

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) Transforming the Rural. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

The Chicken Game – organization and integration in the Norwegian agri-food sector

Hilde Bjørkhaug*, Jostein Vik* and Carol Richards+

*Centre for Rural Research, Trondheim, Norway

+Queensland University of Technology, Brisbane, Australia

Abstract

Up until recent years, all agricultural production in Norway was strictly regulated through spatial policy (location), production quotas, and other price and market regulations. Prices and products were handled by the farmers' cooperatives. International (e.g. WTO agreements) and domestic pressure has gradually loosened the governmental regulation of chicken and eggs. Economic (e.g. new ownerships), technological (innovations throughout the whole chain), political and institutional (liberalisation), and cultural (e.g. in consumption and farming) changes have reconfigured the landscapes of chicken-meat production, opening up new opportunities for the chicken industry. Chicken therefore makes a particularly good case for exploring recent major changes in the agri-food system. In this chapter we investigate evolving rules, risks, challenges and opportunities in and around chicken-meat value chains. Empirically, we build on interviews, document studies and statistics on the structural development of the chicken industry and we discuss how these changes are developing in other parts of the Norwegian agri-food system.

Introduction

Transforming chicken - evolving rules, risks, challenges and opportunities

“If you want to understand agrifood globalization, you should study the chicken industry”. With this claim by the leading “chicken sociologist” Douglas Constance et al (2013), we introduce this paper’s aim, to understand the relationship between agrifood globalization and developments and

trajectories in Norwegian chicken¹ production. Constance's remarks are particularly apropos with respect to this industry as one of the more remarkable agricultural developments over the last 20 years is its growth in Norway as well as globally (see Constance, et al, 2013). Once seen as a luxury item, something to be enjoyed on special occasions such as Christmas (Dixon, 2002), chicken has now become an everyday product available to most people in the global north as convenient and processed fast food 'ready-meals' or a cheap home-cooked meal. Indeed, a wide variety of chicken-based meals have become available. At the same time, chicken is enjoying an image as a healthy low fat food. The combination of convenience, variation, low price and health seems to be unbeatable worldwide. The price of chicken to households has also been reduced over the years. Numbers from the Food and Agriculture Organization (FAO, 2015) show an increase in production from 35 million tonnes of chicken meat in 1990 to 58 million tonnes in 2000, while in the projected number for 2015 shows an increase to 112 million tonnes, the highest rate of growth among meat, and in tonnes, only beaten by pig meat. It is expected to grow further. In the US, it was estimated that 36 kilograms of chicken is consumed per capita per year (Sampson, 2008). In Norway, annual chicken consumption have increased threefold since 1992, rising from 4 kilograms (Aftenposten, 2012), to 18 kilograms chicken eaten per person in 2013 (Kielland, 2013).

However, the growth of the chicken industry has been controversial. Worldwide it has been associated with highly problematic and sometimes bizarre animal welfare issues such as chickens growing so fast that their legs can't hold them up, the collapse of their inner organs because of the emphasis on quick weight gain, burns caused by ammonia in faecal matter, and harsh treatment during transportation and slaughter processes (Burch, 2005; Constance 2008; Constance, et al, 2010; 2013; Miele et al, 2005; 2011). There have also been reported problems with local pollution and local community resistance (Constance, et al, 2003; 2005; Constance 2008) use of marginalised labour in the processing industry and contract farmers locked into asymmetric dependency relations (Griffith and Stull, 1995; Constance, et al, 2013); and challenges connected to contract systems of production (Constance, et al, 2013; Knoeber, 1989).

¹ We use chicken interchangeably as the concept of what in industrial terms is known as poultry and/or broiler.

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural*. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

More recent concerns are the detection of MSRA (Methicillin-resistant *Staphylococcus aureus*), along with frequent reports on E. coli bacteria and salmonella outbreaks, among others (Kielland, 2013), as well as potential infected/resistant bacteria in unhatched eggs (Kielland, 2013).

This said, while there are some basic similarities with respect to the development of the chicken industry in different countries, there are also key differences (see e.g. Boyd and Watts 1997; Burch, 1995; Constance and Heffernan 1991, Constance, 2008; Dixon, 1999; Vik and Bjørkhaug, 2015). For example, while US, agriculture follows varying liberal and deregulated trajectories, Norway is a country where agriculture has traditionally been heavily regulated. It is therefore interesting to see to what degree the chicken industry is symptomatic of a new liberal agriculture in Norway as this country strives to become more calorie self-sufficient. What does this mean in terms of its historic regulatory and supervisory public sector role? Will all regulation become a thing of the past? Not necessarily. Rather, deregulation describes a transfer of regulatory authority and competencies from public authorities and farmer cooperatives to private non-state actors. Such transitions are both controversial and consequential. In her influential book, *The Retreat of the State*, Susan Strange states that “What some have lost, others have not gained. The diffusion of authority away from national governments has left a yawning hole of non-authority, ungovernance it might be called“ (Strange, 1996:14). It seems though, that in the food markets, the “yawning holes of non-authority” are easily filled. Our hypothesis is that when some sectors lose control, other regulation evolves through competing structures of governance.

The term *governance* has become an umbrella term for studies of “new theories, practices, and dilemmas (that) place less emphasis on hierarchy and the state and more on markets and networks” (Bevir, 2011). Without taking an *ex ante* position on whether deregulation in agriculture is emptying the field for authority and responsibility, or whether new evolving structures of governance is ‘just’ outsourcing authority to other actors, we offer insights into agricultural deregulation and governance and its consequences as seen through recent major changes in the Norwegian chicken industry. Consequently, this article investigates evolving rules, risks, challenges and opportunities in and around new developments in the Norwegian chicken value chains, or rather, those *externalities* that are disclosed with the liberalisation of the Norwegian chicken industry.

The chapter is structured as follows: First, we present a theoretical approach to the study followed by the methodological design. The chapter will then discuss economic, technological, political, institutional and cultural changes, and the development of parallel value chains for Norwegian chicken representing “old” social corporative integration and “new” vertical (retail) integration and financialisation. These differing value chains are used as comparative nodes for discussion of the rapid growth in Norwegian chicken production.

The perfect model?

The economic model of the chicken industry has been successful meaning regarding its ability to rationalize and decrease consumer price (Constance, et al, 2013). Constance, et al. (2013) describe how the Southern US chicken industry grew through a favourable climate, low labour costs, technological innovations and government supported food production programs into dominating all US production of chicken production from the 1930s. From being based on independent chicken growers, the Southern model developed as a system of vertically and horizontally integrated firms that controlled production and producers through contracts, leading to regional monopsonies.

While technology and cheap labour have been instrumental in the chicken meat supply chain globally, the economic, organizational and governance structures of the industry are also crucially important in understanding the transformation of the chicken meat supply chain. In particular, variations of integration in the chicken value chain have not only consolidated chicken meat production, but also the power of the oligopolistic market actors. In other words, control of the various segments of the supply chain, either through contractual relationships with chicken farmers/contractors, or through mergers and acquisitions of segments of the chain, control of the supply chain has been placed in the hands of a small number of corporate actors (Constance, 2008; Constance, et al, 2013; Dixon, 2002). Benefits of integration for a integrating company include continuity of supply, access to management information, free communication and co-operation, reduced barriers to market entry, increased flexibility and customization possibilities, direct influence of quality, delivery and cost, spread of the costs of overheads, reduced logistics and speed of data flow (Manning and Baines, 2004:822-823). On the downside, for producers in

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), *The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector*, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural*. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

these contractual arrangements, integrated and consolidated supply chains creates a market force characterized by an ever-decreasing number of customers (for example, major retailer chains), placing even greater power into the hands of the integrating firm (Manning and Baines, 2004). As Constance et.al. (2013) notes in relation to the US, vertical integration rationalized the broiler industry as it brought all aspects of the production chain (e.g. breeding, hatching, growing, feed mills, transportation and processing plants) under the control of the integrating firm.

