

Animal Breeding, Disease and Welfare

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Abstract

In the United States, people display two very different and conflicting attitudes towards the animals that they use. The pet paradigm evolves toward an anthropomorphic viewpoint in which the animal is seen as a dependent, obedient child. The production paradigm evolves towards a "machinomorphic" viewpoint in which the animal becomes an economic unit in a production system. An understanding of animals as animals leads to rejection of the extreme viewpoint of each paradigm. Such understanding is prerequisite to our attention to their welfare. Much of the disease experienced by domesticated animals is a result of 1) the environmental conditions of their confinement; 2) the management practices to which the animals are subjected or; 3) breeding practices that create genetic stock that is defective or predisposed to disease. Essential elements of animal health concern proper management and housing for animals and breeding programs that emphasize functional efficiency and disease resistance. Disease prevention should be a major concern of animal welfarists.

Paradigms of Animal Use

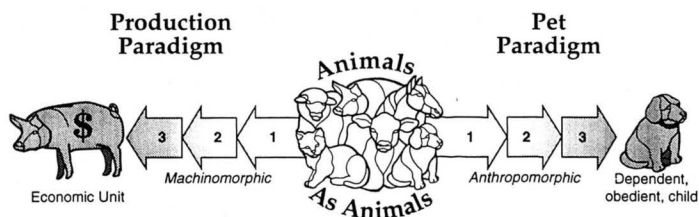
In "Veterinary Services for Animal Use in the United States: A Conflict of Paradigms",¹ two very different ways people view animals were described . . . the pet paradigm and the production paradigm. These paradigms are illustrated in the figure below. Veterinary services for the pet paradigm "have been evolving to accommodate an owner's emotional attachment for or anthropomorphic viewpoint of animals. Medical technology is applied to animals to the extent of the owner's wishes or within the limit of financial resources, whichever comes first. Pet paradigm services evolve along a continuum in which owners (1) accept responsibility for care of animals that are maintained for companionship, amusement, or recreation; (2) include them as part of their 'families'; or (3) in the extreme, substitute them for, equate them with, or pronounce them superior to, people."¹

In contrast, production paradigm services are "designed to recognize an owner's animal production system as a business enterprise. This paradigm evolves along a continuum in which owners (1) accept responsibility for care of animals that are produced for uses such as food, sport, or experimentation; (2) view them as a resource to which technology can be applied to enhance the efficiency of their production (in this continuum, animal husbandry became animal science); (3) and in the extreme, refer to them as units in a production system."¹ These three levels of the pet paradigm and the production paradigm correspond to the numbered areas in the figure.

These conflicting paradigms are perceptions of animals that lead to a particular type of use. "Economic forces and technological developments have accelerated the evolution of these paradigms over the past several decades and thus, have exacerbated the differences between them."¹ Services offered by the veterinary profession have become increasingly specialized and paradigm-dependent. Animals may be perceived via either paradigm and receive very different services. Dogs, traditionally perceived as "pets" in the United States, are also bred for laboratory experimentation and thus require services that are economically relative to the dog's market value (production paradigm services). Alternatively, a pig that "had fallen out of bed the previous evening" received hospitalization, radiographs and a bone plate on the lateral aspect of the femur (pet paradigm services).²

Each paradigm has elements of a commodious and reductionistic viewpoint of animals. In each paradigm, the animal becomes a commodity . . . a resource of convenience, an instrument of commerce. The extreme positions of each paradigm militate against the animal's innate behavioral and morphological characteristics. An important aspect of both extreme positions is that each is based upon an increasing control and domination of the animal's life. Sensitivity towards the animal's behavioral expressions and "quality" of life may be diminished.

