Animal Welfare: Limping Towards Eden

A practical approach to redressing the problem of our dominion over the animals

John Webster

Emeritus Professor of Animal Husbandry, Department of Clinical Veterinary Science, University of Bristol, UK

Blackwell Publishing

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Blackwell Publishing Asia, 550 Swanston Street, Carlton, Victoria 3053, Australia
Tel: +61 (0)3 8359 1011

First published 2005 by Blackwell Publishing Ltd

Library of Congress Cataloging-in-Publication Data
Webster, John
Animal welfare : limping towards Eden / John Webster. – 2nd ed.
p. cm.
Includes bibliographical references and index.
ISBN 1-4051-1877-6 (pbk. : alk. paper)
1. Animal welfare. I. Title.
HV4708 W43 2005
179′.3–dc22 2004021358

ISBN-10: 1-4051-1877-6
ISBN-13: 978-14051-1877-4

A catalogue record for this title is available from the British Library

Set in 10 on 12.5 pt Sabon
by SNP Best-set Typesetter Ltd, Hong Kong
Printed and bound in India
by Replika Press Pvt. Ltd

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To Lizzie with love. Let us limp together . . .
the best is yet to be.

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Preface

The title of this book, *Animal Welfare: Limping Towards Eden*, was agreed with my publisher on the grounds that it would attract most attention if it appeared to be a second edition of its predecessor, *Animal Welfare: A Cool Eye Towards Eden*, first published in 1993. They, who understand these things, reasoned that all books with a scientific base have a finite life span. A new edition would both attract new readers to the same important subject and help to bring old readers up to date. However, I must at the outset make it clear that *Limping Towards Eden* is not a second edition of its predecessor, *A Cool Eye*; it is an entirely new book (albeit on the same subject). Thus, so far as I am concerned, my intention is not that you should read *Limping* in preference to *A Cool Eye*. You should read them both.

Animal Welfare: A Cool Eye Towards Eden was subtitled *A constructive approach to the problem of man's dominion over the animals*. It was written at a time when the scientific approach to the understanding of animal welfare was relatively new. *Part I: How Is It For Them?* drew on science and good animal sense to categorise and analyse welfare problems perceived by the animals themselves as they seek to meet their own physiological and behavioural needs. *Part II: What We Can Do For Them* was part science, part polemic and part practical husbandry as it sought to explore specific problems arising from our determination not to leave animals well alone, but to manipulate their environment, their diet and their very constitution for our own purposes. Its main aim was therefore to set out the ground rules for understanding animal welfare and acting upon that understanding.

The last ten years have witnessed an explosion of active concern in matters of animal welfare and a smaller, though still quite impressive amount of constructive action. This has become manifest in new legislation, new codes of practice for the husbandry of farm animals, new codes of ethics for the treatment of laboratory animals, and new developments in quality-assured, high welfare schemes for food production. All this has been fed by new research and new understanding of animal welfare science. The time has come to review progress. *Animal Welfare: Limping Towards Eden* is subtitled *A practical approach to redressing the problem of our*

dominion over the animals. It is a review of our halting progress towards that unachievable destination where man and animals can coexist without causing each other to suffer, written in full knowledge of the impossibility of arriving at that destination, but with the enthusiasm of one who travels hopefully and the common sense of one who carries a good map.

The first chapter examines animal welfare from a broader perspective than I have attempted previously. It addresses the role of science and the limitations of science and seeks to complement them with an analytical (dare I say scientific?) approach to practical ethics. Chapters 2 and 3 re-examine the ground rules that define animal welfare: first the nature of the challenges faced by animals and their capacity to cope, then an exploration of the fundamental basis of sentience and suffering. In Chapter 4 I introduce the central theme (the 'Big Tune') of this book: namely the development of practical, robust protocols for the assessment and control of animal welfare in real-life circumstances (e.g. on the farm) rather than within the confines of the controlled laboratory experiment. Successive chapters then examine current high-priority problems arising from our practice of using animals, individually or *en masse*, for food and clothing, for science and technology, for sport, or to be our companions. Finally, I try to assemble these pieces into a series of stepping stones on the infinitely long pathway to Eden.

At the time of writing *A Cool Eye* it was relatively easy to set down the principles that underpin our understanding of animal welfare and the practice of good husbandry, partly because the scientific and other forms of 'literature' on the subject were then in their relative infancy, and partly because most principles remain principles whatever new knowledge may accrue. It is inherently more difficult to review progress, particularly when so much has been going on. In this book I have had to be selective, both in the subjects I cover and in the sources I quote. Many references cited for further reading are reviews that provide a point of entry for readers wishing to explore matters in greater depth. I tend to cite original communications only when the material is very new or strictly necessary to support a potentially contentious assertion. I have also spared both you and me from long, comprehensive recapitulation of national and international codes of practice, regulations and legislation, not least because most of this is available free on the world-wide-web. It is, of course, essential to be aware of and act according to regulations and codes of practice. They do *not*, however, explain *why* you should do what they tell you to do, nor give much attention as to how the animal in receipt of this recommended practice might feel as a result of your actions. My aim is not to impose codes of practice on animal owners alone but to guide all us humans who care both for and about animals first towards a better understanding of how animals feel and thus towards standards of conduct more in keeping with their welfare. That would make all sentient creatures (them and us) feel better.

