



Module 1

Introduction to Animal Welfare

Lecture Notes

Slide 1:

This lecture was first developed for World Animal Protection by Dr David Main (University of Bristol) in 2003. It was revised by World Animal Protection scientific advisors in 2012 using updates provided by Dr Caroline Hewson.

Slide 3:

This module covers:

- which animals we are concerned about and why (looking at sentience, suffering, anthropomorphism, and death and animal welfare)
- why animal welfare is complex (considering different scientific definitions of animal welfare; why animal welfare science involves more than veterinary medicine; the roles of science, ethics and law).

Slide 4:

The formal, scientific study of animal welfare began ~50 years ago, and the discipline as a whole is known as animal welfare science. However, the question of whether animals are suffering and what to do about it has mattered to people around the world for thousands of years.

A common criticism of this concern has been that animals don't have feelings as we do, and people who worry about animals may simply be attributing human feelings to animals. This attribution of human feelings to animals is called anthropomorphism.

However, modern science suggests that we share many feelings with animals, to some degree. This scientific finding supports the common intuitive sense that many people around the world have always had, i.e. that animals have similar feelings to us and therefore can and do show signs of feeling fear, pain, pleasure and other emotions.

The capacity of humans and other animals to have feelings that they experience as pleasant or unpleasant is called 'sentience'.

The next slide looks at this definition.

Slide 5:

Sentience is more than local sensation. “A sentient being is one that has some ability to evaluate the actions of others in relation to itself and third parties, to remember some of its own actions and their consequences, to assess risk, to have some feelings and to have some degree of awareness” (Broom, 2006). These feelings matter to the individual (Webster, 2011) and the organism is conscious of feeling something pleasant or unpleasant. Knowing that many species of animal are sentient means we know that they can suffer.

There is clear scientific evidence proving all vertebrates and some invertebrates are sentient. Research into invertebrate sentience is continually advancing and we are learning of sentience and new capacities of invertebrate species every day. Our understanding of sentience is still developing; many species we now think are not sentient may actually be sentient, and therefore able to suffer. For example, there is preliminary evidence that prawns may be sentient.

Slide 6:

Sentience is the capacity to have feelings and to experience suffering and pleasure. It implies a level of conscious awareness.

Animal sentience is the fact that animals can feel pain and suffer but also experience many positive emotions, such as joy and pleasure.

Animal sentience is recognised in legislation around the world (e.g. the Lisbon treaty).

Studies have shown many animals can experience complex emotions which are often thought to be unique to humans, such as grief and empathy.

The acceptance of animal sentience is based on decades of scientific evidence from the fields of neuroscience, behavioural sciences and cognitive ethology.

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Knowing that many species of animal are sentient means we know that they can suffer. Knowing that a species can suffer helps us to ask careful ethical and scientific questions about how we can care for them in ways that prevent “one or more bad feelings continuing for more than a short period” (Broom & Fraser, 2007).

There is growing evidence from neurobiology and behavioural studies that animals can also experience pleasant sensory input that produces positive emotions such as satisfaction. Knowing this will also inform how we care for animals.

Because we do not yet know much about positive emotions, most of animal welfare science and most veterinary clinical work focuses on how to prevent animals from suffering. However, it is likely that during your professional life, there will be practical developments in how to give animals a positive experience of their lives, not simply a life that avoids suffering. Positive experiences are what make an animal’s life a life worth living. An example of a positive

experience could be, when training working animals, if you ask an animal to lift something or do something they are not used to doing, timing the request with a treat will mean the animal associates the task with a positive reward.

Slide 8:

Anthropomorphism is generally seen as a bad thing by scientists. However, some now acknowledge that we can use human needs as a starting point for considering what animals may need in order to have a good life or, at least, to avoid suffering. This is called 'critical anthropomorphism'. An example of this is pain: as humans, we find surgery very painful, especially if no anaesthesia or analgesia is used. It is reasonable to expect the same to be true of many animals. Viñuela-Fernandez et al. (2007) studied the anatomical responses of farm and companion animals to drugs such as morphine; this proved that these animals can feel pain.

