

PROFITING FROM ANIMAL WELFARE: AN ANIMAL-BASED PERSPECTIVE

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Summary:

The animal welfare debate has been developing in the UK since the 18th century and for much of that time the emphasis has been on the use of legislation to protect animals. More recently in farm animals there has been a focus on using market-led approaches to improve animal welfare. In this paper we argue that there is a strong case for examining more closely supply-side solutions to improving animal welfare, in effect asking how much animal welfare can farmers' afford to deliver. The answer appears to be more than some might think. Using a range of examples we illustrate that improving animal welfare need not penalise business returns and indeed may increase profits. A greater focus on delivering improved animal welfare within a competitive livestock industry would allow farmers to gain the initiative in the animal welfare debate. To realise this requires interdisciplinary research combining economic analysis with high quality scientific information on the animals' welfare combined with effective knowledge exchange that positively influences farmer behaviour.

Introduction:

Animal welfare is a high profile ethical concern for the animals that are under our care and management. In most commonly accepted definitions animal welfare is taken to cover both the animals' physical and mental well-being (e.g. FAWC, 2008). Animal welfare concerns are often directed at farm animals partly because of the nature of intensive farming and also because of the scale of the issues given the numbers of animals involved. The debate over animal welfare is complex and needs to be understood when making rationale decisions going forward. In this paper we will examine the development of animal welfare concerns especially in the context of farm animal issues before considering how animal welfare and business profit might be aligned.

Development of Animal Welfare Concerns:

Moral concerns and regulation: It is often portrayed that the modern concern for animal welfare started when Ruth Harrison wrote 'Animal Machines', her treatise on intensive farming and its effects on farm animal welfare (Harrison, 1964). In fact it is more accurate to see 'Animal Machines' as stimulating an already well established concern for animal welfare that dates back to the writings of 18th Century philosophers such as David Hume and Jeremy Bentham. A critical contribution of writers such as Hume and Bentham, was to propose that animals like humans are sentient and therefore have the capacity to experience suffering (e.g. Lawrence, 2008). The proposition that animals can suffer seems to have directly led to the

passing of the first (ever) animal protection legislation here in the UK (see Radford, 2001 for a review). Therefore, animal protection legislation was one of the immediate consequences of a growing belief in animal suffering, a pattern that has continued up until the present. As acceptance of animal sentience has continued to grow (in part through further scientific evidence of the similarities between animals and humans), so has the 'moral pressure' to protect animals (e.g. New Scientist, 2005) leading to a continuous development of EU and UK animal protection legislation. For example the Animal Welfare Act (2006) now requires animal owners and carers to have a duty of care to go beyond preventing animal cruelty and to promote positive welfare in their animals (Defra, 2008).

'Market-led regulation': The reliance on legislation to regulate animal welfare has however been gradually changing to accommodate the role of the 'market' in setting standards and improving farm animal welfare. In policy terms this is seen most clearly in the 'GB Health and Welfare Strategy' (Defra et al., 2004) which promotes the development of partnerships, the understanding of costs and benefits and sharing of roles and responsibilities in improving animal welfare. In the food chain the emergence of farm assurance schemes has led to inclusion of animal welfare in assurance protocols (e.g. Blokhuis et al. 2003) most noticeably in the establishment of the Freedom Foods brand and underpinning standards (RSPCA, 2008) .

The shift to more market-led approaches has inevitably been accompanied with a greater focus on consumer aspects of the animal welfare debate (e.g. McInerney, 2004). Current evidence is equivocal as to the potential for adding value to animal products through higher welfare standards. There has for some time been evidence that the public concern over farm animal welfare is not necessarily matched by a willingness by consumers to pay for welfare (e.g. IGD, 2007). Recent reports (e.g. Welfare Quality®, 2007) present a relatively optimistic picture suggesting that there is an appetite amongst consumers for higher welfare standards and that the market is seeing an increasing number of products with welfare attributes. Others (FAWC, 2005) have been less impressed by the evidence of higher welfare standards having been promoted through market led incentives. One reason often given for the slow progress in promoting animal welfare to consumers is a lack of clear labelling information on animal welfare and this in turn has led to considerable research focus on development of scientifically valid and practical tools for assessing welfare on farms (e.g. (Matthews 2008). Another problem is consumers' preference to assume that animal welfare is taken care of by farmers, the authorities and retailers rather than be confronted by choices that may be considered upsetting or off-putting (SEERAD, 2003). Finally the onset of the 'credit crunch' in 2008 raises the issue of how robust will be consumers' preferences for welfare branded foods in the face of economic down-turn.

