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POLICY DEPARTMENT **C**
CITIZENS' RIGHTS AND CONSTITUTIONAL AFFAIRS



Constitutional Affairs	
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Animal Welfare in the European Union

STUDY FOR THE PETI COMMITTEE



DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT C: CITIZENS' RIGHTS AND
CONSTITUTIONAL AFFAIRS

PETITIONS

Animal Welfare in the European Union

STUDY

Abstract

This study, commissioned by the Policy Department for Citizens' Rights and Constitutional Affairs upon request of the Committee on Petitions, finds out that EU animal welfare policy and legislation has had much positive influence in the world, on the image of the EU as well as helping animals. However, most kinds of animals kept in the EU are not covered by legislation, including some of the worst animal welfare problems, so a general animal welfare law and specific laws on several species are needed. Animal sentience and welfare should be mentioned, using accurate scientific terminology, in many trade-related laws as well as in animal-specific laws.

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LIST OF ABBREVIATIONS

BST	Bovine somatotrophin
BTSF	Better Training for Safer Food
COPA-	Committee of Professional Agricultural Organisations and General
COGECA	Committee for Agricultural Cooperation in the European Union
CAP	Common Agricultural Policy
CIWF	Compassion in World Farming
DEFRA	Department of Environment, Food and Rural Affairs, U.K.
DG	Directorate General of European Commission
ECLAM	European College of Laboratory Animal Medicine
EEPTA	European Egg Packers and Traders Association
EEPA	European Egg Processors Association
EFPIA	European Federation of Pharmaceutical Industries and Associations
EFSA	European Food Safety Authority
ESLAV	European Society for Laboratory Animal Veterinarians
EU	European Union Scientific Committee on Animal Health and Animal
SCAHAW	Welfare
EU SVC	European Union Scientific Veterinary Committee
FAO	Food and Agriculture Organisation of the United Nations
FVE	Federation of Veterinarians of Europe
GM	Genetically-modified
IFC	International Finance Corporation
IGF-1	Insulin-like growth factor-1
ISAE	International Society for Applied Ethology
NERC	Natural Environment Research Council, U.K.
OECD	Organization for Economic Cooperation and Development

RSPCA Royal Society for the Protection of Animals

OIE World Organisation for Animal Health, Organisation mondiale de la santé animale
Sanidad Animal

WTO World Trade Organization

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EXECUTIVE SUMMARY

Background

EU citizens are becoming increasingly concerned that all kinds of production systems and other activities should be sustainable. Animal welfare is an important aspect of sustainability, and also of product quality, and may result in consumers refusing to buy products. The welfare of an individual is its state as regards its attempts to cope with its environment. Welfare includes feelings and health and can be measured scientifically. It is a biological concept, quite different from rights, and refers only to living animals.

The terms welfare, stress, needs, humane and euthanasia are defined and some of the ways in which they are used imprecisely in EU documents and elsewhere are described. Animal health is principally of importance because it is a key part of animal welfare. It can also have economic and human disease consequences. The terms health and welfare have exactly the same meaning for humans and for other animal species, hence the current interest in 'one health' and 'one welfare'. When the welfare of individuals is poor, there is increased susceptibility to disease, hence improving welfare generally reduces disease. Preventing anti-microbial resistance is good for animal welfare and improved welfare can reduce the need for use of anti-microbial products. Those with a medical background and those with a veterinary or other biological background benefit from exchanging information, in particular because of the similarities in disease and in other causes of poor welfare in humans and other species. Care for people and care for animals used by people is generally better if all are considered as individuals.

The current situation

Some of the many EU Directives and Regulations relevant to animal welfare are listed and the role of scientific information in their formation is explained. Most of the legislation concerns animals that are often the subject of trade. The welfare of hundreds of millions of animals has improved as a result of EU policies and legislation.

Although people have long had empathy with the animals that they use, recent increases in knowledge about animal functioning has led to a high level of public concern in many countries about the welfare of animals. EU surveys show that EU citizens are very concerned about animal welfare within and outside the EU. The ban on seal products, enacted because the methods of killing the young seals was considered inhumane, was the subject of a W.T.O. challenge. The ban was considered by the W.T.O. to have the effect of preventing poor welfare of animals as a matter of public morality and not to violate the Technical Barriers to Trade Agreement.

Scientific evidence about animal welfare and data from investigations of public opinion are of major importance when legislation and policies are formulated in the EU. EU policies have led to efforts to improve enforcement of legislation and to the funding of important research on animal welfare by the European Commission. Several world organisations list animal welfare as a factor that must be considered when deciding on methodologies and policies. EU legislation on many animals has had substantial influence on animal welfare policies, legislation and codes of practice in other countries. The legislation on animal welfare, and the policy of basing it on facts, has led to increased respect for the EU.

Where legislation and codes of practice about animal welfare are effectively enforced, the welfare of animals is improved. The European Commission has made constructive efforts to standardise and improve enforcement of animal welfare legislation in recent years.

Enforcement is most effective in relation to slaughter procedures and major housing system changes. Welfare during slaughter, transport and daily care of animals is improved by legislation and codes of practice but education of the people involved in the interactions with the animals also has a major beneficial effect.

Those who use animals, for example in food production, laboratory research, or as companions, range in attitude from very caring to viewing the animals as solely a resource. However, animal users are becoming more aware of the power of consumers to alter their purchasing policies or other actions to prevent methodologies and production systems that are cruel to animals.

The commonest animal kept for human use in Europe is the broiler chicken and this is the subject of EU legislation. However, there is no specific welfare legislation about the keeping of the second commonest animal - trout, the third commonest – salmon, the fourth commonest – rabbits, the fifth commonest – ducks, the sixth commonest – turkeys, the eighth commonest – cats, the ninth commonest – cattle, the tenth commonest – sheep, or the eleventh commonest – dogs.

When the magnitude of poor welfare for individual animals and the numbers of animals kept are considered, the greatest animal welfare problem in the world is broiler chicken leg disorders and related problems. On a world scale, welfare problems of sows, calves and laying hens are extreme but EU legislation has substantially reduced these. The second worst problem in Europe now is poor welfare of dairy cows because of leg disorders, mastitis and reproductive problems. Other important current problems are those resulting from high stocking densities of salmon, trout and turkeys, poor housing and management of rabbits, poor housing and force-feeding of ducks and painful mutilations of many animals. Genetic selection of animals is the cause of welfare problems in many species.

The future

The animals that people keep and use are described in the Treaty of Lisbon as sentient beings. Hence they should not be referred to as merely property. All EU legislation, including that which is not directly concerned with animal welfare, should refer in an accurate way to animal welfare and sentience.

The EU policy of producing welfare legislation for more and more of the widely-kept animals has been reversed in recent years. EU citizens find it unacceptable that most animals kept in the EU are not protected by EU law.

A striking deficiency in EU animal welfare legislation is that some widely-kept animal species are not protected. A substantial number of existing EFSA reports and opinions are specific to these animals and could be used in formulating legislation. The very large gaps in EU legislation on animal protection could be remedied by a general animal welfare law, somewhat like the general animal health law. There should be a general animal welfare law in the EU. This would simplify legislation but, in addition or as subsections, the substantial gaps in coverage of species in EU law should be remedied by specific laws.

Effective enforcement of laws on animal welfare is desirable but is not a substitute for completeness of coverage of the law.

Public opinion investigations, like those of Eurobarometer, indicate increasing concern about animal welfare in all areas of society. This increased concern within and outside the EU, leads to new markets. Consumer power to determine production methods is increasing world-wide and, since the EU has been responding rapidly, markets for welfare-friendly equipment and

for high welfare and other sustainable products have been exploited and can be exploited further.

The animal user industries, animal protection groups and policymakers share the view that animal welfare legislation and policy should be based on science. Research on animal welfare should continue to be actively promoted by the EU. There should be an EU network of animal welfare science centres. Animal welfare enforcement and education are promoted by exchange of information, for example on the internet. The Animal Welfare Science Hub is a good way to do this, as it is unbiased and checked for quality, but it would have to be funded to continue.

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1. INTRODUCTION

1.1. Plan of the Study

Animal welfare is a scientific concept but there are various ethical positions about the welfare of animals. Chapters 2-5 of this Study of Animal Welfare in the EU explain the concept of welfare in all animals, including humans, and how it is related to terms such as needs, stress, feelings, health and sustainability. Links between human issues and issues concerning animals used by people are explored in relation to the “one health” and “one welfare” approaches.

After a brief summary of EU legislation and other actions, affecting animal welfare directly or indirectly, in Chapter 6, some of the impact of the legislation and actions throughout the world are described in Chapter 7. The value to consumers, animal producers and other animal users within the EU is examined in Chapter 8. Not all laws and other actions have the desired effect so actual consequences for animals of the legislation and enforcement strategies are considered in Chapter 9.

Since the legislation does not cover all animals, and may not solve all welfare problems, there are animal welfare problem areas that are not regulated within the EU. These deficiencies are outlined in Chapter 10. In recent years, there have been some changes in administrative structure and strategy in relation to animal welfare in the EU so this is described in Chapter 11. Possibilities for future action are then discussed in Chapter 12.

1.2. The Author

Professor Broom has conducted scientific research and taught in universities since 1964. His research on animal welfare has concerned general principles and the welfare of pigs, cattle, hens, broilers, ducks, sheep, farmed fish, horses, dogs, cats, laboratory animals, zoo animals and some wild animals. He was chair or vice chair of: the EU Scientific Veterinary Committee, Animal Welfare Section (1990-1997), the Scientific Committee on Animal Health and Animal Welfare (1997-2003) and the European Food Safety Authority Panel on Animal Health and Welfare (2003-2009, also Member 2009-2012). He was also: Scientific Advisor on the EU Delegation to World Trade Organisation “European Communities – Measures Prohibiting the Importation and Marketing of Seal Products (DS400, DS401)” (2013), Scientific Advisor to the Council of Europe Standing Committee of the Convention on the Protection of Animals Kept for Farming Purposes, Strasbourg (1987-2000), Chairman of the World Organisation for Animal Health (O.I.E.) Working Group on Welfare of Animals during Land Animal Transport (2003–2006) and, in the U.K., member of the D.E.F.R.A. Farm Animal Welfare Council (1991-1999), Home Office Animal Procedures Committee (1998-2006) and N.E.R.C. Special Committee on Seals (1986-1997). He has written over 350 refereed papers and 10 books and lectured on animal welfare in 45 countries.

He is not a member of any animal protection or animal user society.

1.3. References to Petitions and Publications

Petitions on animal welfare and related areas, made in recent years to the European Parliament, have been taken into account when compiling this Study. Reference is made to some of these petitions in the text and petitions cited are listed. Scientific publications cited are also listed.

2. THE SCIENTIFIC CONCEPT OF ANIMAL WELFARE

KEY FINDINGS

- The terms welfare, stress, needs, humane and euthanasia are defined and some of the ways in which they are used imprecisely in EU documents and elsewhere are described.
- The welfare of an individual is its state as regards its attempts to cope with its environment. Welfare includes feelings and health and can be measured scientifically. It is a biological concept, quite different from rights, and refers only to living animals.

2.1. Welfare and related concepts

Scientists and legislators now use animal welfare as a term that is a scientific concept describing a potentially measurable quality of a living animal at a particular time. Such usage has rapidly become widespread during the last thirty years (Broom 2011). Welfare requires strict definition if it is to be used effectively and consistently in precise scientific measurements, in legal documents and in public statements or discussion (Broom and Molento 2004). Welfare refers to a characteristic of the individual animal rather than something given to the animal by people (Duncan 1981).

Taking account of the proposal by Hughes (1982), that welfare is to do with the animal being in harmony with its environment, Broom (1986) presented this definition of welfare: the welfare of an individual is its state as regards its attempts to cope with its environment. This was further explained in a series of publications (Broom 1988, 1991a, b, Broom and Johnson 1993). The term welfare refers to animals, including humans, but not to plants or inanimate objects. Well-being has the same meaning but is sometimes perceived as less scientific so welfare is the normal scientific and legal term. Equivalent words in other languages include bien-être, bienestar, bem estar, benessere, Wohlergehen, welzijn, velfærd, and dobrostan. Quality of life means welfare, so can be measured in the same way, but this term is not used for brief periods (Broom 2007).

Welfare can be measured scientifically and varies over a range from very good to very poor. Welfare will be poor if there is difficulty in coping or failure to cope. Coping means having control of mental and bodily stability (Broom and Johnson 1993). Feelings, such as pain, fear and the various forms of pleasure, are biological coping mechanisms that have evolved (Broom 1998) and an important part of welfare. All of the mechanisms for coping with pathology, the state of which is health, are also key parts of welfare (see Chapter 4). Both Dawkins (1993) and Fraser et al (1997) also emphasise that feelings and health are substantial parts of welfare and Mellor (2015) explains the role of positive emotions in welfare. The O.I.E. (World Organization for Animal Health, OIE 2011) followed the Broom definition in a helpful description of what is meant by animal welfare. However, the O.I.E. statement is not a definition and has some imprecise parts in it (Broom 2014). The concept of welfare as a state that varies from the good or positive to the poor or negative is important if welfare is to be scientifically assessed. Direct scientific measures of welfare are of how good or how poor the welfare is. Welfare refers to how well the individual fares, or goes through life, not just to a positive condition. In the same way, well-being and bien-être mean how good or poor the welfare is. Since welfare can be poor, it is not correct to talk about preserving welfare, or ensuring welfare, or compromising welfare.

The word "stress" should be used for that part of poor welfare that involves failure to cope, in line with the widespread public use of the word referring to a deleterious effect on an

individual (Broom and Johnson 1993). Reference to stress as just a stimulation that could be beneficial, or as just an event that elicits adrenal cortex activity, is of no scientific or practical value. One definitive indicator of adversity is a negative effect on biological fitness. Stress can be defined as an environmental effect on an individual which over-taxes its control systems and reduces its fitness or seems likely to do so. Hence there are many stress responses, not just one. Using this definition, the relationship between stress and welfare is very clear. Firstly, whilst welfare refers to a range in the state of the animal from very good to very poor, whenever there is stress, welfare is poor. Secondly, stress refers only to situations where there is failure to cope but poor welfare refers both to the state of the animal when there is failure to cope and when the individual is having difficulty in coping.

In order that welfare can be good rather than poor, it is important to know what are the needs of the animal. These needs depend on the biological functioning of the animal and therefore vary from species to species. Most accounts of the welfare of a particular kind of animal start with a summary of its needs, e.g. EFSA Scientific Reports, such as EFSA (2009g), and Council of Europe Recommendations, such as Council of Europe (1999). An example of a statement to this effect in EU legislation is in Article 34 of Directive 2010/63 “on the protection of animals used for scientific purposes”. This states: “The accommodation and care of animals should be based on the specific needs and characteristics of each species.” The motivation system of each animal, including each human, functions to control interactions with the environment. It promotes the occurrence of optimal responses and initiates actions by means of a set of needs (Broom and Fraser 2015 Chapter 4). A need is a requirement, which is part of the basic biology of an animal, to obtain a particular resource or respond to a particular environmental or bodily stimulus (Broom and Johnson 1993, Broom 2008). The need itself is in the brain. It allows effective functioning of the animal and may be fulfilled by physiology or behaviour but is not itself physiological or behavioural. Some needs are for particular resources, such as water or heat, but control systems have evolved in animals in such a way that the means of obtaining a particular objective have become important to the individual animal. The animal may need to perform a certain behaviour and may be seriously affected if unable to carry out the activity, even in the presence of the ultimate objective of the activity. For example, people are not satisfied if food is injected into their stomachs, they want to chew and swallow it. Needs can be identified by studies of motivation and by assessing the welfare of deprived individuals (Hughes and Duncan 1988, Dawkins 1990, Toates and Jensen 1991).

The idea of providing for “the five freedoms” was first suggested in the Brambell Report in 1965. However, a list of freedoms or domains (Beausoleil and Mellor (2015) just provides a general guideline for non-specialists. Animals have many needs and these have been investigated precisely for many species. Hence the rather general idea of freedoms is now replaced by the more scientific concept of needs. The freedoms are not precise enough to be used as a basis for assessment of the welfare of a particular animal.

Since there are many ways in which animals cope with their environment, a wide variety of measures of welfare are possible. Indeed, although any one measure could indicate very poor welfare, welfare assessment studies are normally better if a range of measures is used. When some of the wide range of animal welfare indicators have been utilised, a measure of the intensity of good or poor welfare is obtained. If welfare is poor, for example during some handling, transport or slaughter procedures, the magnitude of poor welfare is a function of the severity of effect and its duration.

Measures of welfare outcome are often valuable for use in legislation and standards. These indicate, at a time of inspection, what the welfare has been in the past, for example injuries, pathologies or walking difficulty on arrival at a slaughterhouse. For details of welfare assessment methodologies, of animal-based welfare-outcome indicators and of risk and benefit analysis in animal welfare, see Fraser (2008), EFSA (2012b,d), Broom and Fraser (2015).