And further noted by Constance, et al (2013:63-64)

Although vertical integration rationalized the broiler industry, the crucial component of the system was the production contracts as the formal link between the broiler grower and the processing firm. The contracts allowed coordination production but did not require the company to either tie up capital in land and buildings or formally employ the farmers, with associated guarantees of wages and benefits.

The latter quote explains how horizontal integration gives the firm control but few responsibilities in the supply chain, leaving several production risks to the farmer. This indicates how 'integrators' or 'chain captains' self-describe as a model of business success that provides healthy and nutritious white meat for the population. However, some of the negative externalities of the industry are glossed over. These externalities may include pollution, exploitation through low unionization, poor compliance with occupational health and safety regulations, breaches of animal welfare regulations, and a dubious record in relation to rights for migrant workers (Sampson, 2008). Others have also written about the extent to which these externalities can be underwritten, such as state provision of subsidized housing to low-paid workers and welfare for injured meat-packing workers (Schlosser, 2002).

Through vertical integration, the "chain captains" are able to control the whole chain but also bear fewer risks, as seen through contract arrangements (Manning and Baines 2004). The position of these chain captains within the supply chain largely depends upon the nation and its own market structures. In the US, "chain captains" are considered to be at the processor and food service level, while in Europe, the power is lie more squarely with retailers (Manning and Baines, 2004:820). This issues raised by Sampson (2008) have been viewed in terms of 'moral economy'

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural*. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

(Jackson, Ward and Russell, 2009) or ‘cultural economy’ by Dixon (2002). This approach extends the commodity analysis reach beyond economics and into moral, cultural and ethical aspects of modern food systems, addressing how chains are shaped by different regulatory bodies and institutional actors (Jackson, et al, 2009). Combining moral and political economies of the chicken supply chain, this paper examines the meat chicken industry and its governance in Norway.

Data and methods

This chapter seeks to give a broad introduction to recent changes in the Norwegian chicken industry, with its economic, technological, political and institutional and cultural elements. The methodology used can be described as abductive. Abduction is a process of gaining new knowledge (Peirce, 1955). Theoretical and empirical sources develop in a dialectic relationship throughout the research. Given the beginning nature and status of research in this field in Norway compared to internationally, it was necessary to develop the research as a road “forward” towards greater knowledge and understanding of what is taking place in the Norwegian chicken chain. Along this journey we have tested, rejected, and adjusted our research questions in dialogue with the empirical data collected and the theoretical tools that we employ in the chapter.

We have employed a broad set of sources to triangulate the data, including interviews, key texts and statistics. In addition to drawing upon relevant journal articles and book chapters that describe developments in the chicken value chain, media texts such as newspaper articles are also an important basis for empirical data in this chapter. Media texts were in particular important in the introductory and final phase of this research given that developments in the chicken industry have been a field of interest to newspaper journalists for a while. The nature of the so-called negative externalities that evolve in and around this production are frequent and regularly reach the newspaper desk as well as social media as ‘sensations.’ A short list might include, for example, salmonella outbreaks, multi resistant bacteria and e-coli finds, labour and animal rights breaches, and air and water pollution events.

Similarly, in their analysis of change management style of the retailer Rema1000, Brustad (2014) and Brustad and Bjørkhaug (2015) show the power of newspaper articles in relation to the

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural*. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

company's attempts to improve environmental, social and economic responsibilities and reputation. In this chapter we also build our analysis on a sample of local, regional and national newspapers using search strings in Retriever over the period between 2005 and 2015.²

Interviews were conducted with representatives involved in the chicken value chain, including hatcheries, farms, abattoirs, refiners, retail shops as well as Norwegian food authorities who govern rules and regulations and execute control in the food value chain. Altogether, 12 people were interviewed for this study. Developments in the market side have been explored through media text and information gathered in statistics on production and consumption, as well as dialogue-meetings and through research literature (see e.g. Kjærnes, 2015).

The report from the public investigation into power relations in the food value chain (Matmaktutvalget) (NOU, 2011:4) and the Norwegian Food Safety Authority (FSA) provides another important source of information for this study. Visits to producers and abattoirs and processing plants, with guided observation tours, and a public dialogue meeting with representatives also provides a valuable source of information. Statistics have been gathered from public sites as well as through the Norwegian Agricultural Authority (Statens landbruksforvaltning (SLF), Norwegian Institute of Agricultural Economics (NILF) and Statistics Norway (SSB) to enable a description of structural changes in chicken production, industry and market of chicken meat.

Evolving rules, risks, challenges and opportunities in the Norwegian chicken sector

In the following section, we present, analyse and discuss important changes in policy settings for the chicken industry and its different responses and emerging challenges in the production and market situation. Here reductionist explanations are clearly inadequate. Rather, we first describe some of the structural and regulatory changes of the chicken industry in Norway, and second discuss some of the developments, dilemmas and problems in the industry in light of major organizational value chains in the industry. In this way, we put forward an improved

² Retriever is a Nordic Region's supplier of media monitoring and tools for research search in printed newspapers, magazines, TV/radio or the Internet (<http://www.retriever-info.com/en/om-oss/>).

understanding of the chicken industry in general and on what can be ascribed to the diverse elements of structures of governance in particular.

Developments in policy instruments and regulations

All agricultural production is regulated and dependent on both an institutional and policy framework and the actions of various players in the market, yet governmental regulation of chicken and eggs have gradually loosened. Recent conceptualizations on the relationship between public authorities and private actors is known as governance or network governance (Bevir, 2011, Daugbjerg and Swinbank, 2012; Land, 2003; Lindberg and Fahlbeck, 2011; Newman, 2005; Pierre and Peters, 2000; Røiseland and Vabo, 2008, Stokerm, 1998; Sørensen and Torfing, 2005). How this interaction is carried out might vary substantially. In an economic area, such as the as the chicken sector, this can develop either through strong producer organization and hence regulation e.g. through a strong cooperative organization or through developments initiated by private market actors closer to the end of the value chain, such as slaughterhouses or supermarket chains. The range of regulation and control might stretch from production of volumes and time of slaughter to quality aspects of products (Richards, Bjørkhaug, Lawrence and Hickman, 2013). Self-regulating markets are also a form of governance, but appear less frequently in the agricultural sector. With state withdrawal, agricultural and food markets are more rapidly developing into oligopolies (markets with few sellers), oligopsonies (markets with few buyers), or monopoly market structures (Olsen, 2015). A theoretical explanation for this is a high degree of factor specificity, meaning that most inputs are locked in a specific production. With this follows dependency relationships and contract bonds between the actors involved. Accordingly, some state that a free market is not a realistic alternative and actors will seek to organize themselves to safeguard their interests (see e.g. Vukina and Leegominchai, 2006; Williamson, 1975; 1985; 1996). The historical development of the Norwegian chicken sector can be understood as a shift in the mix of strong state control, regulation via producer cooperatives and the buyer-controlled contractual relationships, which are constantly affected and challenged by changes in the political and institutional frameworks.

Developing chicken production in Norway

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural*. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

Previously, chicken was a byproduct of egg production. Producers of chicken and eggs were more or less the same. The meat was mostly sold directly from the farm to the merchant. When the cooperative organization, Norske Eggsentraler (Norwegian egg receivers), was established in 1929 Norwegian chicken producers were among the 12,000 members (Foss, Rishovd and Skaufel, 2004). The first modern chicken slaughterhouse was established by the Rogaland egg cooperative in 1937 (Nortura, n.d.).

The cooperative organization of egg production represents developments elsewhere in the agricultural sector at the time. The 1930s, characterized by years of economic crisis, also affected the agricultural sector. In 1930, an Act on Sales of Agricultural Products was introduced and the establishment of the Sales and Marketing Council in 1936 regulated chicken markets through the newly established cooperative organizations (Almås, 2002). This was in line with a social corporate governance model where the state and the cooperative organizations collaborated in regulation of both production and the market for eggs and chicken. Steen (1988) describes the emergence of the social cooperative agricultural system in Norway as a red-green trade-off between social democratic values and the interests of the agricultural sector.

