

## NEW TRENDS IN ANIMAL WELFARE

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### ABSTRACT

Animal Hygiene is, in the words of the organisers of this congress, “a unique scientific interdisciplinary sphere where health and welfare of animals and humans are closely intertwined, and the skills of the discipline are in service of sustainable animal production, public health and biosecurity.” Animal Welfare is, of course, one of the important intertwined disciplines. This is an excellent definition, so far as it goes, but it does not go far enough. Animal Welfare must be viewed not only as a science, but also as a set of values. Moreover, it is not enough simply to consider these subjects as topics for scientific study and moral debate. Right thought alone is not enough. We who are professionally involved have also a scientific and moral obligation to right action: a responsible commitment to promote the health and welfare of our fellow humans and the other sentient animals whom we choose to eat.

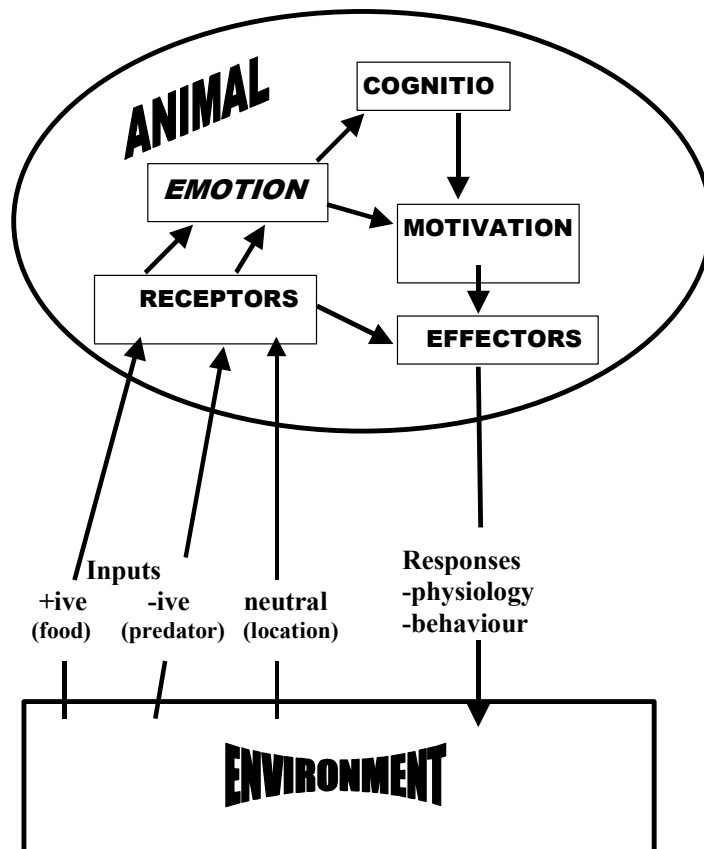
An essay on “New Trends in Animal Welfare” must not, therefore, restrict itself to a review of welfare science. It must also examine the ethical and sociological principles that determine the attitudes of society (producers and consumers) to animal welfare, and explore how the welfare of the food animals may be ensured and improved in ways that are compatible with the other intertwined needs of society for biosecurity, freedom of choice and food at a fair price. This paper will briefly touch on three themes, which are central to the mission of the large, multidisciplinary, multinational ‘Welfare Quality’ programme currently funded by the European Commission under FP6.

- **Animal welfare science:** What is welfare? – What is sentience? – What is suffering? – How can we assess good and bad welfare in a sentient animal?
- **Ethics and values:** What determines human attitudes to animal welfare? – What *should* determine human attitudes to animal welfare
- **Animal welfare promotion:** Welfare monitoring on-farm. – animal welfare promotion through legislation and ‘politics by other means’ – the ‘Virtuous Bicycle’.

### SENTIENCE, WELFARE AND WELLBEING

The most useful definition of welfare, in my opinion, is a personal modification of that of Fraser and Broom (1990), namely “*a state of body and mind as the sentient animal attempts to cope with its environment*”. The two critical words in this definition are *sentient* and  *coping*. This definition covers the full spectrum of welfare from pain to pleasure. We need therefore a separate definition to define good welfare, or *wellbeing*. Here, my simple definition of wellbeing is “*fit and happy*” or “*fit and feeling good*” for those uncomfortable with the word happy (Webster 2005). This too is a state of body and mind. For the body it implies sustained health; for the mind it implies, at least, an absence of suffering from such things as pain, fear and exhaustion. Ideally it should embrace a sense of positive wellbeing (*feeling good*) achieved by such things as comfort, companionship and security.

