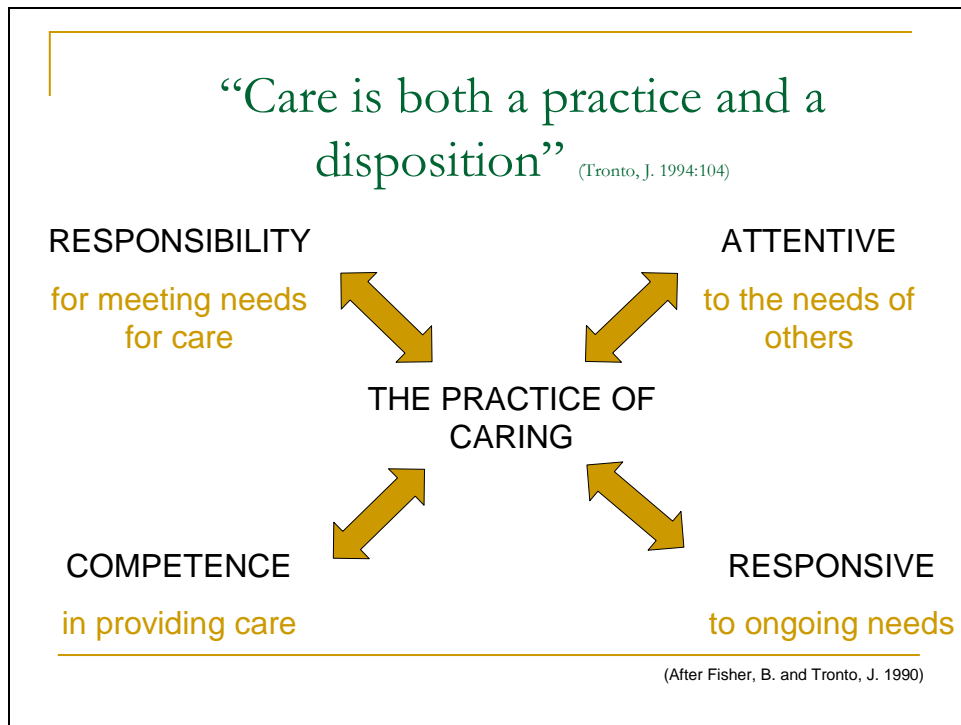


Figure 2.1: Practice of Caring - Source: Author, (2007) after Fisher and Tronto, (1990)

A carer they suggest must be ‘attentive’ to the needs of others and take ‘responsibility’ for meeting these needs by providing care ‘competently’ and in a way that is ‘responsive’ to needs as they change. Following traditional stewardship practices, farmers check their animals daily to ensure they are free from injury and disease, and provide them with the food, water and bedding that is appropriate to their species needs. These actions demonstrate ‘attentiveness’ and suggest that the farmer takes ‘responsibility’ to ensure that the physical and biological needs of the animals are met. Such ‘attentiveness’ also facilitates the prompt and appropriate reaction to any problems found, which along with the ‘responsible’ management of grazing, housing and the administration of veterinary medicines demonstrates the farmer’s ‘competence’ and the ability to ‘care’ for and ‘respond’ to the animal’s ongoing needs. Such practices portray a direct form of ‘care’ in which the farmer comes to know the animals by spending time with them, observing them and handling them, so that any change in behaviour is easily identified. It is a basic level of

‘care’ that recognises farm animals as sentient beings, and is sympathetic to their behavioural needs, allowing them to graze freely and undertake many of their species specific behaviours. It also allows animals to be recognised as individuals with their own personality and characteristic ways of being in the world; traits through which they communicate with other animals and the farmer, and which alert them to adverse behaviour which often denotes suffering, illness and disease. Where these basic needs for care are not met, the health of the animals and the farmer’s self-interest is eroded.

Under more intensive forms of economic agricultural productionism the value of animal ‘natures’ has diminished as technology, artificial inputs and veterinary medicines have increasingly mediated farmer-animal relations to boost productivity and economic efficiency. In these intensive systems the animal itself ceases to be important for its ‘natural’ productive capacity, and becomes a mechanised unit of economic exchange in a market that cares little for maintaining its ‘natural’ animalian state. The more units produced the higher the economic gain. As farmers have broken with interests less committed to farm animals, so there have been important consequences for the type of care these animals receive and ultimately for their ability to maintain a good welfare state. Whilst access to resources may help to boost productivity, leading to savings on labour costs through better equipped buildings, modern feeding systems and biologically controlled environments which can improve animal health by reducing the prevalence of infection and disease, they also confine animals in large numbers, reduce human-animal contact, restrict the animals ability to communicate and some aspects of behaviour, which can be detrimental to their welfare (see Figure 2.2 below). As human-animal relations are mediated by modern equipment, so farm animals come to experience an indirect form of care through which the farmer becomes less attentive, and is therefore less aware of and responsive to their ongoing and individual needs.

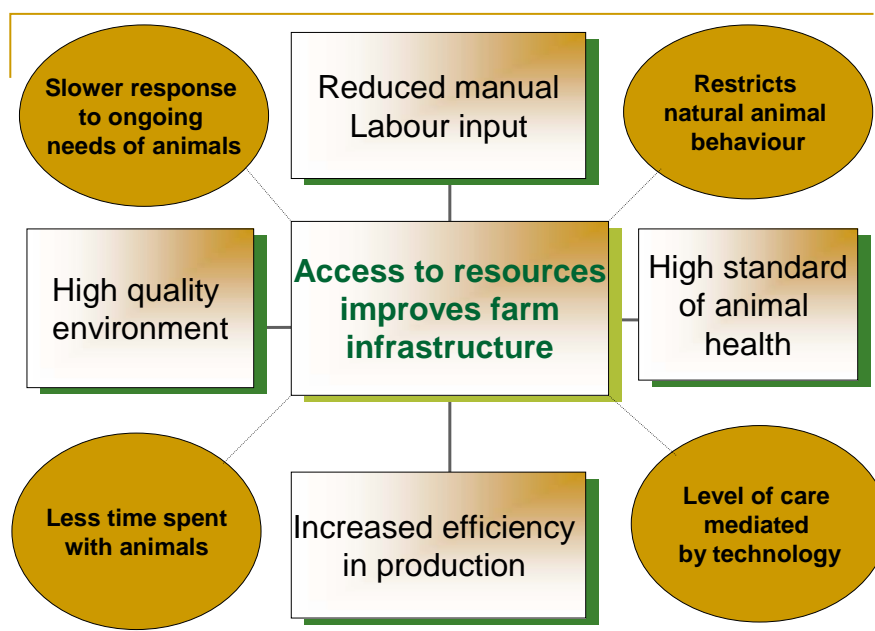


Figure 2.2: The Mediation of Care - Source: Author, (2007)

Stewardship practices have also traditionally involved a respect for and care of land and the Natural ecological cycles in which the soil has furnished plant species with nutrients and water, whilst their energy is drawn from the sun. For the soil to remain fertile and sustain the continuous growth of plants for animal grazing, it must be able to receive, store and release these nutrients, absorbing them from the water table, from organic wastes and animal manures as they are deposited on the land. Stewardship therefore involves the careful management of grazing animals to ensure that they nourish the land with their urine and dung which replenishes and anchors vital nutrients in the soil. Plant roots delving deep into the ground can then absorb these nutrients and convert them into energy in a continuous and renewable cycle of growth, providing nourishment for the animals which in turn nourish the land. The practice of stewardship therefore involves a competent understanding of and attentiveness to the land and its ecological cycles, coupled with the responsible management of livestock to ensure that soil condition and plant growth is maintained.

Where livestock production has intensified, farmland has commonly been overstocked so that its carrying capacity has been exceeded, or the animals have been kept in housing, with the accumulated manure mechanically spread on the land. This has generated changes in

the composition of the soil leading to a breakdown in the Natural and renewable cycles of growth. The importance of these Natural cycles has therefore dwindled as production has intensified, particularly as the application of science and technology has developed artificial means to sustain and increase the productive cycle through the application of inorganic and compound fertilisers as a replacement to organic livestock manure. As a consequence, increasing amounts of resources have been used to compensate for the nutrients lost in the production of newer higher yielding monocultures, altering the structure of the soil and its ability to absorb, store and release the vital elements required for successful plant and therefore animal growth. Indeed Rollin (2001) argues that Natural processes have been overridden by technological means which have acted as a sanding tool to force “*square pegs in to round holes*” (2001:34), allowing productivity to flourish at the expense of the land and the needs and ‘natures’ of farm animals.

Whilst the effect of farmers’ economic actions have seldom been intended or foreseen, Natural ecological and biological cycles have nonetheless been upset, disrupting the balance of relations within the community as a whole. As a consequence fertile soils have been degraded and many of the indigenous wild plant and animal species have diminished, whilst others have become more prevalent, such that they have now become pests. Under traditional forms of stewardship, the wild and unproductive spaces of the farm interspersed with the more valuable areas, provided a wealth of unique habitats, flora and fauna which coexisted in harmony with the productive spaces of the farm, helping to facilitate the livestock production cycle and a ‘natural’ animal life. The more intensive modern livestock systems that rely heavily on inputs however, have threatened these ‘Natural’ farm environments and animal welfare, interfering with the sustainability of the whole production process. Whilst the economic benefits of increasing agricultural production are obvious, productionist agricultural practices have nonetheless been constrained by the need to economize in terms of labour and effort, as well as in terms of the Natural resources that are transformed into saleable products. These constraints have been exacerbated as the livestock industry has been charged with increasing criticisms over its impact on the environment and on the animal welfare and human health implications arising from intensified production practices.

In response to the visual signs of instability encountered and the loss of economic return, farmers have begun to combine old wisdoms of stewardship involving respect for and care of the relationships that exist between humans, farm animals and the environment, with new technologies and farming practices, to compensate for the loss of balance that has been caused by more intensive forms of production. As a consequence, dominant productivist values have gradually been realigned with wider values of Society which recognise the importance of the Natural world and which invoke a sense of responsibility towards farm animals and the environment. Emerging from this realignment I suggest that agriculture has entered into a new paradigm of stewardship, which has widened the scope of concern from economic self interest to incorporate a moral underpinning of our treatment of the Natural world, but also and importantly of the role that farm animals have and do play within it as they become visible as individual beings in relation to the land and their human caretakers.

Understanding

Traditional stewardship practices involving direct forms of care allow farm animals to be considered in the context of the environments in which they are kept and the relationships they have with humans, other herd member's, wild and domestic species. Directly observed in everyday farming practices and through their spontaneous, unpremeditated interactions with humans and other animals, they are commonly seen and described as individual beings with their own perspective on the world; subjective beings that have their own individual needs, desires and personal expressions. Farm animals therefore come to be seen as individual fleshy beings with their own personality, which farmers duly describe in their own particular and quirky ways.

Whilst the use of subjective descriptions are common amongst farmers and also the general public in their direct interactions with animals, they have consistently been dismissed by Scientists who conceive of animals as a mechanical system, with behaviour being seen as an emergent, automatic and reactive, causal effect; a law like mechanical motion that can be formulated and described in logical and mathematical terms. Such mechanistic conceptions of animal behaviour however ignore the subject-status of animals and the experiential aspects of well being and suffering that farm animals have to deal with in their

everyday life. In so doing mechanistic approaches to farm animal welfare that transform subjective animal states into mechanical objects, and describe animal behaviour in terms of constituent physical elements and causal relationships, fail to address the inherent nature of a problem.

Traditional stewardship practices, through which the farmer interacts with farm animals and describes their behaviour as a personal expression of what it may be like to be that animal, provides an opportunity to understand the things animals experience in their day to day lives and the subjective welfare states that relate to those experiences. Indeed biologist and animal behaviourist, Francoise Wemelsfelder (1997), has been developing and legitimising a subjective approach to understanding animals that can only be acquired through such direct interaction and observation over time, and I will come to this in more detail shortly. The point I would like to make for now is that the practices of stewardship can contribute to such an approach, because unlike mechanistic models of welfare, they consider the voluntary nature of behaviour, which can help to explain why an animal attends to and interacts with the environment and others in a certain way.

2.3. Livestock Farming and Animal Welfare

For the duration of their lives, farm animals have to contend with complex environments, including a range of physical conditions, social influences, predators, parasites and pathogens (Broom and Fraser, 2007). In dealing with these factors each individual animal employs various coping strategies which can involve physiological changes in the brain, the adrenal glands, the immune system and in their behaviour (Appleby, 1999). Sometimes the animal is unable to cope with the factors to which it is exposed and will die, or its fitness or reproductive capacity will be reduced as it strives to maintain its health, comfort and ultimately its survival. Broom therefore suggests that “*The welfare of an animal is its state as regards to its attempts to cope with its environment*” (Broom, 1986, cited Broom and Fraser, 2007:6) and that “*Welfare is a characteristic of an animal, not something given to it*” (Broom and Johnson, 1993, cited Appleby, 1999:26). It is then an animals’ attempt at coping or failing to cope with complex environments that act as an indicator of its welfare and these attempts can be measured using a variety of scientific methods and procedures,

which once carried out, bring moral questions of what constitutes good and poor welfare into play. Indeed Appleby suggests that “*The term ‘animal welfare’ is not a term that arose in science to express a scientific concept. Rather it arose in society to express ethical concerns regarding the treatment of animals*” (Appleby, 1997:20).

Animal welfare then is a concept that is inextricably linked to subjective values and ethical positions which make it a difficult term to define, measure and quantify. Although there is no agreement on the exact meaning of animal welfare, it is commonly held that it refers to the quality of an animal’s life and necessarily involves many different elements including animal health, happiness and longevity (Appleby, 1999). The science of animal welfare has been approached from different ethical standpoints which equate welfare to an animal’s biological fitness, its complete mental and physical wellbeing, or its mental and emotional state. From each of these positions, various definitions and criteria have been developed to assess the welfare quality of animal life, creating controversy within the discipline about what constitutes good welfare standards and how they should be implemented and measured. By exploring these different approaches I hope to demonstrate how welfare standards have been affected by moral judgements that have shifted over time as society has learnt more about the complexity of animal lives, their organisation and the sophistication of their behaviour in terms of their similarities with humans (Broom and Fraser, 2007). I hope also to show that what we have learned through animal welfare science about the different ways animals experience their lives within livestock farming systems, contributes not only to our understanding of what farm animals need to have a good quality of life, but also that their positive and negative experiences of the productive farming environment is reflected in the sustainability of the farming system as a whole. In the sections that follow then, I consider how the welfare of farm animals has been approached within science and examine how the shift in attitudes has had important consequences for livestock, culminating in the conscious recognition that animal welfare involves a good quality of life for every individual, and a legislative framework that sets out minimum requirements and standards for their care.

The Science of Animal Welfare

Contemporary ideas and understandings of animal welfare are founded in the science of ethology, which emerging in the 1800s was based on a general recognition of animal subjectivity (Verhoog et al, 2004). By 1920 however there was evidence of two separate approaches, with the science of behaviourism branching off from mainstream ethology. Adhering to the methods of hard science and notions of Cartesian mechanistic thinking, behaviourists focused on the physical behaviour of animals and the measurable biological functions associated with that behaviour. Ethological approaches, alternatively, were based on Darwinian ideas of human-animal continuum, and in recognising animal sentience focused on the methodical study of animals in their 'natural' environment.

Developing different scientific methods that could be understood by a wider audience, ethologists used 'mentally loaded' language (Verhoog et al (2004:77), such as aggression, fear, and stress to describe the animals observed behaviour. Drawing such analogy from human behaviours and physical functioning, ethologists assumed that similarities observed in animals correspond to the feelings experienced by humans. However, the suggestion that animals experienced pleasure or pain through the recognition and description of expressive behaviour was criticised for being anthropomorphic, leading behavioural scientists to suppress any psychological speculation they might have had. Ethologists nonetheless maintained that the study of individual reactions and behavioural nuances was useful for understanding the subjective lives of animals. And they began to bring the 'natural' lives of wild and exotic animals to public attention, raising a sympathetic awareness of animal experiences, involving family relationships, anxieties and conflicts experienced in their everyday lives, whilst pointing to the obvious similarities these have with our own human lives. Compared to the direct observation of an animal's bodily function however, Ethological approaches were seen to involve a series of assumptions about the way animals might feel, leaving the subjective experience of animals open to questioning and revision.

It is from these two different fields of scientific inquiry that contemporary methods and criteria have developed to assess and measure the welfare quality of farm animal lives; methods that consider the welfare of an animal as an outcome of its success based on the

ability to achieve normal growth, fitness and function for example; as an outcome of the animals' happiness based on its mental satisfaction and freedom from distress; or as an outcome of a 'natural' life based on the suitability of the environment in which it is kept (Webster, 2005). Each of these positions has different, yet important consequences for farm animal lives.

Biological Functioning: An Outcome-Based Approach to the Welfare of Farm Animals

Until well into the twentieth century, scientific indicators of animal welfare that focused on the biological functioning of animals, considered good welfare to be a reflection of growth, reproduction and longevity, and the normal functioning of physiological and behavioural processes (Duncan and Fraser, 1997). Within commercial agriculture, factual information relating to the functioning of animals and the quantification of growth and reproduction in specific environments, has been scientifically recorded and used as a yardstick for measuring good animal welfare and high productivity. A good Holstein/Friesian dairy cow for example, would be considered healthy if from two years of age she produced one calf a year, and by her third lactation she produced between 6000 to 120000 litres of milk during a 10 month lactation period, with two months rest before calving again and the process is repeated (Webster, 1994). This functional or output based approach to welfare has had a tendency to objectify the dairy cow, treating her (along with the other herd members) like a machine (Appleby, 1999), and it has failed to account for welfare problems such as hunger, acute metabolic disease, discomfort, chronic pain and exhaustion for example, that may arise as a result of the intensity and duration of the metabolic demands of lactation, or the conditions of feeding, housing and management which may be inappropriate to her individual physiology (Webster, 1994). Additionally, demands for increased milk production gave rise to the popularity of highly productive breeds such as the Friesian Holstein cow for instance, leading to the exclusion of older, hardier, dual purpose breeds such as the Dairy Shorthorn and the Ayrshire. Susceptible to health issues such as lameness and mastitis (Webster, 1994), the high productivity levels of the Friesian Holstein breed has reduced welfare quality for the animals themselves, challenging the contention that high productivity is an indicator of good welfare.

Genetic breeding programmes that have been similarly focused on high animal outputs have commonly reproduced congenital defects, and have led to the emergence of many serious and undesirable side-effects for farm animals themselves (Webster, 1994). Belgian Blue cattle, for example, have been genetically developed to produce a better shaped, highly productive and more profitable animal, but are bedevilled without choice by caesarean births because of hypertrophied muscles which cause difficult calving. Similarly, the Landrace breed of pig, which is considered to epitomise the productivist ideal, has become so large and cumbersome that the hind legs of many animals are unable to function efficiently, causing much suffering and pain (Alderson, 1989). With an emphasis on growth, reproduction and productivity, modern and intensive farming systems have produced livestock that epitomise Cartesian automata and the objective scientific standards of animal welfare, with universal indicators of suffering based on biological function used to justify the systems in which the welfare of farm animals has frequently been compromised. The subjective experiences of animals, and the common sense judgements of humans have subsequently been ignored as these biological indicators of welfare have paid no heed to what the animals feel or what the farmer is able to see, hear, smell and touch in the everyday practice of livestock farming and animal care.

Drawing on a wide range of scientific methods, including veterinary epidemiology and pathology for example, the biological functioning approach nonetheless remains an important component of farm animal welfare that is used to identify and determine the effects of disease, injury and malnutrition, with normal behaviour, bodily function, growth and reproduction for example, indicating good biological fitness and resulting in the longevity of an animal's life. The influence of functioning based approaches has also led scientists to consider the effect of stress on an animal's life, particularly in relation to physical restraint, exposure to cold and the injection of toxins for example, which have been found to induce characteristic changes in cortisone levels and the activation of the anterior pituitary and adrenal cortex within an animal's body. By linking these bodily changes to various external influences such as different types of housing and husbandry procedures, scientists have been able to indicate varying levels of stress experienced by the animal, and therefore which environmental conditions or management practices imply poor or reduced welfare quality for the animal itself.

These methods have usefully been employed to determine the stress animals might experience when kept in close confinement, with links being made with incidence of stereotypic behaviours such as bar chewing and tail biting (Mench and Mason, 1997). Similarly they have been instrumental in the identification of deformities that animals develop as a result of housing size, design and the type of flooring used (Kyriazakis and Savory, 1997) with a high incidence of inflammatory swellings, skin abrasions and foot injuries for example linked to the environmental conditions in which farm animals are kept (RSPCA, 2007). Such revelations have led to the successful prohibition of sow stalls in the UK, as well as veal crates for calves, and battery cages for hens, with legislation introduced in Europe to phase them out over time (by 2012). It has also led to the introduction of minimum space requirements, environmental conditions, health, management and stockmanship standards which have been laid down in Codes of Recommendation for the Welfare of Livestock; DEFRA publication's that specify welfare standards for all farmed animals in the UK.

Biological indicators of welfare then are used to measure animal health, fitness and function, and they provide important information about farm animal lives; about the physiological ways that they are affected by different environments, production methods, pathogens, diets, medicines and so on, recognising that the animal and its welfare is an outcome of incoming stimuli (Webster, 2005). As farm animals are motivated to avoid personal suffering and achieve maximum pleasure, biological indicators have been used to measure the value animals attribute to things that are vital to their existence and can determine the quality of their lives and the consequences of frustration. But they also have their limitations, in that they do not examine the fear an animal might experience when faced with a predator, or when bullied by another animal of the same species that is dominant within the group. Neither do they consider the hunger an animal feels when there is not enough food to eat nor the sadness it might experience at the loss of a family member. Some behavioural scientists, those falling into the category of Methodological Behaviourists, accept that subjective experiences exist for animals but consider that it is no concern of science to study them. Logical behaviourists alternatively, hold the view that statements about the mental events of animals, such as the desire to eat food is meaningless, because the desire itself is not a feeling the animal has, but an engagement in the activity of eating which is essential to maintain life (Dawkins, 1980). Ethological scientists however,

consider that these feelings and many other physiological and emotional experiences are equally important aspects of farm animal welfare because they also affect the ability of an individual animal to cope with the complex environments of their everyday existence.

Enter the Psychologists: Animal Feelings and Emotions

There is a longstanding argument then that farm animal welfare is not just about physical wellbeing and the absence of disease; it is also about the animal's mental wellbeing and the experiences it has in its own subjective world. Considering those experiences however, and the way the animals themselves might feel about these experiences has been extremely problematic in terms of defining and measuring animal suffering. This is largely because subjective experiences are essentially private, with each individual feeling its own pain, happiness, hunger and thirst for example; feelings that might be visible to others in the form of facial expression and bodily comportment or as physiological changes such as heart rate, which can be scientifically measured in the animals body. However, as no one can access the feelings of another being, whether human or animal, there is a reliance on assumptions based on our own experiences; assumptions which cannot be proven by the normal methods of Science. Indeed behavioural scientist Watson argued back in 1924 that “*States of consciousness, like so called phenomena of spiritualism are not objectively verifiable and for that reason can never become data for science*” (cited Dawkins, 1980, 11). This suggests that subjective, qualitative experience cannot inform understandings of animal welfare. More recently however, Midgley has argued that the attribution of human feelings onto animals in a form of “*partial anthropomorphism is both unavoidable and invaluable*” (cited in Appleby, 1999:25) in that it may help to prevent animals from being treated in ways that arouse feelings of pity and revulsion amongst human societies, particularly in relation to some of the conditions found within intensive farming systems. And Dawkins (1980) has appealed for “*as accurate an understanding of the similarities between human and animal experience as can be achieved for as little imagination as possible*” (Gatward, 2001: 117) so that we can increase our knowledge of animals and the quality of their lives.

Since early experimentations proved the feasibility of studying the mental events of animals (see for example Koehler, 1951; Morgan and Nicholas, 1979; Herrnstein and Loveland,

1964) it has become more widely recognised that human perceptions of how animals might feel, can help to provide a range of important information about the welfare of animals, particularly when assessed in conjunction with information gathered from other scientific approaches, such as the biological functioning approaches outlined above (Dawkins, 1980). Greater emphasis has subsequently been placed on feelings-based approaches to animal welfare and a new range of methods has emerged in the fields of zoology, physiology, psychology, animal production and veterinary medicine. Rooted in traditional ethology and the observation of animal behaviour and preferences (as influenced in the work of Sainsbury, 1972; Hughes, 1973; Fraser, 1980; Dawkins, 1980; Duncan and Petherick, 1989; and Wemelsfelder, 1993a for example), these approaches have also considered the animal's ability to cope and/or adapt their biological functioning to various environmental conditions (see Broom, 1991; 1996). In so doing they have established a better understanding of how other beings experience the world and how farm animals themselves are affected by human systems of production.

The methods developed by ethologists to study the subjective feelings of animals try to see the world from the animal's point of view. Whilst this is considered difficult because the animals cannot speak to us in a language we understand, ethologists believe it is possible for animals to express at least some of their feelings in the way they act and what they choose to do. As far back as 1880, Spencer for example made a connection between the subjective feelings of animals and their choice of environment, suggesting that feelings of pleasure and pain evolved to help animals avoid harmful conditions, with pain and suffering motivating animals to move away and find environments that are better suited to their needs. Following this line of reasoning field studies have shown that animals do have preferences about where they chose to live, and that the choices they make are commonly successful. When battery hens for example were offered a choice of fine gauge hexagonal wire or coarse wire in the floor of their cages, Hughes and Black (1973) established the animal's preference by measuring the time that they spent standing on each type of flooring. Similarly experiments with dairy cows have shown that the animals almost always choose the softest surfaces available to lie on, suggesting a preference for areas that are bedded out with straw or similar materials that are comfortable, rather than hard concrete flooring which would be easier to keep clean (Tucker, 2003).

Psychologists have advanced this understanding of animal preferences through the development of motivational experiments in which animals have been trained to respond to certain stimuli in order to obtain a reward or receive a punishment; the reward acting as a positive reinforcer that makes the animal respond in the same way again, whilst the punishment acts as a negative reinforcer to deter the animal. These experiments have demonstrated how animals make informed choices based on their previous experience of how each choice made them feel, and that they learn to avoid, or repeat certain actions which result in a positive or negative experience. Imposing a cost on the animal's behaviour by making it more difficult for the animal to obtain a reward has strengthened the results achieved through preference testing experiments, and has enabled psychologists to determine the individual animal's view of many different objects and farming environments. Knowing that animals express a preference has therefore been useful for such things as housing design and feeding systems, but it also has its limitations. It has been argued for instance that the type of flooring offered to the chickens and cows above is determined by the experiment, and does not reflect the type of flooring the animals would want for themselves. Neither does it provide any indication of the suffering animals might experience as a consequence of that flooring. It has also been argued that the preferences established may not be shared by all individuals and they might vary at different times of the day, and at different stages of the production cycle, leaving individuals to suffer for prolonged periods of time once their choice has been made (Duncan, 1977; Dawkins, 1980). Preferential choices are therefore thought only to provide limited information based on the options that are provided within the context of the experiment. What these experiments do however, is draw our attention to the need for farm animals to have free access to a range of different environments and objects so that they can make choices which allow them to contribute to their own welfare.

There have also been concerns however that the animal might not choose what is best for its wellbeing, with cattle for instance known to eat poisonous plants or eat foods that cause health problems such as bloat and grass staggers. Duncan (1977) suggests that such breakdowns in the 'wisdom of the body' are the result of domestication and he cites artificial selection and the prevention of young animals learning from their parents as key contributors to this behaviour. As Dawkins (1980) points out however, wild animals have also been found to make poor judgements, perhaps suggesting a general breakdown in

communications between animals, or the presence of some other factor that interferes with instinctive behaviours. The principle of preference testing is nonetheless valid, as it provides an insight into the choices that animals make for themselves. Whilst these choices may be misleading in some situations, when taken in the context of information from other sources they get us closer to an approach that considers what the animal feels.

Progressing these understandings of animal feelings, ethologists have studied farm animals in their usual environment, and have built up information about their normal patterns of behaviour. Included in this are vocalisations and particular displays which are used to communicate with other animals and to signal a particular state (Weary and Fraser, 1995). By studying these forms of communication ethologists have been able to determine the state of the animal they signify and have established a signaller's need for particular things such as food and warmth. When young piglets for example nuzzle at the sows udders during a nursing episode their behaviour is seen as normal, but if the piglet nuzzles her udders outside of this time then it indicates to the farmer that it is not getting enough milk and that its welfare is reduced. It also indicates that the piglet is at risk from being squashed by the sow, because outside of the usual nursing period the sow is not expecting a piglet to be that close to her udders and her normal behaviour may result in her rolling or dropping onto it completely unawares (Lund and Weary, 2004).

In establishing the normal or abnormal behaviour of farm animals, ethologists have also drawn attention to the incidence of behaviours such as tail biting and bar chewing that are commonly seen in indoor pig production. And they have been able to demonstrate how these behaviours are not so much indicators of good and poor welfare depending on how often they happen, as behavioural scientists would suggest, but are rather the symptom of a specific problem in the animal's environment. Hence both tail biting and bar chewing have been shown to be the result of prolonged periods of boredom in barren environments and that these incidents can be reduced by enhancing those environments with bedding and/or toys which stimulate the animals and allow them to perform their normal instinctive behaviours. Similarly observations of animals and their reactions to specific mutilation procedures such as castration, teeth clipping, dehorning and tail docking, has enabled Ethologists to determine the impact of those procedures on animal welfare, with animals expressing increased vocalisations, becoming agitated or subdued for example, shown to

experience high levels of suffering and a negative welfare state which restricts its ability to develop and grow, often for some time after the procedure has been performed. As a consequence legislation has been introduced to reduce animal suffering, with certain procedures banned, whilst others have been restricted to particular times of year, on animals of a certain age or only under anaesthetic.

Despite the difficulties in developing an animal centred approach to welfare, there has been an increasing appreciation of the way animals feel as ethologists have learnt about their behaviour, and the choices and preferences they make. This information has not only led to the widespread view that farm animals should not be made to endure undue suffering as a result of livestock farming practices or be unduly deprived of comfort and contentment, but it has also been instrumental in the development of welfare policies which aim to improve the quality of farm animal life. Whilst there is still disagreement about the extent to which these policies go, about what degree of suffering is morally acceptable, these methods do at least recognise animal subjectivities and have begun to find ways to measure positive and negative welfare states.

'Natural' Environments and Welfare

Another approach to welfare that I want to consider here focuses on the idea that farm animals should be raised in 'natural' environments and allowed to live as 'naturally' as possible. Dutch welfare campaigner Lindgren (1989) for example, has argued that animals need to be kept in environments that reflect their 'natural' state, where they are able to see the sun and breathe fresh air, not forced to breathe in the gases from their own urine and excrement as often occurs when they are confined in farming systems with quite different environments to those from which they have evolved (Webster, 2005). In addition to this Rollin (1992, 1993) suggests that farm animals should also be able to express their animal 'natures' if their welfare is to be maintained. All animal species he argues, have their own inherent 'nature' or 'telos' which motivates them to act in particular ways; so it is in the 'nature' of a cow to ruminate, a pig to root and a chicken to scratch around in the ground for example. These biological, 'genetically coded' behaviours are instinctive and animals need to be able to perform them for their lives to be fulfilled, so it is important for the animal that their environment allows them to do so. Kiley-Worthington also suggests that

“...in order to avoid suffering, it is necessary over a period of time for the animal to perform all the behaviours in its repertoire, because it is all functional; otherwise it would not be there” (1989:333). Thus different behaviours are seen to perform specific functions that are vital to the animal’s wellbeing.

The ‘natural argument’ then, is not just about the provision of a ‘natural’ environment that is suited to the animal species, but it is also about the provision of an environment that facilitates the animal’s biological behaviour and allows them to meet their species specific needs. Such arguments have sparked research into the behaviour of animals in the wild so that comparisons can be made with domestic animal behaviours, and to establish any differences and deficiencies in the man-made environments in which they are kept. This research has usefully informed the design and construction of welfare friendly farming systems and different types of housing that allow the animals to freely express their biological behaviour. By studying the behaviour of domestic pigs in Scottish woodlands for instance, Stolba and Wood-Gush (1989) were able to fabricate artificial environments with sufficient resources to allow farmed pigs to express the same range of behaviours they had observed in the wild. This made it possible to make provision for good husbandry in terms of what mattered to the pig; that is to achieve positive satisfaction by acting freely and in a calculated way to promote its own welfare.

Reflecting on the need for animals to have access to ‘natural’ environments, Webster (2005) agrees that to see a cow grazing grass in a green field is natural and good for its welfare. It is also good because the cow has the freedom to express its biological behaviour such as grazing, lying down, ruminating and socialising. But, he goes on, if provision can be made for the cow to express the same biological behaviour in an artificial environment, in a straw bedded yard with plenty of space to lie down and get up in, then that can be good also. Welfare he suggests is only compromised when free expression is prevented, as it is in sow stalls and veal crates where there is nothing the animals can do for themselves to maintain a positive welfare state. Thus whilst farm animals may be unable to experience complete freedom to do what they would like within a livestock production system, being contained in environments with their movements to some extent restricted, farmers can ensure that conditions allow them to express as many biological behaviours as possible to promote positive welfare experiences. Deciding which biological behaviours and the extent

to which they can be performed however, leads us back into the moral argument about what constitutes good welfare and how it should be measured.

Accepting the ‘natural argument’, and the ability to perform biological behaviours as a method of welfare assessment is therefore limited, and is an incomplete basis for assessing good welfare. In part this is because ‘natural’ conditions can be simulated through artificial means, but also as Dawkins (1980) suggests, because the behavioural repertoire of animals will always include some activities that enable them to cope with adverse circumstances, such as shivering in cold weather for example. The provision of a cold environment to enable a lamb to shiver would be of no benefit to its welfare, even though shivering is a behaviour that the lamb performs when cold. There are then some environments that will bring out certain types of behaviour that we can call ‘natural’ or biological, but they are not environments that promote the animal’s well-being. They are environments that challenge the animal’s ability to cope, and therefore provoke a ‘natural’ behavioural response or coping strategy. Additionally Webster (2005) points out that whilst it may be possible for an animal to express itself whilst living in a totally ‘natural’ state, it can also experience considerable suffering as it may be unable to maintain its body temperature in changing climatic conditions despite its ‘natural’ coping strategies. Similarly it may be left to die a slow and painful death from injury or disease, be bullied and excluded by other members of its social grouping, or be preyed upon and live in fear of other species.

A Holistic Approach to Farm Animal Welfare

The provision of ‘natural’ environments that respect animal ‘natures’ and promote a higher quality of farm animal life is one of the guiding principles of organic farming, where a more holistic approach to animal husbandry is employed. In these systems it is widely held that if farm animals have access to ‘natural’ environments and can perform their biological repertoire of behaviours they will have fewer stresses to deal with, and are therefore better able to cope with incidents of injury or disease. This then reduces the need for medical interventions and classical husbandry procedures that may not be compatible with organic standards. Organic systems that allow farm animals to live a ‘semi-natural’ life are therefore considered by many members of the scientific community as well as consumers, to promote good animal health and welfare (Vaarst et al, 2004) and a more ‘natural’ end

product. However, the prevalence of naturally occurring pathogens such as those associated with Bird Flu and Blue Tongue for example demonstrate that free ranging farm animals are more susceptible to disease than their counterparts that are reared indoors, in biosecure environments. Similarly grazing animals are continually exposed to parasites which challenge their health. In conventional grassland farming systems these parasites are commonly controlled by the regular administration of anthelmintic medicines, but in organic systems where the 'natural living' approach is central, anthelmintic drugs cannot be used as a preventative treatment. Rather parasitic control must be achieved through appropriate methods of pasture and grazing management, and through the development of more complex grassland systems which require considerable management skills, an indepth understanding of soil, plant and animal interactions, and good forward planning. Indeed many health problems endured by farm animals in organic systems are often related to deficits in husbandry, system management and knowledge (Vaarst et al, 2004), particularly during the period of conversion from conventional to organic, because the management of animal health and welfare must be approached proactively, through a sound understanding of the patterns of disease, environment management and preventative management strategies, rather than through the routine administration of veterinary medicines.

Understanding how farm animals cope with their environments and how they adapt their behaviour to local conditions to maintain a positive welfare state is therefore important to the success of organic livestock systems. The science of ethology has been particularly useful here as it has helped to identify the internal and external stimuli that affect an animal's motivation to express certain behaviours, how these behaviours should be and are performed, and how the outcome of these performances feed back into their motivational processes to determine if the behaviour should continue, or if something else should be done. Whilst these sets of behaviours and control mechanisms have evolved in wild species, the observation of wild and domestic animals has made it possible to establish how certain behaviours have evolved to reflect the environments of contemporary farming systems. This information has then been used to overcome risks and challenges to animal welfare through the development of management strategies that aim to prevent negative emotions, behavioural problems and problems with physical health. A central part of these management strategies is the provision of choices for the animals; choices that allow them to express a range of species-specific behaviours in the environments in which they are

kept, and to express individual preferences to maintain a positive welfare state. Within organic livestock systems these strategies also necessarily involve balancing the behavioural needs of the animals with the management of the land to reduce the potential threat of parasites and disease, and to remove the need for routine veterinary treatments.

As the price of veterinary medicines has increased in recent years and farm animals have shown signs of resistance to certain drugs, many conventional farmers have also reduced the use of prophylactic treatment programmes to prevent disease amongst farm animals. Under the guidance of veterinary's, farm advisory bodies and organisations they are turning instead to improved grassland management and genetic breeding programmes to improve animal welfare whilst reducing input costs and maintaining production. This suggests an industry wide recognition that farm animal welfare is closely linked with the management of the land.

Towards a Quality of Life (QoL)

Aware of the shortfalls of 'natural', biological and behavioural approaches to the assessment of animal welfare, Wemelsfelder and colleagues (1993b; 2001; 2007) have developed an alternative, qualitative approach to the assessment of animal behaviour that enables different types of information about the animal's "dynamic style of interaction with the environment" (Wemelsfelder and Lawrence, 2001: 209), to be integrated and assessed.

"...to address animals as whole beings is to perceive more than just 'behaviour'; it is to first and foremost perceive a 'beholder', an agent, who performs 'behaviour' in a certain manner, with a certain expression"

During close empirical observation, Wemelsfelder argues that an animal is able to communicate subtle details of its welfare through things like bodily movements, vocalisations and posture for example. Body language she suggests:

"... is more than a pattern of movement or a behavioural style that can be identified over time; it is a psychological dimension that is immediately present and available for assessment, allowing us to judge the quality of an animals experience directly and in considerable detail."(Wemelsfelder, 2007:28)

By making detailed observations of the whole animal over time, physical movement can be evaluated in the specific context in which it is performed. The animal's behavioural style can then be expressed as a direct observation of the animal at any given time, providing an overall pattern of behaviour that allows for fluctuations in expression that reflect the animal's welfare state. Wemelsfelder (2007) suggests that these observations tell us something about the animal's Quality of Life (QoL) which she describes as a complex notion that encompasses more than just the absence of stress or suffering as a result of environmental conditions. Rather QoL is about the relationship the animal has with its environment and how it lives its life. Assessing an animal's QoL through direct empirical observation provides a dynamic, detailed analysis of an animal's experience and has the potential to move us towards a more positive understanding of what the animal likes to do and the opportunities it has to fulfil its own interests.

Such assessments however, are not without difficulty. Quality for example is difficult to quantify and there remains scepticism amongst Scientists over how it is defined and measured, particularly as the descriptors used by observers, such as confident, nervous and calm, are subjective terms that give personality and character to individual animals. For the general public such qualities form the basis of empathy and shared relationships with animals, and they demonstrate a recognition of personality and emotionality which is commonly associated with the continuous expression of sentient experience. In scientific circles however, such qualitative perceptions of animals are often seen as anthropomorphic, with judgements of quality considered variable and open to personal bias. Pointing to a range of scientific approaches and studies that support a qualitative perspective however (including Stevenson-Hinde et al, 1980; Feaver et al, 1986; Gosling, 2001; Goodall, 1990; Buirski et al, 1978; Plutchik, 1980), Wemelsfelder argues that *“if deliberately and conscientiously applied through the use of formal methodologies, such judgements may well open up novel ways of gaining access to both human and animal experience”* (2007:28). Part of the problem she suggests is that for science to accept animals as personal sentient beings, our emotional and moral awareness of captive animals would inevitably increase, and we would be forced to give even more consideration to the moral and ethical boundaries of our human dominion. At the same time however, Wemelsfelder argues that it would provoke the development of imaginative and novel ways to address these concerns.

2.4. Farm Animal Welfare Policy in Britain

Current UK legislation relating to the welfare of farm animals is founded on the Brambell Committee's 1965 report which was commissioned to look specifically at the conditions endured by animals kept under 'factory farm' conditions, and to advise on any standards deemed necessary to maintain animal welfare interests. In line with the recommendations made in the report, the Farm Animal Advisory Committee was established (later to become the Farm Animal Welfare Council: FAWC) as an independent body, and the idea of mandatory welfare standards was introduced to ensure that farm animals would have the freedom to "*stand up, lie down, turn around, groom themselves and stretch their limbs*" (HMSO, 1965). These standards formed the basis of the Five Freedoms and set the stage for welfare reform in both Britain and Europe. The Brambell report also highlighted the need for legislation to define animal suffering stating that whilst "*It is justifiable to assume that the sufferings of animals are not identical with those of human beings; it is equally justifiable to assume that they suffer in similar ways*" (HMSO, 1965:9). For the purposes of the Report animal welfare was described in the following way:

- Discomfort (such as may be characterized by such negative signs as poor condition, torpor, diminished appetite);
- Stress (i.e. a condition of tension or anxiety predictable or readily explicable from environmental causes whether distinct from or including physical causes);
- Pain, recognizable by more positive signs such as struggling, screaming or squealing, convulsions, sever palpitations. (HMSO, 1965:80)

These definitions of welfare outlined in the Brambell Report recognised the need for scientific evidence to inform legislation and moved away from the reliance on an assumed analogy relating to our human perceptions of animal feelings (Hodges, 2003). Scientific definitions therefore came to form the basis for all subsequent recommendations regarding animal welfare in Britain, and the report itself set the necessary criteria for overall improvements in British livestock production.

Following pressure from a welfare-minded consumer lobby that was already alerted to the plight of animals kept under 'factory farm' conditions (Webster, 1995), the 1968

Agriculture (Miscellaneous Provisions) Act, its amendments (1972, 1976) and its subsequent descendants (The Welfare of Livestock Regulations 1978, 1982, 1987, 1990, 1994 and 1998), elicited a compromise between consumer demands for free-range or 'natural' (extensive) agricultural systems, and producer concerns to maintain low production costs. It sought to achieve this by extending the protection of farmed animals through the regulation of husbandry practices, partly through legislation and partly by making provision for codes of recommendation to define the minimum welfare standards for all farmed animals in Britain.

The first Animal Welfare Codes were based on the principles of the Five Freedoms: freedom from pain, hunger, thirst, discomfort and injury (FAWC, 1993), and were derived from scientifically proven research into the biological needs of farm animals. Whilst not mandatory, all people involved with the handling of livestock were (and still are) required by law to have access and be familiar with the welfare codes relevant to the species in their care, and the 1968 Agriculture (Miscellaneous Provisions) Act, made provision that a breach of these codes, whilst not an offence, could be used as evidence in court to establish guilt in the event of prosecution (DEFRA, 2007). The development of these codes made it possible to make better informed decisions about the welfare of animals, particularly as the work of biochemists and ethologists increasingly came to inform legislation (Gatward, 2001). Additionally under the provisions of the 1968 Agriculture (Miscellaneous) Act, farm inspections were made a statutory requirement, as a means to monitor record keeping, regulate and maintain standards of buildings and equipment, feed and water, and to ensure that animals have freedom of movement without unnecessary pain or distress. Being largely concerned with increasing the minimum space requirements for animals kept in intensive livestock units however, a very limited concept of welfare quality emerged at this time (Webster, 1995).

In 1997, a Protocol in the Treaty of Amsterdam on the protection and welfare of farmed animals led to a shift away from the aesthetic, towards an ethical approach to animal protection when an amendment to the EU founding Treaty recognised animals as sentient beings for the first time in political history. Following transformation of the amendment into a Treaty Article in June 2004, all Member States were required to give full regard to animal welfare within EU and national policies that affect animals both directly, through

specific welfare directives, and indirectly, where policies of product safety for example may generate the need for greater animal testing (Radford, 2001). As a consequence animal welfare impact assessments are now encouraged before any new policy is adopted. Interestingly animals used for scientific purposes have been subject to a cost-benefit analysis to determine if the cost to the animal can be justified in terms of any potential benefit to humans, since the introduction of the Animals (Scientific Procedures) Act in 1986 (Webster, 1995). This legislation however, did not extend to the necessary suffering of animals farmed for the production of food at that time, highlighting an inconsistency in the treatment of animals used for different purposes. Indeed Hodges (2003) suggests that the difference in institutional mechanisms used to regulate the use of animals for medicine or in the food chain arises from the basic assumption that everyone has to eat.

In 2002, with the animal disease status in Britain being one of the highest in the world, the loss of consumer confidence in the food and farming industries and the spiraling costs of dealing with animal health issues (DEFRA, 2004), DEFRA, under the guidance of the amended of the Amsterdam Treaty, initiated discussions for the development of an animal health and welfare strategy. On 24th June 2004 the ‘Animal Health and Welfare Strategy for Great Britain’ (DEFRA, 2004) was published, bringing many existing initiatives together to create a framework that would deal with all aspects of animal health and welfare. The aim of the Strategy was to

“Develop a new partnership in which we can make a lasting and continuous improvement in the health and welfare of kept animals while protecting society, the economy, and the environment from the effect of animal diseases” (DEFRA, 2004: 11)

The importance of protecting human health is described in the Strategy as the paramount issue underlying animal health policy, and it states that *“consumers have fundamental expectations about acceptable levels of animal health, the safety of the food they eat, and that standards of animal welfare appropriate to a modern society have been met”* (DEFRA, 2004:28). It also points out however that society is concerned with the health and welfare of farmed animals, which it considers a major contributor to the sustainability of the livestock sector, the wider farming and food industry, and more broadly to the countryside,

rural communities and the rural economy (DEFRA, 2004: 13) It therefore emphasizes the need for a ‘partnership’ between various industry and ‘stakeholders’, including what it called ‘third sector organizations’ that run welfare assurance schemes such as the RSPCA Freedom Food scheme for example.

“Such a partnership is crucial if we are to ensure that the continually evolving threats to animal health and welfare are effectively identified, assessed and acted upon.” (DEFRA, 2004: 12)

The Strategy goes on to place responsibility for animal health and welfare firmly in the hands of animal owners, stating that they have *“a duty of care to meet acceptable animal health and welfare standards”* (DEFRA, 2004: 16). Animal welfare is described here as being concerned with *“Freedom from disease or abnormality, and the state of well being brought about by meeting the physical, environmental, nutritional, behavioural and social needs of the animal or groups of animals.”* (DEFRA, 2004: 16). The Welfare Codes, advisory literature and workshops based on the principles of the Five Freedoms and good husbandry practices, provide the necessary information for owners to self regulate, with any failure to treat animals humanely and as sentient beings, considered cause for prosecution.

As part of the Animal Health and Welfare Strategy, DEFRA launched a public consultation on the review of animal welfare legislation in Britain. This led to the development of a new draft Animal Welfare Act (DEFRA, 2004), which proceeded to gain Royal Assent in 2006. The new Animal Welfare Act (2006) replaced the Protection of Animals Act (1911), and subsequent amendments, updating and bringing together more than twenty pieces of legislation relating to the welfare of farmed and non-farmed animals in Britain (DEFRA, 2007). Additional protection, initially provided by the Welfare of Animals (England) Regulation, was also replaced by new regulations within the Act when it came into force on 6th April 2007. As farm animal welfare is currently covered by comprehensive EU legislation however, DEFRA considered that the new Act would mean no major changes for farmers. It did however, extend its remit to include any living vertebrate animals, with the possibility to extend further where scientific evidence of sentience is found. More importantly, the 2006 Act considered that animal owners now have a ‘duty of care’ or legal obligation to look after the health and welfare of their animals, whilst under previous

legislation the 'duty' was to ensure that animals did not suffer. This means that animal owners are now required to provide a suitable environment that will enable the animal to exhibit normal behaviour patterns, including any need it has to be housed with, or apart from, other animals. It also requires owners to provide a suitable diet along with protection from and treatment of pain, suffering, injury and disease. Additionally enforcers can now take action to protect an animal before suffering begins and a new offence, of failing to provide for any animal in your care, has been created.

Whilst there has been a history of legislation relating to the health and welfare of farmed animals in Britain since the late 18th Century, much of this has been based on aesthetic considerations or assumptions that have been made from analogies of our own perceptions of how animals might feel. It is only since 1997 that animals have officially been recognised as sentient beings and this has led to important changes in legislation, particularly where animals have been farmed under intensive livestock systems in which the risks to both human and animal health have been largely unknown and/or ignored in the interests of profit. Whilst there have been considerable improvements in the welfare standards for farmed animals in recent years, especially in relation to slaughter methods, transportation and the banning of tethering, veal crates, battery cages and sow stalls for instance, this has mainly been in response to political, economic and social concerns. However legislative changes have been informed by increasing amounts of Scientific research into the subjective experiences of animals, their physiology and behaviour for example, which have made positive contributions to our understanding of the experiences animals have and the ways in which we might alleviate their suffering. As Webster (2005) points out however, policies and codes that regulate animal welfare standards in Britain and Europe are frequently considered to be insubstantial in that they reflect the needs of the livestock industry rather than the farm animals they are designed to protect (Webster, 2005).

In 2009 a report by the FAWC entitled 'The Welfare of Farm Animals in Great Britain: Past, Present and Future', suggested in broad terms that the quality of an animal's life is implicit in its welfare, and that farm animal welfare should entail a life worth living; that is a life in which positive experiences outweigh the negative, even though there may be some pain, suffering, distress or lasting harm. A life worth living necessarily implies that

judgements are made on behalf of the animal, and suggests that the aim of animal husbandry should be to provide a good quality of life where disease is controlled with minimal prevalence, and the animal is able to express normal behaviour and make environmental choices to meet its harmless wants. Additionally there should be a ban on most, if not all mutilations, with certain husbandry practices (including the manner of death) being prescribed or forbidden, with opportunities provided for an animal's comfort, pleasure, interest and confidence, and importantly, the highest standards of stockmanship and veterinary care. A life that is worth living can be measured through an animal centred approach, and by utilising various biological, behavioural, psychological assessment methods to assess the whole animal and gain valuable information which can be amalgamated and interpreted to establish its Quality of Life.

2.5. End Points

In seeking to account for the welfare of farm animals to ensure that they have a good Quality of Life and 'a life that is worth living', the new agendas in animal welfare science open up the possibility of accounting for individual subjectivities through direct observation. Whilst the subjectivity of stock animals has been largely ignored in animal geographies and the social sciences in general, the new methodological tools developed can nonetheless contribute to research in this area. Incorporated into an empirical study of everyday farming practices that are underpinned by notions of traditional agricultural stewardship, they can help us to reconfigure farm animals as intersubjective beings that are in-relation to humans and the environments they inhabit. Through the direct observations of livestock within these environments and everyday practices of care, these research methodologies, and the new agendas being politicised in animal welfare policy, can also help us to recognise farm animals as individual beings with their own subjectivity. This would move us towards a better understanding of individual animals so that we could be accountable for their needs, and where necessary effect changes in the way they are treated or the environments they inhabit. Not only then would this go some way to addressing the invisibility of the individual within existing moral and ethical debates, but it also moves us towards a non-anthropocentric approach to rural sustainability; one that is inclusive of farm animals, environments and humans, and is mindful of *all* their needs.

This chapter opened with a sense of there being something missing from theoretical conceptualizations of human-animal relations when addressing farm animals within the relational context of the farm as a biotic community. It went on to consider the way new agendas in animal welfare and ecological sustainability place farm animals in a new relational context that foregrounds notions of care and response-ability. In so doing it has shown that when these agendas are combined they evoke a new sense of relational responsibility between keeper and animal. This responsibility however, is not only about the recognition of the animal as subject; it is a responsibility that takes on an ecological role as well. Emerging from this is a whole new context of relationality that has its own dynamics and contradictions. Crucially within the livestock farm, as the empirical work that follows will show, there are often tensions between these new ecological responsibilities and the new responsibilities for care. These tensions arise from the multiple events and situations that are at work on the livestock farm, and from the multiple encounters that take place when these frameworked relations are played out in the daily negotiations of co-presence.

Chapter 3

Messy Methodologies

“Almost certainly we will need to think hard about our relations with whatever it is we know, and ask how far the process of knowing it also brings it into being” (Law, 2004:3)

“...simple clear descriptions don’t work if what they are describing is not itself very coherent. The very attempt to be clear simply increases the mess...” (Law, 2004:2)

3.1. Introduction

As the early chapters of this thesis have progressed, my overall aim has been twofold. Firstly to demonstrate how individual farm animals have been rendered invisible in our academic understandings of social life, in debates over the broader rights of animals as a human ethical endeavor and in discourses of sustainability. Secondly I have explored different interdisciplinary approaches to find ways that will allow animals to be brought back in to our academic inquiries which enable farm animals to be seen for what they are, as beings in their own right that are co-constituted in the human and non-human world and the environments they inhabit. Within these chapters I have begun to argue for a relational study of the livestock farm which is attentive to making farm animals visible as subjective beings that are involved in intersubjective processes, not only with humans, but also with the environment. It is the recognition of relationality in livestock farming that is paramount here. Livestock farming is not just about human-animal relations, there is also an ecological relationality as well, with humans and animals necessarily bound up in, and reliant on the environment, just as the environment is bound up in and reliant upon them. Indeed Aldo Leopold (1966) recognised this inter-relationality in his Sand County Almanac, as he recalled shooting a wolf on White Mountain and watching her die: *“I realised then, and have known ever since, that there was something new to me in those eyes – something known only to her and to the mountain. I was young then, and full of trigger itch; I thought that because fewer wolves meant more deer, that no wolves would mean hunters paradise. But after seeing the green fire die, I sensed that neither the wolf nor the mountain agreed with such a view”* (1966:139).

This passage serves as a reminder that humans, animals and the environment do not exist in isolation. Rather they are in relations through which due recognition and consideration of the other is rewarded by a sustainable existence. For me it has also represented a challenge in terms of designing my research project as I have had to grapple to find an appropriate methodological framework through which to draw out and make explicit these relations between things so that we might begin to see things for what they really are rather than what political, philosophical and social theories would like them to be.

In what follows my focus turns then to the more specific aims of this thesis and to the methodologies that I have drawn upon in my quest to account responsibly for farm animal subjectivities and inquire into the possibility of a less anthropocentric approach to rural sustainability within the livestock farm. This chapter is therefore concerned with the research process itself, with the selection of things to investigate and how this might be achieved without missing out on the intricacies of complex relations, or relegating the non-human to the sidelines of this thesis. With a focus on ethnography I trace a series of precarious methodologies as they unfold in this research and consider how events, opportunities and experiences have contributed to this unpredictable and messy process. It is through a rather loose methodological framework then, that I aim to bring the complex realities of livestock farming into view and reveal how everyday performances can conceal certain practices that might be deemed unacceptable, have unintended consequences or detrimental effects which then hinder the achievement of rural sustainability.

