

# Qualitative Behavioural Assessment and Potential Uses in Veterinary Practice

Can welfare assessment in veterinary practice become a formalised interaction between veterinary practitioner, owner and animal? This editorial discusses the process of qualitative behavioural assessment and considers its application during veterinary consultation and treatment.

## Qualitative Behavioural Assessment

Qualitative behavioural assessment (QBA) assesses holistic welfare using qualitative methods; an animal is observed, and a list of behavioural descriptors is scored according to the observer's subjective interpretation of the animal's demeanour. Descriptors, which can be fixed (from a pre-determined list) or the free choice of the observer ("free choice profiling", FCP), reflect emotional state and should include positive (e.g. joy, inquisitive, engaged) and negative (e.g. introverted, depressed) emotions (Figure 1). FCP captures the most comprehensive behavioural expression and therefore allows the most complete welfare assessment (Wemelsfelder & Lawrence, 2001). Science increasingly acknowledges that an animal's welfare concerns that animal's perception of its own internal state (Ohl & Putman, 2018, p.29), which is in large part determined by the animal's emotional or "affective" state. Behavioural expression is moderated by emotion – it is the qualitative expressions of behaviour, not the mechanical actions an

animal performs, that are important and are the focus of assessment (Wemelsfelder *et al.*, 2000), and therefore QBA is holistic. It considers the whole animal, both physiology and psychology combined, within the context of the time and place of assessment (Wemelsfelder, 2007).

## Animal Emotions and Behavioural Expression

Evidence of animal emotions is debated widely; undoubtedly mammals experience nociception, with overt observable behavioural responses, however researchers and practitioners are divided on whether mammals consciously feel pain. Mendl *et al.* (2010) conceptualised the quadrant model of animal emotion based upon positive or negative valence (the extent of agreeableness or aversiveness of a situation) and high or low arousal (the strength of response or activation). This allows the assessment of behavioural emotional response in both quantitative and qualitative ways. Regardless of a person's scepticism, emotions (the physiological reaction alone or both the physiological reaction and psychological feeling) increasingly play a part in welfare assessment. Traditionally, welfare assessment focused on negative welfare indicators (e.g. stress hormone analysis, poor carcass quality, injury rate), but we increasingly appreciate that animals can express a wide range of emotions, both negative (e.g. fear, sadness, frustration) and positive (e.g. happiness, love, satisfaction) and therefore positive welfare indicators should be equally considered, if not prioritised (Fraser & Duncan, 1998), in any welfare assessment. QBA allows the entire spectrum of emotions to be assessed as the list of descriptors used is