It is also necessary to have a clear understanding of the word sentience, not least because sheep and other farm animals have been formally recognised by the European Community as sentient creatures, (without ever defining what they mean by the word). My definition of sentience is “*feelings that matter*” (Webster 2005). Briefly, the concept of sentience derives from the way such animals interpret stimuli and sensations, act upon them and review their actions. Consciously perceived stimuli from the external and internal environment are interpreted primarily in an emotional way (“Does this make me feel good, bad or indifferent”). This emotional interpretation may or may not be reinforced by cognition (reason). The emotional (and also, perhaps rational) interpretation of sensation may motivate the animal to action designed to make it feel good, or avoid feeling bad. Alternatively it may deem the information as unimportant and do nothing. The sentient animal will then review the consequences of its action. If it was effective, it will feel better and it will gain the assurance that it knows what to do next time. If its action fails, either because the stress was too great, or because it was constrained in such a way that it was unable to do what it felt necessary in order to cope, then it is likely to feel worse and be more anxious for the future. Thus a sentient animal leads a considered life; its mood and understanding are modified in the light of experience.



**Figure 1.** Sentience: An emotional view of the environment

## STRESS AND SUFFERING

It is necessary to make a clear distinction between stress and suffering as experienced by a sentient animal. When welfare is defined as “*a state of body and mind as the sentient animal attempts to cope with its environment*”, suffering may be defined as its state of body and mind when it fails to cope (or has extreme difficulty in coping with) its environment. When an animal is acutely exposed to a physical or emotional challenge it first experiences a general, non-specific, alarm response involving the hypothalamus/pituitary/adrenal (HPA) axis, which then proceeds to a phase of adaptation. If the stress is moderate, then adaptation may be effective and, in some case, complete. In short, the animal ‘copes’. When the challenge is more intense or more prolonged, the animal may achieve partial adaptation but at some continuing metabolic and emotional cost. If this stress is too intense or prolonged and the cost is too great the animal may proceed to a state of physical and/or mental exhaustion. The definition of *suffering* therefore becomes a state of body and mind where an animal cannot cope (or has difficulty in coping) with physical stress and unpleasant feelings. Extensively reared grazing animals may experience physical suffering through failure to cope with chronic malnutrition and climatic stress a challenging environment. Intensively reared pigs and poultry in crowded barren environments may suffer the emotional consequences of their inability to perform actions necessary to meet their behavioural needs. Fig 2 illustrates the consequences of failing to cope with fearful stimuli. Fear is an adaptive response, essential to survival. Failure to cope with fear may lead to chronic abnormal states such as anxiety or learned helplessness. Suffering, in a sentient animal, is usually a learnt experience. The message for producers and legislators is that some stress in animals is unavoidable. What we must seek to avoid is suffering. Many potential causes of suffering through cruel acts and omissions should be self-evident. Other may be less obvious to a human mind and need the help of animal welfare science to help us understand how sentient animals feel as they seek to meet their physiological and behavioural needs. Thus the aim of welfare science should be to identify and quantify the physiological and emotional challenges to farm animals and devise ways to reduce these challenges and/or help then animals to cope.

