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LIVESTOCK IMPROVEMENT CORPORATION LECTURER 2002

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LIVESTOCK IMPROVEMENT CORPORATION LECTURE

Animal welfare: ethics, economics and productivity

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ABSTRACT

Ethics is about what people think, productivity relates to what useful output animals can provide, while economics is the framework within which these human and technical values get sorted out in food production and consumption. This paper offers a deliberately non-specialist overview of these issues as they relate to farm animal welfare, in an attempt to show a social science approach to what is otherwise regarded as a matter predominantly of animal science. It discusses how ethical positions concerning animal welfare link to consumer preferences, which are the driving force of economic activity, and suggests that in this context science may be informative, but not necessarily influential in determining how livestock production methods are determined. The essential conflict in livestock farming between human benefit and the animals' wellbeing is analysed using a simple model reflecting the choices associated with different preference patterns in society. The simplistic argument that high welfare standards will raise food prices is shown to be technically correct, but the likely magnitudes are very minor. In relation to trade in livestock products, whether in domestic or international markets, the issue of animal welfare standards has ultimately to be considered in the context of satisfying consumer preferences; it should not be overly confused by emphasis on comparative costs or agricultural protection.

Keywords: Farm animal; productivity; ethics; economics; welfare; food; markets; consumer.

INTRODUCTION

The ability to pronounce authoritatively on animal welfare seems, on the surface, to have belonged in the past to a fairly limited group. To a large extent, it has been regarded as the province of vets, who declare a professional commitment, at the outset, to the welfare of animals. Alternatively, it is the welfare activists, who take the stance that they are society's conscience and the guardians of animal wellbeing in the face of an ill-informed public and uncaring forces of commercial exploitation. More recently, as a scientific basis to animal welfare studies has developed, animal scientists have been gaining a more influential role. However, it is too restrictive to view the issue as being one of either exclusive scientific expertise or political advocacy. Farm animals are not some specialist corner of our lives, like metallurgy or the preservation of historic buildings, but a central element in our food production and consumption system – in which *everyone* is involved.

That system is, above all else, an economic one. It consists of a complex of sequential economic activities, involving the use of resources to create (food) products and services and their subsequent exchange and transfer between interested parties. The process is constrained by scientific or technological realities, for sure, and may be influenced by political pressures; but it is fundamentally driven by the values and consumption preferences of the society in which food production takes place, the incentives and rewards of the participants, and the market processes within which it all takes place. As part of this complex, therefore, animal welfare is an issue that is just as much the province of the social scientist who studies human values and preferences, how they affect action, and how individual and collective action in pursuit of benefits mould the way things are done in the world. Indeed, it is a tenable position to declare that it is socio-economic considerations above all else that determine how farm animals are treated.

ANIMAL WELFARE AND HUMAN WELFARE

From a functional point of view, therefore, we have to place *people* (not animals) at the centre of the animal-welfare discussion. The advantage of being (apparently) the highest form of life is that we get to make the rules and, within the constraints of science and current technology, to manage the way the world operates. For a start, we decide what will or will not be considered as constituting animal welfare and what will be done about it. We tell ourselves that preventing or treating disease is for the animal's good, although it is of course for our own benefit (which is why we don't do it for all disease conditions). We feel good about housing and feeding our domestic animals and protecting them from predators as though it was primarily for their benefit not ours. We overlook the fact that castrating them, confining them, determining their diet and regulating their choice of mate is clearly the dominance of our choice over theirs. Furthermore, as well as forming our own perceptions of welfare we also decide the animals to which those perceptions will apply. Domestic pets, in general, are high on the scale. Farm animals score less well, but are still of concern during their productive period until (notwithstanding the care and concern over humane slaughtering) their welfare is severely diminished when their life has no further economic value. We apply very few welfare considerations to animals which have a negative economic value, such as rats or possums, which we cheerfully subject to unpleasant treatment via poisons of one sort or another. And our concern over welfare extends only to the animals we know about or whose situations we can manage; the cruel way in which lions attack wildebeest or the domestic cat terrorises its captive mouse is of necessity left out of the reckoning.

All this makes clear that animal welfare is in reality a subset of human welfare, the animals' preferences and wellbeing having relevance only to the extent that they are important to *us*. We respond to our perceptions of animal wellbeing because it makes us feel better to do so, or uncomfortable to ignore our impact on them. However, if there is any conflict between our preference and the animal's preference, it is ours which inevitably prevails.