This social corporate organization of the industry proved to be robust and was further strengthened throughout the post Second World War period. New instruments were introduced to develop the meat side of the production. In 1957 a tax on chicken meat was introduced to finance market regulation (Foss, et al, 2004). Target prices were also introduced into the yearly agricultural negotiation and agreement in 1958, and public control was demanded for chicken meat. By the end of the 1950s, the animal welfare act included most aspects of Norwegian chicken production.

A very important milestone for chicken production was the establishment of livestock licensing regulations in 1975. The purpose of these regulations was not to limit the total production of chicken. There were no limitations as such to set up a chicken house within the upper concession boundaries for maximum production set by the state. The purpose was rather to regulate *the structure* of concentrated animal feeding operations and to reduce problems with manure from such establishments. The regulations gave authorities control over the scale of production on

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), *The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector*, in Mara Miele, Vaughan Higgins, Hilde Bjørkhaug, Monica Truninger (ed.) *Transforming the Rural. In Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

individual farms (Ministry of Agriculture, 1999: 97-99) and thus provided a livestock-licensing scheme to reduce further structural changes in the industry.

In 1982, agricultural cooperatives with market regulating duties were made responsible for the cost of overproduction in the market (Foss, 2004). This may be seen as a turning point in the development of the partnership between the state and agricultural cooperatives in the social corporatist structure of governance. With the 1980s and a new spring for the neoliberal parties throughout the western world, the social corporatist model started to lose some of its hegemonic status, and a period of restructuring, internationalization and market desegmentation was initiated (Almås, 2002). Internationally, Norway became a part of the European Economic Area in 1992 (activated in 1994), and the conclusion of the GATT's Uruguay round in 1995, led to changes in the import regime. In following years, there were several changes in the organization of the egg and chicken cooperative system as the industry merged and grew throughout the country. The centralized cooperative named Prior Norway was founded in 1999 and restructured in line with private business models. The regulatory role of Prior was reduced and the financial support from purchasing taxes was also reduced.

From the late 1970s, the social-corporate Norwegian agricultural model was met with growing resistance. In the first public investigation of power and democracy in Norway, Berrefjord and Hernes (1978) described the corporate organization of Norwegian agriculture as a segment of the state. The agriculture segment was set up by close links between agriculturally educated bureaucrats in the ministry, agricultural organizations and the cooperatives. Norwegian agriculture was controlled and regulated without significant interference from others. Strong representatives of agricultural interests in the agriculture committee of Parliament have been a feature of the political control of agricultural policy since the late 1800s (Jacobsen, 1978).

This changed during the late 1980s, with challenges posed by overproduction in agriculture and further compromised by new neoliberal waves and the emergence of the "New Public Management" (NPM). Although chicken production, due to its growing consumption, was not affected by the same oversupply problems as other parts of the agricultural sector, chicken production was affected by the shifts in political and organizational climate.

Changing market regulation

The Marketing Act that had been introduced in 1936/37 had given , as mentioned above, agricultural cooperatives, in collaboration with the state, an important role in regulating the market. This role involved a special responsibility to ensure balance between supply and demand in the market. From 1950, the act included responsibility to decide a target price in the market. Target prices were negotiated in annual agricultural negotiations.

In 2008, following decisions made in the agricultural negotiations in 2005, chicken production was further deregulated – or, rather, reregulated. The system of target prices was changed to a system of reference prices which was an upper limit (+ 10%) used to administer the level of tariff barriers (Ministry of agriculture and food, 2008), meaning that a price above reference price gave the directorate of agriculture a mandate to lower the import tariffs on chicken meat. The new system meant that Prior's role as market regulator was demolished. The reason for this was a) the low number of producers and short production cycle made it possible to rapidly adapt production to consumption, b) production was already vertically integrated into retailer control, and c) there is little need to initiate effective regulatory measures to regulate exports or surplus supply (Ministry of agriculture and food, 2005; Steine, et al, 2011). Target prices were replaced by reference prices decided by negotiation among stakeholders (in the social corporate system), as a basis for the further administration of tariff and border protection. Because of political decisions, the responsibility for market regulation of chicken has shifted from producer-organized institutions to regulation by actors at the end of the supply chain, namely supermarkets.

Structuring chicken producers

The permit limit for chickens has changed substantially over time. In 1975, the concession boundary was 35 000 chickens per unit. From 2004 to 2013 the limit was increased to 120 000 produced chickens a year, while in 2013, this limit increased to 140 000 and doubled again in 2015 again to 280 000 chickens per year per unit (SLF, 2015a).

Due to consumption growth, we saw both an increased size in production units, and a growth in the number of producers. In 2014, there were 678 chicken production establishments, 63 more

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) Transforming the Rural. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

than in 2013 (SLF, 2015b). The pattern shows that more and more producers aim for maximum production. There are producers in all Norwegian counties, but volume is very variable. The Norwegian production database (op.cit) shows that most of chicken production is in three regions including Trøndelag counties, Eastern Norway (Østfold, Vestfold, Hedmark, Akershus) and in Rogaland. In these areas, growth has been tremendous since 1999. In the rest of the country, the production of chicken-meat has almost ceased.

Structuring slaughterhouses

Development of Norwegian chicken production has thus been almost explosive: From 19,000 tons in 1990 to about 90,000 tons in 2013 (Norwegian Agricultural Authority, 2014; Statistics Norway, 2006).

The Norwegian Food Safety Authority (FSA) performs supervision and control of the slaughterhouses, while slaughterhouses are responsible for slaughtering, production conditions and the end product. A normal procedure has been to have FSA representatives present at the production line in most slaughterhouses, however, chicken industry employees may also perform the practical control tasks (Food Act, 2004; FSA, 2014a) as the industry shifts toward self-regulation. When it comes to the processing of meat products, control is risk based, meaning supervision and control is more frequently carried out where the risks of failures are greater. In accordance with HACCP (Hazard Analysis and Critical Control Point) regulation, the slaughterhouses are themselves responsible for the safety and quality of their production. Internal (house) controls must comply with FSA guidelines and supervision. Our interview data show that there is an ongoing process of transfer, and uptake, of responsibility and accountability in private companies, from state *government* to private *governance* (see e.g. Richards, et al, 2013).

Changing chickens

Chicken production has become a high-tech industry at all stages of the value chain, from the slaughterhouse through to logistics, refrigeration technology, production of inputs and to the chicken barn. All these factors are essential to achieve efficient production. It is nevertheless

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) Transforming the Rural. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

developments in the chicken itself that are of the greatest importance for the tremendous growth in chicken production over the past 10-15 years.

After a national chicken breeding program closed in 1989, Norwegian chicken production linked up to international developments in the genetic material of chickens. This sector can be described as an oligopolistic market with extreme concentration. Selective breeding, controlled by the industry itself and largely outside the control of national authorities and without transparency, has enabled a situation in which only three companies, Aviagen, Tyson Foods and Groupe Grimaude, with their respective chicken types - Ross, Cobb-Ventress and Hubbard, totally dominate global chicken production. In Norway, Aviagen, originally a US based company, but since 2004 owned by the German Erich Wesjohann (EW) group, dominates 90 percent of production. The technological aspect of the modern chicken is underlined by Aviagen's own presentation of one of its main "models", Ross 308:

"The Ross 208 is recognized globally as a broiler that will give consistent performance in the broiler house. Integrated and independent producers value the growth rate, feed efficiency robust performance of the Ross 308" (Aviagen, 2015).

The Ross 308 has, like several of the other *new* types of chicken, some very important advantages. First, they grow quickly and feed utilization is very high. Second, and another key feature of the current biotechnological state of chickens, is the extreme uniformity among the chicks. With regard to both genetics and slaughter weight, the chickens are practically identical. This is of great importance in terms of standardization and is a favourable situation in a slaughterhouse context. Unlike the present situation in most other livestock production in Norway, for chicken we can speak of standardized and industrialized production. This is significant in terms of slaughtering, cutting, packaging, further processing, and for the presentation of specific products and packages in supermarkets.