Acknowledgements

In my journey on the path of animal welfare I have been educated and encouraged by fellow travellers too numerous to mention. I am most grateful to you all and shall try to thank you personally when next we meet. I must, however, identify some of my closest colleagues and mark them out for special thanks both as contributors to the information that is presented in this book and as critics of my opinions. Special thanks therefore (in alphabetical order) to Nick Bell, Matt Leach, David Main, Mike Mendl, Mohan Raj and Becky Whay.

1 Introduction: Facts and Values

Everything should be kept as simple as possible, but no simpler.

Albert Einstein

'Man has dominion over the animals whether we like it or not.' These were the opening words of *Animal Welfare: A Cool Eye Towards Eden* (Webster, 1994). Their stark message is that any enquiry into animal welfare must start from the premise that the quality of life for most other sentient animals with whom we share the planet is largely governed by how and where we let them live and what we let them do. 'We may elect to put a hen in a cage or to create a game reserve for a tiger, but in each case the decision is ours, not theirs. We make a pet of the hamster but poison the rat.' The fact that we are in charge makes it our responsibility to get it right. Hence the subtitle: *A constructive approach to the problem of man's dominion over the animals*. The argument was presented in two parts. *Part I: How Is It For Them?* was an analysis of the nature of welfare and suffering in sentient animals. *Part II: What We Can Do For Them* was advocacy; an exposition of the main welfare problems currently faced by animals, especially farm animals, and a series of recommendations for action. It was written at a time when the scientific basis for defining and evaluating animal welfare was becoming established and the first steps were being taken to put this evidence into effect. It defined and developed the concept of the 'Five Freedoms', as a comprehensive, practical protocol for assessing the welfare of animals, whether on farm, in the laboratory or in the home. It then used this protocol to explore practical problems in animal husbandry and seek ways to resolve them. This approach was essentially pragmatic. Most matters of emotion, public concern and philosophical debate were either taken as read or simply fell off the edge of the page.

The expression 'a cool eye towards Eden' needs some explanation. Eden was presented as a simple image of that ideal state where 'the lion lies down with the lamb and a little child leads them'. When viewed with a cool eye, such a paradigm is seen to be impossibly distant. Nevertheless it is still a good direction in which to look and a good direction in which to travel. This new book, *Animal Welfare: Limping Towards Eden*, written ten years later, critically reviews our progress.

The expression 'limping towards Eden' is intended to convey the cautious optimism of one who has always accepted that the road would be long and hard. The new subtitle, *A practical approach to redressing the problem of man's dominion over the animals*, conveys the message that this second book does not seek merely to update our understanding of the problem; its primary aim is to offer solutions.

It is necessary to acknowledge at the outset that the expression 'animal welfare' means different things to different people (and other animals). The scientist defines it as 'the state of an animal as it attempts to cope with its environment' (Fraser & Broom, 1990) and gathers evidence relating to the physical and mental state of a sentient animal (i.e. how it feels) as it seeks to meet its physiological and behavioural needs. This is easier said than done. You would think me presumptuous if I were to speak with authority on how *you* feel. Thus we may both conclude that any attempt by us to define how a cow or a rat may feel is a matter to be approached with extreme caution.

For most people, 'animal welfare' is an expression of moral concern. It arises from the belief that animals have feelings that matter to them which means that they should matter to us too. The nature of this belief will obviously be governed by how we think they feel. Our perception *may* carry the authority of scientific understanding or a lifetime of practical experience with animals. It may, at the other extreme, be uninformed, anthropomorphic and sentimental. A concern for animal welfare may be considered a virtue, whether well informed or not. However, all those who express a moral position with regard to our use of animals or work actively to create a good life for animals should see it as their duty to seek a better understanding of animals so that their perception of what is good and bad for animal welfare should accord as closely as possible with how the animals feel about these things themselves.

It is necessary therefore to give due attention to animal welfare as a matter for scientific investigation, a matter for moral concern and a matter for action. Wherever possible, I use the scientific method to review the evidence as it relates to the welfare of sentient animals and, wherever possible, I use established ethical principles to review the elements that can and should define the value that we humans give to other animals. Throughout, I shall seek to distinguish analysis from advocacy. I shall also seek to make a clear distinction between scientific evidence and ethical values. However, I shall not let these stern paradigms of scientific caution and moral rigour divert me from my primary aim, which is to get things done; to work towards real, practical improvements in animal welfare. To quote Thomas Carlyle: 'The end of a man is an action and not a thought, though it were the noblest'.