2.2. Welfare, ethics and rights

This Study concerns animal welfare, a concept that is quite separate from ideas about animal rights. The welfare of animals, a biologically definable quality as explained above, is an ethical issue because most people consider that animals are moral entities with an intrinsic value (Broom 2003, Aaltola and Wahlberg 2015). Once scientific information about animal welfare is available, ethical decisions can be taken. Some of these ethical decisions are about how good or poor welfare should be. Different decisions about the use of animals concern whether or not the animal should be killed. Philosophers and the public have views on the ethics of killing animals for human food, human clothing, and scientific research or as unwanted pets (Regan 1990, Fraser 2008). This is an important ethical question but it is not an animal welfare issue. The animal welfare issue is what happens before death, including the effect on them of how they are treated during the last part of their lives and the killing procedure. Petitions to the European Parliament such as Petitions 0227/2013, 0691/2013 and 1024/2013 concern the welfare of dogs in relation to how to care for them and how to avoid pain if they are killed. However, the decision about whether or not to kill them is a separate ethical question and is not to do with animal welfare.

The concept of humane killing, where animals are to be killed for any reason, involves moral judgement based on scientific evidence. Examples of reasons for killing include: providing a human resource such as food, preventing destruction of a resource by an animal that we might call a pest, preventing spread of disease, providing human entertainment, or benefiting the animal itself by preventing suffering. Most people would say that, where the killing is under human control, we have an obligation to avoid causing pain, suffering or other poor welfare to the animal prior to death and it is better to express it in this way than to refer to rights (Brandt 1996, Broom 2003). Humane means treatment of animals in such a way that their welfare is good to a certain high degree (see example in Section 7.1). The word euthanasia comes from the Greek εὖ (eu) meaning good or well and θάνατος (thanatos) meaning death. Hence it means a good death, i.e. a death that is good for the animal itself. Euthanasia should be used solely to mean killing an individual for the benefit of that individual and in a humane way. If the benefit is for someone else, it should be called killing or humane killing but not euthanasia (Broom 2007, Broom and Fraser 2015). Euthanasia is used in this way when referring to killing humans. It is not called euthanasia if the person is killed for someone else's benefit. When a companion, farm or laboratory animal is suffering, the owner or a veterinarian may decide that it would be better for that animal to be dead than to continue suffering. In that case, it is euthanasia, but if the animal is killed for the convenience of the owner, for food, because a laboratory experiment has finished, because it is considered a pest, or because it may spread disease, it is not euthanasia.

2.3. The use of welfare-related concepts in EU documents.

Since legislation, standards and policy documents sometimes use words that are in earlier documents, the wording may not take account of recent developments in precision in the subject. Some of the recent Directives and Regulations of the European Union which relate to the protection of animals refer to welfare and needs in the manner described above but others are less precise (Broom 2001). The Council Directive 98/58/EC concerning the protection of animals kept for farming purposes, follows the more old-fashioned wording of the 1976 Council of Europe Convention. This Convention was written before most developments in animal welfare science. For example it is said that owners and keepers should "ensure the welfare of animals under their care" (Article 3). This does not take account of the widely-held concept of animal welfare as varying from very good to very poor. The sense intended is "to ensure good welfare in animals under their care". There is also out-dated reference to needs in paragraph 7 of the preamble of 98/58/EC: "provision of housing, food, water and care appropriate to the physiological and ethological needs of the animals in accordance with established experience and scientific knowledge" (see also Article 4 and

Annex 7, 11 and 15). However, as explained above, the needs themselves are in the brain so are not physiological or ethological. It is the fulfilment of needs which requires physiological change or a certain behaviour to be shown. Hence it is better to refer to "biological needs", just "needs" or "needs to show certain behaviours or to maintain physiological states".

3. WELFARE AS PART OF SUSTAINABILITY AND PRODUCT QUALITY

KEY FINDINGS

- EU citizens are becoming increasingly concerned that all kinds of production systems and other activities should be sustainable. Animal welfare is an important aspect of sustainability, and also of product quality, and may result in consumers refusing to buy products.
- Consumer power to determine production methods is increasing world-wide and, since the EU has been responding rapidly, there is an opportunity for exploitation of markets for high welfare and other sustainable products.

3.1. The Concept of Sustainability

When decisions are made about whether a system for exploiting resources should be used, an important question is whether or not the system is sustainable (Aland and Madec 2009). The fact that something is profitable and there is a demand for the product is not now sufficient reason for the continuation of production. A system or procedure is sustainable if it is acceptable now and if its expected future effects are acceptable, in particular in relation to resource availability, consequences of functioning and morality of action (Broom 2001, 2014). A system might not be sustainable for several possible reasons. For animal usage systems, including those involved in animal production, examples of such reasons are: (i) because it involves so much depletion of a resource that this will become unavailable to the system, (ii) because a product of the system accumulates to a degree that prevents the functioning of the system, or (iii) because members of the public find an action involved in it unacceptable. Where there is depletion of a resource or accumulation of a product, the level at which this is unacceptable, and hence the point at which the system is unsustainable, is usually considerably lower than that at which the production system itself fails. Other reasons for unacceptability are exemplified below. A system could be unsustainable because of harms to the perpetrator, harms to other people, harms to the environment, or harms to other animals.

No system or procedure is sustainable if a substantial proportion of the local or world population, at this moment, find aspects of it unacceptable, or if they consider now that its expected consequences in the future are morally unacceptable. Examples of unsustainable practices are discussed by Broom (2012, 2014). Adverse effects on people or animals can be reported in the media around the world. Some consequences of practices in manufacturing, animal production or other human activities are unacceptable because the information that is internationally available makes clear the damaging consequences to people, to animals or to the environment. Some systems of agricultural production are considered unsustainable because of inefficient utilisation of world resources. On the other hand, some systems can use resources efficiently, increase biodiversity, minimise pollution and improve animal welfare (Broom et al 2013).

Media reports of activities or events that the public find unacceptable, may result in consumers in many countries refusing to buy animal and other products from the companies or countries involved, for example dolphins caught in tuna nets, calves kept in small crates or sheep dying on an Australian ship going to Saudi Arabia (Broom 2012). The three examples mentioned here, all animal welfare issues, were all featured widely in the media of many

countries. For very many people, in Europe and around the world, animal welfare is considered to be a public good (McInerney 2004).

3.2. Changing ideas about product quality

The idea of the quality of the goods that people buy has changed in the last 10-20 years. At one time, quality referred to immediately observable aspects, e.g. for an animal food product, its visual qualities and taste. These components of quality are still important, and expectations about taste are tending to become more refined, but other factors are now becoming incorporated into what constitutes good quality. Consumption has consequences and these are now more thoroughly considered. If a food causes people to become sick, the quality is considered poor. If the food tends to make you fat, for some people the quality is considered poor. If food has added nutrients, some consider the quality to be better. In addition, a major recent change is that the ethics of the production method are taken into account. Factors considered by purchasers include: (i) the welfare of the animals used in production, (ii) any impact on the environment, including conservation of wildlife, (iii) ensuring a fair payment for producers, especially in poor countries, (iv) the preservation of rural communities so that the people there do not go to live in towns and (v) the carbon footprint of each product. Factors leading to global warming are now high on the agenda of many discriminating consumers. The French 'Label Rouge' scheme led the way in this (Quedraogo and Le Neindre 1999) and the proportion of French consumers who bought only on price was already thought to have dropped to 25% by that time.

3.3. Opportunities for animal industries

Although the broadening of the concepts of sustainability and product quality is world-wide, the rate of change has been faster in the EU than in some other parts of the world. This provides an opportunity for EU industries to adapt to the new market opportunities and to provide for what consumers demand both inside and outside the EU. Producers from third countries are already having to change some of their production methods in order to sell in those countries where high animal welfare standards are required by consumers. However, there is a time required for development of new systems and, where EU producers have already changed, they have a competitive advantage. This issue is considered further in Chapters 8 and 12.

4. WELFARE IN RELATION TO HEALTH

KEY FINDINGS

- Animal health is principally of importance because it is a key part of animal welfare. It can also have economic and human disease consequences.
- When the welfare of individuals is poor, there is increased susceptibility to disease, hence improving welfare generally reduces disease.

4.1. The terms health and welfare

Diseased animals very often have difficulty in coping with their environment, or fail to do so, hence their welfare is poorer than that of a healthy animal in otherwise comparable conditions. The effects on an animal of laminitis, mastitis, pneumonia or severe diarrhoea are easy to appreciate. Whether the disease causes pain or other kinds of discomfort or distress, veterinary treatment that reduces the effects of the disease is clearly improving the welfare of the animal. It is important to emphasise, as have Jackson (1988) and Webster (1988, 1994), that it is not the diagnosis of the disease that improves welfare but the consequent treatment. Health, like welfare, can be qualified as good or poor and varies over a range. It refers to body systems, including those in the brain, that combat pathogens, tissue damage or physiological disorder so health can be defined as “the state of an individual as regards its attempts to cope with pathology” (Broom, 2006). All of this is encompassed within the broader term welfare, so health is a part of welfare. Many years before the refinement of our definitions of such concepts, the World Health Organization (1946) said “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. The word welfare was not being used in a scientific way at this time but welfare is essentially the same concept as well-being so WHO was referring to the various aspects of welfare. Their definition is not easy to use scientifically as both health and welfare can be poor as well as good and measurement of both depends on the concept being a scale from positive to negative. The WHO definition is also contrary to normal public usage in that most people limit health to conditions related to pathology, physical or mental, as explained above. Hence the WHO definition has been confusing for many people as a result and this is why it is not used here. Health is considered here to be one of the key components of welfare. When an individual is diseased, the welfare is poorer than when not diseased although there is a wide range of effects on welfare from slight to extreme. This is an important area of study for humans and for non-humans. It was a central scientific question in the EU Framework 7 project Animal Welfare Indicators (AWIN) coordinated by A.J.Zanella (McLennan et al 2016, Dalla Costa et al 2016).

Using this definition of health, the term refers to individual living organisms. If populations are considered, the mean health in the population can be evaluated but it is not strictly correct to speak of the health of a population. Neither is it correct to speak of the health of an ecosystem. Similarly, welfare refers to living animals and it is not correct to speak of the welfare of a population or ecosystem. This is because the population or ecosystem does not have methods for coping, even if individuals within them do have such methods.

Much of EU legislation refers to matters that affect human welfare. Some legislation concerns human pathologies, injuries or disorders so is categorised as health legislation. Legislation which deals with animal health may have several objectives. Firstly, both legislators and veterinarians focus especially on risks to human health. Secondly, there is concern about pathologies that may result in financial cost to animal user industries. Thirdly, all poor health of animals is also poor welfare of those animals. The health of an animal is defined in terms of the state of that individual so spread of disease to humans or extra costs for farmers are not part of the health of that animal, even if they are consequences of it. An understanding

of disease transmission methods, of preventive medicine, and of epidemiology in general are clearly relevant to the health of individuals and hence to their welfare.

The idea that animal health is especially relevant to human disease and to the economics of animal production has led to some conceptual confusion. Animal health is not of significance principally because of its consequences for people, it is the effects on the animals themselves that are its major importance. The same is true of animal welfare in that the human reaction to good or poor welfare is not part of the welfare. Welfare is a wider term than health and health is a key part of welfare. Those dealing with animal health issues sometimes have to apply their knowledge to matters such as zoonoses and economic consequences of disease that are not part of animal welfare.

4.2. Disease – welfare interactions

As stated above, an obvious link between welfare and disease is that the welfare of diseased animals is poor. One of the consequences of the poor welfare associated with disease is that the consequences of poor welfare reduce resistance to other disease. This has been known for a long time in the medical and veterinary professions and is part of the more general process whereby poor welfare, whatever its cause, can lead to increased susceptibility to disease. The relationship can account for the downward spiral towards death that has often been described in animals that are initially affected mildly by disease or difficult conditions. Poor welfare may make disease more likely by initiating immunosuppression (Kelly 1980, Broom and Kirkden 2004). Depression can be a consequence of an environment that is difficult, perhaps because the individual has little control over it, and this condition, which certainly involves poor welfare, has further pathological consequences (Irwin 2001). It is also possible for injurious behaviour that is caused to one individual by another and is often associated with poor welfare in both, to increase the likelihood or extent of pathology.

On the other hand, good welfare, sometimes facilitated by the social support provided by conspecifics, can help to protect individuals against disease (Lutgendorf 2001, Sachser 2001). Positive behavioural and mental responses can increase the likelihood that the individual will succeed in coping. Indeed general clinical experience suggests that pathologies, such as tumour growth and proliferation, can be reduced or sometimes prevented in humans if they are happy and thinking positively. This may also be true in other species (Broom and Zanella 2004). Welfare has important and complex interrelationships with pathology. Other links between disease and welfare are discussed in Chapter 5.

5. ONE HEALTH AND ONE WELFARE

KEY FINDINGS

- The terms health and welfare have exactly the same meaning for humans and for other animal species.
- Those with a medical background and those with a veterinary or other biological background benefit from exchanging information, in particular because of the similarities in disease and in other causes of poor welfare in humans and other species. Care for people and care for animals used by people is generally better if all are considered as individuals.

Whilst both health and welfare are terms that apply to humans and all other animals, some people assume that the human disciplines are different in some way from the non-human disciplines. In order to counteract this, there have recently been initiatives and publications emphasising that the concepts are uniform across species. The One Health Concept is generally defined as a worldwide strategy for expanding interdisciplinary collaborations and communications in all aspects of health care for humans, animals and the environment. A resolution promoting this was adopted in 2007 by the American Medical Association and the American Veterinary Medical Association and the concept is further explained by Monath et al (2010) and Karesh (2014).

The concept of welfare described here has always referred to people as well as non-humans but there have been several initiatives drawing attention to this. In 2000 a Dahlem Conference was held in Berlin that resulted in the publication *Coping with Challenge: Welfare in Animals including Humans* (Broom 2001). The international group of contributors to this conference described the similarities, in humans and a range of other species, of studies of stress and welfare referring to physiological, immunological and clinical research. It was clear that human psychiatry and medicine could learn from farm animal and other welfare research and vice versa. More recently, the one welfare approach has been presented (Colonijs and Early 2013, Garcia Pinillos et al 2015, 2016) as discussed below.

The existence of zoonoses that infect humans and other animals makes some animal disease of substantial relevance to human medicine. People sometimes regard an animal as at fault if it has a disease that can be transmitted to humans, although this attitude is not logical. However, zoonotic diseases are one of the central aspects of the one health initiative. The possibility of transmission to humans of rabies from stray dogs and influenza from poultry are widely known. Other key areas are the similarities between humans and other species in metabolic disorders, joint and skeletal diseases, cancers, cardiovascular diseases and a range of parasitic, bacterial and viral infections. Many of the medicines are the same and anti-microbial resistance is a danger to both.

A one welfare topic explained by Garcia Pinillos et al (2015, 2016) concerns people who show cruelty to animals and to people. Some may show violence to both as a criminal act. Others who behave aggressively towards people may treat animals harshly in the course of training, or own dangerous dogs and encourage them to attack humans and other animals. There are also examples of positive effects on animal welfare being associated with better human welfare and better effects on other people. Governments that act in relation to animal welfare are also more likely to act in relation to human welfare. The general message from the One Health and One Welfare initiatives is that closer collaboration can result in benefits in each of the areas. It is also clear that health is an important part of welfare, improving health always improves welfare and improving welfare can often result in later improvements to health.

The one welfare approach can involve encouraging those who use animals in any way to think of them as individuals. This usually results in better treatment and better welfare. In the same way, those who perpetrate crimes against other people can be encouraged to think of their victims, or potential victims, as individual persons who deserve respect. The one welfare way of thinking can be applied to particular animal problem areas, especially where there is human interaction with non-human animals. For example, when considering what to do about stray dogs, or other stray animals, consideration should be given to: the welfare of the stray animals including any diseases that are affecting them, disease transmission to humans and other animals, impact on wildlife, and impact on people affected positively or negatively by the strays. The methodologies for control raise several ethical questions.

6. A BRIEF HISTORY OF EU ANIMAL WELFARE LEGISLATION AND POLICIES

KEY FINDINGS

- Some of the many EU Directives and Regulations relevant to animal welfare are listed and the role of scientific information in their formation is explained. Most of the legislation concerns animals that are often the subject of trade.
- The animals that people keep and use are described in the Treaty of Lisbon as sentient beings. Hence they should not be referred to as merely property. Other policies have led to efforts to improve enforcement of legislation and to important research on animal welfare being funded by the European Commission.

6.1. Legislation

Although the major legislation and other activity of the European Commission in relation to animal welfare is that of D.G. Santé (Health and Food Safety), other sections also take account of animal welfare in the course of their tasks. For example, D.G. Environment has a small team that does this and there are individuals in D.G. Agriculture and Rural Development, D.G. Growth, D.G. Trade and others who ensure that the subject area is considered when they are preparing policy or legislation.

Some legislation and codes of practice which have an impact on animal welfare are deliberately designed to do so but other legislation may have an indirect effect on welfare. Any measure which reduces disease will improve welfare and some conservation measures lead to fewer attempts to kill animals and hence reduce the poor welfare that often occurs during such attempts. In some cases there may be multiple reasons for introducing a legislative measure. As explained in Chapter 3, some measures whose aim is to promote sustainable systems may increase biodiversity, reduce pollution and improve animal welfare.