As for the raising of the Ross 308, there are no independent producers in Norway. Here the supermarkets are influential actors. According to our interview data from the manager of one of the Norwegian chicken slaughterhouses, supermarkets demand uniformity and standardized products. Few, if any, agricultural products have had similar increases in product innovation. The

variation in final products is large, from whole chicken, raw or roasted, chicken mince, chicken sausages, chicken ham, chicken wings, chicken meatballs, chicken legs, chicken clubs, tandoori-chicken, and halal chicken. A paradox with chicken uniformity is that while this uniformity appears to be a good starting point for product innovation, standardization represents significant challenges, which we discuss below.

Market changes

From having once been seen as a luxury product, which could be enjoyed on special occasions such as Christmas (Dixon, 2002), chicken quickly became an everyday product, easily accessible for the average person in many countries. Chicken is sold as fast-food, processed food, simple cooked dishes or as a cheap raw material for homemade meals. Chicken has also gained status as a healthier and more environmentally friendly meat alternative than red meat. Controversial maybe, but from a climate perspective, chicken may be one of the more environmentally-friendly agricultural products (Hille, Solli, Refsgaard, Krokann and Berglann, 2012; Vergé, Dyer, Desjardins and Worth, 2009; Weber and Matthews, 2008). Another significant feature is the decreasing price of chicken to households. As shown in the introduction to this chapter chicken production and consumption has seen tremendous growth. Will consumption continue to increase?

The manager of Scandi Standard, a major Scandinavian chicken producer, claims that they aim to double chicken consumption in Norway and that this will bring Norway on par with the rest of Europe (Sleipnes, 2014). While chicken producers during the last decade have received a lot of media coverage (Kjærnes, 2015), recent events might change this story. The critical media coverage about Norwegian chickens was local, that is, in connection to slaughterhouses or regional concentrated production. One example has been the local coverage in the Trøndelag region of Norway, by the newspaper *Adresseavisen*. This coverage might have been a driver for developing better production conditions (slaughterhouse, work and quality) (Brustad, 2014). The general presentation of increased chicken production and consumption in the public media was, however, for long: favorable prices, new products, health gains (lean meat), accessibility and convenience: Chicken is easy to prepare and tastes good. The growth in chicken consumption has therefore been, according to Henriette Eye (Aftenposten, 2011), Deputy Director in the

Directorate of Health "a very desirable development" to the extent that it has led to less consumption of red meat, and this is seen as a public good.

Since 2013 there has been an increase in critical media coverage (see e.g. Espedal, 2013; Kielland, 2013), and consumers have had increasing concerns over intensive chicken production. While environmental, working conditions, or animal welfare issues did not mobilize Norwegian consumer behaviour, issues connected to consumer health did. From 2014, a new debate escalated in the media nationally and internationally on industrialized livestock production in general, and chicken in particular. Antibiotic resistant intestinal bacteria is found in the DNA of a large percentage of chickens (FSA, 2013). An inquiry revealed the quinolone-resistant bacteria in 7 of 10 Norwegian chickens (FSA, 2014b). The responsibility for a appropriate chicken production was officially placed with the authorities (Kjærnes, Harvey and Warde, 2007). Norway's FSA is also responsible for providing advice to the public on the risks associated with the consumption of infected chicken. According to the current guidelines, it is sufficient for consumers to maintain good hygiene while preparing chicken, and using heat treatment to kill bacteria for the safe consumption of chicken in Norway (FSA, 2014b). FSA is, however, only monitoring the regulation. In late 2014, the antibiotic narasin, frequently used in chicken feed, was linked to the development of antibiotic resistant bacteria. Sales of chicken dropped instantly and in 2015, it is 10-15 per cent lower than in 2014 (Dagsavisen, 2015). Efforts have been made by feed producers and owners of slaughterhouses to develop feed without narasin. Additionally, new research on the relationship between consumption of antibiotic-resistant bacteria in chicken and human health has been established (Ministry of agriculture and food, 2014).

The next section of the chapter will discuss how these economic, technological, political and institutional, and cultural developments have reconfigured the landscapes of chickens and opened new opportunities for the chicken industry and a new "game" in Norwegian chicken production.

Chicken industry trends negotiating politics, (bio) technology and the market

In the current organization of the chicken market it is not possible to be a volume producer without having a delivery contract with a slaughterhouse. With only a few exceptions all chicken is slaughtered in large chicken slaughterhouse plants. Three slaughterhouse owners now share the bulk of the volume slaughtered – the cooperative company Nortura SA, the private retailer Rema1000-owned Norsk Kylling and a third private company Jærkylling which is part of the

Nordic chicken giant Scandi Standard.³ They practically control production in different regions of Norway, but do collaborate in some parts of the value chain. For example, Jærkylling slaughter their chicken in collaboration with the Nortura slaughterhouse in the Rogaland area of Norway. In addition, certain manufacturers located closer to one of the competitor's slaughterhouse plants can have their chickens slaughtered there to prevent the unnecessarily long transportation of live animals.

Three ways of organizing chicken production in Norway

The ongoing retreat of the state as a partner in chicken-meat regulation and management, the weakened position of farmer organizations in regulation and trade, and the increasingly influential role for private capital and retail, leaves us with a situation with three models of organizing the value chains for chicken in Norway. These are the cooperative model, the fully integrated value chain model and the investment model.

We call the first model “the cooperative model”, where Nortura, with their brand Prior, controls the chain all the way from the import of the genetic material to the sale of processed chicken to supermarket chains. Nortura controls almost all the importation of chicken genetic material and sells to the retailer Norgesgruppen. This model is a descendant of the social-corporative model - the agricultural model in which the state and agricultural cooperatives collaborated in the development and implementation of agricultural policies.

The second model is “the fully integrated value chain model”, owned by the supermarket chain Rema Industrier / Rema1000. They own Norsk Kylling AS, and slaughter and process Rema1000 home-brand chicken products Solvinge. Rema controls the chain all the way from the hatchery to the supermarket.

The third model is what we call “the investment model” where ownership has changed over the years and where private equity capital has been involved in developing the chain and where production revolves around the company Jærkylling. This company was formerly owned by the investor CapMan, but was sold to the Nordic chicken giant "Scandi Standard AB" a company formed by CapVest Equity Partners and the Swedish company Lantmännen. Jærkylling produces its own brand "Den stolte hane" and produces on a contract basis with the retailer COOP. This

³ There are a few examples of smaller value chains of chicken production. These promote quality production as part of their growth strategy.

value chain works closely with Prior, both early in the value chain - in hatcheries - and at the slaughterhouse.

Since 2015 the number of major retailers in Norway was reduced from four to three. Since then contracts on sales of processed chicken has been restructured and now goes into one retailer each. Rema1000 already controlled their chain, Nortura lost market share but contracts with Norgesgruppen, and Jærkylling increased their share in full integration with COOP. The three models exist side by side and the market now looks perfectly consolidated, with the manufacturing markets also divided between the players. This is a situation with both oligopsony towards the farmers (few buyers), and an oligopoly towards consumers (few suppliers). The division also has a geographic component towards producers (farmers), and through the value chains towards customers. If seen from the farmer's point of view, who are located in specific regions, the system has a monopsonic structure: Only one possible buyer of the product is available. For consumers the freedom of choice consists in choosing in which supermarket they will buy their groceries, but not to choose between different products in the shop. It is difficult to imagine that this concentration in chicken markets could have evolved without the concentration and strong purchasing power in the grocery industry (Jacobsen and Dulsrud, 1994; NOU, 2011: 4; Olsen, 2015; Tranøy, 2015).