3.2. Towards an Ethnographic Study of the Livestock Farm

Central to this thesis then is the analysis of relations between humans, animals and the environment within the context of the livestock farm. It is my intention to elucidate the interactions that take place on the livestock farm in order to rethink existing interpretations, meanings and practices associated with rural sustainability and animal welfare. To elicit those relations without recourse to deterministic background conditions featuring positivist theory, quantified data and formally prescribed data gathering procedures (Law, 1994), I want to embark on an ethnographic study of the livestock farm itself by drawing on qualitative methods that involve perceptual (observation), visual (photography), audio

(digital sound recording) and textual practices (discourse analysis and interviewing). Initially concerned with observing, describing and telling stories about the material world and the experiences of those who exist within it, these research methodologies allow us to see how realities are crafted and the way particular patterns of action occur in the everyday practice of life (see for example Law, 1998; Mol, 2005a; 2005b; 2008). In the search for new methodological skills that “*take[] the sensuous, embodied, creativeness of social practices seriously*” (Latham, 2003), Geographers and Social theorists (such as Thrift, 2000; Crang, 2003; Latham, 2003; Mol, 2008, 2004; and Law, 1998; 2004 for example) have begun to “*imbue traditional research methodologies with a sense of the creative, the practical, and being with practice-ness...*” (Latham, 2003:2000). This has opened up the possibility for a body-inclusive approach to ethnographic research in which the subtleties of body language can be read through appearances, movements and touch as the researcher becomes immersed in the context of bodily engagements with the researched. Thus just as Wemelsfelder’s qualitative approach to the assessment of animal behaviour (Wemelsfelder, 2007) involves empirical observation and close interaction with animal bodies, these more than representational methods provide a means to explore the intricacies of both human and animal performances which might otherwise be concealed. Such performances often tell a different story to the practices in which those bodies are engaged.

The undertaking of ethnography does not then require an in-depth comprehension of the subject of study, but rather a concern and sensibility for it so that meaning and action can be captured in context, along with a shared understanding of the thoughts, feelings, needs, desires and intentions of those that are involved, be they human or non-human. Importantly ethnographic research methods also reveal a personal story that reflects the experiences and conduct of the researcher along with the trails that are followed to accumulate and order the knowledge that is amassed throughout the research project. As such “*ethnography is a product, an interactive outcome, and nothing to do with observation by neutral or disembodied intellects*” (Law, 1994:16). What begins to unfold here then is my own personal journey as I travel with some of the humans and non-humans that are engaged in livestock farming in the Southwest of England and learn about what is involved and about what it is to be involved.

Ethnographic research however is by no means clear cut. It cannot be pre-programmed because its practice is always replete with the unexpected. Designing this research project has therefore not been a straightforward task. It has been complicated by the complexity and dynamics of livestock farming which has meant that it has not always been possible to follow methodological rules, nor has it been possible to anticipate what will happen during the course of the project, or indeed resolve the research questions. Designing the research has nonetheless been crucial and has necessarily involved precarious reflexivity and a constant adjustment to events as they unfold. Everything I have encountered throughout my investigations has impacted upon the research process itself, starting from the early questions that were raised from the literatures I engaged with, which have also and at the same time influenced and often challenged those who have helped me, not to find definitive answers, but to work through those questions, which more often than not have generated more questions than answers, and to come to some understanding of how and why things occur in the ways that they do.

The language of livestock farming

“doing...has vocabularies of staging and layout, and knowledges of the way in which different staging’s and layouts call forth different dramatic effects, which are vital to our understanding of how bodies are sent about their daily business, positioned, and juxtapositioned in ways which think the world without drawing on cognition” (Thrift, 2003:2020)

In the early stages of this project I had to learn a new language, a new way of speaking to comprehend how those involved in livestock farming give meaning to - and make sense of - what they do. Some of this was gleaned from my engagement with discourses, diagrams, maps and texts including books that described the practice of livestock production, husbandry practices, animal health and environmental conservation. It was from these secondary sources of data that I gained an understanding of livestock farming and was able to formulate a broad set of research questions.

The knowledge I gleaned from these different sources was complemented by my conversations with John and Ian, both neighboring farmers, who took time to show me, or

describe and explain their agricultural practices in clear, understandable terms. As I became more familiar with this new language I began to talk confidently with those involved in the industry, often randomly contacting some of those involved (such as the local slaughterhouse, veterinary practices, feed suppliers and butchers for instance), engaging them in conversation to increase my depth of knowledge and the fluidity with which I could speak. I also visited agricultural shows where I came into contact and spoke with farmers exhibiting their stock, and approached advisory and commercial stalls to find out about what they do, how they do it and why. Despite this growth in confidence I nonetheless remained concerned that my inexperience of livestock farming would be frowned upon within the industry and that this would prevent me from enrolling those I would seek to engage in the substantive part of my research for fear of wasting their time.

These fears however were laid to rest during my discussions with John, another friendly neighbouring and now retired farmer who explained that the things that we talked about had made him think long and hard about the way he had farmed for the last forty years. He had even been kept awake at night as he mulled our conversations over, thinking about what he had done in the past, the impact this had had on his farmland and animals, and how it might have been different if he had thought about these things before. Not heralding from the farming fraternity, I was quite flattered that I had instigated this thought provoking process. My own thoughts at this time were being constantly challenged, but I had not really considered how my investigations might affect others. It was a definite oversight which nonetheless resulted in further conversations which I hope were mutually beneficial, not only for me and the humans with whom I engaged but also for the animals and the farming environments.

Following initial concerns around my inexperience and lack of knowledge about livestock farming, it became clear to me at this point that what I could make present in this research were things that may not be spoken or seen by the people I engaged with, but the things that remained outside existing statements that they used to talk about livestock farming, to interpret what happens and to attribute meaning to all of the things involved. Indeed John Law suggests that “*if we stick too readily to statements then we will refuse reality to many outtherenesses*” (Law, 2004:116). My role as a researcher then was to hear what is said

whilst detecting what is silenced. To do otherwise would be to miss the point of conducting this research.

3.3. Learning about animal bodies

Part of the research undertaken here involved the observation of qualitative assessment techniques for farm animal welfare undertaken for the EU Welfare Quality Project; an EU funded project that sought to develop animal-based assessment measures for animal welfare and their application within assurance schemes. This was undertaken with Dr. Sue Haslam, an experienced veterinary/researcher from the Bristol Vet School, who had arranged to undertake assessments on beef cattle at a Scottish Cattle Mart. The following is an account of one such assessment visit.

Donned in overalls and blue boot covers for biosecurity purposes, we were pointed in the direction of a large cattle shed, that was divided in half, each pen containing an eclectic mix of beef cattle that were being fattened for slaughter. Sue carried with her a clipboard containing a pre-formulated list of practical measures that related to the animal's housing, their feed, health and behaviour. This list was built around the Five Freedoms and included measures to detect the absence of hunger, thirst, disease, pain, and negative emotions, as well as to establish the animal's thermal comfort, and the suitability of space they had in which to move around. She also carried a tape measure, which we later used to take accurate measurements of pen size, and a camera, to photograph specific observations which she felt were important but which may not have been covered, or could not be accurately portrayed on the welfare assessment form.

She began then to make detailed observations of the animals in the context of the buildings in which they were being kept, and she noted them on a diagram along with detailed information about the condition of the building, the type of ventilation, the depth of bedding that the animals had, the number of feeding troughs, the cleanliness and availability of water, and any sharp edges that the animals could come into contact with. She also made detailed observations of animal behaviour in each pen, noting any contacts between them, the number of animals that were standing or lying over a set period of time, and also how long it took them to lie down. The latter was important because it was an indicator of comfort, the harder the ground the more discomfort the animal would experience and the longer this performance would take. In relation to animal health Sue noted the number of animals that were coughing, sneezing, had runny eyes or noses, as well as the level of lameness and condition of their feet. She was also interested in the level and position of dirt that covered their bodies (in deep straw animals tend to be clean), if they had any bare patches on their neck (were there bars they were rubbing against?) or lesions where their fur might have been rubbed back to the skin

(attracts flies and infections), and whether or not they had horns. Horns can be problematic for animals that are contained as they can get caught up in fences and equipment, and they can cause injury to other animals in the group.

Based on the visibility of the animal's tailbone, Condition Scoring was another important measurement used to indicate the animal's state of health, in that it gave some indication of whether an animal was getting enough food, or if it may be suffering from internal parasites or other health issue. Similarly the detection of a swollen abdomen on the left side of an animal's body was used to identify bloat; a common cause of death in cattle that occurs from the build up of gas in the animal's rumen. In terms of animal behaviour Sue looked for signs of bullying amongst the animals, particularly at the feed troughs where it was common for dominant animals to deny the weaker animals access. She also got inside the pen and walking slowly towards an animal with her arm outstretched, attempted to measure its zone of flight. This process was repeated with a number of different animals to establish how interested or nervous they were of humans; something that could be problematic in their handling for routine treatments and health monitoring procedures, as it can cause the animals considerable distress, and lead to death or serious injury of both humans and animals. Interestingly, there was a point during these observations when Gordon the farm worker arrived to top up the animals bedding, entering each of the pens with the tractor to spread fresh bales of barley silage. As he did so the animals began to kick out, jump and frolic about, prancing and playing in their moments of joy, oblivious to both Gordon and the tractor. One black heifer in the first pen got her head right down underneath it, enjoying the smell and feel as she rolled her head around, whilst other animals were eating it. Now up to their knees in fresh bedding the animals were provided with comfort and warmth, and they would not sustain injury when they came to lie down.

During this assessment exercise, and in addition to the observations of the animals themselves, a number of questions were also asked of the farmer and his laborer Gordon. These questions related to management practices, such as how often the pens were cleaned out, where the animals came from, how they were mixed, regrouped and moved around. Did they have a health check before coming onto the farm? Was there a herd health plan? Did they go out in the fields on fresh grass? If so when and for how long? What equipment did they use? How many animals were castrated or dehorned, who undertakes these operations and are the animals given an anaesthetic? Questions such as these were important because "*what you see of animal welfare through aesthetic observation can sometimes be deceptive*" (Sue Haslam *pers.com*). Citing the example of chickens in housing during bad weather, versus free range chickens having to be brought in during very bad weather conditions, Sue pointed out that the housed chickens have an environment designed to suit their purpose with heat, light and ventilation provided. Free range systems

alternatively, where you expect animal welfare to be of a much higher standard, are not geared up to house chickens indoors for prolonged periods of time, and this can more readily lead to health and welfare problems during episodes of poor weather. Speaking to the farmer and his workman then was just as important as observing the animals themselves as it helped to put these observations into the wider context of the farm and the practices that were undertaken. The following diary entry helps to demonstrate this point.

20th November 2007

The two cattle pens we observed revealed two very different sets of behaviour. The first pen was a slightly older bunch of predominantly heifers, Limousin Crosses that had been together for a while. They were fed ad lib and seemed a happy and contented lot, although there were a lot of runny noses, with thick mucous, runny eyes and coughing, which suggested the presence of a virus. There was not a lot of interaction, movement or bullying going on in this pen, although they did frolic and jump when fresh bedding was brought in and spread around.



Figure 3.1: Pen 1 at Dingwell Cattle Mart

In the second pen (see image above) there was a mix of heifers and stots that were a little younger, but still over the 35kg required by the EU protocol Study. The behaviour in this pen was much more active, with a lot of horning and chasing going on, some displacement at the feed trough for the barley cake mix and an awful lot of coughing. Only a few had

runny noses, probably about 8 out of the group of 23, with 3 having runny eyes. I also noticed that some of the animals seemed to have bare areas on their coat around their neck and back. Gordon, the farm laborer told us that the animals in this pen had only been moved there as a group from the mart yesterday. He also told us that two of them had already been treated for pneumonia – usually, he explained all animals carry the pneumonia virus with no problems whatsoever, a bit like our common cold. But when animals come into contact with other animals carrying a different strain, it can develop into something that the animals can't fight off. He was currently trying to prevent this from happening by shaving the animals coat from the neck right along their back to the tailbone, because this helps to control body temperature. Otherwise the onslaught of pneumonia is accelerated when the animals get too hot and then too cold.



Figure 3.2: Pen 2 Dingwell Cattle Mart (Authors own image)

The barn that the animals were kept in was open sided, but it also had a ventilation tube running through the centre on the inside of the roof. This tube, which has a series of blue dots, can be seen in the image above. Gordon explained that this was to circulate air so that bacteria couldn't settle and linger amongst the cattle. This was a new installation and should help to prevent disease and viruses which had been a problem here in the past because the animals were 'brought in' from the Mart and frequently mixed.

It was through my participant observation of qualitative welfare assessments that I learned how to be affected by farm animals (after Hinchliffe *et al*, 2005: 648), and become sensitive to other registers of communication. I also learned how to watch farm animals closely through the eyes of a veterinary/researcher, who firmly committed to a scientific approach to animal welfare assessment, was often skeptical of behavioural observations and what they could tell us. I nonetheless began to learn about the languages that are used to speak of animal health and welfare and to detect the presence of illness, disease, happiness and distress through a combination of scientific and social methods. And I became more aware of animal bodies and the things I should look for to make sense of those bodies during their everyday performances. This gave me the confidence to interpret what bodily performances might mean for the animals themselves. Interestingly during a conversation I had with Sue in which I was trying to justify an experiential outlook to animal welfare, against her veterinary background which she argued necessarily based the welfare of animals on “*scientifically set parameters, group statistics and number crunching*” (the number of animals in a group that are suffering), she told me that:

“Aesthetic observation is what farmers do without realizing that they are doing it. They look at a field, shed, animal or whatever, and know instinctively that something is wrong with that particular situation – they may not know it at first, and without further observation or investigation they will not know what the exact problem is, or how to deal with it, but they will know that something is not right” (Pers. com).

This conversation led me to think how much of a farmer’s work can be compared to the work of nurses, and what Barbara Carper (1978) has described as their ‘ways of knowing’. In developing a model of how nurses know what they know, Carper suggests that they have specific ways of knowing, which include:

1. Empirical ways of knowing - extant knowledge that provides the empirical basis for effective practice.
2. Ethical ways of knowing - an appreciation of how best to respond to a situation in terms of societal benefits, expectations and norms.

3. Personal ways of knowing - those things embodied within the practitioner that influence the way he or she sees and responds to the world.
4. Aesthetic ways of knowing - the practical know how and professional artistry used by each practitioner as they go about their work.

In addition to this Johns (1995; 2005) identified the importance of reflexivity in nursing, and emphasized the impact of past experiences on the present “*the present turning back on itself to reflect on the way it has evolved from past experience*” (2005:4). He also suggests that Carper’s scheme becomes practical when practitioners describe a particular situation using clinical judgment and respond appropriately so as to reduce a particular outcome, at least as they interpret it. In this way they reflect on their actions in the above ways (1-4), and a pattern of knowing emerges within a whole that can be appreciated and re-patterned towards realizing more desirable practices in the future.

These interpretations of a nurse’s way of knowing also reflect the way Gordon had come to know about the health of the animals at the Cattle Mart farm, and how both he and the farmer had decided reflexively on the practices necessary to control the issues they were facing or prevent them in the future.

3.4. Generating Research Materials and Reliable Witnesses

“[Good research practice is]actually a matter of constituting phenomena as actors in the discussion, that is not only of letting them speak, but of letting them speak in a way that other scientists recognise as reliable....The real issue is...the invention and production of...reliable witnesses.” (Stengers, 1997:85 cited in Whatmore 2003:97)

Once relatively confident in my knowledge of livestock farming and observing animal bodies, my attention turned once again to research design or more specifically to the process of identifying and generating relevant research materials. To conduct this farm ethnography it would be necessary to pay close attention to social practices and what the people involved in livestock farming do as well as what they say. This required that I identify my sites of research and spend time on livestock farms, engaging with farmers and

others involved in the day to day practicalities of livestock production. Importantly, in seeking to redistribute attention from exclusively human actors, I also wanted to pay close attention to the farm animals themselves, to the way they lived out their lives within the farm environment, and the ways in which they were affected by everyday farming practices. This I would achieve through perceptual practices involving the empirical observation of livestock in the fields as both the farmer and animals went about their daily business of being in the world. These observations would allow me to come close to the animals themselves so that I could begin to recognise how their various skills are grasped and employed within agricultural production. Additionally, inspired by my work with the Welfare Quality research, they would allow me to observe animal behaviour and consider bodily nuances in response to various stimuli in the environments they inhabit. These observations could then be discussed with the farmer to contextualize their occurrence.

Standing at my kitchen window I was able to watch groups of cattle and sheep without interference as they were moved into and out of a three and a half acre field. The convenience of this viewing point meant that I could watch farm animals at different times of the day, evenings during the summer months and on brightly moonlit nights. I could observe the performances they engaged in including all their mundane acts such as eating and sleeping to the more detailed acts such as mating. If the animals were noisy or if the farmer arrived at the field I could quickly see what was going on at a distance, and keep track of events as they happened to unfold. During the course of the research I therefore became familiar with the animals and found myself drawn to the window to find out how they were and what was going on. Interestingly as I did this my partner and children also became curious and began observing the animals as well, informing me of, and discussing the things that they saw. This magnetism hasn't changed.

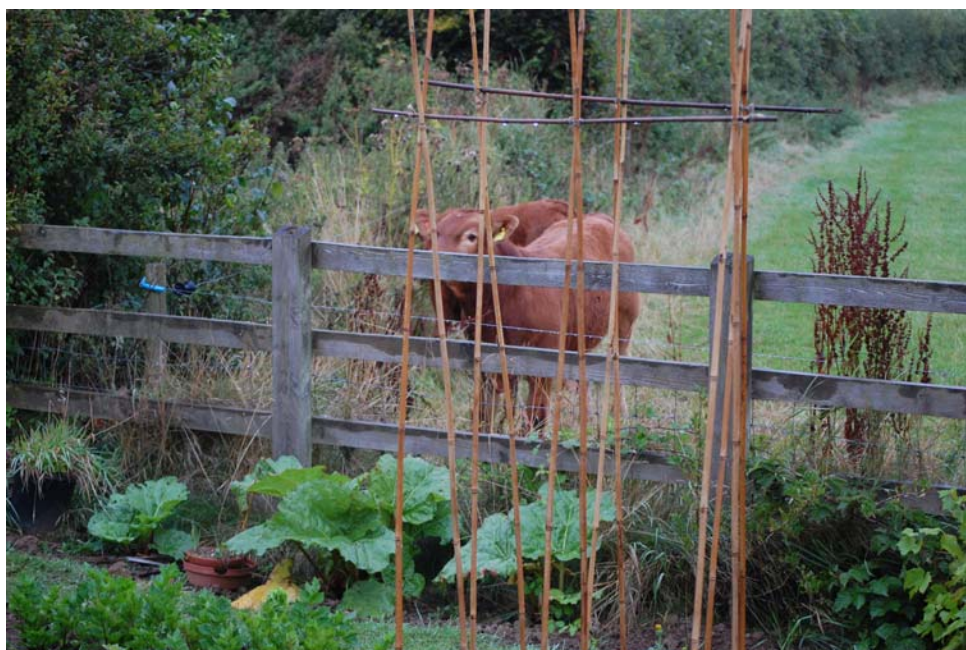


Figure 3.3: Image taken from authors garden, to give some indication of the proximity within which animals were observed (Authors own image)

I was also able to observe the animals and they also frequently observed me in my garden, separated only by a post and rail fence with a single electric wire the other side. A view of the proximity within which animals could be observed can be seen in Figure 3.3 above. As the animals were moved into other fields around my home, including those directly adjoining I was able to observe them discreetly from the convenience of the hedge. This meant that I was able to spend a great deal of time watching these animals, their interactions with each other, with their surroundings, and with wildlife, the farmer and sometimes other humans. I was therefore able to watch the farmer when he visited each day to see if he noticed things that I had picked up on, noting how long it took him to recognise potential issues and his subsequent response. These instances could then be discussed at a later date.

During my observations I often took photographs of the animals on a Nikon D40 digital camera, providing snapshots of some of the interactions and things I encountered. Often criticised academically for ‘objectification’, these visual images were nonetheless valuable for conveying my experiences of animals at ad hoc moments as they occurred at a particular time and place. As such the photographs incorporated into this project were taken instinctively and carry “*a trace of what was there when the shutter speed snapped,*

and so they reassure us....what they picture – really existed...the actual effect of seeing ‘what has been’ depends on, and is unique to, a particular viewer” (Rose, 2003:8). This I felt was important because there were times when I wondered if people would believe what I said. The image below, of the bull separating a cow from her calf prior to mating provides an example of one such occasion.



Figure 3.4: The bull separates a cow from her calf in readiness for mating (Authors own image)

Adopting a qualitative approach to the assessment of animals in the field, I used my own personal expressions to describe what I saw. My perceptions of these animals were expressed in a field diary as a direct observation of what can only be described as a dynamic style of interaction that took place between the animals themselves, between the animals and humans and between animals and the environment. My descriptions were contextualized by the specific expressions and bodily movements that I happened to observe and were complimented by the vocalisations I heard. These details were important in that they helped me to identify particular patterns of behavioural style and to judge what the animals might be experiencing and how they might feel. I was very aware that the terminology I used to describe my observations of farm animals in the field was subjective, and may therefore be construed as anthropomorphic in that it conveyed a form of empathy with the animals that some would argue is biased. My descriptions nonetheless allowed other important stories to be told in this research; stories of farm animals that were then

used reflexively to inform and generate questions within the research process. Without the stories that emerged from these direct observations, farm animals would not have been present in this research and many relevant questions would never have been asked.

3.5. Farm Survey

A central empirical component of this doctoral project has consisted of detailed on-site research within a selected sample of livestock farms in South West England. This research has consisted of lengthy and, in many cases, repeated interviews with farmers and stockmen, observational and ethnographical techniques as well as the use of documentary sources pertaining to herd health, productivity and assurance.

A key concern has been to sample across a range of different livestock farm types. Being in the Southwest of England where a high number of mixed livestock farming systems operate, I chose beef, sheep and pig producers as the target groups for my study. Although dairy farming is also commonly found in this area, it has attracted a great deal of public attention in recent years, particularly in relation to genetic modification and welfare (see for example EFSA, 2009; De Silva and Stevenson, 1995), BSE (Hinchliffe, 2001), the export of dairy calves for veal production (Weeks, 2007) and recent outbreaks of foot and mouth disease (Dekker and Terpstra, 1996). With this in mind, this research has focused on other livestock farming types displaying a wide variety of different production techniques, animal welfare concerns and environmental impacts. The sample of farms therefore included both intensive and extensive systems as well as systems that were operating under the Soil Association, organic or RSPCA (Freedom Food) standards. I also sought to investigate farms across a range of different environments including upland and lowland, or those designated as Areas of Outstanding Natural Beauty, Sites of Scientific Interest or Environmentally Sensitive Areas.

An initial selection of producers was compiled using a variety of methodologies, including word of mouth and snowballing, internet and phone-book sources, local newspapers, registered farm lists, local newspapers and farming and countryside magazines. A list of producers covering the range of beef, sheep and pig production systems was drawn up across a range of environments that exist in the Southwest. My aim was not to achieve a

representative sample of farms, but rather to gain an insight into the way different livestock production systems operate on different environments, to reveal the relationality between things in everyday farming practice.

I began then to make telephone contact with people that I had never met or spoken with before, introducing first myself and then my project, engaging them in conversations about farming before asking if they would be prepared to help me with my research. The responses I experienced were varied, some farmers abruptly telling me that they had no time, whilst some others (particularly those involved in the production of pigs) assumed I was sympathetic to activist animal rights or environmental organisations, and would have nothing to do with me for fear of reprisals. Through the course of the research I have come to understand why. Thus as Mountz, Miyares et al. (2003:39) point out their hostility towards me and the mistrust I negotiated is *“not a barrier to overcome, but rather, an instructive part of the research process”*. A final sample of 14 farms was eventually established, where the farmers and stockmen were prepared to participate in the research. Meetings were subsequently arranged, with all initially inviting me into their homes at a time of mutual convenience for an informal discussion. I was also invited to look around and spend time on some of the farms, and to observe or participate in their everyday farming practices. The production systems these farmers operate and the environments in which they farm are detailed below. It should also be noted that for the purpose of this thesis pseudonyms have been used for all interviewees to protect their anonymity.

Pig Production	Beef Production	Sheep Production	Calf Rearing
Extensive/organic/lowland	Extensive/Upland	Extensive lowland	Intensive Lowland
Intensive/lowland	Organic/Lowland	Extensive/Lowland	
Intensive/lowland	Extensive/Organic/F-Food/Lowland	Extensive/Organic/Upland	
Extensive/lowland	Extensive/Lowland	Extensive/Upland	
Hybrid F-Food/lowland	Extensive/Organic/Upland	Extensive/Upland	
		Extensive/Organic/F-Food/Lowland	

Table 3.1: Participating farming systems and the type of environment on which they operate (nb. Some of the farms detailed above operate mixed systems incorporating beef and sheep, one had a mixed system incorporating sheep production and calf rearing)

3.6. Interviewing

Methodologically then I sought to generate my research material through the empirical observation of livestock, through participant observation of livestock farming practices and also through a regime of semi-structured interviews with farmers from different production systems and types of environment. My interviews with farmers began as an exploratory orientation into the way the day to day work on the farm was organised, how the animals, land and types of production system were selected, and into what it is that farmers do and how they were prepared to do it. To enrich this material however, I wanted to move beyond the farm to engage with and interview other relevant actors involved in livestock production such as the veterinary's employed to provide medical advice and healthcare for farm animals; agricultural organisations and NGOs who produce knowledge about and provide guidance to farmers on all matters of livestock production and/or environmental conservation; animal welfare specialists and government officials charged with the task of implementing and monitoring farm animal welfare, environmental and agricultural legislation. All of these actors influence in some way the everyday practices that take place on the livestock farm, helping to bring specific events such as disease, production targets and pollution into being (Mol, 2005). It was therefore also important to find out about their everyday practices and encounters on livestock farms and about their own particular experiences and views of events as they were brought into being.

This was achieved through a further series of semi-structured interviews with a number of additional actors including: local veterinarians, the lead veterinary officer from DEFRA in the Southwest, representatives from professional and certification organisations, conservation advisors and officers, agricultural specialists and farm assurance scheme assessors. These contacts were identified either through my visits to agricultural shows or through websites, phone directories, local newspapers and agricultural magazines. In addition to this I spoke to many other actors involved in livestock farming such as seed and feed merchants, agronomists and suppliers of minerals and nutrients for both animals and the land, as well as to suppliers of machinery and agricultural equipment such as feeding systems, electronic scanners and ear tags for animals. I also engaged in participant observation at agricultural workshops relating to land and animal care, and assisted in the

administration of routine veterinary treatments and the health monitoring of livestock. Whilst there is an endless list of heterogeneous elements that I could have incorporated in this ethnography, I was necessarily restricted by the limits of the thesis and the purpose of descriptions that I sought to make. I should also make clear that these accounts are informed by the things that I have seen and by what the people I encountered have told me about events as I have sought to unravel the relations between things in livestock farming practice. As such the accounts that are made here are my own. They have emerged from what Mary Louise Pratt describes as an auto-ethnography through which I have drawn on the self-representation of research subjects as I have engaged with them on their own terms, whilst staying faithful to my own self-understandings (Crang, 2005).

As the research process advanced, loose sets of interview questions were developed out of the research materials that had been brought into existence, with different sets of questions emerging for different types of system, different environments and the different actors involved. Copies of the Interview Guides employed are included in the Appendix. During the course of the research a number of issues were identified with greater precision and questions were reformulated to draw out more about the affect/impact of certain practices and processes on animals and land pertinent to this particular project. Within this process it was necessary to recognise that particular evaluations remained sensitive to local conditions and responsive to changing circumstances. The concepts and questions used therefore had to be generalized, and generalized frameworks were developed so that comparisons could be made between disparate farming systems, their local environments, the production methods and practices, so that the things that tied them together could be unveiled.

The informal way in which some of the interviews were conducted allowed for the emergence of a dialogue between interviewer and the interviewees, each reflexively informing all future interviews along with my participant observations and the field diaries of livestock as I continued to observe farm animals. In this way I was able to talk about one interviewee's experiences with another, whilst also reflecting on my own observations of livestock and farming practice, to ascertain convergent or alternative experiences and views. As the interviews progressed I established specific contacts and connections within the wider agricultural industry, particularly veterinarians and those within government agencies with whom many of the farmers I had spoken to were involved. This enabled me

to raise issues familiar to different parties in an anonymous way. In so doing I could provoke conversations involving individual thoughts that would otherwise never be discussed with others in any meaningful way. The interview process therefore seemed to generate, facilitate and provoke a dialogue between scientific and social issues which, constructed as fixed, separate and bounded in the language of livestock farming and existing statements used, actually interweave in practice. It opened up space then, for a dialogue between veterinary medicine, ecological, technical and animal sciences, and the practicalities for humans, animals and the environment of everyday life on the farm.

The face to face interviews with livestock farmers were all recorded on a digital voice recorder which was instrumental in transporting the sounds of the interviews into words in a computer document. As some interviews were conducted outside, they also included the sounds of the animals and the sounds of a working farm. These audio journeys were not in any way pre-planned and often lasted several hours. As I listened to the tapes during the transcription process I was reminded of the specific nuances of the sites, sounds and conversations I had had, with the language that was used and the tone of voice for example, all communicating subtle details that helped to add depth to what was being said, just as the demeanor and vocalisations of the farm animals I observed, described and photographed in Inverness and the fields surrounding my home revealed much more about how they experienced their lives within the farm, and made them present in the research.

My opportunities for participant observation were also important from this respect in that they highlight the particular significance of face to face contact and interactions with both animals and humans in the context of this research. On one occasion for instance, I had the privilege of walking a herd of Welsh Black cattle through the winding lanes of Dartmoor as the farmer and I collected them from their winter pasture and took them back to the farm for a Blue Tongue vaccination prior to being turned out onto the moor. The personal contact I had with the animals during this time as I walked slowly with them seemed to bring a different relational materialism into being, one in which performances could not be hidden. As I walked alongside and in direct contact with the animals, they gave off bodily signs and expressions as they appeared to wrestle with and strain towards mistrust in a sort of Goffmanesque performance. Yes they seemed to know they were going back to the farm

and appeared quite happy about it as we ambled along the lanes, but who was I and what was going to happen to them when they got back to the yard anyway? I was nuzzled and licked, stared at and pushed which made me feel a bit nervous. They stopped at different points on route, sometimes to browse the hedgerow, at others seemingly hesitant to go on, and they tried to turn tail and head off back down the lane. Alert to these signals the farmer would hold out an arm and a stick to divert them back in the direction of the farm, using his knowledge and skill to bring the situation under control. The bodily signs given off by the animals however, were also skillfully controlled through their vocation to survive. The uncertainties expressed in these bodily movements could not be ignored because they gave some indication of how the animals felt, what they might do, where they might go and how they might react to events as they unfolded. It is important to recognise then that these signs and skills that both animals and humans have can only be observed in our direct face to face contact and interactions with them. The data generated through my participant observations have therefore been an important and very relevant part of this research. They also reveal that the things people tell you about in interviews and conversations are often quite different from what happens in practice.

Interestingly the opportunities I had for participant observation also told another story in that they drew attention to those aspects of livestock farming to which I was not given access. Thus whilst I was able to observe, interact and participate on beef, sheep and outdoor pig farms, I was not invited to observe, interact or participate on intensive indoor pig production units that operated on a commercial scale. To me this seemed quite significant in that it suggested that it was these farming systems that had most to conceal.

3.7. The emergence of scale in livestock farming practice

“...phenomena...are not found at the meeting point between things and the forms of the human mind; phenomena are what circulates all along the ...chain of transformations”
(Latour, 1999:73)

The data that was generated in the research and the exchanges this set in motion were not easily separated out into words and things as neatly as might be hoped, with each thing that

was mobilised, whether process, practice, human, animal, environment, equipment, language or object, both displaced and mobilised by others, reflecting what Latour (1999) has described as ‘circulating reference’. In detailing through words and images his account of a scientific expedition, Latour suggests for example that

“...we never detect the rupture between things and signs, and we never face the imposition of arbitrary and discrete signs on shapeless and continuous matter. We see only an unbroken series of well-nested elements, each of which plays the role of sign for the previous one and of thing for the succeeding one” (Latour, 1999:56).

This quote sums up what seemed to occur with the things I encountered in this doctoral research. That everything linked together, intermingled and overlapped made the whole process of mapping my data into knowledge an incredibly difficult task. How could I write about livestock farming practices and convey the things I had learned about, as they have been conveyed to me when things are so shapeless, well-nested and continuous? How could I begin to speak in the voices of the humans, animals and environments that I had encountered in a way that would reflect the things that occur in those everyday practices, and describe the affect those practices have on each of them, when what happens to one impacts upon the other? It was one thing observing things, participating in events and listening to specific explanations, but it was quite something else to amalgamate all of this together and begin to write about and describe them in a responsible and coherent way. As I considered these questions and how to proceed, the certainties of what I had come to know during the course of this research began to dissolve. Thus the ethnography I was immersed in could not be separated from the writing (Crang, 2005).

In my attempts to make sense of all the data that had been generated, I started to construct spider diagrams or mind maps of the practices involved in pig, sheep and beef production to bring the things that I had found out about from my observations, interviews, conversations and interactions, altogether in one place. From these rather large and messy diagrams, images of which are shown in Figures 3.5; 3.6; and 3.7 below, I was able to identify more specific links and patterns that occur in farming practices and make connections between the things that occurred in different types of farming system.

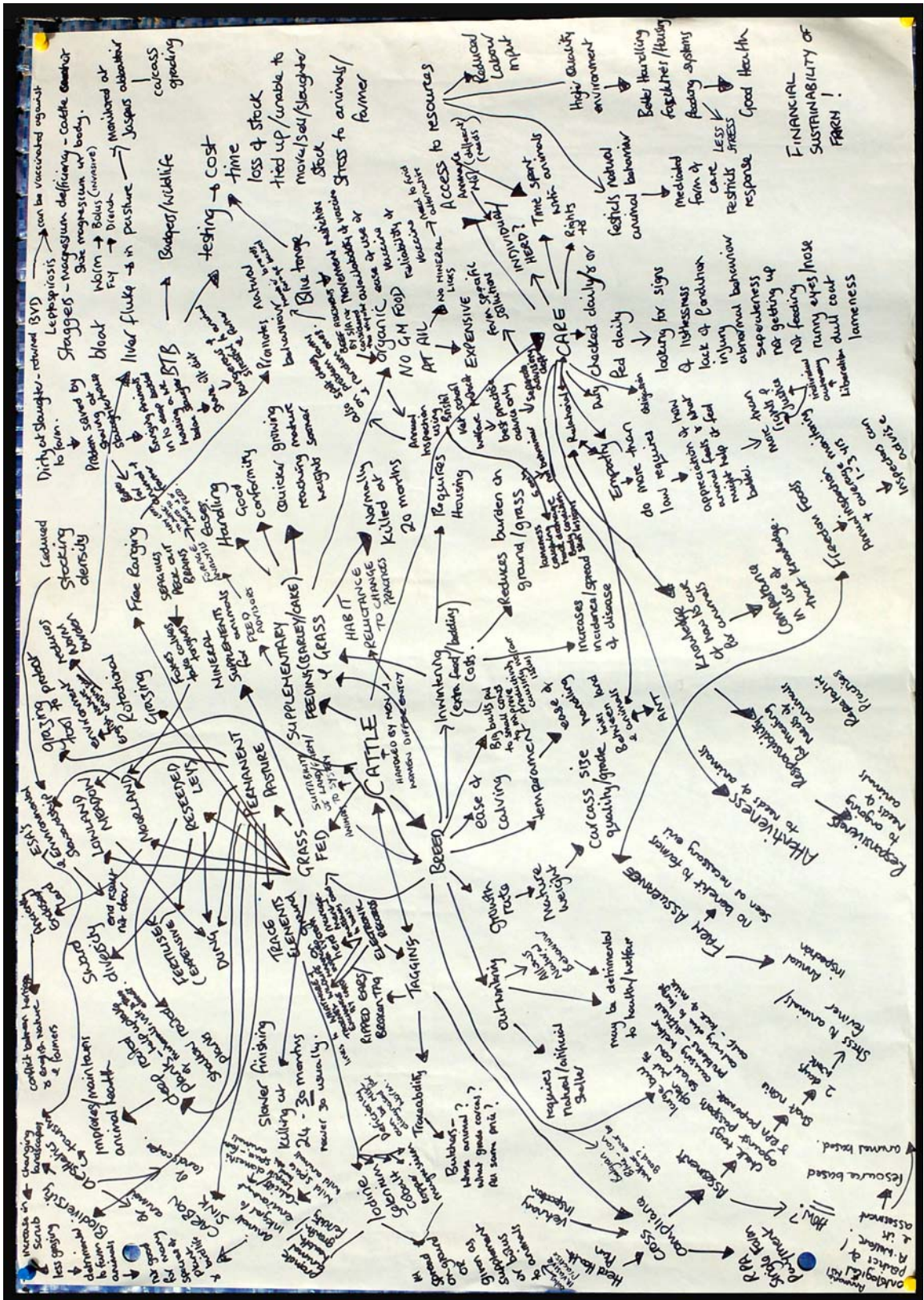


Figure 3.5: Image of Cattle Spider Chart (Authors own image)

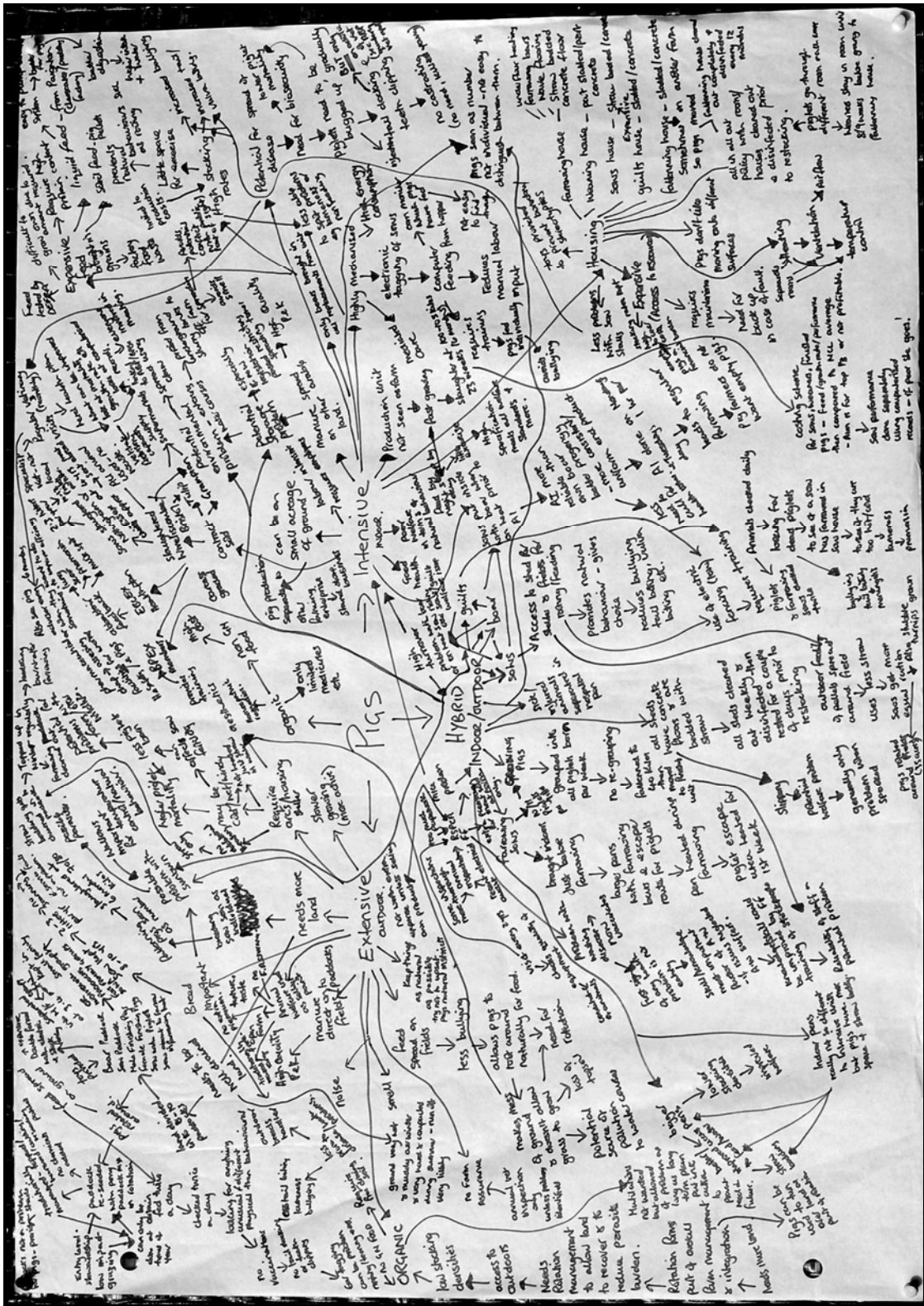


Figure 3.6: Image of Pig Spider Chart
(Authors own image)



Figure 3.7: Image of Sheep spider Chart (Authors own image)

Everyday farming practices for example seemed to centre on either the management of the land or the management of the animals to facilitate production, or they could be linked to the compliance of policies concerned with environmental or animal welfare issues, such as the disposal of wastes and the control of disease. Turning to my interview transcripts, I therefore began to identify and code what had been said about these things with a view to building a framework that would enable me to draw out and describe the complexities of livestock farming and the relationality this involved. This however, was no easy task. When I came to start writing for instance, I was unable to describe the everyday practices that were directed at farm animals without also describing the type of farming system it is incorporated into, the environment in which it is kept, the feed it is given, the nutrients this contains, the production process and the animals role within it, the equipment that is used, other animals and humans with which it comes into contact, its own genetic make up and disease resistance capabilities that are linked to livestock breeding programmes, production targets and the purchasing decisions of farmers, or the prevalence of disease and availability of veterinary medicines with which to control animal disease. I was unable to describe the impact of livestock and agricultural practices on the 'Natural' environment because all of the above things also changed those relations. I could not separate things out to describe their effect on the sustainability of the system.

As I tried to make sense of and organise the data that I had compiled on the spider diagrams and from the transcripts I had coded it became clear that the various practices relating to the environment, farm animals and policy issues took place over different spatial scales. The livestock farm itself for example, which comprised of wild and domestic animals, Natural and Social processes, had to be managed as a whole system. In this sense it was like a biological community in which plants, animals and humans came together and functioned as a stable ecological whole. The stability of each system was dependant on the organizational and management practices through which the animals and the land were ordered and grouped to facilitate the production process for economic gain. Each unique and dynamic system had its own modes of ordering and each mode of ordering was dynamic in its effect. The success of the production process was subsequently reliant on the ability of each individual element that existed within that system to thrive. This was necessarily dependant on the modes of ordering used and the type and quality of care that was individually received.

I began then to reorganise the research data into the three different sites at which livestock farming practices were being performed and played out; the whole farming system; the herd, flock and field; and the site of the individual. By identifying and examining the farming practices that took place at each level, I could begin to build up a picture of farm animal lives and consider the role that they played within the achievement of rural sustainability. It became clear as I did this, that the practices undertaken at each of the levels identified, were illusive, unpredictable and messy, often overlapping, interfering with and concealing other practices undertaken at another spatial scale. This pointed towards hierarchical processes, unfairness and inequality amongst all things involved.

In the chapters that follow then I explicate further some of these hierarchical processes that take place on livestock farms across the southwest of England. Using what are sometimes quite lengthy quotes from my interviews, excerpts from my field diary, and photographic images I draw out the relations between things across a range of spatial scales to show how certain harmful practices are concealed and perpetually reproduced in everyday performances. Organised around different aspects of livestock farming, Chapter 4 for example describes a range of practices that take place in relation to whole farming systems, and considers the contributions that are made by both human and non-human actors as they seek to maintain their existence within those systems, and to maintain its stability as a whole. In Chapter 5, I explore the organizational aspects of livestock farming at the level of the herd, flock and field to draw attention to the unfairness and inequalities involved in generic modes of ordering that facilitate production and the management of the farm. The focus of Chapter 6 is the site of the individual through which I examine the partial and selective practices involved in everyday care. It is through the key research themes then of biological community, modes of order and care, that I draw attention in these chapters to heterogeneous elements that are involved in livestock farming practices, bringing them together in a coherent and understandable way.

In Chapter 7 I go on to use the theme of multiplicity to demonstrate how and where certain elements of livestock farming are made to be highly visible or are left in the background. As I hope will become clear, this visibility is dependent on the character and purpose of descriptions that are used within the existing statements, discourses and languages of everyday farming practice. Whilst these chapters provide no specific answers, they will at

least reveal some of the hierarchies involved in the business of livestock farming, and bring everyday practices that currently disrupt the achievement of rural sustainability into public view so that they might be included for consideration in future debates and incorporated into the development of more holistic management strategies.

Chapter 4

The Ecology of the Livestock Farm

4.1. Introduction

In the first of my empirical chapters I begin to explore and unravel some of the complex relations that exist between humans, livestock and the environment at the level of the farming system. Defined here as a bounded but porous ecological unit, the farming system is fundamental in this research because this is the spatial scale at which sustainability is often held to operate most effectively. As the paradigm of sustainability has taken hold in recent years, successive policy documents on sustainable agriculture have focused on the whole farm as a unit of sustainability. The governing bodies of agriculture have subsequently shifted their emphasis from individual parts of a livestock farming system, which in the past have seen crops, animals and the environment managed separately, towards the development of a whole farm approach which has been rolled out through Cross Compliance, the Single Farm Payment and Agricultural Stewardship Schemes. The discourse of sustainability is also itself a holistic discourse which implies the management of the whole farm. Foundational in this respect is Leopold's (1966) guiding principle which has famously expressed that *"A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise."*

Following the ideas of Naess and Sessions (1984), Deep Ecologists have argued that any approach to sustainability must involve redesigning whole systems based on values and methods that truly preserve the ecological and cultural diversity of 'natural systems'. They view systems as integrated wholes whose properties cannot be reduced to those of smaller units. A systems approach to sustainable agriculture therefore emphasises the basic principles of organisation within any farm. Every farming system is different; everything within it has an order that we need to understand.

"An holistic approach to the management of the farming system involves the temporal, spatial, physical and individual arrangements of interrelated sets of markets, resources,

products, people and processes. Holistic management is complex, but within this complexity lies the potential for synergistic gains. Such gains come from management, the process of choosing arrangements, and not from a given endowment of land, labour or capital resources.” (Ikerd, 1993:157)

Non-governmental organisations such as LEAF therefore promote an integrated approach to farm management that combines beneficial bio-ecological processes with modern farming techniques to provide “*an efficient and profitable approach to livestock farming that is environmentally responsible*” (LEAF, 2010 online). Similarly, the Soil Association promotes a systems approach to a land-based livestock enterprise which supported from the farms own internal resources can achieve a balanced, self-sustaining and persistent agro-eco-system as long as it is managed well. It is within this current paradigm of sustainability that “*the farm is treated like an organism consisting of many complex, interrelated sub-organisms, all of which have distinct biological limits*” (Kirschenmenn, 1991, cited Ikerd, 1993:152).

In this chapter I am interested in the farm as a ‘natural unit’; as a dynamic space that has its own manipulated and assembled ecology; a space that is a bounded, but porous ecological unit, where broader notions of environmental stewardship interact with the management of human and animal encounter. It is at this broad scale of the farming system that I investigate the ecology of the livestock farm as a whole. Following Fox (1995) I use the term ecology to refer to “*the study of the conditions of existence that pertain to, and the interactions between, all the entities that make up [the livestock farm]*”. In what follows I consider how that ecology is managed in both a social and environmental sense. I explore the place of farm animals within that ecological space to see how they influence and are influenced by the ecological conditions, and I consider representations of livestock and farming within the ecological aesthetic. Throughout the chapter a number of questions regarding the spatiality of human-animal-nature relations are opened up. What for example, is Nature within the livestock farming system? How might farm animals be seen as co-constituents in the making and remaking of particular places and spatial formations within this system? (Thrift, 1996; and Sellick, 2005). What is it that livestock contribute to the broader farm environment, and crucially how does the ‘Nature’ of the farm impact upon animal lives?

With these questions in mind the chapter is divided into three sections. The first, *The 'Nature' of Livestock Farming*, is concerned with the way different narratives of Nature are played out within space and considers the implications this has for the management of the farming system as an ecological whole. The second, *Feeding the System*, explores the Natural and Social cycles of livestock production and considers the interactions that take place between living creatures, 'Natures' and processes to create a working, living relation between Social and biotic communities. The third section, *Aesthetics of the Livestock Farm*, is concerned with way aesthetic representations of livestock farming, such as those of farm animals, wildlife and landscape, impact on the farm ecology and the way this is managed. Each of these sub-sections provides a different way of looking at the ecology of the farm, its relationships to Nature as well as its place within it.

4.2. The 'Nature' of Livestock Farming

Often thought of as quintessentially 'Second Nature', farms are spaces where biological and ecological processes and non-humans are controlled, directed, channelled, attenuated and generally brought under anthropocentric control. Within this space farm animals are critical actors in a constructed naturality and, for many, can no longer be considered as belonging to any Natural world. And yet for all their boundaries and human rationalisation, farms remain places of Nature, places where we might never be alone. Even though the whole essence of farming is that of selection involving a deliberate concentration of life (selecting plant species and reducing all others, selecting animal species and reducing all others, selecting certain Natural processes and halting others) – the Natural world abounds, interferes and comes back in at every opportunity.

In recent years there has been a certain re-embracing of this naturality within agricultural policy. The increasing emphasis placed upon protecting and managing Nature as a 'product' of good agricultural practice has for some, become the watchword of post-productivist agricultural policy. Whilst for others, being attentive to and learning to be affected by Nature is, and always has been, the essence of farming as practice. Yet a persistent division remains between the farmed 'nature' of agricultural production and the 'wild' Nature around it. This is evident in various countryside and agricultural policies and

policy instruments. It is also evident in the increasing commodification of embedded 'natural value' that we find in food retailing. And it is creeping into discourses of farm animal welfare, which increasingly privilege 'natural' biological behaviour as an indicator of good welfare in farm animals. Through a portrayal of Nature, as experienced and retold by farmers, I want to consider how 'Nature' within the livestock farm reveals a set of spatial boundaries enclosing and thereby 'othering' wild spaces as different.

Spaces of 'First' and 'Second Nature'

Common on many farms are areas of woodland, river corridors, marshland and bog which, unsuited to agricultural production, are left largely undisturbed as spaces of 'Nature'.

*"The woodland and the marshland, we don't manage that at all, that's just left to it. If anything falls we'll cut it down for firewood and the marsh ground we'll go in once every couple of years if it's dry enough and cut it right back and other than that we leave it. We've got a meadow down the bottom of the farm there and we haven't done anything with it, its perfectly happy it's not economic to do anything with it, bats and owls love it you know we just leave it there. It doesn't affect us in any way you know we just top it every couple of years otherwise we leave it, nature knows best.
(Livestock Farmer, February 2008)*

Unmanaged and agriculturally unproductive, these spaces are conceptualised as 'natural' and 'wild', and, as they fall within and between the managed areas of the farm, they create different types of habitat and cover for a myriad of wild plant and animal species.

Actively promoting the conservation of 'Nature' on his farm, Adrian was surprised when a survey revealed that his medieval and old pasture fields generally lacked anything of interest, whilst a high diversity of insects and wildlife were present in the unmanaged and unstocked areas of the farm.

*“We had a survey done by an entomologist of the whole farm and he comes to our fields which are like medieval and old pastures which are fantastic or I feel, and he said that your fields are pretty much dead as far as insects go. So the only things of interest are in the hedges or in the conservation areas and they’re areas that aren’t particularly friendly to farm animals...you get all the problems like flystrike and ticks and finding the animals in bogs and wetlands you know the whole lot. So even though I have gone a long way down that route [of trying to promote wildlife] there is still no crossover and you know I don’t believe there is such a thing as a wildlife friendly farm, I don’t think there is any crossover between them.....When I say that farming and wildlife doesn’t mix that’s at a fairly high level. I mean organic farming has helped the wildlife in all areas but not to the point where you would say this is a nature reserve.
(Organic Moorland Livestock Farmer, April 2008)*

It is within the bio-spatial imagination of society that wild species have been assumed as Natural, real or authentic, and have been separated, delimited and positioned as part of a ‘First Nature’ that is untainted by human contact. Cultivated crops and livestock alternatively are considered to be ‘unnatural’, controlled and confined, with all aspects of their lifecycle managed for the purpose of food and fibre production.



**Figure 4.1: Managed and unmanaged spaces on the farm
(Authors own image)**

Yet, the separation of wild and domestic species is far from straightforward. The spatial imaginings that give rise to singular identities cannot be so easily purified (Sibley, 1997) into ‘natural’ and ‘domesticated’ spaces, partly as Figure 4.1 above illustrates, because the topographies of agricultural landscapes do not lend themselves to mechanisms that would achieve such separation, and partly because wild plant and animal species do not recognise boundaries other than their own. As the chapter moves on I explore and yet also trouble these boundaries by looking at the mixing of the wild and the domesticated, and how they form an ever shifting assemblage within the bounded space of the farm.

“If wildness can stop being [just] out there and start being [also] in here, if it can start being as humane as it is natural, then perhaps we can get on with the unending task of struggling to live rightly in the world.”

(William Cronon, 1995:90)

Following Cronon, I argue that wilderness is actually ‘in here’, on the farm and I acknowledge not only its presence, but also its key role in both ‘subverting’ and also critically in ‘fixing’ the socio-technical-natural assemblage that we think of as a farm. ‘Living rightly in the world’ is to acknowledge the role and interplay of both.

Subversion

In view of the classic binary state of opposition that is so familiar to theorists of Nature/Society relations, I explore the confrontations that take place between wild-life and domestic-life within the spaces of the farm through the eyes and words of the farmers I interviewed. This first extract is taken from a meeting I had in May 2008 with Mike, an upland farmer, who pointing to the fields where his sheep were grazing, began to explain some of the problems he had experienced during lambing just a few weeks earlier. In Figure 4.2 below is an image of this field in which sheep are now grazing, looking very peaceful and tranquil. Mikes recollections immediately below it however, reveal quite a different scene that takes place there during each lambing season.