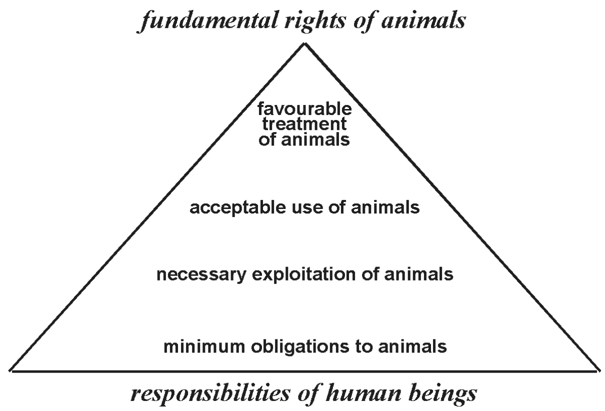
ETHICS

This is not to say, of course, that the inherent interests of farm animals don't get a look in. Another aspect of being the highest form of life is that we have the inclination and ability to reflect on the consequences of our actions. Both as individuals and collectively, certain ethical considerations inform and constrain our actions. 'Ethics' in this context means a set of principles of conduct which govern an individual or a group, and relate to what is considered right or wrong, good or bad, just and unjust, etc. These principles are, therefore, potentially powerful determinants of human action'– and hence, in a world which is driven by human action, can be just as influential on what *will* be done as are scientific or technical constraints on what *can* be done.

However, it is well known that ethics is concerned not with how things are but how they ought to be, i.e., they involve value judgements. By contrast, the hallmark of science is that it eschews value judgements entirely and relies on observation, explanation and inference. So there is no obvious integration of the ethical and the scientific considerations of animal welfare issues, despite the fact that both have something important to say. Veterinary and animal sciences explore how the husbandry conditions of livestock affect their health and wellbeing (widely defined) and, from this technical base, infer what is better or worse for the animal. Hence, they deal, explicitly or implicitly, with preferences and values as perceived by (or on behalf of) the animal. Ethical considerations, by contrast, have their base in more human concepts of animals' wellbeing, ranging from the responsibilities we should assume for the animals in our care to the more extreme declaration of 'rights' that animals possess.[1]

This range in ethical positions is portrayed in Figure 1. At the very peak of the framework is the concept that all animals have basic rights as sentient beings, not dissimilar to the basic rights we presume for all humans. This philosophical position would assert that animals have an 'intrinsic' value simply by virtue of their existence, regardless of where they fit into mankind's managerial activities, and that we should recognise and respond to this; such a viewpoint would, therefore, introduce a major component (a kind of''self-worth') into the value that humans attach to animals that is quite independent of the use we make of them. As one moves down through the more functional utilisation of animals in our own interest, this''ethical value' declines and implies a lower weighting being attached to their interests versus our own. However, at the very minimum, civilised human values would insist that we have obligations to all animals and, whether pets, productive livestock, vermin or general wildlife, we have an inescapable responsibility to be conscious of their wellbeing. This would set the baseline to the way we may use them in economic activity or otherwise to our advantage, and is the main determinant of the animal welfare legislation and regulations that are acceptable to any society. The pyramidal shape reflects the likely strength with which the various positions are typically held in society, from minority to majority acceptance.

FIGURE 1. Defensible ethical positions regarding the treatment of animals



This structure is difficult to incorporate into a natural science framework, in which weights are supposed to be enduring and relationships reproducible; they are susceptible to changing physical and biological parameters, but not, supposedly, to something as unsystematic as what "people" might think at any point in time. Hence, detailed, rigorous and informative though the scientific studies on animal welfare may be, they may, in themselves, have little impact on the treatment of animals within managed livestock farming systems – any more than scientific understanding seems to impinge significantly on human action with respect to smoking, global warming, depletion of fish stocks, consumption of non-renewable energy stocks, or the other multifarious ways we ignore the knowledge of what we are doing. It is perhaps economic science which can best claim to handle the ethical discussions of animal welfare insofar as it recognises ethics as one of the factors in the definition of consumer/society preferences – which are themselves the ultimate determinant of how livestock production processes are pursued. So let us consider livestock production as an economic process.