One of the first steps to right action is to acknowledge that our attitude towards animals is governed almost entirely by our own self interest and, if viewed from their perspective would appear to be grossly unfair. We may be motivated to devote a great deal of care to a valuable racehorse, or a well-loved pet, almost

Figure 1.1 Intrinsic v. extrinsic value: Cordelia at play.

none to a time-expired hen on a commercial farm, and violent harm to a rat in a drain. Our actions towards the other animals – whether we care for them, simply manage them or seek to destroy them – is defined not by their own sentience but by how we categorise them in terms of their *extrinsic value* (i.e. their value, or otherwise, to us). This does not necessarily make us good or bad people; it is just an amoral but inescapable fact of life. In *Eden I*, I drew attention to our duty to respect the *intrinsic value* of the life of any sentient animal and illustrated the point by reference to Cordelia, the rat in the larder (Figure 1.1). When surprised by the presence of a rat in a larder, the typical, normal human response will be to categorise it as unhealthy vermin and seek to remove it 'with extreme prejudice' (i.e. to exterminate it). However, when we discover that this rat is, in fact, a well-loved pet and her name is Cordelia, our attitude changes. We now care for her (and may even, eccentrically, dedicate a book to her). While I do not subscribe to the extreme Buddhist view that we should seek to preserve the life of all animals at all times, we must acknowledge that the quality, and thus the intrinsic value of the life of a rat, or any other animal, is defined by its own sentience, not by our definition of its extrinsic value (as pet or vermin). Thus I firmly believe that we have a duty of respect to all sentient life, not just those whom we see as our friends.

In the ten years between *A Cool Eye* (*Eden I*) and *Limping Towards Eden* (*Eden II*) the animal welfare story has advanced apace. The most notable new developments are as follows:

- a huge increase in the expression of public concern for animal welfare;
- a parallel increase in the scientific study of animal welfare;
- political action for new legislation to improve animal welfare;
- development of voluntary, welfare-based quality assurance schemes for farmed livestock;
- advent of new biotechnology, which makes almost anything possible in the design of animals to suit our own needs.

It is high time to review progress. *Limping Towards Eden* sets out to review critically but constructively what advances have been made in understanding animal welfare through scientific research and clinical observations, what we have achieved in promoting animal welfare through legislation or voluntary codes of practice, how we should deal with problems emerging from the new technologies and where do we go from here. The intention is to map our progress so far and, from this, plot a bold but not foolhardy course into as yet uncharted waters.

To this end, I shall assemble four key navigational aids:

(1) Comprehensive, robust protocols for assessing animal welfare and the provisions that constitute good husbandry.
(2) A sound ethical framework which affords proper respect for the value of animals within the broader context of our duties as citizens to the welfare of society and the living environment.
(3) An honest policy of education that can convert human desire for improved welfare standards into human demand for these things.
(4) Realistic, practical, step-by-step strategies for improving animal welfare within the context of other, equally valid aspirations of society.

1.1 Husbandry and welfare

I take it as self-evident that all who are directly concerned with the management of animals have a responsibility to promote their welfare through the practice of good husbandry. This applies whether the animals are on a farm, in the home, in the confinement of a laboratory or a zoo, or in the expanse of a nature reserve. Husbandry is a good word. Whether it is applied specifically to the care of animals or more generally to care of the living environment, it readily incorporates a proper understanding and application of scientific and economic principles. Moreover, it commands us to cherish and preserve the intrinsic value of the lives over which we have dominion. A good definition of animal husbandry is 'animal science enriched by tender loving care'. This attitude may be criticised by some as paternalistic, but what else could husbandry be?

Since the primary aim of these books is to contribute, through improved understanding, to real improvements in animal welfare, it follows that much of what I

write is addressed to those directly involved in the study and practical care of animals. For them I have sought to create a comprehensive structure for the analysis and assessment of animal welfare and, from this, explore ways by which the cause of animal welfare may be advanced on the farm, in the home, in the laboratory and in the wild. My secondary, equally important target audience is anyone who wishes to develop an educated understanding of the elements of good and bad welfare in animals; the aim here being to bring human perception of animal welfare as close as possible to welfare as perceived by the animals themselves. Most of the pressure for changes in the care and management of animals arises from those who have no direct dealings with animals. For the sake of the animals it is important that you get it right too.

1.2 Definitions of welfare

It is in the nature of those who study animal welfare to create their own definitions of animal welfare according to the 'Humpty Dumpty' principle that 'When I use a word, it means just what I choose it to mean, neither more nor less'. The most generally accepted single-sentence definition of animal welfare is that of Fraser & Broom (1990), i.e. 'the state of an animal as it attempts to cope with its environment'. The merit of this definition is that it recognises that the welfare state of an animal is the outcome of its impressions of incoming stimuli from the environment and the success or otherwise of its actions designed to accommodate these stimuli. Its limitations are many. It does not begin to define what the stimuli may be, whether they emerge from the external environment (like fear in the presence of a predator) or the internal environment (like hunger in the absence of food), or a combination of the two (like anxiety in the absence of a specific threat but awareness that threats exist). Moreover it makes no attempt to say what constitutes good or bad welfare. In essence, it merely says that the welfare of an animal is defined by its welfare state, which is unarguable but not very helpful.

More detailed approaches to define the welfare of an animal as the outcome of its success, or otherwise, in responding to incoming environmental stimuli have revolved around three questions. These three questions appear in Table 1.1, defined both in scientific language and common parlance. I believe that both sets of definitions are necessary to achieve a proper understanding of animal welfare and a proper empathy with animals. The simple question 'Is the animal happy?' appears particularly fuzzy and sentimental at first sight but acquires a degree of scientific rigour when based on evidence of mental satisfaction or freedom from mental distress. It is therefore the responsibility of the welfare scientist to discover reliable indices of mental satisfaction and/or distress. However, the danger with focusing on specific measurable indices is that you may see with perfect clarity the things you are looking for, but overlook things that are not actually staring you in the face. Having, for example, sought and failed to identify scientific markers of mental

Table 1.1 Key questions in the assessment of animal welfare.