Concern for animal welfare involves the question, "At what point has each paradigm gone too far?" Because these paradigms are different, an answer to this question is likely to be paradigm-dependent. Subscribers to the pet paradigm may be quicker to find fault



with the production paradigm and vice-versa. Most Americans are urban and are affected by the "Bambi syndrome." As Lutts explained "Walt Disney's influence is so pervasive in American culture that it often goes unrecognized. It is easy to overlook the obvious."³ Extreme evolution of the pet paradigm has become a marketing opportunity for pet services in the 1990s . . . "chemotherapy is currently offered as a method for prolongation of a diseased pet's life span. Grief counseling for owners, burial of pets, and other anthropomorphic services are promoted for the inevitably terminal cases. Citification of Americans has separated human beings from other animals in the natural world. Apparently some urban people have no model for animal life other than their own life styles."¹ Anthropomorphic treatment of animals can be detrimental to *their* welfare. Further, anthropomorphic treatment of animals is of questionable value to *people*.

In the extreme position of the pet paradigm, animals are seen as cute, surrogate children. "Walt Disney has made us into a culture of cuteness."⁴ Americans have fallen prey to a view of nature as "a simple, uncomplicated, romantic state of happiness and virtue—an escapist fantasy. Disney did not create his audiences' desire for such fantasies, but he did feed it."² The extreme position of the pet paradigm feeds such fantasy as well. The pet is seen as a dependent, obedient child. Most children eventually achieve independence from parents. Their obedience, if ever present, usually diminishes as their age increases. To be acceptable as a pet, an animal must remain dependent and obedient throughout its life. Independence of the pet diminishes the master's bond. Disobedience is interpreted as a "behavioral problem."

Proper management and housing are essential for animal health. "It can be hypothesized that the average knowledge of and application of animal care is less among pet owners than among production animal owners. Therefore, the average welfare of pets is less than that of production animals. "Exotic" pets and even domesticated ones are often subjected to poor nutrition, improper management, or inadequate housing by owners who are ignorant of animal's needs."¹

The production paradigm appears to be understood poorly by affluent, urban people in the United States. The production paradigm evolves toward a "machinomorphic" viewpoint of animals. In the extreme position of the production paradigm, animals are seen as economic units. A veterinary approach to "animal as economic unit" was described by Leman⁵ who wrote that "practitioners must help producers reduce the cost of producing each unit and help improve volume without adding production costs."

Some veterinary educators have "hailed development of services for these extreme positions as the 'cutting edge.'"¹ Concern for animal welfare, however,

demands rejection of the extreme viewpoint of each paradigm. Animals, of course, are not machines, nor are they children. "Study of animals, as animals, might result in an enhanced sensitivity as to what animals are, along with an enlightened recognition of what they are not, and lead to a view more toward the middle rather than to the extremes of either paradigm."¹

Animal Diseases

It could be argued that disease, at some level, is essential to animal populations. Disease in so called "wild" or "free" animals functions as a culling factor or population leveler. The disease toll that is a loss for one species becomes food and/or opportunity for other species. All diseases run their course. However, intervention can postpone, ameliorate, or exacerbate the course of a particular disease.

The "veterinary profession, in large measure, serves the paradigm of the animal owner."¹ Currently, most veterinarians devote their efforts to disease prevention and therapy of domestic animals. Analysis of the origin of diseases found in these animals might enhance our ability to improve the welfare of animals.

In domestic animal populations, some diseases result from the environmental conditions imposed upon animals by virtue of their confinement. Some diseases are "manufactured" by improper management practices. Other diseases in domestic animal populations result from breeding practices which produce defective animals that are genetically predisposed to disease.

Animal Breeding

Currently used methods of breeding animals were first employed in England in the late eighteenth century. In particular, Robert Bakewell, manager of the estate at Dishley is "credited with setting the pattern of modern animal breeding."⁶ Intense inbreeding was the tool for "improvement" of indigenous livestock. Inbreeding reduces vigor and disease resistance. An essential component of a breeding program that considers the welfare of animals involves the exclusion of animals with genetic defects as breeders. In natural breeding populations, harmful recessive genes do not usually accumulate. The recent history of animal breeding has involved selection of unfit animals and the use of breeding methods that accumulate harmful recessive genes that otherwise would have been eliminated in natural breeding populations.