ECONOMICS

Given its conventional subtitle "the science of value", the discipline of economics has little difficulty in embracing ethical values in its analytical frameworks. The central thrust of economics is the study of people's activities (collectively rather than individually) in the creation of value and the pursuit of their own benefit. The driving force of this activity is people's preferences. Those preferences do not have to be explained or justified, or even shown to be rational; rather they are a datum, their satisfaction being the purpose of economic activity and the benchmark for economic efficiency. Sociologists and psychologists may explore where preferences come from, what moulds them, and how robust they are, but economists simply use them to explain and predict how they determine people's activity in production, consumption, investment and exchange, and then to assess how effectively the economy, or economic sector, has functioned. So ethical values cause no more difficulties than any of the other things that underlie personal preferences – education, experience, culture, history, belief, income, self-image, misconception,.... or whatever. Furthermore, economic relationships do not presume a uniformity across all elements in the system – indeed, quite the reverse; it is the diversity of preferences, capabilities and performance across people in society that creates the functioning of the economy. Consequently, the fact that ethical values vary widely across individuals, and so lead to widely differing actions and choices, is of no more consequence than people's differing preferences for cars, foreign holidays, entertainment or charitable causes.

So what has all this to do with farm animal welfare? At its simplest, all economic activity involves using resources to create goods and services that provide human benefit (value). Considering the economic activity of the food system, farm animals appear in the process as''capital', one of the three types of resource used in production (the others are 'land' and''labour'). The output of these animals – milk, meat, wool, etc. – then yields a value in the form of benefit gained by people in consuming the final product. Note that it is *consumption* that generates value, not production *per se*. (Products that are not consumed yield no value, and some outputs that emerge from the production process – such as pollution – actually reduce the overall value gained.) This puts the consumer as the pivotal element in economic activity, the arbiter of what is of value and how much, and to whose benefit everything in the economy is directed. As the great Adam Smith, the grandfather of economics, wrote in 1776: "The object of economic activity is not production; it is consumption". This forces us to accept consumer preference[2] as determining what is right or wrong, better or worse in the way economic activity is pursued – not the declarations of scientists, moralists, academics, doom-merchants or special-interest groups (except insofar as they may influence people's preferences and values, or have the power to impose their view on the rest of us).

From the standpoint of economics, the role of farm animals in food production is, like all other resources, to be used for whatever purpose and in whatever way the society thinks fit in its value-generating activities. Economic analysis, therefore, adopts an essentially utilitarian view of farm animals, whereby they have a 'use value' determined by the manner and extent to which they contribute to human benefit. This, therefore, implies that there can be no such thing as the''intrinsic' value that an ethicist might declare. Value, in economics, is not an inherent characteristic like molecular weight or specific gravity, but something assigned by people on the basis of their preferences and the benefits they perceive. This does not prevent value being attached to the welfare of an animal, or to anything else, beyond the consumption benefits it currently provides in a production process.[3] But these values are still assigned rather than intrinsic, and are all explainable in terms of particular dimensions of perceived benefit.

Before leaving this brief tour of the background to economics, two things should be noted. First, as the driving force of the economy, economic value is something defined for the society collectively, not for any particular interested sub-section. It is not farmers' profits, for example, except insofar as they are consistent with the wider generation of benefits in society. (If we were to accept private financial gain as equivalent to economic value we would be forced to presume that the proceeds of theft, drug dealers' profits and the incomes of policemen are all net additions to economic value!) Second, there has been no mention of money, nor of prices, because the underlying concepts and relationships are entirely independent of those artificial constructions. Monetary units are simply a convenient accounting base for adding and subtracting things, and don't measure anything intrinsic. (Production, consumption and exchange take place quite effectively in some societies without money.) And much of economic theory explains why prices are likely to be totally inaccurate measures of the relative economic value of things anyway.

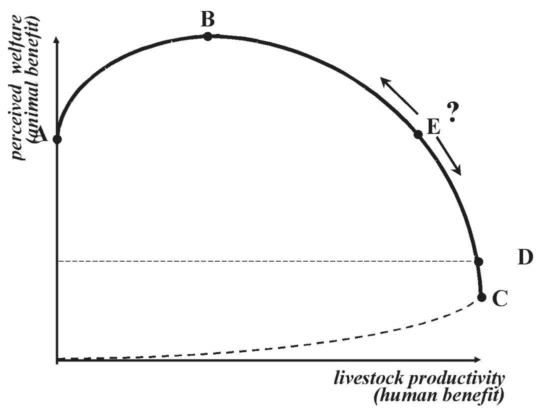
PRODUCTIVITY

Productivity – the amount of useful output obtained from one unit of a resource – is the key to its value. In the case of farm animals, economic logic says that the value we place on them (and the effort we will put in to protect that value) is, in general, directly proportional to their productivity – yield, rate of growth, food conversion rates, fertility. Furthermore, it is to our economic advantage to seek all ways of exploiting the existing productive capacity of our livestock (by appropriate nutrition, management, housing) or of enhancing it further by genetic selection and developing new systems of husbandry. It is this economically-motivated thrust that has led to the modern 'intensive' use of livestock, in which the quantity of other inputs applied per animal has progressively risen over the years. As a result, the average cow now yields twice as much milk as did our grandfather's, the typical broiler chicken reaches a 2kg weight in 40 days compared to 70, a pig can reach bacon weight on 20 per cent less feed, and a finished lamb represents substantially more and better quality meat value. Nobody planned it this way. It has simply been the evolutionary outcome of national and international demand pressures for more and better-quality food, coupled with the attempts by individual livestock producers (ably assisted by public research and the agricultural input companies) to find some cost or output advantage in supplying into a competitive market structure.[4]