However, it is essential not to rely on anthropomorphism alone, without science and other information. For example, many pet cats are not friendly to humans and do not seem to enjoy interacting much with their owners; this is because of their paternal genetics and early experience (McCune, 1995). For most people, the presence of a companion is beneficial, and they assume that if they get a pet cat, the cat will enjoy the owner's companionship and want a lot of close contact, e.g. stroking. However, for many cats, this close attention from their owners is unpleasant, and those cats tend to be independent, not sleep on the owner's lap, etc. In this case, the original assumption that the cat will like social contact is incorrect.

Slide 9:

As vets, we are concerned primarily with the welfare of domesticated and captive wild species that humans keep as companions, for food, for research, or for entertainment. The concerns include:

- how those animals are cared for (including when neglect or cruelty may occur)
- how they are used, e.g. milking cows; shearing sheep and llamas; experimental procedures in research animals; activities required of animals in sport (e.g. dressage, rodeo) and entertainment (e.g. circuses, dog fighting)
- how they are handled and housed during transport and at sales
- how those animals are killed so that they do not suffer during the lead-up to their death and during the killing process (e.g. the slaughter of farm animals for meat, euthanasia because of illness, or killing for population control).

The logic of sentience means that we must be concerned when wild animals are killed because they are pests, or for food (e.g. ocean fish) or sport, that those killing processes are also humane. Vets are not normally involved in the care of those wild species and do not have oversight of their killing. However, because the profession is devoted to animal care, it is important to be aware of the issues; other lectures in this course summarise them. (Adapted from Fraser & MacRae, 2011.)

Slide 10:

People disagree about whether it is right for humans to kill animals. However, the state of death is not a welfare issue in its own right because welfare concerns the quality of an animal's life (suffering, etc), and when the animal is dead, he/she can no longer have experiences.

Humans usually want to have as long a life as possible *and* to avoid a poor quality of life. However, with animals we are usually concerned with giving them a good quality of life, but not in keeping them alive at all costs. Much of the time we end their lives for our own purposes, and the manner in which the animal dies is an important welfare issue. For example, the method of slaughter of food animals should, ideally, cause instantaneous death. For example, farmed fish are stunned and then killed instantly. However, in ocean fishing, the fish are caught en masse and most die relatively slowly, by suffocation.

Although being dead is not a welfare concern, a high death rate in a group of animals is a welfare concern. This is because, if many animals are dying, this may indicate poor husbandry or another problem under which many animals become diseased – and therefore experience bad welfare.

Slide 11:

We have now clarified what animals can suffer (sentient ones) and what we mean by sentience and suffering.

We have also seen that critical anthropomorphism can be a helpful starting point if we are concerned about animals suffering.

Finally, we have seen that death itself is not a welfare concern, but how animals die is very important.

We shall now look in detail at the definition of animal welfare.

Slide 12:

In being concerned about animal suffering, we are concerned about what effect our treatment of animals has on their experience of their lives. Different people have different ideas about how we should treat animals, and they understand animal welfare in different ways. A common view has been that if animals are healthy, their welfare must be good. However, animals can be healthy but still not have a good life experience.

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Most scientists agree that there are three areas to be considered when assessing animal welfare.

The first area is very familiar to vets: physical factors including the animal's physiology, e.g. growth rate or disease. For example, mild early tumours or infections can lead to detectable physical problems for a dog without the dog having any mental problems. This is often referred to as physical functioning – when animals are not functioning well, their owners usually ask the vet to find out why and seek to change it.

The second area overlaps heavily with the first and concerns the animal's mental state, including their preferences and their feelings. As vets, we are also familiar with an animal's feelings as they relate to health and how we can make ill animals feel better (for example, we have drugs to treat nausea and pain). However, other feelings in animals that an animal would choose to avoid can occur without there being any disease or production problem present, e.g. fear and anxiety during handling, but these may not necessarily be associated with any physical abnormality. Often, because owners have not noticed that their animals might have these feelings, they have not asked vets to advise on them, and veterinary medicine in turn has not concerned itself with them very much.

We can distinguish between welfare affecting the physical or mental state of animals. However, most clinical diseases and injuries induce both physical damage to the body and some degree of mental pain or discomfort.