In domestic animal populations, welfare can be enhanced by breeding animals for disease resistance. A consistent effort to select functionally efficient animals for breeding stock is an essential element of animal health. Generally, the best model for a functionally effi-

cient animal is nature's model. Functionally efficient animals, by definition, are more disease resistant. Functionally inefficient animals tend to be predisposed to disease.

The methods used in the 19th century to establish the cattle breeds that are prevalent in the United States were a manifestation of the contemporary Victorian attitude towards animals. This attitude was one of control and domination of animals and the creation of elite purebreds that reflected the breeder's own illusions of aristocracy.⁸ Cattle were subjected to intensive inbreeding techniques that sometimes emphasized traits irrelevant to production, even traits that increased disease rates (example—lack of pigmentation around the eyes of Hereford cattle). However, dogs were the primary targets of this Victorian system that created breeds from “freaks” e.g., dogs with severe morphological deformities.

In this century, there has been a trend to breed cattle with grossly increased muscle mass.⁸ Widespread utilization of caesarean section has allowed development of severely muscular hypertrophied breeds in Europe, e.g., Belgian Blue and Piedmontese, a breed found in northern Italy. Births of Belgian Blue cattle approach a 100% caesarean rate. A significant economic incentive exists for muscular hypertrophied cattle in Europe.

Thus, disease in domestic animal populations has, in many instances, been exacerbated by improper breeding techniques. The best examples of the manufacture of disease by improper breeding are currently found in the pet paradigm. Defective animals, predisposed to breakdown (disease) are a hallmark of the purebred pet industry. Their proliferation has created much of the commerce for “pet repair” veterinary services. Therapeutic remedy for diseased animals can best be characterized as a salvage procedure that is not always doable and is seldom economical in the production paradigm.

Selection of Animals for Disease Resistance

Disease prevention should be a major concern of animal welfarists. Animals fare better when diseases are prevented from occurring rather than when therapy

is applied after disease occurrence. Animals themselves, to a large extent, determine disease outcomes with their own inherent capacity to resist the challenges of diseases.

Genetic resistance to disease is, thus, essential to animal welfare. Early identification and elimination of unfit individuals improves the welfare of the population. Alternatively, therapeutic intervention that prolongs or enhances the reproductive life of defective animals can increase the disease rate in the population.

Beef cattle in the United States are managed under extensive, rather than intensive conditions. The interactions of genotype with extensive management conditions tend to be complex and multifactorial. More consideration should be given to “easy care” cattle production. Natural selection should play a larger role in replacement decisions.⁹ Selection of replacement animals should be made from among those that perform best. Those that do not perform well or those that require therapy or special management practices that are not cost-effective should be eliminated from consideration as breeding animals.

References

1. Ott RS. Veterinary services for animal use in the United States: A conflict of paradigms. *Journal of the American Veterinary Medical Association* 1990;197:1134-1139.
2. Carlson TA. Femoral fracture in a pot-bellied pig. *Agri-Practice* 1994;15:16-19.
3. Lutts RH. The trouble with Bambi, Walt Disney's Bambi and the American vision of nature. *Forest and Conservation History* 1992;36:160-170.
4. Vicchio SJ. From Aristotle to Descartes: Making animals anthropomorphic. In *Animal Intelligence, Insights into the Animal Mind*. Ed by RJ Hoage and L Goldman. Washington, DC, Smithsonian Institution Press, 1986;187-207.
5. Lemam AD. Diagnosis and treatment of food animal diseases. *Journal of the American Veterinary Medical Association* 1988;193:1066-1068.
6. Willham RL. *The Legacy of the Stockman*. Conway, AR, Conway Printers, 1985;82.
7. Ritvo H. *The Animal Estate, The English and Other Creatures in the Victorian Age*. Cambridge, MA, Harvard University Press, 1987.
8. Ott RS. Muscular hypertrophy in beef cattle: déjà vu. *Journal of the American Veterinary Medical Association*. 1990;196:413-415.
9. Hohenboken WD. Bovine nirvana—from the perspective of an experimentalist. *Journal of Animal Science*. 1988;66:1885-1891.