But in the pursuit of ever greater livestock productivity something has to give. While 'new knowledge' is a major ingredient in the process, the major productivity increases the developed economies have enjoyed over the years have largely come at the expense of some other existing element in the total system. We have depleted national resource stocks, created undesirable physical and social side-effects, destroyed natural environments and generally imposed costs on someone or something elsewhere. However, it has always seemed worthwhile (or not bad enough for anyone to stop it) because to a large extent these accessory costs have been unrecognised or insufficiently consequential. (Man has been destroying his surroundings for centuries, for example, but it is only in the last 25 years or so that the issue of 'the environment' has entered general public consciousness.)

So it is with livestock production. As we have pursued the greater productive capacity of our farm animals, so it is perceived that we have progressively challenged and reduced their welfare.[5] A very simple model has become established (at least for economic analysis) to represent this general conflict between the animal's interest, in the form of its perceived welfare, and the human interest as captured in the animal's economic productivity. This is shown in Figure 2. Point A represents an initial reference point indicating that a particular level of welfare is associated with the animal's state when no effort or emphasis is placed on exploiting its productivity (say in the wild state). When we domesticate animals, feed and shelter them, treat their diseases, protect them from predators, etc., we enhance their productivity to our benefit but also believe we enhance their welfare also. To begin with, therefore, animal welfare and productivity are complementary'– but this is not an economically stable situation. After some point (B) the ability to exploit more of the animal's productive capacity by the husbandry methods we develop leads to a progressive decline in their perceived welfare as we regulate and manipulate their lives, treat them more and more as simply an element in our complex resource using processes, and strive to increase the output they can provide. Technological developments in livestock farming make this possible, and economic incentives make it probable. Ultimately a point could be reached (C) where the stress on the animal as a productive 'machine' is so great that it cannot survive, and the whole (animal and economic) system collapses.[6]

FIGURE 2. Conflicts and choices between animal welfare and productivity (see text for details).



The model in Figure 2 is a conceptual framework, not an empirically derived relationship. It is simple (it only has two variables after all) and is broadly generic in that it relates to the 'typical' farmed animal. It does not imply anything about different species, husbandry systems, changing levels of stockmanship or resource quality, or about different types of technology development in livestock farming'– although all these can be accommodated. What it does is provide a useful framework for the discussion in this paper.

ECONOMIC CHOICE IN LIVESTOCK PRODUCTION

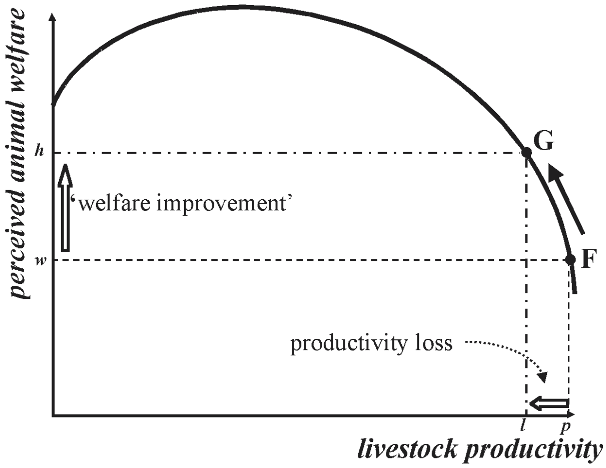
If such a relationship does underlie our commercial livestock production systems[7], how would we expect the everyday economic processes of producer incentive and consumer choice to select a balance between animal productivity and welfare? Clearly if animal welfare is not a consideration – either not recognised or not valued– – then it is rational for all concerned to operate as close to point C as is prudent to do so. It would be technically most efficient, the commercial optimum, and the socially preferred position for farm animal use. However, in all modern societies the potential negative impact on animals of their commercial exploitation has long been recognised, and pushing them to their technical limits (as one does with inanimate resources) is declared to be unacceptable. Hence, a lower limit to animal welfare, or to practices which are considered to threaten it excessively, is imposed and enforced by law; production methods which imply productivity/welfare positions below point D in Figure 2 reflect a social perception of–'cruelty' and are illegal.