Everyman	Scientific
• Is the animal living a natural life?	• Is the animal living in an environment consistent with that in which the species has evolved and to which it has adapted?
• Is the animal fit and healthy?	• Is the animal able to achieve normal growth and function, good health and to sustain fitness in adult life?
• Is the animal happy?	• Is the animal experiencing a sense of mental satisfaction or, at least, freedom from mental distress?

distress in an animal exposed to a putative source of stress, it does help to stand back and say 'Yes, but is it happy?'.

It also appears self-evident to me that the approaches to welfare assessment defined by these three sets of questions are not mutually exclusive. Indeed it is my firm belief that all three approaches are necessary to help us understand what we mean by animal welfare. However, this belief is not universal. Many advocates of animal welfare, scientific or otherwise, argue on the basis that only one of these three premises is necessary to establish a sufficient picture of animal welfare. Debates between advocates of the different positions tend to be unproductive. In order to justify the use of all three approaches it is necessary to examine the strengths and weaknesses of each when viewed in isolation.

1.2.1 The 'natural' argument

Here are three images to illustrate the 'natural' argument: the cow grazing grass in a green field, the lioness hunting on the African plains, the domestic cat asleep in front of an open fire. All these images convey a sense of good welfare because, in everyman's language, all these animals are behaving in a way that they were 'meant' to behave. In evolutionary terms, the cow and the lioness are both free to engage in behaviour that is well adapted to the environment in which they evolved. The cat that curls up before an open fire is not displaying a biological response to natural selection in the conventional meaning of the phrase, but it is obviously doing something that is very natural to a pleasure-seeking cat. Here, everyman's interpretation of the question 'Is it natural?' appears to work better than that of the scientist.

The natural argument is key to very many approaches to the design of environments to promote animal welfare. Most modern zoos and game parks seek to recreate as many features as possible of the natural environment for animals in captivity. This is, of course, partly to improve the educational/entertainment

experience of the visitors, but it is also clearly intended to provide an environment that permits the animals free expression of natural behaviour (i.e. behaviour appropriate to the environments in which they evolved). The same approach was adopted by Wood-Gush, his colleagues and disciples, to the design of high-welfare environments for pigs (Stolba & Wood-Gush, 1989). They first studied the behaviour of pigs in social family groups in the natural (if rather chilly) environment of a Scottish woodland, then sought to create an artificial pig park that provided sufficient environmental resources to permit similar expression of behaviour by pigs kept for farming purposes. The key aim of this study was not to promote natural woodland environments for farmed pigs but to fabricate an environment that allowed the pigs free expression of natural behaviour within the confines of a model farm. Thus the success of the approach was defined by behaviour of the pigs rather than the exact nature of the habitat. This illustrates one of the central themes of this book. We have a responsibility to make *provision* for good husbandry, but what matters to the animal is the *outcome*, namely its own welfare state.

When assessed by outcome, rather than provision, the 'natural' argument has much to offer to the pursuit of good welfare for animals confined by man in environments very different from those in which they evolved. When we accept that it is good and natural for the pet cat to come in and lie down before the fire, we acknowledge two things: (1) it is natural for a cat to do more than simply avoid the discomfort of feeling cold; it will actually seek the hedonistic pleasure of more warmth than is strictly necessary; and (2) the cat can come and go as it pleases.

The welfare of the cat is good on two grounds. It can achieve positive satisfaction, albeit in an 'unnatural' environment; and it is free to act in a way calculated to promote its own welfare. This simple example illustrates a logic that can be interpreted more widely. Consider again the cow grazing grass in a green field. This appears, at first sight, natural and good. On further reflection it is still good because the cow has considerable freedom of expression to do natural things, graze, lie in comfort and ruminate, socialise with other cows or not, as the mood takes her. A field is a good place in which to exhibit natural behaviour, but it is not essential to these things. The welfare objective should be to make provision for as much natural, socially acceptable behaviour as is reasonably possible. If this can be achieved in the relative confinement of (e.g.) a covered straw yard with an outdoor loafing area, then this may be sufficient. However, in the case of two of the most severely criticised elements of 'factory farming' – the battery cage for laying hens and the pregnancy stall for sows – it is clear that no attempt has been made to permit animals free expression of natural behaviour. Their welfare is compromised because there is almost nothing that they can do (beyond eating and sleeping) to promote it.

The argument that animals should be kept in their natural state in order to ensure their welfare may appear to the scientific rationalist to be both superficial

and sentimental. However, when it is re-expressed in terms of outcome, i.e. natural behaviour rather than natural habitat, it becomes much stronger. It is, however, a limited argument and an incomplete basis for assessing good and bad welfare. Obviously it cannot be carried to extremes. Animals on farms or in the home cannot have complete freedom to do what they like, when they like and with whom they like. In the paternalistic world of animal husbandry the keeper has to have some say in these things. More seriously, the decision to define natural behaviour as the single most important criterion for good welfare can create real problems for animals and their owners. For example, when families of sows and piglets were kept together in the Edinburgh Pig Park, the sows were free from classical behavioural disorders of sows in pregnancy stalls, such as stereotypic chewing of the bars of the cage. However, piglet mortality was higher than in conventional pig farming systems. There was also considerable evidence of bullying when different ages of piglets were kept together. I have heard welfarists argue that high piglet mortality 'is simply a production problem' which rather devalues the distress associated with dying.

