
RESEARCHABLE PROBLEMS AND PRIORITIES RELATED TO ANIMAL WELL-BEING

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Summary. The workgroup identified five priority areas for scientific research on animal well-being: measures of adaptation and adaptiveness; measures of social behavior and spacing; measures of cognition and motivation; development or refinement of short-term production practices; and development or refinement of long-term management systems where necessary based on the findings from studies of animal well-being. Research in the first three areas is needed to provide information essential to improving our understanding of how food animal well-being can be defined and measured. Research designed to apply these findings to production practices and management systems is also of high priority, since this research addresses issues which are of direct concern to the public and producers. This is an ambitious agenda. However, animal well-being is a researchable topic, and much can be accomplished if funding is made available in the areas outlined by the workgroup.

Introduction

In today's society, concern is growing about the well-being of animals, whether these animals are found in the laboratory, on the farm, or in the wild. With respect to animal agriculture, this concern has resulted in conflicting views about how the well-being of farm animals can best be ensured. On the one side are those who fear that the well-being of the animals used in agriculture is jeopardized for the sake of profit and that the use of animals in agriculture should be severely regulated. On the other side are those who maintain that farmers recognize and accept a moral responsibility for the well-being of the animals in their charge and that regulations governing the care of farm animals are unnecessary and would cause financial hardship. Resolution of this conflict will ultimately hinge on the ability to determine if and when the well-being of food animals is at risk.

There is no simple definition of animal well-being. Attempts to arrive at an all-inclusive definition inevitably end in arguments clouded by political considerations and by genuine scientific disagreement. Nevertheless, while a perfect definition of animal well-being may not be possible, there is sufficient general

understanding about what constitutes well-being to allow us to begin to address the critical question: how to measure animal well-being.

Animal well-being is a researchable topic. We have the necessary scientific techniques and a sufficient understanding of animal biology to begin the process. Measures of well-being will provide producers and consumers with the information they need to evaluate management practices and to determine which practices best assure the well-being of animals used for food production.

Devising a research strategy to develop measures of animal well-being is not a simple task. A large variety of species are used in agriculture, including such diverse groups as horses, cattle, swine, birds, and fish. Each species has its own biological characteristics and its own specific needs. Species are also maintained under a variety of conditions, ranging from the relative freedom of cattle on the western range lands, to the loose confinement of dairy cows, to the intensive management conditions used in swine and poultry production.

Given this variety, two different strategies could be used to study agricultural animal well-being. The first would be to study each individual species under each of the management situations in which it is maintained. But considering the number of species and existing management practices, this approach would require an immense research effort that would exceed the resources available for this task. The second strategy would be to use a tactic used in human medicine, namely, to search for common characteristics of animal well-being that, in turn, can then be refined and applied to the assessment of individual management conditions. This workgroup endorses the latter as the most judicious approach.

The workgroup supports the two general research objectives for animal well-being formulated by the consensus committee of FAIR '95: 1) to determine scientific measures of well-being in food-producing animals and 2) to develop short-term production practices and long-term management systems based on scientific research findings about animal well-being. We used these two general objectives as guides in developing research priorities. Clearly the accomplishment of the first objective, development of scientific measures of well-being, is a critical step. Evaluation of current agriculture practices and the development of viable alternates can occur only after we have developed meaningful measures of well-being. However, the workgroup recognizes that the second objective is the eventual goal of this research effort. Therefore, we have listed the top research priorities¹ for animal well-being research under each of these two objectives.

Determining Scientific Measures of Well-Being in Food-Producing Animals

As previously stated, developing measures of well-being is the pivotal step in providing a scientific answer to what constitutes acceptable standards for

¹ These detailed priorities are modified from those developed by the NCR-131 Committee on Animal Care and Behavior.

agricultural animal use. As we develop these measures, we must remember that they must not only be acceptable scientifically but must also be viewed as relevant by the rest of society.

To achieve this objective of developing measures of well-being, the workgroup identified three general research areas that should receive priority: 1) the adaptation and adaptiveness of farm animals to their environment, 2) social behavior and space requirements of domestic animals, and 3) cognition and motivation in domestic animals.

