



## KS2

**Animal welfare and the veterinary profession: 50 years of change**

David Fraser

*Animal Welfare Program, Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC, Canada***Introduction**

About 10 years ago I received an unexpected telephone call. It was from the Burger King Corporation to say that the company wanted to create a program to assure their customers about the welfare of the animals in their supply chain, and would I serve on the advisory committee. I admit to having been a trifle skeptical. Fast food restaurants as agents of social change? – it did not quite fit the popular stereotype. But I joined the committee and was pleasantly surprised to find myself in discussions about maintaining public trust and ‘doing the right thing’ for animals. To cut a long story short, Burger King’s engagement in animal welfare led to some tangible changes. In fact Temple Grandin (2000), after years of inspecting slaughter plants with mediocre animal welfare standards, reported a dramatic improvement immediately after chain restaurants became involved.

This, of course, is just one example of the remarkable growth in attention being paid to animal welfare, in some cases by unexpected players:

- In 2005 the 170 member nations of the World Organization for Animal Health unanimously adopted 80 pages of animal welfare standards which now appear in the highly influential Terrestrial Animal Health Code.
- Around the same time the International Finance Corporation, the investment arm of the World Bank, called for animal welfare to be part of the business plan of the livestock companies in which they invest.
- In 2008 the FAO, the United Nations agency involved in agriculture and hunger reduction, held an international consultation on how to help countries, especially developing countries, to implement good animal welfare practices.
- And it is expected that a ‘Universal Declaration on Animal Welfare’ will soon be presented to the United Nations with the expressed support of many of the world’s countries.

Nearly 40 years ago, when I began doing research on the welfare of pigs, animal welfare was on the very fringe of science. To most people the words ‘research’ and ‘animal welfare’ did not belong in the same sentence except perhaps to criticize animal welfare standards in laboratories. So how did it happen that animal welfare moved from being a fringe issue to something that attracts the attention of Burger King, the World Bank and the United Nations?

In this presentation I would like to trace this change by looking at four topics:

- some of the reasons behind the growing focus on animal welfare
- the debate about exactly what ‘animal welfare’ means
- some of the science that has been applied to animal welfare issues
- and the role of veterinarians in this rapidly changing world.

**The growing focus on animal welfare**

Every culture has an ‘animal mythology’ – a set of fundamental beliefs and values regarding animals – which we can often perceive through the art and stories of the culture (material in this section is from Fraser, 2008). In the creation story of the Ojibway culture of central Canada, people had fallen from the sky onto an earth that was covered in water, and they were able to survive only because the animals took pity on them, starting with the turtle who allowed its shell to form the base of the dry land. And throughout Ojibway legends and conduct, we see this fundamental assumption – perhaps not surprising for a hunting culture living in a harsh northern climate – that people are vulnerable beings whose survival is made possible by the cooperation of animals.

The first chapter of the Bible tells the very different creation story of a pastoralist culture where the ownership and care of animals was fundamental to the economy. In that story we read that life began when God created the natural world and filled it with plants and animals, and then, as a final act of creation, produced human beings and set them to rule over the natural world in god’s place. And later in the story, when God flooded the world, it was the capable humans who saved the helpless animals from drowning, which is roughly the opposite of how the Ojibway saw the relationship.

In these two examples of animal mythology we see both empirical beliefs – about what animals are like and the history of our involvement with them – and evaluative or ethical beliefs about how important animals are and how they should be treated. The biblical creation story implied that people and animals are separated by a large gulf which included at least three components. One was appearance: people had been created in the ‘image’ of God, and therefore looked nothing like birds, fish or quadrupeds. Second, people had a different origin: they were created separately from the animals and for a different purpose. And third (although disagreement arose on this point) people were seen as having a unique inner, spiritual nature that animals did not share. Here, then, were three empirical beliefs – about different appearance, different origin, and different inner life – that reinforced the idea of humans as fundamentally different from animals and helped to justify the use of animals for human purposes.

But in modern culture, empirical beliefs are not fixed by the constant retelling of traditional stories, but rather are subject to change in light of scientific discoveries and other developments. And indeed over the centuries we have seen these three empirical beliefs gradually chipped away, at least partly by science.

