

## *Preface*

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Developing a new scientific discipline and making it applicable to everyday life depends upon establishing certain key concepts and evolving skills in using them. Key concepts provide bases from which deductions can be made, and structures to which emerging ideas can be attached. Since the upsurge of public interest in the welfare of animals, there has been much study of **welfare** and of **stress**, to which welfare is obviously related. This interest has extended across many scientific domains, from human medicine, animal biology, veterinary medicine and agriculture to psychology and philosophy.

The significance of the terms stress and welfare has stimulated a considerable amount of writing and no small amount of debate, especially because of their relevance to humans and domestic animals. We are now at a stage where there is a pressing need to build the terms into a conceptual scheme that is sufficiently sound to provide predictions, to allow new data to be added, and to be subjected to exacting tests.

From first principles, we believe there is no reason why the concepts of stress and welfare should be essentially different whether used for humans or for other animals, so the ideas developed will be structured to refer to all animals, both human and non-human. The examples and emphases will nonetheless principally relate to non-human animals, since that is the focus of this series of texts and the background of the authors.

In Chapter 1, the need for careful scientific study of stress and welfare is explained. The reasons for some of the problems in understanding the concepts are discussed, and it is argued that there is a requirement for further analysis of the concepts, and especially for a better synthesis of current ideas. We seek to clarify use of the terms stress and welfare by deriving definitions for them related to the functioning and efficacy of the biological systems that animals use to both regulate their lives and deal with difficulties. These systems include a wide range of biological components including the feelings of the animals. This derivation is explained in Chapters 2 and 3. The definitions, based on established biological concepts and consistent with similar ideas in other disciplines, are described in detail in Chapter 4.

From this theoretical base, sound and practical approaches for assessing welfare are outlined. Chapter 5 provides an account of the responses of animals to short-term disturbances, while the responses to long-term disturbances are documented in Chapter 6. In Chapter 7 the use of animal preference studies to provide information relevant to the assessment of animal welfare is discussed. The question of how great a disturbance of homeostasis, or what level of stimulation an animal should be subjected to is partly a matter of biological judgement, since animals may manage better if exposed to a moderate level of stimulation, even if it is aversive, rather than being protected from stimulation entirely. But ethical considerations obviously also dictate that there must be a limit. A survey of the ethical issues involved and a guide to making ethical decisions about animal stress and welfare are presented in Chapter 8.

Finally, what is believed to be the best current approach for monitoring animal welfare is outlined in Chapter 9. It advocates combining technical measures of stress and welfare, based on a sound biological framework, with appropriate ethical limitations.

Evolution of human society is constantly changing the relationship between humans and other animals, but too often this is to the detriment of those animals. Fortunately, biological studies are uncovering ways of identifying, assessing and alleviating poor welfare. With this information, strategies can be developed to avoid unreasonable impositions on animals. The ultimate goal of the book is to establish a biological base from which can be developed codes of animal management appropriate to a modern and compassionate society.