Some of the EU measures, with consequences beneficial to animal welfare are listed in Table 1. The first EU legislation whose direct aim was to minimise poor welfare in non-human animals was to require stunning before slaughter. Subsequent legislation which will have prevented the occurrence of some poor welfare includes the specification of what comprises veterinary training, including having knowledge relevant to animal welfare. Some poor welfare is also prevented by legislation prohibiting the killing of some birds and other wild animals. Other measures listed have obvious benefits for animals of the species covered. For a detailed review of the legislation as it relates to the main farm animal species, see FAO (2014).

Table 1: Some EU Directives and Regulations relevant to animal welfare

Directive 74/577/EEC	Stunning before slaughter
Directive 78/1027/EEC	Veterinary training
Directives 79/409/EEC, 97/49/EC and 2009/147	Conservation of wild birds
Regulation 3626/82, 92/43 338/97	Wild animals
Directive 83/129/EEC and Regulation 1007/2009	Trade in seal products
Directives 86/113/EEC and 88/166/EEC	Laying down minimum standards for the protection of laying hens kept in battery cages
Directive 99/74/EC	Laying down minimum standards for the protection of laying hens
Directives 86/609/EEC and 2010/63/EU	Protection of animals used for scientific purposes
Directive 76/768/EC and Regulation 1223/2009	Cosmetic products
Directives 88/320/EEC and 99/12/EC	Inspection and verification of good laboratory practice
Regulations 1906/90, 1907/90, 1538/91 and Directive 1999/74/EC	Marketing standards for eggs
90/425, 91/496, 91/628, 95/29, Regulation 411/98, 1/2005	Protection of animals during transport
Regulation (EEC) 3254/91	Prohibiting the use of leghold traps (imports: humane trapping standards)
Directives 91/629/EEC, 97/2/EC, 2008/119/EC	Laying down minimum standards for the protection of calves
Directive 91/630/EEC 2001/93/EC and 2001 2008/120/EC	Laying down minimum standards for the protection of pigs
93/119 Regulation 1099/2009	Protection of animals at the time of slaughter or killing
Regulation 338/97	Protection of species of wild fauna and flora by regulating trade therein
Directive 98/58/EC	Protection of animals kept for farming purposes
Directive 99/22/EC	Keeping of wild animals in zoos
Directive 2007/43/EC	Laying down minimum rules for the welfare of chickens kept for meat production
Regulation (EC) 1523/2007	Banning the placing on the market and the import to, or export from, the Community of cat and dog fur, and products containing such fur
318/2007	Ban on import of wild-caught birds to be kept in captivity
Directives 2009/156/EC, Commission Regulation (EC) 504/2008, Commission Implementing Regulation (EU) 2015/262, Commission Decision 2000/68/EC, Commission Regulation (EC) 529/2007, Council Regulation (EC) No 21/2004, Commission Decision 2006/968/EC	Marking and tracing animals such as horses, other equids, cattle, sheep and goats (valuable for animal welfare because it reduces disease and opens up possibilities for checking on animals with other welfare problems)
Regulation (EU) 2016/429	Transmissible animal diseases and amending and repealing certain acts in the area of animal health (Animal Health Law) and other legislation aimed at minimising animal disease and hence improving animal welfare

In recent years, the sequence of events that led to a Directive or Regulation about animal use in the EU has always included the production of a scientific report by unbiased scientists. As an example of events leading to an EU Directive, the welfare of calves may be considered (Broom, 2009). In the 1970s and 1980s there were research results giving evidence for serious welfare problems in closely confined calves. In 1988 the recommendation concerning the welfare of cattle from the Council of Europe Standing Committee on the Protection of Animals Kept for Farming Purposes stated that cattle should be able to make all normal movements for grooming, exercise and other behaviours. The 1990 report by a group of scientists coordinated by the European Commission was followed in 1991 by Directive 91/629/EEC laying down minimum standards for the protection of calves. This allowed the use of crates of a minimum size but required a report from EU Scientific Veterinary Committee. There was further research on the effects on calf welfare of diet, confinement, individual rearing and space in groups and, in 1994-1995, much public pressure for action. The "Report on the welfare of calves" was produced by the EU Scientific Veterinary Committee, Animal Welfare Section and in 1997 Directive 97/2/EC phasing out the use of veal crates and inadequate diets was passed. There are now many other examples of legislation based on information from scientific reports in the EU and elsewhere. In recent years, the reports are often misleadingly called opinions. A valuable development in many of the outputs of the European Food Safety Authority (EFSA) concerning animal welfare is the inclusion of systematic risk assessments and benefit assessments (Smulders and Algers 2009, Broom 2009, Berthe et al 2012).

Laws should provide guidance, not just a mechanism to punish (Radford, 2001). EU legislation has some guidance incorporated in it but since it is based on scientific reports that are publicly available, these can provide guidance to anyone in the world who may need it.

The subjects of EU animal welfare legislation are generally those with a direct relevance to trade between Member States or with third countries. In some cases an animal product is traded whilst in other cases the animal is traded. The commonest animals used by people are farm animals and much of EU animal welfare legislation concerns these. Laboratory animals and some wild animals that are the subject of trade are also covered. However, companion animals are the subject of only transport and fur sale legislation. Deficiencies in the species coverage of EU animal welfare legislation are discussed in Chapter 11.

Animals covered by EU legislation, such as those that are farmed or kept for various other purposes, are described as sentient beings in some important legal documents, for example the Treaty of Amsterdam. The statement in this Treaty is (European Union, 1997, page 110) "Desiring to ensure improved protection and respect for the welfare of animals as sentient beings, have agreed....". The Treaty of Lisbon (European Union 2007), which supersedes the Treaty of Amsterdam, states "since animals are sentient beings" in Article 6b. An example of a more recent statement to this effect in EU legislation is in Article 12 of Directive 2010/63 "On the protection of animals used for scientific purposes". This states: "Animals have an intrinsic value which must be respected. There are also the ethical concerns of the general public as regards the use of animals in procedures. Therefore, animals should always be treated as sentient creatures and their use in procedures should be restricted to areas which may ultimately benefit human or animal health, or the environment. The use of animals for scientific or educational purposes should therefore only be considered where a non-animal alternative is unavailable. Use of animals for scientific procedures in other areas under the competence of the Union should be prohibited." The concept of sentience is discussed at length by Broom (2014). There is, however some inconsistency in EU legislation as animals are sometimes just described as property.

Some EU legislation whose aim is to avoid or minimise poor welfare in animals, has been challenged by third countries with reference to the rules of the World Trade Organisation. This subject is considered in Chapter 7 but it is mentioned here because the possibility of such challenges inevitably has some influence on what is, or is not, the subject of EU legislation.

One Directive which might result in much benefit to animals and prevent practices that cause very poor welfare is Directive 98/58. This refers to animals kept for farming purposes and

hence can include animals used for working on a farm, such as horses and donkeys, as well as those kept for the production of food and other products. The wording has been interpreted in some Member States as preventing practices such as force-feeding for foie gras production, very restrictive housing and the breeding of genetic strains of animals such as broiler chickens, dairy cows and beef cattle that almost all have severe welfare problems as a consequence of the selection procedure. However, other Member States have not interpreted the Directive as restricting any farming practices. Petition 1546/2014 to the European Parliament described farm horses held by their legs for long periods but it seemed that the only contravention of EU law was if they were not properly identified with a horse passport. Directive 98/58 has led to some actions by Member States, for example the ban on force-feeding in Italy. However, it is clear that this Directive, whose wording is unscientific in parts (see Section 2.3), is not protecting animals throughout the EU and has led to few, if any, prosecutions.

6.2. Other policies

EU framework programmes for research and development have funded animal welfare research directly and have also funded projects related to animal welfare such as animal breeding and animal disease. For example, in Framework Programme 6 the valuable Welfare Quality project was funded and in Framework Programme 7 the innovative Animal Welfare Indicators (AWIN) project was funded. Under Horizon 2020, there are research topics relevant to animal welfare open in the current call, in particular "breeding livestock for resilience and efficiency" (SFS-15-2016-2017), and "alternative production system to address anti-microbial drug usage, animal welfare and the impact on health" (SFS-46-2017). The main output from the animal welfare research projects is scientific papers but the AWIN project also produced the Animal Welfare Science Hub (<http://animalwelfarehub.com/>). This provides information on teaching and research in animal welfare.

In the context of the work of the European Innovation Partnership (EIP) [1] on agriculture, some activities relevant to animal welfare were organised. These included a focus group on the reduction of the use of anti-microbials in the pig-sector, a workshop about on-farm biosecurity and a current focus group concerning "robust and resilient dairy production systems".

The European Commission's 2012-2015 animal welfare strategy outlines a number of actions including: improving enforcement, introduction of a simplified legislative framework, establishing a network of reference centres, further development of outcome-based welfare indicators, supporting international cooperation, providing consumers with better information, and action on specific topics such as the welfare of farmed fish. Reference is made in several chapters of this Study to European Commission activity in some of these areas. However, there are now fewer staff in the European Commission to implement these policies, progress has slowed and there is no updated strategy in January 2017. This was the subject of European parliament questions, Commission answer and resolution (<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+OQ+O-2015000105+0+DOC+XML+V0//EN> <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+OQ+O-2015-000141+0+DOC+XML+V0//EN&language=en> <http://www.europarl.europa.eu/sides/getDoc.do?type=CRE&reference=20151123&secondRef=ITEM-014&language=EN&ring=O-2015-000141> <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2015-0417&language=EN&ring=P8-RC-2015-1278>). Current actions do include the development of an Animal Welfare Platform for discussion of key issues.

7. INTERNATIONAL EFFECTS OF EU ANIMAL WELFARE POLICIES AND LEGISLATION

KEY FINDINGS

- EU surveys show that EU citizens are very concerned about animal welfare within and outside the EU. The ban on seal products, enacted because the methods of killing the young seals was considered inhumane, was the subject of a W.T.O. challenge. The ban was considered by the W.T.O. to have the effect of preventing poor welfare of animals as a matter of public morality and not to violate the Technical Barriers to Trade Agreement.
- Scientific evidence about animal welfare and data from investigations of public opinion are of major importance when legislation and policies are formulated in the EU.
- Several world organisations list animal welfare as a factor that must be considered when deciding on methodologies and policies.
- EU legislation on many animals has had influence on animal welfare policies, legislation and codes of practice in other countries.

7.1. Animal welfare, respect for the EU and the W.T.O.

The EU is widely respected in the world, not principally because it is a large trading unit but because it has adopted many policies and much legislation for moral reasons. The policies and legislation mainly reflect the views of EU citizens in general rather than the commercial wishes of money-making companies. Policies on the various components of sustainability, especially the global environment and animal welfare, are key contributors to the high reputation of the EU.

As might be expected, EU citizens have concerns about the welfare of animals outside the EU. These concerns are reflected in the petitions made to the European Parliament, for example Petitions 2218/2013, 0723/2014, 1129/2014, 1320/2015, 1417/2015 and 0224/2016 whose aims were to prevent poor welfare in countries such as China and Canada, especially when animal products might reach the EU.

An example an EU action with the aim of preventing poor welfare of animals, taken because of the views of almost all EU citizens, is the action on preventing the killing of young seals by inhumane methods. The EU passed legislation in 1983 banning the killing of young seals and trade in seal products. This was done mainly on animal welfare grounds, because of the killing methods, but partly because people did not like the killing of the seal pups at a few days of age. Several countries followed the EU in banning the sale of seal products. In 2009, by which time the seals were being killed at 12-30 days of age while on floating ice floes, the EU legislation on the trade in seal products was updated. This legislation was the result of public pressure over many years. Many of the young seals killed for their fur, principally in Canada, were still not killed in a humane way (Broom 2014, 2016). The EU did not produce sealskin products so this action was not to do with competition with Canada.

The rules of the World Trade Organization (W.T.O.) do not specify that animal welfare is an accepted ground for restricting trade although they do specify public morality as such a ground. The EU ban on seal products was challenged at the World Trade Organisation by Canada and this challenge was supported by Norway. A W.T.O. Panel was constituted

(DISPUTE DS400 European Communities — Measures Prohibiting the Importation and Marketing of Seal Products) and hearings occurred in Geneva during 2013. At these hearings, Namibia, the second largest sealskin producer, and Iceland spoke in support of Canada. Other countries including Russia, which has a ban similar to that of the EU on animal welfare grounds, and the United States, which has a ban on conservation grounds, spoke in favour of the EU position.

Scientific evidence was presented at the W.T.O. hearings by the author and others. It was emphasised that seals are sentient beings with the same pain and fear systems as other mammals. Clubbing and shooting from a moving boat can wound the seal or make the animal temporarily unconscious. Injured seals often enter the water and may escape the sealers and die some hours, days or weeks later. Herding or chasing seals will cause fear and other forms of poor welfare and, despite Canadian codes of practice, seals are sometimes skinned while conscious. It was concluded that there is no reliably humane, acceptable method of killing these seals, unlike abattoir and other killing of animals where there are widely-practised humane methods (Gregory 2007, Broom 2014, 2016). Evidence from Eurobarometer surveys was presented to show the views of EU citizens in relation to seal killing methods.

The W.T.O. panel found that the EU Seal Regime does not violate Article 2.2 of the Technical Barriers to Trade (TBT) Agreement because it fulfils the objective of addressing EU public moral concerns on seal welfare and no alternative measure was demonstrated to make an equivalent or greater contribution to the fulfilment of the objective. Whilst the EU ban on seal products did not violate the general Agreement on Tariffs and Trade (GATT), there were exceptions in the EU legislation that were not accepted by the W.T.O. and these have subsequently been changed by the EU. The current wording has not been challenged. This is a very important result as it is the first time that a product ban on animal welfare grounds, as part of public morality, has been accepted by the W.T.O. The possibility is raised that other product bans on the same grounds might be accepted.

The EU legislation on leg-hold traps and fur products resulting from their use, also led to discussions with third countries and threats of a W.T.O. challenge. The actions of the International Standards Organisation and of several third country governments in trying to avoid the use of inhumane traps have resulted in part from EU animal welfare policy. The EU legislation and policy has resulted in many wild animals, in various countries in the world, no longer being trapped in an inhumane way using some of the worst trapping methods for animal welfare.

The EU has made proposals at the W.T.O. to develop multilateral animal welfare agreements, to develop appropriate labeling, and to agree that non-trade-distorting compensation can be paid when additional costs arise from higher welfare standards (e.g. see Bowles et al 2005).

7.2. The impact of EU decision-making after factual investigation.

Animal welfare policies, like other policies that depend on scientific evidence, include the production of scientific reports from EFSA and similar Authorities, and sometimes public opinion surveys, before decisions are taken. These publicly available reports, surveys and guidance documents, together with Directives, Regulations and information about enforcement procedures all have influence in third countries. Good quality scientific review information has greater influence than biased, politically-motivated information. Laws based on facts have greater influence than laws without a clear factual foundation. Hence the policy in the EU of basing laws on scientific review and the results of Eurobarometer and other objective surveys is altering what happens in third countries. This influence may be on general, methodologies or in specific ways related to particular pieces of legislation and guidance.

Legislation on animal welfare has developed in the European Union and in many countries because of pressure from voters (Broom 2002, 2009). In general, the standards of retail companies have a substantially greater effect on the welfare of farm animals than legislation. The codes of practice of food companies have international impact. For example, many pig producers in Brazil have to comply with the animal welfare standards of United Kingdom supermarkets in order to sell to them whilst egg producers in Thailand have to rear their birds according to the standards of the increasing numbers of European and United States food chain companies who have animal welfare standards. In addition to EU legislation, the reports of EFSA on animal welfare and disease topics are widely used by supermarkets and other food companies when setting standards.

The enforcement of legislation and codes of practice requires a structure and this is part of EU policy (Chapter 9). In addition to the manpower and checking possibilities needed for enforcement, in order that the ethics of the production method can be properly taken into account, products must be traceable. If foods can be traced, it is less likely that toxins, other poor quality materials or pathogens will be in them. If animals can be traced, the sources of animal disease outbreaks are more likely to be discovered and places where injuries, or other causes of poor welfare, occurred are more likely to be found (Broom 2006b). Disease, housing that does not meet animal needs, and management or handling that causes injury or stress in animals are all causes of poor welfare. Legislation and industry initiatives ensuring traceability are important for good animal welfare as well as efficient production.

7.3. EU animal welfare policy and world organisations

World organisations with policies about animal welfare include O.I.E., F.A.O., O.E.C.D. and the World Bank. All of these have been influenced by EU policies and some were initiated because of EU policies. For example, EU representatives have had useful influence in formulating the recommendations of the O.I.E., now agreed by 170 countries. One result of countries signing up to O.I.E. standards has been a demand for training courses like the Better Training for Safer Food (B.T.S.F.) course run by the EU. Another result has been opportunities for EU expertise in construction of welfare friendly systems and for EU producers in sales of products.