Figure 4.2: Sheep grazing peacefully in a moorland field
(Authors own image)

“Well we usually get problems with ravens cos once you start lambing you’ll have like two or three come here the first day, the day after tis ten and then you got thirty, then before the end of the week you got a hundred and they all go and sit up, up top of that Tor up there, then as soon as you’m gone they’m back. But they only take, well the greater black backed seagulls cos we had trouble with one or two of those this year and they will just walk up beside a lamb and stand there beside him and they’ll just stab un straight though the top of his head, take his brains out and then go on and look for the next one, they won’t touch the rest of them, they just want, well they kill em and take out what’s in their head and then go and look for the next one.” (Moorland Livestock Farmer, May 2008)

Challenged by the individual agency of plants and animals themselves, the absolute separation of wild from domestic species within the spaces of the farm is a difficult, if not impossible task to achieve no matter how high or how deep a fence is constructed. Even domesticated species frequently break out of the fields that confine them as birds for example, transport the seeds of cultivated plants to other areas, and livestock *“just leave home if they feel I am keeping them a bit tight”*.

Unable to control or contain wild species within their designated ‘conceptualised’ spaces, the purified realms of Nature and Society are constantly transgressed such that the proximity between wild and domestic species diminishes and the spaces of the farm become what Whatmore and Thorne describe as a “*relational achievement*” (Whatmore and Thorne, 1998:437) or in the case of the ravens and lambs, a relational killing field, in which wild and domesticated species must negotiate their existence.

Oblivious of the cultural classifications that separate wild from domestic, many wild plants and animals live alongside domestic species without conflict or interference. In protecting their own interests however, wildlife can pose a threat to domestic species and the agricultural production process, whilst inversely many agricultural practices threaten wildlife environments. Restricted to the managed areas of the farm, domesticated animals and cultivated plants are unable to defend themselves against the vagaries of snakes and other wild species. Here again I refer to my meetings with Mike, who in recalling his experiences, expresses this point so well.

I put my hand right on it (an adder), well t'was early May down the bottom and I'd been ditching with the digger and cleaning out a ditch and there was one place I couldn't get to cos it was too wet so I thought I'd get in there with a shovel. Well course I'm in there with a shovel chopping out the side of the ditch and I thought I'm just about there, in a minute there's going to be a hell of a rush of water coming down here and I'm going to be up to me armpit so I thought I'm going to get out and do it from up on the bank. So I put me shovel out and I had to put me hand up on the bank to pull myself up, so I put me hand down and I put me hand right on top of him. And of course he bit me right between the finger and thumb. So I come in and I had me pocket knife and I cut all around it with me pocket knife and cut all the skin off..... I've never sweat anything like it....he'd just come out of hibernation and course was very toxic cos he hadden done anything all winter and well I got the full whack of it didn't I. We lost a pony one year and we lost a dog, both got bit in the mouth, the ponies head swelled up cor, well we didn't have time to get the vet and he just swelled up that bad he just choked on his own tongue and the dog the same. We did have the vet for the dog and he injected un but he did the same you know well he's head got bigger than his body and you'm thinking, well its sad. That cow that we had, he was alright cos he was bitten up under the chin in the right place, but the pony was in the wrong, he bit un right on the inside of the lip like and he couldn't breath, it just closed his throat and we couldn't do anything. (Moorland Livestock Farmer, May 2008)

These recollections demonstrate how wild animals, acting on their own instincts intrinsically defy the artificial and conceptualised divisions between wild and domestic space, and how farmers must constantly negotiate with Nature and wildlife on behalf of the animals in their care to stabilise that 'Nature' so that productivity can be maintained.

“Foxes will take lambs, healthy, and you shut new born, we bring the lambs in a paddock here about the size of an acre, you can imagine what it looks like at night with 80 ewes and a hundred odd lambs in there, its chock a block, its like Fort Knox. And you can’t entirely stop the fox from getting in there but he can’t, there is so many sheep in there and he can’t get out with a carcass. I mean he has been in there before but they are less vulnerable and that’s where we bait the fox trap outside the gate. So they are in the small paddock over night and that goes on until they are about a month old.”(Mixed Livestock Farmer, April, 2008)

Fixing

Stories of conflict between wild and domesticated ‘Nature’ (and of human intervention into those ‘Natures’) are relatively easy to find. They are, after all, the currency of anthropocentrism. What I am interested in however is how the two work together on the site of the farm, and how ‘Nature’, even ‘wild’ Nature, is partially enrolled into a more holistic appreciation of the complexity of the world.

Recognising as John does, that *“the whole thing is a circle, wildlife, animals, us, everything”* there is an awareness and acceptance that wildlife is as much a part of the farm as domestic and cultivated species. When the snake for example, strikes out to protect itself, its actions are respected and Mike accepts that he has made a mistake, even laughs at his misfortune and learns from the experience, fencing off ditches to keep livestock safe and generally avoiding certain areas so that wild species are not disturbed. Farmers also take issue with the legal requirement to remove fallen stock arguing as John does, that *“it is perfectly reasonable cycle to leave a body on the ground and let it regenerate and recycle”*. Dead animals are frequently devoured by wildlife before they can be removed anyway and many farmers adopt an unofficial policy of leaving dead sheep on the moors because it provides food for the wild birds and animal species that also inhabit these areas. Figure 4.3 below depicts just one image of a sheep carcass I encountered during the course of this research. I also came across many others, including the half eaten and rotting carcasses of horses, cattle and sheep that once inhabited Bodmin Moor.



Figure 4.3: Sheep Carcass on Bodmin Moor
(Authors own image)

“I mean if we find something that has died, there is never usually enough to take anywhere. If you put a dead sheep out I guarantee you that that carcass will be stripped bare in forty eight hours. We are next door to the woods and we are absolutely heaving in wildlife and I don’t have a problem with it because I mean legally you are not allowed to do that but obviously if you find something that has died, and there isn’t enough left what’s the point in moving it, half a carcass. You might as well let it go, and I’d rather they ate that than your lambs or whatever.”

(Moorland Livestock Farmer, April 2008)

Talking knowledgably about the wildlife on their land, farmers seem to feel that many environmental groups and agencies give them no credit for the work they do. In his annoyance Mike told me that many people “*seem to forget that this place is my life too, just like it is the plants and the animals. We all live here together, sharing the same space, looking after each other. We know what’s here*”. As I spent time on this particular farm I learned not only about the livestock that were produced here, but about two pairs of plovers that had made their nest in fields of grazing sheep. Cropping the grass tight, Mike explained, sheep helped to create the type of habitat favoured by plovers, a ground nesting bird that is now monitored by the RSPB and protected in law. In a conversation with a local RSPB officer some time later however, it became evident that he knew nothing of *this* particular pair of birds. As we walked around the farm undertaking the day to day

activities, my gaze was also directed towards many other wild species including a skylark that ran across the ground to distract us away from her nest, to the tormentil, heathers and wild cotton plants that were blowing in the wind, to the gorse and bracken that encroached on grazing pastures and to a huge badger sett that dominated a south facing slope just outside the boundary of the farm. There is, as Figure 4.4 below illustrates, so much life on a livestock farm, if only we took the time to notice. Astutely aware of the advantages and pitfalls of wildlife and the environment, the farmer demonstrated a deeply affectionate involvement with all of its constituent parts, each one a part of his life and his being. Explaining that “*you have to work with Nature not against it*”, it became evident that for him farming involved a continuous dialogue with the environment “*everything we do here*” he told me “*is dependant on it*”.



Figure 4.4: The Nature of Bodmin Moor: It's so full of life here!
(Authors own image)

I came away with the distinct sense that farming is not just about the production of food as it is so commonly believed, but about the maintenance of a particular type of ecosystem, a mixed community as Mary Midgley calls it, in which domestic crops and livestock take their place alongside wild plant and animal species in a competitive but wholly relational ecology.

Hence, within this farm environment, specific patterns of agricultural land use and management create a variety of habitats in which the lives of wild and domestic species are brought together and overlap in both complementary and conflicting ways. Often determined by climatic factors and the physical characteristics of the land, areas of the farm suited to livestock or arable production are managed to create an environment in which domestic species will grow. And yet, the practice of crop and livestock production also helps to create habitats that are favourable to many wild plant and animal species, and provides the food that is necessary for many others to survive. Nowhere is this portrayed better than in the story of the swallows recalled by Brian, a mixed livestock farmer who is totally committed to his work, his animals and his farm *“I suppose you would say I am a son of the soil. My whole life has been in farming and I am passionate.... You know its part of your life, you’re a farmer and um you just carry on.”*

“The classic story is the swallows, you know every year when I have a school trip and I’m in the field with the cows I say what can you see in the air flying around, ah yes you see birds and what sort of birds, swallows, and what are swallows doing here, well they are actually feeding, what are they feeding on, well they are feeding on the flies that are living on the cow pat that the South Devon cows have put on the ground. And so if, when you see them flying around and they are just turning to get a fly or a moth or something, that depends on these animals grazing on the grass. But there is also something else that is important about these swallows and that is they actually have their nests back in our farmyard and they are in the same barns where the cows have their calves. So I then relate the story about how the swallows and the South Devon’s and basic food chain and the humans, that we are all in it together. We buy the meat that we produce which means I can keep the South Devon cows, the South Devon cows poo on the grass, which means the spiders and flies can live off the poo, the swallows eat the flies and nest back in my barns which is the same barns where the cows have their calves and who lives in the farmyard, the farmer. And that’s how I have a job.” (Mixed Lowland Farmer, February, 2008)

Negotiation

Patterns of agricultural production and management practices thus create and sustain a variety of 'semi-natural' habitats within the farm ecosystem and support a diverse range of wild and domestic species. Whilst areas of the farm that are managed for productive purposes contain domestic livestock and crops, they also help to support wildlife by providing a vital source of food and some very species specific habitats such as those required by the plover. As the quotes above clearly suggest however, much wildlife tends to occupy the unmanaged areas of the farm; areas which left undisturbed allow wild species to develop 'naturally' without interference. Wild species emerge from these unmanaged spaces to forage, feed and extend their range, competing and interacting with domestic species as they make benefit of their presence and contribute towards the ecological cycles on which the production process depends. The farm therefore becomes a complex spatial assembly of loose shifting affiliations and differentially articulated relations in which harmony must be achieved if productivity is to be sustainably maintained.

It is the longstanding co-operation and competition between wild and domesticated species within the relational spaces of the farm that generally bring stability to its complex structure, and which, help to maintain biodiversity and the functionality of the farming system as a whole. Traditionally this has involved husbandry practices that have been rooted in the common indigenous wisdom of the land through which farmers have developed a comprehensive understanding of the constraints imposed by Nature, adapting their practices as they learn from past failures and mistakes. This fragile consensus can, however, be easily interrupted. The networks of animal and plant relations that are tightly woven through on-farm practices become threatened and upset where new interests emerge, extending the farm as networked space, into other policy and conceptual arenas, with other actors and other intentions. This has been so clearly demonstrated in recent years by the issue of badgers and bovine TB which highlights the disturbance to that fragile networked consensus.

In the southwest of England badgers have become increasingly problematic as the favourable environments found within many farming systems have enabled them to thrive, whilst legal protection has prevented any interference. As their populations have grown,

badger sett's that once occupied the wild and marginal areas of the farm have expanded, spilling out onto land that is utilised for production. Burrowing deep underground many of these areas have become unstable and unsafe forcing farmers to fence them off or take them out of the production. *"We've had lambs go down the holes and we aren't allowed to interfere with badger sets, and we've had lambs fall down head first and you don't even see them"*. Also susceptible to the bacterium that causes bovine tuberculosis (bTb), increasing numbers of badgers come into contact with cattle that are carrying the disease as they negotiate their existence within the productive areas of the farm. Moving uncontrolled between wild and domestic spaces, badgers have been instrumental in spreading bTb amongst wildlife populations. They have also been responsible for re-infecting cattle herds, in which bTb is controlled by a systematic programme of testing and culling.

Within the farming system sick animals are treated by farmers and veterinarians who act to prevent suffering and the spread of disease. Rooted in the traditional belief that wildlife is part of a Nature that is untamed and untouched however, conservation policies that protect badgers and other wildlife species prevent any form of interference that disturbs their existence. As a consequence many wildlife populations have increased, with some like the badger getting out of control, leaving wild animals to suffer and carry disease. In taking individual wildlife species out of their 'Natural' context, conservation policies that actively separate the 'Natural' and domestic elements of the farm upset the balance of relations within the farming system as a whole. This approach not only ignores the sustainability of the farm ecosystem on which both wild and domestic species depend, but farmers are left to deal with a system that they can no longer manage as a whole.

"I can't understand why the cows have got to be slaughtered when the badger is sacred. I'm a great lover of wildlife but you have got to draw the balance and be realistic." (Livestock Farmer, April, 2008)

The legal protection of badgers then has not only interfered with the balance of farm ecosystems as population sizes have increased, but it has also prevented farmers dealing successfully with the issue of bTb. As a consequence farming systems have been further disrupted as diseased stock are culled for instance, and as movement restrictions prevent domestic animals from being moved off the farm and sold without license.

“With the tb we have still got all last years calves and we got all this years calves and um that’s when it starts to get really difficult because you haven’t got any more land to put them on and well you’ve et your feed before the winters are out and you got to find money to go and buy more, plus you aven’t had any income because you haven’t been able to sell anything. And like now they’re here, they are eating next winters grass because they got to eat now so you’m losing three ways or more ways than one.”
(Moorland Livestock Farmer, May 2008)

As livestock farms come under increasing pressure from the threat of this disease, badger populations are suffering too, yet they continue to retain the wild status which affords them freedom from interference. Farmers alternatively are powerless to protect the wellbeing of domestic animals, and the overall sustainability of the farming system comes under threat.

It’s a shame because the badger is a beautiful animal and it’s been demonising the farming community because of the government’s inaction to deal with the problem and it’s atrocious and I tell them so. It gives farmers a bad press because publicly we are saying kill badgers, but all we are trying to do is wipe out disease. Of course I think something that has happened to it recently that hasn’t helped the situation and that is we are growing maize and badgers lover maize, they will walk for miles to get maize and of course that’s during the summer and of course during the winter they go into the sheds where dairy farmers are feeding maize in troughs and of course they are doing their jobs there as well and while they are eating the maize they are breathing it out all over the cattle, ideal transfer. So that is a welfare issue for cattle really, and I don’t know what you can do about it, all you can do is stop buying any stores in. The most you can do is have a completely closed herd and keep double fencing your cattle and just keep your fingers crossed, or go out and kill badgers, which I am sure it happens. (Mixed Livestock Farmer, February 2008)

Unsurprisingly then this generates conflict between farmers and conservationists as the lines of battle become re-drawn. This conflict is put into context in the following interview quotation.

We haven't had Tb recently, touch wood, but we did have it here what 15 years ago and they came and culled our badgers. We had 6 DEFRA people here at the time and they trapped 83 badgers, that was one per acre roughly and um they had Tb not all of them but they had Tb. We also had the anti badger people here as well and they cornered one of the MAFF employees and smashed his van and he managed to drive off without being seriously hurt, we had the police here, police helicopter and the protestors were carrying around axe handles so we decided at that point that we wouldn't go anywhere without being in radio contact, it was frightening. One of the MAFF chaps they followed him home and wrote on his car we know where you live. I mean I know what they think they are trying to achieve but they are mistaken because you think Tb was down to Stithians, um Camelford and one other parish in Cornwall and that was what twenty years ago and they were down to three parishes and another couple of years of keeping up the work of the culling them would have got rid of it altogether, but these badger people constructed this effort and they really created the problem that we have now and all these badgers are ill and farmers are having to kill all these cattle because they didn't allow us to carry on and stop it completely, it was so close, it was in three parishes. If we just killed every badger [in those three areas] then that would have been the end of it.

(Mixed Livestock Farmer, February 2008)

There is then a general feeling of frustration amongst farmers who feel that if they had been left to manage the farming system as a whole, rather than being restricted by conservation polices which imposed artificial boundaries and favoured wild over domestic species, that badger populations would have been kept in balance with the rest of the farm and bTb would have been eradicated or at least kept under control. As the management of farming systems continues to exclude wild species under the direction of conservation polices, the sustainability of many livestock farming systems remain fragmented and at risk.

Summary

This collection of stories brings different narratives of Nature into view. These narratives of a Nature that is subverted, fixed and negotiated, demonstrate that the material space of a livestock farm cannot be separated into a 'First' and 'Second Nature' because the physical characteristics of agricultural landscapes do not accommodate divisions between wild and domestic, and because individual plants and animals do not recognise these boundaries. The farm is therefore a 'relational achievement' through which wild and domestic species come together and continually negotiate their existence. Whilst wild species tend to occupy the unmanaged spaces of the farm and operate within their own boundaries, domestic species are largely confined to areas that are managed. They are also restricted by husbandry practices which can leave them vulnerable to wildlife defending their own interests and territory. Actively participating in this process, farmers continually adapt their husbandry practices to protect both wild and domestic species as they seek to maintain a balance and sustain agricultural production. In so doing, they have traditionally adopted a holistic approach to farm management that recognises the importance of the farm ecology. As farm ecosystems have struggled to adapt to the speed and scale at which modern farming methods have been introduced, conservation policies have enforced boundaries that identify and protect wild species that have become endangered or under threat. The composition of the farm ecology has been disrupted however, and such policies have had unremitting consequences as farmers have been unable to manage the farming system as a whole.

With the humane and the Natural once again pulled apart, my attention now turns to the practices through which the Natural and Social cycles of livestock farming are negotiated into a functional, living arrangement.

4.3. Feeding the System

In his infamous *Land Ethic*, Aldo Leopold (1966: 230) describes the land as a biotic pyramid in which energy flows as a circuit through a number of layers, with each successive layer dependant on the one below for food. Soil forms the bottom layer of the pyramid and it is from here that agricultural production and the feeding cycle begin. On

top of the soil is a layer of plants which absorb food from the soil in the form of a chemical solution with different plant types having a preference for soils that are more or less alkaline and succeeding only where conditions suit their particular needs. Organic matter is derived from the death and decay of plants from the layer above the soil and from successive layers of insect, rodents, birds and other animals which rest upon that in the biotic pyramid Leopold describes. As various groups of animals feed on the plant layer beneath them, they deposit their bodily wastes which decompose and flow back into the soil with water, replenishing nutrient reserves in a continuous cycle of renewal that sustains plant and animal growth.

Following the feeding cycle of the biotic pyramid, agricultural production builds on and adapts to these bio-ecological processes as crops and livestock are cultivated to produce food for human societies. However, the manipulation of these processes to achieve higher and higher yields disrupts the feeding cycles of soil, plants and animals, with more nutrients required than soils can sustain naturally in their reserves. The capacity of soils to replenish these reserves through bio-ecological cycles is also diminished, upsetting the stability of the biotic community as a whole and thereby rendering it unsustainable.

Pathways of nutrient cycling and re-cycling thus become a critical network of associations and linkages in the ecological stability of the farm ecosystem, a network that enrolls and co-assembles the wild and the domestic, the human and the non-human, technologies and biologies, and in doing so, both establishes and derives from a series of relational practices. Unpacking that network and these rotational practices, as well as examining the place of livestock in the ways in which they are sustainably maintained are the foci of the following section of this chapter.

The Farm Rotation

The production of livestock is limited by the ecological and physical characteristics of land. Marginal land such as upland for example is generally rough ground that is poor in terms of agricultural quality. It has shallow soil that is stony or very wet and wanting in many of the trace elements and minerals that are essential for the growth of plants and farm animals. Describing the soil as “*acidic and thin with poor nutrient content*”, upland farmers explain that only hardy wild species of old grass varieties will grow, creating permanent pastures

which mature slowly over a short growing season. These pastures provide limited amounts of silage and grazing for livestock, which are commonly sold on as stores for fattening on more fertile land.

“There’s no point spreading straight nitrogen here because of the type of plants you know, rye grass doesn’t grow up here so you couldn’t, well you got to feed the land rather than force it. If you put nitrogen on it, it just wouldn’t do anything. So we use dung and we use compound fertiliser instead of straight nitrogen. That is phosphate and potash as well as a bit of nitrogen, so you got to feed the plant rather than force the plant.”

(Moorland Farmer, May 2008)

Here, the advantage of traditional, hardy breeds of cattle and sheep is that they manure the land as they roam across a wide ranging area.

On lower ground where the soil has been washed down from the hills, *“you get this fat land which has got a nice thick depth of soil that is a lot richer in colour”*. The lowlands are the *“real ground”*, the *“parkland”* and there is *“an oil in the soil”* that you just don’t get in the uplands.

“... As you go up [from the village] its good ground, lots of grass early on. You go over the cattle grid and that’s where the moor starts. Here you got poorer ground until you go down to the valley, that’s the good ground. As soon as you start coming up through to where the trees is to, that’s where it ends...Our winter well, we can have snow up here and we can’t get out and down there the sun is shining and its warm and they are in a T shirt... Everything we got here is dependant on the type of soil we got and the weather conditions, so we are a bit limited.”

(Upland Livestock Farmer, May 2008)

The deeper lowland soils that are richer in nutrients produce *“good finishing pastures”* on which lowland breeds of livestock thrive. Modern lowland breeds are much *“softer”* and *“more productive”* than the upland breeds of livestock. But they drive the need for higher

yielding crops to sustain their growth to mature slaughter weights, putting additional pressure on the soil and the farm environment. Through rotational cropping practices however, lowlands are able to provide plentiful amounts of high energy food for livestock production, whilst grazing livestock and the application of animal wastes help to replenish nutrients in the soil.

Our rotation that we have on most of our farm is well, we have permanent pasture fields for grazing livestock and we have fields that are level where we can grow our arable crops. Our rotation would be grass for 4 years, then that would be ploughed and it would go into wheat, barley, um lupins which we use to make up as a protein source to make our own rations for our cattle and it goes back into wheat, barley again and then probably into potatoes or caulis or veg. And then back into grass.

(Mixed Lowland Livestock Farmer, February 2008)

The influence of a rotational ley has been a well recognised factor since the mid eighteenth century, with each successive crop having its own particular effect. The various rooting and feeding systems of different plants contribute to the maintenance of soil condition and structure, whilst variations in the demand for nutrients help to make best use of the soils reserves.

“We decided that we are not going to buy in lots of fertilisers. We are cutting back on chemical use by rotating crops which is what farmers always used to do but it hasn’t been done so much in recent years. We use lots of clover, we um, we are trying to produce food from our farm ...naturally. We want to encourage clover because it is better on our pocket. We don’t have to spend lots of money on fertiliser and it also drives growth during the hot time of summer when the grass growth tends to slow down.”

(Lowland Livestock Farmer, February 2008)

Helping to maintain farmland biodiversity, livestock animals utilise the available pasture and fodder crops for grazing, with sheep “grazing the short swards of grass that the cattle won’t eat”. Also known as the “animal with the golden hoof” sheep help to “clean up the ground” as their small hooves “press surface stones back into the soil and firm up the ruts

and gullies after the cattle have been moved on.” When sheep are put onto arable crops early in the growing season they eat out the growing tips and “*help the young plants to tiller*” (thicken at the base) so that a higher yielding crop is produced for cutting later in the year. This commonly occurs in traditional methods of rotation and “*helps to control pests and diseases*” to which crops can become susceptible, and it “*reduces the need for chemical sprays*”.

Sheep do quite a big job really, well I think they do. Its like in the winter if you plane it off with sheep when the spring grass comes in at spring you have like a blanket of real green lush grass and you go to some farms and they never get that you know. You know my silage, I never cut early cos I always put sheep on it late cos I got lambs and that, I mean I've cut silage in July 11ME(Metabolisable Energy) silage and its coming off alright its good quality. I can only think that stocking it early and that, and then cutting it, that mine is still good grass because its un-stocked late and its eat off, do you see what I mean... I think what the sheep do as well is they pull out the weeds you know, they kill off the weeds by eating them tight in the winter. So yeah I don't think it hurts to leave it.

(Lowland Livestock Farmer, April 2008)

The characteristic rooting behaviour of pigs can also be beneficial, particularly on land going into arable production as they churn over the ground eating roots and bringing stones to the surface.

We've only got these two fields here, and we plough them up and seed them out with stubble turnips for the pigs to feed on. Normally the whole field will be stubble turnips and they get moved from one field to the other as the crop is consumed, but the top half is down to winter barley this year which I am going to harvest and then put stubble turnips in there. Arable crops have become of such good value I thought it would be more financially beneficial to have some bits of arable and then plant it out to stubble turnips afterwards you see. So the pigs eat the turnips and turn over and fertilise the ground and then we can put the winter barley in there before it goes back to stubble turnips for the pigs again.

(Hybrid Pig Farmer, September, 2008)

Pigs however can also be detrimental in outdoor environments, particularly on permanent pastures as their rooting behaviour disrupts plant growth leaving a muddy surface from which nutrients leach and topsoil is lost through run off. For this reason pigs are commonly rotated through a series of static paddocks or moved from field to field to allow grasses to re-establish and cover the bare earth. Sometimes however, they have rings put through their noses to prevent this behavioural trait.

“Because mine aren’t ringed through the nose or anything like that they will root around and that’s part of the welfare side from my point of view that’s what they would do naturally, if they can’t do that then you’re altering their natural behaviour. So that’s a problem so you need to have enough areas to keep rotating them in the summer and stuff. I mean anywhere that you put them this time of year with it wet is going to end up like a mud pie, they love it but its just harder work for me trancing round to feed them.....apart from that they are brilliant for the soil if you had the time and the energy to put them in a great big field that you’d later want to reseed and graze for cattle that would be fantastic they are brilliant fertilizers for the ground...There is 8-10 paddocks out there for the pigs, which I rotate, and well in the summer the grass and greenery will come through and I reseed through the finishing ones and then electric tape or electric net it to kind of keep them back a bit. I don’t need to use any fertiliser or anything, the straw bedding soaks up their dropping and it just stays in there and gets rooted back into the soil keeping it fertile. A lot of it you will find that it just disintegrates because their little feet just chomp away at it and they just tend to trample it into the ground. It just disappears into the soil and is completely recycled. I could do with two more paddocks really just to make it easier, to rest one paddock for longer and stuff.”
(Outdoor Pig Farmer, April 2008)

Animal manures have traditionally provided all the organic matter to maintain soil condition for the production of any crop, and continue to do so in systems that are under environmental management schemes or have been certified organic. In modern lowland farming systems however, there has been an increasing reliance on artificial fertilisers to maintain high yielding cereal crops and modern rye grasses used in temporary grass leys. Temporary grass leys are cultivated pastures that incorporate a mixture of high yielding plant species including the modern ryegrasses, cocksfoot, timothy and fetescues which can provide a good source of feed for livestock throughout the year. The mix of seed used in these leys depends on system requirements, and preferences take account of seasonal patterns of growth, required yield, disease resistance, energy content and digestibility for the animals.

Unlike traditional seed varieties which have a low nutrient requirement and thrive on poor quality upland soils, modern high yielding seed varieties require highly fertile soil to achieve their maximum productive capacity, and they quickly deplete the soil of existing nutrient reserves. The use of animal manures alone to sustain these crops causes excessive soil enrichment, forcing the Phosphate content to rise, whilst a dependence on inorganic fertilisers increases nitrate levels leading to acidification, eutrofication and an accumulation of heavy metals in the soil which are toxic and therefore harmful for grazing livestock. The nutrient value of artificial fertilisers however can more accurately be determined, and coupled with routine soil analysis can be matched to the desired outcome of the crop.

Whilst many farmers now undertake soil testing as a routine management practice, and spend more time and care on nutrient planning, there are still many who do not, preferring instead to undertake the same practices, often inherited from their forefathers, because “*this is what they’ve always done*”. As a consequence, Natural England (2007) report that approximately 50% of all farmland soils have a higher phosphorous content than crop production requires. The application of quantities in excess of crop requirements is not only expensive but also impacts upon the quality and quantity of crops that are grown, causing diffuse and point source agricultural pollution which then affects surface and ground water sources.

“Permanent, unimproved and uncultivated pastures, contain herbs, weeds, dandelions and plantains and things, and the plants are able to root deeply and that’s what is going to bring up the minerals and the trace elements that the cattle require. Whereas a ley or a reseeded pasture will be more like salad, it will be surface rooting; it’s not going to have access to the deep minerals that moorland or permanent pastures would have.”
(Grassfed Beef Farmer, April 2008)

Trace elements and minerals found in micro amounts in the soil are also vital for plant growth. A shortage however is difficult to identify and can occur for a variety of reasons, with high fertiliser usage, heavy liming, frequent reseeded and the regular harvesting of fodder and silage crops, reported to cause problems in this area. Marginal upland soils are also commonly too deficient in many of these essential nutrients to sustain healthy

livestock. It then becomes necessary to provide additional feed or nutrient supplements to maintain animal health, and veterinary's commonly advise farmers of deficiencies in their area.

Well we feed cattle rolls to the cattle out on the Common all winter everyday. It's like a cereal nut in a big roll, as big as possible so they can pick it up off the ground. And we have actually, well they are made special, they put magnesium in the roll. Well they make em for farmers for these areas, but we well they do what they call a suckler hill roll for hill farms that's got magnesium in it, but we never find the suckler roll is good enough so we feed beef rolls which is there is more cereals in it and not so much waste as the suckler cow rolls which they try to make cheap, so they put in things like citrus bulk and general fillers just to bulk it up which has got no nutritional value what so ever. So we have a beef roll, he's a little bit more expensive but you don't need to feed quite so much of it because it's a little bit better quality and then we get added, they put in 3% calcium magnetite in with the roll so that the cow gets a bit everyday so you haven't got to worry that they haven't had it. But it's a very fickle thing because they only got to go a few days without it, because they cant actually store it in the body so they got to have a little bit all the time and then summer time when they are not having supplementary feed, we feed a powdered high magnesium mineral, which is just powdered magnesium in a bucket. They lick that cos it's got salt and they can lick that all the time they just go there and have it when they want it.

(Upland Livestock Farmer, May 2008)

As the quote below clearly illustrates, testing the soil for the presence of trace elements is a specialist service and is not commonly undertaken unless a problem arises with crop or animal yields.

Moving the farm was a much bigger undertaking than I anticipated and the stock, well you know, you talk about closed herds, you might have heard that expression, they are used to a soil type, they are used to a water they are used to a routine. The first year was fine, but the second year we suffered losses because the mineral uptake had changed. Particularly as it was an organic farm that had been exhausted by intensive farming that had then converted to organic to get more income. Nothing was put into the soil and the animals suffered. That was when we had the soil analysed and there was very little trace elements there to sustain livestock and the ground had to be treated with cobalt and selenium and various things and this year it has been better. They weren't growing very big and they were dying. It's taken three years to get it back. It's noticeable, the first crop of yearlings are the right size now. I wasn't getting the weights from there, I needed to sell five sides to get the same money as I was getting from four sides that I was doing previously, so there is a real economic factor to that.

(Organic, Grassfed Beef Farmer, April 2008)

The characteristic behaviours of livestock produced in outdoor systems contribute in various ways to biological and ecological processes occurring at the eco-systemic level of the farm, with the health and productivity of those animals providing an indicator that those processes have become unbalanced. Integral to the management of farmland, livestock are incorporated into the farm rotation where they perform species specific functions which help to sustain their own productivity. Utilising available crops and herbage, they reduce the need for mechanical cutting, and returning vital nutrients to the soil, they help to sustain biodiversity and the condition of the land.

Without livestock you would have to top the fields and you couldn't because there would be no income from any part of the soil to pay the cost of the topping so it would soon revert to bracken, stinging nettles, thorn and eventually sycamores and I suppose it would go back to Oakland.

(Mixed Lowland Livestock Farmer, February 2008)

The soil however, also harbors worms and parasites that are detrimental to animal health, with wet farmland environments contributing towards issues such as liverfluke for example, a perpetual health problem that causes high mortality in sheep flocks and anemia in cattle.

Worms are any sheep farmer's biggest problems. In actual fact we don't worm our ewes anymore and we don't have a worm problem any more, but lambs are a different story, we have to be quite careful on that. Coccidiosis that's our number one killer in lambs and we have to be very switched on with that. We are very susceptible to coccidiosis, on this farm anyway. Some farms aren't some farms are. We are very susceptible. It starts off in the soil, and it only wants one lamb to have it, if you don't pick it up within a few days it could have gone through the whole batch, then its very costly in terms of preventing, well treatment and in terms of loss of growth.

(Lowland sheep farmer, February 2008)

Similarly harmful bacteria thrives in the soil, causing health problems such as scald and footrot, both painful conditions that are commonly found in sheep and which challenge an animal's ability to cope in its environment. Important for the prevention or control of health issues such as these, is the species and breed of animal and their suitability for the environments in which they are produced. Breed choices however commonly follow market demands, and farmers have been encouraged over the years, to alter their production from traditional breeds that have been suited to their farm environment, to softer, more productive breeds that not only require greater feed intake and place heavier demands on the environment, but which are unable to cope with the physical and climatic conditions of the land. Not only then does the careful rotational management of livestock and crops play an essential part in maintaining soil fertility, but it also plays an important role in keeping these issues under control.

We breed Dorset's because they are the most versatile breed of sheep you can have. They breed any time of year which for us is quite handy. They are classed as a 'down' breed, in this country anyhow. To be honest I don't think it would have made much difference what breed of sheep we had on this particular farm. Some farms it does yeah, but I guess we're fortunate because we can take on a lot of winter grazing and we can chuck the sheep off this farm which is good because it is a very, very wet farm. You go round here now and it's just like walking in a bog in half the fields. But you know we lambed in winter and then we could fortunately just turn the sheep away from the farm. Its like any animal though it has to be managed in that environment, you know if you were stocking them at one ewe an acre it wouldn't matter, but when you're stocking at 10 ewes an acre then dropping back to 6 ewes with lambs at foot then you do have to manage it very, very carefully otherwise you end up with a horrendous mess.

(Lowland Sheep Farmer, February 2008)

The demand for higher crop yields, higher stocking densities and more productive animals has widened the gap between Social and Natural process, disrupting the balance between social and ecological cycles. Attempts to stabilize the living and working relations between them, has involved increasing amounts of artificial inputs and agricultural machinery which is costly to purchase, operate and maintain. As a consequence *"Farming systems have become dependant on chemicals and oil"* driving up the cost of food production whilst impacting on farmland and animals and the relationships between them in unforeseen and unsustainable ways.

“...for us to go back to a situation that does not rely on oil to produce its food we are going to need to go back to smaller units because the way many systems work now is by using machinery which is bringing food indoors to the cows. As soon as the price of oil becomes uneconomic for that system to work, which it will within our lifetime, we then have to go back to a system of agriculture which we have had in our country for generations which has managed to feed our populations but this is the first time ever that this traditional system of the farm has been degraded to such an extent that we will not be able to turn the switch back on again.”

(Mixed, Lowland Livestock Farmer, February 2008)

Recycling Animal Wastes

A breakdown in bio-ecological cycles at the eco-systemic level of the farm also occurs, in varying degrees, when the animals are housed as this mediates their characteristic behaviour and interactions with the land. When cattle are taken off of the fields and housed overwinter to prevent poaching the land, they are bedded out with straw or sand which soaks up and combines with the bodily wastes that are excreted. As the animal wastes accumulate they are regularly removed to maintain good hygiene standards and to avoid the spread of infection and disease. These wastes are *“not disposed of, but utilised. We don’t dispose of anything these days that’s unlawful.”* They nonetheless have to be stockpiled and stored until environmental conditions and the production cycle allow them to be used.

We bed the cattle out every day in the sheds, or every other day depending on how dirty they are. Then we clean them out twice during a winter and we pile it up. Up until now we would pile it up in a heap and spread it in the spring, or if it was dry enough we might put it straight onto the fields, if it was suitable conditions. Sooner or later it goes onto a growing crop, but you have to be careful because you don't want to put it onto a grass field say in April because you are going to be cutting that for silage there in May and it can um prevent the making of good silage because the dung can affect the fermentation. So you need to be able to pick and choose where you put the dung.”
(Lowland Livestock Farmer, March 2008)

Spread directly onto the land through a “*dung spreader hitched up behind a tractor*”, the manure generated by housed cattle is broadcast around pasture fields and deposited on the surface where I have often seen rooks, crows, seagulls, terns, dunnocks and redwings descend in large swathes at different times, systematically turning over and breaking down the dung as they search for insects, worms, snails and small mammals that contribute to the mainstay of their diet. An example of this can be seen in Figure 4.5 below where a flock of redwings can be seen working over the field outside my home. Deconstructed by wildlife, manure is then washed into the soil with rain, replenishing vital nutrients.



Figure 4.5: A flock of Redwings working over field outside the house
(Authors own image)

The manure produced by cattle in winter housing is systematically stockpiled and recycled annually between late winter and early spring in preparation for the growing season.

Wastes generated through indoor production systems by contrast, are difficult to manage because they are continuously being produced, making them so costly and time consuming that removal facilities are generally incorporated into housing design. In pig housing, animal wastes are sometimes managed in the same way as they are for overwintered cattle, but “*straw is expensive and you gotta have storage*”. Most pig production systems therefore install slatted floors which allow animal wastes to pass into gullies and underground storage tanks, where it mixes with rainwater to form slurry.

“We got a lot of underground storage underneath buildings and then it’s all piped out underground to me reception pit next to me store. I try not to put anything in me store till Christmas if I kin and any rainfall that drops on that store, which usually most years October, November, December could be half your winters rainfall, so then that can be pumped right out the fields as dirty water cos I haven’t put no slurry in there. And then we put, we separate our slurry, we just got a simple run down screen and then we pump that through our pipeline and we don’t have to worry about any blockages. If you put neat slurry through its fine if you keep it flowing but if you stop it you get problems and we’ve had a few little problems with blockages and problems. It’s not easy dealing with slurry.”

(Indoor Pig Producer, April 2008)

“*Pig waste is a “liability...we got to get rid of it. It’s not an advantage to me but a disadvantage really*”. Getting ‘rid of’ animal wastes can be problematic, particularly if you farm on a small acreage of land. As the quotes below demonstrate, it is also dependant on the type of soil, the weather and the environmental conditions of the farm.

“We got a dry farm you see, we can travel on this farm. We can travel on this farm any day, this winter or any winter, you never stop carrying slurry because it is too wet. We are only, we are on shillet with about 6 inches of earth. We got a hard road right up over the top of the farm, its miles from any river, we got like woods, a buffer, woods between us and any rivers or streams and the farm is all level on the top and there is no way that any harm can come to anything by us spreading in the winter. If you go up to say Canworthy Water, they can’t even get in the field in the winter, cos the tractor sinks. I mean two totally different situations. If they put slurry on in the winter it will run in the river cos they’m that wet”

(Indoor Pig Producer, May 2008)

“I built up out of pigs and as land has come up I have brought it to spread the risk I suppose and to get rid of all me slurry and I mean I gotta lot of neighbours envious of me with me pig slurry especially with fertiliser at £300 a tonne at the moment you know. But it doesn’t come without a cost. You know you go out with a bin load of fertiliser and get rid of that in no time, but you can’t do that with a trailer load of slurry, so there’s the work load of it and you got to get rid of it. But tis also an advantage”

(Indoor Pig Producer, April 2008)

Expanding from 12 to some 600 acres of land spread across three different holdings, the recycling of pig waste on Stevens farm facilitated the production of high yielding cereal and protein crops which were incorporated into feed rations for the pigs. Where the land was unsuited to cereal crop production, the slurry generated an abundance of grass which needed to be managed so that the slurry could be recycled. Beef was therefore produced as a separate enterprise to make use of the grass on the permanent and temporary pastures. Removing the need for mechanical cutting, cattle now utilise the grass available between April and October and convert it into food *“then you can slurry the field you know, we can graze the field out and slurry it and then move on in rotation like you know. Then when we cut silage they graze it afterwards and that goes into the rotation and we can get more slurry out.”*

“So we’ve had the grass so then we’ve increased the beef over the years as well rightly or wrongly but, we’m on fairly heavy land, and well we try to rotate our corn ground as best we can. Um so it takes the best of yer land into corn really which leaves your beef a bit second place don’t it. The cattle are where we can’t grow corn you know your heavier land your wetter fields but well tis all rotated isn’t it, and well something needs to eat the grass off, if you can’t grow a crop there other than grass. We put pigs muck on it so we end up with lots and lots of grass, so you need something that will graze it off.”

(Indoor Livestock Producer, March 2008)

The transportation of slurry from the pig houses to the fields is also problematic, particularly when those fields are some distance away. The methods of waste transportation and spreading are therefore important aspects of waste management within indoor pig production systems and farmers have various management strategies to resolve the problems that they face.

“Well I think now most people accept that we got pigs up there and we get the smell sometimes, but we try our best to study the weather before we go out with slurry and whatever cos that’s when they smell it more. But we also got an underground pipeline that goes to our off farm which is a mile and a half away and people don’t see the tanker. They don’t smell you then, it’s when they see the tanker that’s when they smell you. You know you can be spreading over there and nobody knows you’re doing it.”

(Indoor Pig Producer, March 2008)

Having constructed an underground pipeline to transport the slurry closer to the fields where it will be recycled, Steven uses a special injector to spread the slurry on the fields. When you use a tanker with a spreader plate it *“sends it out quite high and that’s how you get the smell, so we use an injector, but its expensive to run and it isn’t always possible to use at certain times of the year”*.

“Sometimes if you get the weather wrong and you spread pig slurry and then the sun shines it will burn your grass off. So this is a shallow injector, it just does a little slit in the ground and then dribbles it out behind so it’s not going into the air, so it cuts your smell in half. And it doesn’t contaminate the grass or the soil, its safe. You can leave your cattle in the field, its safe you can graze right after like you know. You need to use your common sense really. Its good husbandry you know... there’s no rules to say you can put so much in, the limit is the weather if you know what I mean. If you put too much on its going to run off you know, or if it’s dry in the summer you don’t put too much on because you burn the grass. ”

(Indoor Pig Producer, March 2008)

By spring storage tanks are often full to capacity, with field access and spreading conditions restricted by heavy machinery and winter weather. The need to empty these tanks to prevent overspill can therefore be quite demanding at a time when other demands are increasingly placed on the farmer’s time.

“Its always a bit of a problem cos in the spring um you might want to get cattle out and you want to get slurry out and it’s a very busy time of the year and like I said before, with fertilizer you can go out and do several acres, but with slurry you haven’t got the staff to do it and the ground conditions isn’t always right and you only need to miss it for two or three days and then you can’t do that field. We try to keep on top of it. As much as we can get goes off now, in March you get good use of it fertiliser wise and try to utilise it as best you can. And then March, April then it can get a bit tight, you never get on top of it quite, not till us get our first cut of silage off and then us got several acres to go at then, then we get rid of most of it then”

(Indoor Pig Producer, March 2008)

These quotes demonstrate that the management of animal waste is a balancing act that relies on bio-ecological cycles and climatic conditions which affect the nutrient uptake of the land at certain times of the year. Whilst farmers use their experience and judgment to make best use of these processes there is a general concern amongst producers that any changes to regulations restricting spreading periods, would have serious consequences, not only for carrying slurry out and recycling it on the land, but also for the prospective damage that may be caused to the environment.

“I aint saying nothing ever gets into the river cos it must leach in mustn’t it, a lot of these things do, but I mean they’m trying to bring in this regulation that we won’t be able to spread any slurry between November and what is it March or something but I don’t think that’s going to be quite right you know, cos I mean there’s so many variables out there. There’s the type of land, um whether the land is accessible to the farm to get rid of, some land will take a lot more um some people go out with their muck everyday, but we can’t. But then on the other hand if people is going out in the winter and there is a little bit of run off it’s not the problem. It is if your rivers is low, that’s when you got to be careful, if something happens then its catastrophic because it isn’t diluted you see. So if they put this in force and everybody goes out the first of March and us all get it a bit wrong, well who knows? And then it’s the labour it’s the work load involved, how can some farmers spread the workload, you got men in the winter looking for a job, and then you wont get contractors when you want to do it. So everything is aiming for bigger and bigger scale, bigger machinery and bigger, bigger risk in a way I feel.”

(Indoor Pig Producer, March 2008)

Whilst the disposal of animal wastes from intensive production systems may be problematic, they also create the opportunity to expand into different forms of production which complement existing arrangements both within and between farms in mutually reinforcing ways. The following quotation provides another example of the innovative ways that farmers utilise animal wastes and recycle them through the system.

The manure, we spread it on our own fields and we have got some farmers, we have got a lot of arable farmers around here, so we swap it for the straw. The other thing is pig shit has got a lot of potash and potassium in it P & K, well potash is very difficult to get hold of, it's like, if you can buy it its £300 - £400 a ton. They reckon that a thousand sow finishing unit which is what we have got produces between 17 thousand pounds worth of P & K a year, so suddenly we might start keeping animals just for the P & K that comes out of their back end, because we can convert food into which arable farmers need to, its for the health and development of root development on plants. So we do like an exchange of straw for dung. I mean we only really borrow the straw, it comes in like that and then it goes back like that enriched with P & K and nitrogen.

(Hybrid Pig Farmer, September, 2008)

Summary

The preceding two sub-sections presented here each demonstrate in their own way how the somatic bodily performances of livestock and the processes of the animal are integrated into the bio-material ecologies of the farm. They show that as socially domesticated beings, farm animals challenge categorical boundaries that fix them within the Social world, resituating them within the Natural and Social cycles of the biotic farm community. The practices that emerge here are to a greater or lesser extent, performed as part of the wider planning strategy for managing the whole farm; managing the nutrients in the soil to facilitate crop production, managing crops and animals to secure an adequate source of food, and managing the bodily wastes of housed animals to replenish the land through a process of recycling. They are about the management of the system. The rotational practices that feed the farming system, its soil, crops and animals, are all strategies to secure its sustainability as an ecological whole. They are systemic practices which point to a continual interaction between animal bodies, the soil and plant ecosystems and the technologies of the farm; technologies that are necessarily specific to the farming system, but which also at the same time permit complex relational assemblages and interconnections between different ecologies, and different forms of husbandry. Enmeshed in understandings of livestock as integral to the farm ecology, the various strategies for

managing the farming system and the unique assemblages that are brought into being, can be more or less sustainable.

4.4. Aesthetic Representations of the Livestock Farm

The physical ecology of the livestock farm environment and the bio-dynamic processes, patterns and practices outlined in the previous section are transformed into a material landscape by different cultural groups who use various symbols to bestow different meanings on the same physical objects. These symbols, which include physical features in the landscape, and aesthetic factors such as sight, sound, feeling and smell, have cultural or historic associations. They are the semiotic resources of the farm ecology and they have symbolic functions. It is through processes of signification that they come to represent or stand in for something else to give it a specific meaning. Semiotic symbols vary between those who live and work in the material landscapes of the farm, and those who visit, and they represent different sets of values that are partial and selective. As each group advances their own ideology; their particular way of seeing or being in that landscape, these values and the practices they generate, converge and conflict. In the remainder of this chapter I want to explore the way prevalent understandings of livestock farming promulgate performances that impact upon farm animals and the sustainability of the farming system. In so doing I hope to tease out the tensions between aesthetic representations, livestock farming practice and the lived experiences of farm animals themselves.

Farm Animals and the Aesthetic of Agricultural Ecologies

The farm as a bio-geographical space is a space where humans, animals and materials combine and are assembled to arrive at some form of ecological harmony. It is also a productive space, where similar assemblies are conceived to assure economic sustainability. Yet the farm is also a critical socio-cultural space, a space of cultural representation, of aesthetic sensibility, and of semiotic value. I want then to consider how the animals, and the human/animal relations of the farm, play an integral part in these representations, cultural formations, social histories and semiotics.

“The moor and farming and the countryside and everything is like this now because we and previous generations have made it like it, it haven’t happened on its own has it, and it wont stay like that unless you carry on doing something every year.” (Moorland Farmer, May 2008)

The farming landscape has organically evolved, emerging over time from social, economic and religious imperatives, developing into its present form by association with and in response to its Natural environment. Within these landscapes, activities of the past continue to influence livestock and farming practices in the present. The remnants of stone huts and a stone circle on Mikes farm for instance prevent fields from being ploughed, whilst huge amounts of chiselled granite from past quarrying activity, restricts livestock grazing. The derelict remains of cottages and a small burial mound also limit the type of agricultural activity that can take place here. On other farms I encountered medieval field systems, standing boundary stones and old Cornish hedgerows which continue to influence farming practices and inform contemporary farming landscapes, generating a positive aesthetic appeal. Coupled with a few sheep and cattle left to wander around the farm freely, Adrian utilises the aesthetic appeal of the farming landscape to draw in the tourists; the authenticity, visual beauty and historical interest being important in terms of how the farm looks and how it is perceived. It also attracts Ancient Monument status which generates specific management strategies that are not always coherent with livestock production, because they restrict grazing practices and fertiliser usage. The images in Figure 4.6 below illustrate how remnants of past activities impose on the farm environment affecting current farming practices, whilst at the same time generating historical interest and developing a positive aesthetic appeal.



Figure 4.6: Remnants of a stone circle, stone hut and standing stone on a Cornish moorland farm. Each site is a mark of past activities that affect current farming practices and generate aesthetic value in the landscape. (Images taken by author, 2008)

“Half of our farm is rough and half is what we call good and basically that revolves around the medieval settlements which are good because they have been in continuous agriculture for a thousand years. And the other areas are more recent intakes in the last two hundred years. There was a big intake of moorland in the 1840s around here and they are rough because they have just put up a stone hedge and said that’s my land like, without properly clearing the rocks or anything like that, whereas the medieval fields have all been cleared long, long ago of any rocks and stuff. They have all got a pretty good mix of plant species, I mean there is probably a better mix in the rougher ground, because the medieval land well we’ve never ploughed them, we’re not allowed, but they would have been ploughed in the last thousand years, several times.

(Moorland Farmer, April 2008)

Whilst aesthetic experience and understandings of the farm landscape undoubtedly includes visual and other surface qualities, it also encompasses bodily and sensuous experience such as imagination and creativity, emotion, tacit knowledge and skill, with individual beings, both human and non-human, engaged with the farm environment rather than separated from it. In this sense the landscape of the farm is not only imbued with cultural meaning derived from human activity, but also with meanings that are created for and by the animals themselves as they live in and engage with the environments they inhabit. Mike explained for instance how his cattle were hefted on the moor, and how by going out and feeding them everyday, they knew where their home was and the areas they could safely go. Roaming freely around the moor, they also encountered livestock from neighbouring farms that also seemed to know their space, occupying other areas which all looked like one big stretch of open land to me.

I know it sounds stupid but within reason they know where that place is, they know where home is. Once they have been born up there, if they have been born there they will stay. Ones that have been born there you’ll find that they’ll calve, we have one old dear old 199 she calved there and I’ve noticed that her calves always calf in a similar sort of area.

(Moorland Livestock Farmer, April, 2008)

Livestock then do not just occupy a space on the farm, they actively engage themselves in their environments and thereby in the way such environments become part of the cultural lexicon of the ‘countryside’. They too are the ‘figures’ in the landscape. In using these spaces purposefully, whether imaginatively, emotionally, functionally or whatever, they too shape the landscape of the livestock farms and moorlands on which they dwell. Think of the well worn pathways farm animals tread through the fields, the bare patches of ground where they like to congregate, and the ridges they have created in negotiating steep areas of land.

If they didn't have the hedgerows and the woodland they wouldn't have shelter, and if they didn't have access to the river bottoms they couldn't choose where, cattle like to choose where they graze at different times of the day. If it starts to rain they will go to one area if it's a bit windy they'll go to another. So they are happier if they have got an area of land with different features so that they can choose to go wherever they want to so that they have more of a natural existence rather than being put in a square field to eat the grass. They enjoy going to the woods picking off the ivy and going down the bottom of the field and lying in the sun away from the wind, and going to the top of the field, you can see it. And the lambs they like to just take off and run, they enjoy it, they enjoy having space, if you put something in the field for the lambs to jump on they will jump on it... they enjoy what's in the environment.

(Mixed Lowland Livestock Farmer, February 2008)

In considering the aesthetic landscape of the farm, Brady (2006) draws on the concept of the ‘dialectic’ to capture “*the meeting of the artefactual with natural processes and the emergence of a third entity that expresses the dynamic relationships through its aesthetic and other qualities.*” (Brady, 2006:3). This dialectic relationship is considered to grasp and locate the two sides of the agricultural production process that generate a synthesis between that which is Natural, and that which is cultural or artificial within the ecology of the livestock farm. This dialectic relationship is an ongoing process in which the tension or conflict between Natural and artificial components of agricultural production is resolved by stabilising a shifting network. Within this network Nature responds to, or resists human actions which are both based on and respond to the very character of these Natural processes in a dynamic interaction that produces a synthesis. It is the outcome of this

dialectic that commonly informs the way we think about the livestock farm and our perceptions of its landscape.

The dynamic relationships between the Social and the Natural can be more or less harmonious or more or less conflicting and constantly seek to change, with varying affects on the landscape of the farm and the animals produced there. In traditional and organic farming systems human activities are perceived to involve a deep engagement with and understanding of bio-ecological processes, as they aim to work in tune with Nature and farm animals rather than against them. Operating on a relatively small scale, these systems tend to utilise naturally occurring materials and indigenous species, and they aim to replicate features that are common to the look of the land, helping to maintain a landscape that compliments the environment. The visual beauty of these landscapes is linked to aspects of biodiversity and achieves a perceived naturalness that has positive aesthetic value.

“We are quite a big farm by Cornish standards but we are still a mixed farm...It’s a very idyllic pastoral scene which I think is very traditional for the westcountry and so it provides benefits because um it creates the landscape and the flora and fauna that we have in the westcountry. A lot of that is due to this type of grazing. And lots of the butterflies etc that you see, moths and spiders that you see in the countryside are dependant on animals like this grazing permanent pastures, and you can’t put a value on those benefits but it’s a fact and if we go down the route of farmers pushing everything to the optimum to get a maximum yield then that means we are all going to have modern ryegrasses and we are not going to have these old pastures. It’s a crying shame because we don’t know what we might lose with these other species around us.”
(Traditional Mixed Livestock Farmer, February 2008)

Bio-ecological processes which are dynamic, spontaneous and less predictable than practices of artificial intentionality can also create unfavourable conditions for agricultural production and Nature can become a measure through which farming abilities may be challenged. Climatic conditions for example determine the success of a harvest and impact upon the prevalence of pests and disease, prompting farmers to find new ways of living on the land and new modes of production. Always in process, these new and emerging practices continually alter the landscape of the farm, whilst also leaving the imprint of

previous activities. But they somehow get lost in the aesthetic landscape dialectic. Thus whilst some breeds of livestock, wild and domestic species have adapted to changing landscapes as they have been shaped through these activities, others have been lost.

Intensive forms of crop and livestock production alternatively are more controlled by humans and resisted by Nature, creating more superficial, formal landscapes that are uniform and orderly. Also related to the management of Nature however, the cultural landscapes created by these over-managed systems have a similar aesthetic appeal to traditional and organic systems. A herd of black and white dairy cows grazing in the field for instance, for many people epitomises naturality, and the countryside in the Southwest. Yet the Holstein Friesian breed is not native to these environments, having been selectively bred and introduced for their highly productive yields. Intensively farmed, these animals place greater strain on the environment than traditional local breeds, and often unable to cope with the demands placed upon them, endure short lives in which their health and wellbeing is compromised. The dialectic of the aesthetic landscape however, disguises this reality and hides important information that guides what we know and how we act. It creates a false normality that can be a threat to farm animals and the sustainability of the livestock farming system.