Beyond that, however, there is little definite that can be said, because the 'right' position is a matter of personal preferences. Because these vary across the population so will the economic choices that would be made when people confront this trade off between animal welfare and productivity. Farmers who don't bother overmuch about their animals beyond the income they can provide, and consumers who don't know or care about animal welfare, and poor consumers whose priority has to be cheap food regardless of any ethical preferences, would all drive livestock farming down to the high-productivity, legal-minimum husbandry standards of point D. At the other extreme, there are likely to be some (perhaps high-income, animal-sensitive and strongly principled people, and possibly 'hobby' livestock farmers) who would elect to have farm animals kept in what are perceived to be the best possible welfare conditions (at point B) and readily accept the lower-productivity, higher-cost food products that this implies.[8]

The bulk of farmers and food consumers, however, would choose their preferred position (shown as point E) to be somewhere in the 'economically rational' zone between B and D. The financial benefit they gain from lower-priced food would be balanced against a personal cost they feel on behalf of the farmed animal. This utilitarian consumer (or farmer), who has all manner of factors'– including ethical principles – determining his/her preferences and valuations, will, at some point, decide that they will not feel better for the added gain of a few pennies off the food bill when they confront their perception of what they are thereby imposing on the animals they are using.

If the economic process of food production is to meet the objective of satisfying the preferences of–'the people', therefore, there is no single 'most appropriate' way for any society in which animals should be farmed and their food produced, but a multitude of ways. In practice, of course, while some diversity of product is possible it is impossible for this potential variety to be satisfied perfectly and so the outcome, for most people, could never be more than an approximation. (This is no great tragedy; no human systems ever function perfectly, and this approximation is the typical outcome in all aspects of our lives.) What we can predict, however, is that the modal preference in the balance between higher animal welfare and cheaper food will move progressively further 'up' the relationship in Figure 2 over time. As societies become food secure, more responsive to product quality, more affluent and able to indulge quality preferences, more aware of animal welfare and other''externality' costs of their economic behaviour, more responsive to the information put out by animal advocacy groups, and more accustomed to expecting and exercising a greater variety of 'choice', then we might safely predict that the welfare standards in livestock production, whether defined legally or decided by market provision, will progressively rise.

FIGURE 3. The economic implications of animal welfare improvement (see text for details)



ANIMAL WELFARE AND FOOD PRICES

Given the increasing focus now being placed by public sector organisations, the media, animal advocacy groups and interested members of the public on the welfare standards in farming, it seems likely that, over the coming years, more action will be taken to ban – as the EU already has – various practices (sow tethers) and production systems (eggs from caged hens), and that codes of practice, regulations and trading requirements will be tightened as a response to these changing social preferences. In terms of Figure 3, we could say that the current standard husbandry practices, represented by point F, are considered to have gone too far in terms of their impact on animal welfare and that a shift in standards 'back' to point G is now called for.[9] If the broad logic of the relationship is accepted, there is no escaping the fact that this will imply some loss of livestock productivity (the now unacceptable practices were adopted in the first place for the incremental productivity gain they offered).

Farmers almost universally object that to require improved welfare standards will raise their costs, viewing the change as solely an imposition on *them* which will thereby reduce their income. The logic of this conclusion is untenable, of course, for there is no inherent reason why cost changes in the economic system remain where they first impinge. If this were the case, one would have to treat all cost increases or quality improvements as a direct tax on producers and, therefore, an unfair reduction in their wellbeing (therefore no health and safety regulations would be acceptable, no employed person could reasonably expect a pay rise, an increase in the price of wheat would reduce profits in the bread making industry, the government shouldn't raise interest rates because nearly everyone will suffer, Mercedes would never develop their business because their cars cost so much more to produce than Fords…. etc, etc!). The reality is that reduced productivity in livestock production raises the supply price of *food* in the economy, and so ultimately it is the consumers of food who carry the cost – just as they have largely received the benefits of increased farming productivity. The extent to which the impacts of cost increases are retained by or distributed amongst different participants in the food supply chain cannot be stated in advance – it is an empirical matter, not a logical one, and depends on a host of factors relating to demand and supply conditions, market structure, institutional arrangements, time periods and other economic characteristics of the food chain.