The first scientific development came from anatomy. Beginning in Italy during medieval times, the study of anatomy became one of the frontiers of scientific research for many centuries. Moreover, this research was communicated to the public in the many ‘dissecting theatres’ that sprouted up in the major centres of learning. These theatres allowed people to witness the dis-



section of animals or even humans cut down from the gallows. And through this anatomical research and the remarkably direct form of public education, it came to be recognized that humans – organ for organ and bone for bone – are actually built on the same anatomical template as the other vertebrate animals.

This realization became common knowledge around the year 1700, and it touched off two centuries when scientists and philosophers alike struggled to understand the implications of this new knowledge. The process culminated with the evolutionary biology of the 1800s and the startling proposal that the reason why we and other species have the same anatomical structure is that we share a common evolutionary origin. Thus, by about a century ago people had lost both their unique appearance and their unique origin.

Late in the 1900s, I think the study of animal behaviour led to a further revision in our view of animals, this one centred on their mental and emotional lives. A classic example is the work of primatologist Jane Goodall who studied animals in such detail that she could describe their personalities and unique life histories. From Jane Goodall we learn about the young chimpanzee she called 'Flint' who, at the mature age of eight, remained so attached to his aging mother that when she died, he stayed near the place of her death until he himself died of starvation. Drawing together this and many other observations, primatologist Roger Fouts (1997) described the chimpanzee as a:

'highly intelligent, co-operative, and violent primate who nurtures family bonds, adopts orphans, mourns the death of mothers, practises self-medication, struggles for power, and wages war.'

Thus, with some species at least, even in our mental lives the gap between humans and animals has come to seem remarkably narrow.

To sum up, the large gap between people and animals that we saw in the Biblical creation story has narrowed through scientific research, so that many people today believe that humans and animals share a common anatomical form, a common evolutionary ancestry and, with some species, a complex mental and emotional life. This altered set of empirical beliefs, about what animals are like, has stimulated a massive rethinking of our ethical beliefs, about how animals should be treated. And because science has expanded from being an element of Western culture, and has become more an element of global culture, perhaps it is not surprising that animal welfare is rapidly becoming a global issue.

### What is animal welfare?

As the current wave of concern about animal welfare began, roughly in the 1960s, a debate emerged over what animal welfare really involves.

The first major criticism of confinement production systems came in the book *Animal Machines*, by the English animal advocate Ruth Harrison (1964). She described cages for laying hens and crates for veal calves, and she claimed that these systems are so unnatural that they cause animals to lead miserable and unhealthy lives. She went on to ask:

How far have we the right to take our domination of the animal world? Have we the right to rob them of all pleasure in life simply to make more money more quickly out of their carcasses?

Later, in *Animal Liberation*, Australian philosopher Peter Singer (1990) adopted the principle that actions should be judged right or wrong on the basis of the pain or pleasure that they cause, and he claimed:

There can be no moral justification for regarding the pain (or pleasure) that animals feel as less important than the same amount of pain (or pleasure) felt by humans.

In these and many other quotations, a key concern centres on words like "pleasure", "pain", "suffering", and "happiness". There is no simple English word to capture this class of concepts. They are sometimes called "feelings" but that term seems too insubstantial for states like pain and suffering. They are sometimes called "emotions" but emotions do not include states like hunger and thirst. Perhaps the most accurate, if rather technical, term is "affective states", a term that refers to emotions and other feelings that are experienced as either pleasant or unpleasant rather than hedonically neutral.

In discussing animal welfare, however, some people put the emphasis elsewhere. A British committee that was formed to evaluate the welfare of farm animals concluded:

In principle we disapprove of a degree of confinement of an animal which necessarily frustrates most of the major activities which make up its natural behaviour. (Brambell 1965)

Astrid Lindgren, the famous author of the Pippi Longstocking stories and a driving force behind animal welfare reform in Sweden, proposed:

Let [farm animals] see the sun just once, get away from the murderous roar of the fans. Let them get to breathe fresh air for once, instead of manure gas. (Anonymous 1989)

And American philosopher Bernard Rollin (1993) insisted that we need:

... a much increased concept of welfare. Not only will welfare mean control of pain and suffering, it will also entail nurturing and fulfilment of the animals' natures

In these quotations, although affective states were often involved implicitly or explicitly, the central concern was for a degree of "naturalness" in the lives of animals: that animals should be able to perform their natural behaviour, that there should be natural elements in their environment, and that we should respect the "nature" of the animals themselves.