Traditional farming methods are commonplace in the southwest of England where agricultural activity is also limited by the physical characteristics of the land. The southwest rural landscape therefore generates a high aesthetic appeal which has been complimented in recent years by a return to the production of more local livestock breeds. These traditional hardy breeds such as South Devon and Devon Ruby cattle and the Devon and Cornwall Longwool sheep, are less demanding on the environment, and complement the indigenous flora and fauna through slower, less intensive patterns of production.

“We got South Devon’s because we farm next to the Lost Gardens of Heligan and we used to farm the fields in and around the gardens and they wanted to have some access for the tourists to walk in and around the fields. The pasture in South Devon is similar to here, they are a traditional breed able to utilise grass and convert it to beef. As you can imagine, a herd of South Devon’s you would have seen them now in the southwest of England for probably hundreds and hundreds of years”
(Traditional Mixed Livestock Farmer, February 2008)

“We made a virtue out of heather moorlands, which are not good farming lands especially in terms of minerals and trace elements and variety of herbage. But the cattle browse anyway and don’t want to be stuck on a mono-diet of clover and ryegrass and it actually suits them very well, particularly the Welsh Blacks which I used to outwinter on the Commons, and they thrived on that. They were cheap to rear because they were only fed on silage and hay which comes off similar land, permanent pasture in-bye. I don’t plough any fields and we don’t use any fertiliser, so it’s an organic system effectively. I chose Welsh Blacks because they are hardy hill cattle and could outwinter, which was what I needed to do because I only had a small acreage and small housing. And I chose South Devon’s because they were of course indigenous to here, well largely. They were also big and they converted grass well, which was what I wanted them to do because I wasn’t proposing to feed them anything else.
(Upland Beef Farmer, April 2008)

Because of their compatibility with the environments in which they have evolved, traditional livestock breeds coupled with traditional, extensive farming practices are now commonly used in the management of AONBs, places of historical or archaeological interest, and on sensitive environments to restore or maintain valued habitats in favourable condition. In these situations livestock numbers are commonly limited to allow specific types of vegetation, such as heather moorland, to regrow, recreating what are considered to be ‘natural’ habitats for endangered plants, birds and wildlife. These practices point towards a semiotic mode of ordering; an ordering that is used to stabilise landscape

formations which are perceived to have aesthetic value. Farmers however, have expressed increasing concern about these ordering practices, suggesting that there are “*too few animals and they are now losing, you know willow, gorse brambles it’s all encroaching in and spaces are being lost*”. This is particularly problematic for the livestock grazing these areas as it not only reduces the available grazing area, but also harbours increasing numbers of tics.

Yeah, cos with the Stewardship on the Common cutting the stock numbers we’ve got a massive influx of gorse on the Common cos with the mild winters as well gorse is growing twelve months of the year now. Course the only thing that’ll stop gorse growing is frost, but if you get a mild winter it grows all winter so you got so much more vegetation that the tics, you get a rise in the tic numbers. We get Redwater from tics and our neighbour over the way there had terrible trouble last year with Louping Ill, which touch wood at the moment we haven’t had. You kin, once they got it you cant do anything about it they’ll just die, but you can prevent it, its just two injections a year and I think it works out something like £7 or £8 per animal. We haven’t done it yet, we just couldn’t afford to do it.

Upland Livestock Farmer, April 2008)

The landscape and ecological aesthetic associated with traditional livestock farming practices then may be highly valued for its naturalness, for the biodiversity and habitats it sustains, but as these practices are engaged within semiotic modes of ordering to maintain the aesthetic landscape, they destabilise the farm ecology, often causing health and welfare issues for the animals themselves, a loss of production and increased veterinary costs.

The positive value attributed to these more traditional and less intensive forms of farming landscape however, is also perceived to add aesthetic value to the food and fibre that they produce. Seen as a more ‘natural’ approach to livestock farming, the traditional, less intensive methods of production suggest an appreciation and understanding of ecological and biological cycles that makes best use of Natural resources, with crops and traditional breeds of livestock historically matched to the specific locality. Reducing the need for supplementary feeding to sustain the growth of the bigger continental breeds, traditional

methods have avoided the use of artificial fertilisers to facilitate the higher yield capacity of modern crop varieties. This naturalness adds a local distinctiveness and a perceived authenticity to the food produced. A flock of polled Dorset sheep I encountered for example had acquired a pink tinge to their fleece from the rich red lowland soil on which they were grown. Whilst the *terroir*, by which I mean the distinctive combination of soil, bio-ecological processes and human activity, gives a distinctive flavour and texture to the animal in its end product form. It has become common then for farmers to embody the quality of their products on the distinctive characteristics of the local environment and the landscape of the farm, adding aesthetic value to the food they produce. Red Ruby beef for example, a traditional breed of North Devon cattle produced in areas around Holsworthy and Hatherleigh is now marketed and sold as an authentic Ruby Country branded product that is promoted for its localness, adding an ethical dimension to its perceived aesthetic value.

“Because they are a traditional breed it’s a marketing angle for us as well. We can say it’s a traditional breed and we are in the westcountry. All the cows calve on the farm, and spend all their life on the farm, and all the food they eat food has been grown on the farm. We take them to the abattoir and we have them back and sell them in the farm shop, so if the meat isn’t right it’s our fault and if it is right, it’s down to us.”
(Traditional Mixed Livestock Farmer, February 2008)

Production choices made at the eco-systemic level then have implications for the environment and the aesthetic value of the farming landscape. Such choices are often relatively autonomous from economic aspects of the system in that the farmer’s decision to produce local breeds and provide only home grown crops to feed livestock may be linked to working with the environment because this is the only choice they have got, or this is what they want to achieve, *“to pass on to future generations”*. But they are also tied up in economic decision making and linked to public and consumer demands which are guided by aesthetic appreciations of the landscapes of the livestock farm. Here they become semiotic modes of ordering in which the dialectic of the aesthetic landscape conceals practices that are detrimental to livestock and the sustainability of the farm. Thus whilst the return to more traditional livestock breeds and a slower pattern of production can help to

protect the material ecology of the farm, and the aesthetic landscapes this has come to represent, it is also necessary to recognise where the limitations lie so that measures can be taken to prevent negative impacts.

Access and Sustainability

That livestock farming practices have helped to create and sustain rural landscapes which have positive aesthetic appeal has generated a diverse countryside that has increasingly been appropriated by 'other' actors in pursuit of a variety of activities ranging from outdoor leisure pursuits such as rambling and bird watching, to the deployment of military training exercises as troops are thrust into the extreme environments of the wild and rugged countryside in preparation for active service. Where once private land ownership afforded livestock farmers the right to exclude such 'others', with no legal right of access, the 1942 Scott Report brought the question of public rights of access to the open countryside within the context of national planning policy. This was followed in 1949 by the National Parks and Access to the Countryside Act (HMSO, 1949) which introduced a structured framework for public access, creating definitive maps to provide evidence of public rights of way with access agreements from the land owner (Cullingworth and Nadin, 2003).

An increased focus on recreation in the early post war years led to the provision of facilities to improve public enjoyment of the countryside, with rural spaces that were valued for their productive capacity, being opened up for public access. Weakened by technology, the linkage between farming and landscape diminished and the nostalgic rural scene once dominated and managed by farmers, became valued for its ecological and recreational interests, with the countryside cherished for its absence of work and its ease of living. Hard work, social exclusion and poverty however, continue to be experienced by many with public access and rights of way having varying implications for farmers, their livestock and the 'natural' farm environment. Whilst some farmers have taken proprietary pride in farming landscapes as hearth and livelihood, others have remained intolerant of urbanites in pursuit of recreation, of tourists and eco-cultists who they feel have no real understanding of the countryside, the 'Natural' environment and all those that dwell within it (Lowenthal, 2007).

Although many activities pursued for recreational purposes do not interfere with agricultural production, and legally are not meant to, others such as the use of off roaders, scramble and quad bikes across country terrain bring added pressures which increasingly challenge the sustainability of the farming system.

We've had two weekends lately, both on a Sunday with motor bikes and we bin out there teatime pulling cows out of the bog. And you can't get within, you know sometimes you are more than 100 yards away from them and that's the closest you can get, so you'm out there with miles of blimmin rope and slings and everything else trying to get out there to get to it. But it gets annoying when it's always Sunday teatime when they've finished having their fun in the afternoon and they drive off. We usually go out there quarter to six on a Sunday evening just to count up and check em up and they're you know there you are, they have had their lovely Sunday afternoon and there we are out there taking a cow out and you think oh well ere we go. There's no thought is there to anything, it doesn't affect them does it, it doesn't even occur to em. I mean they could come in and say you know, at least you'd know then wouldn't you, but they don't even bother to do that. Some of em it don't even register.

(Moorland Livestock Farmer, May 2008)

When off road vehicles are driven around moorland areas as a Sunday afternoon leisure activity, natural habitats are despoiled, whilst wildlife, cattle and other farm livestock that dwell in this normally peaceful landscape are disturbed and frightened by the noise and fast moving action. In their panic to escape from danger, grazing livestock, particularly the inexperienced or those with young, often find themselves in areas of the moor that are outside their usual hefting range, areas in which they may be unfamiliar with the hazards of the landscape. Even livestock in fields and enclosures surrounding open access land can be terrorised by these activities which challenge the individual animal's ability to cope in their environment. For the farmer, caring for, and protecting livestock on or adjacent to Common land and farm land with open access, can be an increasingly difficult task to achieve. It requires a great deal of time and effort to track down missing animals and to undertake rescue operations such as pulling a cow out of the bog. Individual animals may never fully recover, or they can be left badly injured, traumatised, and in need of veterinary attention, housing and additional care. This is distressing for livestock and upsets the

dynamics of the animal group. It is also time consuming for the farmer and imposes an unnecessary financial burden that makes the farm difficult to sustain.

Open access to the countryside has led to an increasing number of dog walkers on agricultural land, particularly since the dog fouling laws came into force under the *Litter Animal Droppings Order* of 1991. Prohibiting the fouling of public areas, these laws made dog owners responsible for clearing up after their pet in all public areas except carriageways with a speed limit of more than 40 mph, on land used for agriculture or woodlands, land which is predominantly marshland, moor or heath and on rural common land (Dog Fouling of Land, 1996).

Since they put the doggie bins down in the village they all come up here now. Yeah they come over the cattle grid, chuck the dog out, drive to the top, they park there, turn around and sit and read the paper whilst the dogs out there wandering around, then they drive back down, open the boot, the dog jumps in and they go back. Before the lane got so bad they used to drive up the lane and park right by our gate, and they would let their dogs do it right on the gateway where you come in and out. And I asked them to pick it up and they said we haven't got to up here, so I said well I'm going to come down and dump all my dog shit outside your door. Then they stopped. Well I got four children here, why should I have it outside our gate when I don't let our dogs do it you know, I take em further out, so why should I have North Hill and other villages and their dogs doing it there.

(Moorland Livestock Farmer, May 2008)

Whilst these laws recognise and protect the general public from the health risks associated with dog faeces in urban areas, including cities, towns and villages, they exclude concern for the risk to people who live outside of these areas. Crucially, consideration of the risk to farm animals, wildlife and the rural environment are also ignored, along with the problems that may be caused for farmers as they seek to protect the wellbeing of livestock under their care.

A while ago we had a thing with the dogs didn't we. Yeah, well this time of year we're calving cows and they are out there walking their dogs straight, you see em they walk straight towards the cows. So I say well you want a run this afternoon? And they say what do you mean? And I said if you take your dog up between they cows the way you'm heading, the dog's going to run back. But if you try to talk to anybody the first thing they do is get aggressive. And they say we have a right, and you think ohhh we aint saying that you haven't got a right, we'm just trying to educate you a bit so that you don't get yourself into trouble. But in the end you just think oh well, carry on but don't come crying to me.....And then they say to me, well you got a dog. But its like I say, I don't take the dogs out when we're calving and the dog got enough sense not to come back to us he comes back home, he'll clear off. Pet dogs come back to them, the owner, and I tell em the cow isn't chasing you, he's chasing the dog, and if you're in front of the dog and the cow comes, she's not going to stop. Tidd'n the bull you got to be frightened of it's the cow, but people just do not see, or don't want to see.

(Moorland Livestock Farmer, May 2008)

These recollections suggest that public perceptions of the countryside and open access farmland often exclude the livestock and other wild animals who occupy this land, leading to behaviour that is not only inconsiderate of the needs of these animals, but which is also often inappropriate to maintain their own safety and that of their companion species. It is perhaps understandable then that some farmers do little to encourage access to their land, particularly where livestock have been put at risk and their lives have been challenged. Fed up with gates being left open on his farm, particularly by military personnel on night time exercises, Mike for example decided to padlock his gates because he was wasting too much time rounding up his stock and providing additional care for injured or distressed animals.

Unable to escape the confines of their field or enclosure, farm animals cannot avoid pet dogs that run free, and whilst it may just be a bit of fun and exercise for the dog it can be a traumatic experience for a cow or sheep, and a costly one for farmers. Preventative tape worm treatments for example are often thwarted by unwanted interactions with pet dogs, which outside of their owners control not only worry farm animals and cause injury and distress, but may encounter and consume a carcass infected with tapeworm, and then

deposit their faeces on land that is grazed by farm animals. Whilst this may be characteristic behaviour for a dog, it can pose a serious threat to livestock and indeed other wild animals.

Well we do worm for tapeworm. I mean you do see tapeworm, when we get lambs in you'll find little tapeworm segments, cos I mean you worm em and that'll clean them out but they'll pick em up again eventually cos its in, its there. But I mean the only trouble with dogs and tapeworm is if you get dogs that's eating sheep that have got an infestation of tapeworm they go into the dog and the dog passes it out and then of course you get hidatit in the tapeworm that the dog has passed out and then it goes back to the sheep and then you can actually catch it yourself just by actually touching the dog or handling the sheep. And it ends up in humans you get a hidatit cyst which can come anywhere on the body, but if you don't find it soon enough or if it burst, well its curtains I'm afraid. They did have a lot of problems with it in Wales and they've had a lot of problems in New Zealand years ago, but by law there now all dogs at a certain time of year have got to be taken to a worming station and they are all injected with Dronsit, which we have used here before now, which actually you know kills that.
(Moorland Livestock Farmer, May 2008)

Where farmers have encountered difficulties with livestock arising from public access to their land, many have found that their attempts at talking to those involved to prevent further or future misdemeanours have led to reprisals which cause disruption to the farming system as a whole.

If you've had to have a go at anybody for something, if you catch somebody in a field with a dog, and he's chasing sheep or something or other else like that and you've had to actually go out and say to somebody look get the dog under control, do this, do that or get out of it, usually about three days after you have the RSPCA arrive, its been reported that you got so and so and so and so and so and so. And you say well who's reported it? Oh we're not allowed to tell you. We had problems here back along, we had the RSPCA, State Veterinary Service, Trading Standards, every other week somebody would be on and they'd have to go down there and look at the stock down there. And in the end I said look this is getting a bit silly, who is reporting all this I said. And they all look right past you, they said oh we can see you got feed blocks and you got mineral blocks, I said yes, oh there's a shed up in the top and they said you got a foot bath and a race, so I said yes and I said here's, you can look at the medicine book and see what's been done. Oh well we don't see what the problems is. So I said well you tell me what the problem is, who's reporting it. Oh we are not allowed to say. So I said if they bloody well report it again, I said and you come here again then I am going to be putting in an official complaint against you cos obviously it's somebody causing mischief. I said if it's the same person that's reporting this all the time then surely to god you can work out that it's somebody that's trying to well. But then luckily after that it all stopped, but I thought to meself well I don't really want all this.

(Moorland Livestock Farmer, May 2008)

It is not necessarily the denial of access rights that most farmers oppose, the countryside after all, as Mike said “*is there for everyone to enjoy*”. But if livestock and the farm environment are threatened by inappropriate usage, and public and animal health is put at risk by a minority of passengers who disregard the humdrum realities of the countryside and needs of others, then it becomes necessary to reconsider our actions, and to account for the access problems that threaten livestock and the sustainability of farming systems which have both created and maintain the rural environments that we cherish and seek to access.

Summary

Aesthetic and cultural representations of livestock farming and farm animals play an important role in both the acknowledged relational presence of farm animals in farming landscapes and in the ways in which those agencies are ordered and managed. Yet, behind the often dialectical relation between artificial and Natural, the human and the non-human, upon which such representations are largely founded, the reality of livestock farming often remains hidden. In reality, the intricate and imbricated co-relations and co-practices between humans, animals and bio-ecological processes that are crucial to the sustainability of the farming system, become overlooked. When we look at the agricultural landscape, we rarely see the years of previous activity that has gone in to making and maintaining that particular place – both human and animal. Neither do we see the limits it imposes upon livestock and farming practice today; restricting grazing, fertilising and ploughing. Where traditional livestock practices are utilised for conservation grazing purposes we see principally the benefits of the environment for ourselves, not that the cattle and sheep are kept hungry, have to endure harsh conditions and suffer the bites of ticks that pass on disease. We don't see the cost this then imposes on livestock production in terms of dead animals, preventative medicines, veterinary consultations and everyday care. Informed by our perceptual processes, what we see is a green and pleasant landscape in which our affective responses are played out. The needs of livestock and the farming practices engaged in their production are often lost within this aesthetic gaze. Yet without livestock, and the continuation of farming practices, these valued environments would change. This points to a need for closer correspondence between the way livestock and farming practices are perceived in society, and their material functions as environmental phenomena outside of the merely aesthetic realm.

4.5. End Points

Through a focus on the ecology of the livestock farm, the sections in this chapter each demonstrate in their own way that farm animals are integral to the eco-systemic processes on which livestock farming is based. They reveal interdependent relationships between the Natural and the Social as the perceptual boundaries historically imposed are transgressed in everyday situations. These three sections of the chapter expose the various modes of bio-social and semiotic ordering that create and re-create such boundaries. Within the spaces of the livestock farm the wild and the domestic live alongside one another, continually interacting and negotiating their existence. In so doing they participate in the bio-ecological cycles on which the biotic community depends, each contributing to their own and others existence, the broader ecology of the farm and to the spaces well beyond. The Social practices of crop and animal rotations, combined with the management of animal waste through the productive areas of the farm, help to maintain these bio-ecological cycles, making best use of Natural resources to produce food for human consumption. These rotational practices are also important for the animals themselves, providing the environment and nutritional requirements to sustain a healthy, safe and happy life. Encompassing a sense of order they create visually pleasing landscapes, which despite their frequency and intensity, are perceived to exude naturality and a positive aesthetic value that is linked to food, ecological biodiversity and rural space. Yet such perceptions are often blind to the intricate relationships that take place within the livestock farm. Indeed these largely aesthetic representations are not always coherent with the needs of livestock, or with the performance of practices to maintain eco-systemic processes and the sustainability of the livestock farm.

With a focus on the farming system as the ecological unit of production, this chapter is the first of three empirical chapters to examine the livestock farm as a bounded yet porous ecological space. Exploring the holistic ecology of the livestock farm, it has drawn attention to the complex interrelationality between humans, animals and the environment and has situated farm animals within the broader ecology of the farm; an ecology in which the boundaries of the traditional ecological community have been enlarged. The 'Nature' of livestock farming for instance, reveals a multi-species ecology that is bound up in the bio-dynamic material processes of nutrient recycling, crop and animal rotation, and the

management of bodily wastes that are discussed in section 4.3. This demonstrates that the livestock farm consists of heterogeneous associations and dynamic assemblages which reveal a different type of ecology; one that encompasses the genuine 'Nature' of the livestock farm as it actually exists, rather than one that is founded on cultural representations of Nature. This broader farm ecology contributes to the physical rural landscape which continually evolves in symbiosis with it, along with the aesthetic, symbolic representations of that landscape, and its subsequent use.

It is then through the narratives of Nature, bio-socio-ecological processes and aesthetic representations revealed in this chapter that, I would argue, the ecology of the livestock farm becomes more than the sum of its parts. It becomes a bio-socio multiplicity of humans, non-humans, and physical matter, which, as they knot together in their various networks of association, strive to defend their own futures. Not the future of the whole system or the other parts within it to which they might also contribute, and on which they might also depend. Rather each part of that ecology exudes self-interest. Think of the snake lashing out at the farmer when disturbed in its ditch, Sunday afternoon off roaders that frighten cattle into bogs, or bovine tuberculosis microbes as they pass from cattle to badgers and back again in a bid to survive. Just as each individual part contributes towards the broader ecology of the livestock farm, and its life giving processes, each one of those parts can also do so in ways that are detrimental to others; ways that when taken together, can disrupt the relative stability of the system as a whole.

In the next chapter I move on to consider how the socio-eco-systemic relationships that have emerged in this chapter are managed to facilitate the production process. My attention turns then to the management of livestock at the level of the field. It is at this scale of production that a sense of order emerges; a hierarchical order that is commonly concealed behind everyday management practices that take place on the livestock farm.

Chapter 5

Modes of Ordering: Herd, Flock and Field

5.1. Introduction

Moving away from considerations of human/animal encounter at the level of the farming system, this chapter shifts the focus to the level of the field, a site where a more precise metabolic management arrangement is practised. Unlike the farming system in which humans, animals and Nature are inextricably bound into a biotic farm community, the field is a space of the herd or flock, where a broad economic and ethical engagement of the farmer interplays with the daily, social and somatic performances of the animal collective. At this scale of the livestock farm a different set of relations and relational ethics are performed through modes of Social and organisational ordering that involve different procedures, methods and logics. Following Law (1994) these are “*imputable ordering arrangements, expressions, suggestions, possibilities or resources.....they are strategies, self-reflexive strategies for patterning the networks of the social*” (1994: 20). Such strategies are both explicit in that they are purposefully reproduced by the human and non-human actors involved and implicit, in that they can become lost in less specific, less intentional, arrangements of practice.

The modes of ordering I investigate here, that take place at the level of the field, all define and fix animals into specific groups, and in doing so, create characteristic sets of relations and distributions which facilitate animal movements throughout the production process. These modes of ordering embody farm animals with characteristic forms of representation which define and perform their function as well as their needs for care. Moreover, they generate standardised feeding practices and husbandry procedures which simplify their management within the farming system. It is through these modes that each animal group is embodied with a particular set of resources, which recursively performed, secure network arrangements to reproduce specific and fixed patterns of livestock production.

Through a closer examination of these organisational practices, their character and structure, this chapter is concerned with identifying modes of ordering that exist on the livestock farm, and with understanding their purpose. It is concerned with the way these orderings are set up and established, the various ways they may be contested and confused, and the processes and practices through which they are stabilised and maintained. Of particular interest to me here are the different sets of relations that emerge through organisational practices, and the way farm animals cope with and respond to them within the farming system. Importantly however, I am also interested in alternative modes of ordering and organisation that might challenge the Social order of the livestock farming system, and thereby draw attention to them.

Underlying these ideas there are a number of questions. How for example is the livestock collective organised to facilitate the production process? What are the implications of this organisation in terms of farm animal lives and the care they receive? How do farm animals cope with and respond to the care they experience? What are the implications of these ordering practices on the health and productivity of the livestock herd or flock? How do they impact on the welfare of individuals? In what ways do they interfere with animalian lives? And what challenges does this present for the sustainability of the livestock farm?

With these ideas in mind this chapter is divided into three parts. In the first *Productive Modes of Ordering* I consider how the livestock collective is broken down and rationally ordered into categorical groups which facilitate their movement through particular patterns of production. Here I want show how modes of productive ordering create boundaries between things that require mechanisms to maintain; mechanisms which generate hierarchical relations as different modes of order converge and compete. In the second section, *Biological Modes of Ordering* I move on to examine the way productive modes of order are scientifically reassessed to maintain the health and welfare of the livestock collective, as the challenges of the production system overlap and compete with scientific constructions of illness and animal disease. In the final section I bring in my own observations of cattle, sheep and pigs to explore the possibility of *Animal Orders* that take place on the livestock farm. Following Pickering (1995) I position myself in the “*thick of things*” and study the choreography of agency as it unfolds” (Franklin et al, 2007: 48) to capture a sense of farm animal lives as grouped for production purposes in the field or in

housing. In so doing I explore the way the animals themselves cope with and respond to various stimuli that may be internal or external to the animal group itself. Through an examination of modes of ordering that take place at the level of the field and the material relations that are implicit within them, I hope to reveal how particular patterns of behaviour can be exploitative in character, embodied in technologies and everyday farming practices which challenge the welfare of individual animals and the future sustainability of the livestock farm.

5.2. Productive Modes of Ordering

Within the strategic organisation of the livestock farm, stock animals are ordered into categorically labelled functions and assigned to fixed and bounded groups. Defined in terms of their species and breed for example, animals are assigned to a particular production system, such as intensive, extensive, upland, lowland, organic or traditional. Each system is organised in its own particular way with specific modes of order generating methods and procedures which structure animal lives. Within each type of system, other species characteristics such as gestation period for example determine the production cycle, with pigs having “*an average of 2 or 3 parities a year*”, unlike cattle that only have one. Similarly defined by reproductive characteristics, the Dorset breed of sheep will reproduce three times a year, whilst other breeds reproduce only once or maybe twice.

*“Dorset’s are the most versatile breed of sheep you can have. They breed any time of year which for us is quite handy. We used to lamb in November now we’ve switched to lamb in March because we need the sheds for the calves. You **can** breed them three times a year, they will do it. You push them very hard though, we have done it before and you will have a lot higher losses, quite a high culling rate amongst the ewes.”*
(Lowland Sheep Farmer and Contract Calf Producer, February 2008)

Embodied in particular patterns of production and characteristically defined, the production cycles of farm animals are often combined to create mixed farming systems in which animals of a different breed and/or species are separately performed generating boundaries between them; between cattle and pigs for example, or between a purebred flock of Dorset

sheep and a flock of Cornwall Longwools. Embodied within a specific production cycle these separately defined animals are exposed to different productive pressures that can be uneven and unequal with cattle bred in outdoor extensive systems for example enjoying a fairly long and ‘natural’ life of “18 years” or more, whilst the lives of pigs kept in indoor systems is commonly only “4 years”, reflecting the intensity of the production system.

Other characteristics, such as biological sex, genetic profile and age define the specific function of the animals within the production system, embodying each livestock group with a particular set of resources which defines their specific role. Mature female animals for example, form the core breeding stock of many livestock production systems, producing offspring for fattening, and depending on their genetic profile, for the replacement of breeding animals when they come to the end of their productive lives. This generates boundaries between different modes of ordering within the production system; between groups of breeding animals and groups of animals that will be fattened for slaughter. It also generates characteristic sets of relations, procedures and patterns of distribution that will impact on the length and quality of animal lives in often complex and unforeseen ways.

The management and care of male and female breeding stock for example will depend on the farming system, with each group ordered, brought together and separated in accordance with the breeding programme and preferred cycle of production. In some outdoor systems “*the rams go in with the ewes for 6 weeks of the year*” and the “*bull will run with the cows in a suckler herd throughout the summer grazing period*”. These are relatively static and stable ordering performances. Similarly in indoor pig production systems, a “*chat up*” boar is commonly used “*to bring the sows on heat prior to artificial insemination (AI)*” or is used as a ‘*catch boar*’ to serve the females for which AI has been unsuccessful. This tactic however, is also used when a group of gilts are entering the productive cycle, because “*you never know when a gilt will come on heat*”. These young adult females that are breeding for the first time are grouped together away from the main breeding herd as their lack of experience in giving birth and mothering requires that more time and attention is paid to them during this particular phase of their lives. They therefore become embodied in a different set of characteristics to the main group of breeding sows, and are engaged in different sets of relation and patterns of distribution because as first time mothers they disrupt modes of ordering that stabilise the system into a unified productive whole. They

force the need then for an alternative mode of ordering - one that can accommodate a degree of 'natural' unpredictability - to compensate for their inexperience.

There'll be about 200 sows in one group um and then we always put the younger sows, what we call the second parity sows into another group so it's the first time they been into that system. All gilts stay in individual pens of five so we can keep an eye on em, and then they will go into the farrowing house, have the piglets and then they go into the system.

(Indoor Pig Producer, March 2009).

The offspring produced from core breeding stock commonly stay in groups with their mother for a limited period of time, with the number and age of offspring being a common determinate of the grouping. At weaning, the animals are separated into single sex groups to avoid interbreeding, and as they get older, are regrouped according to their designated purpose within the production system.

"Ideally I keep heifers and steers separately, particularly the older ones when they are bulling. The young ones they are all to their levels, I believe that you should keep them in their sizes, I don't like mixing sizes because the small get smaller, so they want to be done on age and then ideally on sex when they are bigger."

(Upland Beef Farmer, April 2008)

"The calves are born February and we wean them October, November time and then they get grouped off with males in one pen and females in another. Then in spring we will start to look at some of the heifers that we are going to keep ourselves and they will go back in a separate field until they are ready to go in with the bull, and the others will be fattened until they are about 22 months when they will go for slaughter and the steers will go at 26 months."

(Mixed Lowland Livestock Farmer, February 2008)

What these practices and patterns of distribution show is that the biology of livestock animals itself (in this case, their biological sex) becomes an important mode of ordering, that enrolls male and female animals within a functionality through which productivity is performed. As the young animals produced reach sexual maturity however, their inexperience and/or biologically instinctive behaviour to reproduce destabilises the boundaries of the functional group, generating another mode of ordering relating to their age. Thus whilst modes of ordering define and fix livestock into generic groupings, these groups can never actually be fully performed. Nor can they exist in a vacuum (Law, 1994:111) as constantly developing and moving within and through the production system, groups of animals interact with each other and the environments in which they are kept, so they are always in the process of becoming and being made. For the most part these groups remain relatively static, yet as animals behave ‘naturally’ and in unpredictable ways, they can destabilise boundaries and disrupt the modes of ordering that organise the livestock system into a unified and productive whole. As other kinds of patterns and other contingencies intervene in stable network arrangements, farmers have developed specific protocols for dealing with challenges that disrupt imposed boundaries and the modes of ordering that stabilise the production system.

Within the fixed and bounded groups that facilitate production for instance, not all animals thrive and “poor doers” are commonly picked out and re-grouped with smaller or younger animals as an aid to their recovery. These poor doers do not conform to the generic characteristics of the group, perhaps because ill health or bullying has diminished their ability to cope, and they again destabilise the order and its boundaries. The offending animal is rendered visible, and whilst I will discuss this further in the following chapter, my point for now is that it leads to specific intervention practices involving nurturance and re-ordering so that productivity is maintained. These interventions, as the quotes below demonstrate, generate new distributions and sets of relations between humans, animals, materials and technologies that impact on the experiences and behaviour of the animals themselves.

The cattle are being regrouped all the time. The smallest animals in any group will always be bullied so if you see an animal that is not thriving um the best medicine you can give that animal is to take it out of its group size and put it an a group where it is the biggest animal and then psychologically it will feel like its on top and straight away it will start to improve and push the other ones around cos he's top dog and that, he's trying to get in and get the corn first and get the best food. I think it's a lot to do with the psychology of the animal. No one likes to be at the bottom of the heap and that is the same for animals as it is for humans.

(Lowland Livestock Farmer, February 2008)

"It's a great weakness when you have mixed lots all the time, but if you are a commercial holding then you have to stock much more closely which means that the animals have to readjust all the time. Every time you put cattle into a different bunch they have to readjust to different bugs and diseases as well as the relationships they have with other animals."

(Upland Beef Farmer, April 2008)

The above quote also indicates that it is not only relations between animals that are constantly readjusted as intervention practices seek to reinforce boundaries, but it is relations within and between different organisms that are also constantly changing, bringing new threats and disturbances to the stability of the group. On indoor pig production units for instance, 'poor-doers' can only be kept with other 'poor doers' from the same animal group because they pose a threat to biosecurity arrangements that have been formulated specifically to maintain the generic health of each ordered collective.

“We are picking out any bad ones everyday...with pigs you can’t put big animals in with small ones like you can with cattle because you’re trying to keep the disease resistance between them. If you’re bringing the smaller one back so he’s the biggest in another group, he might come back three or four weeks, so you wouldn’t want that one to contaminate the other younger ones. If he’s smaller and for some reason he iddn’t growing so well, you’re going to contaminate you’re other pigs so you might get a problem there, so you try to get them away from those and then mix them back in with all the other ones, you know the other of that size you might have picked out so they’re even again. And then well we put them into, well we don’t put them into a room of fat pigs then, we put them into a trowbridge style pen with separate air space. If they are in a room of fat pigs they all share the same air space and they’re all breathing the same air, so it’s better for biosecurity and disease risk if you see what I mean.

(Indoor Pig Producer, March 2008)

On some farms newly purchased animals will be kept separately from the main animal groups to prevent any mixing of infections which might challenge the immunity of livestock, and reduce the possibility of spreading disease. With increasing prevalence of infectious diseases such as BTb, Foot and Mouth Disease and Blue Tongue for example, many farmers no longer buy in livestock, preferring instead to keep their herds closed. Or they buy in only the minimum of stock from reliable sources with proof of vaccination and disease free status to maintain their ordered boundaries.

Whilst various protocols and practices are developed to maintain order and therefore stability within the farming system, they also at the same time generate a particular dynamics between different modes of ordering as each bounded group strives to co-exist within the livestock farm. Within these dynamics some animal groups will draw attention, whilst others may be hidden or lost behind part of the network, or a specific performance.

Through the various stages of production for example, animal groups will be moved strategically around the farm so that they are closer or further away from the centre of operations according to their vulnerability. At calving, lambing and farrowing, female breeding animals are particularly vulnerable and need a close eye so that any problems are

quickly identified and medical attention given. These animals are valuable at this stage of the production cycle, as heavily pregnant they are about to produce the next seasons crop of young. Vulnerable, pregnant and lactating females therefore become highly visible at this stage of the production cycle and are brought back to fields around the main farmyard where they can be regularly monitored and checked. Or like groups of sick and injured animals, they may be housed in sheds or barns to give some added protection.

“Well we are lambing at the moment in the shed just up there, I’m poorly today but I would normally be out after tea to see them and then we, I see them every night at 7 o’clock and we take turns the three of us and the other person sees them there 7 o’clock and half past 11 when you go to bed and then you might see them two or three times through the night if its lambing. You’ll spend more time there if its one after the other, but if its fairly quiet you may go home again and come back again a bit later.”
(Lowland Livestock Farmer, February 2008)

On mixed livestock systems calving is often planned to coincide with the period of winter housing so that calves are big enough to be turned out in spring. The sheds are then cleaned out in preparation for lambing. Where no sheds are available temporary pens are constructed to provide additional protection from the elements, or this phase of production takes place later in the season so that animals can be born outside in more favourable conditions, reducing the risk of infection amongst the young and vulnerable stock.

Similarly farrowing and weaning houses also occupy central areas of the farm. Nursing mothers and their young are then kept in close proximity to the farm until all animals are thriving, when they will be moved to more distant fields or housing and they fade into the background of whatever else needs to be done. These practices reveal a different set of relations between animals, humans, materials and architectures as particular arrangements and husbandry procedures are performed. They generate specific locations in which to care for these animals, creating new distributions and interactions between things as they are moved around the farm.

Groups of animals that are finishing for slaughter alternatively, are perceived to be healthy and are placed in fields or indoor units that are furthest away from the farm, on the Commons or on grass keep that has been taken elsewhere. Even the finishing house on

intensive pig units is often on another farm. Modes of ordering can therefore be linked to particular spaces, creating a spatialisation of ordering on the farm. These animal groups remain out of sight, receive little attention, and are checked over less frequently; their invisibility a product of ordering work, as the components of the livestock farm are built up on the basis of what is being performed at any particular time.

“If they are breeding animals, you know like the cows and the ewes they get checked daily because they are more prone to problems, where as the younger animals especially our teenagers that sort of age, there are very, very few welfare problems. If they are out on the middle of the moor somewhere, you know it may be a week or so before you go and see them again, but because they are out in the fresh air they are young and healthy and you now there is not much problem. So if its younger animals out on the moor basically you are going to see them a lot less frequently than the breeding animals. Obviously when they are pregnant, you know you have got to be there if there are any problems you’ve got to be right on top of it. So they have got to be kept closer to the house, and for lambing they would be closer still.”

(Upland Livestock Farmer, April 2008)

Forming the majority group in the production system, groups of fatstock are a financially important resource, but only at the point of slaughter. Prior to this time they commonly endure a process of distancing, both spatially in the farm environment, and emotionally in their relations with other animals, and with the farmer who strives to remain detached (see Wilkie, 2010). These hierarchical relations are constituted in and silenced by modes of productive ordering and the interventions that are generated to stabilise the network.

Summary

The field, as a bounded space, becomes the physical and spatial manifestations of modes of ordering that facilitate livestock production. The modes of ordering mobilised here embody farm animals with specific sets of characteristics which define and fix them into specific groups on the farm. It is through these modes of ordering that the lives of farm animals are “*in some measure performed or embodied in a concrete, non-verbal, manner in the network of relations*” (Law, 1994: 20) that constitute their production. These modes of

organisational ordering have characteristic effects that are representative and distributional, often generating consistent patterns of deletion which render some animals invisible whilst empowering others with specific and extended rights. Thus the patterns that emerge tell of a ranking and hierarchy that reveals the status of an animal group at any particular time. Female breeding animals for example are performed and are so performing themselves as female breeding animals within a particular system of production. In their enforced vocation they are embodied as agents that differ from and rank higher than animals in other groups, particularly those that are being fattened for slaughter. At certain stages in the production cycle when they are most vulnerable and valued most highly, they become highly visible through hierarchical relations in which ‘other’ modes of order that generate ‘other’ ways of being a farm animal are marginalised, leading to uneven practices and inequalities in care.

5.3. Biological Modes of Ordering

Unlike productive modes of ordering, biological modes of ordering define farm animals in terms of what they need to sustain life, such as environmental conditions and their requirements for food. They categorise groups of animals by physiological characteristics and standardise their needs for care, generating specific sets of practice through which the future of animal groups can be managed for production purposes. This simplifies their management within the farming system, generating particular locations, arrangements and patterns of husbandry practice that are generic to each animal group. The practices that they generate are “*reflective, planful [and] thoughtful, [and they] bring together and (more or less unsuccessfully)[] [aim] to reconcile*” (Law, 1994: 137) modes of productive ordering with those of animal health, orderings that converge and conflict in the livestock farming system. These arrangements can therefore be seen as dualistic in that they perform discontinuities between the practices of production and practices that aim to maintain the health of the animals themselves.

Central to these arrangements are routine husbandry procedures which aim to prevent or at least reduce potential risks to livestock of injury, infection or disease. These practices are generally considered to be positive contributors to welfare and might include the regular

testing of animals for diseases such as bTb, the administration of preventative veterinary medicines and vaccinations for known health conditions, and mutilations such as tail docking, castration and dehorning which are commonly undertaken as part of the production process. They are practical arrangements that aim to keep the animals healthy and productive through procedures that have been normalised within biological modes of ordering, and linked to a functional notion of farm animal welfare (as discussed in chapter 2). The performance of mutilations and other routine husbandry practices however, is often embedded in specific institutions and patterns of social interactions which go beyond rules or regulations, in that they are not so much legal requirements, or necessary from the animals' point of view, but social or scientific methods that are preferred, or deemed necessary in particular systems of production to maintain productivity.

Organisations such as EBLEX¹ for example publish information booklets that describe a repertoire of diseases, how to identify, treat and prevent them to achieve *'Better Returns'* from the livestock herd or flock. The practices described here focus on driving down production costs and boosting the efficiency of the livestock collective, with improvements in animal welfare seen as a positive yet incidental effect. Concerned with the wellbeing of the animals themselves alternatively, vets encourage good husbandry practices to improve animal health. Yet as the quotes below demonstrate, this is also approached as a profit making exercise, with *"economic interests"* utilised as a *"persuasion tool"* for making *"appropriate investments in maintaining healthy stock"* (large animal vet, Sept. 2009). Discussing these issues with farmers it was clear that the economic performance of livestock is essential to, and often precedes good animal welfare - *"you have got to be economic first, but you need animal health, welfare, environmental health, food safety and all those other things to be right so that you can do it."*

¹ EBLEX is the new Beef and Lamb Sector Company for England. It is a division of the [Agriculture and Horticulture Development Board](#) (AHDB), established 1 April 2008. The EBLEX Board oversees a strategy delivering a wide range of technology transfer, marketing and promotional programmes to farmers, consumers and businesses in the beef and lamb supply chain. Funded through an AHDB levy paid on all cattle and sheep slaughtered in or exported from England, EBLEX also obtains additional grant funding for specific projects from a range of sources.

“Most farmers don’t, well virtually all farmers don’t want to see their animals sick or ill because they don’t like to see them that way. But its always easier when the value of stock is high, you know when you say what is the most important thing in the welfare of animals, it’s the value of them, there is no doubt about that, not just because it is more cost effective just to call us out, but also because they have got more money to spend on preventative medicine, more money to spend on the environment that they live in or they have got more land to spread them over, all of these things.”

(Large Animal Veterinary, September 2008)

Practices of Intervention

Practices of intervention, developed through scientific research (veterinary medicine) and studies of epidemiology (disease statistics) are aimed at preventing or reducing the possibility of infection or disease within livestock and are commonly undertaken as part of a management routine in which specific groups of animals are targeted at varying stages of the production cycle. Farm animals then are also ordered and assembled into diagnostic categories that are based on and inform specific treatments and procedures that aim to maintain the boundaries of productively ordered groups. Each of these categories is specifically and rigidly defined in relation to the scientific guidelines for a health issue or disease, alongside prescriptions for the practices and veterinary medicines needed to achieve prevention and/or control. These are normalising practices. All animals in a group can then be treated in the same way to maximise protection against the identified threat to their health; threats which unsettle modes of ordering and destabilise the system. As the following quote suggests, these threats are often compounded by the demands placed on the animals and the intensity of production.

“We had a lot of health and welfare issues when we were stashed out with sheep um the old saying is that the sheep’s worst enemy is another sheep, and so the harder you pack them in the more welfare issues you are going to have. So we found that a hell of a lot of the old welfare issues have just dropped off as we have reduced numbers.”

(Organic Upland Livestock Farmer, March 2008)

Generated within biological modes of ordering, routine husbandry procedures are performed to maintain the boundaries of productive animal groups, with disease specifications and treatments developed by veterinary scientists to deal specifically with animal health issues that may be naturally occurring, but which are also often generated or intensified in the production system itself. Thus threats to animal health such as liverfluke, lameness and worms become accepted as normal occurrences, with the administration of preventative treatments normalised as part of everyday farming practice.

Addressing issues of animal health, farmers adopt a proactive approach, generating management or herd health plans that incorporate these preventative treatments as a matter of routine. An example of treatments given to sheep over the course of the farming year is illustrated in the interview excerpt below, demonstrating not only how specific groups of animals are ordered and targeted in relation to their known vulnerability to health issues, but also how these practices are tied in with the production cycle so that they coincide and co-exist with other modes of ordering and the management practices they generate.

“We start the farming year for the sheep in late November and the ram goes in and the ram stays with the ewes until about Christmas. Then about Christmas we start supplementary feeding the ewes with some silage and corn through until they lamb in late April. During that period they will receive one drench for fluke in January and also one um vaccination, a seven in one vaccination, for pasturella and seven other diseases, six weeks before lambing so they have two medical things going on there. We used to scan but we don’t do that anymore, it’s another expense. Then they lamb in the end of April and they spend their summer on the pasture with the lambs who we hopefully now won’t have to worm at all. Oh and also we drench the ewes just before lambing, it’s the only time we drench the ewes for general worms because the younger ewes, well April, May is when the worm burden is highest and the stress of lambing plus the peak of worm burden can cause problems, so we drench the ewes just then. And then with the lambs, hopefully we won’t have to um drench the lambs until they are weaned in September. We shear the ewes generally in late July, and then because we shear them late we apply some fly stuff onto their fleece 8 weeks before shearing and the lambs will have fly stuff on them once or twice during the summer depending on how hot it is and then we shear the lambs in September.”

(Organic Upland Livestock Farmer, April 2008)

Incorporated into routine practices, these preventative treatments are intervention strategies that are used to stabilise the boundaries of productive animal groups and maintain their functionality. As part of this routine, vaccinations against known and prevalent diseases are administered to groups of pregnant females to protect them against ill health at a time when they are most vulnerable. In some systems these animals will also be scanned with ultrasound equipment to identify the number of offspring they are carrying, whilst in others, judgements are based on a combination of hand, eye and experience. This generates new modes of ordering that embody each animal with a different set of characteristics specifically defined by a single foetus, twins or triplets. Scanning equipment and other technological devices then are mobilised as a tool to generate specific ordering modes through which generic yet more precise forms of care can be practised, with the feeding patterns and vaccination doses administered, adjusted to the needs of the adult females and the number of unborn foetus’s she is carrying. These are stabilising practices. As can be

seen from the quote below, the identification of these differences not only contributes to the welfare of animals but it also helps farmers to achieve maximum productivity from their stock.

Scanning is an important tool, not so much maintaining the health of the ewes, it's more the health of the lambs they are carrying in fact, because if you have got singles, twins, triplets and if you are feeding them all the same, singly you'll have huge singles and you're going to have really weedy little triplets and the ewes probably won't cope with it, they will loose condition as well.

(Mixed Lowland Farmer, February 2008)

Technological devices such as scanning equipment then are engaged in boundary work as farmers strive to strike a balance between the modes of biological ordering and modes of productive ordering that co-exist on the livestock farm. The more accurate administration of food and vaccinations that results from the use of these tools also extends the boundary work into the unborn foetus as sufficient nutrients and immunity to disease are passed on through the mother prior to giving birth. As the quote below clearly illustrates, the routine vaccination of pregnant females helps to produce strong newborn animals that have a greater chance of survival. And they have more chance of coping with other forms of stress that would restrict their development and challenge the stability of their prospective productive grouping.

“We vaccinate all the sows before they farrow to get them primed up to pass some immunity to the piglets for like e-coli and clostridia and syphilis and then we feed them up a bit more because the foetus’s grow most in the last few weeks of pregnancy so we feed them a bit more so that we have nice strong healthy piglets when they come out and then, well if they farrow on a Thursday we bring them in the Saturday before so that they have the week and this here is just extra farrowing accommodation and what we tend to do is farrow them in our indoor pens then move them out here when they are three or four days old. You can see these are starting to, you see she’s quite a heavy pig there, she’s uddering up she’s about two weeks away from farrowing that one. If you look that’s a pen of all green ones, so they are in there, they mark spray them all green so they pick them all out and spray them all up with green spray when we vaccinate. We tend to vaccinate a lot to give some immunity to the piglet.”

(Freedom Food Hybrid Pig Farmer, September 2008)

These stabilizing practices however can be costly, with specialist scanning and other equipment, vaccinations and preventative treatments being expensive to purchase. They require facilities to restrain or hold animals whilst the procedures are being performed, and they take up a considerable amount of time and labour to perform and administer. Not all farmers have access to these resources. They nonetheless speak positively about their use, suggesting as Steve does, that they have lead to “*significant improvements*” in the overall health of their stock.

Well yeah we use quite a lot of vaccines you know to try to keep the pigs right so they don’t get the problems; it’s all about prevention rather than cure these days, we couldn’t be without em.

(Indoor Pig Producer, May 2008)

Whilst some farmers may depend on technological devices to create and maintain stable animal groups that are both healthy and productive, others must rely on the coping ability of their stock and/or as mentioned above, their own personal judgements. This is often the case on extensive upland hill farms where it may not be practical to gather up large flocks of sheep that extend over a wide ranging area, or on smallholdings and hobby farms where

stocking numbers are low. In circumstances such as these the health of the animals can be compromised, not intentionally but perhaps through inexperience, lack of time and other pressures on the farm, disrupting the balance between health and productivity.

Mutilations are another form of intervention performed on animal bodies to improve animal health and either increase or maintain the productive performance of the livestock herd or flock. The most commonly undertaken procedures are tail docking, the disbudding or dehorning of cattle and sometimes sheep to protect them and their handlers from injury or ingrowing horn, and castration. These are boundary maintenance procedures that have been normalised in farming systems to stabilise negotiations between productivity and animal health. Each of these procedures inflicts a certain degree of pain and suffering on the animal whilst also carrying with it some benefits to health. Routinely docking the tail of lambs for instance, reduces the risk of blowfly, strike and maggots which are naturally occurring within the farm environment. The rubber ring or elastrator used in this process however, restricts the supply of blood to the end of the lamb's tail so that it eventually falls off, inflicting pain on the animal until the nerve endings die. The pain associated with docking in the first few days of an animals life is assumed to be minimal and is therefore justifiable in terms of the health benefits it brings, particularly as with fly strike and maggots the animals can literally be eaten alive.

“Well personally I think it's something you should do you know you put lambs on lush grass and they are going to be a bit loose for a couple of days you know then you start getting problems with the tail and the flies get attracted to it and everything else, its just you know its more stress on the lamb having the tail. Docking them complete, tail and everything it's much more effective if you dock them its much more effective, as long as you leave them the right length I don't think there's anything wrong with it.”

(Lowland Livestock Farmer, February 2008)

The tail docking of pigs alternatively is a procedure undertaken in response to tail biting, an industry wide problem that occurs when animals are grouped in loose housing within indoor production systems. *“Tail and vulva biting was never an issue when us kept pigs in individual stalls cos the animals was kept separate”*. However, it is now a serious health issue and as the quote below demonstrates, tail docking is routinely practiced within indoor production systems despite Welfare Code Recommendations which clearly state that it should only be undertaken as a last resort, with veterinary approval, and then only when improvements to the environment have been unsuccessful.

“Tail docking yes we do that. We do it at two days old, two or three days old, you nip off about half the tail I suppose, just to take away the bit with no nerves in. Um with no straw you got to or otherwise if you left them long inevitably you would have masses of tail biting because you have got a great long tail waiving around and they will start chewing. We give em toys and things to play with now, you got to, you can’t pass your inspection unless you got pig toys, so they got oak logs or round balls. And yes, yeah it does, yeah, yeah tail biting or flank biting yeah, it helps certainly yeah because it gives them something to do doesn’t it. Yeah you know I am in agreement, it is a bit of a faff sometimes but it is something that you got to do isn’t it.”

(Indoor Pig Producer, April 2008)

This quote indicates that tail biting has become accepted as a normal occurrence in indoor pig production systems, with the practice of tail docking normalised in biological modes of ordering to stabilise relations and maintain production. In outdoor production systems however, where the animals are able to perform their biological rooting behaviour and play, tail biting is not an issue. *“I think that’s just boredom....We have no need to [dock their tails] because we just don’t have the same problem as indoor producers”* and there is no other reason to perform this mutilation. This suggests that docking a pig’s tail does not reduce potential suffering from a naturally occurring threat to animal health as it does with lambs. Rather it aims to change a behaviour that occurs because of the environmental conditions under which the animals are kept, and to stabilise relations between biological and productive ordering. As these environments have been created to facilitate increased

production however, questions are often asked about their suitability for the animals. The quote below puts this nicely into context.

“I think firstly with those sorts of systems you have got to look at what would happen if you don’t do these things. I mean I have seen the teats of sows where the piglets haven’t had their teeth clipped and honestly they are like pin cushions, unbelievably damaged. Similarly obviously in similar environments they will bite each others tails. Now of course the question is should they be in that environment then. I mean I do have a bit of a problem with these intensive pig units personally, but similarly we had um I wont tell you where exactly, but there is an outdoor organic free range pig unit, you know all singing all dancing and they have had numerous welfare visits recently because they are not running it correctly, you know piglets are literally drowning in mud, there is no clean bedding areas for the sows to lie in um the ground has been churned up because they have had too high a stocking density. So then you say to yourself if I am a piglet being reared for meat am I happier here, emaciated, covered in lice and potentially drowning or am I happier in an intensive pig unit which has a nice temperature, plenty of lovely food, lots of little chums to run around with, ok I had me tail docked when I was a few days old, but I don’t know maybe I would be happier there. It is a tricky one isn’t it.”

(Large Animal Veterinary, July 2008)

Indoor pig producers consider that the cost benefits accrued from tail docking are positive in terms of maintaining productivity and the welfare of the victims that would otherwise endure pain within these environments over prolonged periods of time. Using the metaphor of scale, the consequences of production are weighed up according to which action is best in terms of economics, animal welfare and the environments in which the animals are kept, with each aspect ordered preferentially according to the relationship between the benefits and disbenefits that a specific course of action will bring. Whilst actions ought then to be undertaken for the greater good of the animal group, or indeed for the welfare of the individual, personal or partial interests, particularly of a financial kind (and therefore linked to production), often interfere with this process. Situations can then be created in which some actions may be justified, whilst others are not generating a process of hierarchical

ordering and inequalities in the care stock animal's experience. The practice of castrating pigs discussed below, illustrates this point well.

"We don't castrate no more haven't done for years. No pigs no cattle, nothing. Tis funny we had years to get that banned cos they you know, cos it affects the food you see, they convert their food better. And now if we wanted to they won't let us go back they wouldn't let us do it because well it would be cruel see. A bloke up the road he got an outlet that they wont take entire's, we don't call em boars or gilt's tis entire's, so it sound a bit better. But its all, boar taint, it's all age related really. Nowadays pigs grow faster and they'm a lot leaner and we'm paid on lean meat content so its bin right for us, but I mean now to do the job, well I used to do it and take no notice of it but the amount of work it would be now to do that job."

(Indoor Pig Producer, March 2008)

The castration of young animals is an extremely stressful experience that has a negative impact on their growth and performance. That most pig farmers no longer castrate young male animals is because they do not perform as well as animals that are left entire. Additionally because their lives are so short the animals do not reach sexual maturity, or acquire the boar taint that is mentioned above. They do not then disrupt the boundaries of productive ordering which means that no stabilising intervention is required. In beef production systems alternatively castration procedures are justified by the improved quality of the finished carcass, and are undertaken at a time that is convenient to the production system rather than the time when it is less stressful for the animals themselves. These are examples of hierarchical ordering work in which productive modes of order rank higher than animal health.

Practices of intervention such as vaccinations, tail docking and castration then are generated by modes of ordering that embody a characteristic set of ailments and health issues which reduce the level of production that can be achieved in a farming system, and which can also be detrimental to the health and welfare of the animals themselves. These issues are often a result of the production system itself and the modes of ordering that emerge from its organisation, pointing to a tension between the health of livestock and the

systems in which they are produced. Generated within biological modes of ordering that aim to stabilise livestock production, practices of intervention have interactive boundary effects as they straddle the boundaries between keeping animals healthy and keeping animals productive. They demonstrate that within the farming system, livestock animals are embodied in and perform conflicting roles - as natural biological animals and as units of production.

Whilst advances in veterinary medicine and epidemiology have led to significant improvements in the health of livestock, helping to bridge the gap between animal health and productivity to stabilise the farming system, a reliance on routine treatments and medicines in normal day to day practice has led to their inappropriate and overuse. This has been detrimental for the animals, not only in terms of their ability to cope with the stress of intervention practices, but also as the quote below illustrates because harmful organisms are becoming immune to some of the treatments that are routinely being used, leaving stock animals more vulnerable to the infections and diseases that these treatments aim to prevent.