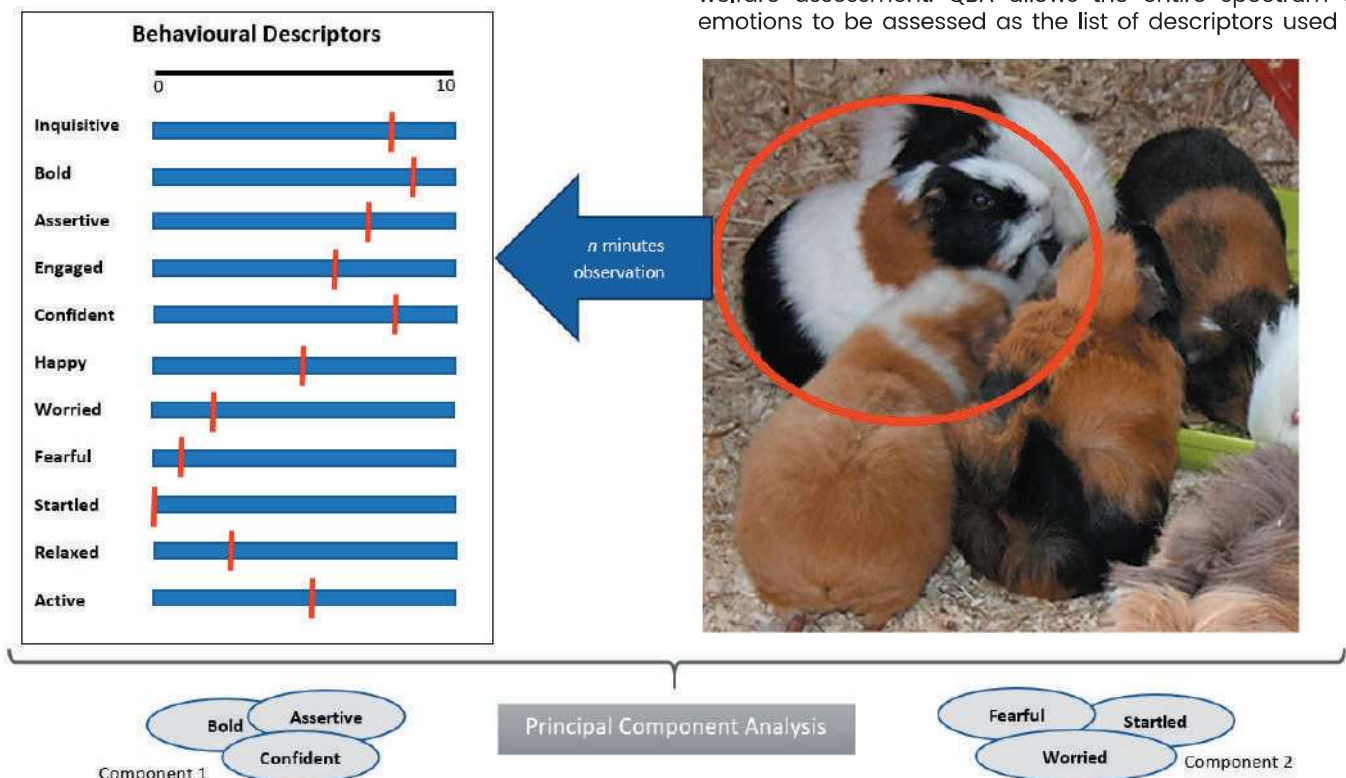


Figure 1. Qualitative behavioural analysis (QBA) process. An individual is observed for some minutes and a list of behavioural descriptors that represent emotional states is derived. The extent to which the individual is exhibiting each descriptor is then scored on a visual analogue scale to give a valid assessment of holistic, individualised welfare. To validate QBA scores for research purposes, principal component analysis is used so that component scores can be correlated between scorers [interobserver reliability] or with multiple physiological welfare indicators like oxytocin and cortisol concentration [validity].

limited only by the assessor's vocabulary. QBA is therefore an extremely inclusive method of welfare assessment.

### QBA Applications Across the Animal Industry

QBA was originally applied in the animal industry by Francoise Wemelsfelder and colleagues (Wemelsfelder, 2007; Wemelsfelder & Lawrence, 2001). Wemelsfelder noted that, when observing an animal, a quality about their behavioural expression, or "body language" was largely overlooked during conventional welfare assessment, which focused on environmental provisions (or deficits in) that could lead to compromised welfare. Welfare is determined not only by an animal's immediate physical environment, but also their early-life experiences and genetics. All are established risk factors for developing behavioural pathology (Rose *et al.*, 2017). However, an animal's personality (or temperament) is also an important moderator of both stress response and disease susceptibility (Cavigelli, 2005). Thus, welfare assessment should be made at the individual level. Unlike traditional personality testing, where a universal list of attributes is assessed within a species, QBA is tailored specifically for an individual; the descriptors are directly relevant and may be unique to that individual.

QBA has been applied to assess farm animal welfare. Pigs (e.g. Wemelsfelder *et al.*, 2012), sheep (e.g. Muri & Stubbsj en, 2017), goats (e.g. Napolitano *et al.*, 2018), cows (de Boyer des Roches *et al.*, 2018), donkeys (Minero *et al.*, 2016) and chickens (de Jong *et al.*, 2010) have been studied and the validity of QBA methodology established as consistency in QBA scores between observers was recorded and QBA scores correlated with multiple physiological measures (e.g. core body temperature, heart rate, cortisol) (e.g. Wickham *et al.*, 2015).

Similar validation occurred when studying dogs (Walker *et al.*, 2016), where researchers found consistency between observers, and validation of QBA descriptors with traditional quantitative behavioural sampling and salivary cortisol. However, Menchetti *et al.* (2019) found inconsistency between QBA and stress scores in shelter dogs, but acceptable inter-observer reliability between veterinary officer and researcher [tester] QBA scores. These studies represent rare applications of QBA to domestic animals relevant to small animal practice; studies on cats, rabbits, hamsters, aviary birds and guinea pigs could not be found. Horses have received some attention (e.g. Minero *et al.*, 2018) where QBA was used to show good welfare was promoted by high-quality human-horse interaction.

### QBA Applications to Veterinary Practice

Given previous applications, is there a role for QBA during veterinary consultation and treatment? Health is specific to an individual and health is a major component of welfare. Given QBA is individualised and holistic, it is proposed that QBA has three potential uses: 1) A diagnostic tool for veterinarians and owners; 2) An indicator of recovery [or lack of recovery] for veterinarians, veterinary nurses and owners; 3) A tool to help determine an appropriate time for euthanasia (Figure 2).

