

experience when face-to-face (or face-to-back) with an animal in the zoo. And at what expense to the animal?

It is possible to display animals in settings more suited to their needs than the one described above (Hancocks, 1980). However, even if nearly optimal conditions for the achievement of educational goals could be reached, one can still question whether the value of education justifies the existence of zoos. How can respect for wildlife be instilled through an institution that exploits the object of purported respect? It is just possible that the ultimate educational message transmitted by a zoo, of whatever caliber, is that it is all right to subject animals to the often fatal stress of removal from the wild, all right to confine them, and all right to make sacrifices (the real meaning, not the scientist's euphemism) of them in the hope (or is it rationalization?) that contact with them through bars, glass, or even directly will raise the quality of life and the consciousness of human beings.

The fact that zoos exist is in itself an education. How the animals fit in, as can be seen from this editorial and the three papers to follow, is a matter of opinion.

### Reference

Hancocks, D. (1980) Bringing nature into the zoo: inexpensive solutions for zoo environments, *Int J Stud Anim Prob* 1(3):170-177.

## Productivity and Farm Animal Welfare

Michael W. Fox

In the search for and debate over objective indices of farm animal welfare, productivity is regarded by many animal scientists and others in the livestock industry as the most reliable measure of an animal's overall well-being and adaptability. On the surface, this would seem to be so, as productivity — in terms of growth rate, milk yield, feed-conversion and egg production — can be easily quantified. However, there are serious flaws in this assumption.

An increase in productivity may not be correlated with improved welfare or overall well-being. It may be attributable to genetic selection, higher protein intake, increased photoperiod, or a number of other husbandry and management variables.

A decrease in productivity does not necessarily correlate with a decline in welfare standards or overall well-being. Some husbandry systems are less efficient and their productivity lower because the animals are fed more roughage, for example, or are of a less productive genetic strain. A reduction in calcium or sodium or a decrease in illumination will dramatically depress egg production, while overall welfare is not jeopardized.

High productivity may actually jeopardize an animal's overall welfare, as exemplified by the so-called production-related diseases (Sainsbury & Sainsbury, 1979) of high-yielding dairy cows, as well as fast-growing pigs and broilers.

Antibiotics, growth stimulants, and other drugs may mask health- and welfare-related problems and lead to spurious correlations between welfare and production.

It is as risky to assume that a high production index is indicative of adequate welfare as it is to assume that low productivity is a sign of ill treatment. For example, store-feeding of beef cattle (in which cattle are kept at a low level of nutrition during the winter so that they just maintain their weight and are in good condition to make high rates of gain from grazing the following spring and summer) essentially mimics the natural seasonal cycle of reduced gain in winter, and as Raymond (1980) emphasizes, it is doubtful that there is any evidence that such cattle are under poor welfare conditions during maintenance winter feeding.

Taken alone, productivity cannot be regarded as a reliable indicator of animal welfare. Assessment of animal welfare entails an analysis of many factors, including health status, disease incidence, longevity, reproductive performance, physiological and behavioral indices as well as production records. This is the complexity that makes the science of animal welfare a challenging interdisciplinary subject.

### References

- Raymond, W.F. (1980) *The Laying Hen and Its Environment*. R. Moss, ed., Martinus Nijhoff, The Hague, Netherlands, p. 321.
- Sainsbury, D. and Sainsbury, P. (1979) *Livestock Health and Housing*. Bailliere and Tindall, London, UK.

## Animals in Film and Television

D.B. Wilkins

Animals are entertaining. This undoubted fact has been exploited by human beings for centuries and to the commercial advantage of many people. The ways in which we have exploited both the natural and unnatural behavior of animals have varied from the straightforward exhibition of an animal in a zoo to the perversity of dog-fighting, in which animals are allowed to fight until one or other is killed or badly injured. Entertainment implies both amusement and enjoyment, and it is incredible to realize that even within our so-called advanced Western civilization there still are people who can gain enjoyment from either directly torturing and killing animals or by witnessing animals inflict pain and death upon each other. North America and most countries in Europe have rightly condemned and outlawed bear-baiting, cock-fighting, and dog-fighting. There is no doubt, though, that these last two still have their followers and that organized events take place. The vast majority of people are appalled when they read stories of illegal dog-fights taking place, but is there any real difference in principle between that and bull-fighting in Spain, fox-hunting in Europe or the use of the cinch strap on horses in rodeos in North America? Each of these is a form of entertainment or sport which depends to some degree on the infliction of pain and suffering on animals.

One justification for "sporting activities" such as hare-coursing or dog-fighting is that the animals are behaving naturally. This must be a distortion of the truth as a