FAO has 195 members and has been involved in animal welfare-related activities for many years. Animal welfare is treated as a global common good within the context of a responsible development of the livestock sector that contributes towards the achievement of FAO's mandate. Animal welfare is considered to have potential to generate benefits for producers and their animals. FAO's main principles are that support should be given to good animal welfare practices in countries with less developed economies and that priority should be given to practices that lead to benefits for both people and animals (FAO 2014). FAO believes that improvements to animal welfare in food production systems can play a significant role in improving the welfare of people by such means as improving access to food of animal origin and reducing risks to human health through improved food safety and animal health. The FAO review quoted here is presented as a summary of what the EU has done in major areas of animal welfare legislation, followed by a discussion of the extent to which this lead has been followed in some other countries. The OECD has produced statements about animal welfare standards. The International Finance Corporation (IFC), which is part of the World Bank Group, is the largest multilateral financial institution investing in private enterprises in emerging markets. It has published a Good Practice Note entitled Animal Welfare in Livestock Operations. Introducing the note on its Web site, IFC states "Higher animal welfare standards are increasingly seen to be a prerequisite to enhancing business efficiency and profitability, satisfying international markets and meeting consumer expectations". IFC has also issued guidelines on Creating Business Opportunity through Improved Animal Welfare. These guidelines are intended to guide IFC's own investment practices in the field of livestock, which are aimed at enhancing future profitability by improving the efficiency of animal production

and reducing losses. The IFC policies are similar to those of the EU but they are applied throughout the world.

7.4. Effects of EU calf welfare legislation on third countries

In 1997 the Directive 97/2/EC phasing out the use of veal crates and inadequate diets for calves was passed. This was the first key EU Directive relating to the most important factor in the life of farmed animals: housing conditions. Prior to this time, the calf in the EU often lived in a small box hardly bigger than its body. Its diet included no roughage, even up to six months of age when the rumen was fully functional. The diet also included a grossly inadequate amount of iron so that all calves were anaemic to the point where the immune system did not function properly (EU Scientific Veterinary Committee 1995). Many calves in the world still have extremely poor welfare because of the veal crate system.

The EU Directive enormously improved the welfare of calves in the EU. Group-reared calves with a diet of sufficient roughage and iron have much better welfare than calves in crates with a poor diet (EFSA 2006a). Since that Directive in the EU, many countries and states have initiated legislation ensuring that only conditions that lead to good welfare of calves is permitted.

7.5. Effects of EU poultry welfare legislation on third countries

Chicken meat (broiler) production costs depend mainly on feed costs and welfare standards do not vary greatly across countries or between the EU and third countries (van Horne and Achterbosch 2008). The 2007 EU Directive has had a relatively small direct effect on broiler welfare. However, the principle introduced in that Directive, that animal-based welfare-outcome indicators (EU SCAHAW 2000, Berg et al 2004) can be used to judge compliance with welfare legislation has had some beneficial influence on animal welfare inside and outside the EU. This principle has been taken up in some food retail company standards so the major effect of this and other animal welfare Directives is via such standards. (Bowles et al 2005) report that increasing proportions of chicken meat production in Argentina and Thailand is now designed to comply with EU legislation and food company standards.

Laying hen production costs, from country to country, are also most affected by feed costs but the space provided per bird also has a significant effect on cost (European Commission Scientific Veterinary Committee 1996, van Horne 1996, van Horne and Achterbosch 2008). The 1999 EU Directive setting minimum space per laying hen and banning battery cages has led to a great improvement in hen welfare and has had much influence around the world. Similar legislation and retail company standards are now in place in New Zealand, India, Taiwan, an Australian state, and several states of the U.S.A. Demand from consumers for high welfare egg products has increased in many other countries. The EU legislation, rather than solely EU consumer attitudes, has been a major factor in this world-wide change, which is accelerating.

7.6. Effects of EU pig welfare legislation on third countries

There is much scientific evidence showing that the welfare of pregnant sows is extremely poor when they are confined in tethers or stalls (gestation crates) (EU Scientific Veterinary Committee 1997.) The EU ban on close confinement of pregnant sows has been followed by Canada, New Zealand and nine states in the USA. In Australia, the ban by the main supermarket chains effectively prevented continuation of the system. In several other

countries, including Brazil, the EU lead is likely to be followed. Hence the EU legislation has had a major impact in the world.

7.7. Effects of EU welfare of animals during transport legislation on third countries.

Since any problem with transport of animals between Member States was a potential barrier to trade, there was much effort in the EU to standardise regulations about the welfare of animals during transport. This resulted in a rapid increase in research on the subject (EU SCAHAW 2002, EFSA 2004a, 2011, Broom and Fraser 2015). The directives and regulations on the welfare of animals during transport refer to a wide range of animals, not just to farm animals. Many of the principles in the EU legislation were followed in the recommendations of the OIE on the subject. Hence legislation by many countries around the world has been influenced, directly or indirectly, by EU animal welfare policies.

The European Court of Justice decided in its Judgment of 23 April 2015 (*Zuchtvieh-Export GmbH v Stadt Kempten*, Case C-424/13) that EU rules on transport have to be complied with even if the journey continues outside the EU. In order for a transport operation involving a long journey for horses, cattle, pigs, sheep or goats to be authorised by the competent authority of the place of departure, the organiser of the journey must submit a realistic journey log which indicates that the provisions of the Regulation will be complied with, including for the stages of the journey taking place outside the EU. The planned journey as stated in the journey log must show that the planned transport will observe, inter alia, the technical rules on watering and feeding intervals and journey times and resting periods. Should the journey log not satisfy these requirements, the journey can be prohibited or the persons responsible be prosecuted. This ruling, when implemented, should result in better welfare for at least some animals in the third countries provided that adequate facilities are provided.

7.8. Effects of EU welfare of animals at slaughter legislation on third countries.

The first animal welfare legislation in the EU was on requirements for stunning before slaughter and there has been a series of updates to this legislation. Much scientific research has been conducted on how to identify animals that are stunned, or are still conscious, or are dead. This research has been conducted on a wide range of species and there are reports on how to stun all of the main farmed species of mammals, birds and fish (EFSA 2004b, 2009a, b, c, d, e, f, h). The EU reports and legislation on stunning and slaughter have had a wide-ranging impact in many countries. This has been facilitated by the OIE recommendations on the subject, themselves directly influenced by EU-derived information. In order to export meat and other products from slaughtered animals to the EU, third countries have to comply with EU legislation on food hygiene and on stunning. As a consequence, slaughterhouses in Brazil, Thailand, Namibia and many other countries utilise information from EFSA reports and methods of stunning that are effective and allowed by EU legislation. Better Training for Safer Food (BTSF) courses, run by the EU, have informed people in many countries about how to slaughter animals in a humane way. This has led to better welfare for the animals and opportunities for European equipment manufacturers to sell their products worldwide.

7.9. Effects of EU laboratory animal welfare legislation on third countries.

The general EU legislation on the protection of animals used for scientific purposes has an influence elsewhere in the world because it is used as a model for new legislation with the same general objective. A more wide-ranging effect is on the practices of companies that test their products on animals. Even if there is no legislation limiting what can be done to the animals, the companies often have to adopt codes of practice in order to sell their products. The EU legislation banning the testing of cosmetic products on laboratory animals, because it causes poor welfare in the animals, was intended to improve the welfare of animals world-wide (see European Commission response to Petition to the European Parliament 0471/2013). The Regulation has been reinforced by the decision of the European Court of Justice in 2016. The Court decided that the EU cosmetics Regulation must be interpreted to mean companies cannot rely on results from animal tests conducted outside the EU to support the safety of products inside the Union. This will mean that many cosmetics companies producing outside the EU, but who want to sell their products inside the EU, will have to stop some testing of products on animals. In many cases they will stop completely as it is more economic to produce similarly for their whole market and because the world attitude to such testing is changing.

The requirements of Annex III of Directive 2010/63 “on the protection of animals used for scientific purposes” deals with the care and accommodation of animals. It has long been my view that the greatest animal welfare problems for animals kept for scientific purposes, in the EU and elsewhere in the world, result from widespread inadequate housing conditions that do not meet the needs of the animals. In particular, rodent housing is poor. There has been a tendency to try to maximise hygiene at the expense of providing flooring, bedding, social companions and other resources that the animals need. The provisions of the 2010 Directive require that the needs of the animals be properly considered when designing and managing housing. One consequence of this Directive is that EU cage and equipment manufacturers are now producing higher welfare equipment which they will be able to sell in other parts of the world as the public forces improvements in laboratory animal welfare in those countries. The action of the EU is likely to have effects on laboratory animal housing throughout the world and to benefit millions of animals outside the EU as a result.

7.10. Effects of EU welfare of animals in relation to performance-enhancing drugs, cloning and genetic modification legislation on third countries.

Farm animal growth can be increased by treatment with some drugs. However, some of these drug uses have been banned in the EU as a result of evidence of increased risk of poor welfare in human consumers or the animals themselves. One example of this is the injection into cows of bovine somatotrophin (BST) produced by genetically modified bacteria. Although BST is a naturally occurring hormone, the genetically modified form is slightly different chemically and the amounts that can be given to the cows to increase milk production are much greater than that which would normally be present in the animals. The question considered by two EU scientific committees was whether or not there was scientific information about the consequences of the use of BST that would allow a decision about permission for its use in the EU. One report concerned animal welfare, the other human consumer health.

An assessment of the risk to consumers if dairy cows are regularly injected with recombinant BST was conducted (EU Scientific Committee on Public Health 1999). This identified a very small increased risk associated with an increased concentration of insulin-like growth factor (IGF-1) in milk as IGF-1 can make existing tumours grow faster. However, a much bigger effect on animal welfare was found (EU SCAHAW 1999). There were increases in clinical

mastitis, foot disorders and reproductive problems (see also Broom 2014, 2017 in press). As a result of this evidence, the EU banned the use of recombinant BST. The EU scientific reports and legislation had influence on many countries around the world as most have subsequently banned the use of recombinant BST.

A further example of a drug that increases aspects of growth in pigs and cattle but has negative effects on the welfare of the animals is ractopamine. The use of this drug has been banned in the EU and subsequently in most countries in the world. However, not all countries follow the EU lead as the use of both BST and ractopamine is permitted in the USA.

Cloning means production of genetically identical offspring and there are effects of cloning procedures on animal welfare. Cloned fish usually do not survive well. Domestic fowl subjected to primordial germ cell transplantation have a hatching rate reduced by about 60% and survival of hatched birds to adulthood reduced by 20%. Cloned cattle, pigs, sheep, goats and horses have much increased mortality in early life, with survival to weaning only 10-25%, and some developmental problems such as the large-offspring-syndrome. Although cloned animals that do survive usually have no further problems, mortality is too high and problems are too frequent so production or import of cloned farm animals for commercial purposes is not permitted in the EU. Some other countries are likely to follow this lead.

Genetic modification procedures can result in improved welfare, for example because of better disease resistance. However, a wide range of animal welfare problems can also result. As a consequence, all GM animals should be subject to a comprehensive range of animal welfare evaluation. This view has led to the production of EFSA guidelines on how to check GM animals (EFSA 2012a). Similar procedures may be used in other countries.

8. PUBLIC ATTITUDES TO ANIMAL WELFARE AND THE VALUE OF EU ANIMAL WELFARE LEGISLATION TO CONSUMERS AND TO THE ANIMAL USER INDUSTRIES

KEY FINDINGS

- Although people have long had empathy with the animals that they use, recent increases in knowledge about animal functioning has led to a high level of public concern in many countries about the welfare of animals.
- Those who use animals, for example in food production, laboratory research, or as companions, range in attitude from very caring to viewing the animals as solely a resource. However, animal users are becoming more aware of the power of consumers to alter their purchasing policies or other actions to prevent methodologies and production systems that are cruel to animals.
- Public opinion investigations, like those of Eurobarometer, indicate increasing concern about animal welfare in all areas of society. This increased concern within and outside the EU, leads to opportunities for commercial exploitation of the market change.
- The welfare of hundreds of millions of animals has improved as a result of EU policies and legislation.

8.1. Attitudes to animals

The idea that animals used by people should not be treated like inanimate possessions but should be protected from actions that might cause suffering, is very old and widespread in human society (Broom 2014). Irrespective of any law, many people have condemned those perceived as being cruel to animals. On the other hand, cruelty was part of some forms of human entertainment, some of which are now the subject of legal bans.

Two components of the thinking of those who want to protect animals are empathy and compassion (Würbel 2009). As Bentham (1789) said, people identify with and care about individuals that can suffer and this is still a widespread view (Dawkins 1993). The term 'pathocentrism' is used by German-speaking scientists and refers to those who focus especially on suffering. People are more likely to show empathy with those perceived to have a capacity for feelings similar to that of humans. Griffin (1984) referred to "a deep-seated sympathy for animals as sentient creatures". People are also likely to show compassion only to those whom they perceive to need compassion.

The treatment of animals is an area in which there are codes of conduct and descriptions of good practice. Even amongst groups of people whose objective is to kill animals, there have long existed unwritten codes of conduct concerning what actions were, or were not, permissible. For example, as discussed by Serpell (1986, 1989), people using guns and dogs to hunt mammals or birds would expend energy and resources trying to ensure that, firstly animals were shot in a way likely to kill quickly and secondly that shot animals were found and killed rather than being left to die slowly. These hunters' codes, even if their whole activity might be condemned (see European Parliament Petition 1619/2013), have the objective of avoiding the worst welfare. The same aim has led to efforts to kill animals humanely in slaughterhouses. There is an aesthetic component to the motivation behind such legislation because most people regard the sight of an animal in pain as repugnant. There is also preference for killing methods that do not involve the sight of blood and animal welfare scientists sometimes have difficulty in arguing for a method of killing that is demonstrably better for the welfare of the animals but is not aesthetically pleasing. For example, the method of killing unwanted day-old domestic chicks that is best for their welfare is to put

them into the rapidly revolving blades of a macerator. The handling is minimal and the death is instantaneous. However, members of the public will sometimes not wish to see this method used and this may lead to actions that have negative effects on animals. If the chicks are killed with the aversive gas carbon dioxide, for example, the magnitude of poor welfare is greater for each chick than if a macerator is used. It is my view that the moral position, relating to welfare, should be considered more important than the aesthetic position.

The way in which animals are treated is much affected by the way in which the human user or carer thinks about those animals. The animal may be thought of as no different from something inanimate. Actions which cause poor welfare in the animals are much more likely, when there is this attitude, than if the animals are considered to be similar in many ways to humans. Hence knowledge of animal functioning tends to engender respect where the animal is sentient, that is to say that the animal has significant capacity for awareness of itself and its relationships with its environment. In recent years, knowledge of animal functioning, particularly their behaviour and physiology, has increased rapidly and has been the subject of much media attention. This is a major reason for increased concern about the welfare of animals.

8.2. Public concern about animal welfare

Public concern about animal welfare has increased in many countries during the last forty years and especially in the last twenty years. Evidence for this is summarised in Table 2. Recent attitudes of EU consumers are summarised in 8.5 below.

Table 2 : Evidence for increased concern about animal welfare.

1.	Letters from the public, media coverage.
2.	References in parliamentary discussions and government statements.
3.	Requests for scientific evidence concerning animal welfare.
4.	Activity of scientific and other advisory committees.
5.	Funding of scientific research on animal welfare.
6.	Increased teaching and conferences.
7.	More legislation.

(from Broom 1999)

Members of the public exert influence by letters to government, to other public bodies and commercial organisations and by statements that appear in the media. Members of the European Parliament have reported that they receive more letters about animal welfare than about any other topic. Politicians respond by raising the issues, including them in manifestos, seeking scientific information, encouraging further research and teaching, and passing laws.

This increased concern of the general public was not mirrored by some in the veterinary profession forty years ago but now, veterinarians lead many efforts to improve animal welfare. For example, 2009 position paper of the Federation of Veterinarians of Europe (F.V.E.) on surgical castration of piglets and the latest position paper that refers to trade in dogs and states clearly that the welfare of the dogs, including the minimising of disease, should always have priority over any financial considerations. There are many other examples of such veterinary attitudes in relation to all animal trade.

8.3. Attitudes of animal users

People who own or work on farms, or other commercial organisations using animals, are influenced by a variety of factors when they are deciding on animal housing and management policies and when they are executing these policies. They will be endeavouring to make a profit so the monetary costs that they incur, and the potential financial returns that they are

likely to get for their product, will be factors of major importance to them. A cost to those involved in animal industry, which may not be fully appreciated by many of them, results from consumers who do not like some aspect of production and refuse to buy the product (Broom 1994).

The attitudes of animal users depend upon early training, traditional practices, acquisition of knowledge from others subsequent to any training, personal experience and general beliefs and philosophy. Training in agriculture and other animal-use businesses, did not, until recently, include much information about animal welfare except where it impinged on profitability. Even diseases were often mentioned in agriculture training only in relation to effects on growth, offspring production or product quantity and quality. Today's training courses are more likely to include information about the welfare of the animals and most journals for the agriculture industry, nowadays, cover animal welfare issues. Traditional practices are often deemed by farmers, or others who keep or use animals, to be right for the sole reason that "this is the way that we have always done it". Although some of these methods are the best ones to produce good welfare, others are not and traditional methods and practices should not persist just because there is a tradition to use them.

