Inter- and intra-observer reliability of experienced and inexperienced observers for the Qualitative Behaviour Assessment in dairy cattle

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Abstract

Qualitative Behaviour Assessment (QBA) is part of the Welfare Quality® protocol for dairy cattle, although its inter- and intra-observer reliability have not been reported. This study evaluated inter- and intra-observer reliability of the QBA for dairy cattle in experienced and inexperienced observers using videos. Eight experienced observers performed the QBA (20 descriptors) twice for 16 video clips (60 s per clip; series 1) showing 4–17 animals. They assessed another 11 video clips showing herds (4 shots of 30 s per clip; series 2). Ten inexperienced observers performed the QBA on both video series one time. Inter-observer reliability of experienced observers ranged from slight to moderate (both assessments of series 1), and from low to high (series 2) for descriptors, and from slight to moderate for the QBA score. Inter-observer reliability of inexperienced observers ranged from low to moderate (series 1), and from low to high (series 2) for descriptors, and was moderate (both series) for the QBA score. Intra-observer correlations varied largely per descriptor and observer. They were both negative and positive, and ranged from low to very high. High correlations, however, were not necessarily associated with low paired differences. Values of half of the descriptors and the QBA score differed amongst experienced and inexperienced observers. The QBA appears insufficiently reliable as a tool for welfare assessment in dairy cattle.

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

Introduction

Worldwide, consumers are increasingly concerned about the welfare of farm animals. European consumers, for instance, expect their food to be produced and processed with a significant attention for animal welfare (Blokhuis et al. 2003). To meet consumer requirements, various on-farm welfare schemes have been developed to assess and improve farm animal welfare (Blokhuis et al. 2003). Recently, an on-farm welfare assessment protocol for dairy cattle was developed within the European Welfare Quality® project. This protocol contains several measurements of which the outcomes are used in a three-step multi-criteria evaluation model to enable the assignment of dairy herds to one of four welfare classifications (not acceptable, acceptable, enhanced, and excellent) (Welfare Quality® 2009). A specific measurement within this on-farm assessment protocol is the Qualitative Behaviour Assessment (QBA). In the Welfare Quality® Assessment protocol (WQ protocol) for dairy cattle, the QBA is the only measurement that is linked to the criterion ‘positive emotional state’ (Welfare Quality® 2009). The QBA is a qualitative measurement that records the expressive quality of behaviour (Welfare Quality® 2009). In other words, how animals interact with herd mates and with their environment, which is visible by their ‘body language’ (Wemelsfelder et al. 2006). The QBA, as used in the WQ protocol for dairy cattle, consists of 20 descriptors, e.g. active, relaxed, fearful and happy, that are valued on a rating scale (Welfare Quality® 2009).

Measurements in an on-farm assessment protocol that will be used for certification of farms or farm products must be valid and reliable (Knierim & Winckler 2009). Measurements are reliable if they are precise and consistent (Martin & Bateson 1993). For observers, a differentiation can be made between two aspects of reliability: inter-observer reliability and intra-observer reliability. Inter-observer reliability measures the extent to which two or more observers achieve the same results when measuring the same observation (Martin & Bateson 1993). Observer reliability was tested for several welfare measurements from the Welfare Quality® project for cattle (Windschnurer et al. 2008; Bokkers et al. 2009; Plesch et al. 2010), but little is known about the inter- and intra-observer reliability of the QBA in dairy cattle. In one study involving four observers experienced in cattle behaviour and handling, none of the descriptors reached...