“Well worm resistance is becoming more of a problem; there are lots of farms that can’t use a lot of these drenches now because they are resistant to it. You know if we are not careful we will become like Australia where they can’t keep sheep on some farms. You know 15-20 years after they realised they’d got wormer resistance, taking the sheep off the ground, they did a trial and put some sheep back in on these farms after twenty years of having no sheep and they still, the worms were still resistant to the drug, which is quite frightening really. So everybody has to be quite careful really everybody needs to be very careful now.”

(Mixed Lowland Farmer, February 2008)

Anthelmintic drugs for example, have been developed and used widely to bring the worm problem in livestock farming, under control. Relatively cheap to purchase, these drugs have been overused, with animal groups targeted too frequently or with incorrect dosages.

Whilst there are three types of anthelmintic drug² used in the treatment of worms, I have spoken to farmers during the course of this research that have identified resistance to two of those groups on their farm, with many more experiencing resistance to one³. In responding to these issues, some farmers no longer ‘blanket treat’ their animals, preferring instead to target only specific groups that are most vulnerable at certain times. This suggests that whilst the worm problem may be prevalent, it is not all animals that are affected by them, and therefore do not require treatment. Individual animals therefore challenge the biological characteristics on which the worm issue has been based and disrupt its normalising practices.

Farmers also alternate the drugs they use to avoid a build up of resistance, or following current scientific advice, take samples of dung and test it for worm eggs so that they treat only those animals where a high count is found. These are stabilising practices that seek to balance the relation between animal health and productivity, with other biological orderings that are harmful and disruptive. They require a lot more work and a more in-depth understanding of health issues, harmful organisms and their management within the system. Many farmers therefore continue with the same old routine - *“I know people who worm routinely every six weeks regardless you know, because it’s what they have always done”*. This suggests a tension between keeping the animals healthy through scientifically proven means, and keeping the animals healthy in day to day farming practice; a tension that seems to be recognised by vets and farmers alike, who as the quotes below suggests, try to respond positively so that stability can be maintained. That not all animals suffer the effects of a particular disease or respond to the mechanisms for its control also suggests a discontinuity between the generic characterisations generated by biological modes of ordering and the normalisation of routine treatments.

² Benzimidazoles which are white drenches; Levamisoles which are yellow drenches; and Macrocyclic-lactones which are clear drenches

³ Research undertaken by the Moredun Foundation has shown that Benzimidazole resistance for example has more than doubled from 25% to almost 60% between 1990 and 2000 with resistance now found on most farms.

“We have got one or two farms that actually have got their own Fecpac systems to sample their own dung, but we do have a lot of farms bringing in samples that we would ensure, well we would offer the service that you would get the same day result. That’s the problem with faecal egg counting, unless you get the results there and then, you have gathered the sheep in and you are not going to turn them out and then get them in again and worm them if required. If you have got them in you are probably going to worm them anyway cos when am I next going to see them, and then that’s how they get over wormed. So you do need the same day result.”

(Large Animal Vet, September 2008)

“In fact the best way of reducing your worm burden or any parasite burden is to treat the animals, put them back on the same pasture for ten days and then move them on. Cos if you treat an animal and then put it onto clean pasture its going to be excreting all the dead worms, but there will be a certain proportion that aren’t dead that are resistant and you are putting the resistant ones back on that grass. And then they are eating those resistant worms again. Whereas if you put the animals back on the same ground for ten days, after ten days you will have cleared the gut of all the worms and then you move them on and there won’t be any resistant worms on that grass. Yeah its, the trouble is any parasitic infestation, the advice you are given is going to change from one year to another, it changes so quickly at the moment because they are finding out new things you know it just changes so quickly.”

(Mixed Lowland Livestock farmer, February 2008)

Within the three groups of anthelmintic drugs available to treat or prevent worms, there are a wide range of different products designed to control a specific combination of roundworm, tapeworm, lungworm and fluke. Targeted at specific groups of livestock at various stages of the production cycle these drugs have different methods of application and various withdrawal periods before the animals can be slaughtered for meat. Some of these are drenches poured onto an animal’s back, whilst others are administered orally, being inserted into the mouth and squirted onto the back of the tongue using a specially designed dosing gun. They impose on and interfere with the animal in the belief that a brief

moment of intervention and discomfort is better than the prolonged suffering from parasitic infestation which generates health problems and reduces productivity. Whilst some resistance to anthelmintics drugs has developed through overuse, they have generally become more efficient in targeting worm populations and combined with rotational grazing have led to improvements in the overall health of the herd or flock. Being specialist medicines however, that contain a range of toxic chemicals designed to kill off the parasitic worms the routine use of some anthelmintics has created problems in other areas of the farm.

There is a wormer called Ivomec, Ivomectin which is the most powerful wormer available to us but it carries on killing parasites even once it has left the animal. So you put it on the animal, in fact its so powerful you only have to pour it on the animals back and it kills all the internal and external parasites on that animal and when the animal poo's it out at the end of the day it carries on killing things in the ground and soil. Being organic we are not allowed to use that though. There are only three groups of wormers and that's one of them, and it is the most popular amongst farmers because it is just one splash and it's done. I think it might be dearer than the others because it does everything.

(Organic Upland Farmer, April 2008)

Some of the Ivomectin wormers can affect the pasture so we have chosen not to use them in certain fields because we are aware that it can affect the teasels and the spiders etc. There is some pastures on the farm that we want to maintain as species rich so we only use Ivomectin if we have to and then only on certain fields. You don't actually need to worm the cows unless you've got a problem because they are not that intensive so we just worm the calves and then they would go into a different field."

(Mixed Lowland Farmer, February 2008)

These quotes clearly demonstrate that whilst preventative medicines improve animal health and maintain productivity, the routine use of some drugs coupled with the blanket treatment of all animal groups can have a detrimental impact on the environment as the chemical treatments used have continued to perform outside of animal bodies. As a consequence the

biological cycles of the soil are disrupted and micro organisms have been killed off, having a negative impact on farmland biodiversity. Not only then does this reduce the availability and quality of food for livestock and present a challenge to animal health and productivity, but it also impacts on wild bird and other animal populations that occupy or pass through the farm. Interventions performed to maintain boundary relations between livestock production and animal health, also then interfere with biodiversity and the wider farm environment. This suggests that organisational practices aimed at stabilising the farming system need to account not only for productive and biological modes of ordering that facilitate production, but also for the broader ecological orderings with which they co-exist.

Summary

Modes of ordering that are practiced at the level of the field not only embody livestock with specific characteristics which normalise farm animals, but they also generate a host of generic husbanding practices that facilitate production, structuring and organising the animal collective into simple manageable groups. Rooted in agricultural and veterinary science and following traditional notions of animal welfare that are linked to productivity, these practices generate specific and generic patterns of feeding, movement and care. Separately defined and bounded, modes of ordering that facilitate production, and biological modes of ordering that characterise animals according to their physiological needs for life overlap and compete. In so doing they conceal a dualistic relation within the animals themselves as natural biological beings and as units of production. Various mechanisms and strategies of intervention are used to stabilise these relations as they emerge in day to day life. As ailments and disease become normalised in biological modes of ordering a range of routine treatments are proactively employed as preventative measures to bring animal health under control and to maintain the productivity of the livestock collective. These intervention practices perform boundary relations, which also at the same time conceal boundary effects which can be positive, in that they contribute significantly to the health of the livestock collective, and the overall productivity of the farm. But as they normalise harmful conditions and their mechanisms of control they conceal hierarchical orderings that have a negative effect on the broader farm environment and the stock animals themselves. What is considered normal for one animal for example, may not be normal for another, and whilst a particular condition, illness or disease may be

rigidly defined by set biological characteristics, each individual animal will experience that in different ways, and respond differently to the standard treatment or procedure prescribed. Individual animals therefore disrupt the boundaries of biological and productive order and the normative practices used to maintain their stability. These orderings and practices do not then allow for the expression of what counts as suffering. Indeed Despret (2005) alludes to this very point in her discussions of ethological research and knowledge construction, where in posing the question “*what counts for them*” (in this instance sheep), argues that it is necessary to provide the means through which to expand the repertoire of hypotheses and questions that are posed, to avoid constructing knowledge behind the backs of those she studies.

5.4. Animal Orders

How then can we know what counts for farm animals? How do we get at the questions to find out? Indeed Franklin et al (2007) suggest that establishing the action and interaction of an animal in qualitative research is problematic because “*Cartesian influences have dominated a view of animal agency that reduce it to instinct or pre-set behavioural responses*” (2007: 43). There is then a need to find new ways of describing and analysing to overcome this problem. In exploring new ways to research humans and their interactions with therapeutic companion animals, Franklin et al (2007) go on to propose an ethnomethodological approach to focus on the way people or ‘members’ (‘*trans-species*’) construct their world. For ethnomethodologists they suggest, “*the world has an orderly, if not an ordered, quality and this orderliness is produced over time by people (and animals together) in everyday life*” (Franklin et al, 2007: 51). Over time and through close ethnographic observation, these orderings become visible and we can begin to understand animals as individuals that have both agency and consciousness.

Indeed Rosamund Young (2003) has achieved this by paying close attention to the animals at Kite Farm, by observing them and telling stories about their seemingly mundane day-to-day existence. Using her own interpretation of their actions and individual characters she describes in considerable detail the relationships, interactions, behaviours and emotions of cattle, sheep, pigs and chickens, and identifies the orderings, routines and preferences that

emerge through her observations. Recognising each animal as an individual with its own personality, she demonstrates how their intelligence is developed and extended over the course of their lives. And she shows that by observing animals rather than interfering with them, they are able to communicate and let her know what they want and need for a happy, stress free and healthy existence. It is the animals she suggests that run the farm and she is their privileged guardian, providing assistance only when it is asked for or required.

In the previous sections of this chapter I have shown how modes of ordering that embody farm animals with particular characteristics at the level of the field have come to ‘stand for’ or ‘speak on behalf of’ those animals as they live out their lives in particular systems of production. It becomes clear from this that there are similarities and differences to the way these animals are represented and in the materials and effects that modes of ordering both generate and perform. Common amongst them is a process of simplification which facilitates their management within the farming system, but also at the same time conceals other modes of ordering and stories that may be told from another point of view; stories that are forgotten, excluded, deleted, or suppressed; and stories that are ignored or considered irrelevant in accordance with a specifically desired outcome. I would argue for instance that ordering for production or animal health conceals the relationships that Franklin et al (2007) wish to get at through trans-species ethnomethodological research, and which Young (2004) talks about in her book *The Secret Life of Cows*; relationships that take place between farm animals themselves, as the backstage work of the animal group is subsumed within its functional (productive) or biological category, inhibiting their own enterprise.

In this sense modes of productive and biological ordering are partial and selective, and they strain towards an instrumental understanding of farm animals and livestock production that conceals its complexity, particularly with regards to farm animals and their character of agency. What counts as truth for them? Whilst I cannot claim to have any answers to this question, I would like to suggest that the lives of farm animals can ‘be told differently’ than the modes of productive ordering within which they are currently lodged and performed. Through empirical observations of animals in the field for example, different modes of being animal can be brought into view, telling ‘other than human’ stories of livestock production.

In the final section of this chapter then, I turn my attention to interactions that occur between the animals themselves as they go about their daily business of living in the world. During the course of this research I have become increasingly fascinated by and aware of the different ways that animals manage their relations with others, negotiating and adapting their behaviour as they are grouped and re-grouped to stabilise the networks that facilitate their production. The more I have watched groups of cattle, sheep and pigs, the more obvious it has become that farm animals themselves are not passive agents with fixed social and spatial identities that have informed and standardised farming practices. Rather their instinctive behaviours and interactions challenge socially inscribed boundaries and the groupings that are enforced upon them as they use the farm spaces in their own animalian ways. Negotiating their relations with others, farm animals order and manage their day to day lives. They look after each other, build friendships, make enemies and perform a variety of different roles as they actively participate in their own care and wellbeing.

Following Law (1994), I view these inter-relational animal performances as enterprising. Enterprise he suggests has to do with opportunism, with seeking out resources and combining them to create other performances that secure further resources. Whether physical, emotional or material, these are the inter-relational resources that fuel animal livelihoods and secure their existence as they strive to make the most of their circumstances, reacting to, anticipating and avoiding difficulty in their day to day lives. Re-presented as enterprise, animal performances reveal common themes between the Social and the Natural as they strain towards a particular form of dualism, that of being (Socially) productive and being (Naturally) animal. And they draw attention to areas of conflict between the two. Enshrined in this division between productivity and animality is the issue of tail biting in pigs. Whilst a wealth of veterinary science literature has been written about this subject, I want to use my own observations to show that tail biting is a mode of ordering amongst pigs that come together in face to face contact. It is a form of enterprise through which the animals manage their relations within the group, as they build up and reproduce a form of trust and mistrust between themselves.

Watching a group of Cornish Black piglets that had been born and reared outdoors, I saw forty to fifty animals of all ages playing with each other in a large muddy field. They played contentedly with the stones, rolling around, nipping each other and having a real

ball. In Figure 5.1 below for instance, they can be seen playing with my bootlaces without any trepidation or fear.



Figure 5.1: Chewing bootlaces (Authors own image)

They had plenty to occupy them and plenty of food to eat as they rootled happily amongst the bare earth and stones for grubs and roots, and remnants of the feed that is scattered around the field daily. During the time that I spent here all of the animals were getting along with each other and getting on with their lives, sharing the same space and enjoying each others company regardless of their size, age or gender. As can be seen in Figures 5.2 and 5.3 below, this particular group of pigs was quite an eclectic mix.



Figure 5.2: Playful pigs (Authors own image)



Figure 5.3: Pigs of all sizes, age and gender for fattening (Authors own image)

In this outdoor environment tail biting was an instinctive behaviour that took place amongst young pigs as they engaged in play fighting with other members of the group. It generated and maintained a hierarchy between the animals, which once established, only reoccurred to reinstate or challenge the order that had been established within the group. As the animals did not have to compete for food or a mate within this particular grouping and the extensive environment in which they were kept, such challenges to that ordering were a very rare occurrence with relations between animals remaining coherent and stable. The animals seemed to know who they could commune with, how far they could push the boundaries and who they should stay away from to make their life easy. A form of trust and mistrust seemed to emerge between them.

Within intensive indoor production systems, tail biting starts from the same instinctive behaviour, but as the piglets are weaned and regrouped with other animals they are confined and heavily stocked in groups with anything from 100 to 300 other animals in artificial environments. This makes it difficult to establish a hierarchical ordering or to maintain a dominant position within the animal group. Seemingly confused by the lack of order and without any sense of trust, pigs continue to bite the tails of others as they try to cope with or overcome the anarchic situation they find themselves in. In this environment tail biting develops into an unnatural, compulsive behavioural disorder that continues incessantly, causing distress, injury and often death. Thus far from the harmless instinctive behaviour that creates stability within the animal group, tail biting becomes a mechanism

through which the animals cope with disruption to their natural mode of ordering. These disruptions are brought about by socially inscribed modes of ordering that embody farm animals as units of production within intensive farming systems.

When animals are able to establish a hierarchical ordering within their group, relations between them appear to be much more relaxed, with very little aggressive behaviour occurring between them. Not only was this evident amongst the group of outdoor pigs I spent some time observing, but also amongst a beef suckler herd in the fields surrounding my home. These animals, some of whom are captured in Figure 5.4 below, spend a great deal of time grooming and licking each other at certain times of the day. An activity that was not only commonplace between a cow and her calf as a maternal behaviour that one might expect, but it also occurred routinely between the cows themselves.



Figure 5.4: Caring in the cow community (Authors own image)

When the whole herd grazed the field as they did routinely together in the early part of the morning, late morning, late afternoon and again through the evening until dusk, certain animals would always be seen grazing side by side. At other times these same animals would stand in small groups, or lie down together chewing their cud and passing the time of day. They seemed to support and comfort each other and look out for one another, each providing care and companionship for significant others within the group. There was a form of trust between them that seemed to emerge as an informal mode of ordering; a trust

which also at the same time strained towards surveillance, towards keeping an eye on those animals that could not be trusted in quite the same way. In Figure 5.5 below for example, some cows watch over others within their respective groupings.



Figure 5.5: Group work (Authors own image)

Interestingly the bull appeared to have his own entourage, which I came to realise were the dominant females within the herd. Three females were at his side for the most part of each day, seeing to his every need, grooming and licking him. An example of this pampering is shown in Figure 5.6 below. And when his interests were aroused as a cow came on heat, they would usher the intended conquest towards him as though it was their duty to do so.



Figure 5.6: The pampered bull and his faithful followers (Authors own image)

With his mind obviously focused on the job in hand, I observed the bull on more than one occasion separating a cow from her calf by getting between them. Figure 3.4 on page 114 and in Figure 5.7 below show this practice occurring, the bull sometimes gently nuzzling the calf away, leaving the field clear for his forthcoming performance.



Figure 5.7: The bull has separated the calf from its mother prior to mating (Authors own image)

The bull would also interact with the calves, as he is in Figure 5.8 below, no doubt reinforcing his dominant position in the herd. Although oftentimes, as Figure i.i on page 13 also illustrates, these interactions appeared to be more of a ‘hello how are you doing’ or perhaps ‘that’s enough of that’ as he took on a fatherly role.



Figure 5.8: Father and son interactions (Authors own image)

On many occasions the calves could be seen together in a group away from the main herd. At these times, one of which is pictured in Figure 5.9 below, they could be seen playing or having an afternoon nap under the watchful eye of a cow that appeared to have been designated calf minding duties, whilst the rest of the herd grazed peacefully, often in an adjoining field to which they had access through a gate that had been propped open.



Figure 5.9: Calf-minding (Authors own image)

Being a parent myself I can relate to the occasional need for space as the behaviour of young children, like any young animal can be very demanding and at times unrelenting. On one occasion however, the gate blew shut between the two fields separating 4 calves, a heifer and the bull from the rest of the herd. Hearing a commotion I was drawn to the kitchen window, where I discovered the cows bellowing out for their offspring from one side of the hedge, and calves bellowing back from the other, each pacing up and down the hedge line opposite each other in what could only be described as a state of panic and despair. When I looked out some time later the calves had stopped pacing up and down and had pushed themselves up against one side of the gate in an attempt to make contact through the bars, with their mothers. But this prevented the cows on the other side from pushing the gate back open and prolonged their separation. The noise throughout this ordeal was relentless, and surprisingly loud, keeping my children awake until the early hours of the morning. And it continued throughout the night until the farmer arrived the next day. During this time the calves had become extremely distressed, and without the protection of their mother had suffered the effects of hunger and thirst leaving them vulnerable and

susceptible to ailments such as pneumonia that are commonly brought about by increased levels of stress. Similarly the cows, which had not grazed in their normal way throughout the period of separation, had become agitated and more susceptible to milk fever and mastitis which commonly occur when their milk is not taken away.

Whilst this separation may have been an unfortunate incident, it drew my attention to the distress that is caused when animals are routinely separated for slaughter or weaned as part of the production cycle. Some farmers wean animals by the sudden and complete removal of calves to another field close to the farm yard where a watchful eye can be kept on them, whilst their dams are moved out of sight and usually out of earshot to lessen the disturbance. This causes immense stress for all animals concerned, with distress calls and behaviour replicating that described above, only more prolonged and drawn out over a much longer period of time. Calves commonly lose condition and their growth rate is set back by weeks or months, leaving them less able to cope with other potential threats caused by poor weather, illness or infection. Some farmers therefore wean their animals gradually to reduce production losses, and to minimise distress, but this procedure is followed less often than you might expect with most opting for sudden and complete separation. This may be because facilities prevent them from managing the animals in another way, or it may be because this is what they have always done. Interestingly, it became clear during the interviews that organic farmers and those with a heightened awareness of holistic farming practices adopted a more gradual approach to weaning, as they seemed to empathise with their animals and the suffering that this process caused. Others however, had hardened to it.

“We have two pens, cows in one side and calves in the other, with the gate in between so only the calves can get through. We give the calves corn in the neighbouring pens so they can get through and access the corn and the cows can’t have it. Eventually the calves get used to the corn and we make it so that the calves can’t get back to the cows. The cows can still see the calves so they’ve not been taken away completely so they are not too stressed and then the calves are on corn so they aren’t missing out on milk because they are having corn instead.”

(Lowland Livestock Farmer, Feb 2009)

The livestock farm is a working place that performs the vocational ordering of livestock to facilitate production. Both weaning and separating animals for slaughter are practical arrangements that are generated by this process. Whilst these modes of ordering and grouping are external to the animal world, the animals, in their enforced, face to face interactions, actively perform their own modes of internal ordering to sustain their animalian enterprise. On the outdoor pig farm mentioned above for example, I stumbled across two sows and their piglets that were sharing the same paddock when all other family groups were in individual pens. Paul, the pigman, explained that each time he had tried to separate the animals and give them their own space, they would break down the fence to get back to each other. So determined were these animals to be together that their face to face interactions generated organisational intelligence which enabled them to actively defy the electric fences used to keep them apart. Fortunately for them, Paul conceded to the power of their agency and left them together. *“Well they kept going through the fence, they wanted to be together. So in the end after knocking the fence down two or three times I just left them to it you know.”*

Within the vocational modes of ordering of the livestock farm, animals in their face to face interactions generate bonds that provoke specific forms of behaviour and emotional reactions that can interfere with the production process. Whilst this may have a happy ending as in the case of the pigs above, it can also be problematic for animals, often interfering with their health and wellbeing. On one occasion for example I saw a cow kick out at a young bull calf as he tried to suckle her milk, and recall feeling horrified when she continued to kick him and bash him with her head forcing him away. Completely rejected

the calf limped off slowly towards the safety of the hedge, obviously injured and very distressed. Here he was approached by another calf that licked him and offered him some comfort following this terrifying ordeal. In the days that followed the calf spent most of his time lying close to the hedge obviously distressed and in considerable pain, and he would get up only when necessary to stay close to the herd or when John tried to get close to him to make sure he was ok.

It was only much later when I spoke to John that I realised this calf had only recently been introduced to the herd to replace an animal that had died during a difficult calving. When a calf is still born or has died at a very young age it is common practice to purchase a replacement animal so that maximum productivity is maintained. These are often bull calves from a dairy farm, the twin of an inexperienced mother, or the calf of a cow that has died during calving. Hormonal changes which trigger the maternal instinct during the period of giving birth, prompt a bereaved cow (or other female animal during this phase of their lifecycle) to accept another animal often without realising that it is not her own. Sometimes alternatively a calf may be accepted because it allows the mother to perform her maternal behaviour, or perhaps it acts as a distraction and a way of minimising her distress. David for instance explained that *“We’ve got an old dimbo here that doesn’t know what sucking on it. In fact I’ve weaned most of the calves here now and the younger calf that’s still with its mother is double suckling, it’s got two mums.”* Sometimes however a cow will just not accept an animal that is forced upon them, particularly when this animal has been brought in from another farm.

“I thought the calf would go on the cow without any problem but she wouldn’t accept it. So I kept them near home for a while and kept trying with them and then after a while she seemed to be fine with it here. But as soon as I had gone the cow seemed to keep bullying the calf and kicking it, so I had to remove the calf from the herd in the end. It was feeding well by then on a creep feed so I put it in with a group of last years calves and kept an eye on it close to home and it seemed to pick up, it was fine. It went in over winter and was fine, and back out again in spring with the others. But then the other morning it didn’t come running as usual, it staggered half way across the field and then collapsed”

(Mixed Livestock Farmer, January 2008)

Despite the farmer’s efforts to care for the bull calf above, the young animal failed to win over the affection and nurturance of the cow that had been designated his surrogate mother. Whilst the calf did receive some sympathy from other herd members he was not only denied the vital nourishment of milk that he needed, but was brutally attacked by his non-maternal mother who had not been allowed the time to come to terms with her own loss. Unsurprisingly the young animal failed to thrive and eventually died after a great deal of suffering; suffering that was generated by a discontinuity between modes of being animal and modes of production.

On other occasions, relations between animals can provoke a different emotional response and set of behaviours as the journal entry below indicates.

As I answered my door one Friday evening, I found a local man concerned about the well being of a bullock in the field below my home. The bullock was down in the mud on its side and he didn't know who to tell or who it belonged to. I phoned the farmer but there was no reply and had to leave a message on his answerphone. When I went to the field the bullock was still lying on its side in the mud with the rest of the herd gathered around it, seemingly knowing that something was wrong. From where I was standing it looked like the bullock was dead, but concerned that the animals didn't know me I didn't enter the field as this might cause further distress. The following morning the bullock was still in the same position surrounded by the rest of the herd who were nuzzling and sniffing at the ground around him, and not eating as they would be normally at this time of the day. By lunch time I noticed that the bullock had gone, but the rest of the herd were still stood around the very spot where he had laid, heads bowed low as if in mourning. They seemed to recognize that one of their fellow herd members, a son, sibling, friend or companion had died on this very spot, and that he was no longer there. And I could sense a collective sadness amongst them as they tried to make sense of what had happened and come to terms with their loss together as a herd, in the same way I have done in the past with my family and friends following the death of someone close. (Diary Entry 31st May 2008)

My recollections of cattle mourning the death of this bullock draw attention to a bond between the animals within the herd, much like the bond that develops between human family members and intimate or close family friends. It also illustrates that cattle like humans have feelings for each other that are disturbed and upset by separation and death; feelings which the animals must come to terms with and which can cause them to react in a variety of different ways. These observations demonstrate the sharing of sadness and grief amongst an established animal group. The feelings and emotions that farm animals experience in their internal interactions with other animals however are concealed behind the performance of vocational modes of ordering which facilitate production. These vocational modes of ordering also and at the same time generate and perpetuate the face to face relations that animals have within a group; relations which are often harmful to the animals themselves. The enterprising work of the animals that goes into sustaining their

animalian selves and the stability of the animal group is then subsumed within the performance of their productive functionality.

Summary

Thrust together through the vocational modes of ordering that are generated by livestock production, farm animals are forced into face to face interactions which generate backstage performances of animal enterprise as they opportunistically engage and interact to secure available resources. This generates a hierarchical ordering through which a form of trust emerges creating stability within the animal group. And they provoke other performances through which friendship and companionship, care and emotional attachment evolve. These enterprising performances demonstrate the organisational intelligence and ability of animals to actively engage in, create and maintain a stable network arrangement. It generates animalian modes of ordering that embody farm animals with their own characteristics and performative roles, generating particular feelings, emotions and specific patterns of behaviour. Enterprising animal performances are internal modes of organisation that take place within the animal group. However they are generated by the external performances of livestock production, which embody farm animals as productive units, imposing on and disrupting animalian lives and their own internal orderings within the animal group. Within livestock farming systems then, farm animals become a dualistic effect as they strive to perform their lives 'backstage' as animals in their own right, whilst also at the same time being performed 'front stage' as units of production.

5.5. End Points

Each of the sections in this chapter provides a glimpse into the complexity of the livestock farming system and the organisational practices that are mobilised to bring order to this complexity at the level of the field. They demonstrate that the modes of ordering generated to facilitate livestock production are intentional, non-subjective, self reflective strategies that are embedded in social and scientific networks which represent and speak on behalf of farm animals in partial and selective ways. These modes of ordering embody farm animals with specific sets of characteristics that generate particular patterns of relations and spatialisations, and they mobilise materials, equipment, architecture and practices which standardise animal performances, animal health and disease, and all other arrangements that are necessary for their care. These are normalising processes. They create generic categories which compete against each other, and whilst these categories may be fixed and bounded, they intermingle and overlap in unpredictable ways generating the need for other specific protocols to maintain their stability and the unity of the system. Emerging from this boundary work are hierarchical relations through which some modes of ordering are concealed or deleted, whilst others are endowed with specific and extended rights. This generates dualistic arrangements between practices of production and animal health, and between animal health and the broader farm ecology. Put differently, it creates a tension between science and practice. And as social and scientific networks speak on behalf of farm animals, they conceal unfairness and inequalities that inhibit animal enterprise and their ability to contribute to their continued existence. This interferes with the sustainability of livestock farming systems.

This chapter has focused on the organisation of livestock farming systems and the modes of ordering that are generated at the level of the field. It has shown that organisational practices recursively embody and conceal farm animals in generic performances and hierarchical relations which conflict with their own animalian enterprise and the biotic community of the farm. In the last of my empirical chapters I move on to explore how the generic ordering and management of livestock farming systems that takes place at the level of the field, is played out in practice at the site of the individual – the site at which the welfare experience for farm animals begins, and also ends.

Chapter 6

The Co-ordination of Care and the Welfare Experience of Individual Farm Animals

6.1. Introduction

In the last of my empirical chapters I explore a third organisational scale of livestock farming through a focus on the micro level of the farm and the site of the individual. In chapter 4 the focus was on relations that took place at the macro level of the farm and the ecology of the system. Here the interdependent relationships between the Natural and Social were brought into view to demonstrate how livestock animals both participate in and make significant contributions to the biotic ecology of the farm and the broader rural environment. Inquiring into the relations between breeders and their animals Jocelyn Porcher (1997) has previously argued, and I have to agree, that these inter-relationships show us how farm animals are working together with humans, technologies and the environments they inhabit in a way that permits other aspects of a relationship to be brought into view such as “*the judgment animals make about humans.....the contrast between exploitation and collaboration, the question of the sentiment of accomplishment, that of gift and exchange*” (Despret, 2008: 129). In chapter 5, the organisational practices of livestock farming systems and the relations this generates at the spatial scale of the field were examined. It became clear in that chapter that modes of ordering to facilitate production embody farm animals with specific characteristics which generate generic performances and husbandry practices that disrupt animalian lives, the environment and broader biotic community of the farm in what are complex and often detrimental ways. In this chapter I move on to consider how generic farming practices are experienced by individual animals themselves, and how their pleasure, pain and suffering may be concealed behind material relations and normalizing practices that take place at other organisational scales.

This chapter then is about caring for animals within the livestock farming system, and it is about the individual care that farm animals experience as they go through the production process. Following Mol (2008), I see care as the everyday activities involved in looking after farm animals, and making their lives good - making their lives, as the FAWC and other welfarists now advocate, 'worth living' (see Chapter 2). In contemporary healthcare literatures Mol shows us that 'caring' activities are commonly distinguished from 'curing' activities which involve the administration of drugs for the treatment of illness, injury and disease. But using the example of diabetes, she argues that these activities cannot always be easily separated. Practices of animal care involve the provision of suitable environments, companionship, food, water, shelter and medical attention that is commensurate with ongoing animalian needs. They are about taking responsibility for farm animals, being attentive to their needs, and responding to those needs in an appropriate and competent way. The husbanding practices designed to foster the care of livestock are generated by and established within the farming system and the modes of productive ordering that take place at the level of the field. Embodying farm animals with generic sets of characteristics however, these modes of order can erode the quality of care that is experienced by the individual and have untold effects on animal health. In *The Logic of Care*, Mol (2008: 2) clearly shows us that "*The ideal of good care is incorporated in practices and does not speak for itself*". The care livestock experience then may not reflect what the individual animal needs to achieve good health and quality of life, but the needs of the farming system and its productive functionality.

This opens up a number of questions about the importance of animals as individuals in their own right. What does it mean for example, to be an individual animal within the wider context of the farming system? Does the individual have a place? How does the individual animal become visible within that system and how might this differ between species and other modes of ordering through which individuals are organised to facilitate production? Are generic caring practices sufficient to achieve high welfare standards for each individual animal, or do they necessarily involve some level of compromise? Where, if at all, is such compromise apparent? And in the wider context of this thesis, does the maintenance of individual welfare have implications for the rural environment and the overall sustainability of the livestock farming system?

With these questions in mind the chapter is divided into five sections. In the first, *Care and the Individual*, I am concerned with the visibility of individual animals within the farming system, and at the situations in which specific forms of care are selectively directed at different individuals, generating an uneven and unequal welfare experience. The second section, *Routine Care and Welfare*, explores the way issues of animal health are normalised in welfare assessments and considers the impact this can have on the individual animal and its quality of life. In the third section, *Care and Recording Individual Performance* I look at the monitoring procedures used to determine the productive performance of livestock, and explore the implications this can have on individual animal lives. I move on then in the fourth section to consider *Care and Observing the Individual* to reveal a different more affective form of care, before going on in the final section to explore *Culling as Care*, and the contexts in which this occurs. By attending to relations at the micro level of the farm I hope to show how the care that is experienced by livestock can be partial, selective and hierarchical, reflecting the needs of the system to maintain productivity, rather than the needs of the individual to have a life that's worth living despite its contribution to the sustainability of the farm.

6.2. Care and the Individual

As became clear in the previous chapter, farm animals are targeted and grouped according to the needs of the species or breed, to their age, size, sex, and function and to their particular stage of production at any given time. These groupings both generate and facilitate management practices and husbandry procedures which are designed to maintain the productive performance and economic capabilities of the livestock herd or flock. The practices that they generate are generic practices of care. Considered only in terms of their productive or economic resource value however, there is a danger that farm animals become ethically, politically and statistically invisible which can downgrade their care and treatment to the lowest common denominator and disguise the individual behind a host of normative practices. What I am interested in here then is the circumstances under which livestock are cared for as individual animals as opposed to the herd, flock or group in which they are ordered and managed, or to the overall farming system in which collectively they form only one organisational part. And I am interested in the quality of care they

experience as individual animals. As the individual animal is both the site and target of welfare objectives, the conditions through which it becomes visible can give some indication of the importance of the individual within the farming system, within the production process, and as a being in its own right. And it can draw attention to relations that are generated at other organisational scales that may have a negative impact on individual animal lives.

Visibility and Behaviour: Non-Conformity

Through the course of this research then I have engaged with many farmers, shadowing them as they work and attend to their livestock on a day to day basis. During this time it has become evident that not all farm animals are visible as individuals, and for those that are, the process through which this occurs is very selective. As the quotes below illustrate, farm animals become visible as individual beings when they “*behave differently to the rest*”, or “*look and act differently*” to what is considered to be the norm.

Well the first thing you'd notice, you could see an animal that was looking listless or it might be limping which is pretty obvious, but you might just see an animal that is hunched up in a corner on its own, not choosing to go up and eat with the rest of the group. So its behaviour really.....I don't think anyone would notice, they wouldn't know if it is normal behaviour or not, but if you have been working with animals for a few years you should be able to recognise if something's not normal, but then, would you know what the reasons for it is?

(Mixed Livestock Farmer, February, 2008)

But, and this is something I have been trying to understand from the outset of this research, what is normal for farm animals, and how do we measure it? In response to these questions farmers have explained that they get to know what is normal when they check on their animals daily, which they have to do by law, and when they handle them during routine husbandry procedures and move them around the farm. As they go about their daily duties they “*keep an eye*” on their animals whenever they are passing, “*looking over the hedge or gate*” to make sure things are alright.

When an animal is restless it walks a lot. Um you can tell when they are thriving; an animal that hasn't adapted is not going to carry condition. You can tell how they relate to other cattle you know if they are bottom of the pecking order or if they are top dog or if they are just one of the mob. I think body language will tell you, if you are a stockman you um instinctively understand these things, you know if an animal is out of sorts.

When you walk into a field you look for the things that are odd.

(Organic Beef Farmer, April, 2008)

The above quotes seem to suggest that that normality is defined as a daily performance of standard mean behaviour on the part of the animal within its usual environment. And that it is by spending time with the animals, caring for them and observing them, that farmers become familiar with the way their animals look, behave and respond to different stimuli. In so doing they get a feeling for what is normal and what is not. *“It's instinctive, you do it automatically....you spot something out of place instantly because you are sort of tuned in to it you know”*.

Amongst the farmers I have interviewed it is commonly held that *“attention to detail”* is important when checking over livestock. David praised the army training he had received as a young man, explaining that it had helped him to *“notice something immediately it was out of place. You always notice the button undone or the crease in the wrong place, it never got blankoed.”* This he felt was important for the care he was able to provide for his animals, as it enabled him to identify something that was out of place; something that was already *“out of place”* in the normal scheme of daily performances. He could then deal with the situation swiftly, reducing the negative impact on the welfare of an individual.

“Well I am always looking for anything that just isn’t right, or a stupid sheep that’s shoved his head in the fence or something like that you know...I look at their behaviour, cos if anything is wrong it behaves differently, but well its physical as well really cos if its wrong its physically different. I don’t think anybody would be able to pick up on it though cos I don’t think anybody necessarily knows what they should be like. But yeah, we sort of notice, well even though you haven’t got names for em all like you, you just about know all of em really in a roundabout sort of way, if one stands out any different from all the rest then you know it. It’s a bit like that pig over there since I took his mate away last week he’s been making some really funny old oinking noises all week, he’s been going oink, oink, oink as if to say open the door so I can see what’s going on out there like you know.”

(Mixed Lowland Livestock Farmer, March 2008)

An animal that behaves differently to the rest of the herd or flock, or like the pig in the quote above that is making more noise than usual, or that looks or is doing something out of the ordinary, will attract the farmer’s attention and make itself visible rather than being lost amongst the group. These different sorts of behaviours and physical appearances are not considered normal, rather they tend to occur when an animal is unwell, or when it has been injured, and is hungry, frightened or distressed. I have often heard it said for instance, that *“sick or injured animals will lie down under a hedge”* or *“keep themselves separate from the rest of the herd or group”*. They can also look *“off colour”* and *“have a dull coat and eyes”* which makes them stand out amongst the crowd.

When we go out and check our animals um we're just looking literally for something under the weather you know. I could say I'm looking out for lame ones but that's pretty obvious stuff, it is just an instinct thing when you see a flock of sheep you know, having looked at a flocks of sheep everyday for years and years you can just about spot when one is under the weather. So you are looking like for their ears, very often that's a tell tale sign you know very often they have droopy ears and listlessness. And lamb reaction to you and whatever you are doing with the dog. So it is behavioural problems I would have said were the, you know the first thing you see. And then you would investigate further.

(Upland Livestock Farmer, April 2008)

The more familiar farmers are with their animals the easier it is for them to differentiate between what is normal and what is not, but this also depends to a large extent on their experience and available time, and if the animal has the ability to express that behaviour within the environment in which it is kept. It has become clear from my interviews that farmers in the more harsh upland areas, whose work is necessarily attuned with the farm environment, and those with closed, pedigree or fairly small herds, engage more and are in closer contact with their animals than intensive livestock producers. Figure 6.1 below for example shows an upland farmer maintaining contact with his animals through his daily feeding routine. Through the performance of specific practices these farmers get to know their animals as individuals in their own right, recognising particular traits and characteristics that sets each animal apart.

"They don't really need the extra feed at the moment but I give them a bit just so that they get the contact with people, especially now they have been dehorned as they'm usually a bit wary. If you don't have the contact, when I need to bring em in for a tb test or something else, it makes my life and theirs very difficult. Giving em a bit of feed keeps the connection between us and it means that I can make sure they are healthy and ok."

(Upland Livestock Farmer, April 2008)



**Figure 6.1: Maintaining contact with livestock through everyday practices
(Authors own image)**

If an animal becomes sick or injured within systems where frequent human-animal contact is maintained, a change in individual behaviour is more easily recognised and the farmer can respond promptly to reduce any suffering without his presence causing the animal unnecessary distress. The quote below illustrates this well and provides an insight into how relationships and understandings between humans and animals develop.

It's like looking at your kids in the morning, when they come down in the morning you can tell if they'm swinging the lead, that they don't want to go to school and you can tell if they'm not very well can't you. And if you got a greedy cow in the winter and he's not greedy there, you know he's definitely, there's something wrong. Or if he's standing there and he's looking, he's puffing or a bit wide eyed, you know he's got staggers, you just know. But that's what being a hill farmer's about. Tiddn't what you read in a book is it. You know our kids would tell you that, me daughter could have told you that when she was three. She'd tell you at three or four, you know when you said about how do you tell which cows is yours, she'd tell you which ones was ours and what their names were, and which ones belonged to a neighbour and which neighbour see cos we have three or four. So when we say oh Lil nip out, like now when she comes home from school she wants to ride her pony, so we say nip out and check the cows and see if, what's on. Well she'll nip out and say oh so and so is looking like she's coming on to calve or, you know they'm like family.

(Upland Livestock Farmer, May 2008)

Visibility and Technology: Mediated Relations

As modern livestock farms have become increasingly mechanised and additional labour has become a thing of the past, there has been a general reduction in the time farmers have available to spend with their animals, leaving the plight of the individual easily overlooked. This oversight is compounded by the fact that not all modern ailments show distinct physical signs which cause the individual to look or behave in other than normal ways. Subtle changes are not easily spotted and can be difficult to identify, particularly when the animal is kept in a large group. In these situations the animal's inability to cope in its normal environment and with its day to day life goes unnoticed, but continues to have a negative impact on the quality of its life.

Recognising and responding to the needs of individual animals then is not easy to achieve, particularly when population densities are high. Or as Steve, an indoor pig farmer pointed out, when all of the animals look the same or are confined in one space. In these situations

he told me that an animal will move around infrequently, in fact only to find food or an area in which to defecate, and has little if any opportunity to express its individual personality or communicate with the farmer. Often the only thing that distinguishes one animal from another in these situations is an identification number that is stamped on its ear tag; a number that is unique and specific to the individual animal. Yet the personalised ear tag and identification number does not make an individual easily recognisable, nor does it make the individual visible to the farmer as an animal in its own right, with its own specific needs and preferences to sustain its wellbeing.

Its harder stockmanship [in intensive mechanised systems] because you can't see the individual animal as it feeds because it's doing it all day, so you are relying on the computer to tell you what's going on. And you know there could be a sow in there that's got a sore foot but she's come out to feed in the quiet time, you won't know actually that she's lame till she's too lame to walk to the feeding station if you see what I mean, because they're all lying down. Its not like dairy farming, a dairy farmer sees he's cows every morning coming in the parlour and you can see oh one there's gone a bit lame. But because they are all in there together you don't see them individually. And also pigs haven't got quite the same identity as a cow if you know what I mean. Each cow got different colours and different shape a bit more. Our pigs mainly are just numbers, well we haven't got names for them they're just numbers aren't they. In the old system, pigs were kept in separate stalls so you knew instantly if one hadn't eaten and could check her over straight away. But now that the pigs are loose housed it can be a couple of days sometimes before you find her and it all takes time, and that's something we haven't got. (Indoor Pig Producer, March 2008)

With access to sufficient resources to build a mechanised infrastructure of care, Steve has reduced the manual labour input on his pig production unit by providing a technologically controlled environment, which minimises the risk of infection and meets the basic physical and biological needs for animal care.

Well you put the pigs in a pen and um you set it up when you put them in and the temperature drops as they grow because a pig as he gets older needs less temperature so the computer control system does that. It picks it up by the temperature, put it like that. And if the alarm was to go off cos the room had got too cold or too hot, it would either put the alarm off in here, and if nobody hears it fairly quick it would ring us, it rings you up to say there is a problem. At the moment they have got it back one place now, it roots it back to one place, so you can go in there and see which pen it is, cos sometimes I've been out there and think well which pen is it in like, you got to go around every pen till you find the problem.

(Indoor Pig Producer, March 2008)

The time that Steve now spends with the animals, observing, handling and caring for them, is significantly diminished, with direct attentive, responsive caring practices towards individual animals being mediated by technology. Used to replace the work of humans, this technological equipment reproduces a standardised form of animal care. This may simplify the management of animals within the production system, but as the quotes above clearly indicate, this is deficient of individual needs for care. Whilst the computerised system is programmed to cover a variety of different tasks, it is unable to detect, and react to the range and extent of problems that is likely to occur, and is therefore less responsive to ongoing individual needs. Although the health of the animals is paramount in this system, and the pigs are kept to very high standards, the individual is not cared for as a being in its own right. The mechanisation of routine caring practices which mediate the relation between humans and animals can therefore be detrimental to welfare and the overall quality of individual animal life.

Visibility and Empathy: Knowing the Individual

It became clear during this research then, that farmer's who operate closed systems, or have smaller herds and flocks, recognise and pay more attention to individual animals. They become more aware of individuals and of the bonds that are built up between individual herd members which also have a considerable influence on animal wellbeing. Armed with such knowledge these farmers are better equipped to deal with and manage the care of their

stock in a way that is sympathetic to individual needs. The implications of knowing individual animals in this way became apparent to me when I helped out with BTb testing on a small Dartmoor hill farm. During this routine procedure the animals were ordered through the race so that one “*old girl*” in particular, (I don’t recall her name, but she certainly had one) didn’t get left on her own. “*She just panics*” David told me “*and then she will try and jump over the gate, and I don’t want her to do that because she will just injure herself*”. As I watched David negotiate the situation, he seemed to be able to predict how the animal would move. He had a feeling for what she would do next and was able through a series of human-animal exchanges to respond to her movements to keep her calm and safe. It is only because he knew the animal and recognised her needs as an individual that David could do his best to ensure that she stayed with other animals throughout the whole procedure, maintaining her sense of security and preventing her self harm.

These actions not only demonstrate the *affect* of the human-animal relationship as one individual negotiates the other, but it also demonstrates a form of empathy in which the farmer has projected his own experiences and feelings of what it is like to be frightened onto the animal, and has used this knowledge to create a situation in which the animal remains safe. It is then through some sort of contextual and individualised empathic *affect* that the farmer negotiates with the animal and compensates his own actions to maintain the quality of care he provides; care that recognises and responds to individuality on a day to day basis within the production system.

What I find interesting about these observations however, is that an individualised or affective form of care such as that described above can exist side by side with another production system that operates on the same farm. This is often a more intensive production system in which the individual animal remains invisible unless they deviate from the norm; a system in which care is normalised or standardised by technological equipment. A good example of this is the extensive beef system that Steve operates alongside his intensive pig unit. Here the cattle might take second place to the pigs in that they are only a small part of the business, contributing as they do to the management of pig waste (see chapter 4), but with a limited number of animals in the herd he has got to know them all individually.

I quite enjoy doing the beef; it makes a change from the pigs. I don't mind pigs but it's not very pleasant. Well they're alright but sometimes they just don't want to move very far and when you've shifted two hundred odd weaners that don't want to move like we have there today, after four or five hours of it you think oh I don't know my knees are sore now.

Indoor Pig Producer

The 10,000 pigs that go through his indoor production system each year alternatively, are just numbers on the computer system. This makes it difficult to empathise with and be responsive to animals and their individual needs for care, particularly when human-animal contact is minimal and mediated as it is in his system. This suggests that the care animals experience is linked to the specific patterns and cycles of production in which the animals are engaged; patterns which also necessarily link to the breed and species of animal and to the economic viability of their production within the broader ecology of the farm.

Empathising with an animal because it is sick or injured, demonstrates concern for how the individual itself might be feeling. Through the stories I have heard and the actions that I have witnessed, it was clear that some farmers and their families would go out of their way to nurture and care for a sick or orphaned individual in the hope that their actions might make the animal feel better, or give them a new lease of life, even if only for a relatively short period of time. Think of lambs by the Aga for instance. Empathising with an individual animal commonly influences the care and attention it receives following an accident or injury or throughout a period of illness as well as its recovery.

Its like that cow that was down in the bog wasn't it, we stood her up four days in a row and we'm there you know the kids is taking buckets of water and you'm doing your best to keep it going and I went down there and well once she was stood up she would stand but she wouldn't get up on her own and you'm thinking, well you try everything. And then well cos there's no green grass (in the shed), I'd go down and pick a bag of green grass or something just to, you know she had plenty of silage and plenty of corn, but you just think oh you know when your feeling poorly you want a bowl of strawberries or something you know or you'll give the kids a little treat just to boost em up, and you do that for the cow. So you know you'm thinking of em and you try, but then well it dies and you think well you've done your best. It's like the nurse you know, not everyone when they'm in hospital, well a nurse must feel the same.

(Upland Livestock Farmer, May 2008)

As with the previous recollection of the nervous cow, the farming family above empathised with the injured animal by drawing on their own experiences of sickness and injury and by acting in the same way that they would towards another human being. In so doing they provide the animal with treats of fresh green grass that is suited to her individual dietary needs and which she cannot obtain herself as she is confined to the sick bay, unable to venture out because of her injuries. She is also provided with a bit of extra kindness not dissimilar to the care and affection that she would likely have experienced if she had been able to remain with the rest of the herd, amongst her own family and friends who would also have shown kindness and contributed to her care. The relationship between human and animal in this instance then was more akin to a relationship between humans, and the care the cow received as a consequence demonstrated an awareness of her individual and personal needs. That this was not enough to save her life was no fault of her owners who like other herd members had been distressed by her passing. By the same token however, the family knew they had done everything in their power to make the animal comfortable. Acting on their acquired knowledge of farm animals and their own moral values they had brought her some happiness, not only in the last few days of her life, but throughout her entire stay on the farm where she had always been recognised as an individual that was

similar to, yet still different from all the rest. No blame or guilt can be attached to such actions.

It seems then that farmers are able to build up more meaningful relationships with individual animals when they are in relatively small or closed herds, as in these systems, unlike the more intensive livestock systems, the individual has the opportunity to become or make itself visible and can therefore be seen as an animal in its own right, with its own life, personality and requirements for care. Individual animal's John insisted "*have got to have the ability to exhibit normal behaviour...you know cows and calves have always grazed grasslands and that's what they should be doing. So we should devise a system that will allow them to do that and allow them to be individuals.*" What I find interesting about this quote is that John makes a link between normal behaviour, and 'natural' biological behaviours, considering them both to be necessary for the animal to communicate and be recognised as individual within the farming system. Knowing animals as individuals allows for the development of a closer human-animal bond, which over time facilitates a broader understanding of what each individual needs. If these needs can then be met on the animal's terms and they are allowed some freedom to participate in their own care rather than being treated wholly as a collective, farm animal welfare would shift to another dimension. That individuals are not always visible in many commercial and more intensive farming systems however, suggests an ironic tension between maintaining productivity through the health of the herd or flock, and the specific and personal needs of each individual animal. If individual animal needs were both recognised and attended to, it could generate the potential to increase productivity and higher welfare standards, although not necessarily at the pace at which these systems currently operate.

Visibility and Selection: Inequalities in Care

The visibility of farm animals as individual beings both within and between production systems for different types of animal, is also often very selective resulting in uneven and unequal experiences of care. Common on most livestock farms for example is the breeding bull, boar or ram that dominates the production system. This animal is commonly singled out from the rest of the herd or flock to receive a specific form of care that can be differentiated from the rest.

“The boar, well he’s got his own little area, he’s got a pen on his own and a sow will be brought to him whenever she is on heat. We have got two boars at the moment, but we keep one up the top and one down here. You can’t keep them in together because they have a tendency to fight. You know if I was to bring the older one down here then he is going to want to say I am boss so we have to keep them apart.”

(Outdoor Pig Farmer, July 2008)

In terms of the visibility of individual animals I find this quote interesting for two reasons. Firstly, the boar is singled out from the rest of the herd and has his own pen because as an individual animal he is of functional importance. He is also a valuable individual in that his progeny will secure future production on the farm, inheriting his genetic qualities which can be valuable in themselves in terms of carcass conformity, temperament, and resistance to disease for example. The dominant breeding male therefore has a functional value that makes him visible and individualises him within the farming system. This reproductive functionality generates a whole host of practices that differentiates his care and nurturance from the rest of the herd. In his own separate space, the boar is able to eat his own food rations without having to fight for them, rations which are also specific to his functional needs. With a covering of straw to protect him from injury, the boar is able to sleep in his own bed, dung in his own corner and rootle around freely without interference. The only caveat to this of course is when a sow is brought into the pen for ‘natural’ service and he is required to undertake his reproductive duties. Bringing the sow to the boar ensures that his energy levels are retained for the production of high quality sperm and the performance of impregnation. He must be fit, ready and willing to perform whenever this occasion arises if good conception rates are to be achieved. In fact a newly acquired or recently appointed herd boar will commonly undergo a period of *“training to make sure he is up to the job”*.

When we buy a new boar it will be kept completely separate from the main breeding herd for 6-8 weeks and then we'll bring it back and then train it to work. Yeah, well its not easy in pigs sometimes, they jump on the wrong end or something, or they can't reach and you gotta help em."

(Indoor Pig Farmer, March 2008)

In undertaking an important functional role that will secure future production on the farm, the boar must always be "*fit for purpose*". This requires that the health and wellbeing of the individual animal is maintained to ensure his continued fertility and reproductive capacity. This is particularly important as "*a pig farmer's biggest expense is an empty sow; an empty pig costs money.*" It is in the farmer's best interest then to recognise and respond to the needs of this particular animal and to keep him in good health so that he performs his specific function. Interestingly, as we have seen from earlier quotes in the chapter, the level of care an animal experiences often goes beyond what one might call simply concern for its being 'fit for purpose'.

Being singled out for individual treatment however does not necessarily involve the visibility of the boar's own personal and specific needs, rather he becomes visible and is cared for as an individual only insofar as this does not interfere with his functional role within the production system. If the boar is provided with copious amounts of food for example as would likely be his own wish, it would "*lower his fertility*", which means that his diet must be restricted if productivity is to be maintained. This ignores the feed intake requirements needed by each individual animal which undoubtedly differs as all boars are not the same, and can leave some individuals in a perpetual state of hunger. As the capacity to cope differs between individuals, some animals can be overworked, leaving them tired and exhausted and susceptible to ill health. Individual requirements for care can therefore easily be overshadowed by the functional needs of the production system. The singular visibility that a dominant breeding male achieves, does however afford the individual a better quality of care than a pig that is being fattened for slaughter or a breeding sow for instance. These animals remain anonymous within the mode of production that generates their order, and generic practices of care, unless, as we have seen, they make themselves known through 'other than normal' behaviour.

A second and important point I would like to make about the quote above, is that a dominant breeding male follows a ‘natural’ pattern of behaviour to fight off other males that threaten his status. This animalian ‘nature’ gives him ‘greater subjectivity’ in that it sparks an awareness of his aggressive behaviour and renders him visible as an individual within the system. Grouping entire adult boars (or bulls, or rams) together is not a viable option if production is to be maintained, so the farmer has no choice but to separate them out and manage them as individuals. Whilst a boar is generally kept in a separate pen or paddock, a bull or ram will roam freely in the field with the breeding herd or flock that he alone will serve throughout the breeding season. Overwinter the bull will be housed separately from the rest of the suckler herd, although visual and physical contact will always be maintained to prevent loneliness, stress and agitation, which can make him break out of his pen. A ram alternatively can never be isolated or kept alone as he is naturally a “*flock animal and will just pine for the company of others. If he is left on his own he would die*”. The ram therefore remains outside in the company of castrated wether’s that are sexually anonymous and pose no threat to his dominant status. These practices highlight a spatialisation of individuality within the livestock farm.

Whether boar, bull or ram the male breeding animal is generally quite large, strong and heavy. He often has horns and a tendency towards aggressive behaviour, particularly when he feels threatened. The biological and characteristic traits of these individual animals’ also then influences the human-animal relationships that take place on the farm (see Wilkie, 2010 for example), and this also has consequences for the care they experience.

I talk to the pigs yeah the bigger ones and give them a pat. The older ones will come over and have a good old scratch you know. I don’t to the boar though, cos he’s got great big tusks, I mean he’s quite tame really but I wouldn’t want to push my luck with him you know.