Some broad inferences can be drawn, however, which are difficult to dispute. First, the unavoidable logic of the law of diminishing marginal returns suggests that where modern–'intensive' farming systems are practised, successive incremental gains in livestock productivity have come at progressively larger incremental costs in terms of animal welfare. It follows that, in the initial steps towards reduced intensity of production, relatively small sacrifices in productivity could yield appreciable perceived gains to the animal's welfare. (This is reflected in Figure 3 by the relatively steep gradient of the curve between points F and G.) Acceptably higher animal welfare does not mean going back to 1950s farming systems, therefore, but simply the easing of some of the more recent excesses in production technology.

Second, the consequent x per cent rise in unit production costs at the farm level does not adequately capture the overall economic impact of the change. Livestock output is only a raw material in the production of what consumers ultimately acquire and pay for as food. Lots of economic processes have to take place after the farmer's output leaves the farm gate – transport, marketing, slaughtering, processing, manufacturing, wholesale distribution, portioning, packaging, and presentation on the retail shelf or the plate of a food catering outlet. The final price of food is a composite of the costs of all these value-adding processes. An x% rise in the cost of the farm-level raw material becomes progressively smaller as it is factored down the length of this complex chain of economic activity, therefore, until it emerges as a, perhaps quite minor, percentage increase in food price. Even in the case of liquid milk or eggs, probably the most 'raw' of livestock products consumed, the farm-level cost contributes no more than half to the final price. With cuts of meat the proportion gets smaller, with cheese and yoghurt smaller still, even less in a frozen lamb stew – and as a proportion of the price of a McDonald's burger or a cheese omelette the farmer's cost is pretty thin. The general conclusion is that, if we view society's food-supply system rather than just the livestock farmer's interest, the increases in farm-level production costs from improved animal welfare are likely to have relatively minor impacts on the price of individual food products. And bearing in mind that welfare improvements generally impinge on only a few elements in the complex of production activity – the prohibition of certain practices, somewhat greater space provision, specified bedding or housing facilities, more explicit emphasis on health, shorter periods in transport, etc. – they are unlikely to radically transform the whole cost structure of livestock production anyway. Taken together, these arguments lead one to ask what all the fuss over the economic consequences of higher animal welfare standards is all about!

The other issue portrayed in Figure 3 is that in moving from F to G, the reduced livestock productivity of *lp* is compensated for by a perceived increase in animal welfare of *hw*. We can measure the financial cost of *lp* by conventional farm-management accounting procedures, and, using empirical information on economic costs down the food chain, predict what this implies as a price rise in the final food product. What the analyst cannot say is whether the value people place on the higher welfare associated with the product they consume exceeds this (small) monetary cost. For some it will and for some it won't, since personal preferences and valuations vary widely throughout the consuming public as we have discussed. This observation is relevant to the frequent lament of livestock farmers that "consumers say they want higher welfare products but when they get to the supermarket they won't pay for them". First, this is not true, because it makes generalisations about a uniform""they" which are invalid. If the statement said "*some* consumers say… but… they won't *all* pay for them" then it is true"– but totally unremarkable. What people might say they want has in itself no significance and no impact on what happens in the economy.[10] Declared desires, or even actual needs, are not the forces that determine economic activity unless they are accompanied by the willingness to pay. Those people who won't pay the price for a good or service they say they would like, by definition do not actually value it that much. They do not exercise any *demand* for it, and their desires have no influence on what is produced or consumed.

ANIMAL WELFARE AND MARKETS

There are two aspects to this issue – one relating to livestock production and supply in the domestic market, and the other relating to international markets.

The predominant framework for organising the use of resources, supplying the variety of goods and services and satisfying people's diverse consumption preferences is the system of markets. (State ownership, management and allocation based on centralised planning is now a minority element in the world.) This seems to function fairly effectively – though far from perfectly – and we are accustomed to the idea that the pattern of consumer demands ultimately determines how resources are used. In the case of livestock products, the way in which the animals are cared for is effectively perceived by the consumer as a characteristic of the resulting product's 'quality''– as is its nutritive merit, its taste and flavour, origin, safety, environmental credentials, chemical constituents, and various other attributes relating to its technical composition and provenance. In principle, it is the preferences and demands for these characteristics that determines the extent to which they will be supplied.