The third area also overlaps with the other two, especially with the mental state of the animal. It concerns an animal's species-typical behaviours (e.g. hens dust-bathing; pigs rooting; horses pair-bonding to groom; polar bears walking for many kilometres as part of their hunting behaviour) and its environment – whether it is kept in the sort of natural environment in which it evolved. This 'naturalness' area of animal welfare has not been a traditional part of veterinary work, because often it is not an obvious cause of ill-health. If an animal is kept in a way that does not allow them to express important behaviours, the animal can develop abnormal behaviours, and may suffer from frustration and other negative emotions as a result. Furthermore, restrictions on behaviour and environment may lead to physical effects, sometimes severe. It is also important to understand that just as there are aspects of naturalness that can lead to good welfare, for example, having the ability to express natural behaviours, there are also aspects of naturalness that can lead to poor welfare. For example, it can be natural for wild animals to starve, be diseased or feel extreme pain.

So we can see that these three areas of animal welfare may or may not overlap with each other.

Slide 14:

This slide illustrates these three areas of animal welfare and how they can overlap. Any significant compromise in one area tends to affect the other two, although this may not always be the case.

For example, if a single hen is housed in a wire cage on her own and has food, water, a perch, a nesting box, and an area for dust-bathing, her physical functioning is likely to be good. Her mental state is likely to be good too, although she may feel frustration because of social isolation which may occur even if other birds are close by, in other cages. She will also be able to perform important behaviours like nesting before she lays. However, some people would still have concerns for her welfare because keeping a chicken in a cage is not 'natural'. The cages actually impact on other areas of welfare including the health of the animal, e.g. wired floors are likely to cause injuries; if an animal is frustrated then he or she may self-mutilate or perform stereotypical behaviours, which can cause physical damage. So in this example, the chicken's welfare is affected in terms of all three of the 'naturalness', 'physical' and 'mental' areas of welfare.

These three areas of welfare should never be looked at in isolation and we should focus on the centre of the diagram where they all overlap. It requires a holistic approach to welfare, incorporating all three and understanding the relationships between the areas.

A different example is a sheep which is farmed extensively but has a chronic infection of the foot. Some aspects of naturalness of the sheep's welfare will be very good. However, his/her welfare will be affected in terms of:

- physical area (functioning: slower movement, weight loss because the animal is unable to access enough good grass or extra feed), and
- mental area (feelings: pain, hunger, perhaps fear, if separated from the flock, and therefore is more vulnerable to predators)
- the overlap between physical functioning and mental state.

These examples illustrate that animal welfare is a complex concept and that people – including scientists – may not agree on an animal's welfare because they value the three areas of welfare differently. We will now look very briefly at some of these earlier scientific definitions.

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The earliest definitions concerned physical areas of animal welfare, particularly in connection with how an animal might cope with stress and how the body responds to stress physiologically. Professor Don Broom developed this view of welfare (see slide).

McGlone (1993) proposed an apparently more extreme view: that welfare is only poor when survival or reproduction are impaired by a physical problem (see slide). Similarly, Moberg (1985) argued: "...the only defensible measurement of well-being in animals is to determine if the animal is suffering from stress. Furthermore, I believe that the most appropriate indicator of stress is the appearance of a pre-pathological state."

Slide 16:

Other scientists argued for mental states, notably Professor Ian Duncan, as in this slide. Professor Marian Dawkins made a similar argument: “To be concerned about animal welfare is to be concerned with the subjective feelings of animals, particularly the unpleasant subjective feelings of suffering and pain” (Dawkins, 1988).

More recently, researchers as well as vets, owners and others are all acknowledging that an absence of negative feelings does not mean an animal’s welfare is good. To have good welfare, it is important to have positive feelings such as happiness, safety, satisfaction, etc. (Yeates & Main, 2008; Mellor et al., 2009).

Behavioural studies and research in neurobiology using techniques such as brain imaging are beginning to indicate when animals experience positive feelings, and how much the opportunity to experience positive feelings matters to animals (Mellor et al., 2009). However, the idea is not that we have to prevent animals from ever having any negative feelings. That is unrealistic and unnatural: negative feelings have adaptive value because they motivate the animal to avoid, or escape from, harmful situations. Rather, the goal is not to keep animals in such a way that they experience only negative feelings and cannot remove themselves from that situation or adapt to it (Keeling et al., 2011).

Slide 17:

In the 1960s, there was widespread public concern about the effect on animals of the intensification of farming. In the UK, the government set up a committee of scientists and others to investigate the matter. The committee was named after its chair, Brambell, and they issued a report known as the Brambell Report.

One of the comments in that report was: “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 Committee, 1965).