Animal welfare is a complex thing. It deals with the totality of experience that determines the state of body and mind of a sentient animal. It cannot be expressed simply in terms of words such as 'natural' or 'healthy' or 'happy', when these concepts are considered in isolation, not least because these things frequently conflict. The natural death of a wild animal may be slow and painful (and this is probably worst for the predators at the top of the food chain since there is no one to put them out of their misery), the healthy bird in a cage may be suffering from extreme frustration, the chronic human smoker may enjoy smoking but fail to sustain fitness. The words of Albert Einstein are as relevant to the topic of animal welfare as they are to the general theory of relativity: 'Everything should be made as simple as possible, but no simpler'.

1.2.2 The 'fit and healthy' argument

Anyone who 'owns' an animal, whether on the farm, in the laboratory or in the home, has a responsibility of care which should, at the very least, seek to ensure that the animal is 'fit'; i.e. healthy, protected from injury and able to achieve normal growth and function. It is, moreover, reasonable to expect that this state of fitness should be sustainable. Most farmers would claim that the whole point of livestock farming is to promote good health and normal function since it would be economically foolish to do otherwise. Many will go further and claim that these things matter more, both to them and to the animals, than some fuzzy concept of happiness, linked perhaps to the freedom to exhibit 'natural' patterns of behaviour. When scientists in the European Community and Australia were asked to review the welfare of sows in pregnancy stalls, the Australians concluded that confinement stalls for pregnant sows were acceptable on welfare grounds; the Europeans concluded that they were not. The two groups had studied the same evidence but apportioned value differently. According to the Australian view, the

sows in confinement stalls showed an acceptable degree of fitness and this was sufficient reason to justify the system on the grounds of animal welfare. The European view was that the denial of natural behaviour was sufficient reason to impose a ban.

While fitness is an essential element of good welfare, it is not a sufficient description of good welfare. Consider this observation, which appears in many forms:

> *I know my cows/hens are happy. If they weren't, they wouldn't give milk/lay eggs the way they do.*

This sentence does contain a partial truth. A cow or hen that fails to produce milk or eggs in the expected amounts could well be unfit and this loss of fitness could be associated with distress. Thus the animal failing to perform to target may also be unhappy. However, the implication of the sentence is that loss of fitness is not just one (important) potential source of distress, but the *only* source of distress. This view is clearly unsupportable. It is also unacceptable to use productivity in farm animals as a sufficient definition even of fitness. Commercially satisfactory production targets for a flock of broiler chickens or a herd of dairy cows are frequently associated with a prevalence of lameness that is unacceptable on welfare grounds because many individual animals are in chronic pain. I shall consider this issue in more detail in Chapters 5 and 6. In both these examples, commercially acceptable production standards for the population are not compatible with sustained fitness in individuals. Thus, even within the limited definition of 'fit and healthy', productivity can never be a sufficient description of good welfare.

1.2.3 The 'happy' argument

According to this argument, 'happiness', i.e. mental satisfaction or, at least, freedom from mental distress, is the only measure necessary to define good welfare. This argument is based on the premise that the welfare state of an animal is determined by how it feels as it faces up to the elements of its life. What matters to the animal itself is that it *feels good*. It is not concerned by its present state of health and fitness unless that lack of fitness directly impacts on the way it feels. For example, bone weakness associated with improper nutrition will predispose an animal to fractures, and thus failure to sustain fitness, but does not present a welfare problem until the weakness proceeds to the point where it starts to hurt. I accept the simple logic of this argument so far as it goes. If good and bad welfare are defined by how an animal feels, then, by definition, how it feels is all that matters. I can also accept the argument that the welfare of an animal can be satisfactory when it is profoundly unfit. The old man and the old dog in the park on a sunny day, both walking slowly and stiffly to minimise the pains of arthritis, may be profoundly unfit but feeling good. However, while one can, with perfect sophistry claim that feeling good is the only measure of how good one feels (and therefore is all that matters to the animal), I cannot accept this as a sufficient

description of our responsibility to ensure the welfare of the animals in our care. Our responsibility must be to promote both their happiness *and* their fitness. Husbandry is, I repeat, a paternalistic concept. We would be in breach of our duty of care as parents if we allowed our young children unrestricted access to drugs (or even sweets). This is obviously because these things compromise their sustained fitness even though they can make the children feel extremely good at the time. Since this book is written to be read by people, not other animals, the concept of welfare must embrace not only how animals feel but also our responsibility to promote their fitness so that they may continue to feel good for the best part of their lives.