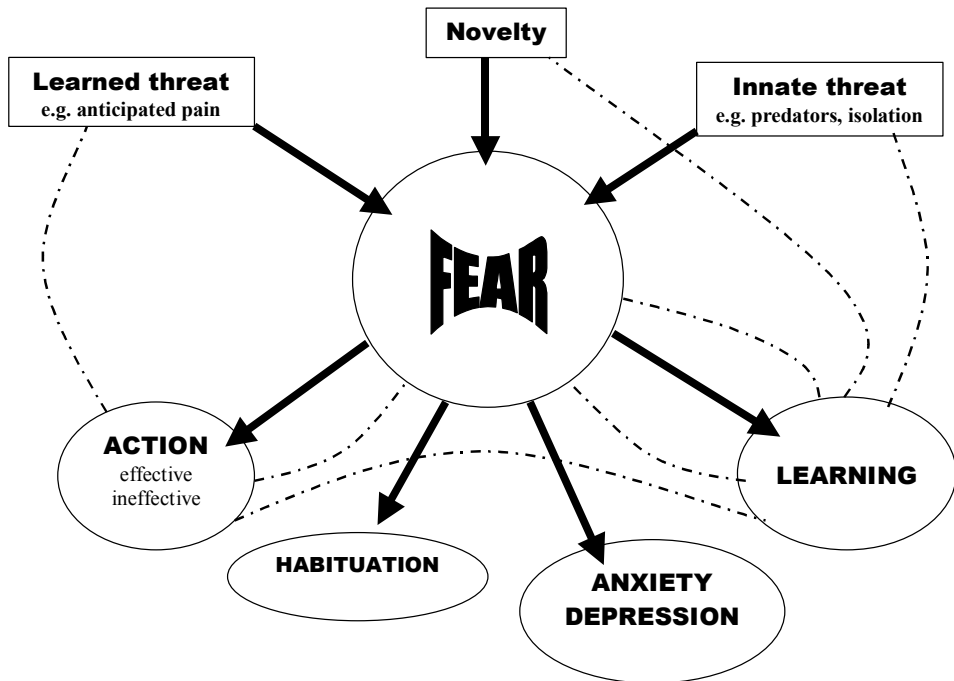


Figure 2. Fear and its consequences

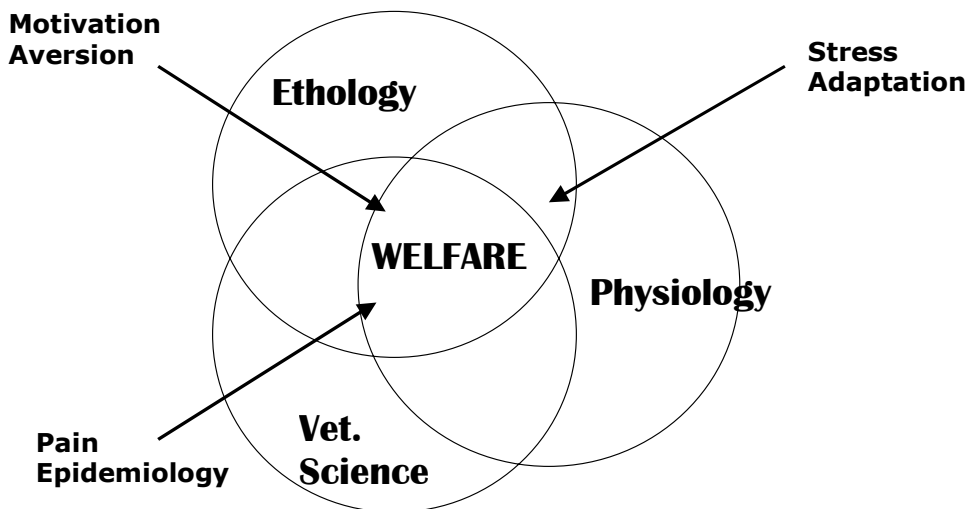


Figure 3. Welfare science as the overlapping element of three scientific disciplines, ethology, physiology and veterinary science

## TRENDS IN ANIMAL WELFARE SCIENCE

Strictly speaking, animal welfare science is not a discipline as such, but the (large) area of overlap between three distinct disciplines: physiology, ethology, and veterinary science (Fig. 3). It follows therefore that a review of new trends in welfare science should highlight new and relevant approaches within these disciplines (and also draw attention to approaches that have become stale and derivative). There is not scope within this paper for a proper review. I shall only pick out some highlights and lowlights.