The growing focus on market-led approaches to animal welfare has improved our understanding of consumer perspectives on animal welfare. Social science research undertaken by the EU's Welfare Quality® project suggests that consumers are concerned that animals should not suffer in food production, and that they should 'live natural lives'; consumers also tend to 'bundle up' animal welfare with other concerns such as the environment (Welfare Quality®, 2007). Of these, the concern of consumers that animals should live natural lives is most in contradiction to current livestock farming which in general continues to experience competitive pressures leading to further intensification (e.g. Fraser, 2008). This 'contradiction' between consumer and farmer perspectives is a useful point to remind us of the animal, which often appears 'caught' between human interests. In fact scientific evidence of the animals' perspective suggests that we should be cautious about drawing simple conclusions, as the relationship between intensive production systems and animal welfare is complex:

- (a) A study of welfare in broiler chickens kept at different stocking densities concluded that 'care' of birds (in terms of the environment producers provided for the birds) was of more importance in terms of 'obvious' welfare measures (e.g. mortality) than stocking density *per se* (Dawkins et al., 2004). Having said that it was also the case that some aspects of welfare (including behaviour) did deteriorate with stocking density and these may yet be shown to be important (see below).
- (b) A review of laying hen systems (LayWel, 2008) illustrates that moving from battery cages to 'free-range' systems tends to replace poor welfare associated with lack of behavioural freedom with poor welfare associated with more physical challenges (e.g. mortality, feather pecking, certain diseases). The LayWel report emphasised the importance of considering the capacity of systems to deliver improved welfare (i.e. whilst battery cages must always be behaviourally restrictive it was argued in principle that 'free-range' systems could be improved to reduce physical challenges).
- (c) A study of dairy cow welfare found evidence of better leg health (lameness and leg injuries) on organic compared to conventional farms (e.g. Rutherford et al. 2008). The study also identified key factors (e.g. length of time on grass; age at first calving) contributing to the improved leg health on organic units; in principle these risk factors for could be addressed by conventional dairy farms.
- (d) It is often assumed that grazing livestock are in better welfare as a result of being seen to live more 'natural lives'. Yet extensively managed ruminants face significant challenges to their welfare in terms of variable food supply, extremes in weather conditions, and disease risks (e.g. (Turner & Dwyer 2007).

The observation that consumers often 'bundle-up' welfare with other issues such as the environment (Welfare Quality®, 2007) emphasises that animal welfare improvements increasingly need to be seen in the context of other societal concerns. The most obvious of these concerns is over climate change, which has grown dramatically in recent years. More

recently the issue of security of food supplies has also been raised, in part triggered by the impact on food supply of diverting grain crops to production of bio-fuels but also by substantial food inflation in the EU (e.g. Lawrence, 2008).

In summary we conclude here that:

- (a) The growth of concern in animal welfare and the intensification of livestock production can be seen as independent processes that 'collided' as a result of developments in agriculture and wider society. Animal welfare concerns are not an inevitable consequence of intensification of livestock production (see also Fraser, 2008);
- (b) Animals' day to day experiences are key to animal welfare and hence the relationship between systems of production and welfare is complex; as far as the animal is concerned the 'devil is in the detail';
- (c) The focus on protecting animals and improving animal welfare through legislation has begun to be replaced by a 'mixed model' of legislative minimum standards supplemented by 'market-led' initiatives;
- (d) Consequently there has been a growing focus on 'demand-side' solutions especially to improving animal welfare through stimulating 'demand' for high welfare products. The extent to which such 'market-led' solutions will be effective in the long-term remains unclear due to issues such as the risks of 'market failure' (where the market fails to protect species or segments of a sector) or fragility of consumer preferences in the context of economic recession;
- (e) There is a growing need to integrate animal welfare with other emerging concerns such as climate change.