Farmers and other animal users have to live with their families, friends and neighbours. If these people are critical of the effects on the welfare of animals of the methods used, the farmer may change these methods. In some cases, the animals are very obvious to all who pass by the farm. If a sheep or cattle farmer has many animals that are noticeably lame, in their fields, there will be a considerable likelihood that someone will comment on this to the farmer. Similarly, horse establishments or zoos whose animals are lame, may be criticised. People in charge of animals do not like to be thought incompetent or uncaring, so they may respond to such comments by giving the animals veterinary treatment or changing the management system so as to avoid lameness. If the animals are inside a building or otherwise hidden from public view, the number of people who might comment on poor welfare will be smaller and there is a greater chance that the farmer or other person responsible can persuade himself or herself that there are no significant welfare problems.

Meetings with others in the same business and reading trade magazines will tend to help animal users to arrive at common views about their various problems. A farmer, laboratory-animal technician, or zoo-keeper who has to reconcile himself or herself to poor welfare in some animals will find it easier to do so with the support of others. Such influences can slow down change towards better welfare in the animals, especially if economic factors mitigate against such change.

The views of the general public are largely made known to farmers and others involved in animal usage via the media. There is frequent coverage of animal welfare issues in European newspapers, on radio and on the television and this, by bringing scientific knowledge about animal complexity to the attention of people, affects their attitudes. Farmers and some other animal users may see themselves portrayed as uncaring. Some such portrayals are unfair but others are correct and the farmer cannot hide from them by putting animals in buildings and associating only with other farmers. When public demonstrations about animal welfare issues occur, the people who use the animals need to take note of them.

8.4. Attitudes to animal welfare and consumer pressure

Members of the public in all parts of the world, particularly in developed countries, are now insisting on transparency in commercial and governmental activities and on changes in methods of producing of various products. Consumers drive legislation and retail company codes of practice for animal production (Bennett, 1994; Bennett, et al 2002). There is a gradual changeover from a "push society", driven in the case of animal production by the producers of the animals, to a "pull society", driven by consumers and facilitated by

governments and food retail companies (Broom 2010, 2012). Increasing numbers of consumers now demand ethical production systems and refuse to buy products where production involves, for example, inhumane slaughter methods, rearing calves in small crates, unnecessarily killing dolphins in tuna nets, or the payment of very low prices to poor farmers in developing countries. As a consequence, many systems developed with consideration of only short-term market factors, even if widely used at present, are not sustainable. This means that, in some countries, the public have already demanded that such systems do not continue. Throughout the world, the public are likely to make such demands in the relatively near future. The first steps may be the setting up of supply for niche markets but the rapidity of increase in consumer pressure is likely to lead to change away from the most unacceptable systems (Pollan 2006). Changes with small economic cost are likely to occur faster than changes with more substantial cost. One of the first examples of consumers forcing change is the gradual disappearance, in increasing numbers of countries, of animal production procedures with poor welfare for the animals, such as the global movement towards cage-free eggs. A second example is the development of fair-trade systems and labelling schemes, which may eventually replace non-fair-trade products in supermarkets and other retail outlets. A possible future example may be that consumers will cease to tolerate very low biodiversity in farmed areas and buy only those products that can be produced from systems with moderate or high biodiversity.

If food is not safe, in that it contains damaging levels of toxins or pathogens, most consumers will never buy it however cheap it is. Individual food production companies are expected to be responsible for this aspect of food quality but the public expects their government to ensure that adequate standards and adequate checking systems exist. The discovery of dioxin-contaminated animal-feed and human food in Belgium (Bernard et al 2002) is an example of this. Another is the lack of transparency in the meat food-chain, with possibilities of failed food safety checks that led to horse meat being found in UK burgers. Incidents of this kind can have wide-ranging repercussions for governments and companies can go bankrupt because the public becomes aware of such failures. The concern of consumers about toxic substances that might have a negative effect on the health of humans and other animals is clearly demonstrated by Eurobarometer surveys. As a consequence there is legislation requiring the testing of products on animals, with negative effects on animal welfare. These negative effects are the subject of petitions to the European parliament, e.g. Petitions 1833/2013 and 1379/2015 referring to the REACH legislation and pesticide testing. Whilst most consumers want products adequately tested, and do not want them tested initially on humans, the point is made in that petition that old tests that harm animals greatly should not be continued if new tests with less adverse effects on animal welfare are available. Some testing can now be carried out on cell cultures, or by other means that do not involve live animals, but other tests cannot. A further issue concerns which animals should be used in laboratory work. Petition 1336/2015 seeks to stop the use of primates in scientific research. However, other animals might then be used and, given the sentience of all vertebrate animals, the most important action is to avoid severe effects and high magnitudes of poor welfare in the animals.

The extent of concern about animals in general has grown during the last 100 years. Poor welfare of animals that are used in the production system is a major reason why some animal production systems are regarded by the public as unacceptable (Ryan 1997). Hence these systems become unsustainable unless there is some modification to them.

8.5. The value of EU animal welfare legislation to consumers

A valuable part of the EU policy on animal welfare is to conduct surveys of consumers about the subject. As described in section 7.1, the EU defence of its ban on seal products on animal welfare grounds at the W.T.O. was supported by concrete evidence about the attitudes of consumers to this issue. In the latter part of 2015, D.G. Santé (Health and Food Safety) of the European Commission initiated Special Eurobarometer 442 on the "Attitudes of

Europeans towards Animal Welfare" (EU D.G. Health and Food Safety 2016). The survey was conducted in 28 Member States of the EU and involved a total of 27,672 EU citizens from different demographic categories. These people were interviewed face-to-face at home in their own language.

In the light of the explanation of the concept of animal welfare in Chapters 2-4 above, some of the questions used in the Eurobarometer "general understanding of animal welfare" section were not entirely clear scientifically and the results less precise than they might be as a consequence. However, the questions about "the importance of protecting the welfare of farmed animals" were clear and the results striking. 94% of Europeans stated that it is important to protect farm animal welfare and, of these, 57% said it is very important. The range of responses across Member States was 86% to 99%. Most people (82%) thought that farm animal welfare should be better protected than it is at present and in five Member States, there were more than five percentage point increases in the proportion of respondents saying that it should be better than in a similar 2006 survey. Similarly, 74% of Europeans considered that the welfare of companion animals should be improved, the largest proportion of such respondents being in the southern part of the EU.

The views of people about what should be done to improve animal welfare included 87% who favoured education campaigns, 64% who wanted more information about the conditions in which farmed animals are kept, 93% who thought that imported products should be subject to the same welfare standards and 89% who agreed that the EU should do more to promote awareness of animal welfare internationally. A finding from this survey which is especially relevant to future action in the EU is that 89% of respondents thought that there should be a law obliging any person using animals for commercial purposes in the EU to care for them. There is currently no such legal obligation but there have been discussions in the EU about a general animal welfare law. A general animal health law was recently agreed.

In some circumstances, respondents to the survey indicated that they were willing to pay a higher price for welfare friendly products but it is clear that more precise questions need to be asked to obtain better answers to such questions and actual purchase situations are needed to be sure of the answer. Interest in selecting high welfare products was clear from the fact that more than half of respondents said that they looked for labels identifying such products.

A Eurobarometer survey, like that reported above, is of substantial value to the animal use industries because it shows that animal welfare has to be carefully considered in order to ensure future sales. However, as mentioned above, actual sales may be different from stated preferences or attitudes. The term attitude refers to evaluation of extent of favour or disfavour (Eagly and Chaiken 1993). As Ajzen (1991) emphasised, attitudes are not always translated into intentions and the intentions may not be translated into performance or action. However, some people do act according to their attitude so it is important to investigate. The reliability of the transition from attitude to intention and intention to performance requires analysis for each topic investigated.

Evidence from various sources shows that consumers think that government, producers and retailers have responsibility to prevent poor welfare of animals used for food or other purposes. EU legislation is perceived to be of value to consumers but actions by commercial companies in setting up standards are also perceived to be valuable. In relatively complex areas such as animal welfare, many individual consumers prefer government or supermarket companies to ensure that the welfare of animals used in production is not poor. They do not want to have to compare complicated labels. It is for this reason that more and more retail food companies are producing documents explaining their standards and assuring customers that they do nothing harmful to animals. Other consumers will work harder to ensure that the welfare of the animals is good by checking labels and avoiding some products completely. Increasing numbers of consumers are now doing this in restaurants by asking about the

origins of food, avoiding certain dishes or restaurants that provide them and avoiding restaurants that will not supply such information.

8.6. The value of EU animal welfare legislation to the animal user industries

Legislation and standards based on scientific evidence is welcomed by the animal user industries. The clarity that is provided makes it easier for the industry to explain its position and creates a more equal situation for the various producers who obey the law or follow the code. High welfare standards with effective enforcement improve the image of the industry. The animal production industry is not always perceived by consumers as responsible and as producing a high quality product. However, if they follow sustainable methodologies, including the avoidance of poor welfare in the animals, they improve their image. As explained below, they may also gain commercial advantage outside the EU by using high welfare methodologies but this varies from product to product. Any gains like those mentioned may need to be set against the higher costs of some welfare improvements.

There have been many studies calculating the cost of improved welfare systems, as compared with previous systems (e.g. Brouwer et al 2011, Menghi et al 2011). These studies usually focus on the direct cost to the producer. The extra cost to the consumer is also relevant. If an egg costs the producer one cent more because of the system, a one cent increase in cost to the consumer may be such a small increment that sales would not be reduced. However, the extent of competition amongst producers would be an important factor in determining whether or not a business could tolerate the increase if it is not passed on to the consumer. If consumers selected the improved welfare egg over other eggs, the producer would do better when it was produced and marketed.

A further, crucially important cost to take into account when considering whether or not to produce higher welfare products is the cost of doing nothing and continuing production as before. More and more consumers are refusing to buy products if they perceive them to be associated with poor welfare of animals or other unsustainable practices. In some cases they become vegetarian but in more cases they just avoid certain products. For many animal products, the current market is smaller than it could be because of this. One example of this is the high proportion of consumers who never buy foie gras because of the force-feeding of the ducks. Another example is the decline in rabbit meat consumption because the consumers know that rabbit welfare is often poor in rabbit farms. Both of these situations could be remedied by production without poor welfare.

Farmers who comply with either legislation or codes of practice whose effect is to improve animal welfare may receive a subsidy or some investment support to offset extra costs (Bennett 1997). They may also receive higher prices from consumers for their products, or larger orders, or some orders rather than none.

Animal welfare science has had financial benefits for meat production where production, transport, slaughterhouse and meat sales are integrated. Better welfare during transport and pre-slaughter handling leads to better meat quality so higher income. An example in slaughterhouses is the development of gas-stunning of pigs and poultry. Welfare and meat quality are better if good gas-stunning systems are used. The best of these involve the use of inert gases rather than carbon dioxide and consumers are aware of this. The need to take up new developments is emphasised by Petition 1560/2014 to the European Parliament but scientific evidence on stunning efficacy and the feasibility of using different gases is important here.

Where animal products are readily exported to third countries, producers of high welfare products in the EU may have a competitive advantage if consumers in the country to which they export demand such products. Since most countries in the world are seeing a slow or

fast change towards demands for better animal welfare, there are many such opportunities. Various meat products can have added value if they have a high welfare label. Shelled eggs and liquid milk are less likely to be exported to third countries but egg and milk products can more easily be exported so there are possibilities for competitive advantage for EU producers. The EU legislation on welfare during transport might provide opportunities for EU animal transport companies. Again, this depends on a situation where the third country consumers and legislators are catching up on EU progress in relation to animal welfare.

A very clear, and already exploited, opportunity for EU industry concerns manufacturers of equipment and other resources for animal production. In many countries, even when legislation has not yet been enacted, consumer demand leads to opportunities to exploit markets for higher welfare products. There are now many slaughterhouses in China, Brazil and other countries equipped by EU manufacturers able to provide high quality equipment complying with EU legislation and EU supermarket standards. The policies of the EU in relation to animal transport, even if the wording of the legislation needs some improvement, have led, not only to better welfare of the animals, but also to better meat quality. Hence there is a value of the best transport vehicles and animal handling systems in the higher value of the meat, particularly because of reduced frequencies of condemnations. Poultry housing systems and laboratory animal housing systems, produced by EU manufacturers to comply with animal welfare legislation, are being exported to other countries where consumers are demanding that the welfare of animals be improved. Another whole area of welfare improvement is that associated with disease reduction. Less disease means better welfare for the animals so systems and methodologies reducing disease, that are provided by some EU companies, have an opportunity in many parts of the world.

9. ANIMAL WELFARE LEGISLATION, ENFORCEMENT AND IMPACT ON ANIMALS

KEY FINDINGS

- Where legislation and codes of practice about animal welfare are effectively enforced, the welfare of animals is improved. The European Commission has made constructive efforts to standardise and improve enforcement of animal welfare legislation in recent years.
- Enforcement is most effective in relation to slaughter procedures and major housing system changes. Welfare during slaughter, transport and daily care of animals is improved by legislation and codes of practice but education of the people involved in the interactions with the animals also has a major beneficial effect.

9.1. Animal products and welfare: laws, standards and enforcement

The actual effect of legislation on the welfare of animals depends upon the responses of those owning and managing the animals. This response, in turn, depends upon the nature of any enforcement. Some systems for farm animal production will not continue if they are made illegal because they depend upon large manufacturers who are easily forced to change to a legal system. Other aspects of legislation can be enforced only by checks on-farm and on transport vehicles, markets, slaughterhouses etc. The extent of law-breaking will be significantly affected by the frequency and quality of the checks. For many transgressions, unannounced inspections are necessary if transgressors are to be discovered. There are regional and national differences in the seriousness with which legislation is viewed by those involved in the animal production business.

The Food and Veterinary Office of the European Commission's Health and Consumer Directorate General carries out missions to Member States to check on the enforcement of legislation on animal welfare and other topics. For example, as reported in (DG)SANCO/2010-8814/GR, there were missions to 25 Member States to check on enforcement of animal welfare standards for laying hens kept in unenriched cages. These checks were conducted two years before the date when the changes had to be completed. In each Member State it was found that progress had been made towards implementing the ban on small battery cages but, whilst all Member States had mechanisms to do so, some had not imposed sanctions on those who had not acted adequately. The report also considered the efficacy of the various enforcement measures.

Farmers often sell animals, or their production of milk, eggs etc., to single purchasers who represent large retail chains or wholesale distribution companies. The increase in direct selling to supermarket chains has led to considerable power being placed in the hands of these supermarket companies. It is possible for these purchasers to lay down conditions for animal production and to enforce these by inspection. The standards set by the supermarket chains are determined by what people will buy and by their reputation with the public.

For large companies which retail food, including supermarket chains and fast-food companies, their public image is of great importance. Bad publicity because of a risk to public health, a risk to the environment or the occurrence of poor welfare at any stage of the

production process can be very damaging. Hence it is in the interest of such food companies to avoid any scandal that might threaten their good image. When these companies receive many letters from consumers complaining about a product that they sell, they have to take notice of what the consumers say.

As a consequence of consumer pressure, food retail companies are adopting standards that they impose on their suppliers. In some cases, these standards are quite simple, for example, many years ago, the supermarket chain Albert Heijn in the Netherlands and elsewhere limited their sales of eggs to "scharreleie" which meant that the hens were reared in conditions where they could scratch in litter. Marks and Spencer in the U.K. and elsewhere stopped selling eggs from battery cages. In other cases, elaborate standards have been described in detail and sent to suppliers. Both companies explained in their standards how the eggs that they sold are produced and the consequences for hen welfare. One of the first systematic attempts to provide comprehensive information about the conditions under which animals were kept in the course of food production was the "Freedom Foods" scheme run by the R.S.P.C.A. in the U.K. In this scheme, the standards for housing and management have been set by a widely respected animal protection society and farms are inspected by Freedom Foods staff. Retailers who subscribe to the scheme are allowed to use the Freedom Foods logo which is accepted as honest by the purchasing public. Acceptance, by the public, of products which are produced in such a way that the welfare of the animals is good, depends upon trust in the organisation which is carrying out the labelling and inspection. Some large supermarket chains and other food retailers are trusted because it is thought that they could not afford to be found out if they were not labelling and policing adequately. In general, the standards of food retail companies are enforced better than national laws because the retail companies have more people per producer to do the enforcement than the government has.

The enforcement of standards by food retailers has led to substantial changes in the welfare of animals on farms because every producer has to conform to the standards in order to sell their products. The rapid development of such schemes in several countries has, in general, been based on scientific evidence about animal welfare.

9.2. Welfare during transport: laws, standards and enforcement

Laws can have a significant effect on the ways in which people manage animals during transport. Within the EU, the Council Regulation 1/2005 'On the protection of animals during transport and related operations' takes up some of the recommendations of the EU Scientific Committee on Animal Health and Animal Welfare Report, 'The welfare of animals during transport (details for horses, pigs, sheep and cattle)' (EU SCAHAW 2002) and of the European Food Safety Authority 'Report on the welfare of animals during transport' (EFSA 2004a). Laws have effects on animal welfare provided that they are enforced. Enforcement of regulations concerning animal welfare during transport is more likely to be effective than in some other situations because the vehicle is usually on a public road where it can be seen by the law enforcement officers. In addition, vehicles often have to pass places where checks by veterinary service officers are possible. The actual effectiveness of transport legislation depends on whether or not the wording ensures that proper checks will be carried out. Transport companies will not wish to be caught disobeying laws if penalties for transgression are great enough. These penalties may be fines, or disqualification from conducting their business but bad publicity for the company might also be costly to them.