(Outdoor Pig Farmer, February 2008)

David, the pigman on an outdoor production system interacts with individual animals as he goes about the farm undertaking his daily duties. When I shadowed him around the farm he spent some time rubbing and scratching the neck and back of the boar (see Figure 6.2 below) who seemed to enjoy the attention immensely, getting up and participating in the

relation by pushing back against him as you would do for instance when someone scratches your back. *“They are not vicious”* he told me. *“I always start off back here at the head first when handling and scratching though and I work my way forward cos you never know really do you.”*



Figure 6.2: Human-pig interactions (Authors own image)

Humans then are generally cautious of a dominant breeding male and they interact with it in a different way than they do with other animals because of the perceived or potential threat that they pose to their own personal safety. A spate of recent newspaper articles reporting incidents of farmers being crushed, injured, or killed by their animals, and bulls in particular suggests that these fears may be warranted, although you can never fully appreciate the conditions under which these events have occurred. Whilst discussing this subject and his own personal interactions with livestock, Brian explained that although he felt that he had a special relationship with the bulls on his farm, he had to be careful not to let them know this for fear of reprisals. Acknowledging their subjectivity, he went on to explain how they reminded him of his children, in that *“if you let them know that they can get the better of you, they will”*.

I have got four bulls and they are all different characters. They have all got names and you talk to them when you work with them and when you see them you say hello to them. Um but you mustn't let the bull know that he is special because as soon as he thinks he's special he'll start behaving differently. He'll start then pushing his weight around. So you need as you walk past, to give him a bang on the shoulder and then um just carry on.

(Lowland Mixed Livestock Farmer, February 2008)

As the reproductive life span of a breeding bull, boar or ram can extend over many years, a farmer will get to know these animals more than other animals that are sent off for slaughter. Not only then does the dominant male breeding animal become visible when he reaches sexual maturity and acquires productive and economic importance, he also becomes visible as the farmer gets to know him as an individual over time, with his own personality and quirky ways of being on the farm. This highlights changes in the human-animal relationship over the life course of the animal and indicates a difference in the way humans interact with different animals on the farm. It also suggests that there is a limit to the recognition of individuality, as over-familiarity alters the balance of those relations between human and animal.

When you are around animals for many years you get to know them quite well “*like you know your own children.*”, but this tends to vary according to species, breed, age and function, with cattle and pigs being quite “*friendly*”, particularly the old and young. Sheep however, as the quote below suggests are often “*nervous and flighty*” which makes it difficult to relate to them and meet their individual needs for care.

*“You can’t build up a relationship with a sheep because they just don’t remember. A sheep is born to die; they seem to spend all their life trying to find a way of killing themselves. They are very hard, you need an awful lot of patience, I know many farmers just can’t abide sheep because they are just so frustrating and they will die for no reason. But you just have to accept that and move on.
(Mixed Lowland Livestock Farmer, February 2008)*

Although the human-individual-animal relationship might vary according to species, the dominant male of the herd or flock is still held in high regard for the job they do on the farm in facilitating productivity, and also because of their stature, which stockpersons seem to find aesthetically pleasing. A certain pride then is taken in the bull, boar or ram; a pride that I saw in the glimmer of farmers eyes when they presented these animals to me, describing their conformation, or their likeness to predecessors, particularly in pedigree stock and closed herds. This glimmer was there in David’s eyes when he showed me a photograph of his first herd bull. It seemed to suggest that the look and condition of the dominant breeding male is important to the farmer, because it denotes the animal’s productive capacity. It also reflects on the farmer and his ability as a stockman to produce high quality livestock that are well managed and cared for. A great deal of time and effort is therefore spent searching for the right individual, whose productive performance will be remembered for years to come, visible in the quality of future offspring on the farm.

I did have an Angus bull, but I like Limousins really because they are easy calving and up sucking and you get your meaty carcasses you see. But I had an Angus from some breeders down Penzance. I went and looked at heaps of Angus's trying to find the right bull because they were either too short or too dumpy most of em. But this one down there had a bit more stretch about im so I had this one off them but the bloody thing got lazy after a couple years, he was only four, four and a half years when I sold him last summer, he was a tonne when I sold him I suppose that's why he got lazy really, but he's offspring are coming through yielding a lovely lot of meat so I want to go down an buy another Angus off the same crowd really. But I brought a Hereford cos I didn't have time to go to Penzance so I brought a Hereford bull off a friend of mine that breeds Herefords so at the moment I got a Limousine and a Hereford but me Limousin he's about ten year old now and he's in the fattening pen up there, so I shall probably have a Hereford and an Angus up there this time next year.

(Lowland Livestock Farmer, April 2008)

It is as an individual animal then that the bull, boar or ram becomes a trademark of the farm, depicting certain standards and quality. As such the dominant male breeding animal will often be entered into an agricultural show, although it is not only a dominant breeding male that is presented for showing. Any individual animal that either is or has the potential to demonstrate that it is prime breeding stock and therefore highly productive, becomes visible for this purpose. As does an individual pedigree animal that epitomises its breed. Individual animals selected for showing are commonly separated from the rest of the herd or flock so that their condition is maintained prior to and throughout the showing season. Each individual is transported to the showground, where a makeshift stall is constructed out of straw, gates and metal bars. Here the animal will be tethered, washed and groomed and generally pampered by the owner, having a shampoo and blow dry so that its carcass conformity and productive qualities can be shown off to their best advantage. In poor weather conditions a jacket or blanket bearing the animals name is commonly used to keep it clean and dry prior to entering the show ring, when the animal is put on a leash and held at close quarters so that it can be tightly controlled as it is walked around in circles. As the leash is pulled up so the animals head will be raised, whilst a swift tap on the legs with a

stick makes the animal walk quicker or slower or alter its posture, demonstrating its temperament and profile to the panel of judges.

A rosette awarded to a prize winning beast will increase its individual value and guarantee its existence, for the immediate future at least. A prize winning animal is a selling point for the farm, particularly a bull, boar or ram whose infamous breeding qualities are passed on in his progeny or in his semen which is often drawn off artificially and offered for sale. This clearly demonstrates that the visibility of livestock can also be linked to its individual productive performance which is exaggerated in the show ring when an animal is presented in all of its glory, or rather the farmer's glory (no matter how unnatural this might be), along with details of its productive success. Whilst this may be a selfish investment on the part of the farmer, it does not necessarily devalue his intentions for good care.

6.3. Routine Care and Welfare

For a vet, animal scientist, epidemiologist or laboratory technician, normality in relation to farm animal welfare is established through the recording of facts about the physical and biological characteristics of animals, and the illnesses and diseases which cause them to suffer. Over time these facts have been amalgamated into huge bases of classificatory knowledge systems which are vitally important in farm animal care because they provide the information necessary to identify and treat animals that are suffering from a range of different conditions that are detrimental to their welfare. They are also drawn upon to detect specific ailments, perform surgical procedures and to eradicate disease through the identification of pathological conditions, or conditions that are exaggerated or diminished forms of a scientifically proven norm. In Chapter 5 it was shown how this normalisation of disease in the Veterinary Sciences, generated modes of biological ordering which categorised and grouped animals so that generic husbandry procedures and preventative treatments could be routinely performed to maintain the health and productivity of the livestock collective. In this chapter however I am interested in the individual attention to care that emerges from veterinary practice.

Whilst quantitative data may demonstrate a deviance from scientifically proven norms which characterise a particular health issue or disease, this does not necessarily translate into a welfare problem for an individual animal, as all individuals have different tolerance levels for different things. The detection of illnesses and disease as problematic to individual welfare is not then a matter of gradation, or shifting along a continuum, rather it is a jump or break in which the condition goes from one side of the boundary to the next in such a way that difference becomes qualitative in that it must be observed in the animal and not in its pathology.

Within a livestock farming system the normativity that matters in relation to the welfare of individuals is established as we have seen, by farmers as they come to know what is normal for the animals within the specific context of daily performances on the farm. It is through these everyday practices that the farmer is able to identify differences within the individual that may indicate ill health. When a farmer is unfamiliar with the condition an animal exhibits, and is concerned that the individual is suffering he will use his personal judgement to determine if the vet should be consulted. Most farmers will tell you however that they don't call the vet out unless it is absolutely necessary.

If it was down to individual sheep, when you have a sheep lambing say and its got a problem you can't really have the vet out because quite often by the time the vet arrives here its too late, so you do what you can and then you think what you are going to do. It can be tough on the sheep but if you think that the sheep is suffering you have then got to make a choice and think either you are going to let the sheep suffer, or are you going to get the vet out. Trouble is you get the vet out for a sheep and they'll treat it and you spend money on it, but because sheep are sheep and they've got weak hearts they'll just die, so you may spend £50 on a sheep and it will still die, so there's no point. So you've got to think hang on a minute am I going to make the sheep better, no I'm not, is the vet going to make the sheep better, or is he going to make the other sheep better if it is a flock issue. If it's not, then you have to take the first decision and that is to shoot that sheep, because what you mustn't do is allow the sheep to suffer, which is hard but that's what has to happen and at least we are making that choice here. In say Australia or New Zealand the farmer doesn't even know the sheep is ill because he has got fifty thousand sheep and he doesn't even look at them.

(Mixed Lowland Farmer, February 2008)

The above quote suggests that the vet will only be called when there is a recognition that the condition of an animal has gone beyond the care that can be provided by the farmer, or is outside of the capacity of the farmer to supply or administer treatment. It is only then at the moment of contact that the vet becomes immediately concerned for the welfare of the individual. Once in attendance a range of scientific measurements will be taken from the animal to identify the uncommon or deviant condition, with any necessary treatment administered so that suffering is minimised and normality swiftly resumed. These actions suggest that the practice of caring for an individual animal is interrelational in that it involves everyday farming practices that facilitate production, and the practices of veterinary science which have both defined and normalised animal health and disease. The care an animal requires to maintain good health does not then precede farming practices that facilitate production, but rather forms part of it, the two as Mol (2008) suggests, are necessarily intertwined. It is then the recognition of difference within everyday animal performances that highlights a deviation from scientifically constructed norms, and this prompts the need for individual attention to care.

It is through husbanding practices that the health and welfare of an individual animal is stabilised, with adjustments persistently made according to individual circumstances. Sometimes this requires the administration of medicines, or veterinary intervention, but more often than not the farmer will use his own skill and judgment to bring a sick or injured animal back to good health. Maintaining the health and welfare of livestock is therefore a practical task. The material routine practices that are utilised to achieve it however, are moral activities. As Chapter 2 has shown, moral activities can be the cause of much ambivalence, disagreement, insecurity, misunderstanding and conflict, in this case between farmers, vets, consumers, governments, environmentalists, and even the animals themselves, who may or may not respond, or be able to respond to the particular course of action that is deemed necessary or morally right.

There is then disagreement over what constitutes a health and welfare issue and what should be done in the interests of an animal, to care for it, treat or prevent injury suffering and disease. In some instances the individual suffering of an animal will be aligned with pathological judgments which mark the individual in negative ways. So if we think for a moment about Bovine Tuberculosis, a disease that has become so prevalent amongst cattle that a pathological test, the tuberculin skin test (although there are others), has been developed and adopted to identify individuals that show signs of the harmful microbes in their system. Where an individual animal reacts to the tuberculin skin test in a negative way it is considered to be deviant or abnormal and is subsequently dispatched (killed) to prevent individual suffering and the further spread of the disease into other individuals. The use of normative judgements therefore allows some individuals, i.e. those that demonstrate a deviance, to be differentiated from those that are considered normal in pathological terms. Such actions are controversial because the performance of this test requires that parameters are set to define normality. As all individuals demonstrate different tolerance levels however, are affected differently by disease, and adopt varying coping strategies, who is to say what the parameters that define normal should be? Perhaps thousands of individual farm animals are being dispatched unnecessarily, and many more are suffering as a result of testing for this disease.

I had some cows and calves in the race for a bTb test and one reversed back, well we were up pissing around doing ones checking them and all this and of course a cow had reversed back and sat on a bloody, the calf had he's neck back and got trapped in the back of the race see... I am convinced that this testing is added stress on the animals for one thing and I'm sure it puts em back a week or ten days, you probably know the figures more than me, but you know its probably at least a week, ten days you know, I know it does cos they don't do well at all after that."

(Mixed Lowland Livestock Farmer, March 2008)

The scientific knowledge base then profiles the characteristics of animals and diseases as a generic and normative achievement, but this ignores differences between the animals themselves as individuals and their ability to cope with infection and disease. It also ignores the differences in infections and disease, how it has developed and how it is performed in the individual animals encountered. Consider lameness in sheep for instance. Lameness can be one of the most serious and prolific causes of poor welfare amongst farm animals, most notably in dairy cattle and chickens, but also in sheep where it commonly goes unnoticed because of their low status and economic value. The underlying cause of lameness in sheep can be scald or strip, footrot, CODD, Shelley hoof, toe granuloma and abscess, each of which requires identification and the administration of a specific treatment. When a farmer observes an individual sheep hobbling or kneeling however, what he identifies is lameness, not the specific infection or condition that has caused it. The actual cause gets lost behind the generic lameness condition and more often than not a generalised treatment is adopted, such as *"hoof trimming and purple spray or an anti-bacterial foot bath"* which is commonly believed to be the normal solution. Whilst the individual animal is treated for the lameness condition however, this has not been put into its specific context, which is the actual condition from which the individual is suffering. This ignores the specific welfare needs of the individual animal. Interestingly farmers seem to hold varying views on lame sheep, some even suggesting that it's a bit like a headache in that it is an easy excuse to make when you don't want to do something, although all those I have spoken to unanimously agree that it is a perpetual welfare problem.

“oh I frickin hate lame sheep but you cannot ever, I’d like to think one day you can go out and think you can go all round the farm and there isn’t a sheep that’s hopping somewhere, but its like the buggers do it for devilment, its like if you got somebody coming with ee to look at something, you think you was on bloody four legs yesterday, you was perfect, today you’m hopping and then you go out again tomorrow and he bloody wont be, and you think why. But it’s just annoying isn’t it.”
(Upland Livestock Farmer, May 2008)

Identifying the specific cause of lameness in an individual animal is only one aspect of dealing with the problem. Another concern for me at least, is the point at which the farmer decides that an individual needs treatment. Whilst a famer might notice a lame sheep during his daily inspection, the individual frequently goes unnoticed because the condition itself has become normalised in everyday farming practice.

I’m always looking at feet and there always seems to be something lame and we’re always trimming, but you never seem to get on top of it, we’re always and always trimming the damn things.
(Mixed Lowland Livestock Farmer, March 2008)



Figure 6.3: Lost amongst the flock, a lame sheep grazing
(Authors own image)

It is not uncommon then for individual animals with a lameness condition, such as the sheep pictured in Figure 6.3 above, to be left to suffer without any treatment, or to be treated generically without identification of the underlying cause. Indeed sheep farmers have frequently told me that they do not treat an individual animal when they notice it is lame because it not unusual, it is always expected *“you know if you have a group of a hundred sheep you’re always going to get one or two that are going to be lame”*. Instead they target lameness through the routine treatment of the flock, with a procedure and/or medication that has been statistically proven to control the problem in a certain percentage of the overall population. What this suggests however, is that at any one time it is acceptable to have a certain percentage of individual animals suffering from a lameness condition because they have not responded to the treatment administered. There is then little concern for the animal that continues to suffer whilst its individual needs are ignored. In a small flock this may involve only one or two animals, but in bigger commercial flocks it could involve the suffering of hundreds of individuals who become hidden behind statistical norms.

In recent years vets and farm advisory bodies have begun to encourage farmers to target the individual, to identify the exact cause of lameness and administer the appropriate treatment in the exact doses needed thereby reducing individual suffering. This however has come about not so much for the sake of the individual animal, although vets would argue that this is their ultimate aim, but to reduce production losses and a build up of resistance to some of the treatments used. Whilst this may lead to an increase in the visibility of the animal as an individual, my attendance at a recent EBLEX demonstration on lameness revealed that although most farmers don’t like to see an animal suffering, the majority of them still routinely treat the flock and ignore the individual because, as the attending vet explained *“this is what they know and what has been successful for them in the past”*. It is only when the health of the livestock herd or flock comes under threat that the veterinary will be called. *“I wouldn’t call the vet out for a sheep, I couldn’t afford to”* unless that is, *“if it’s a flock health issue then we have them out for that but if it’s an individual basis it’s just not economical to do so”*.

It is then the overall utility or benefits achieved by farmer’s actions in relation to the flock rather than the individual that remains a primary concern. And it will continue to be this

way until such time that the use of these routine treatments is no longer a viable option and the whole flock are affected by lameness or some other welfare issue with no means of control. It may then no longer be possible to produce sheep (or other livestock) on the farm. To ignore the individual, and individual differences not only then perpetuates welfare issues that cause animal suffering, but it also in this instance places the future sustainability of the entire British sheep industry in jeopardy. This has implications for the rural environments in which these animals are kept. Health issues such as bTb have similar connotations for sustainability of the cattle industry.

6.4. Care and Individual Performance

Monitoring the performance of farm animals is a management procedure that aims to ensure first and foremost, that the farming business remains economically viable, with records about the overall performance of the herd or flock compiled and used to inform general management strategies. Whilst these records relate to the performance and productivity of the overall herd or flock, they are necessarily comprised of data recorded for each individual animal. The farming systems I have encountered have each had their own way of recording and using this information, with some investing in electronic or computerised systems, and others scrawling notes about the medical and productive history of individual animals in a book. An example of the parameters that are monitored for the performance of cattle is presented in figure 6.6 below. This information is sometimes collected via a handheld electronic scanner that reads the electronic identity tag of each individual animal. Electronic Identification (EID) tagging is a legal requirement for the identification of cattle and sheep⁴ in the UK, and for the traceability of their movements both on and off farm, until they reach the table. Electronic tags also provide a modern and efficient method for data capture and transfer, enabling data relating to various parameters such as weight, health issues and medicines administered, to be entered into a computerised system. The use of EID tags for this purpose however, is limited by the cost of equipment

⁴ EID tagging of sheep was introduced on 31/12/2009, whilst all cattle born after 1/1/1998 in the UK must have a DEFRA approved ear tag fitted in each ear. The primary tag must bear the symbol of the crown (the BG logo) and the animal's unique lifetime identification number. The secondary tag contains a microchip to enable electronic identification.

for scanning and monitoring (Figure 6.4 below), as well as the computer and software applications that this requires (Figure 6.5 below).



**Figure 6.4: Handheld EID Scanner being used to read the tags of individual sheep. As they are run through a race their weight is being measured and automatically recorded. The information is then sent electronically to the mainframe computer, where records are held.
(Authors own image)**

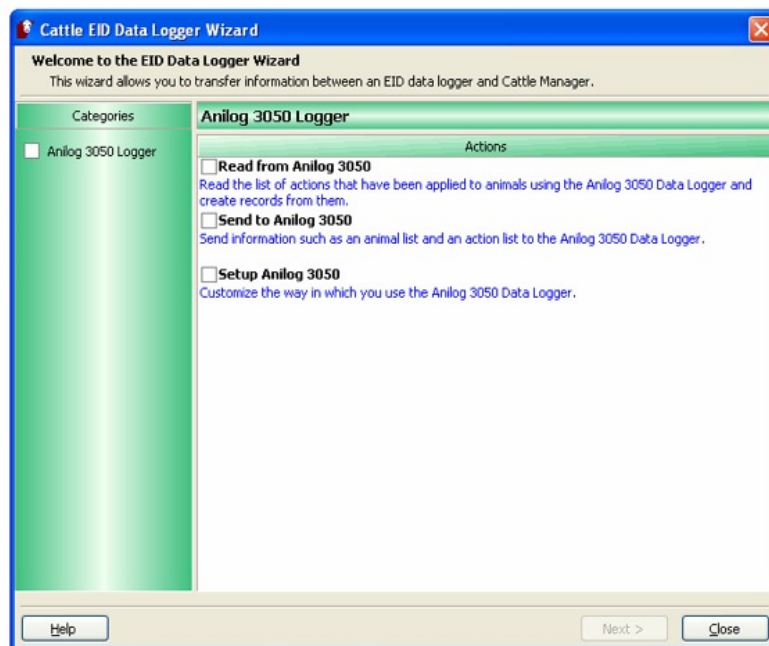


Figure 6.5: Software applications allow data transfer from EID Scanner to computer

Figure 6.6: Computerised Cattle Record Card

The information recorded will be compliant with agricultural policy and any Farm Assurance obligations that the farmer might have. Data relating to each individual however are matters of fact that are gathered about the animals. These facts often take the form of correlations between parameters that are measured in large numbers, and are specific to the farm. The different parameters however are often measured because it is easy to do so, or they are currently popular within the industry literature, not because they are relevant to the health and welfare of the individual animal in its day to day life. Selectively chosen, and dependant on the information that is required for the management of a particular system, these parameters define the working criteria for the farm.

Steve's indoor pig farm for example operates a complex computerised system which controls all aspects of an animal's life, from its movement through the system to the feed ration it should have in relation to its body weight at any stage of the production cycle. It is also used to record details of the health issues encountered by each individual animal, the medicines administered and the treatments failure or success. The record cards below in Figure 6.7 give an example of the data collated about each individual animal.

Registration of sows : Served

Animal	Date	Boar 1	Boar 2	Pregnant
Y550	310705	GP	1	✓
Y552	310705	JN	3	✓
Y594	310705	SH	3	
Y633	310705	JN	AMPM	✓

Registration of sows : Farrowed

Animal	Date	Live	Dead	Foster	Pen
Y485	310705	14		-2	2T
Y583	310705	11			2T
B823	010805	12	2		2T
Y579	010805	11	1		4M

SowCard

Animal	Entered	Pen	DOB	EarTag	Breed	In.	A-Code	Sire	Dam	Transp					
Y633	021003	10M													
Li	Serv.	Boar 1	Boar 2	Farr.	Li	De	So	Fo	Sat.	Wean.	No	Wt	Pen	Wa	Sv
1	021203	J	J	270304	5	1		4	220404	9	63.0			5	5
2	270404	J	J	190804	13			-2	160904	11	77.0			5	5
3	210904	H	H	140105	9				070205	9	63.0			5	5
4	120205	G	G	070605	11				040705	10	70.0			5	5
5	090705	J	J												22
5	310705	J	J	2311											
Pigs/Year	Litr/Sow	Non-pr/Li	Preg.day	Li/Lit	De/Lit	Wea/Lit	Kg/Pig	Far. Int							
22.9	2.41	10.5	115	9.5	0.2	9.8	7.0	145.7							
Culled	Code 1	Code 2	Price												

Figure 6.7: On-Farm Recording with AGROSOFT WINPIG Online [Available from] <http://www.agrosoftltd.com/winpigproduct.asp?id=58> (Accessed 11/11/2010)

The information that is collected subsequently informs the care an animal receives at various stages of its life, controlling its feeding and breeding times, and the genetic heritage of its offspring for example. It also enables the farmer to undertake complex costings to determine the productive efficiency of each individual and to compare their health and performance against industry wide standards.

We run the unit as three different units really. I do a costing scheme for the sows, the weaners and for the finished pigs so we know what feed is going to each group and then we know how many days they went in so then you got your growth rate, well a heap of it you got your performance for your whole herd you see what part of the herd you'm slipping down on and it gives you your performance compared with the MLC average in the top third, you got to aim for the top third all the time you see otherwise you'd be out of business. Then we do an individual sow which we run in house now, each sow is recorded and she gets an updated sheet every month and we get an updated sheet every month with her previous performance, you got her previous litters so then you can decide where her have had health problems whatever, so her weaning weights, everything's weighed when it's weaned, days average weaning, you can see if hers overlaid on a lot of her pigs and what her pigs have died of, you can see if hers overlaid a lot of her litter it may not be worth keeping her, it isn't worth chancing it. I'm afraid you got to look at it really, well you can't be sympathetic to em, it's business isn't it.
(Indoor Pig Farmer, March 2008)

Organisations such as BPEX (British Pig Executive) publish standard formats for the calculation of individual performance in relation to breeding for example, and to calculate the cost of productive performance in terms of the food an individual animal consumes. Examples of these forms can be seen below in Figures 6.8 and 6.9, and are available for farmers to access online.

Feed costs			Cost of production (£/pig)	
Dry sow diet (£/t)	175		Feed	
Lactating sow diet (£/t)	220			
First stage weaner diet (£/t)	600			
Second stage weaner diet (£/t)	300			
Breeding herd				
Litters per sow year	2.26		Sow	11.31
Litter size born alive	11.00		Weaner	15.77
Pre-weaning mortality (%)	13.30			
Weaning age (days)	26.00		Veterinary & Med	2.20
Rearing herd mortality (%)	2.50		Transport & Marketing	0.54
Pigs weaned per sow year	21.55		Electricity & Gas	1.10
Pigs sold per sow year	21.01		Water	0.37
Sow feed usage (t/sow year)	1.279		Straw & bedding	0.57
			Other variable costs	0.50
			Labour (including family)	4.50
			Building depreciation	4.22
			Building repairs & maintenance	0.10
			Equipment depreciation	0.48
			Equipment repairs & maintenance	0.05
			Other fixed costs	1.12
Sow feed usage adjuster	0%		TOTAL COSTS (£/pig)	42.82
			TOTAL COSTS (£/sow)	899.96
Rearing herd			Average weaner sale value (£/pig)	38.10
Weight at entry (kg)	7.2			
Weight of weaner sold (kg)	33.9			
First stage weaner diet (kg/pig)	6.0			
Rearing herd FCR	1.74			
Rearing herd FCR Adjuster	0%		Non-productive days	21
			Net margin (£/weaner sold)	-4.72

Figure 6.8: Example of Breeding Herd Calculator

Online [Available at] <http://www.bpex.org.uk/PracticalAdvice/producerkt/KfTeam/Feedherdcalc.aspx>
(Accessed 11/11/2010)

Grower diet (£/t)	215	Cost of production (£/pig)	
Finisher diet (£/t)	210	Weaner costs (£)	34.00
Weight at entry (kg)	30	Feeding Herd Only	
Transfer weight (kg)	60	Feed	
Slaughter weight (kg)	100	Grower	12.92
Grower feed (kg/pig)	60	Finisher	29.04
Finisher feed (kg/pig)	138	Overall	41.97
Total feed (kg/pig)	198	Veterinary & Med	0.76
FCR Growing stage	2.00	Transport & Marketing	3.30
FCR Finishing stage	3.46	Electricity & Gas	0.51
FCR Overall	2.83	Water	0.40
P2 (mm)	11.0	Straw & bedding	0.80
Carcass weight (kg)	76.0	Other variable costs	0.37
		Labour (including family)	3.80
		Building depreciation	4.22
		Building repairs & maintenance	0.10
		Equipment depreciation	0.48
		Equipment repairs & maintenance	0.05
		Other fixed costs	1.12
		TOTAL COSTS (£/pig)	91.88
		TOTAL COSTS (p/kg Dead Weight)	120.8
			8
		Average Sale value (£/pig)	102.6
			0
		Average Sale value (p/kg Carcass)	135.0
			0
		Net Margin	
		(p/kg Dead Weight)	14.12
		(£/pig)	10.73

FCR Adjuster	0 %	
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Enter figures in the yellow boxes Change FCR using the adjuster

Feed cost of last kg live weight gained (p/kg dead weight)	117.92
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Figure 6.9: Sow feed costing calculator.

Online [Available at] <http://www.bpex.org.uk/PracticalAdvice/producerkt/KfTeam/Feedherdcalc.aspx>
(Accessed 11/11/2010)

The data that is collected is used to establish norms about the productive efficiency of individual animals and is regularly monitored to identify those that fail to meet the production target set. On further assessment of individual data the cause of under performance can be established and a decision will then be made either to adjust the care an animal receives, or to remove it from the system. This points to an instrumental form of care in which the criteria used to determine the future care of an individual depends on what the farmer is trying to achieve, with some operating to very tight margins. Yet the monitoring and assessment of performance data is a time consuming process that takes place in an office away from the animals. It focuses on computerised data as opposed to the animal body in the flesh. It mediates human-animal relations, and in so doing ignores the immediate experiences and needs of the individual animal. Performance monitoring however, is a management tool that is increasingly being used to stabilise the farming system so that productivity is maintained.

In the pig production system above for instance, which is geared towards high turnover and productivity, individual animals that destabilise the system are identified through performance monitoring data, and removed from the system because of their age, for the production of small litters, or for having high numbers of still born or squashed piglets, as this is seen to interfere with the achievement of normal production targets. Specific information about animals and/or the practices of care that result from the collection of this data, often go unnoticed outside the immediate vicinity of the farm unless someone specifically looks for them. And even then, methods of research are not always available to examine important issues with any measure of success. The art, as Mol suggests however is to *“track down and attune to the specificities that are relevant”* (2008:86), that is the specificities that are relevant to the health and welfare of individual animals. This, as the quote below illustrates, is just what Dan uses his electronic tagging system and performance monitoring for.

Electronic tagging is the number one reason why the welfare of our animals has improved. Probably about once a month we run each one through the race individually. Then we weigh it and condition score it. That's the most important thing for its health, condition scoring, you have to put your hand on every ewe, you have to. By eye you can never get it right you know no matter how long you have been doing it, so we actually put our hand on. Unless you actually put your hand on it you cannot assess it properly. Six weeks prior to the rams going in we will go through every ewe and check their records, all their medical records, make sure they are not costing us too much, check their feet, check their udders, teeth everything like that. Then we will cull out anything we don't want or isn't performing well. We would usually cull about 10%, we are quite strict, anything that's not performing well that's costing us too much in drugs we'll cull it. That's one of the beauties of electronic tagging we do have all that information at our fingertips, every drug we give them is recorded electronically per head, you know costings per head everything like that so we can work out, we can sit down and decide exactly what we want to cull for what reason. We have been electronic tagging our sheep now for ten years...we didn't have to do it; it was a choice we made. And for the welfare of our animals it is our number one reason why it has improved.

(Lowland Livestock Farmer, February 2008)

For the animals on the farm described in the quote immediately above, the electronic tagging system introduced a whole new way of life whereby they were brought into the farmyard and run through the race on a regular monthly basis. In these situations animals were given the opportunity to participate in their own care, opportunities that Porcher and Despret (as discussed earlier in this chapter) suggest are needed to enable the animals to communicate in different ways. In this instance the electronic tagging and scanning equipment allowed the animals to represent themselves in ways that were perhaps not previously considered relevant or possible. The information collected about each individual was then used to establish its future management following an assessment of its condition and identification of its individual needs. The regularity of this procedure increased the level of human-animal contact in this particular system, which meant that each individual animal became accustomed to being handled, causing a lot less stress during essential husbandry procedures. Regular handling also enabled the farmer to

recognise and respond promptly to health and welfare issues that an individual may experience, increasing its chance of survival whilst reducing its suffering. Unlike the computerised intensive pig production unit encountered earlier in this chapter then, where animals experienced an instrumental form of care, the use of electronic tagging and monitoring in this particular system is not only used to collate data about individual performance, but it also provides the opportunity to increase human-animal contact and give individual animals an opportunity to speak in different ways. As the farmer assesses the condition of each animal through ‘hands on’ contact, he uses his experience as a stockman in conjunction with performance data to make more informed decisions about the care that individual requires to maintain its health and welfare and to ensure it has a good life.

6.5. Care and Observing the Individual

It starts to become clear then that performance related data which provides facts about farm animals and the parameters that are measured, have to do with the way farming systems are configured in one way rather than another, and with the organisational conditions that allow this to occur. As we have seen above the lived reality of pigs in indoor production systems is quite different to that of the sheep that are reared in outdoors systems. Different from this again is the lived reality of individual animals on small farms or organic farms for instance, where unlike the larger, more intensive commercial systems the performance monitoring of individuals seemed almost an irrelevance. In these smaller systems farmers were not concerned if an animal did not achieve a specified production target which the more commercial farmers assumed to be normal, if not essential to sustain the business. Rather they based their judgements on what they knew and observed.

“...if one of mine wasn’t calving I would allow it, and sometimes I’d let them miss two calving’s and like as not I’d get twins the third time, where as a lot of people wouldn’t, if they missed a calving they would be out.”

(Organic Upland Beef Farmer, April 2008)

When animals are forced to produce more than they are ‘naturally’ capable of, “*they are less able to cope and more prone to ill health*”. Accepting the ‘natural’ productive capacity of an animal therefore demonstrates the recognition of its individuality and shows an appreciation of what that animal does contribute to the system, rather than what it could achieve if pushed. Farmers that do not force their animals to produce higher and higher yields however, are no less aware or concerned with the costs of production. As the quote below clearly demonstrates, they are all too acutely aware, frequently subsidising the costs of the livestock enterprise with a secondary income derived from outside the farm so that the animals can be maintained to their own preferred health and welfare standards. This suggests that a much higher value is placed on individual animals and the quality of life they experience on the farm.

You see on this farm I would say without a shadow of a doubt, economic performance is the least, David is old school you know, I will do this for nothing, I will continue to do this until I drop dead, I don't care if we loose heaps of money. You know if the animals need Terramycin or whatever, he goes and he gets it without a thought as to how much it is costing or if we can afford to do it. So the economic performance does not come in to it at all, he just works a few extra hours to pay for what we need to keep the thing going. So that would come bottom, economic performance, and animal health would come top. (Mixed Lowland Farmer, April 2008)

There was also less of a tendency to cull individual animals for what some might consider to be under performance. Instead more effort was put into caring for the individual and when unwell, nursing them back to good health. This would suggest that it was not so much productive performance that was being monitored in these systems, but individual welfare. This was commonly achieved, not through the collation and analysis of performance related data, but by knowing the individual animal, observing and interacting with it on a day to day basis. As becomes clear from the following diary entry, knowing the animal as an individual has consequences for its care and welfare experience within the farming system.

“With only a small closed herd of around 40 cattle, all of the animals on David’s farm were given names and he knew them each individually. He interacted with them daily talking to them and asking them how they are, having a conversation with them as though they were human. The cows responded with head, eye and body movements and some gentle vocalisations. On one occasion I watched David softly patting the back of a young cow and encouraging her on as she limped along behind the rest of the herd on the way back to the yard, where they were due for tb testing. It was obvious the young cow had a problem with her back end; she was limping and walking up the lane much more slowly than the others. This made her stand out as being different from the rest of the herd, as a deviation to the norm. Inquiring about this individual I discovered that as a young heifer she had come badly off after the bull had tried to ride her. Being a heavy animal his weight had damaged her hip bone making it difficult for her to walk. Having consulted the vet David discovered that nothing could be done, yet whilst most farmers would have culled her, David took a special interest in her wellbeing, keeping her comfortable and allowing her to live out the rest of her life with her family and friends in the herd, knowing she would never be a productive animal, knowing that she would always cost him money.”

(Diary entry, July 2008)

6.6. Culling as Care

The practice of culling as we have seen above is commonplace on the livestock farm. Primarily a means to relieve animals of their suffering, it is also used as a management strategy to reduce stocking numbers through the selection and eradication of weak, superfluous or difficult animals, and to dispose of animals that have no purpose, such as bull calves on a dairy farm. Culling is therefore an emotive issue that is seen by some as an excuse for purposeless killing, whilst for others it is considered to be a form of care, in that it is seen to contribute to the overall health of the animal collective and reduce individual suffering. In what follows I consider some of the circumstances in which culling takes place to see how it influences animal care and the experiences of the individual.

On Steve's indoor pig unit health related issues were considered to be uncommon because pigs are "quick turnaround" with genetic improvement that is much faster than it is for cattle and sheep, and his stock were specifically selected for its unique disease resistant qualities. As the quote below demonstrates, he nonetheless culled some 10-15% of the 10,000 animals that went through his system each year because of poor health. The electronic data he collected for each individual animal provided details of what these health issues were, and flagged up specific problems so that they could be dealt with accordingly to prevent reoccurrence or disruption to the system.

Yeah you get a percentage, yeah you'll cull for health but it will mainly be um on performance figures most of the time you know, if a particular sow hasn't reared enough piglets or enough weight or um enough piglets born or you know different things like that there, if she's had a lot of still borns or... there's probably only 10, 10-15 % which is health issues that might be mastitis or lameness really. Most of it is age really. Age and performance. You gotta make sure you keep your herd young if you kin.
(Indoor Pig Producer, March 2008)

With a similar turnover of animals Mervin gave a culling rate of 45% per year on his indoor pig unit, but unlike Steve did not separate out health related culling, amalgamating the figure with old age and underperformance. What interests me about these figures, is that they conceal the killing of a lot of individual animals, not for the production of food which is commonly assumed to be their primary function. Or necessarily for health related issues, but because for whatever reason, they do not meet standard production targets which have been identified as normal. In some farming systems these animals will only become visible through the performance monitoring process, where they are identified as individuals that deviate from the norm. Once an individual is identified as deviant and its records have been assessed, it may receive treatment that is specific to its particular condition, or often as not it will be culled; removed from the system and killed.

Ian for example explained that he used the performance records of his flock to identify and treat a particular health issue and to monitor the progress that each animal made. If the condition failed to clear up after three successive attempts at treatment, the animal would

be culled to prevent any future losses, in what he called a “*three strikes and out*” approach. This target was then reduced to two strikes after twelve months and Ian now operates a “*one strike and out*” procedure with “*anything excessively daggy, with footrot, needing extra drenches or time, being weeded out to improve the overall health status of the flock*”. The idea behind this approach “*is to get the animals to look after themselves, so they have got to be healthy*”. This was achieved by adopting a low to zero tolerance of animals prone to particular health issues which were monitored through performance recording the animals for their ability to reproduce, in the case of breeding stock, or to grow and produce improved carcasses, in the case of fat stock. These practices point to a recognition that animals can and do contribute to their own health and wellbeing. As I have shown in Chapter 5, animals look after themselves through their own modes of ordering and organisation. They participate in a range of enterprising activities to sustain their animalian lives, such as feeding, relationship building, communicating and undertaking their biological behavioural activities. But these things can only be achieved if they have appropriate opportunities to do so.

By culling all animals deviating from the established norm and adopting a selective breeding programme to improve the genetics of the flock, the aim behind the “*three strikes and out*” approach was to ensure that each individual animal produced was “*fit for [their intended] purpose*” so that profits would be optimised through the performance of the stock. Secondary to this, and incidental to economic performance, the process of monitoring and culling out individual animals that underperformed, was considered in some systems, to improve animal welfare, particularly as we have seen above in Dan’s system, where monitoring procedures incorporated specificities that were relevant to this purpose.

On some of the more commercial and intensive enterprises I visited however, it was clear that individual animals were dispatched on a regular basis because they would cost too much money to keep, taking up the space and food rations of another productive unit, otherwise known as an individual animal.

Um because there is so many numbers, and they are all pretty well the same yeah, yeah I mean I go around once a week and shoot anything that's not very well or its lame or suffering or whatever else and I can go around and do that and walk away and not think any thing about it.

(Indoor Pig Farmer, March 2008)

Once individual living beings, the bodies of these dead animals cannot enter into the food chain and are regularly disposed of to maintain hygiene standards.

Well mainly actually what we have here, the grey wheelie bins are mine for here on the farm and I put the dead piglets in them... Then every Tuesday they are collected and go off to the incinerator. It's not very nice, but its part of the process. You know I think you have these people who have no idea how farms operate. They just see packs of meat in the shop and have no idea where it comes from or how it is produced.

(Pig Producer, March 2008)

Whilst all farmers accept culling as a necessary part of their work, it became evident through the interviews that their approach to the task and the way they experienced it was very different. On some farms, often the smaller less intensive systems it was taken very seriously and often only occurred if an animal was suffering from a serious illness or injury with very little chance of recovery, or was too old to continue its life without pain and discomfort. On these occasions farmers felt it was their duty to dispatch the individual to relieve it of its suffering and legally they are obliged to do so. But there was also a tendency to treat animals kindly and with respect as they did. There were also occasions however, when an individual animal would be culled because it could not be cared for as the farmer would wish. This sometimes occurred when a cow was due to calve outside of the normal calving period and the farmer had other commitments on the farm, leaving him unable to attend to her needs at this delicate time. Or it occurred, and this I have to say surprised me, because an individual animal was temperamental.

Temperamental animals were considered “*too much of a liability*”, not just in terms of handling and the performance of husbandry procedures, but for the distress and upset they

caused to themselves and other animals on the farm. For some, the effort David had put in to keep his cow safe during routine bTb testing is not practical, in that they do not have the time or the resources available to care for the animal in this way. Jim explained for example, that he culled temperamental animals because his wife would not go near them. This meant that during busy periods, when he was away, or doing other jobs on the farm, the animal did not get the care and attention that it needed. Last year he had culled four animals because of their temperament. *“It’s for their welfare....they [good tempered animals] are easier to work with. If an animal is poorly we can treat them easier. They are not going to get so stressed and we aren’t going to get so stressed... It’s better for everyone concerned.”*

David told me in anthropomorphic terms how he likes his cattle to be *“nice people. I don’t want an uptight bullock. In fact we have only ever kept nice cattle on this farm. Good tempered animals enjoy much longer happier lives and will breed over a longer period”* extending their productive life and their overall productive performance. Killing an animal then, because it’s individual requirements for care do not fit with the generic practices of the system, was considered to be a positive welfare outcome, in that it reduced the suffering of the individual concerned. The vets that I interviewed were in full agreement with this practice and actively encouraged it, arguing that the death of an animal can prevent or put an end to individual suffering.

The life of individual animals then takes on a different meaning in different farming contexts. In some systems, often the large intensive production units the life of an individual is commonly taken to maintain the productive efficiency of the livestock collective and is monitored through performance data. New technological methods of data collection also at the same time provide the opportunity to increase awareness of the individual, and to meet individual needs for care. In other systems, the smaller farms in particular, the life of an animal is more often considered in terms of the individual and how it experiences that system. That both of these systems often co-exist on many farms is a paradox of the industry and a reflection of its standards. It suggests that production targets and standards for the pig, beef and sheep sector are widely unequal and demand patterns of production and husbandry practices that involve different types of care for different individuals, in order to sustain the economic viability of the business.

That livestock are born to die is another such paradox. The death of an individual however need not be meaningless, nor the life it experiences poor. Indeed as the Rare Breeds Survival Trust frequently argues, the best thing that you can do to keep farm animals alive is to eat them. It is only by eating them that the future of their breed and their species will survive (Alderson, 1989). The death of any farm animal is a presence that is felt in the background of livestock production, with productivity being a pre-condition for each individual life. Between these two alternatives there are questions about how animals can live a good life, and how their daily lives within the production system can be improved to ensure that they have a life that is worth living. How then do we best shift arrangements that help farm animals that live well in farming systems, to other animals in other systems, other sites and situations?

6.7. Summary

The individual lives of farm animals then are concealed behind a range of different factors, from their role and function within the production system to the generic organisational practices through which that system is managed. As becomes clear in this chapter, the visibility of animals is partial and selective, with individuals commonly recognised for their productive capabilities, when they deviate from the productive characteristics with which they have been embodied or the normativity that has been established through various forms of routinised care. These practices of care impact on animal lives in uneven and unequal ways resulting in a different welfare experience for each individual. In some systems individuals are able to express their welfare experience freely, communicating affectively through their behaviour and interactions with the humans charged with their care. In other systems however, such behaviour is restricted by the environment in which the animals are kept and by the technological equipment that mediates human-animal relations and provides a mechanised or instrumental form of care. Technological devices however make life easier for the farmer, reducing the workload and saving on labour costs. They also facilitate the selective collection of facts about animals relating to individual health and performance. These facts are used to make objective judgements about animal lives and the quality of life an individual experiences. Investment in such equipment however, can make it difficult to pass judgements about its effect on individual animals,

particularly where there is evidence of improved productive efficiency. Selectively chosen and combined with human animal interactions however, health and performance data has the potential to enrich understandings of individual animal needs and generate improvements in their day to day lives and welfare experiences.

6.8. End Points

I hope it has also become clear in this chapter that whilst farm animals are not free, they do not depend entirely on the farmer for their health and wellbeing. They also depend on their animalian traits and individual characteristics which can also make them visible within the production process, generating different forms of care. And crucially they depend on their relations with other animals, who also rely on them as individual beings within the herd or flock. Individual animals then are not passive in their care; they eat, grow and reproduce within the livestock system. They are active agents in their own care and production. One moment the individual takes care of itself and the next it is taken care of by the farmer and perhaps the vet, depending on circumstances and the productive, performative, economic or animalian value it has acquired. Care tasks then are shared in various ways. They also change. Thus when something is done for an individual animal that is sick or injured or suffering the ill effects of a disease, it may not always work. The question then is not who is to blame, but what can be tried next. These are practical choices, and the practical tasks that emerge as a result can make all the difference to the welfare experience of an individual animal and the quality of life it enjoys. Constantly trying to figure out what to do next on a day to day basis however is not practical, so experimenting with practices, farmers in conjunction with veterinary and agricultural scientists establish acceptable routines. In a dynamic farming system however, these daily routines require constant adjustment. And this I would argue requires an awareness of animals as individual subjective beings.

A 'good life' for farm animals demands that the organisational processes which facilitate production generate routine caring practices that are generic to the species and particular animal breed, to its age, sex and function within that production system. It also demands the recognition of, and response to, an animal's ongoing individual needs. The two are

necessarily intertwined. However as Mol (2008: 79) suggests, " *different logics push and pull in different directions*", with the needs of the farming system to maintain production pulling against the need to maintain the welfare of individual animal lives. Within this dynamic, individual animals often become an inconvenience when they do not conform, or are unable to conform to normative production practices and the normative treatments that have been designed to form part of their ongoing care. This is not a result of their own individual, animalian disposition, but because a farmer or vet, or indeed anyone else involved in caring for livestock, has been unable to provide the conditions necessary for this to occur.

Chapter 7

Bringing it all Together: Towards a Cosmopolitics of the Livestock Farm

7.1. Introduction

This thesis began by suggesting that farm animals occupy a liminal space, straddled between the Natural and the Social world as neither wild nor domestic creatures. That they are situated in ethically confusing terrain, bound up in relations with the human and Natural as aesthetically pleasing landscape features, environmental tools and sentient commodities that are confined and killed for food, whilst also at the same time being animals in their own right that have their own lives and their own sensibilities. Within the chapters of this thesis I have tried to make sense of these sets of relations and our ethical encounters with farm animals. Taking animal welfare, environmental and social sustainability as my point of focus, I have looked for ways to reconceptualise the ecologies of human-animal relations within the context of the livestock farm.

Through entanglements in Chapter 1 with the geographical and social sciences, and ethical engagements concerning the place of animals within society, the thesis has shown that whilst farm animals have been largely invisible in these debates, and the lives of individual farm animals ignored, new methodological tools have been developed that have opened up the possibility to see farm animals in relation to humans and the environments they inhabit. Combined with the new agendas in animal welfare and ecological sustainability discussed in Chapter 2, which recognise animals in the broader farm ecology and have found new ways to account for their individual subjectivity, a framework was developed through which to conduct a relational study of the livestock farm; a framework that has enabled this thesis to reveal a more than human world, where farm animals are in relation to humans and the environments they inhabit, and like humans are recognised for their individual subjectivity and the work that they contribute to the sustainability of the farm.

7.2 Key Findings

The empirical investigations that have emerged from theoretical and methodological frameworks developed in this thesis have re-qualified an understanding of ‘sustainability’ within the context of livestock farming as a multi-species and biomaterial assemblage of ecologies: ecologies that encompass the multiple ‘Natures’ and practices of the livestock farm and their different ways of relating. Within these ecologies new sets of actors have become visible as the differences that farm animals can and do make to socio-bio-political arrangements have emerged in the narratives and detailed descriptions of livestock farming practice. Importantly the investigations documented here have shown that farm animals are not just resources for human use, but are intrinsically bound up in these multi-species ecologies which are of symbolic and symbiotic importance. Farm animals can not then be ‘added on’ to the ecologies of the livestock farm as a supplement to human life, rather they are part of the assemblages that Whatmore and Braun (2010) refer to as ‘originary’. This as Mackenzie (2002) explains, suggests that they are “*irreversibly and inextricably pre-supposed in the constitution of what is said to be added on*” (cited Whatmore and Braun, 2010: xvii-xviii). They are integral to both Natural and Social worlds. It is within these assemblages that humans and their technologies, non-humans and physical matter each add their own dynamics to the differential relations that constitute life on the livestock farm. These bio-socio-ecological assemblages can be seen then as contingent outcomes; their formation is immanent, not pre-ordained. They are always in process and under constant negotiation. They are political communities that inhabit common worlds.

Contrary to dominant conceptions of farm animals as dumb mechanistic objects or units of production, the documentation of things as they emerge in farming practice has revealed how livestock farming is not just the achievement of humans. Rather as multi-species ecologies are ordered into different assemblages to facilitate production, farm animals themselves participate, not only in bio-material ecologies, but also in their own care and their own production. The level of participation and the contributions animals are able to make however, is uneven and unequal, with technology mediating care as systems become more intensified. It is in these more intensified farming systems that modes of organisational practice based on generic characterisations, normalise animals, disease, care and productivity, restricting their ability to perform certain behaviours, communicate with

other animals and their human caretakers, leaving them unable to fully participate in their own health and wellbeing. On extensive and organic farming systems alternatively, a more individualised, empathic and interpretive way of caring emerged - one that recognises the need for, and benefits of animal behaviours and individual expression to promote animal health, productivity and the overall quality of life.

Further to this, and from my observations in the field, farm animals became visible as individual beings that feel, think and organise their lives in pursuit of their own enterprise. This visibility was formed through their own, animalian modes of ordering which were seen to interrupt, interfere with and reconfigure modes of ordering used to organise the production system, and occurred despite the limitations placed upon animals within the confines of the livestock farm. As farm animals were shown to both create and define their own lives within the lives we create for them – interacting with each other, defending their integrity, not responding to our wants – it becomes clear that they not only affect *us* differently, but they actively question our practices.

Generating different assemblages at different spatial scales within the farming system, the everyday practices involved in livestock production that have emerged in this thesis reveal different ways in which the subjective experiences of individual animals and their overall Quality of Life (QoL) is commonly affected. Whilst the indepth descriptions of these practices are in no way meant to be judgmental, they nonetheless demonstrate that livestock production is clearly embedded in a utilitarian ethic that involves practices that pertain to the greater good of the herd or flock, rather than for the good of the individual animal and its ability to have a life that is worth living. Yet it is through the individual that the multiplicity of the herd or flock becomes possible, with each individual being a source of value for another. Before the individual animal becomes the eventual representation of the herd or flock however, it is disposed both in and to it. Indeed Nancy (2000: 96) suggests that

‘Being’ [individual] or ‘to be’ [individual] neither gathers itself as a resultant commune of beings, nor shares itself out as their common substance.....Beings touch; they are in con-tact with one another; they arrange themselves and distinguish themselves in this way. Any being that one might like to imagine as

not distinguished, not dis-posed, would really be indeterminate and unavailable: an absolute vacancy of Being.”

Being part of the herd or flock, and living in it, exposes the disposition of the individual animal - it exposes the simultaneity in which the individual participates, is exposed by and exposes itself to the multiplicity. The descriptions that have been documented here have then been essential in providing an insight into the livestock farm and the quality of life experienced by individual animals. They prompt us to question the extent to which the practices that take place there should be contested or maintained.

Taken together the empirical chapters in this thesis reveal a tension running through the heterogeneous assemblages of multi-species ecologies. That is a tension between the rationalised, conceptualised structures and regulated orderings of the farm, and the practices that are performed – the actual, affective, relational and embodied performances. This suggests that the livestock farm is not just heterogeneous and porous, rather it is multiple and confused. It emerges as a multi-species space and site of negotiation in which farm animals as constituted in practice, matter. This mattering is fundamental in that it reveals multiplicity within the singular, and it causes us to rethink the singularity of the livestock farm.

In the final chapter of this thesis I do not wish to rehearse that which has gone before. I have I hope shown by now that the practices involved in livestock farming, are deeply embedded in Social and Natural relations within the broader farm ecology, and that farm animals as part of this dynamic, inter-relational assemblage, deserve to be appreciated as subjective individuals, with practices of care improved on their own terms. The question that remains however is how do we do this? How can the hard and fast divisions that have been constructed between humans, farm animals and the environment be re-constructed as a more unified political science of the livestock farm? In my quest for a way forward I follow Hinchliffe et al (2005: 644) and insist that “*Instead of human free choice versus the dead weight of nature[] [I am] interested here in the pursuit of understanding where things matter through the fraught processes of engaging with human and non-human worlds*”.

To bring this thesis to conclusion I want then to consider how the politics of livestock farming might be recast to demonstrate the relatedness that exists between all participating elements, rather than the selective aspects that are made visible through highly selective orderings and a politics that is currently grounded in a stable and unchanging Nature. To do this I explore the possibility of cosmopolitics as a conceptual tool to rethink the singularity of the livestock farm that is constructed in current political arrangements, and account for the multiplicity of relations that have become visible in this research.

Cosmopolitics is about making things visible in their interactions and relations to justify their existence. It is about making things visible to enable them to be politicised.

Importantly, cosmopolitics does not allow one set of commitments to be sacrificed over another, nor does it allow non-human participation to be written out of political negotiations. Rather, cosmopolitics “*entertains the problematic togetherness of the many concrete, heterogeneous, enduring shapes of value that compose actuality....*” (Stengers, 2000:80). It therefore problematises the relation between what is fact and what is fiction.

Furthermore, it assumes that knowledge about human, non-human relations and practices is of a temporary and provisional status, based on a constantly shifting set of associations; heterogeneous associations in which all who are touched by an event, define and are defined by it, whether they are aligned with, or opposed to it. In so doing, cosmopolitics draws attention to the singularity of each and every situation - a singularity that refers not to individual things or components, but to the unique combination of those components within a specific context. As each component invents its own way of using the event to construct its own position, so the singularity of that event has multiple meanings, multiple interpretations and multiple effects.

This aim of this thesis has been to make farm animals visible through relations, to explore how that visibility is formed, and to recognise that visibility as an ongoing negotiation between all things that come together within the livestock farm, whether human, non-human or physical matter: between the ‘facts and fictions’ of the bio-politics of the livestock farm. In the cosmopolitics proposed by Stengers (2000), the politicisation of things in relation implies a capacity for consultation with those that have previously been invisible or weak; things that have been unable to participate in decisions that directly threaten their worlds. This cosmopolitical consultation is important and relevant to this

thesis, because it opens the possibility to make us slow down and think about “*the habits that make us believe that we know what we know and who we are, that we hold the meaning of what makes us exist*” (Stengers 2000: 1003). Thus as farm animals have become present in the heterogeneous associations of the livestock farm, and sustainability has been reformulated as multi-species sites of bio-socio-ecological assemblages and the relations that pertain between them, so cosmopolitics becomes the means through which to achieve these multi-species sites of negotiation.

In what follows I weave these heterogeneous associations and their relations together to explore how a cosmopolitical arrangement might move us towards a more inclusive policy discourse; a discourse in which the needs of farm animals are considered in relation to, as opposed to separate from, the goals of ecological sustainability as both the human and non-human might speak out and have an opportunity to be heard.