As a diagnostic tool, QBA may aid the identification of a generalised feeling of "illness", which is likely associated with feelings of sadness, discomfort, fear, lethargy, disinterest and timidity. It may also allow specific health concerns, like pain, to be identified. The use of QBA to assess acute animal pain has been criticised (Beausoleil & Mellor, 2011) due to issues with our vocabulary for animal pain and our ability to detect pain. QBA should be used to assess the holistic demeanour of an animal and not just pain in isolation. An animal in acute

pain may still show behavioural changes even if masking the pain. Coupling QBA with other assessment methods may help here, for example the NC3Rs Rabbit Grimace Scale, Glasgow Composite Measure Pain Scale for cats, or Colorado State University Canine Acute Pain Scale. Here the application of QBA may additionally and uniquely capture the animal's own perception and feelings about being in pain. This is useful as pain is associated with secondary emotional responses like depression and sadness, which in turn lead to other health problems. QBA may help predict the likelihood of those secondary problems developing, allowing preventative treatment to take place. Similarly, gait analysis used in farm animal veterinary medicine may be enhanced by applying QBA to determine how being in a pain state is affecting the animal's welfare.

As part of a general application, QBA may raise an alarm that the environment of the animal is failing to provide for that animal's welfare needs, but it does not directly assess how. This would typically be achieved with a traditional welfare assessment method like applying the FAWC five freedoms model. Here specific deficits in environmental provision can be identified once QBA has alerted owner and practitioner to a welfare problem beyond the physical health of the animal. The zoo literature emphasises the use of QBA with established methods to determine behavioural diversity (Rose & Riley, accepted) and integrates QBA into a large-scale audit process where health, behaviour and behavioural descriptors, environmental assessment (physical and social) and nutrition are simultaneously assessed.

QBA may also prove useful when psychological conditions such as separation-related disorders in dogs, eliminatory issues in cats and canine dementia are diagnosed. These conditions may be symptomless initially and are not associated necessarily with any physical health indicators, but they do represent significant welfare issues that need treatment/management. In the case of separation-related disorders, QBA may alert owners and veterinarians to an underlying fearfulness and anxiety, a problematic dependency on the owner and unease at being left. Established anxiety-related behaviours (e.g. destruction, compulsive vocalisations or licking) are difficult to treat even when both pharmaceuticals and behaviour modification programmes are used. Detecting generalised anxiety at an early stage could prevent further complex welfare issues and reduce the risk of the animal being relinquished.

As an indicator of recovery (in acute and chronic cases), QBA may be used to ascertain, not how well (or badly) the animal is responding to treatment, but how the animal feels given or despite the treatment – the joy, relief, and confidence an animal may increasingly show as their recovery progresses are not measurable by any other means; there are no physiological measures (though see Rault *et al.*, 2017, for a review of the use of oxytocin as a measure of positive welfare state). If treatment strategies are particularly harsh and make the animal feel unwell, QBA can help owner and veterinarian determine if continued treatment is ethical. In this way, QBA can effectively alert owners and veterinary practitioners to a quality of life (QoL) issue. Given we cannot rationalise a treatment plan or poor prognosis with our pets (or farm animals) it is important to reflect on the animal's welfare and if treatment remains ethical. QBA can therefore bridge the gap between veterinary opinion and owner denial around treatment types and euthanasia. Many owners may unknowingly prolong suffering and poor welfare, having failed to realise the reduction in their animal's QoL. By applying QBA the veterinary practitioner can review their own

practice and crucially help the owner realise their animal's negative welfare state. The owner may then be more willing to discuss euthanasia or accept that euthanasia is required. Existing successful applications of QBA in the animal industry suggest that the proposed applications in veterinary practice would similarly prove successful. Beausoleli and Mellor (2011) suggest the following criteria for success: 1) Knowledge of species-specific behaviour; 2) Experience interacting with and observing animals in various contexts; 3) Willingness to engage with animals as sentient beings; 4) Adoption of a whole animal perspective to describe how the animal interacts with its environment. Contextual bias (where same demeanour is graded differently in different contexts) (Wemelsfelder *et al.*, 2009) must also be avoided. Observers in the veterinary context (veterinarians, veterinary nurses and owners) would be extensively familiar with the species and typically the specific individual. While veterinarians and owners have been criticised for lacking ethological knowledge prohibiting objective behavioural sampling (where the frequency of event or duration of state behaviours are systematically recorded using standardised protocols) (Christiansen & Forkman, 2007) a strength of QBA is that there is no need to differentiate and judge specific behaviours but subjectively assess the overall demeanour of the animal. Context may be an issue for veterinary practitioners, particularly if the behaviour is assessed outside of the consultation room (e.g. on a farm or in the owner's home). Specifically, this could widen a gap between the veterinary practitioner's welfare assessment and the owner's welfare assessment, particularly concerning quality of life and euthanasia. If the veterinary practitioner is willing to consider emotional expression, that welfare incorporates more than health specifically (while of course acknowledging how important good health is for good welfare) and has experience of the context in which they judge demeanour, QBA application should be both valid and reliable.

