Using qualitative behaviour assessment to explore the link between stockperson behaviour and dairy calf behaviour

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ABSTRACT

Dairy farming usually implies close and frequent contact between the stockperson and the animals. A good human–animal relationship (HAR) is therefore essential for good animal welfare. To fully understand the quality of the HAR both the stockperson behaviour and the animals' reaction to the handler needs to be assessed, as they mutually affect each other. Qualitative behaviour assessment (QBA) has during the last decade become a method to assess animal welfare through scrutiny of animal body language. The application of this method to characterize stockperson behaviour, on the other hand, is novel. This study aimed to, through the use of QBA, to characterize stockperson behaviour and to portray the body language dairy calves of the animals in his/her care. Further, the study tested the relationships between stockperson behaviour and calf behaviour using structural equation modelling (SEM). The assessments were performed in 2006–2008 on 110 Norwegian dairy farms. The stockperson sample consisted of 79.6% males and 20.4% females, with a mean age of 46 years. The dairy calves (including young stock) were mostly Norwegian Red and were 3 to 298 days old at the day of observation. Ten items of the stockperson QBA were analysed through Principal component analysis. The handling styles that emerged were termed calm/patient, dominating/aggressive, positive interactions and insecure/nervous. The 31 items of the calf QBA were also analysed using principal component analysis and revealed two dimensions of calf behaviour labelled pos/neg mood and high/low arousal. Based on the expected relationships between stockperson behaviour and calf behaviour a structural model was developed and tested using SEM. The analysis revealed that stock-persons who handle their calves patiently and pet and calmly talk to them during handling have animals with higher levels of positive mood, as characterized by high scores on QBA items like friendly and content. Stockpersons with a nervous handling style, or who were dominating and aggressive, on the other hand, had calves with more negative mood. These findings are important as they show the direct link between human behaviour and calf behaviour and once again confirm the significance of good stockmanship. The results also highlight the importance of proper training and self-awareness for those working with livestock.

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1. Introduction

1.1. Human–animal relationship

In dairy farming, the stockperson is in frequent and close contact with his/her animals during procedures such as

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[1] Sadly passed away during the course of the project.

milking, cleaning and inspection. This is especially true for a country like Norway where production units are small (average dairy herd size is in 2013 was 24 cows (Statistics-Norway, 2013) and animals are kept indoors most of the year.

A good human–animal relationship (HAR), here defined as "the degree of relatedness or distance between the animal and the human, i.e., the mutual perception, which develops and expresses itself in their mutual behaviour" (Estep and Hetts, 1992, p. 6) is therefore fundamental to good animal welfare. A vast number of publications have been dedicated to the topic of HAR in various species, including companion (e.g. Marinelli et al., 2007; Ellingsen et al., 2010) and productions animals (e.g. Coleman et al., 1998; Waiblinger et al., 2002; Breuer et al., 2003). What is generally found, is that animals having a positive bond with their caretaker are safer and easier to handle, while lack of habituation to people, as well as negative handling with shouting and hitting leads to poorer animal welfare, more fear, acute and chronic stress (Hemsworth et al., 2000; Hemsworth, 2003; Simensen, 2004) and reduced reproduction (Hemsworth et al., 1986). Studies have also shown that a negative HAR leads to decreased milk yield and increased residual milk in dairy cattle (Rushen et al., 1999; Waiblinger et al., 2002). On the other hand, calm touching and talking to cattle during milking leads to higher milk yield (Hemsworth and Coleman, 1998).

It has been known for some time that a major factor influencing the HAR is the nature of the daily interactions between the stockperson and the animal (Hemsworth et al., 1981a,b), as stockperson behaviour determines the animals' reaction towards humans (Waiblinger et al., 2006). During the last decades a great deal of work has therefore been done in the area of HAR and animal welfare assessment in production animal species (e.g. Rushen et al., 1999; Waiblinger et al., 2006; Bertenshaw et al., 2008; Windschnurer et al., 2008; Welfare Quality, 2009). In this process a method called qualitative behaviour assessment (QBA) has undergone extensive testing and is proving a time efficient and valid addition to a number of these animal welfare assessment protocols.

1.2. Qualitative behaviour assessment

QBA is an integrated assessment of the whole animal where the animal's body language is evaluated as an indication of the animal welfare state (Wemelsfelder and Lawrence, 2001). Originally the QBA was developed by the use of spontaneous judgements in a process called Free Choice Profiling. Untrained personnel were asked to observe animals for a period of time and then write down the behaviours or mental states they felt best described the animals' status. The observers showed high agreement and the method had good repeatability and correlated well with other behavioural and physiological measures of animal welfare (Wemelsfelder and Lawrence, 2001). The scale was then further developed to a pre-fixed list of descriptors containing words like happy, content, nervous, frustrated and aggressive, as seen in Welfare Quality® (Wemelsfelder et al., 2009a). The QBA has been validated on a wide range of species including veal cattle

and calves, dairy cattle (Rousing and Wemelsfelder, 2006; Wemelsfelder et al., 2009a), horses (Napolitano et al., 2008), pigs (Wemelsfelder et al., 2001) and dairy buffaloes (Napolitano et al., 2012). Using QBA to describe stockperson behaviour, however, is a novel way of characterizing handling styles.

1.3. Aims

Using QBA on stockperson behaviour, this study aimed to characterize different handling styles of stockpersons interacting with their dairy calves and young stock. Using Qualitative Behaviour Assessment on the dairy calves, we also set out to portray the body language of the animals. Haskell et al. (2003) suggested the use QBA to evaluate the response of dairy cows to humans and Brscic et al. (2009) stated that QBA may be sensitive to the quality of human contact. The final aim of the study was therefore, using structural equation modelling (SEM), to develop and test a model showing how stockperson behaviour correlates with the behaviour of the animals.

2. Materials and methods

2.1. Data collection

The current study is based on qualitative behaviour assessment of stockperson and dairy calves, including young stock up to 10 months of age, conducted on 110 Norwegian dairy farms between January 2006 and March 2008. All behaviour registrations were carried out by the same observer, an experienced livestock inspector and agricultural advisor. Farms were randomly selected from a list of dairy producers covering pre-defined regions of Southern Norway. All selected farms were members of the Norwegian Cattle Health Recording System (NCHRS). NCHRS commenced nationally in 1975 (Østerås et al., 2007) to guide farmers in management related issues, including feeding and breeding. Membership is not mandatory, but 98.5% of the Norwegian dairy herds regularly report milk yield, disease occurrence and treatment of individual animals (Tine, 2012). The stockperson that participated was the one who on a daily basis managed the farm's calves and young stock.

The stockperson sample consisted of 88 (80.0%) males and 22 (20.0%) female, with a mean age of 46 years (SE ± 0.04). 87 (79.1%) participants were married or had a partner and 58 (52.7%) had children. 13 (11.8%) of the respondents had primary school as their highest level of finished education, 73 (66.4%) had completed upper secondary school and 14 (12.7%) had university college or university degrees. Educational information was missing for 10 (9.1%) of the sample. The stockpersons were generally very experienced with dairy calves, as mean years of experience was 24.5 (SE ± 1.22).

The vast majority of the calves included in the QBA were Norwegian Red. Remaining calves were Norwegian Red cross breeds, Jerseys, Simmental, or the local breeds Norwegian Red Polled Cattle and Blacksided Trønder and Nordland Cattle. The mean number of calves and young stock on the farms that were included in the study was 31