In this final and concluding section *Weaving a Cosmopolitics of the Livestock Farm*, I construct a series of experimental theoretical engagements with cosmopolitics, and cosmopolitical representations by weaving them together haphazardly with the complex arrangement of associations and representations that have emerged in this thesis, between humans, farm animals and the broader ecology of the livestock farm. In so doing I do not provide answers to the multitude of questions that emerge from this research, but open up possibilities for the evaluation of human/non-human relations for future consideration.

7.3. Weaving a Cosmopolitics of the Livestock Farm

I turn first then to the quote by Hinchliffe *et al* below as a reminder that the research set out to trouble existing accounts of livestock farming and explore the possibility that any conception of sustainability needs to be more than just human.

“...cosmopolitics, as well as refusing to recognise all the old settlements (Latour, 1997, page xii), involves a double injunction: to take risks (in other words to engage in ontological politics rather than in perfecting epistemological eyepieces) and to allow others, of all shapes, sizes and

trajectories, to object to the stories we tell about them, to interfere in our processes as much as we interfere in theirs. Only by doing this can we hope to learn how things matter to humans and non-humans” (Hinchliffe et al, 2005: 655-656)

In attempts to trouble these accounts it has become apparent in this thesis that relations between things in contemporary livestock farming practice do not conform to the singular unified whole through which politics currently operates; rather the relations between things resemble a cosmopolitical arrangement in which multiple realities, both human and non-human negotiate their existence on a continual basis. The course of these negotiations however is currently disrupted by existing political orderings that make visible and give consideration to selective realities which place humans at the centre of ethical and policy discourses through which livestock farming emerges as a singular and unified whole. The challenge as I see it then is therefore to extend the cosmopolitical arrangement that is evident in livestock farming practice into wider policy discourse to provoke a more inclusive proposal for a sustainable rural future. In thinking about such a proposal I explore the cosmopolitics of Isabel Stengers, considering how this is currently played out in livestock farming practice and how it might contribute to existing political orderings in which a whole host of entities, both human and non-human are necessarily implicated.

Cosmopolitics

Cosmopolitics as inaugurated by Stengers (2000) involves the (self/co)-organised arrangement of humans and non-humans that constitute existing environments. Whilst modern political arrangements have constructed Nature as a separate entity to Society, as a backdrop against which political activity is defined and directed, cosmopolitics is an attempt to rebuild the linkages between politics, scientific practices, human and non-human entities, and physical matter, which exist in the common and shared environments they inhabit. Thus far from the singular realm of Nature upon which human cultures build themselves, cosmopolitics seeks to account for the practices that produce and maintain an environment of assemblages, an environment in this instance that takes the form of the livestock farm.

Historically attempts have been made to create a universal political community in which the shared experience of reason has meant that all people could participate as citizens within a global community. This however has ignored the realities of competing interests within that community, especially where those realities have been of the non-human kind, as non-humans, unable to speak of and for themselves have been reliant on scientific representation. Drawing on the philosophical work of Alfred North Whitehead and Bruno Latour, and physicist Ilya Prigogine, Isabelle Stengers has mobilised the concept of cosmopolitics in an attempt to overcome this bifurcation, using it as a tool to navigate human and non-human relations that are engaged in a common world, and to construct a political community that is actively created through the organisation of relations among all of the entities that exist within those communities. A common shared world, according to Stengers, is created through cosmopolitical practices that take the creation of environments as a political process which does not follow a predetermined path. This she argues creates a common world that does not already exist, but which has the potential to exist through cosmopolitical practices. A cosmopolitics therefore recognises the need to create a common world that may be possible through political practices. It is then a politics of environments or communities, in which all entities “*demand to participate in the common world, the **cosmos**, the name the Greeks gave, as Plato put it, to the well-formed collective*” (Latour, 2004:183). It is about the constitution of these environments, and their modification and maintenance through relational processes.

This is not something new, human societies have for centuries had their own cosmopolitical arrangements which govern their engagements with the non-human world. These arrangements have involved practices that assume and maintain a particular set of relations between things which reinforced ways of engaging with the surrounding environment. Throughout history then we have seen changes in our modes of production which have altered the way we engage with the environment and the non-human world. Hunter-gatherer societies for example had a particular cosmopolitical settlement that allowed them to navigate human/non-human relations within their communities, involving established practices for hunting and gathering, along with rituals and traditions that shaped the environments in which they have lived. Agricultural and other societies have had different cosmopolitical arrangements that have governed their relations with the non-human world, relations which have evolved through modification to allow industrial agricultural practices

with agro-chemical solutions. Our understandings of how the world works and how to make use of things has changed over time, and has influenced our engagements with it; engagements which have become habitually ingrained in everyday practices without further thought or consideration for the implications they might have. It is within these very engagements then that the '*epistemological eyepiece*' to which Hinchliffe et al (2005:655) refer above, has become blind to existing entanglements between the human and non-human, along with the new cosmopolitical arrangements that materialise as properties between them are exchanged. Such blindness has prompted Latour to argue that in the shared and common world of human and non-human entities and practices, we must create "*better articulated associations*" (2004:86) if we are to hold our world together.

Livestock Farming: A Complex Site of Associations

In pursuing the creation of better articulated associations, this human and non-human ethnography of the farm, has shown that the livestock farm is a complex site of associations, made up of a mosaic of habitats used by humans, domestic animals and a variety of wild plant and animal species, all of which reside or pass through a patchwork of different spaces. It is a part of the rural landscape that political leaders have designated as important for its functional role in the production of quality local food, for its biodiversity and aesthetic qualities and the contribution this makes to the local and national economy, creating jobs whilst also maintaining a particular way of English life. The people engaged in livestock farming then are charged with a multifaceted responsibility involving the care of the environment, not just for its contribution to the production of food but for the contribution it makes to a landscape that is increasingly drawn into an industry of leisure, a landscape that is also shared with non-human beings, some of which under current political arrangements we have a duty to protect. Alongside this, livestock farmers have legal obligations relating to the production and care of farm animals that are raised for human consumption, and must use methods that meet specifically defined needs for welfare in terms of environmental conditions, along with species, gender and age specific requirements for food, comfort, company, husbandry procedures and veterinary care. At the same time there is also a need to conform to consumer demands and be compliant with food safety standards aimed at protecting human health, and preventing the transfer of zoonotic disease. The livestock farm is also a business that needs to provide an income for

production to be sustained and to support farming families and the rural way of life they uphold; a way of life on which the ‘natural’ environment, wild plant and animal species, farm animals and humans depend.

As farmers strive to uphold these responsibilities they are inevitably faced with a host of competing interests which they must try to accommodate for their enterprise to remain viable. These efforts however, have been hampered by the level of priority assigned to different interests, which under current political arrangements have also changed over time as concerns for food security, animal welfare, and ecological sustainability have entered into the political arena as a result of new scientific knowledge and heightened public concern. Additionally as the preceding chapters have shown, many aspects of livestock farming have remained outside of political discussion, hidden behind a plurality of social and political practices that reproduce the livestock farm as an ontologically singular and stable assemblage where food is produced and wealth is accumulated to sustain human lifestyles. This view of livestock farming has assumed that the ‘natural’ world is a resource for human use and there has been a political reliance on scientific expertise to provide the ‘truth’ about what can be achieved and how this should be done, what matters and why. Underpinned in recent decades by a productionist ethic in which economic gain has been hailed as a positive achievement, this singular vision of livestock farming has had little regard for Nature and non-human lives.

Hitherto Cosmopolitics

How then do we go about knowing a shared, common world and its internal workings when there is a lack of understanding about non-human practices? For Stengers, like Latour, this has involved a re-envisioning of natural science. Seeking to move away from the idea that science is the producer of single truths about the Nature of this world, Stengers has argued that the statement “*this is scientific*” “*depends on a politics constitutive of the sciences, because what is at stake are the tests that qualify one statement among other statements – a claimant and its rivals*” (2000:80). She goes on then to argue that within scientific practice it is the non-human apparatus that is employed in experimentation that allows “*its author to withdraw, to testify in his place... [that] makes the phenomenon ‘speak’ in order to silence the ‘rivals’*” (*ibid*). There are then, she suggests, many possible explanations about a

particular phenomenon, some of which are stronger than others. By employing non-human apparatus however, one scientific statement can be made to speak louder and with greater authority about this phenomenon than alternative accounts, whilst also at the same time welcoming challenges to that particular interpretation. Scientific practice can therefore be seen not so much a producer of truths, but as a demonstration of strength in which accounts of phenomena are challenged so that others may be proven in an experimental setting.

If the same rhetoric is applied to the politics and practice of human-nonhuman relations in livestock farming, it would mean that one account of the world would not be privileged over another as the authoritative means to (re-)produce or change the relations between them. In this cosmopolitical arrangement both the human and non-human would retain authority to speak and act for themselves in the world they share in common as they engage each other politically, in ways that can be peaceful as they work in harmony with each other such that we do not notice them, or in disruptive and aggressive ways that can cause unwanted or unanticipated destruction. Whatever these arrangements may be, they involve a negotiation between human and non-human entities, and the co-operation with, as opposed to the privileging of, science in political practice. Where and how this form of politics takes place, which properties should be included and how it is organised is a matter for what Stengers (2000) has described as the cosmopolitical parliament.

Unlike existing parliaments which do not take into consideration all of the active participants in determining an environment - for example failing to account for livestock and their interrelations in the broader farm ecology that were shown in Chapter 4 - and ignores or overlooks actors that currently have no standing - accounting only, as chapters 4, 5 and 6 have shown, for selective things, groups or individual animals - the cosmopolitical parliament as articulated by Stengers always remains open to new participants and "*Every new representative is added to the others, complicating the problem that brings them together*" (Stengers, 2000:154). Already in existence, if only provisionally, the cosmopolitical parliament simply ratifies and acknowledges existing human, non-human assemblages, and actively allows them to participate in political life as assemblages that are composed of different practices from different times and different places. In this cosmopolitical parliament all of the relations that exist on the livestock farm are already included. It is the role of the parliament to create these relations among entities as political.

As Stengers points out however, “*it is not a question of establishing links, but of inventing-thematising them as political*” (2000:154).

The links that she talks about here are the connected relations among practices that form network assemblages such as those that are found in the livestock farm; networks that are formed between humans, farm animals and the ‘natural’ environment and all that is contained in the broader ecology of the farm. Within these networks the different goals and objectives of participants, such as economic production, farm animal welfare, ecological sustainability, biological functioning and the pursuit of existence through the agency of non-humans, often come into conflict, leading to the weakening of some relations and the strengthening or annihilation of others in an ongoing negotiation for the validation and continuation of one practice over another. Creating the links between practices as political Stengers argues, is the only way that a cosmopolitical parliament can be brought together to consider the questions of conflict without continuing the biased subjective politics that is currently operationalised. It is only by inventing-thematising relations and practices as the result of political processes that the possibility of negotiations among fluid environments is created.

Such a parliament is always in process, “*a vector of becoming or an ‘experience of thought’, a tool of diagnosis, creation, and resistance*” (Stengers, 2000: 155). Emerging only out of the relations between the actors participating in a particular assemblage, the cosmopolitical parliament provokes problems and makes challenges as a solution prevails, forcing actors to decide if they should participate in a particular network of practices, and to decide which, if any of these practices should be weakened, strengthened or discarded.

Complexity in Practice

As Chapter 4 has shown, a similar kind of negotiation process is evident in the practice of livestock farming, where relations between humans, farm animals, the environment, wild and domestic species and a whole host of other things involved in farming practice are constantly negotiated to achieve productivity. It became clear in this chapter for instance, that the management of the farming system involves the planning of crop and animal rotations, husbandry procedures, breeding schedules, waste management strategies, feeding

regimes, land and soil management. And that parallel to this there are other processes at work, such as climatic conditions, biological cycles and the prevalence of disease, which impacting on all of the practices detailed above, cannot be pre-determined. We saw then how the relations between things within the ecology of the farm had to be continually monitored and negotiated in day to day operations. That poor weather conditions caused delays in the harvest, and provided low yields of poor quality feed for the overwintering of livestock. That stock animals had to be brought in off the fields early to prevent the poaching of land, the loss of biodiversity and the possibility of soil erosion and run off into adjoining rivers and streams. It became clear that such conditions were detrimental to livestock, with parasites thriving in areas of wet and sodden ground, whilst young and newborn animals struggled against the stresses of inclement weather. It became clear also that for farmers, there is always a need to be one step ahead of the game; to be aware of what can happen within the ecology of the farm and be able to think about all conditions of possibility and be prepared to deal appropriately with all eventualities, whatever this may involve. For them it is a 24 hour job, 7 days a week. Farm animals can require attention at any time of the day or night, whilst the combine must be ready to go as soon as the crop is ready and weather conditions are right. These situations are negotiated with whatever else needs to be done or is happening at the time in ever changing conditions and environments. There is no escaping the challenges of negotiation involved in the practice of livestock farming; these challenges do not stop, they are always in process, and being affected by something over which the farmer and/or the animals have no control.

Chapter 4 has also shown that whilst the farmer is planning a management strategy and negotiating changing conditions, negotiations between other non-human entities and biotic matter are also taking place; between different microbes in the soil for instance, between the soil and its nutrients, between the nutrients in the soil and the plants that utilise them, and between the plants and nutrients and the animals that consume and make use of them in pursuit of their existence, as well as between the animals themselves, both wild and domestic. As Lorimer (2009) suggests, hybridity, and I would also add multiplicity is not only human. These negotiations between the non-human, biotic and abiotic elements of the farm all impact upon the practice of livestock farming. The farmer by no means acts alone. There is work being done by farm animals as they furnish the land with their dung for instance, whilst ecological processes work at breaking down the dung and replenishing

nutrients in the soil. The actions that are taken in the process of negotiation between all existing entities however are necessarily experimental, in that there is no certainty of what the outcome of any of these actions will be. Each action will influence the eventual outcome of relations and negotiation, and impact on relations between other things within the system. The relations that take place therefore involve an ongoing process in which different realities provoke different reality effects that provoke constant negotiation.

The negotiations that take place within the livestock farm then are necessarily temporary, changing from one minute to the next in response to climatic conditions for example as we have already seen above, and coming to an end when an animal is slaughtered. They are nonetheless important as new negotiations are continually operationalised when a different weather front materialises or when another animal moves in as a replacement to the last, provoking a different arrangement of relations between things. Within this new arrangement the remaining, pre-existing entities do not forget what has already passed; rather they find different ways to negotiate with the new entities that are drawn in, building on past experiences as they strive to strengthen their current position. A farmer for example draws on the knowledge and personal experience acquired over a lifetime of farming to deal with each situation encountered, from choosing healthy animals that are suited to the farming system, to providing what those animals need to maintain good health and welfare, to recognising and responding appropriately when this does not occur. Similarly as Chapter 5 has shown, when a farm animal is on the receiving end of an electrical shock from a live boundary fence it will find new and innovative ways to reach over or under it to escape its confinement, and it will get in front of the weather to negotiate poor climatic conditions. All of these situations involve engagements with other entities with whom negotiations are experimental. As things come together in different situations, new negotiations are provoked as each entity claims its relevance to the particular situation and strives to maintain its existence within the context in which it finds itself; a context that resonates with a cosmopolitical parliament.

Cosmopolitical Representation

A cosmopolitical parliament is necessarily specific to a particular problem and it generates discussion and negotiation amongst participants so that the problem is temporarily resolved

without laying down an authoritative constitution for the future. The efficacy of the parliament is to

“catalyse a regime of thought and feeling that bestows the power on that around which there is a gathering to become a cause for thinking.....It compels everyone to produce, to ‘artifactualise’ themselves in a mode that gives the issue around which they are all gathered the power to activate thinking, a thinking that belongs to no one, in which no one is right” (Stengers, 2009:1002)

As a new problem arises a new parliament will be formed that is specific to that problem and its particular constituents as the cosmopolitical arrangement achieved for one problem cannot resolve another because the relations involved will always be different. When constituents enter into a parliament, they contribute to a new resolution as *“new interests [are] provoked in their coming together”* (Stengers, 2000:154) enabling the possibility of engagement, negotiation, compromise and co-existence. To enter into a parliament constituents must prove their interest in others and in making them interested by demonstrating their differences, however small they might be, making claims about themselves to show how they matter in that particular problem and how they are relevant to what is being discussed. Relations between farm animals illustrate this point well. As Chapter 5 has shown, each individual negotiates relations with other herd or flock members as they are ordered and re-ordered into relatively stable and functional groups to facilitate production. In the cosmopolitical parliament each constituent must also be able to show that their participation would change the situation, making it different from the way it is currently understood to be, and what it would be like if they were not included. Similarly farm animals establish their place in the hierarchical ordering of the group through their actions and interactions with others. Think of the bull and his entourage; what did those particular cows do/show to earn or establish themselves in that particular role? In the parliament each participant must speak out for itself with no guarantee of being heard or of being accepted, and it is up to each individual participant to demonstrate their significance, or to enrol a representative that is able to do this for them. Within the hierarchical ordering of the livestock herd or flock, animals can speak and act on their own behalf. Within the wider context of the livestock farm however, they are currently reliant on other forms of

representation that, as Chapter 6 has shown, do not always acknowledge their individual needs for care.

In current political arrangements it is scientists that have had the means to represent selected entities through experimental events. But the linking of experiments to particular arguments has produced quasi-objects which have their own particular effect. It was shown in Chapter 5 for example, that the needs of farm animals were often obscured or deleted behind other practices aimed at maximising production and economic efficiency. Whilst such claims do not go unchallenged in the cosmopolitical parliament, it does not allow for agreement that is derived from scientific truth or from Universalist discourses which go beyond the sphere of the problem and end negotiations and debate prematurely by excluding others that are specifically relevant to it. The construction of a new common world through a cosmopolitical parliament necessarily requires that political linkages are created which account for diverse forms of knowledge and understanding about relations between the humans and non-human entities that constitute existing environments. Rather than asserting a particular and partial version of reality that best suits their purpose – versions of reality which currently disrupt and destabilise farming practice - the cosmopolitical parliament makes links and modifications to an environment and the entities that are already in existence.

Farming Practice: Selective Representation and Competing Interests

Parallel to the plurality of competing interests that exist within the livestock farm and their selective visibility, there is a narrowly singular vision of ecological sustainability that has come to dominate ethical and political practices relating to livestock farming in recent years as concerns for the environment have gained political capital. Within this there has been a tendency to deny the existence of relations between the human and non-human that takes place in an environment in everyday life, and it prematurely ends the political debate about ecological sustainability by excluding selected entities that already exist in that environment, from the discussion.

As becomes clear in this thesis, it is impossible to separate the ‘natural’ farm environment from the human and non-human entities of which it is comprised, just as it is impossible to

separate farm animals from Nature and dismiss them as unworthy of consideration in terms of their ecological importance because they have been brought into human societies for the convenience of a regular and reliable source of food. Farm animals are still animals, beings in their own right; they are like humans and other non-human entities and physical matter that make up a farm environment, part of a shared and common world. Within this shared environment farm animals negotiate, as the empirical chapters have shown, not only with members of the same herd, or group, but with other species of farm and domestic animals, wildlife and humans with whom they come into contact during the course of their lives. This negotiation process however is dependant on communication between human and non-human entities and between different species and breeds, and can be difficult to achieve because they do not share the same form of language. For a parliament to function there must be modes of expression. For farm animals these are embodied within the organisational ordering and technologies of the farm.

Animals like humans who are unable to use language however, express themselves and communicate through various forms of behaviour. As Chapters 5 and 6 have shown, when cattle are unwell or unable to cope in their environment they will stay away from the main herd, keeping close to the hedge, ears drooping and head bowed low, and they will bunch up together when startled or frightened, or express their displeasure vociferously when separated from their loved ones, or there is not enough grass to eat. It was shown also in these chapters however, that in some farming systems this expression of animal behaviour is not always permitted because human-animal interactions are mediated by technologies or because environments were inhibitive.

I take issue then with Callicott's (1989: 30) accusation, following Leopold (1972) and Muir, that farm animals are unthinking, like tables and chairs, "*as much a ruinous blot on the landscape as a fleet of four-wheel-drive off-road vehicles*", as this suggests that they have no ability to communicate or have a life outside of the human realm. Like many scientific descriptions, this representation constructs farm animals in binary opposition to their wild and autonomous counterparts. And it creates a universal truth that ignores a wealth of other questions unrelated to the specific interests of science. To suggest that the animal does not communicate is to do it a disservice when in the negotiation process its only modes of communication (physical appearance and behaviour), is overshadowed by a

machine, which within current political arrangements provides a more powerful representation of efficient productivity and care. In such environments the animal is unable to compete with this technology in its negotiations for existence, and this can lead to unnecessary suffering and poor welfare quality. What we see in these situations is the scientific context of farm animal welfare being pushed out of the economic context of livestock farming into invisibility, leaving farm animals to endure environments that are not suited to their welfare needs.

Expressive forms of communication also require appropriate interpretation. Within the context of the livestock farm, the research has shown, that the person best qualified to do this is the farmer or stock person charged with their care; the person that is spending time with them and handling them on a day to day basis. But this also requires that they have knowledge and experience of the animals in their care. Being human, farmers can only interpret what an animal is trying to communicate through its behaviour, but, and this is where welfare science is invaluable, with an understanding of the biological, physiological, behavioural and physiological needs of the species, breed and categorical group that have also been identified through various scientific practices, including veterinary science and medicine, they can do so responsibly. The research has shown that in terms of health and welfare, many farmers think it is important that animals have the ability to communicate within the environment in which they are kept, and that given the opportunity to participate in negotiations in which they are implicated they can communicate their needs and contribute to their own care. Chapter 6 for example has shown that with the ability to express themselves differently, and through different technologies, such as scanning equipment, farm animals can engage the farmer in different ways. Combining this new information with a repertoire of scientific and tacit knowledge, and personal experience, helps the farmer to recognise and respond to this communication to establish what is wrong and the course of action needed. Making these links and modifications to that which is already in existence enables farm animals to participate and negotiate their existence. In so doing it resembles the work of the cosmopolitical parliament.

Cosmopolitics: Representing the Non-Human

Unlike Latour's 'Parliament of Things' (2004), in which 'Natures' are present and represented by Science, and human societies are present along with all the objects they use as the foundation on which to build their moral stability, with representatives arguing from different corners about the same quasi-object that they have created, Stengers limits parliamentary participation to humans who act as "*representatives of a problem that engages and situates them*" (Stengers, 2000:155). It is these humans she suggests, that must invent the links that bring into existence networks of prolongations and introduce new interests that have been provoked by their coming together. As such humans are the problematic assemblages that come together to address a particular problem. They create extended networks of relations amongst practices that were previously contradictory, animating links in order to achieve a temporary settlement amongst the entities involved. It is humans for example that engage in the social practice of livestock farming, which as the research has shown involves organisational ordering practices across a range of spatial scales that creates assemblages of relations to facilitate production; dynamic assemblages of loose shifting affiliations that require constant negotiation to maintain relative stability.

Whilst Stengers cosmopolitical parliament relies on humans that do not recognise the longstanding divisions between Society and Nature, it does allow for the inclusion of other forms of knowledge and expertise outside of Science. So we have the experts or scientists, whose "*practice is not threatened by the issue under discussion*" and the diplomats who "*are there to provide a voice for those whose practice, whose mode of existence and whose identity are threatened by a decision*" (Stengers, 2009:1002). It is by widening the scope of knowledge beyond science Stengers argues, that enables many other different questions to be asked about contemporary problems which commonly have far wider affects than just the scientific community. As such any controversy within an environment is open to anyone that is affected by the consequences of a problem, and "*every proposition passes through those who are the most qualified to put it at risk*" (Stengers, 2000: 159). The most qualified being those best able to "*pose questions to which their interests make them sensible, to demand explanations, to posit conditions, to suggest modalities, in short, to participate in the invention*" (Stengers, 2000:160) of the common world they inhabit.

This requires that human diplomats “*listen to the vagueness of the epistemic thing*” (Rowe, undated) to learn what it is that matters to both the humans and non-humans that constitute an environment because they are necessarily accountable to those they represent. With the ability to envisage the difference between that which is acceptable to those represented and that which might harm or destroy what keeps them in place, diplomats provoke a consultation in which scientists and experts may be forced to reconsider their position and their preferred course of action. This has the potential to bring into being a cosmopolitical arrangement that enables both human and non-human entities to object to existing ways of knowing them, allowing them to intervene in our processes as we intervene in theirs.

Farming in Practice – Representing the Non-Human

There are I believe similarities between Stengers parliament and livestock farming; similarities which if extended to incorporate other forms of knowledge and representation could lead to a cosmopolitics of the livestock farm. It has been shown in this research for instance, that under current political arrangements farm animals have been represented by science through a focus on the biological function of livestock, nutritional and environmental requirements, and on the identification, causes, prevention and treatment of illness and disease. Guided by the need to inform political decision making, the expert practices engaged in this knowledge construction, involving the collation and dissemination of biological and statistical data, have been entirely self-focused, with scientists unaffected by the knowledge produced. Livestock farmers alternatively, do not carry influence within the political realm. The tacit knowledge and experience that they glean from their daily performances, including the intricate engagements with farm animals and the land that are built over generations, often by farmers working with the same animal families on the same area of land, have historically been ignored in scientific constructions of knowledge and the political discussions that emerge. Yet farmers are governed by the knowledge of science and the regulatory frameworks this generates. Also affected by farm animals, the environment and broader farm ecology, the farmer I suggest is constituted within the site of two or more ontological realms and emerges as a hybrid twixt Society and Nature, human and non-human, science and farm animal.

This I would argue qualifies the farmer to speak with some authority on behalf of the non-human elements of the farm, to challenge scientific assumptions which conflict with farming practice, and which might have detrimental effects on the environment and non-human lives. As the interests of the non-human and farm animals in particular, have been masked by selective representations which prevent their visibility within ethical and political discourse however, discussions about livestock farming and hence rural sustainability have been ended prematurely, without consideration for all things involved. Thus whilst livestock farmers have been reliant on the natural sciences to guide farming practice, land and animal care, and they are the first to praise scientific developments which have led to improvements in the environment and animal welfare quality, there is still a great deal of tension between science and farming practice, as the narrowly constructed sciences continue to ignore the multiple realities that exist within the livestock farm. It becomes necessary then to adapt existing political arrangements to account for this multiplicity, and to allow farmers to act as diplomats to represent non-human entities that already exist within the livestock farm.

If consultation between all existing entities within the farm environment is to be provoked into a cosmopolitical rather than an ontologically singular arrangement, there must be better means of communication between science and practice and between humans and non-humans, so that each entity relevant to a particular situation will have the opportunity to speak out and be heard, or at least be represented by those most qualified to speak out on their behalf. This requires that the politics of livestock farming is reorganised to account for its ontological multiplicity. But this is not straightforward. The pull of existing realities that currently dominate livestock farming practice, such as the financial implications of adapting existing practices to account for farm animals as subjective individuals and the broader ecology of the farm, are difficult to overcome, so there is much to be discussed if a cosmopolitical arrangement is to be achieved. Taking cosmopolitics to be about the search for peaceful coexistence between seemingly contradictory practices however, it must be recognised that the process of achieving peace or relative stability, unavoidably involves conflict through the continual challenge to existing relational assemblages. What cosmopolitics does then is to acknowledge that convergence between all entities and practices, both human and non-human, is at least possible, even though at any time the already existing relations within an environment, may erupt into tension, conflict and

potential disaster as new parliaments come into being to negotiate different arrangements. This search for peace and relative stability is an ongoing challenge in which all of the entities existing in the livestock farm provoke new relations as they come together and demand to be heard through various forms of communication, and as they negotiate their position in a shared and living world that is always in the process of becoming something new.

Appendices

Appendix A. Farmers Interview Guide (Beef)

Appendix B. Farmers Interview Guide (Sheep)

Appendix C. Farmers Interview Guide (Pigs)

Appendix D. Interview Guide for Veterinary's

Appendix E. Interview Guide for Natural England

Appendix F. Interview Guide for RSPB

Appendix G. Interview guide for EBLEX

Appendix H. Interview Guide Farm Assurance Officers

Appendix A

Farmers Interview Guide (Beef)

Section 1: Context - Basic farm business information

How long have you been farming and how long have you been here?

Could you describe the farm system that you operate and the animals that you stock? Are you a Breeder, Breeder and Finisher or Finisher?

Where do the animals go after they leave you? (Do you sell your animals direct to an abattoir (as deadweight), have contracts/agreements with local shops/supermarkets, or sell direct to the customer? Are your sales generally private or through a market, ad hoc or contractual? Which market and abattoir do you use and why? Do your buyers specify any special requirements/conditions?)

Is it a family run business, partnership, company etc? How does this affect the way things are managed?

Do you rent out any grass for keep or have any shared farming agreements with landowners? How does this affect your management practices?

Is any of your land classified as for example: Upland, Lowland, Moorland, Nitrate Sensitive, LFA, DA, SDA, AONB, ESA, ASSI, Joint Character and how does this affect the way you manage your land? What area of your land is eligible for the Single Farm Payment?

Do you have, or are you in the process of converting, to organic status? If so, how long have you been certified organic and what percentage of your farm is registered?

Does having animals mean that there are times of year when you need extra help? If so what would this be for and when? (E.g. to help with lambing, sheering, tb testing, silaging and to cover illness etc, or employ contractors to undertake specific tasks such as hedge trimming and harvesting). Do you require extra help for the management of your land? Which requires more time and management, land or animals?

Have you made any major changes on your farm in the past ten years?

Have you undergone any form of diversification or do you have an income outside of the farm business e.g. wife working off the farm?

Animal Health, Animal Welfare, Economic Performance, Environmental Health and Food Safety are all important aspects of farming. Which, if any of these which would you say are most important for you on your holding? If you had to put them in a list how would you prioritise them?

Section 2: Caring for farm animals and the land

Beef

What breed or cross breed of cattle do you produce and why has it been selected? (Is this upland, hill, lowland or x breed and is it specifically a beef breed or beef/dairy x) What particular traits/characteristics do you aim for when breeding your cattle and what are the advantages/disadvantages of keeping this breed in relation to your farmland? Are these breeds well adapted to this particular landscape and environment? Why is this the case and how do you know? Are they susceptible to any particular welfare issues because of the landscape/environment?

What breeds have you produced in the past and what made you decide to change?

If you grow your calves on for slaughter, at what age and weight would they go? What are they finished on? Do you have finishing pasture? If so how long are they put on this? What distinguishes finishing pasture from ordinary pasture?

Are your cows primarily for breeding? How long would you keep a breeding cow? What happens to it during and after this time?

Do you have your own bull or do you hire?

Do you have a health plan for your herd and is this drawn up in conjunction with/on the advice of your veterinary? What is the role of the veterinary in maintaining the health and wellbeing of your animals? Is this successful and how has it changed?

Do you buy in stock and where do you buy from – private sale, market – how often and how far away?

Do you acquire health records prior to purchase and are the animals inspected, separated and treated prior to mixing with main herd?

How many head of cattle do you have, how do you group them, where are they kept and how does this change throughout the year?

Once grouped do you keep stock together or are they frequently re-grouped?

Could you describe a typical day/year in the life of a cow? Over the course of a year, how long are they indoors/outdoors? What limits the time spent in or out of doors? Does this vary or do you try and keep this as fixed as possible for management purposes?

I believe that the best person to judge the health and welfare of farm animals is the farmer, I am therefore interested in how you care for your cattle, what you look for and when: so for example how often are they checked and what do you look at/for? Could you show me exactly what you are looking for on this picture? How often would you do this and what would you look for first? Are they specifically biological, physical or behavioural conditions? What do you consider is most/least important in determining the health/wellbeing of your animals? Are these things fairly obvious – would anyone notice or would you need some knowledge of cattle to realise there was a problem? How long does your inspection take with each group of animals? How do you interact with your cattle in

this time? How much time do you spend with your cattle observing them or undertaking routine husbandry practices? Would this be on top of your routine inspection? How has the time you spend with your cattle changed over time and how has/does this structure the lives of you and your family?

When moving your cattle, do you use a dog, other workers/family members, quad bike, tractor, Landover, stick? How does this affect their behaviour/wellbeing? How does this affect the land?

What and how are your cattle fed and watered? How does this change through the year and with what effect on the land?

What are the main problems you face in maintaining the health and welfare of your cattle (e.g. lameness; internal/external parasites; bloat bTb; redwater, BVT, Pneumonia) and how do you manage/control/prevent these problems? Do you vaccinate against leptosporosis and worms or use pour-on wormers and drenches as a means to prevent health problems in your herd? If so how are they administered, stored and disposed of? Have you had a problem or noticed an increase/decrease in the number of ticks and tick related health problems in your cattle such as redwater, tick born fever, abortion/reabsorbtion of foetus, louping ill (viral disease that can affect man)? Why do you think this is? How do you manage/control these problems and how has this changed? Do you manage your cattle differently if you are not using medicinal treatments and preventatives? What is your management strategy and how effective has this been?

Do you undertake castrations, tail docking, dehorning and debudding or is this something you have the vet or another person do for you? How is this managed?

How do you manage sick or injured animals, including calves – do you have separate hospital pens and how useful/successful is this in aiding recovery?

Roughly what is the mortality rate of cattle on your farm, when is it highest (in or out/summer/winter/calving etc) and what is the most common cause?

If cattle are outwintered do they have access to natural or artificial shelter/dry bedding?

Do you house cattle when calving or do you provide shelter if outside?

Do you scan your cattle and how does this contribute to maintaining their health and wellbeing? Who does this?

If you have an internal rearing system for calves how is this managed?

If you house cattle either overwinter or when calving, where and what sort of building is it (e.g. loose housing/pens); is it insulated/heated/ventilated/lit and if so how? What type of flooring does it have and how does this affect the cattle? Are animals tethered? Do you provide bedding – what and how often is it topped up/replaced? How do you manage this? How is the excess/waste removed? How/where is it disposed of and/or stored (eg slurry pit/dung heap)? How long is it stored before disposal? Have you had any problems with the storage or disposal of waste?

How are the animals fed and watered in the housing and how does this affect their health?

What, if anything has improved the welfare of cattle in recent years? Is this enough or are there other things that you would like to see improved?

Do you use animal welfare as a selling point for your product at all? If so does it work? How do you substantiate your claims to high levels of animal welfare (better taste /quality) and how is the level of animal welfare monitored (farm assurance schemes? Does it provide a higher mark up for your product?

Land

What do you view as the strengths and weaknesses of your farmland?

How do you care for your farmland? Could you describe a typical year's land management cycle?

Do you have rotational grazing, cropping, sowing - and how often would you rotate/reseed? Do you or are you able to leave land fallow? If not, why not and with what effect?

How do you maintain the condition/quality of your land used for animal husbandry and how much time and resources does this involve? How does this vary according to land type (arable, pasture, silage/feedcrops)? To what extent does the time spent managing farmland shape the management and welfare of your animals? And to what extent does this shape the lives of you and your family?

What machinery do you use to maintain the land used for animal husbandry and what effect does this have on the land and the animals?

What in your opinion makes good grazing? How important is good grazing for animal health and welfare?

How do you measure the quality of your grazing? Do you sow particular species, if so what and is this following advise (from where?) or your own personal choice (how decided?)? Are all sown species successful? Has this changed over time for better or worse and what do you think has caused this? How has this affected the quality of grazing? Has the seed mix used had any noticeable affects on the welfare of your animals and if so why do you think this is?

If you regularly use preventative medicines to keep your animals in a good state of health, such as anti-biotics/sprays/drenches/pour-on treatments/dips etc, do they have any affect on the condition of the land, grazing or feed to be stored? And how in turn does this affect the health of the animals? Is it important for you to use preventative treatments, or do you treat only when a problem arises? (Micro-organisms, worms and flies that would normally break down animal dung are often killed off so that dung stays on ground longer and animals will not graze around it for longer period reducing availability of grass (Ivomectin).

To what extent do your animals contribute to the maintenance of your land? What would happen to your land if the farm animals were removed and what would you need to do to

maintain the land to at least its current condition? Is this feasible, achievable? If not, why not?

How could you improve the quality and condition of your farmland?

Section 3: Ways of Knowing - Perceptions of Animal Welfare and Sustainability

How would you describe your relationship with your animals and the land? What do they mean to you? Is there a difference in this regard between the types of animal and types of land you have (e.g. cattle, sheep, pigs and then heifers, bulls calves etc./woodland, pasture, arable, moorland etc)? What informs this position? How, if at all are they treated differently, what takes priority and what receives most of your time and attention? (Animals or land, and which species/type, male/female, old/young)

How do you define animal welfare (linkage to terms such as protection, wellbeing, individual needs, health, and sentience? And what do you consider to be most important in terms of animal welfare: prolonged hunger, thirst or malnutrition; physical comfort and safety; absence of injury; absence of disease; absence of pain; ability to express normal/natural social behaviour (grooming, huddling); ability to express normal/natural behaviour such as foraging and exploration; good human animal interaction; or the absence of fear or stress?

How would you define a good natural environment? (Linkage to terms such as preservation, conservation, species rich, biodiversity, leaving the land in a better condition than when you started, success of the whole farm - integration)? And what do you consider to be most important in terms of maintaining your farmland; Soil quality; water quality; quality of pasture; maintaining habitats, biodiversity and wildlife or the needs of the whole system?

Do you see the quality of the environment and the welfare of your animals as being linked? Is environmental quality and animal welfare something that is mutually reinforcing, or do you think that they oppose/challenge each other? How and in what ways?

What do you see as the cause and effect of poor animal welfare and environmental management?

Do you see improvements in animal welfare as being detrimental or beneficial to the environment? Has your role in maintaining the welfare of your animals helped to improve the environment and overall sustainability of your farm?

What has been the impact of your particular farming system on the animals and the land? Has health/welfare/soil condition been maintained, improved or declined and why do you think this is the case?

How has the way you care for your animals and the land changed in the time that you have been farming?

Who are the main drivers of animal welfare and sustainability issues? Are there any groups/organisations/institutions that you feel understand the animal welfare and sustainability issues that you have on your farm?

What role do you think science plays in improving animal welfare and the environment? Do you think scientific research has a grasp of the reality of problems that you face on your farm?

How do you see animal welfare and sustainability issues being dealt with in the future – how would you like to see things develop? Have you made any contingency plans for dealing with these issues and any policy changes that may occur?

Section 4: Limitations

Do you think current animal welfare and environmental policies are sufficient? Do you currently meet or exceed these standards? How easy/difficult is this for you? What else should be done?

What do you feel limits your ability to care for your animals and the environment on your farm? What could you still do to improve animal welfare and the condition of your land and what stops you?

Have there been implications (good or bad) for the welfare of your animals arising from changing husbandry/land management practices generated by agri-environment policy?

How does the value of an animal or parcel of land influence the care that it receives? Would you call a vet for example to save the life of a sheep or a calf or would you cull the animal? And would the usefulness of a piece of land determine how much time, effort and resources were invested in it? (Do time and resources necessarily equate to care?)

Do you think that animal welfare and sustainability objectives are compatible?

Do you find that trying to achieve good animal welfare as well as farming sustainably is a difficult task? If so, how/why? If not, why not – how do you manage the two successfully, particularly in relation to cross compliance and/or any agri-environment or welfare/quality assurance schemes that you may participate in?

How could farmers be supported to improve animal welfare in the future? Would a higher premium for your products affect the level of care you are able to give, improve their health and well being and/or improve the condition of your land?

Do you consider your farming system to be sustainable? What would be needed to make it sustainable? Is this feasible/achievable?

Section 5: Farm Assurance Schemes

Do you participate in any Farm Assurance Schemes? Which one(s) and is this high quality (conventional), specific/high animal welfare, or organic? What motivated you to join/not to join? Have you ever changed or left a scheme? Why?

What are the advantages/disadvantages of being a member? Could you operate successfully without being a member?

Whose interests do you think Farm Assurance Schemes serve and has this always been the case?

What are the specific animal welfare and environmental requirements of this scheme? Are these requirements additional to the welfare/land management practices you provided before you joined the scheme? Are they above current legal requirements? How easy/difficult are they to comply with? What limits compliance? Could/should these requirements be more stringent and if so what should be done? How are they monitored, by whom and is it consistent?

Do you think that membership in an assurance scheme is enough to convince consumers that high welfare and environmental standards are maintained? If not what do you think needs to be done to achieve this?

How do you think Assurance Schemes will develop in the future and what will this mean for you?

**Finally if time maybe ask a bit about “Ways of knowing”
(Linked to Carpers ways of knowing in nursing)**

EMPIRICAL - Where does your knowledge of animal welfare and environmental issues come from? (Scientific reports, veterinary advice, practical experience, agricultural college, defra or other advisory body, other farmers, family knowledge, campaigns, magazines/newspapers)

ETHICAL – to what extent has this informed your appreciation of how best to respond to your animals and the land in terms of societal benefits, expectations and norms?

PERSONAL – Is there something else that has influenced the way you see and respond to these things (such as family knowledge/culture, religious beliefs, and personal characteristics)?

AESTHETIC – How have you gained the practical knowhow/professional artistry that you employ as you go about your work in caring for the animals and land? How have these skills been learnt or acquired? If you have been brought up on a farm how have you come to know what you do? Similarly if you have come to farming later, how have you acquired your knowledge and experience? Do you feel that your level of knowledge is enough or could this be improved? In what areas and how?

REFLEXIVE – Has your understanding of animal welfare and sustainability changed in the time that you have been farming and how has this affected the way you farm now? Can/do you draw on past experiences in your current farming practices? How important is this in terms of animal welfare and land management?

Appendix B

Farmers Interview Guide (Sheep)

Section 1: Context - Basic farm business information

How long have you been farming and how long have you been here?

Could you describe the farm system that you operate and the animals that you stock?
Would you class yourself as a Breeder, Breeder and Finisher or Finisher?

Where do the animals go after they leave you? (Do you sell your animals direct to an abattoir (as deadweight), have contracts/agreements with local shops/supermarkets, or sell direct to the customer? Are your sales generally private or through a market, ad hoc or contractual? Which market and abattoir do you use and why? Do your buyers specify any special requirements/conditions?).

Is it a family run business, partnership, company etc? How does this affect the way things are managed?

Do you rent out any grass for keep or have any shared farming agreements with landowners? How does this affect your management practices?

Is any of your land classified as for example: Upland, Lowland, Moorland, Nitrate Sensitive, LFA, DA, SDA, AONB, ESA, ASSI, Joint Character and how does this affect the way you manage your land? What area of your land is eligible for the Single Farm Payment?

Do you have, or are you in the process of converting, to organic status? If so, how long have you been certified organic and what percentage of your farm is registered?

Does having animals mean that there are times of year when you need extra help? If so what would this be for and when? (E.g. to help with lambing, sheering, tb testing, silaging and to cover illness etc, or employ contractors to undertake specific tasks such as hedge trimming and harvesting). Do you require extra help for the management of your land? Which requires more time and management, land or animals?

Have you made any major changes on your farm in the past ten years?

Have you undergone any form of diversification or do you have an income outside of the farm business e.g. wife working off the farm?

Animal Health, Animal Welfare, Economic Performance, Environmental Health and Food Safety are all important aspects of farming. Which, if any of these which would you say are most important for you on your holding? If you had to put them in a list how would you prioritise them?

Section 2: Caring for farm animals and the land

Sheep

What breed or cross/breed of sheep and lamb do you produce and why has this particular breed been selected (is this breed upland, down or x of the two)? Do you aim for any particular traits/characteristics when breeding your sheep and lamb? What are the advantages and disadvantages of keeping this breed in relation to your farmland? Are these breeds well adapted to this particular landscape and environment? Why is this the case and how do you know? Are they susceptible to any particular welfare issues because of the landscape/environment, e.g. footrot or worm infestation due to wet ground?

Have you bred different varieties in the past? What made you decide to change?

If you grow your lambs on for slaughter, at what age and weight would they go? (Early fat lambs – less than 6 months, hogget's – store lambs under 12 months – prime mutton – 12 months old). What are they finished on? Do you have finishing pasture? If so how long are they put on this? What distinguishes finishing pasture from ordinary pasture and is it managed differently?

Are your sheep used primarily for breeding lamb/hogget's/mutton? Do you have any wool sales? How long would you keep a breeding sheep and how many lambs would you expect her to produce? What happens to it during and after this time?

Do you have a health plan for your flock and is this drawn up in conjunction with/on the advice of your veterinary? What is the role of the veterinary in maintaining the health and wellbeing of your animals? Is it successful and how has this changed?

Do you buy in stock, how often and where do you buy from – private sale, market – how far away is this?

Do you acquire health records prior to purchase of stock and are the animals inspected, separated and treated prior to mixing with main flock?

How many sheep/lambs do you have, how do you group them, where are they kept and how does this change throughout the year?

Once grouped, do you keep them together or are they frequently re-grouped?

Could you describe a typical day/year in the life of a lamb/sheep? Over the course of a year, how long are they indoors/outdoors? What limits the time spent in or out of doors? Does this vary or do you try and keep this as fixed as possible for management purposes?

I believe that the best person to judge the health and welfare of farm animals is the farmer, I am therefore interested in how you care for your flock, what you look for and when: so for example how often are they checked and what in particular do you look at/for? Could you show me exactly what you are looking for on this picture? What would you look for first? Are they specifically biological, physical or behavioural conditions? What do you consider is most/least important in determining the health/wellbeing of your animals? Are these things fairly obvious – would anyone notice or would you need some knowledge of sheep

to realise there was a problem? How long does your inspection take? How do you interact with your sheep in this time? How much time do you spend with your sheep observing them or undertaking routine husbandry practices? Would this be on top of your routine inspection? How has the time you spend with your sheep changed over time and how has/does it structure the lives of you and your family?

If you shear your sheep, when is this done and by whom?

Do you use a sheepdog, quad bike, Landover, tractor, other worker/family member in the day to day management of your sheep? How does this affect the behaviour/wellbeing of the sheep? How does this affect the land?

What and how are your sheep fed and watered? How does this change through the year and with what effect on the land?

What are the main problems you face in maintaining the health and welfare of your sheep (e.g. footrot/lameness; internal/external parasites; dentition)? How do you manage/control/prevent these problems and what do you use? Do you use sheep dip as a preventative measure against external parasites etc? What make do you use and where do you get it from? How effective is it? Where do you administer it and how do you store/dispose of it? If you don't use dips/drenches, have you noticed any increase in ticks and had any related welfare issues such as abortion/reabsorbtion of foetus, or louping 111 (viral disease)? Do you manage your sheep differently if you are not using dips to control ticks, such as acclimatising the sheep to ticks prior to putting them to the ram? What about controlling worms/maggots, if you don't use anthelmintic drugs, has the problem increased/decreased? What is your management strategy and how effective has it been?

Do you undertake castrations, tail docking, dehorning and debudding, or is this something you have the vet or another person do for you? How is this managed?

How do you manage sick or injured animals, including lambs – do you have separate hospital pens and how useful/successful is this in aiding recovery?

Roughly what is the mortality rate of your flock and at what time of year is this highest? Is this when the animals are in or out? What is the most common cause of mortality and why do you think this is?

When do you aim to have your lambing season and what are the reasons for this?

Do you house sheep during lambing or do you provide shelter if outside?

Do you scan your sheep and how does this contribute to maintaining their health and welfare?

If you artificially rear lambs, how is this managed? What are the advantages/disadvantages in terms of animal health and the environment?

If you house sheep overwinter or during and after lambing, is the building insulated/ventilated and how? What type of flooring does it have? How does this affect the

sheep? Do you provide bedding – what and how often is it topped up/replaced? How and where is the excess stored and disposed of? How long is it stored before disposal? Have you had any environmental problems with the storage or disposal of waste?

How are your sheep fed and watered in the housing?

What if anything, has improved sheep welfare in recent years? Is this enough or are there other things that you would like to see improved?

Do you use animal welfare as a selling point for your product at all? If so, does it work? How do you substantiate your claims to high levels of animal welfare (better taste/ quality) and how is the level of animal welfare monitored (farm assurance schemes)? Does it provide a higher mark up for your product?

Land

What do you view as the strengths and weaknesses of your farmland?

How do you care for your farmland? Could you describe a typical year's land management cycle?

Do you have rotational grazing, cropping, sowing - and how often would you rotate/reseed? Do you or are you able to leave land fallow? If not, why not and with what effect?

How do you maintain the condition/quality of your land used for animal husbandry and how much time and resources does this involve? How does this vary according to land type (arable, pasture, silage/feedcrops)? To what extent does the time spent managing farmland shape the management and welfare of your animals? And to what extent does this shape the lives of you and your family?

What machinery do you use to maintain the land used for animal husbandry and what effect does this have on the land and the animals?

What in your opinion makes good grazing? How important is good grazing for animal health and welfare?

How do you measure the quality of your grazing? Do you sow particular species, if so what and is this following advice (from where?) or your own personal choice (how decided?)? Are all sown species successful? Has this changed over time for better or worse and what do you think has caused this? How has this affected the quality of grazing? Has the seed mix used had any noticeable effects on the welfare of your animals and if so why do you think this is?

If you regularly use preventative medicines to keep your animals in a good state of health, such as anti-biotics/sprays/drenches/pour-on treatments/dips etc, do they have any effect on the condition of the land, grazing or feed to be stored? And how in turn does this affect the health of the animals? Is it important for you to use preventative treatments, or do you treat only when a problem arises? (Micro-organisms, worms and flies that would normally break down animal dung are often killed off so that dung stays on ground longer and animals will not graze around it for longer period reducing availability of grass (Ivomectin).

To what extent do your animals contribute to the maintenance of your land? What would happen to your land if the farm animals were removed and what would you need to do to maintain the land to at least its current condition? Is this feasible, achievable? If not, why not?

How could you improve the quality and condition of your farmland?

Section 3: Ways of Knowing - Perceptions of Animal Welfare and Sustainability

How would you describe your relationship with your animals and the land? What do they mean to you? Is there a difference in this regard between the types of animal and types of land you have (e.g. cattle, sheep, pigs and then heifers, bulls calves etc./woodland, pasture, arable, moorland etc)? What informs this position? How, if at all are they treated differently, what takes priority and what receives most of your time and attention? (Animals or land, and which species/type, male/female, old/young)

How do you define animal welfare (linkage to terms such as protection, wellbeing, individual needs, health, and sentience? And what do you consider to be most important in terms of animal welfare: prolonged hunger, thirst or malnutrition; physical comfort and safety; absence of injury; absence of disease; absence of pain; ability to express normal/natural social behaviour (grooming, huddling); ability to express normal/natural behaviour such as foraging and exploration; good human animal interaction; or the absence of fear or stress?

How would you define a good natural environment? (Linkage to terms such as preservation, conservation, species rich, biodiversity, leaving the land in a better condition than when you started; success of the whole farm - integration)? And what do you consider to be most important in terms of maintaining your farmland; Soil quality; water quality; quality of pasture; maintaining habitats, biodiversity and wildlife or the needs of the whole system?

Do you see the quality of the environment and the welfare of your animals as being linked? Is environmental quality and animal welfare something that is mutually reinforcing, or do you think that they oppose/challenge each other? How and in what ways?

What do you see as the cause and effect of poor animal welfare and environmental management?

Do you see improvements in animal welfare as being detrimental or beneficial to the environment? Has your role in maintaining the welfare of your animals helped to improve the environment and overall sustainability of your farm?

What has been the impact of your particular farming system on the animals and the land? Has health/welfare/soil condition been maintained, improved or declined and why do you think this is the case?

How has the way you care for your animals and the land changed in the time that you have been farming?

Who are the main drivers of animal welfare and sustainability issues? Are there any groups/organisations/institutions that you feel understand the animal welfare and sustainability issues that you have on your farm?

What role do you think science plays in improving animal welfare and the environment? Do you think scientific research has a grasp of the reality of problems that you face on your farm?

How do you see animal welfare and sustainability issues being dealt with in the future – how would you like to see things develop? Have you made any contingency plans for dealing with these issues and any policy changes that may occur?

Section 4: Limitations

Do you think current animal welfare and environmental policies are sufficient? Do you currently meet or exceed these standards? How easy/difficult is this for you? What else should be done?

What do you feel limits your ability to care for your animals and the environment on your farm? What could you still do to improve animal welfare and the condition of your land and what stops you?

Have there been implications (good or bad) for the welfare of your animals arising from changing husbandry/land management practices generated by agri-environment policy?

How does the value of an animal or parcel of land influence the care that it receives? Would you call a vet for example to save the life of a sheep or a calf or would you cull the animal? And would the usefulness of a piece of land determine how much time, effort and resources were invested in it? (Do time and resources necessarily equate to care?)

Do you think that animal welfare and sustainability objectives are compatible (E.g. restricting access to a natural water source because of bank erosion/low stocking densities or extensive grazing to maintain natural habitats and biodiversity)?

Do you find that trying to achieve good animal welfare as well as farming sustainably is a difficult task? If so, how/why? If not, why not – how do you manage the two successfully, particularly in relation to cross compliance and/or any agri-environment or welfare/quality assurance schemes that you may participate in?

How could farmers be supported to improve animal welfare in the future? Would a higher premium for your products affect the level of care you are able to give, improve their health and well being and/or improve the condition of your land?

Do you consider your farming system to be sustainable? What would be needed to make it sustainable? Is this feasible/achievable?

Section 5: Farm Assurance Schemes

Do you participate in any Farm Assurance Schemes? Which one(s) and is this high quality (conventional), specific/high animal welfare, or organic? What motivated you to join/not to join? Have you ever changed or left a scheme? Why?

What are the advantages/disadvantages of being a member? Could you operate successfully without being a member?

Whose interests do you think Farm Assurance Schemes serve and has this always been the case?

What are the specific animal welfare and environmental requirements of this scheme? Are these requirements additional to the welfare/land management practices you provided before you joined the scheme? Are they above current legal requirements? How easy/difficult are they to comply with? What limits compliance? Could/should these requirements be more stringent and if so what should be done? How are they monitored, by whom and is it consistent?

Do you think that membership in an assurance scheme is enough to convince consumers that high welfare and environmental standards are maintained? If not what do you think needs to be done to achieve this?

How do you think Assurance Schemes will develop in the future and what will this mean for you?

Finally if time maybe ask a bit about “Ways of knowing”

(Linked to Carpers ways of knowing in nursing)

EMPIRICAL - Where does your knowledge of animal welfare and environmental issues come from? (Scientific reports, veterinary advice, practical experience, agricultural college, defra or other advisory body, other farmers, family knowledge, campaigns, magazines/newspapers)

ETHICAL – to what extent has this informed your appreciation of how best to respond to your animals and the land in terms of societal benefits, expectations and norms?

PERSONAL – Is there something else that has influenced the way you see and respond to these things (such as family knowledge/culture, religious beliefs, and personal characteristics)?

AESTHETIC – How have you gained the practical knowhow/professional artistry that you employ as you go about your work in caring for the animals and land? How have these skills been learnt or acquired? If you have been brought up on a farm how have you come to know what you do? Similarly if you have come to farming later, how have you acquired your knowledge and experience? Do you feel that your level of knowledge is enough or could this be improved? In what areas and how?