Given these points we wish to emphasise in this paper that 'profit from animal welfare' can also come from 'supply-side' decisions taken at farm level on the basis that:

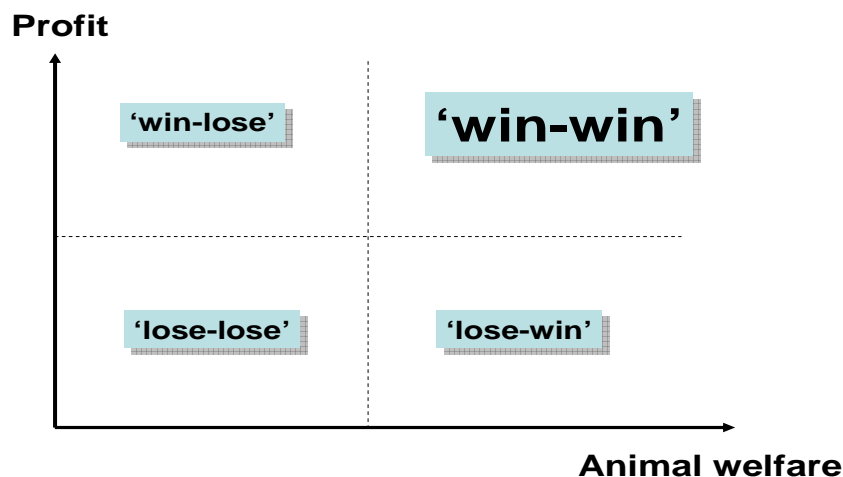
- (a) Improving welfare can reduce costs and raise profits;
- (b) Supply-side solutions may help identify more profitable market opportunities;
- (c) Rather than finding themselves being 'sandwiched' between regulations and market-demands, farmers can gain the initiative in the welfare debate;
- (d) Interdisciplinary science especially linking economics and animal science can provide considerable assistance to this approach, bringing objectivity, independence and innovation to farm-level decision making.

Animal welfare & economics

Economics is the study of how to allocate scarce resources in the face of unlimited human wants. Economic analysis therefore has the capacity to achieve a better understanding of and insight into the inevitable 'trade-offs' that are required to match resources against demands. Previous explorations of economics and animal welfare have tended to emphasise the demand-side (e.g. McInerney, 2004). However it is equally valid to apply economic

approaches to the supply-side and to farm-level decisions that affect animal welfare. Analysis of farm-level trade-offs will identify a range of scenarios from 'win-win' (where profit and welfare are aligned) through to 'lose-lose' (where neither farmer nor animal are winners; see Figure 1).

Figure 1: The potential 'trade-off's' between profit and animal welfare portrayed as 'win' or 'lose' scenarios; clearly 'win-win' scenarios will be the most attractive to farmers and animal welfare interest groups.



If we are to properly assess the trade-offs between profit and animal welfare at farm-level then we need to: (i) identify and estimate the 'hidden' costs and benefits of different farm-level decisions; and (ii) properly understand the 'animals' perspective' and integrate this understanding in economic modelling of farm decisions.

Analysis of trade-offs:

Components of systems: There are a number of well established examples where welfare and profit can be simultaneously improved by addressing system components:

- (a) Dairy cow health: Health is an obvious area in which to look for positive relationships between welfare and profit. For example in the past dairy cow breeding was focused narrowly on milk production (Rauw et al. 1998). More recently as measurements of 'functional traits' have become available it has become clear that the narrow focus on breeding for milk yield is unfavourably correlated with reductions in fertility and health traits (Lawrence et al. 2004). This in turn has led to significant changes in the indices developed to help farmers in choosing bulls. Today the most profitable bulls will produce daughters which yield less milk but are healthier and longer-lived (Amer and Wall, in preparation). The 'cost' of producing less milk in this case is more than matched by the 'benefit' of lower costs due to better health and a lower herd replacement rate.