1.3 Sentience

The summary definition of animal welfare used throughout *Eden I* was that 'the welfare of a sentient animal is determined by its capacity to avoid suffering and sustain fitness'. This can be further shortened to:

Good welfare = 'Fit and happy'

Or, if you are uncomfortable with the word happy, then

Good welfare = 'Fit and feeling good'

This shortest of all definitions is, I believe, sufficient so long as it is clear what is meant by fit and happy. Fitness describes physical welfare, e.g. freedom from disease, injury and incapacity, and this acquires particular importance when these problems can be directly attributed to the conditions in which the animals are reared. Words like happy, feeling good and suffering describe the mental state of a sentient animal. This, of course, requires a definition of sentience. *Chambers Dictionary* defines sentient as 'conscious, capable of sensation, aware, responsive to stimulus'. This range of definitions can be taken to mean almost anything so is quite useless for practical purposes. All biologists will agree that all animals, starting with the simple amoeba, are responsive to stimuli. Most will agree that reptiles and fish are capable of sensation. Philosophers and experimental psychologists spectacularly fail to agree on what they mean by the words conscious and aware. Some argue that only humans (and possibly the higher primates) are aware. According to their particular Humpty Dumpty definition, awareness implies self-awareness; the recognition of oneself as a unique individual, and/or a conscious awareness and (more or less) rational interpretation of how one feels. By this argument, the human, using language, can say to him/herself 'I am in pain' and thus transfer the sensation into a mental concept. The 'unaware' animal, having no language, is unable to articulate pain as a concept. However, this is no reason to argue that the distress associated with pain will be either less or greater. A woman in severe abdominal pain may be aware that this pain is associated with childbirth

(which should lessen the distress) or terminal cancer (which will increase it). The 'unaware' animal in a similar degree of pain but unable to rationalise it may then, according to circumstances, feel either more or less distress than the aware human. To generalise this argument, I propose that unpleasant sensations (such as pain) evoke a sense of emotional distress in a sentient animal and the existence of this distress does not depend on the ability of the animal to interpret the sensation in a conceptual way.

A sentient animal is therefore a feeling animal, where the word feeling implies much more than simply responding to sensation. A frog with its head removed but spinal cord intact will respond to a harmful 'nociceptive' stimulus to its foot by withdrawing its leg. A sentient animal, such as a rat, will respond similarly to a similarly nociceptive stimulus such as an electric shock from the floor of its cage. If these shocks are repeated, the rat will learn to associate them not only with the acute sensation of pain but also with an emotional sense of distress and will be motivated to seek ways to avoid receiving further shocks. If it is helpless to avoid repetition of the stimulus it will display anxiety which may progress to profound depression. The sentient animal therefore demonstrates both a physical reflex to the stimulus and an emotional response, i.e. distress. This emotional response is adaptive (where possible) because it leads the animal to avoid this distressing experience in the future. Whether or not this response can be called 'aware' is a truly academic question (in the worst sense of the word academic): the animal is in distress and that is sufficient cause for concern. In matters of animal welfare, the words of Jeremy Bentham must still act as our guide:

The question is not 'Can they reason? Can they talk?' but 'Can they suffer?'

Animal sentience involves conscious feelings. It also implies that these feelings matter. Marian Dawkins (1980, 1993) has pioneered the application of economic theory to the study of motivation in animals by seeking to measure how hard animals will work to achieve (or avoid) a resource or stimulus that makes them feel good (or bad). I shall discuss this approach at greater length in Chapter 3. For the moment, it is sufficient to say that it matters to a sentient animal how it feels, and some feelings matter more than others. This leads, I suggest, to a workable definition of sentience as it applies to animal welfare:

A sentient animal is one for whom feelings matter.

This definition of sentience as 'feelings that matter' recognises that animals experience emotions associated with pleasure and suffering. Many of these emotions are associated with primitive sensations such as hunger, pain and anxiety. Some species may also experience 'higher feelings' such as friendship and grief, but it would be an anthropomorphic fallacy to overemphasise their importance. However, it would be equally fallacious to underestimate the emotional distress caused to farm animals by hunger, pain and anxiety. Although these sources of suffering in animals may be called primitive that does not make them any less intense.

1.4 The Five Freedoms and Provisions

To understand animal welfare and to put this understanding into practice, it is not sufficient simply to express the wish to see an animal fit and feeling good, but to convert this expression of good intent into a set of working rules suitable for application in the field. My approach to the practical implementation of good welfare is encapsulated in the 'Five Freedoms and Provisions' (Table 1.2), which form the basic philosophy of the UK Farm Animal Welfare Council (FAWC, 1993). The Five Freedoms identify the elements that determine the ideal welfare state as perceived by the animals (i.e. feeling *really* good). The Five Provisions define the husbandry and resources required to promote, if never achieve, this ideal welfare state.

I should explain how this concept of the Five Freedoms came about. The seminal book on farm animal welfare was *Animal Machines* by Ruth Harrison (1964), which first drew attention to the 'factory farming' of pigs, hens and veal calves in conditions of extreme confinement. Government response to public concern aroused by this powerful book was to set up the Brambell Committee (1965) of Enquiry into the welfare of animals kept under intensive husbandry conditions. In response to their specific terms of reference, i.e. the problems of extreme confinement, they proposed that all farm animals should have, at least, the freedom to 'stand up, lie down, turn round, groom themselves and stretch their limbs'. These soon became known as the Five Freedoms. At the time they were a clear exposition of the most serious deficiencies in farming systems that interpreted welfare (if they thought of it at all) only in terms of health and productivity, which, as I have indicated already, does not even equate to sustained fitness. The Brambell recommendations, for the first time, extended the definition of animal welfare to include the need for farm animals to perform natural behaviour.