In another example of how some authorities stress the importance of natural living, the scientists Barnard and Hurst (1996) argued that species have evolved behaviours and physiology that enable them to survive and to reproduce and that that is the basis of natural selection. They concluded that domestic animals should be kept in ways that allow them to perform the behaviours, i.e. in accordance with natural selection.

The American ethicist Professor Bernie Rollin has also argued for this. He noted that animals have an inherent nature (in Greek, *telos*), or “genetic traits manifest in breed and temperament”, and he argues that, to have good welfare, animals need to be able to fulfil their nature (Rollin, 1993).

Slide 18:

Related to mental states and aspects of naturalness is the idea that animals need to perform certain highly motivated behaviours that are typical of their species. Those behaviours would have developed in their wild ancestors to enable them to obtain essential resources and therefore, to survive (e.g. in calves, the act of suckling to ingest milk from the mother; in pre-parturient sows, building a secluded nest in which to give birth).

The *need* to show a behaviour originates in the brain and therefore it is generally understood now that if animals do not live in an environment that permits these behaviours the animals are likely to experience negative emotions and therefore to suffer. This has given rise to the idea that animals have behavioural needs and that being in an environment that enables animals to express the behaviours can be a source of positive emotion (reviewed by Widowski, 2010).

Slide 19:

These examples show that animal welfare is a complex concept with three important areas – physical, mental and aspects of naturalness. The best definition therefore seems to be one that combines all three areas.

That is what the World Organisation for Animal Health uses. The Organisation is known by its French acronym OIE (Office International des Epizooties) and is based in Paris. The OIE represents around 178 countries and territories, and is taking the lead in promoting animal welfare standards around the world. Its statement regarding welfare is on this slide, and it stresses the importance of scientific evidence. This definition covers all three aspects of animal welfare:

Functioning (Physical)

- coping; healthy; disease prevention; nutrition

Mental (Feelings)

- comfortable; safe; not suffering from unpleasant states; humane handling and slaughter

Aspects of Naturalness

- coping; able to express innate behaviour.

Slide 20:

Another set of key statements that combines all elements of welfare are known by the term the Five Freedoms.

The Five Freedoms were based on the concerns and recommendations laid out in the Brambell Report (discussed above), published in the UK in 1965. They are listed on the slide, and you can see that they also relate to physical functioning, mental state/feelings and natural behaviour.

The Five Freedoms overlap with the three aspects of welfare: physical, mental and naturalness. For example, to achieve functioning we need freedom from injury and disease, freedom from hunger and thirst, freedom from thermal discomfort, freedom from fear and distress, and so on.

Slide 21:

We started this lecture by clarifying that being concerned about animal welfare means being concerned about animal suffering. We defined suffering, and we saw that only sentient animals can suffer. We have now also clarified what animal welfare is, and that it is a complex concept that includes the physical, mental and aspects of naturalness. We have also seen that because veterinary medicine has not traditionally been concerned with animal behaviours that are not signs of disease, veterinary medicine has not traditionally covered all of animal welfare.

Individuals value these various aspects of animal welfare differently. That is what makes animal welfare controversial, and the arguments have not changed over many millennia. We will now look briefly at the historical context, and see how animal welfare science developed.

Slide 22:

Taking India as our first example, concern for animals is part of the ancient religions practised there. Concern is motivated in part by a belief in reincarnation, that is, that the animal may be a reincarnated human soul, and that your own actions as a human will affect how you are reincarnated.

Another example from India is the Bishnoi tribe in Rajasthan, as on the slide.

Slide 23:

In China, Confucianism includes concern about animal suffering.

India and China are only two examples from around the world. Today, the dominant ethical arguments about how we should treat animals are rooted in Western thought, starting with the philosophies of the Ancient Greeks, with influential additions from thinkers in Britain and other European countries in the 18th and 19th centuries.

Slide 24:

Fraser has pointed out that all today's arguments – for example, about whether or not to eat animals, and what our duty of care is to animals – are the same concerns that the Ancient Greeks had. Some of these are outlined here.

Slide 25:

Western thought developed following that era and in Britain in the 18th century, a philosopher called Jeremy Bentham pointed out that treating animals well was nothing to do with whether or not they could talk or think, but simply whether they could suffer. In 1822, Britain passed what was probably the first animal protection law in Western democracies. However, in non-Christian religions such as Islam and Judaism, there were already religious laws in place about treating animals well.