The science of ethology began with the study of the normal behaviour of animals (the ethogram), first in their natural environment, and then in the presence of environment challenges or environmental restrictions that challenged their ability to cope. This provided convincing evidence that many intensive farming systems were profoundly unnatural and could lead to severe distortions of natural behaviour such as stereotypes. I suggest however that this approach is nearing its “sell-by date”, partly because papers are becoming increasingly derivative but mainly because observations of animal behaviour do not directly address the more important question, which is “how do animals feel?” Much more valuable, in my opinion, is the study of motivation in relation to animal fitness and animal welfare as pioneered by Marian Dawkins (1990). For a recent review of just how far this science has travelled I recommend the review by Kirkden and Pajor (2006). This work addresses the very nature of sentience, pleasure and suffering since it reveals the feelings that matter, measures how much they matter and points to how things may be improved.

The most important (and thoroughly studied) area of overlap between physiology and welfare science is the study of stress. As indicated earlier, the response of animals under stress can be divided into three phases; alarm, adaptation and exhaustion. Much (too much) attention has been directed at trying to quantify the intensity of the alarm reaction by measuring elements of the HPA axis, (e.g. cortisol). There are two critical limitations to this approach. First, the alarm response is non-specific, and does not necessarily distinguish between unpleasant distress and pleasant excitement. Secondly, stress does not equate with suffering and most suffering arises from the cost of adaptation (or exhaustion) after the alarm phase is over. I strongly advise therefore that future studies in stress physiology should concentrate on stress-specific ways of measuring the costs of adaptation, e.g.:

- Physiological costs: increased metabolic rate, loss of body condition, immuno-suppression, exhaustion
- Psychological costs: anxiety, learned helplessness, chronic pain, malaise

The overlap between veterinary and welfare sciences occurs when veterinary science addresses problems of animal health that clearly give rise to a great deal of suffering, where the overall magnitude of the problem is a function of its severity and duration in each individual and its prevalence in the population. By these criteria, lameness is the most severe ‘veterinary’ welfare problem in most farm species (broiler chickens, dairy cattle, sows, sheep). Lameness in broilers is most prevalent in fast growing strains and could be greatly reduced through effective government action to prohibit the sale of the most susceptible strains. In dairy cattle the risk factors are multiple and vary greatly from farm to farm. The most effective approach to investigation and resolution of lameness in dairy cattle is through properly planned investigations carried out not in the laboratory but in the field, with the farm itself being the primary source of input variables. Such experiments are likely to require the active participation of 60 or more farmers and their veterinarians, and this can present a whole new range of problems.

One final point: Welfare science is a “fuzzy” science. Single questions, however elegant and precise, can never yield complete answers. Neither can any of the single disciplines, ethology, physiology, or veterinary science, yield complete answers when studied in isolation. Welfare science should be approached using the old sailor’s technique of triangulation, seeking an approximate fix on the point of interest from at least three directions, in order to minimise the ‘triangle of uncertainty’.

## ETHICS AND VALUES

This argument starts from two fundamental principles.

- We humans have a moral right to rear other species for the production of food.
- Most of the animals that we farm for food are sentient creatures with the capacity to experience well-being and suffering.

Our aim must be to seek an ethical compromise between these two things. Mepham (1996) has devised an “Ethical Matrix”, which identifies the concerned parties whose interests command respect in relation to a specific issue, then applies the ethical principles of beneficence, autonomy and justice to each of the affected interest groups. Here, the interest groups are humans, (consumers and producers), farm animals and the living environment. Humans are the ‘moral agents’, who bear the responsibility for right action; farm animals and the environment are the ‘patients’, profoundly affected by the moral quality of our decisions but unable to contribute to them. Table 1 summarises the rights of all parties worthy of respect, and the responsibilities, which are borne by the moral agents only. Consumers have a right to healthy, wholesome food, and the right to freedom of choice, whether this be governed by price, convenience, taste, appearance, animal welfare or any combination of these and other factors. These rights bring the responsibility to respect the rights of the animals we use for food. In many cases these responsibilities need to be enshrined in legislation, since we all need the help of the state to keep us good (viz. speed limits for motorists).

Farmers have the right to earn a fair living from the rearing of animals in a manner that is efficient, healthy and does not compromise their welfare. These rights should not be eroded by unfair competition, especially when this is imposed by competition elsewhere in the food supply chain. With these rights comes the responsibility to promote animal health and welfare through good husbandry. The simple application of utilitarian ethics should acknowledge that food animals have the right to good health and welfare whether on farm, in transit or at the point of slaughter. A more sympathetic concern for the autonomy of each individual animal should give respect to freedom of choice, best achieved through environmental enrichment. Justice for the farm animals requires that they should experience “a life worth living”.