There are three main value chains for chicken in Norway. They all start with the international Group Aviagen, in its Scandinavian department in Sweden - Aviagen Swechick AB. These deliver eggs to Nortura owned Samvirkekylling Rugeri (cooperative chicken) hatchery. When these are hatched and one day old, they are moved to a parent grower where they stay for 18 weeks. From these farms they move on to the egg growers who sell eggs into the three incubation contracts that produce day-old chicks for chicken producers. All chicks (with few exceptions) are Ross 308. There are three incubation categories: Samvirkekylling, Haa Rugeri and Hugaas Rugeri. Nortura controls the first two, while the latter is controlled by Rema Industrier.

This consolidation into a tripartite model has not been, and is still not without conflict. A long conflict between Nortura and Jærkylling took place around the slaughterhouse cooperative established in south-west Norway. Later there was friction around cooperation between these two chains in terms of distribution of producers, and these escalated around retailer contracting. There have also been significant conflict within the models - particularly related to Norsk Kylling AS at its location in Støren – mid-Norway. This culminated with Rema 1000's full takeover of Norsk Kylling from the founder Agnar Østhus, and subsequent court cases between individuals in the

former management of the new Norsk Kylling. The internal conflicts dealt with matters that could potentially adversely affect the reputation of Rema 1000. Finally, there have been several conflicts between the chicken value chains and government departments in relation to working conditions and environmental issues, as well as those around animal welfare. In a Norwegian context, the most remarkable conflicts have been unfolding around Norsk Kylling AS and Rema Industrier (see Almås, 2015, Brustad and Bjørkhaug, 2015; Vik and Bjørkhaug, 2015). Regarding issues related to the slaughterhouse, there has also been much more media interest in connection with the operation of Norsk Kylling AS than the other slaughterhouses (Brustad, 2014). In addition to issues related to animal welfare and risk, (health and infection), Norsk Kylling has reported on environmental degradation, contamination of the local environment and waterways, the poor working environment and labour rights, internal control and financial fraud. Problems, however, are not restricted to Norsk Kylling AS. In 2011, the national Food Safety Authority conducted a national audit of chicken production. Significant shortcomings were identified:

The main impression after the revision of the 5 slaughterhouses included in the supervision project is that handling of chicken at slaughterhouses must be improved. It was revealed between 1 and 3 deviations at 4 of the 5 houses. Several of the deficiencies that were identified are essential to ensure the animals' good welfare. (FSA, 2012: 36)

Farmers and worker's autonomy

To what extent does the Norwegian chicken industry develop in the direction of the American model explained by Constance et al (2008), in which growers are locked into a high debt burden and short-term contracts? Today, all farmers engaged in industrial chicken production do so on a contractual basis. Farmers contract with a slaughterhouse in one of the three value chains we have described above. This also applies for those producers who are members of the cooperative enterprise Nortura.

We have not studied the farmers' contracts and are not aware of any significant differences between the three chains. However, interviews with representatives indicated that the cooperative Nortura has a bigger focus on farmers' income welfare in relation to insecure contracts. Nevertheless, the market situation, meaning the contract with the retailer, determines the volume that is produced in the chain.

In relation to labour conditions in the slaughterhouse, the FSA investigation revealed major challenges in relation to skills and training among the staff (FSA 2012). According to figures

from Statistics Norway (Ødegård and Andersen, 2011), approximately 20 percent of employees have an immigrant background in the meat industry. Through field studies and interviews, our impression is that slaughtering and processing chicken in Norway is mostly performed by non-Norwegian labour, many on temporary contracts. This is partly conducted through agencies sourcing temporary workers on short-term contracts, but some also hold permanent positions. Yet, with the generally high turnover of labour and language barriers that come with many different nationalities it is difficult to establish positive cultures for developing good animal welfare and hygiene routines.

Another factor found in an US study of effects of immigrants' workers was opportunities to keep prices on a lower lever to consumers (Adcock, Anderson and Rosson, 2015). This has not been studied in detail in Norway and legally enforced minimum wages applies in all sectors, however violations might occur as well as systematic skewness in low wages among immigration compared other workers. According to analyses of media texts, worker rights have been violated in a large scale at the Norsk Kylling slaughterhouse at Støren. In this case examples have been shown of employees working without contracts and others without legal residence in the country (Brustad, 2014). Where workers have not been allowed to organize themselves via unions, it has been revealed that some employees have been illegally monitored in their lunchroom (Aftenposten, 2013). Several of these conditions have also been documented through a court case between Norsk Kylling and the former quality manager at the facility (Adressa, 2013). Brustad (2014) and Brustad and Bjørkhaug (2015) have shown that the situation surrounding conditions at one slaughterhouse was made better when the close relationship between Rema Industrier (Rema 1000) as co-owner and conditions at the slaughter facility received media coverage in national newspapers. Interviews further suggest that considerations related to reputational risk led to a greater focus on best practices and good working conditions. This shows that responsible leadership, (and media investigation), is necessary to ensure good hygiene and quality systems in a slaughterhouse. The findings also indicate that concerns about reputational risk led to an increased effort by Rema 1000 to solve ongoing conflict.

Animal welfare and risk assessment

Much of the criticism of the chicken industry has related to poor animal welfare. A critical issue is the extreme growth rate, as mentioned above. Feeding and growth is interrelated, but according to Aviagen's own specifications, a Ross 308 normally reach an "as-hatched performance" of more than 1,2 kilograms at day 25 (Aviagen, 2014). This is a rapid growth, and performance has

increased significantly over the past decade. By comparison, a chicken in year 2000 normally lived for 12 weeks (84 days) to reach an average weight of just under a kilogram. Growth rates and efficiency have so far been central to the genetic evolution, or revolution, of chicken genetic material.

There are significant challenges with the biotechnological development of the modern, industrial meat chicken. The rapid growth of chickens often means their bone structures are unable to cope with the weight. In some cases this leads to leg breakage and/or difficulties in standing up. In addition, some chickens have trouble with paralysis, injuries and fleshy tissue in the heart (interview FSA). These challenges are global. How they are dealt with varies significantly between countries. European countries with their relatively high level of public involvement appear to have both a high awareness of the problems and a capacity to intervene in cases where there are proven problems with animal welfare (Robins and Phillips, 2011).

Large stocking density in the barns is another challenge. Misjudgments, procedure failure, or incorrect electrical installations can quickly cause major damage such as acid burn damage on chicken legs and chest due to the ammonia concentration in chicken excrement. Obviously, this is something farmers want to avoid as far as possible, as it influences profitability as well as industrial reputation when these issues are publicly debated.

In addition to production and producer caused risks, public governance has changed in recent years. Auditing is now risk-based and the financial and practical responsibilities are devolved to growers. Knowledge and close control is of course required in order to operate properly with high animal density, but it appears to be difficult. A risk based evaluation in 2012 revealed a high numbers of errors:

Inspection on chicken farms showed that discrepancies were detected in 132 of 152 herds. 102 of 152 herds had serious discrepancies that led to the notification of formal decisions or decisions without warning (FSA, 2012: 31).

The farms were selected on the basis of a risk assessment, and were thus not randomly selected. FSA expected to find problems in many flocks, but noted: Many of the deviations are, however, very basic requirements of the Animal Welfare Act and the results clearly show that animal welfare in chicken flocks must be better. "(FSA, op.cit.)

Nevertheless, production takes place in a relationship between authorities (FSA), supermarkets, the chicken slaughterhouses, and farmers. The most recent directive for chicken production will

allow for animal density calculated in an incentive system governed by the slaughterhouse. If production scores high on selected control variables such as weight and lack of damage, farmers will receive an opportunity to produce with a higher animal density. Poor production will be rewarded with a lower output and therefore profitability. In the Food Safety Authority report on animal welfare in chicken production, it is acknowledged that it is difficult for the grower to have a complete overview of the situation in the barn and is "caught in the system" in that slaughterhouses together with the hatcheries determines the number of animals that producers receive and when the chicken can be slaughtered (FSA, 2012:33). Hatcheries also determine the genetics of chickens that are delivered. An interview with FSA demonstrated that an insertion of one of Cobbs chicken subtypes, (that has been tested in one of the value chains), at a farm used to produce Ross 308 might lead to problems due to differences in feeding and growth rate between the different breeds.