The checks carried out on enforcement of EU legislation on transport are the responsibility of the competent authority in each Member State. These are not always properly carried out, as is clear from the replies of the European Commission to those who petition the European Parliament about lack of traceability and about welfare problems during animal transport (e.g. Petitions 0216/2015 and 0545/2015). However, the methodologies used and the efficacy of these are subject to overview by the European Commission. For example, a report produced “in order to share experiences on possible solutions related to controls of animal welfare during transport in the Member States” (DG(SANTE) 2014-7350-MR) clearly helps to ensure that there is uniformity of awareness about the methodologies that can be used. These include approval of the means of transport, planning of roadside checks, penalising transporters, using satellite navigation data, preparing contingency plans for dealing with emergencies, using training methods for official veterinarians and for drivers of animal transport vehicles, and preparing guidance for animal fairs, markets and transport of fish. The actual use of all such methodologies was also investigated, during each study in one of ten Member States, by a team of experts from the Commission and from three other Member States. Other reports on enforcement of transport legislation include one on transport of equids (DG(SANCO)/2008-7982-GR) and one on the transport of unfit animals (DG(SANTE) 2015-8721-MR).

Codes of practice can also have significant effects on animal welfare during transport. Retailer codes of practice concerning welfare during transport are likely to be obeyed because members of the public can see the vehicles so the retail companies try to ensure adherence to their codes (Broom 2002).

9.3. Welfare during slaughter: laws, standards and enforcement

National or regional authorities carry out checks on slaughterhouses because of the food safety and disease transmission regulations as well as the animal welfare regulations. As a result, the enforcement of animal welfare regulations at slaughterhouses is often better than the enforcement of animal welfare regulations on farms. Checks by the European Commission on how well legislation on welfare at slaughter is enforced have been reported for Member States (DG(SANTE) 2015-7213-MR) and for third countries that export meat to the EU ((DG)SANCO/2011-6261-GR). The findings of these studies included that Member States targeting their controls on specific slaughter procedures were more effective at dealing with difficult animal welfare issues than those that used only general risks for planning official controls. Particular problems included: poor results from water-bath stunning of poultry, the killing of pigs where there was a very large throughput of animals, the monitoring of animals to check that they are stunned and aspects of the training courses. The obligatory use of and checking of closed-circuit television in slaughterhouses can greatly improve animal welfare.

As explained in Chapter 2, welfare-outcome indicators obtained on arrival at a slaughterhouse can provide valuable information about the welfare of the animals on farm or during transport and pre-slaughter handling. The key factor here is whether or not such information using welfare-outcome indicators is required to be collected. At present, information relevant to food quality must be collected. Information about infectious diseases other than zoonoses is sometimes required and is important for animal welfare because disease is such an important cause of poor welfare in animals. Other welfare-related information is seldom collected by the competent authorities. Some welfare-outcome indicator information, such as number of animals with broken bones, substantial

bruising, dark firm dry or pale soft exudative meat, or walking difficulties is collected for meat companies or food retail companies.

9.4. Actual effects of laws, standards and enforcement on animal welfare

Some system changes required by law in the EU have led to great improvement in animal welfare. The banning of calf crates and inadequate diet for calves, confinement of pregnant sows in stalls and tethers, and the keeping of laying hens in small battery cages have been generally obeyed. The welfare of calves in individual pens with low iron and no fibre in the diet is very poor and that of group-housed calves with an adequate diet is much better. The keeping of sows in pens that do not allow turning around, normal social interaction and other normal movements leads to some of the worst welfare of any animal and a well-managed group-housing system is much better for sow welfare. Laying hens in well-designed aviaries, or enriched cages large enough to permit wing-flapping and other activities necessary to fulfill hens' needs, have much better welfare than hens with only 450cm² per bird in battery cages. Since the animals are in their living conditions for almost all of their lives, banning conditions that do not meet the needs of animals is more important for welfare than regulating tissue-damaging procedures, transport or killing methods. As discussed in Chapter 11, the living conditions for many animals are scarcely regulated by EU law, e.g. dairy cows, rabbits, domestic fowl kept for breeding laying hens or broilers, ducks, and turkeys. For others, there is legislation but it does not prevent some negative aspects of living conditions on welfare. Examples include broiler chickens and fattening pigs. Broiler chickens in the EU still have high levels of painful leg disorders and fattening pigs often have their tails docked despite the EU Directive 2008/120 (see also Section 10.4). The living conditions of laboratory animals should be improved by the most recent EU legislation. The enforcement system varies among Member States so the legislation may have little effect in some places. The same is true of the enforcement of the zoo animal Directive, see Petition 2301/2014 to the European Parliament. Whilst some Member States have specialist groups inspecting zoos, others have no such arrangement.

Farm animal industry standards generally have a small effect on animal welfare in relation to housing systems. The effect is to reduce the frequency of the worst practices. Supermarket and other food retail company standards have a substantial effect on the welfare of animals because they are enforced effectively.

Animal transport legislation has resulted in a reduction in some of the worst practices in relation to animal welfare in some areas of the EU but not in others. The legislation which has had the most effect, as with slaughter legislation, is probably that requiring that staff involved should be trained. The attitudes of those involved in the transport and slaughter industries is now more oriented towards consideration of the welfare of the animals. However, there continue to be bad practices, such as animal handlers using force, including electric goads, during loading and unloading and vehicle drivers driving too fast around corners.

The work of those who interact with animals in slaughterhouses is important because of their responsibility for animal welfare and public health. Training courses help to establish high standards and pride in work. The welfare of animals in slaughterhouses is generally better now than ten or twenty years ago and this is a consequence of legislation, efforts to improve carcass quality and the standards of production and retail companies.

9.5. Animal welfare consequences of costs of compliance with laws and imports from third countries

In some areas of business, compliance with a particular law is sufficiently expensive to have a negative impact on other activities. This could result in worse welfare. Whilst most animal welfare legislation does not appear to do this, the possibility should be considered. Where a system is changed, both the changeover cost and any difference in production cost have to be considered and balanced against any change in revenue from sales or market opportunity. As mentioned in section 8.6, the possibility of an overall decline in sales of a product if a low welfare system continues should also be taken into account when evaluating the costs of switching to a higher welfare system. In some cases, such a switch has just a one-off cost of the changeover. In other cases there is a greater net production cost and in yet other cases there is net increase in income. If there is a greater net production cost, any benefit to animal welfare of the system change might be counter-balanced, to some extent, by poorer welfare resulting from producers spending less on staff and other aspects of care during production. All of these factors should be considered when formulating policies.

If a change to higher welfare systems in one country just results in imports from a second country where no such changes have occurred, at that time there would be no improvement in the welfare of the animals. It might be that consumers in the second country would force a similar change so the welfare would improve. However, the prevention of imports that would not be legal in the importing country is clearly needed. Where it is the EU which requires the high welfare system on moral grounds, it should be possible not to allow import from third country that does not comply. As discussed in Section 7.1, the W.T.O. seal products case, involving the EU, may lead to such prohibitions being acceptable under W.T.O. rules. This would lead to better welfare of animals as required by EU consumers.

10. DEFICIENCIES IN CURRENT EU ANIMAL WELFARE LEGISLATION AND POLICY

KEY FINDINGS

- A striking deficiency in EU animal welfare legislation is that some widely-kept animal species are not protected. A substantial number of EFSA reports and opinions, already produced, are specific to these animals and could be used in formulating legislation.
- The commonest animal kept for human use in Europe is the broiler chicken and this is the subject of EU legislation. However, there is no specific welfare legislation about the second commonest animal - trout, the third commonest – salmon, the fourth commonest – rabbits, the fifth commonest – ducks, the sixth commonest – turkeys, the eighth commonest – cats, the ninth commonest – cattle, the tenth commonest – sheep, or the eleventh commonest – dogs.
- When the magnitude of poor welfare for individual animals and the numbers of animals kept are considered, the greatest animal welfare problem in the world is broiler chicken leg disorders and related problems. On a world scale, welfare problems of sows, calves and laying hens are extreme but EU legislation has substantially reduced these. The second worst problem in Europe now is poor welfare of dairy cows because of leg disorders, mastitis and reproductive problems. Other important current problems are those resulting from high stocking densities of salmon, trout and turkeys, poor housing and management of rabbits, poor housing and force-feeding of ducks and painful mutilations of many animals. Genetic selection of animals is the cause of welfare problems in many species.

10.1. The generality of EU animal welfare legislation and policy

All animals used by people are covered by the Treaty of Amsterdam and Treaty of Lisbon statements that animals must be considered as sentient beings. This means that the animals are not just goods, or products, or possessions, but have some intrinsic value and must be treated accordingly. This fundamental principle should therefore underlie all EU legislation and policy that has any bearing on living animals. At present it is not considered in all aspects. This point is discussed in more detail in Section 10.5 below.

A further anomaly concerning which animals are the subjects of legislation and policy is that, whilst some species of animals are covered, others are either not covered at all or only covered by the rather vague, general and not very scientific Directive 98/58. A “joint declaration on animal welfare” in 2014 by the Ministers of Agriculture of Denmark, Germany and The Netherlands follows the lead of the European Commission’s own 2012-2015 animal welfare strategy and urges the European Commission to “further improve the current level of animal welfare in future legislative proposals and to systematically address existing shortcomings in the legislation”.

As explained in Section 6.1, some of the EU legislation and other policies on animal welfare have been directed towards facilitating trade between the Member States. Uniformity of legislation on transport, slaughter and the animals that produce the more widely traded goods was desirable for financial reasons, as well as for reasons of public morality. In addition, species were considered for legislation one at a time and some, listed below, remain to be considered. A result of this anomaly is that those outside the EU are bemused by the patchy coverage.

When I lecture on animal welfare in various parts of the world, for example during EU B.T.S.F courses, a common question concerns the absence of EU legislation on species as widespread and economically important as dairy cows and beef cattle. The questioners sometimes ask if the general public in the EU are not concerned about the welfare of these animals. In addition to the many farm animals not covered, the paucity of legislation on companion animals, working animals including equids, and wild animals is also remarked. Much of the animal welfare research funded by the EU has focussed on farm animals but training courses on animal welfare topics have often included issues related to companion and working animals because these matters were requested by the non-EU country in which the course was given.

10.2. Scientific reports on animal welfare by EFSA and predecessors which have not led to legislation

Most scientific reports on animal welfare, currently produced by EFSA but formerly by the Scientific Veterinary Committee or the Scientific Committee on Animal Health and Animal Welfare, are requested by the European Commission or the European Parliament because legislation is planned. However, a series of reports and opinions have been produced that have not led to any legislation (Table 3).

Table 3: Examples of EU scientific reports and opinions on animal welfare not yet followed by legislation (reports intended as explanatory material are not listed here).

EU SCAHAW (1998). Welfare aspects of the production of foie gras in ducks and geese.

EU SCAHAW (2000a). The welfare of cattle kept for beef production.

EU SCAHAW (2001). The welfare of animals kept for fur production.

EFSA (2005b). The impact of the current housing and husbandry systems on the health and welfare of farmed domestic rabbits.

EFSA (2007b). Concerning animal welfare aspects of husbandry systems for farmed fish in relation to Atlantic salmon.

EFSA (2008a). Concerning animal welfare aspects of husbandry systems for farmed trout.

EFSA (2008b). Concerning animal welfare aspects of husbandry systems for farmed fish: European eel.

EFSA (2008c). Concerning animal welfare aspects of husbandry systems for farmed fish: sea bass and gilthead sea bream.

EFSA (2009g). Scientific report and opinions on the effects of farming systems on dairy cow welfare and disease.

EFSA (2010b). Scientific opinion on welfare aspects of the management and housing of the grand-parent and parent stocks raised and kept for breeding purposes.

EFSA (2010c). Scientific opinion on the practice of harvesting feathers from live geese for down production.

EFSA (2012c). Scientific opinion on the welfare of cattle kept for beef production and the welfare in intensive calf farming systems (Legislation on calves but not on beef cattle).

EFSA (2014). Scientific opinion on the welfare risks related to the farming of sheep for wool, meat and milk production.

The reason for lack of legislation in relation to some of these subject areas may be that one or more Member States might be unwilling to support legislation because the industry is largely on their territory. However, some of the industries are in almost all Member States.

10.3. In the EU, which animals are kept in greatest numbers?

The concept of welfare applies to every individual animal but there is sometimes a tendency for the welfare of the individual to be considered less when the animals are numerous. As in most areas of the world, the most numerous animals kept for human use in the EU are farmed animals, the commonest being the broiler chicken. In Europe there are approximately 4000 million chickens kept for meat production. These are the subject of Directive 2007/43. The second commonest farmed animal is the trout, about 1000 million, and the third commonest is the Atlantic salmon, about 440 million. Neither is covered by legislation on keeping conditions and management, the most important part of life in relation to welfare. The remainder of the domestic fowl kept in Europe are about 400 million laying hens and tens of millions of parent birds kept for breeding broilers and laying hens. The laying hens are the subject of Directive 99/74 but the parent birds are explicitly excluded from the broiler and laying hen Directives. Other numerous farm animals which are not covered by any specific legislation on keeping methods include farmed rabbits, 340 million; ducks, 170 million; and turkeys, 150 million. The totals in the EU of the commoner large farm mammals are: pigs 148 million, bovines 88 million, sheep 83 million and goats 10 million (Eurostat). Pigs and calves are covered by legislation on keeping conditions. Companion animals are much less numerous than farm animals. There are about 99 million cats and 65 million dogs (www.statista.com) but many more aquarium fish. Animals used for experimental purposes total about 11 million in the EU and are covered by legislation.

10.4. The extent of animal welfare problems and EU legislation

As mentioned briefly in Section 2.1, the magnitude of poor welfare in a given situation is a function of the intensity or severity of effect and its duration. A further factor in the extent of any problem is how many animals are affected. At present, some of the worst animal welfare is that of broiler chickens during the latter part of the growing period when a high proportion of birds have leg and other disorders because of the fast growth caused by genetic selection and ad libitum food provision (EFSA 2010a). The pathological condition causes much pain and other poor welfare. Since this a problem of thousands of millions of animals, it is the greatest animal welfare problem in the world. It is somewhat ameliorated if Directive 2007/43 is enforced and further reduced if the highest standards of food retail companies are followed.

In my view, the animal welfare problem in the EU which is second in extent is that of the high-producing dairy cow (EFSA 2009g). Dairy cows producing large quantities of milk have

high levels of leg disorders, mastitis and reproductive disorders. The proportion of cows affected by one or more of these disorders is high and the animals live with the poor welfare for a substantial part of their lives so, although the numbers of individuals are not the largest, the overall extent of the welfare problem is very great. There is no EU legislation to prevent this.

Were it not for the EU bans on close confinement of sows and calves, and on the keeping of hens in small battery cages, the welfare problems of these animals would be rated by welfare scientists and consumers as extremely important. In parts of the world where there is no legislation like that of the EU, the problems of such sows, calves and hens are very great. The extent of poor welfare in pigs reared for meat production is great in most parts of the world because the space and resources provided are insufficient and the needs of the animals are not met (EU SVC 1997, EFSA 2006b, 2007a). Growing pigs need material to manipulate, or substratum in which to root. If this, and adequate food and water, are not provided there is a high risk that tail-biting and other abnormal behaviours associated with poor welfare will occur. The magnitude of poor welfare in inadequately housed and managed pigs is high and over 100 million animals are involved. In the EU there is some variation in the implementation of the legislation. This is the subject of petitions to the European Parliament such as Petitions 0336/2012, 0721/2014 and 1141/2014. Routine tail-docking is prohibited by Directive 2008/120 but evidence is easily obtained to show that tail-docking is more widespread than it would be if the legislation were obeyed (see also Section 9.4). A review of the reports of DG Health and Consumer Protection, available in 2014, in 28 Member States showed that only six complied with the legal requirement regarding tail-docking and only seven complied with the legal requirement regarding the provision of manipulable material (Edman 2014). The study by Marzocchi (2014) for the European Parliament reported that only three Member States were compliant with EU tail-docking requirements and also drew attention to the petition to EU Agriculture Ministers, sponsored by Compassion in World Farming and signed by 475,576 people, asking that they ensure compliance with the EU Pigs Directive.

The welfare of farmed trout and salmon can be very good but stocking density is often too high and there can be major problems caused by insufficiently oxygenated water or by disease (EFSA 2007b, 2008a). Many salmon and some trout are subject to fin-chewing by other fish, a behaviour that is principally the result of high stocking density. The fins are sensitive tissue so there will be pain if they are chewed. Also the fins are of key importance in locomotion so substantial reduction in fin-size impairs normal function. Inspectors or consumers who know what intact fins look like can readily see that fins have been chewed when checking or buying fish, hence chewed fins are good welfare-outcome indicators. The poor welfare in salmon and trout is quite severe and often of long duration so the magnitude of the problem is high. The numbers of animals are hundreds of millions so the extent of the problem is great. There is no EU legislation to prevent this. Some other species of farmed fish have welfare problems as explained in EFSA (2008 b,c).