Any moral view of the production of food from animals should also embrace a proper respect for the living environment. In this regard, farms should not be viewed simply as food factories, but as one of the most powerful forces for good or bad in relation to environmental quality. Farmers who own the land now are the stewards of the land for all of us, for ever. We are justified in criticising them if they destroy the habitat of wildlife or pollute the rivers. However we cannot expect them to sustain and enrich the quality of the living environment simply on the money that we (the consumers) pay them for producing food as a commodity. If we wish to ‘save the planet’ then we must all make our contribution. As always, we shall need some help from legislation. One of the more promising new trends in this regard is the evolution of the EC Common

Agriculture Policy (CAP) to encourage and reward Environmental Stewardship Schemes, which recognise the need of society to contribute, through taxation, to the cost of sustaining the quality of the living countryside.

**Table 1.** Application of the ethical matrix to identify rights and responsibilities in relation to the farming of animals for food

	Wellbeing	Autonomy	Justice
Human society (Consumers)	Healthy, wholesome, tasty food, fairly priced	Freedom of choice	Respect for animals enshrined in legislation
Producers	Financial success	Free competition	Good husbandry for animals and the land
Farm animals	Wellbeing on farm, in transport and preslaughter	Environmental enrichment	“A life worth living”
Living environment	Conservation and sustainability	Biodiversity	Respect for the environment and its stewards

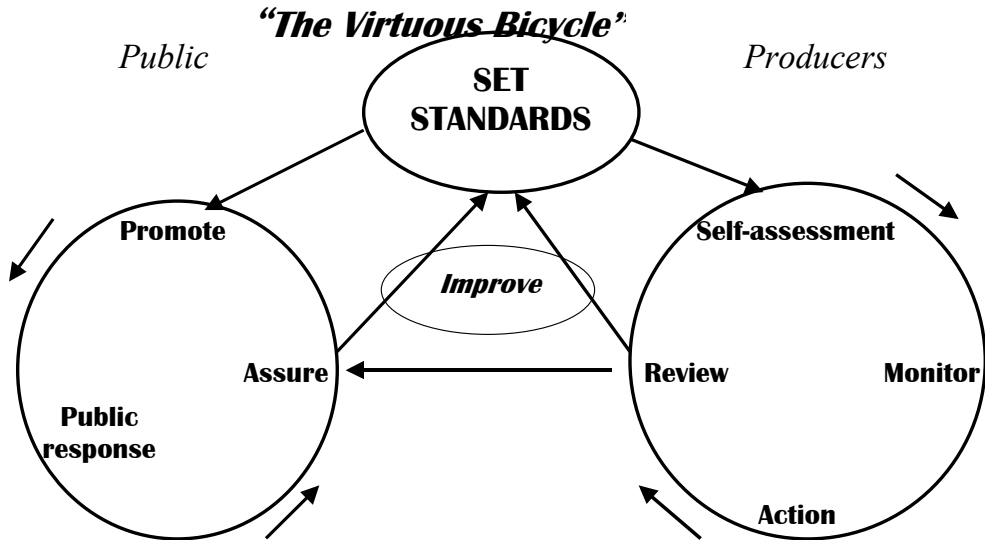
### **RIGHT ACTION: PROMOTION OF ANIMAL WELFARE**

The drive towards improved welfare for the farm animals should be driven by four engines for change, all operating together.

- Increased international awareness of the nature of animal sentience and the responsibilities that this entails.
- Realistic, practical, step-by-step, strategies for improving animal welfare consistent with efficient, economic production of safe food from healthy animals.
- Legislation to encourage and enforce improvements to farm animal welfare.
- Increased consumer demand for ‘added value’ foods, where animal welfare is an essential and proven area of added value.