There are also challenges relating to transport and slaughtering. Media reports show that 15 years ago, there was major public interest in lengthy transportation times. There have, however, also been major technological developments in transportation. Problems can arise in winters with very low temperatures. In such circumstances, chickens are killed and destroyed at the farm due to problems encountered with acid content by further growth and density after the ideal slaughter date.

Another challenge, but of a different nature with the current structure in the chicken industry, is the near 100 percent of "Norwegian" chicken originating from the same hatchery. Hence industrial chicken production is turned into an extreme monoculture, with the obvious risks this entails. Through the currently strong border protection, Norwegian food production avoids some of the global chicken diseases. Meanwhile, it has been revealed that antibiotic-resistant bacteria can be imported to Norway via the Aviagen import line through eggs imported to Norway from the Aviagen Swedish affiliate (Aviagen SweChick) (Kielland, 2013; Nortura, n.d.). The three major hatcheries in Norway, Hå Rugeri Jæren which is a privately held company in partnership and co-ownership with Nortura, supplies day-old chicks for chicken producers in Southern and Western Norway, Hugaas Rugeri where Rema are owners, which supply Central Norway, and Samvirkekyllings own Rugeri in Hedmark, control the market. There is thus little competition for germplasm or the import of genetic material to Norwegian chicken production. All the eggs are literally in one basket. To the extent that serious problems arise in connection with the genetic material, it could result in the potential closure of the three value chains for chicken production in Norway. Risk is here both associated with the development and spread of infectious diseases

(Kielland, 2013) and supply. Problems in the Aviagen production and distribution system and / or one of the hatcheries could lead to considerable and immediate problems for the chicken value chain. The 2008 report "Nine meals from anarchy" (Simms 2008) described the inherent vulnerability in the current oil dependent and logistics intensive food system, and few other production systems are more dependent on a continuous and well-functioning logistics than chicken production. The probability of a breakdown in these systems might not be huge, but the consequences of any such result certainly will be.

Conclusion

From a business perspective, the recent development of chicken has been a major success in Norway. However it has been a bittersweet success. An important prerequisite for this rapid growth has been a flexible regulatory framework in relation to production and processing. It has allowed for new genetics, more production, bigger slaughterhouse capacity and new forms of collaboration between the chicken players. In cases where there have been reasons for tightening or strengthening regulations, either because of pollution concerns, labour or animal welfare or food safety considerations, the government has not intervened in a way that would restrict further growth of the industry. Indeed, the observed growth in the market could not be possible without the FSA providing flexible solutions, without weaker livestock licensing rules, without looser market regulation, and without agricultural authorities allowing for increasingly larger chicken barns on the farms. Hence, the current structure and situation is a direct result of political choice.

The so-called deregulation of the food value chain, as we have seen in this study and in other studies internationally (e.g. Constance, 2008, Richards, et al, 2013), quickly leads to re-regulation. Re-regulation involves new private management systems, such as controlling production through contracts and new and potentially exclusive quality systems. In the Norwegian value chain, we have seen that regulation takes place within integrated value chains. Increasingly control functions are carried out by the private sector and but partly in a collaboration between government and industry. However, we have not identified major differences between the chains or that chains differentiate in relation to special qualities, yet. The majority of the products appearing in supermarkets are almost identical, but wrapped in different brands and labels.

Constance (2008) suggested that organization of agriculture would evolve in direction of what he described as "the southern model" - a model where political deregulation, bio-technological capabilities, global inflationary pressures, and vertical integration characterizes modern chicken

production within an extremely inhumane production system. He suggested that this causes massive violations of norms and rules in relation to the areas discussed above: to the situation of people, animals and nature. Our interpretation of the situation in the Norwegian chicken industry is, however, that 1) interaction and collaboration between food safety authorities, producers and slaughterhouses so far have kept animal welfare issues at a (relatively) low level compared with other countries, major challenges still exist, 2) import restrictions on chicken have reduced pressure and enabled reasonable standards of production and processing, and 3) retailers will, through their control and interest in the supply chain, aim to secure reputation of chicken in general, and their production chain in particular. A retailer cannot afford to be associated with animal welfare problems or other scandals of various kinds and over time (Brustad, 2014). The combined effect of import restrictions, the desire for the maintenance of quality in the production processes, and standards in the Norwegian welfare state model will undoubtedly also contribute to focusing on worker rights in the chicken industry. As such, the Norwegian model might have moderated the development of the chicken industry in spite of the problematic aspects of parts of modern chicken production.

Further integration is undoubtedly taking place. While Rema 1000 is vertically integrated, the "cooperative model" and the "investment model" are also strongly integrated with "their" buyer. While we noted that the Norwegian model has moderated developments in the chicken value chain, there exists structural pressures that may lead to similarities with US and Australian conditions (Constance, 2008; Dixon, 1999). For how long will a consolidation between the three players sustain or when will the chicken game soon play a new round? Will smaller chains evolve or will three become two or one? The political economy of chicken is dynamic and both continued growth and stagnation in the market for chicken-meat sets the current structure to the test.

Acknowledgements

The authors receives funding from the Norwegian Research Council (FORFOOD Project No 220691, AGRISPACE 233810 and Agropro (225330/E40)) and the Australian Research Council (Project Nos. DP 110102299 and DP 160101318)

References

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural*. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

Adcock, F., D. Anderson, and P. Rosson (2015) The Economic Impacts of Immigrant Labor on U.S. Dairy Farms. Downloaded November 15 2015 from <http://www.nmpf.org/files/immigration-survey-090915.pdf>

Adressa (2012) *Norsk Kylling betaler tilbake fire millioner kroner*. Downloaded May 4 2014 from <http://www.adressa.no/nyheter/okonomi/article6654683.ece>

Aftenposten (2011). *60 millioner kylling ender her*. Downloaded May 3 2013 from http://www.aftenposten.no/nyheter/iriks/60-millioner-kyllinger-ender-her-5116997.html#.U2Vf7a1_s38

Aftenposten (2012). *Feathers fly over poultry producers*. Downloaded February 7, 2012 from <http://www.newsinenglish.no/2012/02/07/feathers-fly-over-poultry-producers/>

Aftenposten (2013). *Filmet ansatte på pauserommet med skjult kamera*. Downloaded November 24 2013 from <http://www.aftenposten.no/jobb/Filmet-ansatte-pa-pauserommet-med-skjult-kamera-7092292.html>.

Almås, R. (2002). *Norges landbrukshistorie. IV. Frå bondesamfunn til bioindustri*. Oslo: Samlaget.

Almås, R. (2015). Regional samhandling, nyskaping og utviklingsbanar i tre matklynger: Gauldalen, Frøya og Kviamarka. Pp. 51-86 in H. Bjørkhaug, R. Almås and J. Vik (eds.). *Norsk matmakt i endring: Nyskaping og endrede maktforhold i den norske matvarekjeden*. Bergen: Fagbokforlaget.

Aviagen (2014). *Ross 308. Broiler performance objectives*. PFD Downloaded May 21, 2014 from www.aviagen.com

Aviagen (2015). *Ross 308*, Downloaded August 3, 2015 from <http://en.aviagen.com/ross-308/>.

Berrefjord, O. and Hernes, G. (1978). Markedsforvitring og statsbygging. Pp. 81-112 in Hernes, G. (ed) *Forhandlingsøkonomi og blandingsadministrasjon. En publikasjon fra Maktutredningen*. Oslo: Universitetsforlaget.

Bevir, M. (2011). Governance as Theory, Practice and Dilemma. Pp. 1-16 in Bevir, M. (2011). *The Sage Handbook of Governance*. London: SAGE.

