Intra-day variation of Qualitative Behaviour Assessment outcomes in dairy cattle

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Abstract

Qualitative Behaviour Assessment of cattle expression using a fixed rating scale of 20 descriptors is one of the measures of the Welfare Quality® (WQ) assessment protocol for dairy cattle. As for other on-farm measures of welfare, reliability is an important issue especially if farms are to be certified. This study investigated the repeatability of QBA results across three different observation times during the day (early morning, late morning, early afternoon). For this purpose, 13 observers assessed a total of 30 video clips from ten commercial dairy farms using visual analogue scales to score the 20 QBA terms. QBA scores for ‘emotional state’ were computed according to the Welfare Quality® protocol (WQ_QBA) and, additionally, a Principal Component Analysis was carried out. The latter revealed two main dimensions which may be described as ‘mood’ and ‘activity’, the former thus corresponding to the ‘emotional state’ score of the WQ protocol. Both for scores derived from the WQ protocol and from PCA, mixed model analysis for repeated measures revealed a significant effect of observation time depending on the farm. Mixed model analysis for repeated measures revealed a significant effect of observation time for three farms out of ten on both the WQ_QBA score and the PCA ‘mood’ dimension; a similar effect was found for eight out of ten farms for the PCA ‘activity’ dimension. These results indicate that observation time potentially affects WQ (and other QBA) outcomes on a proportion of farms. However, given that outcomes for WQ_QBA and PCA ‘mood’ were consistent for the majority of farms, procedures suggested in the Welfare Quality® protocol may constitute a reasonable compromise between reliability and feasibility. If the QBA assessment should reflect the ‘mean mood’, multiple assessments throughout the day may be carried out.

Keywords: animal welfare, dairy cattle, observation time, Qualitative Behaviour Assessment, reliability, Welfare Quality®

Introduction

Farm animal welfare is becoming an important issue among European consumers (European Commission 2007). In order to accommodate these societal concerns substantial efforts have been undertaken to produce a reliable system to assess animal welfare on-farm that is based on scientific findings (Blokhuis et al 2008). The assessment protocols that were developed within the framework of the EU project Welfare Quality® (WQ) provide such a system for the assessment of animal welfare on-farm. The WQ approach is based on four principles (Good feeding, Good housing, Good health, Appropriate behaviour) and, in total, twelve criteria allocated to these principles. Besides a number of quantitative, mostly animal-based measures, Qualitative Behaviour Assessment (QBA) also forms part of the protocol (Wemelsfelder et al 2009c). QBA is the only measure that is linked to the WQ criterion ‘positive emotional state’ (Welfare Quality® 2009a). The qualitative assessment relies on the ability of human observers to integrate perceived behavioural details into descriptions of an animal’s ‘body language’, using descriptors such as ‘relaxed’, ‘fearful’ or ‘content’ (Wemelsfelder et al 2009c). A large number of studies covering different species, eg poultry (Gallus gallus domesticus): Wemelsfelder et al (2009a); horses (Equus caballus): Fleming et al (2013); pigs (Sus scrofa): Wemelsfelder et al (2009b); buffalo (Bubalus bubalis): Napolitano et al (2012); beef cattle (Bos primigenius taurus): Stockman et al (2012); Wemelsfelder et al (2009c) provides strong evidence that observers consistently distinguish expressive behavioural patterns into dimensions from positive to negative mood, and from low to high arousal within these moods. This first component, in particular, thus provides integrated information which is directly relevant to emotional experience and thus to animal welfare. Qualitative terms describing patterns of behaviour and emotional experience have been used before, eg in the field of animal temperament and personality research (for examples of a review, see Uher & Asendorpf 2008; Meagher 2009). However, the assessment