The rabbit is the fourth commonest species of animal kept in Europe and farmed rabbits have a range of major welfare problems (EFSA 2005b). The breeding does are subject to high metabolic pressure as they are bred repeatedly, immediately after giving birth to a litter. They may have six litters in a year and have an average life expectancy of only one year, much less than they could have if kept and managed in good conditions. The low space allowance per animal, the insufficient height of the cages and the inadequate flooring lead to high levels of infectious disease, foot disorders and stereotypies. Rabbits can be farmed in good conditions but, at present the extent of poor welfare is great. There is no EU legislation to prevent this.

Ducks can be kept in good conditions on farms but many do not have their needs provided for. Most are not provided with a water surface that allows them to exhibit their usual aquatic-related behaviours such as adequate preening, shaking movements to remove water, taking up water by the beak, paddling and swimming. The Council of Europe (1999) requirements for ducks, to which most countries in Europe are signatories so they should be specified in

law, state that ducks should be able to dip their heads in water and spread water over their feathers. This is not possible if only nipple drinkers are provided. Provision of an open water surface improves duck health as well as other aspects of welfare. Ducks are often kept at too high a stocking density, resulting in poor feather condition, movement difficulties and, in Muscovy ducks, pecking injuries and the use of beak-trimming and painful bits inserted in the beak.

The most extreme welfare problems for ducks are caused during foie gras production (EU SCAHAW 1998, Rochlitz and Broom 2017). 97% of foie gras production is from ducks and 3% from geese. The ducks are force-fed a very large amount of food in the last part of their life and this 'gavage' is aversive to them. In order to be able to force-feed the birds, they are kept in very small cages, either in individual cages or crowded very close together. The liver expands to up to ten times the normal size and liver function starts to fail as the condition becomes more pathological. Hence the mortality rate is much higher than without force-feeding. There is no EU legislation which prevents poor welfare in ducks.

Geese are also used for foie gras production and the feathers of both ducks and geese are used in pillows, duvets, sleeping bags, insulated jackets etc. Many of these feathers are collected after birds kept for meat or egg production are dead. However, some feathers are taken from live birds. If the feathers are being shed at moulting time, this collection may have little negative effect on the welfare of the birds but if they are plucked from live birds, pain and other poor welfare will occur (EFSA 2010c). This practice could be regulated within the EU but, at present, there is no specific legislation on duck or goose welfare.

The major welfare problems of turkeys are a consequence of the aggression that results from keeping them at high stocking density. The birds may have injuries or they may be affected adversely by the measures used to minimise aggression. They may be unable to show normal behaviour because they are kept at too low a light level and they may suffer the pain and functional disability resulting from beak-trimming. The abnormal body conformation, largely due to the large pectoral muscle, of adult male turkeys renders them incapable of mating with a female. This loss of a fundamental biological function is ethically questionable and has some direct effects on the welfare of the individuals. There is no EU legislation which prevents poor welfare in turkeys.

The welfare of beef cattle and sheep is generally good when they are kept at pasture, provided that diseases are adequately controlled. The welfare is poor in some animals in housed conditions, or in feed-lots, where the stocking density is high. There are also painful farm operations such as castration, tail-docking of sheep and obligate caesarian section in some breeds of cattle. Whilst the individual identification of animals is good for welfare (see Section 7.4) procedures for marking, such as inserting ear-tags, can be painful and are the subject of petitions to the European Parliament (e.g. Petitions 2377/2013, 0561/2014, 1307/2014). The use of anaesthesia and analgesia can prevent much of the pain involved in these various operations. There is no EU legislation which prevents such poor welfare in beef cattle and sheep.

It might be thought that Directive 98/58 would prevent the practice of bull-fighting but it does not. The bull is very seriously wounded during many bull fights and it is not able to avoid the situation where it will be wounded, either before or after it is pierced by lances and swords. The suggestion that the bull does not feel the wounds because of the action of naturally-produced opioids is clearly incorrect. Very few EU citizens find this treatment of the bulls to be acceptable and it is often the subject of petitions to the European Parliament. For example, Petition 1553/2013 in which it is pointed out that no specific EU legislation prevents the poor welfare associated with bull-fighting but that an Animal Welfare Law would be likely to do so.

Rearing conditions are long in duration so welfare problems during day-to-day living result in the greatest magnitude of poor welfare. Problems during transport and slaughter may be

severe but are of relatively short duration. Both the transport and slaughter conditions are covered by EU legislation. As discussed in Chapter 9, enforcement of slaughter legislation can be good so poor welfare prior to death is minimised effectively. Enforcement of transport legislation is more variable but incentives for transport companies to comply with the legislation include improved carcass value with good transport conditions and supermarket codes of practice. Enforcement of some on-farm legislation is much more difficult so the welfare may not always be good. However, the enforcement of major system changes, such as the battery cage ban, is feasible and effective.

Legislation on the welfare of animals kept for experimental purposes, largely in laboratories, is very well enforced in some Member States, when compared with many non-EU countries, and quite well enforced in all parts of the EU. The enforcement of the zoo animal directive varies greatly from one Member State to another (see Chapter 9 and Petition 2301/2014) so the welfare of the animals also varies. Some zoo animals cannot successfully adapt to any current zoo conditions so, in my opinion, they should not be kept in zoos.

Most companion animals and working animals are well-treated in the EU but some are not well-treated and various mutilations of the animals are permitted in some Member States. Whilst welfare of the animals during transport is covered by the same legislation as for farm animals, apart from the prohibition of the sale of skins from dogs and cats and the requirement for individual identification of equids, other aspects of the welfare of the animals is not the subject of EU law. There is a substantial problem with stray dogs in several Member States, and the welfare of these dogs is sometimes very poor, but there is no EU legislation on this. Also, whilst retail company standards can have a large beneficial effect on farm animal welfare, there are no such standards for companion and working animals. Many Member States have laws about cruelty to animals but it is anomalous that there is no community-wide legislation on the welfare of pets and working animals. For example, it seems remarkable to most EU citizens that the practice of throwing live donkeys from high buildings is not illegal in the EU unless it is prohibited by national legislation.

Deliberate or commercially-motivated cruelty to wild animals is not prevented by EU law, apart from the legislation aimed at conservation of wild animals, which does reduce the extent of poor welfare in some animals, and specific regulations on the import of wild-caught birds, zoo animals, the killing of seals and the use of leg-hold traps. Some traps for wild animals that result in very poor welfare, such as glue traps and snares, are still permitted in the EU, as underlined by Petition 0820/2015 calling for the prohibition of the glue traps to catch rodents in the EU. Neither is wild animal welfare the subject of many retail company standards. The legislation banning the import of wild-caught birds into the EU was passed very rapidly after the production of an opinion by EFSA on the subject (EFSA 2006c). This opinion highlighted the 80-90% mortality of wild-caught birds before they reached the EU. It also explained that the welfare of all wild-caught birds is very poor because confinement in a cage, diet change, handling and other disturbing experiences have extreme effects including lethal shock, suppression of the immune system and high susceptibility to pathogens. The EU legislation prevents poor welfare and some conservation risks. Other wild animals, for example reptiles, are subject to similar risks but are not protected in this way, except for some that are on a CITES endangered list. Most wild animals and some captive bred animals cannot adapt to captivity so should never be kept as "pets". Legislation could include lists of species of animals allowed as pets, laboratory animals, farm animals or zoo animals.

10.5. The wording of EU legislation directly concerning animal welfare.

The meaning of animal welfare and of related terms is discussed in Chapters 2 to 4. The wording of EU legislation directly or indirectly concerning animal welfare often does not conform with the scientific meanings of these terms. This can lead to confusion and variation in interpretation

of the legislation. Lundmark (2016) is one of many authors who have pointed out such difficulties, for example in the interpretation of terms such as “necessary suffering” and “natural behaviour” (see also Lundmark et al 2013, 2014). Examples are given of variation in how policy-makers interpret such terms between countries, between regulations within a country and between species within a regulation. It is clearly desirable that terms are used in a precise way so that they correspond with scientific meanings and reduce the likelihood of variation in interpretation.

10.6. Other EU legislation which might affect animal welfare.

The EU has some legislation concerned with activities within the EU, or aimed at improving trade with third countries, that refers to animals even if it is not principally about animal welfare. All of this legislation should take account of the fact that most of the animals used by people are sentient and cannot therefore be regarded only as goods to be traded or otherwise used. A statement about the difference between live animals and inanimate objects is included in some but not in other EU legislation. Examples of legislation in which the Treaty of Lisbon reference to sentient animals is not taken into account include Regulation (EU) 576/2013 on the non commercial movement of pet animals, Regulation (EU) 1016/2012 on zootechnical and genealogical conditions for the breeding, trade in and entry into the Union of purebred breeding animals, hybrid breeding pigs and the germinal products thereof ('Animal Breeding Regulation') and Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (IAS Regulation). An example of an international trade agreement that does not make such a reference is the CETA agreement with Canada, December 2016.

11. RECENT CHANGES IN EU ANIMAL WELFARE POLICY AND THEIR POSSIBLE CONSEQUENCES

KEY FINDINGS

- A policy of producing welfare legislation for more and more of the widely-kept animals has been reversed in recent years. EU citizens find it unacceptable that most kinds of animals kept in the EU are not protected by EU law.
- The very large gaps in EU legislation on animal protection could be remedied by a general animal welfare law, somewhat like the general animal health law.
- Effective enforcement of laws on animal welfare is desirable but is not a substitute for completeness of coverage of the law.

11.1. Brief description of recent changes in animal welfare policy

The changes in animal welfare policy in recent years have parallels in other areas of EU activity but, in this area, the changes are substantial. For many years, it was clear that there was an aim to produce a more and more complete set of Directives and Regulations so that, eventually, all animals used by people would be covered. As explained in Chapter 6, there was initially a focus on slaughter, transport and animals used for scientific purposes but the first legislation on the welfare of laying hens, calves and pigs in their housing conditions was passed before 1992. Subsequent legislation up to 2010 has refined the existing legislation, extended it to more species and specified certain areas of product labeling in relation to animal welfare, environmental impact and other aspects of sustainability. A trend in legislation towards the use of welfare-outcome indicators has been initiated.

In recent years, despite there being much new scientific research on the welfare of animals, some of it reviewed by EFSA, there has been no extension of EU legislation to new species. A list of EFSA and other EU scientific opinions and reports that have not been followed by legislation is in Section 10.2. In the last two years the EFSA Scientific Panel on Animal Health and Animal Welfare has received few new mandates on animal welfare from the European Commission. Perhaps the most surprising failure to produce legislation is on the welfare of dairy cows as there were EFSA opinions with clear recommendations in 2009. As described in Section 10.4, dairy cow welfare during keeping conditions on farm may be considered to be the second greatest animal welfare problem in the EU but this poor welfare is not prevented by any EU legislation (see Petition to the European Parliament on the Welfare of Dairy Cows by 18 animal protection societies, 2015). Also, the second, third, fourth, fifth and sixth commonest animals kept in the EU are not protected during normal living by animal welfare legislation (Section 10.3). The tens of millions of domestic fowl parent birds, kept to produce broilers and laying hens, have major welfare problems (EFSA 2010b) but are also not protected (see Petition 0210/2013 to the European Parliament). Neither are the keeping and management of dogs and cats or how to deal with stray dogs and cats. Given these very large gaps in legislation, the policy of not initiating new legislation is a great policy change.

Animal welfare science funding has promoted work that is likely to be useful to the legislation objectives, as well as fundamental science objectives about how individuals cope and the various indicators of good and poor welfare. Whilst research funding on animal welfare has continued in the 7th Framework, current plans group animal welfare with other areas so might lead to less funding of direct relevance to animal welfare. Unless there are specific animal welfare science projects funded by D.G. Research, not only will gaps in knowledge not be filled but the research area will not keep pace with changes in animal usage. The application

of molecular biology techniques to animals and new methods of animal husbandry are examples of such changes.

Further changes in animal welfare policy are, firstly, to check more precisely the enforcement procedures throughout the Member States and to investigate aspects of animal welfare enforcement in third countries (Chapter 9) and, secondly, to organise educational courses on animal welfare. The B.T.S.F. courses (Section 7.3), and courses on behalf of O.I.E. with EU support, on animal welfare have been held in many countries.

11.2. Consequences of the changes: general areas

A high level of concern for animal welfare amongst a large proportion of the public in the EU is indicated by surveys like the recent Eurobarometer (Section 8.5). Consumers perceive that EU legislation and other policy has been constructive in dealing with their concerns about animal welfare but is deficient in some areas. If there is no further legislation, the faith of the public in the legislators will decline.

The impact in the rest of the world of EU legislation and policy on animal welfare is seen by many people around the world as an example of the civilizing influence of the EU (Chapter 7). If nothing further is done and the large gaps in legislation remain, the reputation of the EU in this respect will decline.

Public opinion across the world is moving towards more and more demands for high welfare in animals (Sections 8.1 and 8.2). The advantages to EU producers of being in the forefront of the supply of high welfare systems and products (Section 8.6) will decline if the EU does not continue to lead in all areas of animal welfare.

11.3. Consequences of the changes: better enforcement and education

Any effort to improve the efficiency with which current EU legislation is enforced is good for animals and good for uniformity of action, and hence fairness, in the EU. Enforcement is the responsibility of the competent authority in each Member State. However, there is variation in the amount of effort put into such enforcement and in the expertise of those who do the work. This has led to substantial protests from animal protection groups and to information in the media about practices in some areas that would not be permitted in others. Producer groups in areas where compliance is high also protest to politicians and the media if they perceive that they are put at an unfair disadvantage by failure to enforce legislation in some areas of the EU.

As explained in Chapter 9, there have been increased efforts by the European Commission in recent years to exchange information about the best methods for enforcement and to check on how effective enforcement is in each Member State. This is having a significant and valuable effect on the prevention of poor welfare in animals. It is a continuing process so the problems are not yet solved. As detailed in Chapter 9, enforcement is easier in some animal treatment situations than in others.

The policy of providing educational information about animal welfare, by way of courses in those other countries in the world that request them, has a great benefit for animal welfare in those countries. It also helps the EU in political discussions and in promoting the reputation of the European Commission, and the EU as a whole, as a centre of civilised activity.

11.4. Consequences of the changes: no general animal welfare law

The Directive 98/58 has offered relatively little protection to animals, so at present, about 65% of animals kept by man are protected by EU law, during normal living conditions, and 35%, perhaps 300 million, are not (Section 10.3). The recent animal health law is wide-ranging in its impact. There could also be a wide-ranging animal welfare law to protect all animals used by people. If this law covered all sentient beings, all vertebrate animals, cephalopods and decapod crustaceans would be protected (Broom 2014). The “joint declaration on animal welfare” in 2014 by the Ministers of Agriculture of Denmark, Germany and The Netherlands calls on the European Commission to propose an updated, comprehensive, clear and simple legislative framework that in addition would improve enforcement”. The largest numbers of animals not yet protected are farmed trout, salmon, rabbits, ducks, turkeys, cattle and sheep and pet fish, dogs and cats. Most EU citizens find it unacceptable that these animals are not protected. In some Member States, some or most of these animals are protected but in others they are not. People can be cruel, legally, to these animals in some Member States but not in others. This situation makes the EU an object of derision for some people in third countries. The number of people in the world who think that causing suffering to animals is an important matter is increasing every year. For example, a survey in Viet Nam showed that 77% of people thought that causing suffering to animals is morally wrong and 75% thought that there should be a law to minimise suffering in animals (Podberscek 2005, 2016).

11.5. Consequence of the changes: animals that are not protected

If there is no new EU legislation on animal welfare, given the weak way in which Directive 98/58 is interpreted, animals such as dairy cows, beef cattle, sheep, horses, the main farmed fish species, rabbits, domestic fowl kept for breeding laying hens or broilers, ducks, turkeys, cats, dogs etc will not be protected for most of their lives in much of the EU. At present in the EU, there is a large amount of animal suffering that could be prevented. The vast majority of this prevention could occur without any increased cost to commercial users of animals. Whilst some changes would have a short-term cost, markets would be better preserved in the longer-term and some changes would improve the profitability of commercial animal use. Some would provide new trading opportunities for EU companies producing equipment for use in animal industries or for exporters of high welfare animal products (see Section 8.6).

Filling the large gaps in animal welfare legislation is best done by EU legislation, rather than by having different legislation in different Member States. Some of the problems of having different legislation in States with no control over movements of animals and products between them is apparent from the current situation in the United States of America. Some animal production systems, animal treatment practices and animal transport controls now vary from one State of the U.S.A. to another. Animals and products treated or produced legally in one State are illegal in the adjacent State. Movement of products from one State to another are not allowed to be blocked. This causes problems for producers, transporters and consumers. It would be better if the laws on animal welfare in the U.S.A. were Federal laws. Since almost all animal welfare laws in the EU have some impact on trade within the EU, the policy of having EU laws rather than subsidiarity in this area continues to be the best way forward.