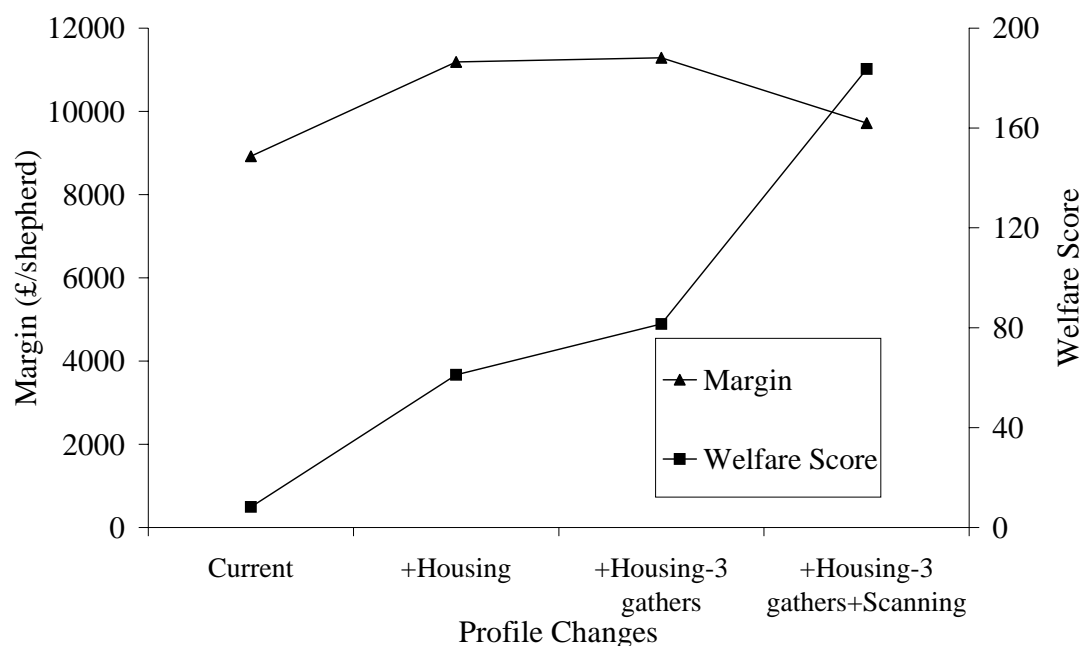
- (b) Neonatal survival: Substantial numbers of young farm animals die within hours and days of birth. Neonatal mortality is likely to result in suffering and is also often seen as a key component of business profit. In sheep production there are many approaches available to farmers to improve lamb survival and currently there is considerable interest in the use of genetics to produce more viable lambs at birth (e.g. SAC, 2008). Farmers' may focus on the direct financial benefit of having more lambs to sell but it is also important to note the hidden costs attached to the choice of genotype. In a study of the impact of breed type on labour at lambing, a breed with more viable lambs required less than 20% of the labour input relative to a breed with less viable lambs requiring greater levels of assistance (Dwyer & Lawrence 2005).
- (c) Animal temperament: Animals' have behavioural dispositions or temperaments that affect how they react to specific conditions. In recent years there has been growing interest in the relationships between animal temperament and other traits of interest to farmers. For example there is a clearly established relationship between beef cattle temperament and meat quality from research in the US and Australia (e.g. (Kadel et al. 2006). In pigs it is common for fighting to occur between unfamiliar individuals when mixed into new groups and this can cause physical damage and reduced weight gain (e.g. (D'Eath & Lawrence 2004) and also potentially stress-induced effects on meat quality (D'Eath et al., in preparation). As many studies have shown temperament traits to be under genetic control (e.g. (Turner et al. 2008) there are potential benefits to welfare and business returns to introducing selection for temperament into farm animal breeding programmes.

Trade-offs at systems level: There has been less attention on optimising welfare and profit at the level of the production system or farming enterprise. Yet this is essential to view the overall sustainability of the options facing farmers. For example at a component level it may seem that there is an option to improve welfare and profit through increasing labour, when within the farming enterprise there maybe insufficient capacity or flexibility to meet that demand. It is generally beyond our capacity to resolve the complex of factors that determine the 'right decision' in a complex system such as a farm. Economic modelling provides powerful approaches for resolving complex sets of relationships and can be used both to define the decisions that optimise for diverse goals (e.g. profit and welfare) but also the consequences of different decisions.

An example of such an approach comes from a Defra funded project (EWES; see also: www.sac.ac.uk/sheepwelfare) on extensive sheep farming systems. As with other forms of livestock production, extensive sheep farmers have choices to make over the system that they use including the degree of intensity of the system. In this study alternative management practices were ranked by farmers and experts for their effect on welfare using a market research technique known as adaptive conjoint analysis (Stott et al. 2005). The financial

impacts of the different management options were also appraised. According to this analysis feeding was important to welfare but for labour there was a trade-off between welfare and profit. The study concluded that for individual farms it was possible to improve welfare, sometimes for profit and often at little cost through a careful choice between available strategies (Figure 2).

Figure 2: Path to the welfare maximising profile for a hill sheep farm (Defra 2005). The graph illustrates the trade-off between practices viewed by farmers and experts as leading to increased welfare and gross margin.



