The Dog That Doesn't Bark: Animal Interests In Economics

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Abstract

Although animal welfare issues have become increasingly important to the economic fortunes of many producers, the interests of animals themselves are absent from standard economic analysis. By contrast, scholars from other disciplines such as philosophy and law have examined animal issues in considerable detail. This paper outlines a simple way of formally incorporating the insights of these disciplines within a traditional economics framework. If animals have economic standing, then current practice makes excessive use of animals as production inputs and is thus economically inefficient. However, efficiency would not, in general, entail zero use. Optimal usage depends on the costs to animals and the benefits to humans and thus reflects the usual cost-benefit tradeoff inherent in economics. Even if animals are accorded no economic standing, externalities imposed on human producers leads to similar qualitative conclusions.

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"Just a robot?" A little passion entered her voice. "That's the argument always. Just. Just! Why should the Solarian, Bander, have hesitated to kill us? We were just human beings without transducers. Why should there be any hesitation about leaving Fallom to its fate? It was just a Solarian, and an immature specimen at that. If you start dismissing anyone or anything you want to do away with as just a this or just a that, you can destroy anything you wish. There are always categories you can find for them."

Asimov (1986, p302)

1 Introduction

Animal issues are increasingly fundamental to the economic interests of many producers. In particular, farmers and other agents involved in food production are well aware of growing consumer concerns about animal welfare. For example, the United Kingdom's Farm Animal Welfare Council has explored the possibility of assigning animal welfare grades to all products for which animals are an input. And research laboratories that make use of animal subjects are the subject of ongoing scrutiny, and sometimes harassment. These phenomena represent, at least in part, a growing belief that animals have legitimate personal concerns – what I henceforth refer to as 'animal interests'.

Researchers in some disciplines have directly confronted animal interests. The philosophers Rachels (1990), Regan (1983), and Singer (1975) mount compelling cases for the assignment of various kinds of rights to animals, while Sunstein (1999, 2003) and Ibrahim (2007) consider animal issues from a legal perspective. However, the contribution of economics has been much more modest: standard economics models, to the extent they consider animal welfare at all, view animals as property that has no direct economic interests. As McInerney (2004) puts it, from the standpoint of economics, "(farm animals') value and importance is derived explicitly from what they contribute to economic output..." and that "...(animals') preferences and wellbeing (have) relevance only to the extent that they are important to (humans)."[1] Similarly, Frank (2002, p421) notes that the usual economics framework "...assign(s) zero value to the welfare of any sentient life with no spending power." Thus, most authors (e.g., Bennett and Blaney, 2002, 2003; McInerney, 2004) at best view animal welfare as a standard public good

[1] Carlsson et al. (2003) note that such a human-centric definition of animal welfare has obvious implications for the conclusions able to be reached.

issue, where harm to animals imposes negative external costs on humans, while ignoring the welfare costs of animal use *on the animals themselves*, i.e., on animal interests. The sole exception is Blackorby and Donaldson (1992) who, in a utilitarian framework that assigns explicit moral standing to animals, conclude that their use in activities such as food production or cosmetic testing is likely to be difficult to justify.

One possible rationale for this lack of interest by economists in animal interests is that it merely reflects legal realities which deny standing to animals. But as noted above, this has not deterred scholars in other disciplines from pursuing the topic. And economics has traditionally felt unconstrained in pointing out the resource allocation implications of particular legal or institutional arrangements. Nor is there widespread unanimity on the standing of animals that might render any incorporation of their interests in economics models a purely academic exercise: as Leslie and Sunstein (2007) point out, two-thirds of Americans in a 1995 poll agreed that "An animal's right to live free of suffering should be just as important as a person's right to be free of suffering." Although the true support for such a statement is almost certainly softer than the poll result indicates, it does, nevertheless, suggest that the current complete absence of animal interests from economics is something of a special case.