Slide 26:

Moving forward to modern-day concerns, these grew with the development of modern intensive agriculture in the 1950s and 1960s in Europe and North America in the aftermath of the Second World War. The focus was on making animals more productive (e.g. with faster growth rates, producing more milk, producing larger litters) so that people could afford to eat more nutritiously and so enjoy better health. The systems typically involve housing animals in large numbers, and veterinary medicine was and is an important part of the animals' welfare there, because such housing allows infectious diseases to spread quickly. However, the development and use of veterinary vaccines and antibiotics prevents them from suffering in this way.

As other nations develop economically today, they too want affordable, nutritious animal-based food, and national agricultural practices are drawing on and adapting the intensive approaches developed in Europe. Two examples are:

1. In sub-Saharan Africa: cross-breeding zebu and other indigenous breeds, to increase their fertility and other traits while retaining their suitability for being managed by pastoralist farmers, under the local climatic conditions (Scholtz et al., 2011).
2. In Asia: there is rapidly growing demand for a more Western diet in most Asian countries, notably China and India; that is, for a diet including more meat and fish, rather than traditional rice/carbohydrate-based meals. There is also growing demand for dairy products: by 2006, cheese dominated the growth in dairy consumption in both Malaysia and Japan, perhaps because of its use in burgers at fast-food outlets such as McDonald's and Wendy's (Pingali, 2006).

Slide 27:

As intensive husbandry developed in the Europe and the USA in the 1960s, there was growing public concern about its effects on animals. In the UK, a book on the subject, *Animal Machines* by Ruth Harrison, caused such concern that the British government called for a committee of scientists, vets and others to examine the question. That was the Brambell Committee, which published the Brambell Report, which was mentioned earlier.

There was also public concern about other animals under human care or influence e.g. the use of wild-caught primates for research, and the need to conserve wild species.

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In light of concern for farmed animals in particular, and the Brambell Committee's report, scientists began to formally investigate questions of animal welfare. The discipline is known as animal welfare science, and it has arisen out of specific questions that the public want answered, e.g. do hens need to dust-bathe as they would in the wild? Why do piglets bite each other's tails in intensive systems? Do dairy calves suffer if they are removed from their mothers after 24 hours?

Because animal welfare science arose out of public concern, rather than from general curiosity about the world, it is a "mandated science" (Fraser, 2008a).

Slide 29:

Animal welfare science is now a well-established field, and this slide gives some examples of that. The professional group for researchers in animal welfare is the International Society for Applied Ethology (ISAE) (which was co-founded by a veterinarian, Andrew Fraser). The logo is at the top of the slide, in green.

The other images show examples of the scientific and academic publications on the topic of animal welfare. There are at least 50 books on the topic in English; you will see some of them in the reference list at the end of this module.

There are several peer-reviewed scientific journals that include a lot of animal welfare research, and more and more of this research is appearing in the veterinary clinical journals as well. In addition, there are two principal peer-reviewed journals that are dedicated to animal welfare science. They are *Animal Welfare* (shown on the slide) and *Applied Animal Behaviour Science*, which is the ISAE's publication.

Slide 30:

The importance of animal welfare internationally is reflected by the OIE, which we mentioned earlier when discussing definitions of animal welfare. The OIE's member countries have authorised the organisation to "take the lead internationally on animal welfare with guidelines and recommendations". The OIE has an Animal Welfare Working Group which holds international conferences every three or four years, e.g. Egypt in 2008, Kuala Lumpur in 2012. Since May 2005, the World Assembly of OIE Delegates has adopted seven animal welfare standards in the *Terrestrial Animal Health Code* and two animal welfare standards in the *OIE Aquatic Animal Health Standards Code (Aquatic Code)* (OIE, 2011b).

The Food and Agriculture Organisation (FAO) of the United Nations (UN) now has an online resource for international and national information related to farm animal welfare, called the Gateway to Farm Animal Welfare (FAO, 2011).

Slide 31:

Animal welfare is also an aspect of the One Health Initiative. This is an international collaboration among all health professionals, including veterinarians. It aims to expand knowledge of diseases in people and animals worldwide, especially because several diseases put both animals and people at risk. Animal welfare is involved here because disease affects feelings and functioning so much. Also, mass slaughter is sometimes used to prevent the spread of some diseases to animals and people. When this is urgent (e.g. during outbreaks of avian flu) animals can suffer at the time of slaughter because personnel are not trained to handle them humanely.