One could imagine that the implementation of desired animal welfare standards (subject to the minimum legal requirements) could be left entirely to the market, with products carrying different welfare standards being offered by food retailers in proportion to the pattern of consumer preferences and people choosing to buy what they want. Livestock farmers would sort themselves out in supplying these various demands, as they do with the relative demands for their output more generally, and a variety of husbandry systems and welfare standards would be practised. To a minor extent, this happens already with some products (organic, free-range eggs) but as already stated, it could only crudely approximate a complete satisfaction of consumer valuations. To really work at all across the range of animal production it would require consumers to be sufficiently well informed about livestock farming to know what they prefer, a means of effectively articulating those values down to farmers, a robust way of ranking the levels of animal welfare across production methods, a clear and informative system of product labelling, an accepted framework of assurance, a fully implemented system of certification, all being flexible and responsive to the inevitable changes in supply and demand conditions over time; in short, it requires the theoretical perfect market that appears only in first-year Economics textbooks.

As well as these practical difficulties, there is a potentially major one in terms of social ethics. Markets give decision-making influence to people in direct proportion to what they spend – so the higher-income groups possess an undemocratically greater ability to determine how livestock production takes place. However, the pattern of consumer preferences expressed in market expenditures is not the same as the pattern of values held by the society collectively. Arguably, poor people have just as much right to say how animals should be kept as do rich people. Vegetarians and vegans share equal standing in society with meat-eaters and deserve the opportunity (which the market does not provide) to contribute their values to the definition of the wider social preferences on farm animal welfare. Overall, therefore, as in many other areas of economic activity, it is socially inappropriate to leave animal welfare standards to the market place.

So the government, or some other influential public-sector institution steps in and defines the appropriate norms for animal welfare on behalf of the society collectively (the role of NAWAC in New Zealand and FAWC in the UK is along these lines). These–'norms' generally take the form of welfare codes and recommendations that are generally above the legal minimum (if only because legislation is always historical, slow and difficult to update) and not necessarily legally enforceable. However, they can effectively become the ruling minimum standards if adopted and implemented by powerful players in the food-supply chain. For example, producer groups may adopt the standards and actively promote their product's qualities and its share in the market place; or more usually the major food retailers may require that their farmer suppliers meet the code standards if their livestock output is to be accepted. Either way, consumers are presented with products meeting enhanced welfare standards without being asked what exactly their preference is.[11] In effect, the retailer becomes 'the consumer' in terms of defining the demand conditions to which farmers have to respond. None of this, of course, prevents the development of minority markets for the''even higher welfare' products, but, in general, there will be far less product diversity than the theoretical market-based solution to setting welfare standards.

All this can work fine in closed markets where the preferences of a nation's consumers are met by the production activities of the nation's livestock farmers, and the same welfare standards are accepted by both. But we live in a world of increasingly open, globalised markets, with farmers in some countries having a competitive cost advantage in supplying livestock products to other countries. In international trade situations, the link between food consumers and the livestock producer is even more remote, and the means for ensuring that consumer quality preferences are met are far less easy and straightforward. The tendency in such circumstances is for governments of importing countries to look to impose strict requirements on the product that is supplied from overseas'– and in the case of animal welfare standards, this has become a highly contentious political issue in international trading arrangements.

The attitude of agricultural exporting countries tends to be that any such restrictions amount to protection of the importing country's producers, and, in an era of developing global markets and greater acceptance of 'free trade' propositions, this is both improper and possibly illegal. Given the long history of agricultural protection by the main food importers such as the EU[12], of course, this is an entirely reasonable suspicion. Those countries with a strong economic advantage in agricultural exports can claim to be unfairly held back by trade restriction, despite being able to offer cheaper food products to the overseas consumers. And, in the logic of economics, based as it is on the role of economic activity being to generate the maximum benefit for consumers, there is no justification for any such trade restriction. If a country wishes to support the incomes of its farmers beyond their market earnings, the efficient way is to transfer them money via the public expenditure budget, not to distort trade and resource use patterns.

However, there is another side to this argument. The purpose of trade is to enable consumers to buy what they want – not to allow producers to sell what they would like to. If imported livestock products meet exactly the same animal welfare standards in production as domestic farmers are required to satisfy, and this can be incontrovertibly demonstrated and guaranteed, there is no justifiable economic reason to restrict imports (assuming other quality standards are equally satisfied). In principle, consumers are indifferent as to the source of what they buy as long as it has all the attributes they seek.[13]

But trade restriction does not necessarily mean protection of producers; it can equally mean protection of consumers or the values of the society – and an exporting country has no basis for objecting to that. (Countries that control the import of hard drugs or pornography hardly do so to protect their domestic heroin producers or sex trade.) If it is agreed that particular animal welfare standards are appropriate to the values held by a society and that they should therefore be espoused by all[14], then it is entirely proper for the government to impose those requirements on all livestock products, whether domestically produced or imported. Indeed, it would be both inconsistent and irrational not to do so. There is no logic in requiring domestic products to meet specified food-safety standards, for example, but then failing to impose the same requirement on imported food. The same applies to all 'quality' characteristics of food that are considered essential, of which animal welfare is but one. Such trade restriction is necessary to maintain the ethical stance a country wishes to adopt in its consumption activity, and to prevent those individuals who do not subscribe to the collective values (of which there are always many) being able to opt out. In this context, the fact that the imported livestock product is 'cheaper' is merely a confusion, because unless it is also precisely comparable, it is actually a different product; a simple price comparison is no more informative than that between beer and whisky.