In this paper, I outline one possible way in which the insights of scholars from other disciplines about animal interests could be incorporated within a formal, but simple, economics model of resource allocation and discuss its implications. This exercise suggests that current practice makes excessive use of animals as production inputs and is thus economically inefficient. However, efficiency would not, in general, entail zero use, although the efficient scale in industries where the benefits of animal use are low (such as cosmetics testing) may be such that production ceases entirely. I also consider possible mechanisms for achieving the efficient allocation. Finally, I point out that a broader consideration of human interests that takes account of documented externalities leads to similar conclusions, even if animal interests are given zero weight.

2 Economic Efficiency and Animal Interests

2.1 Modelling animal interests

To illustrate how animal interests might be incorporated in economics, and to examine the implications of doing so, I use the standard welfare concept of economic surplus. In the traditional economics framework, economic surplus

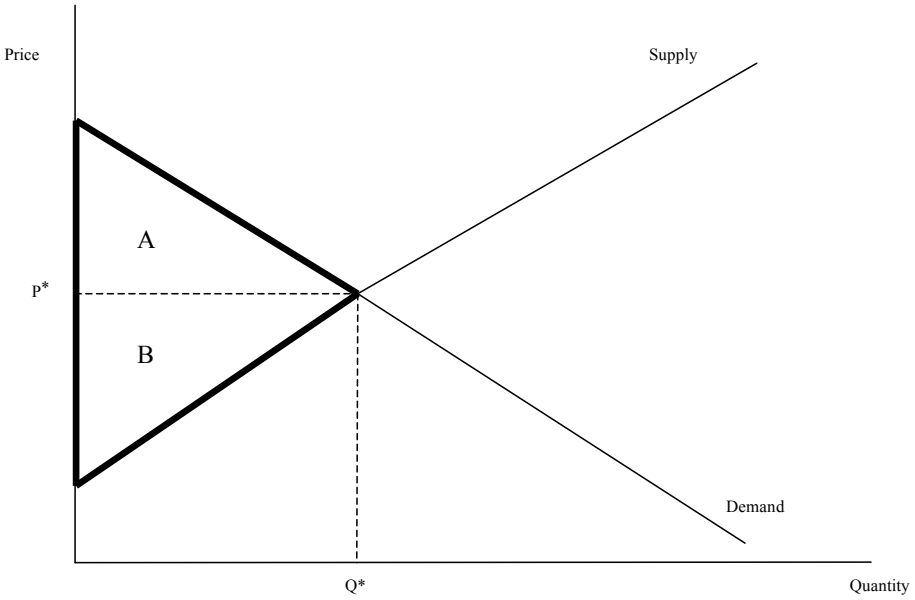

Figure 1: Conventional Economic Surplus. Consumer surplus is denoted by the triangle labelled A; producer surplus by the triangle labelled B. Total economic surplus equals the sum of these two areas.

equals the sum of consumer surplus – the amount that consumers benefit by being able to purchase a product for a price that is less than they would be willing to pay – and producer surplus – the amount that producers benefit by selling at a market price that is higher than they would be willing to accept.

These concepts are illustrated in Figure 1, which contains demand and supply curves for some arbitrary product that makes use of animals as inputs. Given the supply and demand curves, unrestricted trading in this product leads to the quantity $Q^\star$ being purchased at price P^*. As each point on the demand curve represents the amount consumers would be willing to pay per unit for the corresponding quantity, consumer surplus equals the triangle denoted by A. Similarly, each point on the supply curve represents the amount producers would be willing to accept per unit for the corresponding quantity, so producer surplus equals the triangle denoted by B. Total economic surplus is then given by $A+B$. Moreover, since the economic surplus associated with each possible quantity equals the area lying between the demand and supply curves to the left of that quantity, it is obvious that Q^* yields the maximum-attainable surplus.