Burch, D, (2005), Production, Consumption and Trade in Poultry: Corporate Linkages and North-South Supply Chains. Pp: 166-178 in N. Fold and W. Pritchard (eds.) *Cross-continental Food Chains: Structures, Actors and Dynamics in the Global Food System*. London: Routledge.

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural. In Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

Boyd, W. and M. Watts (1997). Agro-industrialization just in time: The Chicken industry and postwar American capitalism. Pp: 192-225 in D. Goodman and M. Watts (eds.) *Globalising Food: Agrarian Questions and Global Restructuring*. London: Routledge.

Brustad, S. (2014). *Bærekraft, omdømme og maktmuligheter: En undersøkelse av Norsk Kyllings omtale på trykk*. R-3/14. Trondheim. Norsk senter for bygdeforskning.

Brustad, S. and H. Bjørkhaug (2015). Omdømme, makt og mulighetsrom for bærekraftig styring – om Norsk Kylling i media. Pp 175-197 in H. Bjørkhaug, R. Almås and J. Vik (eds.) *Norsk matmakt i endring: Nyskaping og endrede maktforhold i den norske matvarekjeden*. Bergen: Fagbokforlaget.

Constance, D. H., and Heffernan, W. D. (1991). The Global Poultry Agro/Food Complex. *International Journal of Sociology of Agriculture and Food*, 1, 126-142.

Constance, D. H., A. Bonanno, C. Cates, D. Argo, and M. Harris (2003). Resisting integration in the global agro-food system: Corporate chickens and community controversy in Texas. Pp. 103-118 in R. Almas and G. Lawrence (eds.), *Globalisation, Localisation, and Sustainable Livelihoods*. Burlington, VT: Ashgate Press.

Constance, D.H. and R. Tuinstra. 2005. Corporate chickens and community controversy in East Texas: Growers' and neighbors' views on the impacts of industrial broiler production. *Culture and Agriculture* 27(1), 45-60.

Constance, Douglas H. (2008). The Southern Model of Broiler Production and Its Global Implications. *Culture & Agriculture* 30:17-31.

Constance, D. H., F. Martinez and G. Aboites (2010). The globalization of the poultry industry: Tyson Foods and Pilgrim's Pride in Mexico." Pp. 59-76 in A. Bonanno, H. Bakker, R. Jussaume, Y. Kawamura, and M. Shucksmith (eds.), *From Community to Consumption: New and Classical Statements in Rural Sociological Research. Research in Rural Sociology and Development. Volume 16*, Bingley, UK: Emerald Group Publishing Ltd..

Constance, Douglas, Francisco Martinez, Gilberto Aboites, and Alessandro Bonanno. 2013. "The Problems with Poultry Production and Processing." Pp. 155-176 in H. James *The Ethics and Economics of Agrifood Competition*. New York: Springer Press

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural*. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

Dagsavisen (2015) Kyllingsalget i stampe. Downloaded August 12 2015 from <http://www.dagsavisen.no/innenriks/kyllingsalget-i-stampe-1.375786>

Daugbjerg, C. and A. Swinbank (2012). An introduction to the 'new' politics of agriculture and food. *Policy and Society*. 31/:259-270.

Dixon, J. (1999). Reflexive accumulation and global restructuring: Retailers and cultural processes in the Australian poultry industry. *Rural Sociology*. 64/2:320-333.

Dixon, J. (2012). *The Changing Chicken. Chooks, Cooks and Culinary Culture*. Sydney: UNSW Press.

Espedal, J. T. (2013). *Her er Ross 308*. Innsikt, Aftenposten , September 16. Pp. 12-13.

FAO (2015) Food Outlook. Biannual report on global food markets.. Downloaded August 5, 2015 from <http://www.fao.org/3/a-i4581e.pdf>.

Food Act (2004) *Lov om matproduksjon og mattrygghet mv. (Matloven)*. LOV-2003-12-19-124. Helse- og omsorgsdepartementet. Downloaded May 5 2014 from: <http://lovdata.no/dokument/NL/lov/2003-12-19-124>.

Foss, B., N. Rishovd and I Skaufel (2004). *Matglede gjennom 75 år: Prior Norge 1929-2004*. Oslo: Prior Norge BA.

FSA (2012). *Sluttrapport. Nasjonalt tilsynsprosjekt 2011. Dyrevelferd i slaktekyllingproduksjonen. Elektronisk versjon*. Downloaded November 6 2014 from: http://www.mattilsynet.no/dyr_og_dyrehold/dyrevelferd/ansvar_og_oppgaver/rapport__dyrevelferd_i_slaktekyllingproduksjonen_2012pdf.7500/binary/Rapport%20dyrevelferd%20i%20slaktekyllingproduksjonen%202012.pdf

FSA (2013). *Funn av antibiotikaresistente bakterier i kyllingkjøtt*. Downloaded December 17 2014 from: http://www.mattilsynet.no/dyr_og_dyrehold/produksjonsdyr/fjorfe/funn_av_antibiotikaresistente_bakterier_i_kyllingkjott.10137

FSA (2014a). *Offentleg kjøttkontroll*. Downloaded May 3 2014 from: http://www.mattilsynet.no/mat_og_vann/produksjon_av_mat/kjott_og_kjottprodukter/offentleg_kjottkontroll.5358

FSA (2014b) *Foreløpige tall: Resistente bakterier i syv av ti kyllinger*. Downloaded December 12 2014 from: http://www.mattilsynet.no/mat_og_vann/smitte_fra_mat_og_drikke/antibiotikaresistente_bakterier/forelopige_tall_resistente_bakterier_i_syv_av_ti_kyllingfileter.17209

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural*. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

Griffith, D. and D. D. Stull (1995). Hay trabajo: Poultry processing, rural industrialization, and the Latinization of low-wage labor. Page 129-151 in D. D. Stull, M.J. Broadway, and D. Griffith (eds.), *Any way you cut it: Meat processing and small town America*. Lawrence, KS: University Press of Kansas.

Hille, J., Solli, C., K. Refsgaard, K. Krokann, K. and H. Berglann (2012). *Environmental and climate analysis for the Norwegian agriculture and food sector and assessment of actions*. NILF - working papers. Oslo: NILF.

Jackson, P., N. Ward and P. Russell (2009) Moral economies of food and geographies of responsibility. *Transactions of the Institute of British Geographers*.
34/1:<http://onlinelibrary.wiley.com/doi/10.1111/tran.2009.34.issue-1/issuetoc>12–24.

Jacobsen, K. D. (1978). *Teknisk hjelp og politisk struktur: en studie av norsk landbruksforvaltning 1874-1899*. Bergen: Universitetsforlaget.

Jacobsen, E. and Dulrud A. (1994). Kjedenes makt til fobrukernes beste? Konsentrasjon og integrasjon i dagligvarehandelen med matvarer i Norge. Rapport nr. 4-1994. Lysaker: SIFO

Kielland, I. R. (2013). *Kyllingfeber*. DN magasinet, November 16:6-17.

Kjærnes, U., M. Harvey and A. Warde (eds.) (2007). *Trust in food. A comparative and institutional analysis*. Houndsmills, Basingstoke: Palgrave Macmillan.

Kjærnes, U. (2015) Forbrukernes makt i norsk matsektor – for liten eller for stor? Pp. 199-220 in H. Bjørkhaug, R. Almås and J. Vik (eds.). *Norsk matmakt i endring: Nyskaping og endrede maktforhold i den norske matvarekjeden*. Bergen: Fagbokforlaget.

Knoeber, C.H. (1989) A real game of chicken: Contracts, tournaments, and the production of broilers. *Journal of Law, Economics, and Organizations* 5/2, 271-292.

Lang, T. (2003). Food industrialisation and food power: Implications for food governance. *Development Policy Review*, 21/5-6:555-568.

Lindberg, G., and E. Fahlbeck (2011). New forms of local collective governance linked to he agricultural landscape: Identifying the scope and possibilities for hybrid institutions. *International Journal of Agricultural Resources, Governance and Ecology* 9/1-2:31-47.