All of the above quotations reflected the views of social critics and philosophers, but when farmers and veterinarians engaged in the debate, they brought a different focus. For example, one veterinarian defended confinement systems this way:

My experience has been that ... by-and-large the standard of welfare among animals kept in the so called "intensive" systems is higher. On balance I feel that the animal is better cared for; it is certainly much freer from disease and attack by its mates; it receives much better attention from the attendants, is sure of shelter and bedding and a reasonable amount of good food and water. (Taylor 1972)

Or as the veterinary educator David Sainsbury (1986) put it:

Good health is the birthright of every animal that we rear, whether intensively or otherwise.



Here the primary emphasis is on the fairly traditional concerns of veterinarians and animal producers that animals should have freedom from disease and injury, plus food, water, shelter and other necessities of life – concerns that we might sum up as the basic health and functioning of the animals.

In these various quotations, then, we see a variety of concerns that can be grouped roughly under three broad headings: one centres on the affective states of animals, one on the ability of animals to lead reasonably natural lives, and one emphasizes basic health and functioning. These are not, of course, completely separate or mutually exclusive; in fact, they often go hand in hand. Letting a pig wallow in mud on a hot day is good for its welfare because the pig will presumably feel more comfortable (an affective state), because it can perform its natural cooling behaviour (natural living), and because it will have less disruption of its body processes caused by heat stress (basic health).

But the different criteria do not always go together. The gestation stall, where sows cannot walk or turn around for most of pregnancy, is a way of promoting healthy weight gain and avoiding injuries from aggression, but it is very unnatural and may create a life that is not very pleasurable. Feeding sows as much as they want may avoid unpleasant feelings of hunger, but can lead to unhealthy weight gain. Some outdoor systems look very natural, but involve parasitism and low piglet survival. Thus, genuine disagreements can arise when people try to create standards or practices to promote animal welfare based on any one of the three areas of concern.

### **Animal welfare science**

As this debate unfolded in the 1960s and 1970s, people began doing scientific research on animal welfare. Partly the research was done for the practical goal of making production systems more efficient by making them better suited to the animals. And partly the research was done because people expected science to resolve the disagreements over the interpretation of animal welfare. Surely, if animal welfare standards were 'science-based', there could be no disagreements based on differing interpretations of animal welfare. The outcome, however, proved more interesting as the following simple examples show.

Some of the research used the basic health and functioning of animals as an indicator of animal welfare. In one elegantly simple example Ragnar Tauson and co-workers (1998) improved the design of cages for laying hens just by studying the health of birds in cages of different types. They found that the birds developed foot lesions if the slope of the floor was too steep, and neck lesions if the feed trough was too deep and installed too high for comfortable access. There was often feather damage that could be reduced by using solid side partitions, and overgrown claws that could be prevented by installing abrasive strips. By modifying cage designs accordingly, Tauson was able to make large improvements in animal welfare as well as production efficiency, and this research then formed the basis of animal welfare standards for cage design, first in Sweden and then in the European Union.

Other scientists tried to improve animal welfare by making living conditions more 'natural' for animals. On many commercial dairy farms, calves are separated from their mothers within the first day after birth, and are then fed milk from a bucket, usually in two fairly large meals per day. This, of course, is very unnatural. Under natural conditions, the calf would stay close to the cow for the first two weeks, and would feed many times per day in

smaller meals. Leaving cows and calves together is not feasible on dairy farms, but calves can still be fed in a more natural way. First, if the calves suck from a teat rather than drink from a pail, the sucking action seems to stimulate certain digestive processes more effectively. Second, if the teat feeding system allows the calves to have many small meals per day (as they would if feeding from the cow), then they can consume a larger daily intake without developing digestive problems. As a result, such calves gain much more weight than calves fed twice a day by bucket (Appleby et al. 2001).

In other cases, research has tried to reduce unpleasant affective states in animals. Hot-iron disbudding of calves involves heating a ring-shaped iron to about 600 degrees Celsius and pressing it against the calf's head so that it burns through the nerves and blood vessels that would allow the horn to develop. Research in New Zealand by Stafford and Mellor (2005) used changes in plasma levels of the stress-related hormone cortisol as an indirect indicator of the resulting pain. Hot-iron disbudding was followed immediately by an increase in cortisol, but that reaction was blocked if lidocaine was used to freeze the area. Even with lidocaine, however, cortisol levels showed a clear increase several hours after the disbudding, probably because the area remained inflamed and painful after the freezing had worn off. However, if an analgesic such as ketoprofen is added to the calf's milk on the morning and evening of the dehorning, the second peak of cortisol is also eliminated. The results indicate that effective pain management requires both local freezing and a longer-acting analgesic.

