"Behavior as a Tool in the Assessment of Animal Welfare"

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Abstract

A central issue in animal welfare research is how to assess the welfare state of animals objectively and scientifically. I argue that this issue can be approached by asking two key questions: 1) is the animal physically healthy and 2) does the animal have what it wants? Behaviour is used to answer both of these questions. In the assessment of physical health, it can be used for clinical and pre-clinical diagnosis. In the assessment of what animals want, it has a major role through choice and preference testing. It is particularly important that applied ethologists develop methods for assessing welfare in situ--in the places where concern for animal welfare is greatest such as on farms and in zoos. Rather than construct lists of many different welfare indicators and give each of them the same weight, I argue that the assessment of animal welfare should be directed at answering two key questions: 1) Are the animals healthy? 2) Do they have what they want? Behaviour has a major role in answering both. Behaviour is currently used to help answer the first question through its use in the clinical and pre-clinical assessment of pain, injury and disease, and potentially could have an even greater role, particularly if used in conjunction with new technology. Behaviour is also of crucial importance in gauging what animals want, most obviously in the use of choice and preference tests, but also through other methods that are particularly suitable for on-farm welfare assessment. These include quantitative observations of the spatial distribution of animals and of behavioural ' indicators' of what animals want, such as vocalisations.

Keywords: *central, Behaviour, clinical, animal, welfare , vocalisations*

I. Introduction

To qualify and quantify animal welfare, novel assessment tools have been and are being developed, while existing assessment tools are being modified so that they can be applied to multiple species living under different housing and management conditions. The results of such assessments should be reliable, consistent and reproducible. We review the steps that should ideally be taken to develop, validate and apply animal welfare assessment tools. The first step should be to find a definition of animal welfare that the various stakeholders can agree upon. The second step should be to formulate and agree upon a framework for the evaluation of animal welfare. Both theoretical/conceptual frameworks, which provide a structure for research and suggest which facets are considered important, and ethical frameworks, which explicate the underlying moral position, should be considered. Finally, animal welfare assessment tools should be developed and validated based on both the adopted welfare definition and the welfare evaluation framework(s). However, this three-step approach has not always been followed in the development of welfare assessment tools currently in use. We expect that transparency and clarity regarding the underlying definitions and frameworks will increase the likelihood that the resulting welfare assessment tools will give similar weight to the aspects considered relevant to animal welfare, as it helps to specify the aspects that are considered to be key elements of animal welfare. This approach should lead to convergent assessment results and higher correlation of welfare indicators between assessment tools.

II. Methodology

This suggests that as a minimum we will need to make twelve separate measurements, unless some indicators can assess more than one criteria. If we are assessing whether the animal is healthy or not, we may look for evidence of the presence or absence of a number of specific diseases, generally those that are most prevalent for that type of animal in the environment in which they are living. In designing our welfare assessment protocol or scheme we also need to ensure that we do not focus only on the negative aspects of animal welfare, but also include indicators of measures that assess positive welfare states. These have typically received less research attention than negative aspects of animal welfare, until recently. However, these are now starting to be included in welfare assessment schemes, with some schemes specifically focusing on opportunities for good welfare. In order to make the process of welfare assessment simpler, and to reduce the number of separate measures, a goal of welfare assessment is to identify single indicators that integrate information about many areas of animal welfare. These are termed 'iceberg' indicators, after the notion that only the tip of an iceberg is visible above the water, but much more ice is present below the surface. In the same way a small measurement, or the iceberg tip, could be made but this would allow assessment of a much larger or more integrated view of animal welfare.

Although a number of these have been proposed, there is not yet a universally accepted iceberg indicators for welfare assessment.

III. Results

Production indicators are not generally very sensitive to short-term changes in feeding, which means that it may require relatively severe or prolonged hunger to have occurred before the measures are indicative of a welfare concern. Although behavioural indicators may get closest to measuring the state of hunger, and can be very sensitive to availability of food, these are often not feasible to assess in all situations and thus the physical indicator of body condition is often used in assessment schemes. For many species there are already well-validated scales to allow visual assessment of fatness (e.g. in horses, dogs or cattle) or by manual palpation (e.g. sheep or goats), that can be reliably applied to assess this criteria. Absence of prolonged thirst can be a more challenging aspect of welfare to assess through animal-based measures other than through physiological indicators of dehydration, which are often not feasible to apply. However, some physical indicators such as poor skin elasticity (e.g. how quickly the skin returns to normal following a pinch, sometimes called skin tent test) or sunken eyes associated with dehydration may be possible, or the behavioural indicator of motivation to drink when offered water. None of these indicators have shown good validity or reliability in testing and in many assessment schemes assessment of absence of prolonged thirst is measured by the resource-based indicator of access to water.

IV. Discussion

The first criteria seeks to determine if the animal has a suitable resting place, or a bed, in its normal environment, and that it is able to rest when it needs to do so. Animal-based indicators associated with the first of these can be physical (e.g. does the animal have a clean coat which might indicate that it has been able to lie in a clean and dry bed, do they have injuries that may be related to lying on a hard surface) or behavioural (e.g. assessment of lying time or roosting time in poultry, or the ability of all the group of animals to lie simultaneously). The second criteria addresses whether the animals are kept at a suitable temperature for the species and for the age of the animals, for example young animals may need to be maintained at warmer temperatures than adults. Animalbased measures for this criterion could assess temperature of the animal directly (although this is often difficult to do in large numbers of animals) but most focus on the effort that animals need to exert to maintain core body temperature, an indication that the animals are outside their thermoneutral range (the range of temperatures at which the animal can comfortably live without need to use behavioural or physiological means to raise or lower their temperature). Potential indicators could be physical assessments of panting, sweating or shivering, and behavioural measures of huddling together or lying in postures or locations that may help them conserve or dissipate heat.

V. Conclusion

Expression of other behaviours may assess whether the animal shows evidence of stereotypic or other abnormal behaviours, whether the animal is very fearful or seems withdrawn and not engaging with the social environment. Abnormal behaviours can involve very repetitive behaviours that do not appear to have any function (stereotypy), such as pacing, swaying, chewing, walking in circles, jumping up and down (in caged mice), head nodding or twirling or other behaviours that are performed very frequently in the same manner for long periods of time. Other abnormal behaviours might involve the animal licking, biting or chewing parts of its own body, or that of another animal in close proximity, to such an extent that this can lead to injury. A good relationship between the animal keeper and the animal being cared for can be a very important part of animal welfare, as discussed in earlier Units. To assess the quality of this relationship potential animal-based measures can involve testing how close animals are willing to approach a person (either someone they know or a stranger), whether they seek to avoid human contact, and how they respond when approached or touched.

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