Economic surplus is commonly used by economists to address welfare issues, but the underlying supply and demand functions incorporate only direct human interests. For example, the supply function reflects only the

costs of production incurred by human producers, and not the costs borne by animals. That is, each point on the supply curve reflects the financial cost to human producers of using animal inputs, but not the costs imposed on, and endured by, animals themselves. As Dillard (2007), Ibrahim (2007), Singer and Mason (2006) and many others point out, these costs can be considerable: discomfort, stress, fear, pain, suffering and premature death.[2]

How might animal interests be incorporated in the economic surplus framework? In principle, this requires only a straightforward modification of the underlying concept, as follows:

$$\begin{aligned} \text{'True' Economic Surplus} \quad &= \quad \text{Consumer Surplus} + \text{Producer} \\ &\quad\ \ \text{Surplus} - \alpha(\text{Animal Loss}), \end{aligned} \tag{1}$$

where Animal Loss is the value of the welfare costs imposed on animals during the production process and $\alpha \geq 0$ is a parameter representing the extent to which such costs are recognised by economic modelling. These additional terms warrant further discussion. In general, Animal Loss is designed to capture the idea that the pain and suffering imposed on animals used in the production process acts counter to animal interests and that this loss has a monetary value. One – fairly conservative – way to make this concept more concrete is to think of it as the monetary cost of the improvement to food, living conditions and slaughterhouse techniques that would make animals indifferent between being used for production purposes and not existing at all. The parameter α then represents the extent to which this cost is given economic standing. For example, $\alpha = 0$ is the case considered by traditional economics, while $\alpha = 1$ corresponds to Singer's (1975) 'equal consideration of interests'. In short, Animal Loss is the welfare cost to animals and α is the portion of this cost that economists choose to recognise.

In this setup, the efficient price-quantity combination is that which maximises (1). As noted above, this is (P^*, Q^*) when $\alpha = 0$; the important question is how this might be changed by the recognition of animal interests, i.e., when $\alpha > 0$.

This issue is addressed in Figure 2, where the principle encapsulated in equation (1) is captured by 'adjusting' the supply function to reflect the costs imposed on animals in the production process. That is, rather than just reflect the financial cost to human producers, each point on the supply curve now represents these costs *plus* the monetary value of the costs imposed on the animals used as inputs in the production process. Assuming the latter

[2] As Leslie and Sunstein (2007) observe, the demand function may also overstate the true benefits due to consumers receiving insufficient information about these costs imposed on animals, but I ignore this issue until section 2.3.

