

## The importance of measures of poor welfare

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Marian Dawkins makes the important statement that scientists should be involved in the assessment of animal welfare. She emphasises in particular the assessment of animals' preferences and the evaluation of the importance of such preferences to the animals through procedures that force the animals to balance any preference against a cost that must be incurred when demonstrating it. Such studies provide information that can be used in designing better conditions and management methods for animals and hence can be of great value in attempts to improve animal welfare. Dawkins places too little value on direct measures of animal welfare, however. Singer also adopts this position, referring in general terms to such measures as being merely "very indirect ways of understanding what the animals themselves felt about different situations." Thus, both authors ignore or belittle the majority of the essential information concerning animal welfare.

The term "welfare" should refer to a characteristic of an individual at the time under consideration, that is, to its state rather than to anything which is given to that individual. When conditions are favourable, animals regulate their interactions with their environment without difficulty. Under hostile conditions, animals use various methods to try to counteract the adverse effects of those conditions. These attempts to cope can themselves be measured and, if they fail, adverse effects on the animal can be measured. The welfare of an individual is the state resulting from its attempts to cope with its environment (Broom 1986a). Hence welfare varies along a continuum from very good to very poor and can be measured (Broom 1988b). If an individual fails to cope with its environment so that there are substantial adverse effects on its life, then it is under stress and its welfare is poor. Stress is an environmental effect on an individual that overtaxes its control systems and reduces its fitness (Broom 1986a; Fraser & Broom 1990). If the individual succeeds in coping but has great difficulty in doing so, its welfare is again poor.

At present, most of the useful direct measures are of poor welfare, but in the future there may be possibilities for measuring good welfare directly; sophisticated preference tests, like those of Dawkins, are valuable indirect measures. Some measures of poor welfare, such as failure to grow, injuries, signs of severe disease, or high levels of adrenal products, have been used for a long time. Others – such as high frequencies of stereotypies, severely reduced responsiveness, misdirected behaviours, impaired immune system function, or evidence of self-narcotisation using brain opioids – are now being quantified more accurately. Individual variation in the coping methods

used means that although any one indicator can show that welfare is poor, the absence of an indicator (e.g., reduced growth rate) does not mean that welfare is good. A range of indicators must be used in order to identify and quantify poor welfare (Broom 1988b).

The methods for investigating welfare advocated by Dawkins are more suitable for some situations than for others. When welfare problems are short-term (for example, when animals are being handled, transported, or operated on), welfare can be investigated using learning experiments; the first effects of the procedure cannot be measured, however, and some procedures are so unpleasant that the repeated exposure to them in the learning situation that would be needed to assess preferences would be most inhumane. In these circumstances, the actual effects on the animals should be measured. If clear signs of poor welfare are present, the treatment can be criticized on welfare grounds whether or not preferences against it are shown.

Preference studies may sometimes provide incorrect information about either the real preference or the welfare of the animal. An animal that is suffering may not try to avoid the stimuli or situations that are hurting it. There may be other circumstances in which an animal gets its preferences wrong in that it actually chooses something that harms it. As Dawkins mentions, with reference to Timberlake (1984) and Logue (1988), animals sometimes show preferences for immediate apparent gain rather than long-term benefit. The animals' "perceived costs" may be erroneous. This situation does not mean that information from preference studies should not be used but that it should be interpreted with care and considered together with direct measures of animal welfare. Dawkins explains some of the problems associated with her approach and rightly emphasises its advantages when designing both conditions for animals. After designing better systems for the housing and management of animals using preference studies, however, it is still essential to use direct measures of welfare to compare the new systems with the alternatives.

There is a place for measures of animal preferences and for direct measures of welfare in our attempts to understand the responses of animals to their environment and to improve animal welfare. Welfare cannot be assessed by preference studies alone, however; veterinary surgeons' vast knowledge concerning the recognition of signs of injury or ill health and the rapidly increasing number of other indicators of poor welfare must be used, too.