The One Health Initiative is supported by the World Organisation for Animal Health (OIE).

Slide 32:

We now move on to how veterinary medicine and animal welfare science overlap. We saw earlier that veterinary medicine already concerns the functioning and feelings aspects of animal welfare, through the diagnosis, treatment and prevention of disease. Infectious diseases have been particularly important, especially in intensively farmed animals, and vets have been very important in this aspect of animal welfare.

For example, there are now at least 60 vaccines against major infectious diseases in the main domestic species (e.g. tetanus in horses; Newcastle disease in poultry; clostridial diseases in sheep; rabies in many species; distemper in dogs). These diseases would otherwise cause widespread suffering. Vets continue to research infectious diseases and to advise governments and individual owners about the best use of these vaccines, so that many millions of animals are protected each year.

As research has revealed more about how animals can suffer for reasons other than infection or other disease, vets in different countries are including this consideration more and more. Because of the rapid expansion in knowledge of health and diseases – infectious and otherwise – in all veterinary species, veterinary medicine has not always kept up with

developments in the other fields relevant to animal welfare, especially the field of applied animal behaviour.

Vets have always understood a lot about normal animal behaviour as it relates to physical health: many clinical signs of disease are changes in normal behaviour (e.g. a calf that is mouth-breathing instead of breathing quietly through his/her nose; a horse that is lame, i.e. not bearing weight evenly on all four legs). Vets also use an animal's behaviour to assess how much pain he/she may be feeling, and to determine the appropriate mixture of analgesic drugs to give.

What is still quite new for veterinarians is the growing scientific knowledge about behavioural signs that occur because the animal's handling or housing are not appropriate. Similarly, there is more and more research arising on the importance of positive emotions in animal welfare; this research may in time tell us how, as vets, we can advise animal owners about how to facilitate more positive experiences for animals.

Slide 33:

Today, countries worldwide agree that animal welfare is important, and animal welfare science is an established scientific discipline. In addition to the many government research departments and non-veterinary university faculties that teach and study animal welfare, more and more vet schools also have research groups and postgraduate training in animal welfare.

The World Organisation for Animal Health (OIE) recommends that animal welfare is a required Day 1 competency for all veterinary graduates (OIE, 2011c). That means that when you graduate as a vet, you should be able to:

“...explain animal welfare and the related responsibilities of owners, handlers, veterinarians and others responsible for the care of animals; identify animal welfare problems and participate in corrective actions; and know where to find up-to-date and reliable information regarding local, national and international animal welfare regulations/standards in order to describe humane methods for:

- animal production;
- transport; and
- slaughter for human consumption and killing for disease control purposes.”

Slide 34:

Many people today agree that we have an obligation towards animals. Their reasons for this may differ. For example, for some people it is because animals have inherent value. For others, it is because animals have economic value to us, i.e. are useful to us for food, etc. For others, it is because of empathy, i.e. concern that animals can suffer. For others, it is because the species of animal is becoming rare and we have the power to prevent it from dying out.

These different reasons for showing concern for animals mean that, in turn, there are different views about what our obligations to animals entail. That is the field of ethics – how we should treat animals. Other lectures will look more closely at ethics, and at how the law on animals may or may not reflect these concerns.

Slide 35:

To sum up this introduction to animal welfare:

- Animal welfare is concerned with how sentient animals experience their lives, in terms of their physical functioning, mental state and natural behaviours. To understand these three aspects requires science – hence animal welfare science.
- Animal welfare is affected by people's values – how they think we should treat animals, and what they think is important for animals. Science helps us to understand some of these issues. Ethics then weighs that knowledge with human desires (e.g. to earn a living by farming; to clear land and build houses), so that we can decide how we should treat animals. That is the field of animal ethics.
- Related to this, animal welfare also involves the law, i.e. society's rules about how we must treat animals. Ideally, animal welfare law should reflect the decisions that society has reached – using science and ethical reasoning – about how we ought to treat animals. However, often animal welfare law may set a low standard of care because there may not be public money available to enforce higher standards or because the public is not aware of welfare problems or is not willing to spend money on enforcing higher standards of welfare.

The rest of this course will examine these three aspects of animal welfare – science, ethics and law – and show you how they apply in practice.