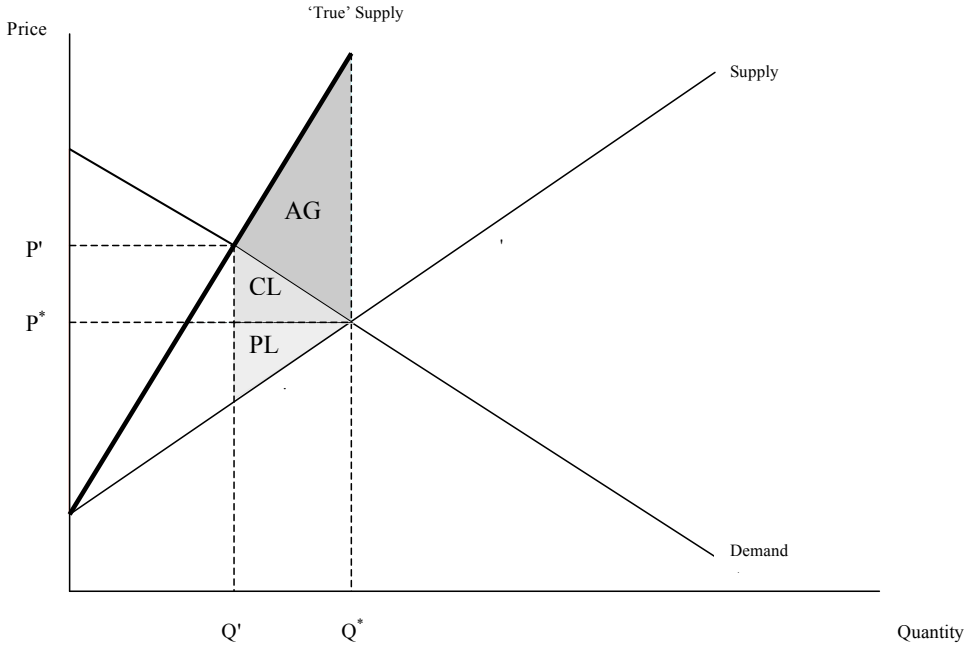

Figure 2: Economic Surplus with Animal Interests. Recognition of animal interests ($\alpha > 0$ in equation (1)) moves the supply function to the curve labelled 'True' Supply, resulting in the quantity Q' being purchased at price P'. Compared to (P^*, Q^*), (P', Q') has lower consumer and producer surpluses by an amount equal to the triangles $CL + PL$. But it also has lower animal losses – by an amount equal to $CL + PL + AG$ – so its total surplus is greater.

cost is a fixed amount per unit of production, this moves the supply curve upwards and to the left about its origin on the vertical axis – depicted as 'True' Supply in Figure 2.

The magnitude of the shift in the supply curve depends on (i) the costs imposed on animals in production (the value of Animal Loss) and (ii) the extent to which these are recognised (the value of α). The principal implications of such a change are as follows:

1. Because the new framework explicitly measures recognised animal losses – depicted by the area between the two supply curves – the combination (P^*, Q^*) is seen to be economically inefficient. Compared to (P^*, Q^*), the situation (P', Q') that arises under the 'true' supply curve generates lower consumer and producer surpluses – by amounts equal to CL and PL respectively – but animal losses are also lower, and by the larger amount $AG + CL + PL$. Hence, there is a net gain of AG and so economic surplus is greater at (P', Q') – where the quantity produced is lower, implying less use of animals. This occurs because recognition

of animal interests raises the costs of production, thus increasing the price that must be paid by consumers for any given quantity of the good, and hence lowering the actual quantity purchased. The original allocation (P^*, Q^*) *appears* to be economically efficient only because it ignores these additional costs.

2. Nevertheless, for any *finite* level of costs imposed on animals as part of the production process, the efficient use of animals is strictly positive (even if $\alpha = 1$). That is, so long as the true supply curve is not itself vertical, its intersection with the demand curve – (P', Q') – must lie to the right of the vertical axis and hence a positive quantity of the good is produced. This reflects the usual economic tradeoff between costs and benefits: an input is used up to the point where the additional gain from doing so is exactly offset by the additional cost.

3. As a result, the intensive use of animals can, in principle, be economically efficient even when the value of animal interests is explicitly recognised – so long as the benefits from doing so are sufficiently great (i.e., the demand curve for the product is high and to the right in Figure 2). Some areas of medical research may, arguably, fit this criterion.[3] At the other extreme, however, goods for which the benefits are low – such as cosmetics testing and fur products – will see the supply and demand curves intersect very close to the vertical axis. The resulting quantity may not be of sufficient scale to maintain such industries, in which case production could cease entirely. The same is potentially true of goods that impose particularly severe costs on animal interests, such as veal production and battery hen farming, since in such cases the true supply curve will lie far to the left of the original curve.

2.2 Achieving animal interests

Although the principal goal of this paper is to illustrate how animal interests might be incorporated within the *methodology* of economics, having done so it is natural to ask how the efficient outcome (P', Q') might be achieved. Clearly, a sufficient mechanism for doing so is one that 'moves' the supply curve from one that ignores animal interests to one that fully incorporates these interests.

There are three principal ways by which this could be brought about. First, a tax equal to the welfare-cost-per-unit-of-use could be imposed on

[3]Whether or not they do in practice will also depend on the availability of substitute methods, such as computer modelling.

the use of animals in production. By forcing producers to confront the costs they impose on animals, the actual supply curve would be identical to the true supply curve depicted in Figure 2, thus leading to the outcome (P', Q'). However, this approach has a significant drawback: although the use of animals in production will decline to an efficient level, this will not benefit the animals who continue to be used unless the government is able to find some way of returning the tax revenue to these animals – a most unlikely outcome. In short, although a tax would succeed in internalising the true cost of animal use to producers, it provides no obvious mechanism for compensating the animals on whom costs are imposed. Moreover, identifying, imposing and collecting the appropriate tax for all of the myriad uses made of animals would almost certainly be an administrative nightmare.