These considerations have to be resolved in the developing new framework of world trading arrangements, or the potential major benefits to all participants of freer product markets will be lost and nations will resort to distorting interventions again. At present there are institutionally (i.e., arbitrarily) defined reasons for restricting agricultural trade that are acceptable and others that are not, despite their apparent similarity in terms of consumer preferences. Disease risk (Sanitary and Phytosanitary measures) is a permissible criterion, environmental implications are 'sort of OK' but animal welfare criteria are not accepted in international fora. This creates the situation that technical values are apparently more important than ethical values – never mind that trade is supposed to satisfy people's consumption preferences. It results in unsustainable inconsistencies in many countries trying to raise animal welfare standards, whose producers validly claim they are simply penalised by domestic production regulations while qualitatively inferior imports have to be allowed in, to no-one's advantage but that of overseas suppliers.

CONCLUSIONS

The position we arrive at is that, if farm animal welfare concerns are to have any connection with ethical principles held in society, they must relate to the food that is consumed there, from whatever source, not simply to the animals that are farmed there. The meaningful measure of livestock productivity is the ability to supply products that satisfy the multifaceted consumption values of people, not simply the capacity to knock out generic commodities at the cheapest possible cost. The major role for science in this context is to develop new livestock-production techniques which raise physical productivity without reducing welfare, or equivalently improve animals' welfare with no reduction in their productivity. This is tantamount to shifting 'outwards' the whole relationship in Figure 2 – a new and seemingly far harder task than has been accomplished in the major developments of the past decades.

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[1] Or, more realistically since we make the rules, that we confer on them.

[2] Collectively, not individually, for it is recognised some individuals exhibit personal preferences the rest of society explicitly rejects.

[3] Contemporary economic analysis of natural resources and environmental conservation, for example, allows for 'existence values', a benefit gained from simply knowing that something is there even if it is not personally utilised - the blue whale, the Amazon rainforest, undiscovered insect life.

[4] The widespread practice of agricultural support policies has not been the prime cause (the same sort of productivity growth has happened across all sectors of the economy), but it did make life easier for those farmers who were slower or less good at achieving these efficiency gains.

[5] The word 'perceived' is important. As discussed earlier, we don't know what the animal thinks (and it cannot be the dominant consideration anyway when their role is to be productive resources). But to the extent that we respond to personal feelings of discomfort about the way animals are treated, we are responding to our perceptions of their welfare. As discussed later, these perceptions, and the importance attached to them, will vary widely across people.

[6] Many argue that we are getting very close to this point in some cases, as with the problem of ascites in broilers or the persistent problems of mastitis, lameness and infertility in high-yielding dairy cows.

[7] And diagrams in the style of Figure 2 are a common feature in the economic analyses of other production processes.

[8] There are undoubtedly some segments of society (vegans, perhaps) for whom point A is the preferred position where animals are not farmed at all and, lower welfare if it is, consider this to be better because it is more 'natural'.

[9] For diagrammatic purposes point F is drawn well down the curve towards the lower limit of sustainable animal welfare. The reality is that different animal production systems will be arrayed at different points along this curve. Most people would probably consider housed broiler production to be already close to this limit, with the most intensive dairying and pig production systems not far above. Outdoor pigs or grass-based beef would most likely be seen as lower productivity/higher welfare systems, free range poultry and extensive sheep would perhaps be considered as positively 'welfare friendly', while organic farming would doubtless claim to be operating near the top of the curve.

[10] Any more than does the fact that many of us want England to win a test series against antipodean opposition.

[11] Though retailers have shown a remarkable reluctance to cease their 'no frills' budget lines (to which very few explicit quality standards are attached) because they wish to retain the custom of all segments of the market.

[12] The USA has covered both bases by being an agricultural exporter and agricultural protector!

[13] Though location of production may, in fact, be one such attribute – but that is a matter for individual choice, not government action.

[14] i.e. that animal welfare standards are a public good, not something for individual private choice.