11.6. Consequence of the changes: the balance between actions to enforce laws and to enact new legislation

The importance of effective enforcement of laws is strongly emphasised in Chapter 9 and Section 10.4. The serious animal welfare problems not covered by law in the EU are also strongly emphasised (Chapters 9, 10 and Sections 11.2, 11.4, 11.5). The current question in the EU is to determine the best balance between devoting resources to enforcement and to new legislation. Given the Eurobarometer results, and the many Petitions to the European Parliament, it is clear that the vast majority of EU citizens think that both should be done. Indeed, there is a clear view that it would be morally wrong to fail to enforce legislation or to fail to produce new legislation to help to solve what are perceived as very serious animal welfare problems.

The reputation of the EU in the world (see Chapter 7) would also suffer if there were either failure to enforce laws or failure to produce new laws to solve longstanding problems. In several countries around the world there are now general laws on animal welfare or proposals for such laws. This action would seem to be an efficient way to deal with the present anomalous situation in the EU where so many animals are not protected.

12. POSSIBILITIES FOR FUTURE EU ANIMAL WELFARE POLICY

KEY FINDINGS

- Animal welfare enforcement and education are promoted by exchange of information, for example on the internet. The Animal Welfare Science Hub is a good way to do this as it is unbiased and checked for quality.
- The animal user industries, animal protection groups and policymakers share the view that animal welfare legislation and policy should be based on science. Research on animal welfare should continue to be actively promoted by the EU. There should be an EU network of animal welfare science centres.
- All EU legislation, including that which is not directly concerned with animal welfare, should refer in an accurate way to animal welfare and sentence.
- There should be a general animal welfare law in the EU. This would simplify legislation but, in addition or as subsections, the substantial gaps in coverage of species in EU law should be remedied by specific laws.

12.1. Enforcement and education

The current animal welfare policies of carrying out checks and information exchange on the enforcement of legislation in all of the Member States, and of running courses in third countries, are of clear value and should be continued. It is likely that some of the enforcement actions could be more effective but current practices in this respect are evolving with experience so some improvements can be expected. Some areas of legislation are much more difficult to enforce than others.

The number of staff, available in the competent authorities of the Member States to carry out animal welfare inspections, has been substantially reduced in some Member States in order to cut costs. In some Member States it may be that the initial expenditure on such staff by the Member State government was too low. The insufficiency of staff numbers may be so great that proper enforcement is not possible. It is clearly the responsibility of the European Commission staff to point out such inadequacies.

The animal welfare science research, and the series of EFSA guidance documents (EFSA 2012d,e,f,g), on welfare-outcome indicators has improved the possibilities for checking on the current and previous welfare of animals. Animals arriving at slaughterhouses are currently inspected for disease control purposes and extra welfare checks could be carried out, for example to check walking ability. Animals in the slaughterhouse and carcasses after death are also checked. Welfare-outcome indicators such as bruises, bone-breakages, chewed fins and meat conditions such as dark firm dry and pale soft exudative could also be checked. These indicators provide information about welfare on-farm and during transport and pre-slaughter handling. Such checks are useful in enforcing some current legislation and could be even more useful if specified in future legislation.

The animal welfare education opportunities include provision of better information on the internet. This might be done by utilising the Animal Welfare Science Hub <http://animalwelfarehub.com/> set up by the EU 7th Framework funded AWIN (Animal Welfare Indicators) project. This site was set up with the aim of providing unbiased educational material about animal welfare and already has much information. When animal welfare

courses are listed, the quality of their content is checked by the International Society for Applied Ethology (ISAE), the leading academic society on animal welfare science. A site of this kind is a better source of information than a site run by an animal protection society or an animal user organisation, or one that is open to all with no checking of the accuracy of information. However, at present, no continuing funding is provided to ensure the up-dating and further development of the site.

12.2. Welfare science research

As emphasised in many Chapters above, scientific evidence about animal welfare is available and more can be obtained. Consultations were carried out by the author, for the production of this Study, with stakeholders in the animal use industries and other interested parties including animal protection groups, consumer groups, Members of the European Parliament and staff of the European Commission and Member State agencies. When asked whether legislation and policy on animal welfare should be based on scientific evidence, all responded positively. There are ethical questions in addition to those concerning welfare but, as the Eurobarometer surveys have shown, a high proportion of EU citizens consider animal welfare to be important and animal welfare science is needed in order that the best decisions can be taken about the genetic selection, keeping and treatment of animals.

Much of the information needed in order that there can be better enforcement and better legislation in the EU is already available. However, there are many new developments in science and technology that will help in these areas in future so new welfare science research is needed. There should be further EU funding for research on the scientific measurement of animal welfare. In addition, systems for using animals should be sustainable, as discussed in Sections 3.1 and 6.1 and by Aland and Madec (2009), Broom et al (2013), so they should be acceptable to the public in relation to: world environmental impact, maintenance of biodiversity, ensuring good welfare of animals and providing fairly for the people involved in the work. Research is needed on how to combine animal welfare and these other factors in sustainable systems.

In addition to the general funding, some species have been studied much less than others in animal welfare science. In particular, there should be more study of: some species of farmed fish; farmed birds and mammals other than domestic fowl, pigs, cattle and sheep; companion animals including horses; and housing improvements for laboratory rodents and zebra-fish.

A report from the European Commission (2009) proposed that there should be a network of reference centres on animal welfare and this was repeated in the 2012-2015 animal welfare strategy document. The arguments in favour of this would appear to be even stronger now so it should be implemented.

12.3. Inclusion of animal welfare and sentience in all relevant legislation

There is a need for most current and all future EU legislation that might affect non-human animals, to be reviewed so that the wording does not just refer to animals as goods or property. In some cases there should be explicit reference to consideration of animal welfare. The review of the Common Agricultural Policy is an opportunity to implement EU policy to improve animal welfare, for example by requiring good welfare of animals whenever there is a subsidy or other farmer support mechanism.

As explained in Section 10.5, in legislation there should be precise usage of terms such as animal welfare and suffering to correspond with scientific meanings and reduce the likelihood of variation in interpretation.

12.4. An animal welfare law

Those concerned with animal use industries and those involved with the protection of animals agree that legislation and other aspects of policy on animal welfare are desirable in order that all in the EU can follow the same rules. The value of the civilising influence of the European Union policies on other countries in the world is also widely appreciated. Whilst legislation should not greatly disadvantage EU industries, changing consumer demands in relation to animal welfare and other aspects of sustainability have to be considered in any business and by policy makers.

At present, many commercial activities involving the use of animals are not covered by EU law. As discussed in Sections 8.5 and 11.4, much of the current inadequacy of coverage of animals in EU legislation could be solved by an animal welfare law, somewhat like the animal health law. It is not for the author to say how this might be done, apart from suggesting that such a law could cover all sentient animals and to comment that some countries have animal welfare laws that could be a source of information in the preparation of such a law. Many of the problems raised in petitions on animal welfare topics that are submitted to the European Parliament, could be solved by a well-constructed animal welfare law.

12.5. Priorities for new EU legislation

As discussed in Section 11.6 and other chapters, a moratorium on new animal welfare legislation, like that in recent years in the EU, has major negative effects on animals, on public confidence in EU functioning, on opportunities for EU companies and on the reputation of the EU in the world. If a new animal welfare law were formulated as enabling legislation, new legislation on particular species might be follow-ups to that. Alternatively, legislation on each species could stand alone. All of the species and topics mentioned in Sections 10.2 and 10.4 could be the subjects of new legislation. The priority areas might be decided according to which involve the greatest extent of poor welfare for animals, which attracts the greatest public concern, or which is easiest in relation to the availability of appropriate information and preparation.

Since disease has such a large effect on animal welfare and poor welfare of animals makes them more susceptible to disease (Section 4.2), anti-microbial resistance is directly and indirectly linked to animal welfare (see Chapters 5 and 6). Improvements in animal welfare reduce the need for anti-microbial usage and hence reduce the risk of the development of resistance.

The topic for legislation listed in Section 10.4 as the second most important animal welfare problem is the welfare of dairy cows. There is already a set of EFSA opinions from 2009 on this. The welfare of trout, salmon and rabbits also have EFSA opinions. Rabbit welfare is particularly poor and there has been much new scientific information on rabbits since that opinion. There are also needs for Directives on the keeping of ducks for meat and egg production and the keeping of equines.

Welfare problems of animals that are not the most numerous are sometimes severe and the subject of much public awareness. A topic where there is a recent review and much public concern is the production of foie gras by force-feeding. Animals which are farmed or otherwise

used by people but which are not fully-domesticated can have major animal welfare problems. Animals farmed for fur production are the subject of Council of Europe Recommendations and the EU SCAHAW Report (2001) "The welfare of animals kept for fur production". The welfare of these animals is the subject of petitions to the European Parliament (e.g. Petition 0214/2013) and the keeping of animals for fur production is banned in several Member States but there is no EU legislation.

Another area of public concern is the keeping methods and training methods of animals in circuses (Petition 0103/2013). Some Member States have no laws about the use of animals in circuses, others prohibit the training and exhibiting of non-domesticated animals in circuses, whilst others prohibit all animal use in circuses. Many circuses move from one Member State to another but animal welfare during housing and training is not controlled by EU legislation. Other shows involving animals might be encompassed by such legislation. Whilst some shows in zoos are informative, illustrating the behaviour and other functioning of animals, and involve no negative effects on animals, others may harm individual animals directly, or devalue the animal for the observer by making it look ridiculous and hence lead people to treat animals as objects rather than sentient beings (see European Parliament Petition 1248/2013).

Many people have concerns about the welfare of companion animals, for example the continued production of dog breeds with harmful defects (Petition 1071/2014), the production of puppies in inhumane conditions (Petition 1690/2013) and the use of harmful materials in bird cages (Petition 2391/2013). As mentioned in Section 10.4, the welfare of stray dogs and other stray or feral animals is often poor. There are also human health and wildlife problems resulting from the presence of stray dogs and cats. This subject has been raised in petitions to the European Parliament (e.g. Petitions 1155/2013, 0251/2014, 0094/2015) and there is a need for EU legislation in this area.

Conservation legislation, wildlife crime and the marketing of products from wild animals has been discussed in Sections 3.2, 6.1, 7.1 and 10.4. Animal welfare is improved by some of the legislation in these areas. There remains considerable potential for EU legislation that would have conservation, biodiversity and animal welfare benefits.

Scientific methodology for the assessment of animal welfare is continually advancing. Legislation should therefore be up-dated so that it can achieve the stated objectives as well as possible. As mentioned in Section 12.1, new legislation on animal welfare could usefully involve the use of welfare-outcome indicators, largely animal-based. Other new developments need to be taken into account in legislation. For example on-line sale of pets and other animals (European Parliament Petition 0337/2013) opens up possibilities for malpractice that could harm animals as well as consumers.

The arguments for new legislation on animal welfare are supported by public opinion in the EU but there are also some export opportunities for companies selling high welfare equipment and products, given the increasing market for these around the world.

In order that developments like those summarised in this Chapter can occur, a discussion forum like the Animal Welfare Platform may help but there have to be general policy decisions and there must be sufficient manpower in the European Commission to implement the actions. The Member States also need sufficient manpower to enforce the laws but some have cut veterinary inspection staff to a level where enforcement is not sufficiently effective.

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Petition to the European Parliament 0210/2013 by M. N. (German) on inadmissible poultry breeding practices.

Petition to the European Parliament 0214/2013 by Ronald Schirmer and Annekatrin Pötschulat (German) on fur farming in Germany.

Petition to the European Parliament 0227/2013 by Anita Willemse (Dutch), supported by 570 co-signatories, concerning the granting of a licence for a business in Cuenca (Spain) which kills dogs.

Petition to the European Parliament 0337/2013 by Lorenzo Croce (Italian) on the online sale of pets.

Petition to the European Parliament 0471/2013 by Gian Marco Prampolini (Italian), bearing 27 signatures, on animal testing and vivisection for cosmetic research purposes.

Petition to the European Parliament 0691/2013 by Julia Knorr Alonso (Spanish), on animal welfare in Spain and the European Union.

Petition to the European Parliament 1024/2013 by Aurore Bardeau (French) seeking provisions to regulate animal euthanasia.

Petition to the European Parliament 1158/2013 by T.Ch. (Belgian), on Animal rights.

Petition to the European Parliament 1248/2013 by Pedro Pozas Terrados (Spanish) representing Proyecto Gran Simio.

Petition to the European Parliament 1553/2013 by Diana Patricia Giraldo Tejada (Spanish) on the protection of animal rights in Spain.

Petition to the European Parliament 1619/2013 by C.J. (German), on a ban on hunting all songbirds and penalties for countries failing to comply.

Petition to the European Parliament 1690/2013 by Sylvia Van Atta (unknown), on behalf of Many Tears Animal Rescue, on animal rights.

Petition to the European Parliament 1833/2013 by Gisela Urban and Gabriele Menzel (German), on behalf of several animal protection associations, bearing 7724 signatures, on animal testing and the REACH Regulation.

Petition to the European Parliament 2218/2013 by C.J. (German) on banning the import of leather, leather goods and fur from China.

Petition to the European Parliament 2377/2013 by G.J. (German) on the use of ear tags for the identification of livestock.

Petition to the European Parliament 2391/2013 by C.J. (Dutch), on a ban on birdcages containing zinc.

Petition to the European Parliament 0251/2014 by Pia Berrend (Luxembourgish) on the mistreatment of stray dogs in Romania.

Petition to the European Parliament 0561/2014 by Sven Niederstrasser (German) on the abolition of the compulsory use of ear tags on free-range calves.

Petition to the European Parliament 0721/2014 by Joanna Swabe (British), on behalf of Human Society International, and two signatories, on the Routine docking of pigs' tails.

Petition to the European Parliament 0723/2014 by M-J F. (Portuguese / Canadian) on Food safety and Free trade agreements.

Petition to the European Parliament 1071/2014 by Linda Mäki-Sulkava (Finnish) on breeding of unhealthy traits in animals (dogs).

Petition to the European Parliament 1141/2014 by Fredrick Federley (Swedish), on the cutting of pigs' tails.

Petition to the European Parliament 1307/2014 by A. K. (German) bearing 582 signatures, on a ban on the use of ear tags for the identification of cattle.

Petition to the European Parliament 1546/2014 by R. P. S. (Spanish) against the immobilisation of horses with pliers.

Petition to the European Parliament 1560/2014 by Corinna Haussmann (German) on the use of helium in place of CO₂ for stunning animals for slaughter.

Petition to the European Parliament 2301/2014 by Moona Hellsten (Finnish), on the cruel treatment of animals in a zoo (Zoo du Mont) in Toulon, France.

Petition to the European Parliament 0094/2015 by Pia Berrend, on the terminology used for stray domestic animals in the proposal for a Regulation of the European Parliament and of the Council on Animal Health (COM/2013/0260).

Petition to the European Parliament 0216/2015 by Linda Manley-Bird (British) on the implementation of the TRACE system in Greece.

Petition to the European Parliament 0545/2015 by Dieter Soßna (German) on the transport of animals for slaughter.

Petition 0820/2015 by Annick Pillard (French) on prohibition of the glue traps to catch rodents in the EU.

Petition to the European Parliament 1320/2015 by Susanne Prahm (German) supported by 8 co-signatories, on the ill-treatment of cats and dogs in China.

Petition to the European Parliament 1336/2015 by Patrick Katzer (German) on a ban on scientific experiments on primates.

- Petition to the European Parliament 1379/2015 by Gisela Urban and Gabriele Menzel (German) on behalf of several animal welfare organisations, supported by 4.680 co-signatories, on the protection of humans and animals against toxins and pesticides.
- Petition to the European Parliament 1417/2015 by M.V. (Italian) on animal cruelty in China.
- Petition to the European Parliament 2015 on the Welfare of Dairy Cows by 18 animal protection societies.
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ANNEX 1 - ANIMAL WELFARE GAPS IN EU LEGISLATION AND POLICY

Animal / issue	Estimates of numbers animals in Europe	Legislation on keeping conditions and management?	Current welfare problems	Indication if EFSA reports have not been followed up
Broiler chickens for meat production	4000 million	Yes Directive 2007/43/EC	Leg disorders	
Trout	1000 million	No	Too high stocking densities, also diseases	No
Atlantic salmon	440 million	No	Too high stocking densities, also sea lice, diseases	No
Laying hens	400 million	Yes Directive 99/74/EC		
Parent birds kept for breeding broilers and laying hens	Tens of millions	No excluded from the broiler and laying hen Directives		No
Farmed rabbits	340 million	No	Poor housing and management	No
Ducks and geese	170 million	No	Poor housing, force-feeding for foie gras production	No for foie gras No for harvesting feathers from live geese for down production
Turkeys	150 million	No	Too high stocking densities	
Pigs	148 million	Yes	Poor welfare, tail-biting	
Bovines	88 million	Yes: Calves No: Dairy cows disorders	Dairy cows: leg disorders, mastitis,	No for effects of farming systems on

			reproductive problems Dairy bull isolation Beef cattle: mutilations without anaesthesia, production-related disease	dairy cow welfare and disease No for welfare of cattle for beef production
Sheep	83 million	No	Mutilations without anaesthesia, disease	No
Goats	10 million	No		
Cats	99 million	No		
Dogs	65 million	No	Stray dogs	
Aquarium fish		No		
Animals used for experimental purposes	11 million	Yes		
Wild animals		A few species		
Animals kept for fur production		No		No
European eel See bass Gilthead sea bream		No		No No No

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