Alternatively, extensive animal welfare regulations could be imposed on producers who use animals as inputs, effectively forcing such producers to move to the true supply curve in Figure 2 and so meet the full costs of their animals' interests. Of course, such an approach is already followed in many countries – albeit often in fairly diluted form (i.e., low α) – but its effectiveness is severely hindered by weak enforcement. For example, responsibility for enforcing animal welfare laws in the New Zealand agricultural sector lies with the Ministry of Agriculture and Forestry, but this organisation currently has only five inspectors, or one for every 10 million animals. Funding for this role has also declined in real terms in recent years, despite representing only a tiny fraction of the Ministry's budget; indeed, the Minister of Agriculture openly admits to having more pressing priorities.[4]

A final approach, to be used in conjunction with the second, would therefore be to confer legal standing on animals, thus enabling individuals or organisations to undertake legal action on their behalf in order to ensure compliance with welfare laws and regulations.[5] Currently, animal welfare prosecutions in New Zealand can be undertaken by only three agencies: Ministry of Agriculture and Fisheries, the Society for The Prevention of Cruelty to Animals, and the New Zealand Police. Of these, the enforcement capabilities of the first are, as already discussed, severely under-resourced; the second receives no government funding and so is similarly constrained, and in any event tends to concentrate on domestic animals rather than those used in production; while the third rarely uses its prosecutorial powers in animal welfare cases. Empowering additional parties to undertake this role would enable better enforcement of recognised animal interests, and thus move the supply curve closer to its 'true' position.

[4] See *New Zealand Farmers Weekly*, 28 July 2008.

[5] See Sunstein (1999) for a more extensive discussion of this idea.

2.3 Beyond animal interests

In the analysis above, I have assumed $\alpha > 0$, i.e., that the welfare of animals – from the perspective of animals themselves – matters and is recognised. Two other cases also warrant consideration. First, where animal interests are unrecognised, but human interests depend to some extent on the treatment and welfare of animals. Second, where where animal interests are unrecognised *and* human interests do not depend directly on animal welfare.

The first case is easily dealt with. Equation (1) becomes:

$$\begin{aligned} \text{'True' Economic Surplus} \quad = \quad & \text{Consumer Surplus} + \text{Producer} \\ & \text{Surplus} - \alpha'(\text{Animal Loss}), \end{aligned}$$

where α' denotes the extent to which animal welfare enters the calculation of human interests. Note that, because humans will rationally put their own interests ahead of those of animals whenever a conflict arises, $\alpha' < \alpha$. Otherwise however, the analysis is the same as that depicted in Figure 2.

The second case is more difficult. At first glance, it might seem that such a case is simply that considered by the standard economics paradigm, thus invalidating Figure 2 and its accompanying discussion. However, this is not necessarily the case. Dillard (2007) points to evidence from a variety of sources suggesting that the highly unpleasant work undertaken by slaughterhouse workers results in their being subject to various kinds of psychological trauma, including stress disorders, reduced empathy, and the development of multiple personalities. Furthermore, Fitzgerald (2007) finds that slaughterhouse employment is associated with significantly increased crime, including rape and other violent responses. Thus, those most actively involved in the denial of animal interests seem to suffer adverse consequences from doing so, and, at least in some cases, impose those consequences on others.[6]

Such outcomes are, of course, straightforward manifestations of a negative externality: because the psychological costs of slaughterhouse employment typically only show up after some period of time, slaughterhouse employers are able to avoid bearing these costs as part of the employment relationship, effectively transferring them first to the employees and subsequently