1) Adaptation and Adaptiveness

With the exception of fish, most food animals have been domesticated for thousands of years. However, selection under intensive management conditions has occurred only recently and has been largely oriented toward the improvement of production traits. A concern is whether individual animals are able to adapt physiologically and behaviorally to such intensive conditions, given the adaptive constraints resulting from their genetic history. A goal of research in this area is to determine the relative roles that genes and environment play in influencing well-being. This information can then serve as the basis for either modifying management practices or developing genetic selection programs to improve the “fit” between animals and their environment where necessary.

The research priorities for this area are:

- a) to develop quantitative behavioral, physiological, immunological, and neurobiological measures of stress in food animals and determine their interrelationships;
- b) to characterize genetic differences in these responses when food animals are exposed to various conditions; and
- c) to determine the mechanisms by which genetics and environment influence both the development and expression of responses to stress.

2) Social Behavior and Spacing

With the intensification of animal agriculture, a major concern is whether restricted space adversely affects animal well-being. To answer this question, we need a better understanding of the social behavior of our food animals, how the quality of space influences behavior, and the consequences that any change in patterns of social interaction and space utilization have on the animal’s well-being.

The research priorities for this area are:

- a) to determine how the animal perceives and utilizes the quality and quantity of space provided, including aspects such as pen configuration, vertical space, and perimeter areas;
- b) to determine the physiological, behavioral, and immunological responses of animals to different qualities and quantities of space;

c) to study the influences of group size, group composition, social interactions, and individual distances on well-being and determine how these factors affect space utilization; and

d) using the information obtained, to model the use of pen, feeder, and waterer space.

3) Cognition and Motivation

The subjective experiences (“feelings”) of animals are a major concern of the public. However, there is currently little scientific information which can be used as a basis for addressing this concern. Studies need to be undertaken to determine what the animal senses and perceives and what it can learn about its environment and the consequences of its own behavior. It is also necessary to assess motivation to determine whether it is important to well-being for animals to be able to perform particular types of behaviors in different environments.

The research priorities for this area are:

a) to develop methods to quantify the subjective states of animals, such as contentment, pleasure, fear, and frustration, and

b) to evaluate the motivational states of animals (e.g., hunger, thirst, libido, comfort needs) under various housing and management conditions.

Developing Short-Term Production Practices and Long-Term Management Systems Based on Scientific Research Findings About Animal Well-Being

The goal of the previous research objectives is to provide analytical methods for evaluating animal well-being. These analytical methods are necessary in order to determine the influence that current animal agricultural practices have on the well-being of farm animals and to assist the industry in developing management practices that assure the well-being of farm animals. Two general areas of current practice require attention: 1) short-term production practices and 2) long-term management systems. These interrelated areas are separated here for the purpose of discussion.

1) Short-Term Production Practices

Short-term production practices such as transportation and slaughter and special agricultural practices such as beak trimming and castration are an important or necessary element of animal management, but they also unquestionably affect the well-being of animals. These practices need to be addressed by research focused on specific circumstances and species considerations.

The research priorities for this area are:

a) to evaluate existing and alternative practices with regard to potential pain, stress, or discomfort;

b) to evaluate the efficacy of analgesics for reducing the pain and discomfort associated with special agricultural practices; and

c) to develop improved or alternative procedures to those that produce pain, stress, or discomfort.

2) Long-Term Management Systems

Current long-term management systems must be evaluated for their effect on farm animal well-being. Equally important, however, is evaluation of the benefits, if any, of modification of these systems and of the development of novel management systems.

The research priorities for this area are:

a) to investigate the basic behavioral, genetic, immunological, and physiological responses of animals to management systems;

b) to use these responses to evaluate alternate or modified management systems and to compare them with conventional management systems; and

c) to capitalize on this knowledge to devise new management systems when warranted and to assess the biological and economic viability of those systems.

An overall research priority for both short-term practices and long-term systems is to determine the ethical and societal concerns which might be raised or allayed by changes in production practices and management systems.

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