This was a great step forward and, as we shall see, is eventually having a major impact on minimum standards for the farming of hens, pigs and veal calves. It is right that animals should have the freedom to 'stand up, lie down, turn round, groom themselves and stretch their limbs'. Nevertheless this does not begin to be a complete description of welfare. It is not even a sufficient description of natural

Table 1.2 The Five Freedoms and Provisions.

(1) *Freedom from thirst, hunger and malnutrition* – by ready access to fresh water and a diet to maintain full health and vigour.
(2) *Freedom from discomfort* – by providing a suitable environment including shelter and a comfortable resting area.
(3) *Freedom from pain, injury and disease* – by prevention or rapid diagnosis and treatment.
(4) *Freedom from fear and distress* – by ensuring conditions that avoid mental suffering.
(5) *Freedom to express normal behaviour* – by providing sufficient space, proper facilities and company of the animal's own kind.

behaviour since it only refers to behaviours related to the maintenance of physical comfort and excludes, for example, social behaviour. Nevertheless these aspects of maintenance behaviour did (and still do) tend to dominate welfare discussions, and thus welfare legislation, to the exclusion of all the other factors that might contribute to the sustained fitness of an animal and its sense of feeling good. However, the Five Freedoms is a memorable phrase, and affords animals one freedom more than Franklin Roosevelt promised the American people, so it would be a pity to lose it. Within FAWC therefore, I proposed that the phrase be retained but reinterpreted to encompass all the factors likely to affect the welfare of farm animals whether on the farm itself, in transit or at the point of slaughter.

The Five Freedoms may appear to describe an ideal but unattainable state ('Eden'). However, they should not be interpreted as an absolute standard for compliance with acceptable principles of good welfare but as a practical, comprehensive check-list of paradigms by which to assess the strengths and weaknesses of any husbandry system. The first four freedoms (Table 1.2) describe freedoms *from* potential sources of stress, the fifth describes the freedom *to* express natural behaviour. They should certainly not be taken to imply that all animals should be free from exposure to any stress, ever. The aim of good husbandry is not to eliminate stress but to prevent *suffering*. Suffering does not equate with stress. It may occur when an animal fails to cope (or has difficulty in coping) with stresses (1) because the stress itself is too severe, too complex or too prolonged or (2) because the animal is prevented from taking any constructive action it feels necessary to relieve the stress.

Table 1.3 illustrates the practical application of the Five Freedoms to the evaluation of alternative husbandry systems for laying hens. I shall develop this approach in much greater detail throughout the book. For the moment, I have simply considered three alternative systems – the conventional battery cage, the

Table 1.3 An outline comparison of the welfare of laying hens in the conventional battery cage, the enriched cage and on free range.

	Conventional cage	**Enriched cage**	**Free range**
Hunger and thirst	Adequate	Adequate	Adequate
Comfort			
thermal	Good	Good	Variable
physical	Bad	Adequate	Adequate
Fitness			
disease	Low risk	Low risk	Increased risk
pain	High risk (feet and legs)	Moderate risk	Variable risk (feather pecking)
Stress	Frustration	Less frustration	Aggression
Fear	Low risk	Low risk	Aggression Agarophobia
Natural behaviour	Highly restricted	Restricted	Unrestricted

'enriched' cage, improved to EU Council Directive 99/74/EC (1999), which sets out minimum standards for laying hens to include more space and environmental enrichment (e.g. a perch and a nest box), and the 'free-range' system – and ranked them according to the Five Freedoms. Thus:

- Adequate freedom from hunger and thirst can be achieved in all systems.
- Thermal comfort can be maintained in all cage systems. On free range it will be variable. However, since hens can choose whether to be indoors or out, then thermal comfort is likely to be satisfactory most of the time.
- Physical comfort is unacceptably bad in the conventional barren battery cage when space allowance for hens is only 450 cm^2. To give two examples only: the birds damage their feet on the wire floors and they are unable by virtue of restricted space and the barren environment to perform natural comfort behaviours such as wing flapping, grooming and dust bathing. In the enriched cage, which provides a perch, a scratching surface and more space, some of these comfort behaviours become possible. Outdoors, on free range, the bird has both the freedom and the resources necessary to perform comfort behaviour, provided of course, that it has the courage to go outside.
- Control of bacterial and parasitic infections is easier in cages, mainly because the birds are kept out of contact with their excreta, and that of passing seagulls.
- Osteoporosis leading to chronic pain from bone fractures is likely to be a problem with all laying birds in the extreme confinement of the barren cage stocked at 450 cm^2 per bird. This is because one of the major predisposing factors to osteoporosis is extreme, enforced inactivity. The enriched cage permits more movement and some increase in bone strength. Active birds on free range have denser bones but are at greater risk of damage, e.g. to the sternum or keel bone as they fly to roost.
- There is good evidence that laying hens experience extreme frustration in the barren cage; most especially, the frustration associated with their inability to select a suitable nesting site prior to laying their daily egg. The enriched cage and the free-range unit are both equipped with nest boxes which avoids this source of distress, provided, of course, that there are enough nest boxes to go round.
- A laying hen is probably less likely to experience fear when confined in a group of three or four birds within a caged system than when in a group of 4000 birds on a free-range unit. This fear may result from its experience of aggression, or it may simply experience agarophobia, i.e. fear of open spaces. Note, however, that while this fear may be a stress, it may be adaptive rather than a source of suffering, especially if the bird can take appropriate action to stay out of fearful situations. It does not pay to be brave if you are a chicken.
- According to the fifth of the freedoms, the freedom to express normal behaviour, the free-range unit wins by a distance.