The first action, increasing awareness, is perhaps the most important of all. Too many people, in too many regions of the world, are simply not aware of the nature of sentience and suffering in farm animals. Once they are, their attitudes should improve (if only a bit). Welfare charities like CIWF, RSPCA and WSPA have demonstrated that they are the most effective media for spreading this awareness. The second action, the development of effective strategies for improving farm animal welfare, depends on continued progress in our understanding of what it takes to keep farm animals fit and happy. and the application and marketing of these principles through the coupled virtuous cycles of quality assurance and quality control (Fig. 4).

## Welfare-based Quality Assurance



**Figure 4.** ‘The Virtuous Bicycle’: coupled progression to monitor, ensure and promote high standards of animal welfare

### WELFARE-BASED QUALITY ASSURANCE

Wherever shoppers for food are offered a choice and have a reasonable income, they demand quality. They can set their own standards for qualities such as appearance, taste and price. However they have to take other things on trust, such as source, food safety, and production standards which, of course, include animal welfare. This has generated a plethora of farm assurance schemes ranging (in U.K.) from the ‘Little Red Tractor’ to organic standards set by the Soil Association and ‘Freedom Food’ welfare standards set by RSPCA. The intention is that both consumers and producers should benefit from a system that adds value based on the quality of the production methods. Organic food standards (which include a proper concern for animal welfare) have been conspicuously successful. As a general rule however, it is probably unrealistic to expect that animal welfare, considered in isolation, will be sufficient to attract affluent, choosy consumers looking for added value. It is more likely to succeed when incorporated into a package that incorporates other selling points such as local, sustainable and fair trade. The notable exception to this general rule is free-range egg production according to the ‘Freedom Foods’ standards that now make up about half of total egg sales in many U.K. Supermarkets.

The most important question for professionals and indeed the animals is ‘Do these welfare-assurance schemes deliver what they claim to deliver?’ Do they:

- Ensure good standards of animal welfare?
- Ensure better standards of animal welfare than on unassured farms?



- Address specific welfare problems as they occur?
- Incorporate a protocol for regular review and upgrading of standards?

At present, the answer to all these questions is either ‘No’ or ‘Don’t know’. Most current standards are based on measures of the resources and records necessary to promote good husbandry. This is good in so far as it goes but it fails to address the most important questions ‘Are the animals fit and how do they feel?’ At Bristol, my colleagues David Main, Becky Whay and I have developed animal-based protocols for the direct assessment of animal welfare outcomes (see Main et al. 2003, Webster et al., 2004, Whay et al. 2003a, b). To summarise our published and unpublished work very briefly I can say that the welfare of the free-range hens in our study, in general, looked good but dairy cows had their problems, especially lameness whether or not the farms were accredited to Freedom Foods or Organic standards. The need to incorporate direct, animal-based measures of welfare into Quality Assurance schemes has been recognised and taken up by the FP6 ‘Welfare Quality’ programme.

One of the main problems with Farm Assurance schemes is that they can simply become pieces of paper to be filed away between inspections. A scheme for Farm Animal Health and Welfare only becomes effective if it is part of a dynamic strategy to ensure and improve standards. This is illustrated in Fig. 4. The accreditation body sets husbandry and welfare standards acceptable to both producers and consumers/retailers. The sequence of events for the producer is as follows. S/he first carries out a self-assessment of the enterprise to check on compliance with standards and identify any problems. An independent monitor then assesses the unit using a protocol looking mainly at welfare outcomes. Farmer, monitor and veterinary surgeon then address any immediate problems and devise a living strategy for health and welfare. The effectiveness of this strategy is reviewed after an appropriate time (e.g. one year or less if there are problems that need to be resolved quickly). The effectiveness of the strategy then feeds back to the farmer for further self-assessment and to the accreditation body who can bench-mark the farm against approved standards and provide real assurance to the public as to what is being done. This sets in motion a virtuous cycle of review, action, improvement and further review.

Any welfare-assurance scheme will, of course, only work if the public is aware of it, value its standards and trust the assurances that it provides. It is necessary therefore also to set in motion a second virtuous cycle of information transfer between the accreditation authority and the public that sets out clearly the quality standards and provides honest evidence to indicate how well the scheme is working. Simultaneous rotation of both wheels creates a ‘Virtuous Bicycle’ which can bring benefits to all concerned parties; consumers, producers, and the animals themselves.

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