Manning, L., and R. N.Baines (2004). Globalisation: a study of the poultry-meat supply chain. *British Food Journal*. 106/10:819-836.

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural*. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

Miele, M., I. Veissier, A. B. Evans, and R. Botreau (2011). Animal welfare: Establishing a dialogue between science and society. *Animal Welfare*. 20:103–117

Miele, M., J. Murdoch and E. Roe (2005) Animals and ambivalence: governing farm animal welfare in the European food sector. Pp. 169-185 in Higgins, V. and Lawrence, G. (eds.) *Agricultural Governance: Globalization and the New Politics of Regulation*. Routledge Advances in Sociology, Vol. 17. London: Routledge

Ministry of Agriculture (1999). *Om norsk landbruk og matproduksjon*. Oslo: Regjeringen.

Ministry of agriculture and food (2005). St.prp. nr. 69 (2004-2005). *Om jordbruksoppgjøret 2005 – endringer i statsbudsjettet for 2005*. Oslo: Regjeringen.

Ministry of agriculture and food (2008). St.prp. nr. 69 (2007-2008). *Om jordbruksoppgjøret 2008 endringer i statsbudsjettet for 2008 m.m.* Oslo: Ministry of food and agriculture. Downloaded 23.09.2013 from <http://www.regjeringen.no/nb/dep/lmd/dok/regpubl/stprp/2007-2008/stprp-nr-69-2007-2008-.html?id=515511>

Ministry of agriculture and food (2014). *Styrker forskning på antibiotikaresistens*. Downloaded 17.12.2014 from <https://www.regjeringen.no/nb/aktuelt/styrker-forskning-pa-antibiotikaresistens/id2355685/>

Newman, J. (2005). *Remaking governance: peoples, politics and the public sphere*. Bristol: Policy Press.

Nortura. (n.d.). *Nortura, et historisk tilbakeblikk*. Downloaded 16.01.2014, at <http://www.nortura.no/historie/>

NOU (2011:4). *Mat, makt og avmakt: om styrkeforholdene i verdikjeden for mat*. Oslo: Departementenes servicesenter, Informasjonsforvaltning.

Olsen, P. I. (2015). Kjøpermakt i verdikjeden for mat. Pp. 87-116 in H. Bjørkhaug, R. Almås and J. Vik (eds.). *Norsk matmakt i endring: Nyskaping og endrede maktforhold i den norske matvarekjeden*. Bergen: Fagbokforlaget.

Peirce, C. S. 1955. *Philosophical writings of Peirce*. Ed. by Justus Buchler. New York: Dover.

Pierre, J. and B. G. Peters (2000). *Governance, politics and the state*. London: MacMillan.

- Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural. In Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited
- Richards, C., H. Bjørkhaug, G. Lawrence and E. Hickman (2013). Retailer-driven agricultural restructuring-Australia, the UK and Norway in comparison. *Agriculture and Human Values*, 30(2), 235-245.
- Robins, A. and C. J. C. Phillips (2011). International approaches to the welfare of meat chickens. *Worlds Poultry Science Journal*. 67/2:351-369. doi: 10.1017/s0043933911000341
- Røiseland, A. and S. I. Vabo (2008). Governance på norsk. Samstyring som empirisk og analytisk fenomen. *Norsk statsvitenskapelig tidskrift*. 1-2:86-107.
- Sampson, K. (2008). A Feminist Political Economic Analysis of the US Chicken Industry. *Development*. 51:547-554
- Schlosser, E. (2002). *Fast Food Nation: What the All-American Meal is Doing to the World*. London: Penguin
- Simms, A. (2008). *Nine meals from anarchy: oil dependence, climate change and the transition to resilience*. Pamphlet: New Economics Foundation.
- Sleipnes, P. A. (2014). Vil fordoble kyllingforbruket i Norge. Kjøttbransjen. Downloaded August 15 2014 from www.kjottbransjen.no website:
- SLF 2015a Husdyrkonsesjon Downloaded October 1 2015 from <https://www.slf.dep.no/no/statistikk/utvikling/husdyrkonsesjon>
- SLF 2015b Fjørtefekonsesjon. Downloaded October 1 2015 from <https://www.slf.dep.no/no/statistikk/utvikling/husdyrkonsesjon/fj%C3%B8rfeproduksjon>
- Statistics Norway (2006). *Kjøttproduksjon, 2005*. Downloaded November 6 2014 from <https://www.ssb.no/jord-skog-jakt-og-fiskeri/statistikker/slakt/aar/2006-04-03>
- Norwegian Agricultural Authority (2014). *Markedsrapport 2013. Pris- og markedsvurderinger av sentrale norske landbruksvarer*. Rapport nr. 7/2014. Oslo: Statens landbruksforvaltning.
- Steen, A. (1988). *Landbruket, staten og sosialdemokratene: en komparativ studie av interessekonflikter i landbrukspolitikken i Norge, Sverige og England 1945-1985*. Oslo, Universitetsforlaget.
- Steine, G., A. Vasaasen, A. Nordlund and I. Pettersen (2011). *Regulering for organisering - markedsregulering i kjøttsektoren*. NILF-notat No 8 - 2011. Oslo, Norsk institutt for landbruksøkonomisk forskning.

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) *Transforming the Rural. In Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited

Stoker, G. (1998). Governance as theory: five propositions. *International Social Science Journal*, 50/155:17-28. doi: 10.1111/1468-2451.00106

Strange, S. (1996). *The retreat of the state: the diffusion of power in the world economy*. Cambridge, Cambridge University Press.

Sørensen, E. and J. Torfing (2005). *Netværksstyring: fra government til governance*. Frederiksberg: Roskilde Universitetsforlag.

Tranøy, B. S. (2015). Makt i matkjeden. Pp. 23-50 in H. Bjørkhaug, R. Almås and J. Vik (eds.). *Norsk matmakt i endring: Nyskaping og endrede maktforhold i den norske matvarekjeden*. Bergen: Fagbokforlaget.

Vergé, X. P. C., J. A. Dyer, R. L. Desjardins, and D. Worth (2009). Long-term trends in greenhouse gas emissions from the Canadian poultry industry. *Journal of Applied Poultry Research*, 18/2: 210-222.

Vik, J. and H. Bjørkhaug (2015). Kyllingens politiske økonomi – et bilde av det fremtidige landbruket? Pp. 149-174 in H. Bjørkhaug, R. Almås and J. Vik (eds.). *Norsk matmakt i endring: Nyskaping og endrede maktforhold i den norske matvarekjeden*. Bergen: Fagbokforlaget.

Vukina, T., and P. Leegomonchai (2006). Oligopsony Power, Asset Specificity, and Hold-Up: Evidence from the Broiler Industry. *American Journal of Agricultural Economics*, 88/3589-605. doi: 10.1111/j.1467-8276.2006.00881.x

Weber, C. L., and H. S. Matthews (2008). Food-miles and the relative climate impacts of food choices in the United States. *Environmental Science and Technology*. 42/10:3508-3513.

Williamson, O. E. (1975). *Markets and hierarchies: analysis and antitrust implications: a study in the economics of internal organization*. New York: Free Press.

Williamson, O. E. (1985). *The economic institutions of capitalism: firms, markets, relational contracting*. New York: Free Press.

Williamson, O. E. (1996). *The mechanisms of governance*. New York: Oxford University Press.

Ødegård, A.M. og R.K. Andersen (2011). *Østeuropeisk arbeidskraft i hotell, verft, fiskeindustri og kjøttindustri*. Fafo-notat 2011:21. Oslo: FAFO.

Authors' Accepted Manuscript of Bjørkhaug, H. J. Vik, C. Richards, (2017), The Chicken Game – Organization and Integration in the Norwegian Agri-Food Sector, in Mara Miele , Vaughan Higgins , Hilde Bjørkhaug , Monica Truninger (ed.) Transforming the Rural. In *Research in Rural Sociology and Development*, 24 pp.45 – 69. Emerald Publishing Limited