I shall deal with the welfare of the laying hen in much more detail in Chapter 5. These examples are presented here in brief only to illustrate the central logic of the Five Freedoms. The welfare of animals in any system must be assessed according to all the paradigms (which add up to rather more than five). It is not sufficient to claim that the free-range system is superior simply because the birds are free to express normal behaviour. If mortality, preceded by a period of malaise (i.e. feeling unwell), on a free-range unit is shown to be significantly greater than in a caged system, then this must be taken into account, not just on economic grounds, but also because it is an important measure of poor welfare. There are those (and I do not include myself in this group) who will claim that the freedom to express natural behaviour is so important that it overrides any of the other freedoms (the first four freedoms *from* potential sources of stress). Where they and I differ in this regard is in the way we *value* these different elements of welfare. It is only natural that different individuals should rank the five freedoms differently according to their own sets of values when passing judgement in matters of animal welfare. However, an overall judgement on the welfare of animals in any particular system is not acceptable if it omits reference to any of the freedoms, whether through ignorance or design. The ideal judgement will be one that assesses the importance of the different freedoms in a way that most closely approximates to the animal's own measure of these things. This is why the study of motivation (what matters to an animal and how much it matters) is so central to the science and practice of animal welfare.

Another diagnostic role for the five freedoms is to identify and characterise risk factors for poor welfare. Many individual abuses of animal welfare are obvious. These include sins of commission (the imposition of direct harm) and sins of omission (such as starvation and neglect). The latter can usually be ascribed to poverty, ignorance or neglect, features of poor stockmanship which, like the poor, will be with us always. The main concern of scientists, welfarists and legislators should be for those elements of poor welfare that cannot be attributed to obvious individual cases of cruelty or neglect but to problems that may occur wherever animals are kept, on farms, in the laboratory or even in an animal refuge, and which can be linked directly to intrinsic features of the system. To paraphrase Ruth Harrison, 'If one individual causes one animal to suffer through a direct act of cruelty he is liable for prosecution. If thousands of individuals cause millions of animals to suffer as a direct consequence of the system in which they are reared then this becomes accepted as standard practice'.

A quick scan through the Five Freedoms for evidence of potential systematic abuse to welfare reveals the following examples:

- *Hunger or acute metabolic disease* – through improper feeding and/or breeding.
  Example: the high-yielding dairy cow.
- *Chronic discomfort* – through bad housing, loss of condition, etc.
  Example: pigs on concrete floors.

- *Chronic pain or restricted movement* – due to distortion of body shape or function.
  *Example*s: lameness in broiler chickens and dairy cows.
- *Increased disease* – through overwhelming exposure to pathogens, pollutants and/or diminished immunity.
  Example: post-weaning diarrhoea in pigs.
- *Chronic anxiety or frustration* – through improper housing, stockmanship or social contact between animals.
  Examples: tail-biting in pigs, feather-pecking in poultry.
- *Metabolic or physical exhaustion* – due to prolonged, excessive productivity.
  Examples: 'spent' laying hens and dairy cows.

This list introduces an important further element, not included within the Five Freedoms, namely the concept of exhaustion; the suffering experienced by animals that once could cope but now can cope no more. The nearly-spent hen and the emaciated dairy cow do not suffer because they are killed at an early age (death is the end of suffering). They suffer because *they are not killed*. They are made to continue production when they appear, *and feel*, physically worn out.

1.5 Ethics and values in animal welfare

I have already argued that we have a moral duty to respect the intrinsic value of any animal in our care, independent of its extrinsic value to us. However, this moral judgement and any action consequent upon this moral judgement cannot be made in isolation. We should also give due respect to other sentient beings directly or indirectly involved in our use of animals. These include the farmers who produce our food, consumers who cannot afford expensive high-welfare food and, not least, those individuals who owe their life and health to the results of experiments with laboratory animals. We must also consider the overall impact of any decision on the living environment. When we acknowledge our duty of respect to animals, farmers and those in need of medical care, we recognise the intrinsic value of these parties. We should also acknowledge that we are powerfully motivated by self-interest. Thus our actions with regard to these other parties is likely to be heavily influenced by what may be described pedantically as our perception of their extrinsic value or more bluntly as 'what it takes to make us feel good'. This can manifest in many ways. The gourmand and the vegan will have very differing views on the production of food from animals. The gourmand is motivated primarily by the venial love of good food and the vegan (perhaps) by an ascetic sense of moral righteousness. Both parties may be able to marshal a rational defence of their point of view. However, both parties should, if they are honest, concede that their motivation is linked to the primitive emotional need to feel good about ourselves.