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Title: Recognising & assessing positive welfare: developing positive indicators for use in welfare assessment

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Note: Abstract

Recognising & Assessing Positive Welfare: Developing Positive Indicators for Use in Welfare Assessment.

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The use of positive welfare indicators: a proactive approach.

Welfare assessment methods have developed greatly over recent decades with regards to both behavioural and physiological indicators. However, whether welfare is being assessed on the basis of biological function, affective state or 'naturalness', the emphases have remained heavily on identifying those key indicators of poor welfare or welfare concerns that require more immediate action, often via legislative change. The reactive approach in identifying welfare concerns has been the underpinning force behind legislative changes to mould animal management systems into more acceptable arrangements but as consumer interest in food sourcing grows, it is becoming increasingly apparent that acceptable is no longer enough and positive welfare indicators offer a future avenue for developing improved, 'higher welfare' systems in a more proactive manner [1]. The benefits of employing positive welfare indicators as assessment tools offer potential avenues of development for all animal sectors, not just within agriculture. Positive welfare indicators can fall into 3 categories: indications of contentment / pleasure, luxury behaviours, and behaviours that support ability to cope with challenge.

Indications of contentment / pleasure.

Good welfare is not just an absence of negative experiences but also an ability to experience positive affective states. The ability of non-human animals to experience emotions in the same manner as humans remains a controversial topic, however, recent advances in neuroscience have been used to evidence the existence of positive affective states in animals with regards to behaviours such as positive anticipation [2].

Luxury behaviours.

Luxury behaviours are often deemed to be key positive welfare indicators due to them being the first behaviours to be lost during challenging situations. As such, any occurrences have been assigned the 'good welfare' indicator label – if the animal is performing these behaviours then the situation must be of a sufficient welfare level to enable them to. These luxury behaviours have often been considered separate from those 'fundamental' behavioural needs [3] so commonly used to determine minimum requirements in welfare legislation. There is, however, a risk that by focusing on the more urgent 'demand' behaviours, a situation may never be achieved that is high enough for the luxury behaviours to occur. As the luxury behaviours may be indicative of less transparent long-term rewards, their absence could still result in negative or less favourable consequences for the animal involved. The identification of key luxury behaviours for different species could therefore become essential tools in the assessment of good rather than acceptable welfare, and behaviours such as play, allogrooming and certain vocalisations could become increasingly important [4-7]. In the absence of clear indicator luxury behaviours, it may be enough to assess behavioural diversity as a measure of welfare (e.g. using the Shannon-Weaver diversity index) by identifying those systems where a greater spread across the behavioural repertoire is encouraged, a method increasingly employed in zoo collections (McCormick & Melfi, unpublished) [8]. The use of behavioural diversity as an assessment tool can also help to eliminate the risk of over-recording luxury behaviours that are acting as self-rewarding mechanisms in stressful situations.

Behaviours that support the ability to cope with challenge.

It may not be enough to simply identify the presence of behaviours indicative of positive emotions, but focus may also be required on identifying the existence of systems that allow animals to cope. Management systems do not need to be absent of any potential stressors – in fact this could be argued to result in a lack of stimulation – but should enable animals to cope with these acute events in a way

that prevents a chronic stress situation from occurring. As such, the study and assessment of positive indicators of welfare should also include those behaviours / situations that allow coping. Studies in rats have identified that negative affective states are associated with faster startle responses and reduced anticipatory behaviours [1, 9] but investigations into the situations that link positive affective states to coping are limited.

Previous social studies in domestic cattle have focused on the negative perspectives, i.e. dominance and aggression, but no work had been conducted on the potential positive benefits of social bonding. A large, dynamically managed, dairy cattle herd was studied to establish the existence of preferred partners according to proximity scorings. During these initial stages, it was established that heifers (52%, n=34) were significantly more likely to have one or more preferred partners compared to cows (32%, n=12) (X^2 = 8.210, df=1, p=0.004) with relation to the probability of being associated with a particular individual – although it was suggested that this could have indicated that experience of repeated regroupings in cows had caused a dissolution of previously formed bonds.

Following stage 1, commercial regrouping practices continued to affect the possible existence of preferred partnerships. During stage 2, six focal animals, previously identified as having a preferred partners (PP) that they were still housed alongside were separated off from the rest of the group for 30 minutes in a holding pen, either with their preferred partner or with a random individual from within the group. Three separation conditions were studied: 1. Focal animal (A) separated with their PP (B); 2. Focal animal (A) separated with a random individual (C) whilst B is released back to the home group; 3. Animal B separated with a random individual C whilst focal animal A is released back into the group. The heart rates of focal animal A during stage 1 and stage 2, and animal B during stage 3, were monitored using a Polar (Protrainer 5 Equine RS800) heart rate monitor, adapted for use in cattle, at 15 sec intervals. All protocols were approved by a Moulton College ethical committee. Heart rates differed significantly between stages (P=0.001) with focal animals (A) having lower heart rates when separated with their preferred partner (80.2 BPM) compared to being separated with a random individual (82.6 BPM). Interestingly, the partners' heart rates when with a random individual (79.9 BPM) were lower than the focals' in either situation. Although the actual difference in heart rates was small, the distinction was clear and this opens up further areas requiring research with regards to threshold levels beyond which chronic stress becomes physiologically damaging. There is also potential that the presence of any familiar cow could provide some degree of support but that the distinction lay within the level of familiarity.

From these results it can be suggested that some individuals seem to benefit from having their preferred partner present during a potentially stressful situation. It could also be suggested that some individuals are more sensitive to stressful situations compared to others. When developing / assessing dairy management systems, those that support the formation of social bonding and subsequently manage animals in a way that these bonds can be maintained may in turn provide a higher welfare system by improving the coping ability of individuals.

Conclusions

Much emphasis has been placed on identifying indicators of poor welfare but the effective assessment of good welfare is an area gaining momentum both within academia and industry [10]. A wide range of behavioural methods exist that can be utilised as good welfare indicators in all animal management systems but the subtle nature of these indicators requires rigorous validation and development to create systems that can easily be employed by users on site.

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