We are taking a similar approach to address the issue of housing for farrowing sows in intensive pig production. Indoor sows are routinely housed in farrowing crates which have long been an issue of concern to animal welfare groups (e.g. Viva, 2008), and there is sound scientific evidence that crates interfere with the sows' motivation to build and give birth in a nest (e.g. Jarvis et al. 2002). Yet policy makers remain reluctant to phase out the use of farrowing crates as alternative 'pen' systems have often been shown to increase piglet mortality. The farrowing crate is therefore a classic welfare dilemma where it has proved difficult to find options that improve the welfare of the sow without imposing costs on the piglet and the farmer. In a Defra funded project ('PigSafe'; see also:

<http://www.sac.ac.uk/research/projects/theme/animalwelfare/>) we are using economic modelling to optimise the interests of the sow, the piglet and the farmer. Although at an early stage, our analysis suggests that using current research knowledge there is in fact only a relatively small difference in physical and financial performance between crates and a 'designed-pen' which provides for improved sow and piglet welfare. In future work we plan to

use a combination of design innovations, stakeholder inputs and further iterations of the economic model to improve the performance of the pen option relative to the crate.

Scope for further work: Promising as these examples are of the potential to reconcile welfare and profit we believe that much work is still needed to fully exploit the opportunities.

The importance of building in the animals' perspective: A criticism that could be levelled at current work is that it is overly reliant on expert opinion as to the welfare consequences of farmers' decisions and insufficiently informed on the animals' own perspective. We don't see this as an insoluble issue but one that requires further interdisciplinary work between economists and animal scientists. There are a number of approaches developed by welfare scientists for assessing welfare from the animals' perspective. One line of reasoning has been to use behavioural tests that 'ask the animal' to act as a consumer and to choose between options (e.g. Dawkins 2004). In principle it seems to us that the use of such animal choice approaches could link well to economic modelling of profit and welfare.

A more sophisticated and biologically based view of the animal welfare to economic modelling has the potential of highlighting previously 'hidden' costs and benefits. An example of this comes from work on the relationships between animal management, stress and food safety (e.g. Humphrey 2006). This research suggests that animal stress hormones can directly influence the 'behaviour' of pathogens such as 'Campylobacter' causing them to become more invasive and capable of moving from the gut into other tissues. This previously unidentified set of relationships hence establishes a potential conflict between competitive pressures to reduce the costs of poultry production, for example by increasing stocking density, resulting in increased animal stress and hence direct risks to human health. Such information could be important in defining optimal levels of farming intensity that cater for animal, producer and consumer interests.

Encouraging changes in farming practice: The success of a supply side approach can be measured by the extent of 'take-up' and change of practice by farmers. A number of welfare issues have remained intransigent to change on farms even with considerable effort going into research and knowledge transfer. However more recently there are encouraging signs that 'welfare messages' are beginning to impact on farmers' decisions. For example in Scotland, as part of the Scottish Government sponsored research programme, the use of consultants to translate our welfare research into farmer relevant messages has substantially increased the extent of our knowledge transfer activity. A more proactive approach to knowledge exchange (KE) is to integrate farmers directly into research activities. There are an increasing number of projects such as the EWES and PigSafe projects mentioned earlier, where farmers or producer bodies are directly involved in the research process. Clearly with a large number of possible KE programmes available, evaluation should take place of the

most effective strategies. However we would argue that whatever the precise details of the KE programme it will always be more effective if it addresses the supply-side issues we have been discussing in this paper.

Conclusions:

The modern debate over animal welfare is based on the moral concern that non-human yet sentient animals have lives in which they suffer or where they do not have enough positive experiences. It happens that much of this concern is directed at farm animals. Given that animal welfare is a moral concern it may seem inappropriate to consider whether we can profit from it. Yet the recent emergence of market-led approaches to improving animal welfare indicates the relevance of economics to the farm animal welfare debate. The main focus of this paper has been on supply-side issues, in effect asking how much animal welfare can farmers' afford to deliver. The answer appears to be more than we might think. We have used a number of examples to illustrate that improving animal welfare need not impose great penalties on business returns and indeed may even increase profit. Of course not all scenarios will both be good for the farmer and the animal, but systematic analysis such as we are proposing here will discriminate between those that can be resolved at the farm-level and those where resolution requires decisions taken elsewhere (e.g. by other partners such as retailers, or through government policy). As we argued earlier one benefit of our approach is that it allows farmers to seize the initiative in the welfare debate. To realise this we also emphasise the importance of a science-based understanding of the animals' perspective in order to allow an accurate evaluation of trade-offs and to properly represent the farmers' and animals' interests in farm decisions.

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