In the early stages of the debate about animal welfare, some people expected that the science would eliminate any disagreement over the different elements of animal welfare by finding the one 'scientific' view. Instead, each of the different views of animal welfare led to research that provided different and complementary ways of improving animal welfare, and all three have led to practical improvements and science-based animal welfare standards. Thus, instead of the science resolving the different interpretations of animal welfare, the different interpretations actually came to underlie and enrich the science.

The take-home message for the animal-based industries is that all three views of animal welfare have a scientific basis, and that the single-minded pursuit of any one criterion of animal welfare may fail to promote animal welfare as judged by the other criteria. For standards and practices to be widely accepted as improving animal welfare, they need to make a reasonable accommodation to all three.

### **The role of veterinarians**

What is the role of veterinarians in this world of changing values and emerging science?

First, we need to recognize that animal welfare research is not a mature field of science. Much of the research is still more conceptual than strategic. Much of it is done at a research-farm scale, not a commercial scale. And much of it does not yet involve the multi-disciplinary teams that are needed to look at all the implications of new ideas. There is a great opportunity for veterinarians to work with animal welfare scientists to refine and broaden the science, and to apply it in practical ways. Here, then, is a scientific and technical role.

Second, the increased public concern about the welfare of animals has created an expectation that veterinarians will provide leadership in promoting animal welfare, not just as technical



specialists working to prevent and treat disease (important as that is), but also as champions of animal welfare in a broader sense that includes the different areas of concern. Here is a social leadership role.

I believe there is some urgency about fulfilling these roles. Some highly intensive pig production emphasizes basic health but ignores other animal welfare concerns; these systems sometimes offend against the public's view of what constitutes decent treatment of animals. Unless scientists and veterinarians can deal with the problems, then legislators and referenda may do so instead, and the outcomes may be less than ideal for the animals and for producers. At the other extreme there is a growth in outdoor systems that tend to be seen by the public as high-welfare, more or less by definition, but may involve serious problems of basic health and functioning. There is a need for technical innovation and good standards to ensure that this well-intentioned development does lead to good welfare for the animals.

But why, in 2010, are such basic problems as these still waiting to be solved? A century ago, agricultural and veterinary students studied a subject called 'animal husbandry' which included the feeding, breeding, handling, management and housing of animals. Then certain branches of science became established – nutrition, physiology, genetics – and before long, animal husbandry was replaced by a handful of scientific specialties. But when that happened, some of the original components of animal husbandry – the handling and management and housing – seemed to be forgotten as areas for scientific research and training. I think animal welfare science is finally restoring these missing elements of animal husbandry, but with a scientific basis that was not available a century ago. Here we see an educational role for veterinarians: to use animal welfare science as a way of restoring animal husbandry in veterinary education.

## Conclusions

What can we conclude from a presentation that has ranged from creation stories to studies of animal pain? Perhaps five things:

- First, the social concern about animal welfare that we see today has grown out of a long history of change in attitudes, driven to a large degree by scientific discoveries that narrowed the gap that we perceive between people and animals.
- Second, social concern about animal welfare includes three main elements: (1) the basic health and functioning of animals, (2) the affective states of animals, especially freedom from negative states such as pain and distress, and (3) the ability to live in a way that suits the animals' natural behaviour and other adaptations.
- Third, each of these elements of animal welfare has a scientific basis, and all three have given rise to practical improvements and science-based standards. The science did not arbitrate among the different views of animal welfare; rather the different views of animal welfare influenced the science and contributed to the richness of its ideas and approaches.
- Fourth, the single-minded pursuit of any one element of animal welfare does not guarantee a high level of animal welfare as judged by the others. For practices and standards to be widely accepted as improving animal welfare, they need to strike a balance among all three.

- Fifth, the increased focus on animal welfare, and the emerging science of animal welfare, have created expanded opportunities for veterinarians to take on new scientific and technical roles, new social leadership roles, and new educational roles in improving the lives of animals.

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