REFLEXIVE – Has your understanding of animal welfare and sustainability changed in the time that you have been farming and how has this affected the way you farm now? Can/do you draw on past experiences in your current farming practices? How important is this in terms of animal welfare and land management?

Appendix C.

Farmers Interview Guide (Pigs)

Section 1: Context - Basic farm business information

How long have you been farming and how long have you been here?

Could you describe the farm system that you operate and the animals that you stock? Are you a Breeder, Breeder and Finisher or Finisher?

Where do the animals go after they leave you? (Do you sell your animals direct to an abattoir (as deadweight), have contracts/agreements with local shops/supermarkets, or sell direct to the customer? Are your sales generally private or through a market, ad hoc or contractual? Which market and abattoir do you use and why? Do your buyers specify any special requirements/conditions?)

Is it a family run business, partnership, company etc? How does this affect the way things are managed?

Do you rent out any grass for keep or have any shared farming agreements with landowners? How does this affect your management practices?

Is any of your land classified as for example: Upland, Lowland, Moorland, Nitrate Sensitive, LFA, DA, SDA, AONB, ESA, ASSI, Joint Character and how does this affect the way you manage your land? What area of your land is eligible for the Single Farm Payment?

Do you have, or are you in the process of converting, to organic status? If so, how long have you been certified organic and what percentage of your farm is registered?

Does having animals mean that there are times of year when you need extra help? If so what would this be for and when? (E.g. to help with lambing, sheering, tb testing, silaging and to cover illness etc, or employ contractors to undertake specific tasks such as hedge trimming and harvesting). Do you require extra help for the management of your land? Which requires more time and management, land or animals?

Have you made any major changes on your farm in the past ten years?

Have you undergone any form of diversification or do you have an income outside of the farm business e.g. wife working off the farm?

Animal Health, Animal Welfare, Economic Performance, Environmental Health and Food Safety are all important aspects of farming. Which, if any of these which would you say are most important for you on your holding? If you had to put them in a list how would you prioritise them?

Section 2: Caring for farm animals and the land

Pigs

What breed/cross breed of pig do you produce and why has it been selected? Do you aim for any particular traits/characteristics when breeding your pigs? What are the advantages/disadvantages of keeping pigs in relation to the landscape on your farm? Are these breeds well adapted to this particular landscape and environment? Why is this the case and how do you know? Are they susceptible to any particular welfare issues because of the landscape/environment?

Have you bred different varieties in the past? What made you decide to change?

If you grow piglets on for slaughter, at what age and weight would they go? (Is this for bacon, pork or heavy pigs?) What are they finished on? (Do you have finishing pasture? If so how long are they put on this? What distinguishes finishing pasture from ordinary pasture?)

Are your sows primarily for breeding? How long would you keep a breeding sow? What happens to it during and after this time?

Do you have a health plan for your herd and is this drawn up in conjunction with/on the advice of your veterinary? What is the role of the veterinary in maintaining the health and wellbeing of your animals? Is this successful and how has this changed?

Do you buy in stock and where do you buy from – private sale, market – where and how far away?

Do you acquire health records prior to purchase and are the animals inspected, separated and treated prior to mixing with main herd?

How many pigs do you have, how do you group them - do you select which pig goes with which, or are they grouped by age or weight? Where are they kept and how does this change throughout the year? Do they have toys? Are pigs grouped differently when put into housing units and when they are outdoors? If so, how and why?

Once grouped do you keep stock together or are they frequently re-grouped?

Can you describe a typical day/year in the life of a pig? Over the course of a year, how long are they indoors/outdoors? What limits the time spent in or out of doors? Does this vary or do you try and keep this as fixed as possible for management purposes?

I believe that the best person to judge the health and welfare of farm animals is the farmer, I am therefore interested in how you care for your pigs, what you look for and when? So for example how often are they checked and what in particular do you look at/for? Could you show me exactly what you are looking for on this picture? What would you look at first? Are they specifically biological, physical or behavioural conditions? What do you consider is most/least important in determining the health/wellbeing of your animals? Are these things fairly obvious – would anyone notice or would you need some knowledge of pigs to realise there was a problem? How long does your inspection take? How do you interact

with your pigs during that time? How much time do you spend with your pigs observing them or undertaking routine husbandry practices? Would this be on top of your routine inspection or built into it? How has the time you spend with your pigs changed over time and how had/does it structure the lives of you and your family?

What and how are they fed and watered? How does this change through the year and with what effect on the land?

When moving your pigs, do you get extra help, use pig boards, a stick, quad bike, Landover or tractor? How does this affect the wellbeing of your animals? How does it affect the land?

What are the main problems you face in maintaining the health and welfare of your pigs (e.g. lameness; internal/external parasites; tail biting/bar chewing) and how do you manage/control/prevent these problems? Do you vaccinate your pigs against illness or use parasiticides or anthelmintic drugs to treat external and internal parasites? What do you use, where do you get them from and how effective are they? How would they be administered, stored and disposed of? If not using them, do you manage your herd differently to prevent problems associated with these parasites? How successful has this been?

Do you undertake castrations, tail docking, or do you use a veterinary or other person to undertake these tasks? How is this managed?

Do you condition score your animals and when would you do this?

How do you manage sick or injured animals, including piglets – do you have separate hospital pens and how useful/successful is this in aiding recovery?

Roughly what is the mortality rate of your herd and at what time of year is this highest? Is this when the animals are in or out? What is the most common cause of mortality and why do you think this is?

Do you rear your pigs indoors, outdoors or a combination of both? When would they be indoors and for how long? What sort of housing/shelter do they have? Where is it and why? How is it constructed? Is it insulated/heated/ventilated? Do you have a back-up generator to maintain heating/ventilation? How do you maintain temperature control when pigs are outdoors and for sows and piglets when housed together? What sort of flooring does the housing have? What affect does this have on the pigs/piglets? Do they have additional bedding materials? Would this differ according to the type of rearing system, if so how and why? How often is this topped up/replaced or the shed disinfected? How is this managed (do the animals stay in or are they removed first?) How long does this take? How does this affect the wellbeing of your pigs? How and where is the waste disposed of? How is it transported/stored and for how long? Have you had any environmental problems with the storage and disposal of this waste?

Do you use farrowing pens? How is this managed? (Are sows tethered/do piglets have dry nesting area away from sow/do you use mechanical farrowing aids). What affect does this have on the welfare and/or behaviour of your pigs?

Do you scan your pigs and how does this contribute to maintaining their health and welfare?

If you have an internal rearing system for piglets, how is this managed?

How are the animals fed and watered in the housing?

Do you use animal welfare as a selling point for your product at all? If so does it work? How do you substantiate your claims to high levels of animal welfare (better quality/taste) and how is the level of animal welfare monitored (farm assurance schemes)? Does it improve your sales and/or provide a higher mark up for your product?

Land

What do you view as the strengths and weaknesses of your farmland?

How do you care for your farmland? Could you describe a typical year's land management cycle?

Do you have rotational grazing, cropping, sowing - and how often would you rotate/reseed? Do you or are you able to leave land fallow? If not, why not and with what effect?

How do you maintain the condition/quality of your land used for animal husbandry and how much time and resources does this involve? How does this vary according to land type (arable, pasture, silage/feedcrops)? To what extent does the time spent managing farmland shape the management and welfare of your animals? And to what extent does this shape the lives of you and your family?

What machinery do you use to maintain the land used for animal husbandry and what effect does this have on the land and the animals?

What in your opinion makes good grazing? How important is good grazing for animal health and welfare?

How do you measure the quality of your grazing? Do you sow particular species, if so what and is this following advise (from where?) or your own personal choice (how decided?)? Are all sown species successful? Has this changed over time for better or worse and what do you think has caused this? How has this affected the quality of grazing? Has the seed mix used had any noticeable affects on the welfare of your animals and if so why do you think this is?

If you regularly use preventative medicines to keep your animals in a good state of health, such as anti-biotics/sprays/drenches/pour-on treatments/dips etc, do they have any affect on the condition of the land, grazing or feed to be stored? And how in turn does this affect the health of the animals? Is it important for you to use preventative treatments, or do you treat only when a problem arises? (Micro-organisms, worms and flies that would normally break down animal dung are often killed off so that dung stays on ground longer and animals will not graze around it for longer period reducing availability of grass (Ivomectin).

To what extent do your animals contribute to the maintenance of your land? What would happen to your land if the farm animals were removed and what would you need to do to maintain the land to at least its current condition? Is this feasible, achievable? If not, why not?

How could you improve the quality and condition of your farmland?

Section 3: Ways of Knowing - Perceptions of Animal Welfare and Sustainability

How would you describe your relationship with your animals and the land? What do they mean to you? Is there a difference in this regard between the types of animal and types of land you have (e.g. cattle, sheep, pigs and then heifers, bulls calves etc./woodland, pasture, arable, moorland etc)? What informs this position? How, if at all are they treated differently, what takes priority and what receives most of your time and attention? (Animals or land, and which species/type, male/female, old/young)

How do you define animal welfare (linkage to terms such as protection, wellbeing, individual needs, health, and sentience? And what do you consider to be most important in terms of animal welfare: prolonged hunger, thirst or malnutrition; physical comfort and safety; absence of injury; absence of disease; absence of pain; ability to express normal/natural social behaviour (grooming, huddling); ability to express normal/natural behaviour such as foraging and exploration; good human animal interaction; or the absence of fear or stress?

How would you define a good natural environment? (Linkage to terms such as preservation, conservation, species rich, biodiversity, leaving the land in a better condition than when you started, success of the whole farm - integration)? And what do you consider to be most important in terms of maintaining your farmland; Soil quality; water quality; quality of pasture; maintaining habitats, biodiversity and wildlife or the needs of the whole system?

Do you see the quality of the environment and the welfare of your animals as being linked? Is environmental quality and animal welfare something that is mutually reinforcing, or do you think that they oppose/challenge each other? How and in what ways?

What do you see as the cause and effect of poor animal welfare and environmental management?

Do you see improvements in animal welfare as being detrimental or beneficial to the environment? Has your role in maintaining the welfare of your animals helped to improve the environment and overall sustainability of your farm?

What has been the impact of your particular farming system on the animals and the land? Has health/welfare/soil condition been maintained, improved or declined and why do you think this is the case?

How has the way you care for your animals and the land changed in the time that you have been farming?

Who are the main drivers of animal welfare and sustainability issues? Are there any groups/organisations/institutions that you feel understand the animal welfare and sustainability issues that you have on your farm?

What role do you think science plays in improving animal welfare and the environment? Do you think scientific research has a grasp of the reality of problems that you face on your farm?

How do you see animal welfare and sustainability issues being dealt with in the future – how would you like to see things develop? Have you made any contingency plans for dealing with these issues and any policy changes that may occur in the future?

Section 4: Limitations

Do you think current animal welfare and environmental policies are sufficient? Do you currently meet or exceed these standards? How easy/difficult is this for you? What else should be done?

What do you feel limits your ability to care for your animals and the environment on your farm? What could you still do to improve animal welfare and the condition of your land and what stops you?

Have there been implications (good or bad) for the welfare of your animals arising from changing husbandry/land management practices generated by agri-environment policy?

How does the value of an animal or parcel of land influence the care that it receives? Would you call a vet for example to save the life of a sheep or a calf or would you cull the animal? And would the usefulness of a piece of land determine how much time, effort and resources were invested in it? (Do time and resources necessarily equate to care?)

Do you think that animal welfare and sustainability objectives are compatible? (E.G. restricting access to a natural water source because of bank erosion/contamination/low stocking densities or extensive grazing to maintain natural habitats/slatted flooring in housing to aid environmental management)

Do you find that trying to achieve good animal welfare as well as farming sustainably is a difficult task? If so, how/why? If not, why not – how do you manage the two successfully, particularly in relation to cross compliance and/or any agri-environment or welfare/quality assurance schemes that you may participate in?

How could farmers be supported to improve animal welfare in the future? Would a higher premium for your products affect the level of care you are able to give, improve their health and well being and/or improve the condition of your land?

Do you consider your farming system to be sustainable? What would be needed to make it sustainable? Is this feasible/achievable?

Section 5: Farm Assurance Schemes

Do you participate in any Farm Assurance Schemes? Which one(s) and is this high quality (conventional), specific/high animal welfare, or organic? What motivated you to join/not to join? Have you ever changed or left a scheme? Why?

What are the advantages/disadvantages of being a member? Could you operate successfully without being a member?

Whose interests do you think Farm Assurance Schemes serve and has this always been the case?

What are the specific animal welfare and environmental requirements of this scheme? Are these requirements additional to the welfare/land management practices you provided before you joined the scheme? Are they above current legal requirements? How easy/difficult are they to comply with? What limits compliance? Could/should these requirements be more stringent and if so what should be done? How are they monitored, by whom and is it consistent?

Do you think that membership in an assurance scheme is enough to convince consumers that high welfare and environmental standards are maintained? If not what do you think needs to be done to achieve this?

How do you think Assurance Schemes will develop in the future and what will this mean for you?

Finally if time maybe ask a bit about “Ways of knowing”

(Linked to Carpers ways of knowing in nursing)

EMPIRICAL - Where does your knowledge of animal welfare and environmental issues come from? (Scientific reports, veterinary advice, practical experience, agricultural college, defra or other advisory body, other farmers, family knowledge, campaigns, magazines/newspapers)

ETHICAL – to what extent has this informed your appreciation of how best to respond to your animals and the land in terms of societal benefits, expectations and norms?

PERSONAL – Is there something else that has influenced the way you see and respond to these things (such as family knowledge/culture, religious beliefs, and personal characteristics)?

AESTHETIC – How have you gained the practical knowhow/professional artistry that you employ as you go about your work in caring for the animals and land? How have these skills been learnt or acquired? If you have been brought up on a farm how have you come to know what you do? Similarly if you have come to farming later, how have you acquired your knowledge and experience? Do you feel that your level of knowledge is enough or could this be improved? In what areas and how?

REFLEXIVE – Has your understanding of animal welfare and sustainability changed in the time that you have been farming and how has this affected the way you farm now? Can/do you draw on past experiences in your current farming practices? How important is this in terms of animal welfare and land management?

Appendix D.

Interview Guide for Veterinary's

How would you define animal welfare? How have conceptions of animal welfare changed within the veterinary profession in recent years?

There seems to be more and more emphasis being placed on outcome based measures as a means to establish the welfare of farm animals, yet scientists worry about the accuracy and usefulness of measuring these outcome based incentives. How important do you think these measures are? Do you think that outcome based measures will continue to play an important role in animal welfare assessments in the future?

What is the role of the vet in maintaining the welfare of farmed animals today? How/why has this changed? How do you think the role of the veterinary will develop in terms of supporting the welfare of farm animals in the future? Do you think there is likely to be more veterinary input into Farm Assurance Schemes?

Do you think that there is a need for more specialisms within the veterinary profession – many farmers I have spoken to complain about the lack of vets with large animal experience, often feeling that they have more knowledge and experience than the vet that they call out in an emergency (it is only when the farmer does not know what the problem is, or when they need access to prescribed medicines that the vet is called out in the first place – therefore if the vet is inexperienced or lacks knowledge in this area the farmer understandably gets annoyed), whilst the pig farmers I have spoken to seem to use vets from outside of their locality because they have specialist knowledge and experience that their local vets do not (this also links in to farm assurance schemes because pig farmers have quarterly veterinary inspections/meetings for this purpose). How important is it that vets specialise, are there currently enough vets with specialist knowledge and do you think this is something that may happen more or less in the future?

What sort of relationship do you have with farmers? Is it purely business (treat an animal when sick or would you say it is more friendly, compassionate, or advisory? How do you help farmers improve the care of their animals to reduce the need for intervention?

When assessing the health and welfare of farm animals what exactly are you looking for?

Do you currently undertake welfare assessments for any sort of monitoring purpose? What particular aspects of welfare do you assess? Are these requirements specific to a farm assurance scheme or government regulation? Are you looking specifically at physical, biological or behavioural aspects of welfare? Do you spend time observing animal behaviour or measuring their level of comfort in terms of how long it takes them to lie down for example, and how often things like bullying/riding might occur in a group of animals? How useful might these sorts of observations be? Would you check for things like the use of illegal substances such as thyrostatic action hormones and beta-agonist as part of the routine? If so how is this done?

When assessing animal welfare, do you use a welfare assessment tool such as the Bristol Welfare Assessment Protocol (BWAP)? If so which parameters do you use?

How many visits on average would you make to a farm each year in connection with assessing the welfare of livestock as opposed to treatments or routine tb testing for example?

How often would inspections be carried out and how long would it take? If an annual inspection for monitoring purposes, would the farmer be notified of your visit or would it be spot checks or pre-arranged?

Do you advise farmers on how to overcome problems or would you have to refer them to a specific advisory body/organisation?

Do you undertake herd and flock health planning with farmers? What does this involve and how useful is it in practice for improving the welfare of farm animals? Is this generally for Farm Assurance Scheme purposes? What are the costs involved with health planning?

What is the uptake of farm health planning, is it something that all farmers do? If not why do you think this is?

Do you see the welfare of farm animals as being linked to the quality and condition of the farm land? If so how? Could improving the welfare of farm animals also lead to improvements in the quality and condition of the farmland, its flora and fauna and the overall sustainability of the farm?

Is livestock farming compatible with the protection/preservation of birds, wildlife, the natural environment, biodiversity and heritage or are there conflicts between them which may compromise the health and wellbeing of farm animals (e.g. where traditional breeds may be used to maintain particular landscape types – such as Smallacombe forestry where trees have been cut down and the debris left lying, and where there is very little grass available, do you think the welfare of animals is compromised in these situations? Have you come across any situations like this?)

Does bird/wildlife pose a threat to farm animals? How/why? And vice versa.

How has the health and welfare of farm animals improved over the years? What have been the main improvements and who/what has been the main influence of this?

What are the main problems currently faced by farmers and how are they being dealt with/tackled? Is this enough to secure the health and wellbeing of livestock for the future? What more could/should be done to improve things?

What are the implications of different diets on animal health and welfare? So for example if a cow was fed only on grass against being fed on grass with supplements of barley, lupins, stubble grazing with turnips and kale or brought in mixed feeds, is one better than the other? How would welfare be affected?

Would you see a difference in welfare if an animal was fed on permanent pasture as against a reseeded ley?

If animals have supplementary feeding would this reduce the need for licks and boluses to provide additional mineral requirements? Is all grass/grazing deficient in the trace elements and minerals (particularly cobalt, selenium and iodine) that farm animals need to maintain health?

How do mineral/trace element deficiencies in the land impact on grazing animals?

What are the implications for farm animal welfare of feeding GM feed?

How does the speed at which pigs, sheep or beef cattle grow impact on the animal's health and wellbeing? Is it better in terms of welfare for an animal to reach mature weights naturally, at slower speeds, or can feeding supplements to reach mature weights sooner also have welfare benefits?

Do you consider the welfare of farm animals to be better or improved by particular bits of equipment and machinery such as tipping crates for sheep, or by the provision of or particular type of housing and handling systems? Would you consider the welfare of farm animals to be poorer where a farmer doesn't have access to such resources?

Is the level and quality of animal welfare provided a choice farmers make or is it more to do with policy requirements, access to resources or perhaps the type of person they are – their affinity with and/or ability to empathise with their animals?

Would you say that ear tagging is a welfare issue? Is this a common problem? Could anything be done to improve the current situation? Is tagging necessary or should we be looking for new ways to monitor/trace livestock? How effective is tagging in terms of traceability?

What is the importance of breed in maintaining the health and welfare of farm animals? (E.g. suitability to environment/large bulls on small heifers/selective breeding, embryo transfer and genetic modification for particular traits) Is culling for disease resistance and temperament a good farm management practice?

Is the overwintering of animals in sheds beneficial/detrimental in terms of welfare? What about the out-wintering? How important is natural behaviour here?

Tail docking and teeth clipping in pigs is not supposed to occur as routine unless absolutely necessary, yet this is something that I have come across within indoor pig units, often as a result of veterinary recommendation on quarterly reports that are required for farm assurance purposes. Do you think that the systems in which these practices are used routinely need to be changed so that the problem does not occur, or is it acceptable to continue these practices?

Animal Aid have recently published a report about the state of pig welfare in British farming systems and released photos that depict poor welfare, filthy overcrowded

conditions with dead animals and medicine bottles lying around all over the place. Yet these piggeries undergo quarterly inspections by the vet – does this reflect badly on the veterinary service as well as the pig industry in general, or are the conditions in these places really not as bad as activist groups such as Animal Aid, like to portray?

Do you think the welfare of cattle could be improved if the muck from its body was removed after stunning at the slaughter house? Would this be possible/desirable/feasible? Or do you think the farmer should take more care to keep the animals clean, perhaps bringing them in to straw bedded housing a week or so before slaughter?

What is the role of the abattoir in maintaining/improving the health and welfare of farm animals?

Have you seen an increase/decrease in welfare problems arising as a result of agri-environment schemes? (So for example where stocking densities have been reduced – moorland farmers report an increase in ticks and tick related illness/disease)

Are there more welfare problems in some areas/environments than others, or in particular farming systems?

Is the welfare of farm animals impinged when they are kept on designated area of land which cannot be improved in any way?

Are woodchip corrals beneficial/detrimental to animal welfare?

Can changes in animal husbandry practices bring about significant improvements in farm animal welfare generally? If so what in particular? Would farmers agree with this? How do you think making changes to improve the welfare of farm animals be achieved without the farmers feeling like changes have been imposed upon them?

Specifically Organic

Is it easier/harder to maintain the welfare of livestock in an organic system compared to a conventional farming system?

Should there be exceptions to the organic rule (i.e. where farmers have a dispensation to use certain treatments/preventatives because their animals are susceptible to a particular problem), or should alternative husbandry practices be found?

If it is acceptable for certain veterinary medicines and preventative treatments to be used to treat illness and prevent welfare problems in farm animals, would it also be acceptable to use certain chemicals/treatments/improvers on the land?

What are the implications for farm animals of the no GM feed ruling by the Soil Association? What benefits are there to animal welfare that warrants the additional costs of non GM feed? Is it likely that livestock numbers will decrease in organic systems so that farmers can avoid additional feed costs or put more land into arable production? What implications might this have for animal welfare?

One organic farmer I spoke to was concerned about how to get mineral supplements into livestock now that mineral blocks could not be used (because of added flavourings). Is this a common problem? What alternatives are there?

In organic farming systems would there be an increased risk of e-coli leaching in to surface waters as manure containing e-coli (more at certain times of year than others) is excreted directly onto pasture?

In outdoor pig production, there is likely to be an increase in excess nitrogen in the soil which would then increase the risk of nitrogen leaching. One way of managing this is by reducing nitrogen from supplemental feed sources, but what effect would this have on the welfare of the farm animal?

Methane emissions may be reduced in cattle by increasing the grain in their diet, but what would the welfare implications of this be? (Breed may be important factor here as cattle selected for their lower residual feed intake, which is those requiring no supplementary feed intake, would have a better feed efficiency ratio, thereby reducing methane gas emissions).

Is animal welfare better, worse or indifferent in extensive as opposed to intensive farming systems? (E.g. lower stocking densities may improve overall health of herd but as animals may not be checked as often, sick or injured animals may be difficult to find/identify (although this is just as relevant in intensive systems where animals all look the same) and/or handle)

Do you think farm animals self medicate (eat specific herbage to promote their own health and wellbeing), or participate in looking after themselves in any way? (What might an animal contribute to its own wellbeing?)

Is the welfare of an individual animal approached differently than a whole herd or flock? Which is more important and how might this have changed?

According to Lunde (2006) parasite related diseases are the biggest welfare issues in organic farming systems, why is this and how is it generally controlled? How different would this be from conventional systems?

Soil Association assessments for animal welfare use the BWAP parameters for measuring the welfare of farm animals but that they don't use the whole programme, preferring instead to utilise only 5 (i.e. lameness, coughing, hock, body condition and skin lesions), does this tell us enough about the welfare of farmed animals?

Appendix E.

Interview Guide for Natural England

First of all could you tell me a bit about English Nature (possibly also use for the RSPB/English Heritage/GAP) and what your role is within this?

Could you tell me how and when environmental policies have emerged within this organisation, and who/what has been the main drivers behind the introduction of these policies? Do you work with partner organisations and in what capacity?

Have policies relating to the natural environment/ biodiversity/ heritage/ bird and wildlife emerged as separate issues within your organisation?

Would these policies have included or been considerate of farm animal welfare? Or have farm animal welfare and environmental policies evolved as separate issues within this organisation. How and when, if at all, has this changed? How do you see things developing in the future, and what do you think has influenced this?

Do you think that farm animal welfare and policies designed to protect and enhance the natural environment, biodiversity; bird and wildlife go hand in hand? Are they compatible or do the needs of one conflict with the needs of the other?

How do you decide the best use for a piece of land and how or why that piece of land matters in terms of sustainability? What environmental targets and indicators influence this?

How is an area of land designated (in terms of its habitat type, its biodiversity, its wildlife and/or bird life importance for example)? Would designations be based on general information about a particular type of landscape/habitat type or would they be site specific? Would farmers/landowners and managers be involved in this process? Do you ever have conflicts over how it should be designated? Where for example you believe that an area of ground should be designated as heather moorland, when farmers working the land might argue that the land has never been heather moorland but purple moor grass? Or where skylarks and other birdlife thought to be declining are actually higher in numbers according to the farmer than the RSPB may accept? What might lead to the emergence of such discrepancies and how would they be dealt with?

Do you use any management tools, such as GIS to help you with designating land and developing management plans? What specifically do you use them for and how does this work? Do you need to do anything else or are these tools enough to provide you with the information that you require to develop your plans? If you spend time out in the field, how much of your time would this take? Would this be more or less than using the GIS? Which is most useful/important in assisting you with developing management plans and why?

When devising land management plans how do you balance the needs of all stakeholders? What would take priority? (for instance between the farmers economic needs as stocking densities are reduced on land for which they pay to rent grazing rights, and in an area where fields have been designated anciently enclosed and where they can do nothing to maintain or improve the condition of the land and grazing; and the preservation or recreation of favourable habitats for plant, bird and wildlife?) How exactly would you go about creating a management plan for something like this, how is it all managed? What if anything takes priority and why?

What if anything would be the main conflicts that you see arising between stakeholders? (so between for example English Heritage, the RSPB, the Wildlife Trust, Farmers/land managers, conservationists, tourists).

Where conflicting interests occur on a farm for instance, would you incorporate the interests of all stakeholders over the entire area of the farm, or would you have one area where wildlife takes priority, another birdlife, another biodiversity and another farm animals. Within the spaces of a farm can all of these things be accommodated in a way that is beneficial to each? And would this allow the farm to remain economically viable as a business?

Would public amenity land be treated differently than land used mainly for farming?

Are farm animals used as a means to protect and preserve particular habitat types (e.g. the NNR on Goss Moor uses horses, ponies and cattle to manage the landscape, whilst the NNR at the Lizard uses just horses and Exmoor ponies)? If so, which ones and why? Would the management plans fully regard the needs of the farm animals in order to maintain their welfare? So for example where woodlands may have been cut down so that the land can be returned to an alternative favourable habitat, the management plan may require that a set number of stock animals are required to graze that land to achieve this. Would you then consider if there was sufficient grazing there to meet the needs of those animals in the early stages? If there wasn't would you allow supplementary feeding until there was? Would you ensure that the site was safe for the stock to go on (by clearing all the debris from the trees that had been cleared to prevent injury to the animals and to enable them to gain access to the whole area)? How would the plan be monitored to ensure that required effect was being achieved and that the welfare of the farm animals was good and not deteriorating?

Once you have determined what sort of habitat is most favourable for a particular area of land, how do you decide its extent (what area that particular habitat should cover, what species should be allowed (or not) to grow there, and what height these species should be allowed to grow to)? How do you decide on the stocking densities required to achieve a particular end? What about the availability of grazing that is left when the desired effect is achieved, is this sufficient to meet the needs of the animals? Will the existing bird and wildlife remain or will their habitats have been lost? Will heritage sites still be visible? Will the public be able to access these sites safely? What about increases in ticks and the increase in tick borne diseases such as louping ill, tick fever, blackleg and redwater that cattle, sheep and horses are susceptible to, and the increased risk of Lyme disease in humans? How do you then account for and manage these problems?

Some areas of land are managed by grazing only, nothing may be added to the land to improve or maintain its condition (Morris has anciently enclosed land that he can graze only, he used to be able to spread calcified seaweed on it but is no longer able to do this so he is unable to maintain the land in good condition). Surely over time the nutrients in the soil and the quality of the land and grazing will diminish leading to a reduction in biodiversity, which in turn will impact on the welfare of the grazing animals. How is this sustainable?

How do you see the responsibility for land management, farm animal welfare, Nature conservation etc as being distributed? Do you think you have a responsibility for farm animal for example or is this down to the farmer to work into the management plan that you devise? Similarly for habitats, plant, bird and wildlife, is it up to the individual organisations dedicated to these areas to ensure that what happens is desirable? What if things go wrong or cannot be achieved within a specified plan, is there a review process?

Would a management plan form part of a farmers cross compliance requirements for Single Farm Payment purposes? Would this be voluntary or compulsory? How would this then be monitored, managed and coordinated and by whom? What would be involved in an inspection and who would undertake this? Are they spot checks or pre-arranged? Do you give advice to farmers/land managers where problems are identified or would you refer to specific advisory bodies? What would be included in such an assessment – would it be the whole farm or area of land, or specific areas only? How long would it take and would some things require more time than others? Would you assess the welfare of farm animals within this procedure? If so what /how would you assess – would you use an assessment tool? How would this information then be used/disseminated?

Do you think a farmer is adequately compensated for participating in schemes designed to protect and enhance the natural environmental, heritage, biodiversity, bird and wildlife? What about the extra work and costs involved for example with leaving field margins for plant, bird and wildlife, which farmers have told me increases the weed burden and so the need to spray their crops. Also how beneficial is this for the plants and animals it is designed to protect?

How would plans for areas of Common land such as that on Bodmin Moor and Dartmoor be managed, particularly where not all members of a commoners association or those with commoners rights agree to participate in a scheme? Have schemes in these areas been successful? Have there been any difficulties?

Do you think existing policies are sufficient to achieve sustainable land management practices?

Do you consider that farm animal welfare is given enough/too much consideration within these policies - do they have a future in land management? What might be changed for the better?

What would you say is the biggest barrier to achieving sustainable land management practices?

What if anything would you like to see happen to improve the current situation and what would the implications of this be for farm animal welfare?

Appendix F.

Interview Guide RSPB

How does the RSPB see the relationship between farm animals and land management?
What are the practicalities involved in this?

What is the ecosystem relationship between birds, wildlife and farming? How do they all fit together or don't they?

When muck/dung is spread on the fields rooks and crows start to work over the ground, followed by starlings and possibly dunnocks, and other bird species all doing their bit to break down the dung so that it can be taken down in to the ground by the earthworms. To what extent is this seemingly natural process worked in to something deliberate – is dung spread at a time when bird populations are high? What are the rules for spreading dung in management plans and to what extent are bird populations built in to this?

Are there other ways in which the natural activities of birdlife is or could be incorporated into farming practices?

Are there any birds that help in the management of other species – e.g. sheep help to clean the ground for cattle by reducing the worm burden in the soil. They can also be used to encourage tillering of grass or other crops is they are grazed when the plants are young.

Is there evidence, or do you come across instance where one species helps to manage another.

To what extent are birds used as indicator species for biodiversity on farmland? Which birds are used and why? Whose biodiversity does this refer to – what is good for one species may not be for another (e.g. livestock)

Specialists: Corn Bunting, Goldfinch, Grey Partridge, Lapwing, Linnet, Skylark, Starling, Stock Dove, Tree Sparrow, Turtle Dove, Whitethroat, Yellowhammer *Generalists:* Greenfinch, Jackdaw, Kestrel, Reed Bunting, Rook, Wood Pigeon, Yellow Wagtail.

I am interested in the cuckoo, they thrive in areas where their host species live, so this is often farmland and open moorland. To what extent does the cuckoo contribute to the elimination of its host species? Is it also an indicator bird? Often farmers get the blame for the decline in some birdlife but could this be part of the natural process?

To what extent do you see intensive livestock systems as detrimental to birds, so for example an intensive pig or poultry unit – what are the implications of this for birdlife – for example does the ammonium harm them or put them off nesting in these sites – is the equipment, machinery detrimental to birdlife? What are the negative aspects of these intensive units for birds?

What has been the role of the RSPB in developing policies aimed at improving the natural environment? What/who has influenced the development of these policies? How and when have these policies emerged and with what effect on birdlife?

Have policies relating to different aspects of the natural environment emerged and been dealt with as separate issues within your organisation or have they co-evolved?

Has farm animal welfare been a consideration within this or has this been seen as a separate issue? How/when might this have changed? How do you see things developing in the future and who/what do you think might influence this?

Do you think that policies designed to promote animal welfare and those designed to protect and enhance the natural environment, plant bird and wildlife are compatible or do the needs of one conflict with the needs of another?

How do you decide if a particular piece of land matters in terms of sustainability? What environmental targets and indicators influence this?

How is an area of land designated in terms of its importance to bird life for example? Would designations be based on general information about a particular type of landscape/habitat type or would they be site specific? Would farmers/landowners and managers be involved in this decision making process? Do you ever have conflicts over how it should be designated? Where for example skylarks and other birdlife thought to be declining are actually higher in numbers according to the farmer than the RSPB may accept? What might lead to the emergence of such discrepancies and how would they be dealt with?

Do you use any management tools, such as GIS to help you with designating land and developing management plans? What specifically do you use them for and how does this work? Do you need to do anything else or are these tools enough to provide you with the information that you require to develop your plans? If you spend time out in the field, how much of your time would this take? Would this be more or less than using the GIS? Which is most useful/important in assisting you with developing management plans and why?

When devising land management plans how do you balance the needs of all stakeholders? How would you go about creating a management plan and how would it all be managed and monitored? Do you work with farmers and land managers (with what success)? Do you incorporate animal welfare when compiling these plans? What if anything takes priority and why?

What if anything would be the main conflicts that you see arising between stakeholders? (so between the interests of the RSPB for example with English Heritage, the Wildlife Trust, Farmers/land managers, conservationists, tourists). Would reducing stocking densities to protect certain habitats and biodiversity have a beneficial or detrimental impact on birdlife, particularly on moorland areas where the gorse and bracken would increase?

Do you target specific areas of a farm for particular species or would you devise a management plan for the whole farm? And would this be considerate of the interests or other groups/organisations?

Do you consider the financial viability of the farm when devising management plans aimed at protecting birdlife?

Would you use farm animals as a means to protect and preserve particular habitat types for birdlife? If so which ones and why? Would management plans fully regard the needs of the farm animals in order to maintain their welfare? Would/could you adapt plans to improve farm animal welfare?

Would public amenity land be treated differently to farmland? If so how and why?

Some areas of land are managed by grazing only, nothing may be added to the land to improve or maintain its condition (Morris has anciently enclosed land that he can graze only, he used to be able to spread calcified seaweed on it but is no longer able to do this so he is unable to maintain the land in good condition). Over time it is likely that the nutrients in the soil and the quality of the land and grazing will diminish leading to a reduction in biodiversity, which in turn will impact on the welfare of the grazing animals. Would this also impact on the birdlife and in what way?

How do you see the responsibility for land management, farm animal welfare, Nature conservation etc as being distributed? Are there some areas of land management not currently covered by groups/organisations/government departments? Do connections between these various stakeholders currently work well together?

Do you think you have a responsibility for farm animals for example or is this down to the farmer to work into the management plan that you devise or contribute towards? What if things go wrong or cannot be achieved within a specified plan, is there a review process and if what does this involve?

What will be the impact of rising grain prices on birdlife, so for example where less/no cattle are grown in favour of arable crops, how will this affect birds?

Would a management plan relating to the protection of birds form part of a farmers cross compliance requirements for Single Farm Payment purposes? Would this be voluntary or compulsory? How would this then be monitored, managed and coordinated and by whom? What would be involved in an inspection and who would undertake this? Are they spot checks or pre-arranged? Do you give advice to farmers/land managers where problems are identified or would you refer to specific advisory bodies? What would be included in such an assessment – would it be the whole farm or area of land, or specific areas only? How long would it take and would some things require more time than others? Would you assess the welfare of farm animals within this procedure? If so what /how would you assess – would you use an assessment tool? How would this information then be used/disseminated?

Do you think a farmer is adequately compensated for participating in schemes designed to protect and enhance birdlife? What about the extra work and costs involved for example with leaving field margins, which farmers have told me increases the weed burden and so the need to spray their crops. How beneficial is this for the birds it is designed to protect?

How would plans for areas of Common land such as that on Bodmin Moor and Dartmoor be managed, particularly where not all members of a commoners association or those with commoners rights agree to participate in a scheme? Have schemes in these areas been successful? Have there been any difficulties?

Do you think current farming and environmental policies are sufficient to protect birdlife as well as maintain the welfare of farm animals, the quality and condition of the natural environment and the sustainability of the farm business?

Do you consider that farm animal welfare is given enough/too much consideration within these policies - do they have a future in land management? What might be changed for the better?

What would you consider to be the biggest barrier to protecting birdlife in the Southwest of England?

What if anything would you like to see happen to improve the current situation and what would the implications of this be for farm animal welfare?

Has the removal of set aside impacted on programmes aimed at protecting farmland birds? Would this be an area of conflict between the protection of birdlife and farming practices? Were the RSPB consulted/involved in making this decision?

What are the advantages/disadvantages of livestock farming to birdlife? Some farmers report problems with rooks, magpies and seagulls in particular in relation to the welfare of their livestock, particularly the youngstock, is this a widespread problem and how can they deal with these issues?

Are bird numbers actually increasing again in the southwest? If so in which areas would this be and why?

Some of the farmers I have spoken to get quite cross about the lack of knowledge they are deemed to have regarding birds and other wildlife on their land, do you think this is a fair comment/assessment or are they more knowledgeable, empathic and caring towards them than is often thought, taking measures to protect and not disturb, rather than carrying on regardless or just acting within the law because they have to?

What are the implications of arable fodder crops, permanent pastures and reseeded leys of farmland birds? Which would be most beneficial and why?

How important is the seed mix for birdlife in reseeded leys?

With moorland stocking densities being reduced to promote certain types of habitat such as heather moorland, there has been an increase in gorse and bracken. What effect has this had on birdlife? What about burning and swaling practices used to manage scrubland, what are the implications of these for the birds? Would the RSPB be involved in any of this?

One farmer explained to me that although he has taken measures to improve the birdlife on his farm by growing bird crops and leaving field margins and permanent pastures, he has had to remove the skylark plots he had put in because they had increased in size and were attracting rooks and crows that were harmful to his crops. Has this been a common experience and have you come across other things like this that may be detrimental to the farmer, the land or the livestock?

What are the implications of no till (maybe tilled once then herbicides used to control weeds), versus mechanical tilling (organic systems) for birdlife? Do all herbicides have a detrimental impact on birds or can they be used successfully if managed well?

What are the implications of different types of pasture for birds?

Appendix G.

Interview Guide for EBLEX

It states on your website that EBLEX seek to create a sustainable and competitive beef and lamb industry, what exactly does this entail?

When talking about sustainability does this also include environmental sustainability?

How and when have environmental policies emerged/affected your organisation and who/what if anything has influenced this? In your experience, what impact has agri-environmental policies had on your members? How has it affected their farming practices and/or the welfare of their animals? What have been the main problems farmers have encountered in meeting the requirements for agri-environment policies? Does this vary according to the type of land/farming system? Which farms in particular struggle to meet policy requirements most? How, if at all do EBLEX address these problems and how do they help the farmer?

What have been the economic implications arising from agri-environment policies for the overall sustainability of beef and sheep farms?

Do you think current agri-environment policies go far enough to protect the natural environment and keep land in good agricultural condition for future production? Are they sufficient to ensure the future sustainability of the industry or does more need to be done? If so what/why?

How and when have policies relating to the welfare of farm animals emerged within your organisation? Has this been related in any way to environmental policies or have welfare standards and objectives been a completely separate issue? How might this have changed?

What have been the implications of animal welfare and/or environmental policies for the quality, safety and price of the end product and for the economic viability of livestock farmers? What has been the role of EBLEX within this?

Do you think the achievement of good animal welfare and environmental sustainability in terms of maintaining the quality and condition of the land, protecting our national heritage, biodiversity, plant, bird and wildlife are linked? Are all of these things actually compatible or are the objectives they each seek to achieve conflicting? If conflicting where do they conflict and how? (E.g. reduced stocking densities can improve condition of land and parasite burden for cattle and sheep, whilst at the same time reducing the available grazing for sheep that prefer the shorter swards. Less stock also means that the farm is less productive in economic terms – how do they begin to balance out all of these things? Lower input costs-adding value to end product-raising meat prices?

Do you consider that improvements to the natural environment can have a positive impact on the wellbeing of farm animals? If so how?

What about improvements in animal welfare, could they help to improve the sustainability of the land? If so how and in what ways?

Are current animal welfare policies and standards sufficient or do you think there is more that needs to be done? If so what and how? Does the EBLEX farm assurance scheme currently meet or exceed these standards? If it exceeds them in any area why have the standards been set higher?

How would you define animal welfare? (For example do you link it to terms such as protection, wellbeing, individual needs, health, natural behaviour and sentience?)

What would be the main welfare problems that you encounter as you talk to farmers in the southwest?

How can these problems be reduced? Do EBLEX contribute towards finding solutions and if so how?

A lot of farmers I have spoken to express concern about ear tagging, do you find this is a common problem that has implications for the welfare of farm animals? Do you think double ear tagging is necessary? Could it be done differently or in a way that does not impinge on the welfare of the animals?

Do you think that the addition of equipment such as cages to turn sheep and high quality housing etc improve the welfare of farm animals? Would you say that the welfare of animals on farms without access to such resources is poorer? How/why?

What, if anything do you think prevents farmers from caring for their animals and the land in a way that they would like and to the standards they wish to see?

How do you see issues/policies relating to welfare and environmental sustainability as developing in the future? What role do you think EBLEX will play in this?

Do you think EBLEX understands the reality that many farmers face in meeting environmental and animal welfare policy requirements? What are the main problems that you come up against and how do you help farmers overcome these problems?

How often do you undertake farm assessments for your Farm Assurance Scheme?

Who does the assessments?

What do assessments involve, do you specifically assess farm animal welfare for example and if so would this be on an individual basis or for the whole herd? What are the specific animal welfare and environmental requirements of the scheme?

Would you require a veterinary report for the animal welfare assessment?

What animal welfare protocols do you use (e.g. Bristol vet school)? Would this involve assessment of biological, physical and behavioural parameters or only certain ones? Which ones and why?

How long would an assessment normally take? How much time is spent assessing animal welfare quality and how much time is spent assessing the land and records/paperwork?

What is involved for the farmer? How much notice would they get? Do you undertake spot checks?

Can the assessor offer definitive advice to the farmer, or would the advice they give be best practice advice only? Is this advice likely to be animal specific solutions or farm specific?

Do you have a health and welfare advisory department within EBLEX or would you refer farmers to other advisory bodies? If so which ones?

In your farm inspections would you also be looking at the quality and condition of the land? How and what would you be looking for/at?

How important is herd health planning for farm animal welfare? Is this something that your farm assurance scheme requires? What does/should this involve? Would this be something that farmers can do on their own just by recording and monitoring farm information or does it require veterinary consultation? How many EBLEX members actually do this? If low number, why do you think this is?

What role does the vet play in beef and sheep farming today? How has this changed? How do you see this developing in the future?

What are the biggest health and welfare problems you have come across for cattle and sheep in recent years? How are these things being dealt with? Is this enough or are there other things that you think should be done? If so what/how?

Would your farm assessments also include physical check for the presence/administration of illegal substances for either animals or land; disposal of waste etc or would this be a paper exercise only?

How is the information from farm assessments collated/disseminated? Is this linked to cross compliance for the single farm payment at all? If so how does this work? If not do you think it will be in the future.

How does the farmer benefit from being a member of EBLEX? Has this always been the case or have things changed? How do you think this might change in the future?

Do you think that membership of a farm assurance scheme is enough to convince consumers that high welfare and environmental standards are maintained? If not what do you think needs to be done to achieve this?

How often do farms fail their inspection and what is/are the most common causes? What happens if they fail?

In your opinion, how has farm animal welfare improved in recent years and why?

What are the implications of breed on farm animal health and the natural environment?

What is the effect of different feeding regimes on animal health and welfare? For example feeding compound foods, sugar beet, grain, reop, stubble turnips or kale for example against feeding a grass only diet?

Do you consider the speed at which an animal reaches mature weights to impact on its health and wellbeing? What about the impact this might have on the environment?

What effect would feed and the speed of reaching mature weights have on carcase quality, grade and profitability?

Do you consider clipping animals before slaughter to be a welfare issue for animals and/or farmers? Is it feasible for farmers to house animals prior to slaughter in deep straw to get them clean or would it be more welfare friendly to clip them at slaughter once stunned?

Do you consider movement restrictions to be a problem for farmers in terms of maintaining the health and wellbeing of their animals, for example where restrictions prevent a calving cow being returned home from 5 miles down the road. Or is it more important to protect the British herd/flock. (Similarly with the imposition of blue tongue restrictions, some holdings must fall on the border of two counties or at least have land/animals within both restricted and unrestricted areas; what are implications of this for farmer/animals?)

What role does the abattoir play in maintaining or improving animal welfare?

Appendix H.

Interview Guide for Farm Assurance Officers (Freedom Foods)

First of all could you tell me a bit about what you do and about your role within that? What is your background (are you veterinary trained or have you been trained with the RSPCA and to what level?) Are you fully employed by the RSPCA or are you freelance?

How has the Freedom Food standards come about? What would you say has been the main driver behind improving farm animal welfare?

How does Freedom Foods differ from other Farm Assurance schemes like Red Tractor, Assured British Meats, the Soil Association, FABL, and CMI etc? How stringent are your standards and assessments in comparison to other schemes? Do you also assess for these schemes? How does that work? Is it a good idea to do this – do farmers find it helpful?

How would you define animal welfare what does it involve (does it for example include biological functioning – linked to productivity/reproduction – sentience – linked to an animals ability to feel emotion and suffer pain - the behavioural needs of the animal – linked to its natural telos – and environmental conditions – so how/where it is kept)? Is more emphasis placed on any of these things than the other – so for example would the animal's ability to behave naturally take precedence over productivity for example?

One of the requirements of the scheme is to produce a veterinary health plan, is this something you give advice on or help farmers to do, or is it something they must complete with their own veterinary? How important are these health plans – have you seen improvements in welfare because of them?

How often do you assess Freedom Food farms? Are farmers notified or are they spot checks? Do you have assessors specifically for pigs, beef, dairy and sheep or would one person assess all?

What does an inspection involve? How long would an average farm take to assess? What exactly are you looking for – I assume this involves ensuring the buildings/equipment/electrics/health and safety etc, are all up to standard as well as checking paperwork and the animals themselves? How long do you actually spend with the animals during the assessment and how does this equate with everything else that you assess? Do you see the animal's in situ (field/shed/moors) or are they run through a race and inspected individually? Are you looking at the health and welfare of the individual animal or are you more interested in the overall health and welfare of the whole herd? At what level would a farm be considered non-compliant – would it need to be over a certain number of lame sheep for example – if so how many would that be? What are the most common problems that you find?

Are you able to give advice to farmers where problems are identified in terms of animal health and welfare or would you have to refer them to their veterinary surgeon or other

advisory body? What about with other problems that you might identify, for example with waste disposal, housing and equipment?

What sort of relationship do you have with farmers? Do they pick your brains and use you as a source of reference and advice? Do you think they should be able to or should they be going back to their own vet and paying for that advice?

How would you expect health and welfare problems to be rectified – obviously if an animal needs treatment then that must be given, but would you expect the farmer to put in place measures to prevent a reoccurrence of an illness or disease, like the soil association do for example, or would you be satisfied that animals are routinely treated with anthelmintics to prevent illness and disease? Similarly I understand that FF doesn't allow routine teeth clipping, tail docking and nose ringing for example, how often does this happen in reality? Are farmers expected to make changes to the system so that the need for these mutilations is removed? (The reason I ask is because in general indoor pig units tail docking and teeth clipping seem to occur as routine and is endorsed by the vet in the quarterly inspections, yet government welfare codes, like the FF codes clearly state that this should not be done routinely unless absolutely necessary and that measures should be put in place to prevent it? But from what I see nothing changes and the practice continues.

Are you able to provide veterinary treatment, write prescriptions or cull an animal that is suffering?

A lot of the assurance standards seem to be about having a plan in place to cover most eventualities – how effective is this in reality – its one thing having a plan written down but in your experience, do they work in practice?

One Freedom Food farm that I visited was a bit put off with the assessment because the assessor had suggested that the electrics on the farm would need to be replaced in the near future and this would obviously involve considerable investment. The farmer seemed to feel that the money could be spent better elsewhere on the farm making the animals more comfortable – Is this something that you come up against very often? Do you get many members leaving a scheme because of things like this? Do you have ways of helping them with expensive outlays like this?

Do Freedom Foods provide any sort of training to farmers in the care of animals?

Are you concerned with the management of the whole farm? Do you look at things like the quality and condition of the land? How important do you think the quality and condition of the land is in relation to the welfare of the farm animals? How does the type of land and soil type impact upon the welfare of farm animals? (Trace elements and minerals, wet ground and liver fluke/worm burden – but also in terms of rough moorland, scrub, Nature conservation sites, upland, lowland etc).

What about the animals feeding regime – how would this impact upon welfare and is this something that you look at? So for example where you have grass fed beef as opposed to beef that graze and are also fed cattle rolls, or home mixed feed rations incorporating things like lupins and clover or chicory (which is supposed to have anthelmintic properties) for example – would the health and welfare of one be better than the other. Would different types of pasture affect the welfare of the animals where for example, you have permanent

pasture, reseeded leys, meadowland, wetland etc? FF promotes the slow growing of animals as being welfare friendly – what are the benefits of this and how is this affected by the feeding regime?

How important is breed in achieving good health and welfare? Is this linked to the natural environment and type of land that animals are kept on and the type of system that is being operated? How and why? Do you think the welfare of breeds such as the Belgian Blue can ever have good welfare – should breeds like this be allowed to survive – even though they may contribute something to increasing production? Is it important to develop breeds for specific purposes to avoid welfare issues, such as the featherless chicken for example?

Can animals be brought onto a Freedom Food farm from a farm that is not FF?

If an animal is reared outdoors, is it detrimental to welfare to then finish that animal indoors in an intensive unit for example, or would an animal reared indoors and then finished outdoors suffer?

What costs are involved with being a FF farm? Is it expensive to achieve your standards, or do you feel it is within the grasp of all farmers?

How important is access to resources such as machinery and equipment in maintaining the health and welfare of the animals? If a farmer hasn't got access to such things would you say that the welfare of his animals would be compromised? In general do FF farmers have access to such equipment/machinery/housing and handling systems – is it a requirement of the scheme which may exclude some farms that may have high welfare standards?

Is being a FF farm cost effective? Does the use of welfare as a selling point actually command a higher price for the end product and does the farmer actually benefit from this?

To what extent would you say the natural environment of the farm is improved by adopting these higher animal welfare standards?

Could farm animal welfare be improved if the quality and condition of the land were improved? If so how?

Do you have many organic FF farms – are the two things compatible? How do you find animal health and welfare on organic farms generally – is it better or worse than standard FF farms?

Are all animals kept on FF farms free range? Many people would argue that an animal needs to be able to go outdoors to be able to perform its natural behaviour and to graze naturally, so how do you justify this? Hugh Fernley programme suggested that chickens are now lacking in omega oils and other minerals, vitamins and trace elements derived from free range grazing which affects their wellbeing and changes the composition of the meat – there now being higher fat than previously. Is it necessary for animals to be free ranging to ensure high welfare or can it be achieved in other ways? What about the use of stalls in cattle sheds – is this acceptable in FF standards – how would this be justified?

Similarly with the use of chemicals, antibiotics etc should they be used – especially where things like Ivomectin may be detrimental to the invertebrates in the soil?

Do you use a farm assessment tool such as the BWAP (Bristol Welfare Assurance Programme) or any of its parameters? If so which ones and why? How do find assessing these?

What do you think about the use of outcome based measures in farm animal welfare assessments? Is this something that you do? How easy or difficult is it? Do you think the results are reliable – how can you justify the results? Can outcome based measures tell us anything more than environmental measures and if so how? Do you think that more outcome based measures should be used in assessments generally?

What sort of mortality rates would you expect on FF farms? Would this be any different from non FF farms? Why?

Do you look at abattoir records - is this something that you consider to be important in maintaining the health and welfare of farm animals?

Do you agree that culling persistently problematic animals to improve the overall health of the flock or herd is a good management policy? (So selective breeding – e.g. 3 strikes and out – low calvers, susceptible to mastitis, lameness – small litters, low survival rate etc. Also culling for temperament – is this good practice?)

What happens when a FF farm is tied up with tb or have movement restrictions imposed because of disease – how are things like overcrowding, not enough feed etc dealt with when farms are on standstill – and what about having to change the system from perhaps one that doesn't finish to one that does because of imposed regulations – how is animal welfare affected/maintained then? Do you come across problems because of this?

Do you have any ff Farms that have animals on ESA land or where they might be used for land management purposes for Natural England or the National Trust for example?

As an assessor, would you have any form of contact with the farms own vet and if so what would this be for?

Do you consider outdoor rearing of pigs to be a welfare problem where sows farrow outdoors?

What about housing cattle – should they be housed overwinter – what if anything would this depend on? Does housing impinge on an animal's ability to perform its natural behaviour and as such is this a welfare issue?

Are there any environments or farming systems in which you consider animal welfare to be poorer than it should be or are poorer than others?

Is tagging a welfare issue?

How much more space than government guidelines do you specify for farm animals in general? One FF farmer I have spoken to has actually increased his space requirements in

sheds to more that ff standards this year in attempt to keep his cattle cleaner and reduce the need for cleaning/shaving animals prior to slaughter (although I don't think it has worked) – is this something you find problems with and do you look for solutions to things like this?

Do you sample and assess feed? What do you look for?

What do you think affects the farmer's ability to care for his animals: finance, time, access to land, machinery and other resources, knowledge and experience, his affinity with the animals and his ability to empathise with them?

Do you consider movement restrictions to be detrimental to animal welfare?

Are farm animal welfare objectives compatible with maintaining environmental security, the biodiversity of plant, animal and bird life and the preservation of heritage sites? Do these things challenge or compliment each other? Do you see farm animals as playing a role in achieving the other objectives or is livestock more about profitability of the farm?

How do you think animal welfare has improved in recent years? How/Why?

Is the promotion of animal welfare achieved through the herd/flock management or through the needs of individual animals? Is there a difference and is it important?

Does FF have restrictions on land use/management in relation to animal welfare, so for example can FF farms use Ivomectin?

Would you advise farmers to use faecal egg counts to reduce the reliance on anthelmintics?

When conducting assessments do you bring animals in and run them through a race or do you look at them as a herd or flock in situ?

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