[6] An alternative interpretation of this evidence is that individuals able to tolerate slaughterhouse working conditions are more likely to have violent and criminal tendencies. If this were true, then it is no longer so clear that the slaughtering of animals has unrecognised social costs. Indeed, at least so long as $\alpha = 0$, it could even be beneficial, insofar as slaughterhouse work may offer an 'escape valve' for personalities that might otherwise act against humans.

to society. In this case, Equation (1) becomes:

$$\begin{aligned} \text{'True' Economic Surplus} &= \text{Consumer Surplus} + \text{Producer} \\ &\quad \text{Surplus} - \alpha''(\text{Animal Loss}), \end{aligned}$$

where α'' denotes the extent to which animal welfare costs impose negative externalities on human interests. As with all negative externalities, the failure to internalise these costs results in a supply function that under-estimates the true cost of production (i.e., a supply curve that lies too low and/or to the right), leading to too much slaughterhouse employment and, hence, to too great a use of animals. In short, even when $\alpha = 0$ (so that animal interests have no direct economic standing), the external costs of animal usage on humans means that the analytical picture is essentially the same as in Figure 2.

3 Concluding Remarks

In this paper, I have outlined a simple way of incorporating the 'animal interests' insights of legal and philosophy scholars within a formal economics framework, and explored the consequences of doing so. Although similar to the standard economics analysis of externalities, my contribution is more radical (and similar to that of Blackorby and Donaldson, 1992), focusing as it does on the animal usage costs imposed directly on the welfare of animals themselves, rather than simply those that humans are willing to accept as having negative implications for their own welfare.

Unsurprisingly, relative to the standard economics framework that ignores animal interests, the new framework suggests that animal usage is almost certainly too high. On purely economic grounds, however, involving a comparison of costs and benefits, optimal usage is unlikely to ever be zero.

References

Asimov, A., 1986. Foundation and Earth. New York: Ballantine.

Bennett, R. and R. Blaney, 2002. Social consensus, moral intensity and willingness to pay to address a farm animal welfare issue. Journal of Economic Psychology 23, 501–520.

Bennett, R. and R. Blaney, 2003. Estimating the benefits of farm animal welfare legislation using the contingent valuation method. Agricultural Economics 29, 85–98.

Blackorby, C. and D. Donaldson, 1992. Pigs and guinea pigs: a note on the ethics of animal exploitation. Economic Journal 102, 1345–1369.

Carlsson, F., P. Frykblom and C. Lagerkvist, 2003. Farm animal welfare – testing for market failure. Göteborg University Working Paper.

Dillard, J.,2007. Slaughterhouse nightmare: psychological harm suffered by slaughterhouse employees and the possibility of redress through legal reform. Georgetown Journal on Poverty Law and Policy, forthcoming.

Fitzgerald, A., 2007. Spill-over from 'The Jungle' into the larger community: slaughterhouses and increased crime rates. American Sociological Association. Available at: http://www.allacademic.com

Frank, J., 2002. The actual contribution and potential contribution of economics to animal welfare issues. Society and Animals 10, 421–428.

Ibrahim, D., 2007. A return to Descartes: property, profit, and the corporate ownership of animals. Law and Contemporary Problems 70, 89-115.

Leslie, J. and C. Sunstein, 2007. Animal rights without controversy. Law and Contemporary Problems 70, 117-138.

McInerney, J., 2004. Animal welfare, economics and policy. Journal of the Royal Agricultural Society of England 165.

Rachels J., 1990. Created From Animals. Oxford: Oxford University Press.

Regan, T., 1983. The Case For Animal Rights. Berkeley and Los Angeles: University of California Press.

Singer, P., 1975. Animal Liberation: A New Ethics For Our Treatment Of Animals. New York: Avon.

Singer, P. and J. Mason, 2006. The Ethics of What We Eat. Melbourne: Text Publishing.

Sunstein, C. 1999. Standing for animals. University of Chicago Law School, Public Law and Legal Theory Working Paper No. 06. Available at SSRN: http://ssrn.com/abstract=196212.

Sunstein, C., 2003. The rights of animals. University of Chicago Law Review 70, 387–401.