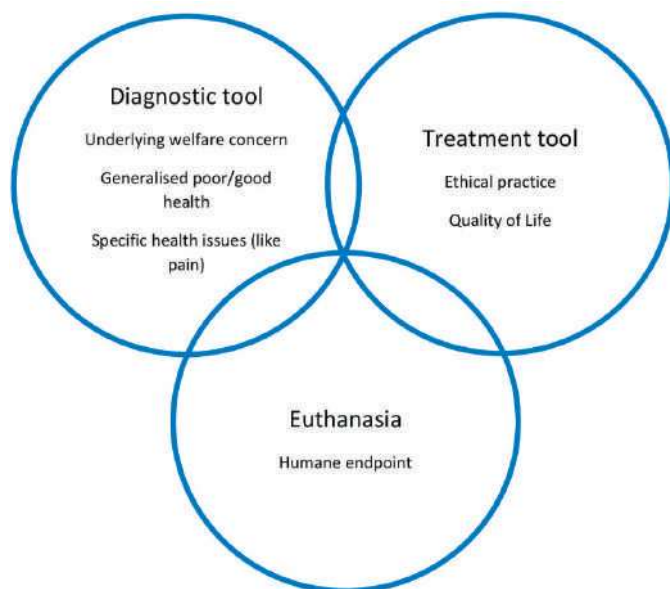


Figure 2: Veterinary applications of qualitative behavioural assessment.

### Conclusion

As our concept of animal welfare progresses, there is increasing need to perform welfare assessment at the level of the individual and consider equally reduced negative welfare indicators and increased positive welfare indicators. While health remains a fundamental component of welfare assessment, the emotions of the individual animal are increasingly important to assess holistic welfare. QBA provides a means of assessing the demeanour of an

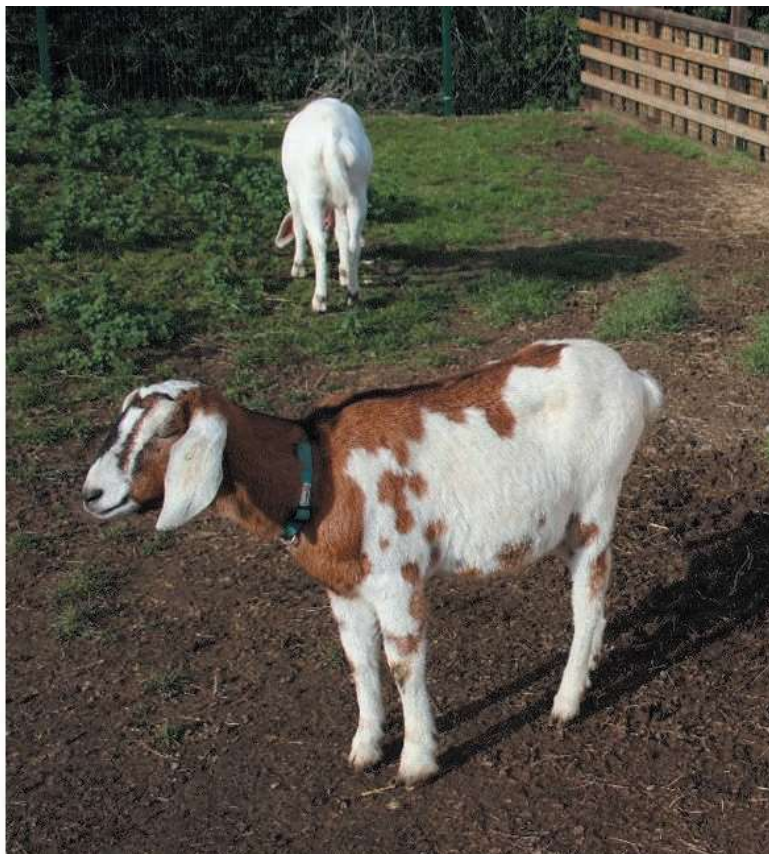
animal to understand how that animal feels about being either unwell or in good health.

Applying QBA during veterinary diagnosis and treatment may alert owners and practitioners to a QoL issue and underlying welfare problem. In this way, QBA may aid further diagnoses and more effective treatment, and promote ethical practice.

Possibly the most useful and powerful application of QBA in veterinary practice is as part of a welfare assessment test battery or audit, where other health and welfare assessment tools are also applied. Knowing not just that an animal is ill but how that animal feels about being ill represents a crucial development in veterinary practice and QBA provides a means to assess this.

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*Using Qualitative Behavioural Assessment can help veterinary practitioners to assess an individual animal's quality of life. Combining QBA with other models of welfare, like the Five Freedoms, helps us assess an individual's welfare within the context of that animal's environment. An inquisitive, engaged and active goat, if housed in isolation, may develop welfare issues that can exacerbate health concerns, but when kept with others, with sufficient space and resource, may experience a good quality of life.*

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