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Animal health and welfare planning improves udder health and cleanliness but not leg health in Austrian dairy herds

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ABSTRACT

Animal health and welfare planning is considered an important tool for herd management; however, its effectiveness is less well known. The aim of this study was to conduct animal health and welfare planning on 34 Austrian dairy farms and to evaluate changes in health and welfare after 1 yr. After an initial assessment using the Welfare Quality protocol (Welfare Quality Consortium, Lelystad, the Netherlands), results were reported back to the farmers. Health and welfare area(s) in which both the farmer and the researcher regarded improvement as important were discussed. Management practices and husbandry measures were chosen according to the respective farm situation. One year after interventions had been initiated, farms were reassessed, and the degree of implementation of improvement measures was recorded. The average implementation rate was 57% and thus relatively high when compared with other studies. High degrees of implementation were achieved related to cleanliness and udder health, at 77 and 63%, respectively. Intervention measures addressing udder health were mostly easy to incorporate in the daily routine and led to a reduced somatic cell score, whereas this score increased in herds without implementation of measures. The decrease in cows with dirty teats was more pronounced when measures were implemented compared with control farms. The implementation rate regarding leg health (46%) was comparably low in the present study, and leg health did not improve even when measures were implemented. Lying comfort, social behavior, and human–animal relationship did not require interventions and were therefore seldom chosen by farmers as part of health and welfare plans. In conclusion, the structured, participatory process of animal health and welfare planning appears to be a promising way to improve at least some animal health and welfare issues.

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INTRODUCTION

High levels of animal health and welfare are important for successful dairy cattle farming. However, health concerns such as lameness and mastitis have repeatedly been described during the last decades. Several studies indicate that foot and leg health (e.g., prevalence of lame cows) is at an unacceptable level (Whay et al., 2003) and has not improved appreciably during this time (Clarkson et al., 1996; Haskell et al., 2006; Dippel et al., 2009). Furthermore, levels of milk SCC and mastitis incidence are both relevant for welfare and farm economics (Huijps et al., 2008), thus emphasizing the importance of improving udder health (Green et al., 2007; Ivemeyer et al., 2008, 2012). The substantial between-farm variability of these health problems indicates that achieving or maintaining a high health state is possible within existing systems.

Improvement in health and welfare may be facilitated by approaches based on education, enforcement (i.e., legislation), or encouragement (Whay and Main, 2010). Advisory activities in livestock production have frequently been based on the dissemination of knowledge in a top-down approach and on providing technical information for improvement (Whay and Main, 2010). However, more recently, participatory involvement of the farmer has been considered crucial for successful interventions (Whay and Main, 2010; Main et al., 2012). For instance, the fact that a lameness control plan was only poorly implemented in UK dairy farms could be attributed to insufficient integration of farmers (Bell et al., 2009). On the contrary, encouraging farmers to take action to improve undesirable health and welfare states has proven successful in the past with respect to udder and leg health. For example, providing information on how to tackle lameness and supporting farmers in formulating a farm-specific lameness action plan rather than imposing predefined control measures by the researchers resulted in a decrease of lameness

prevalence by approximately 12 percentage points in UK dairy herds (Main et al., 2012). Similarly, in a 2-yr study among 65 Swiss dairy farms, when farmers were included in the development of suitable improvement measures, treatment incidence of mastitis decreased by about one-third without deterioration of udder health (Ivemeyer et al., 2008).

Animal health and welfare planning constitutes an approach to integrate farmers' participation and encouragement. It was first introduced into British farming (Sibley, 2002) and made compulsory in most UK assurance schemes commencing in 2000 (Main et al., 2001). Several intervention studies (e.g., Bennedsgaard et al., 2010; Brinkmann and March, 2010; Ivemeyer et al., 2012) also applied the animal health and welfare planning approach. These studies emphasize the initial assessment and evaluation of health and welfare by an external person, implementation of farm-specific measures, and constant review and adaptation of measures as key aspects. The structured process includes farmer ownership of goals and measures, involvement of all relevant people, and the acknowledgment of good aspects on the farm (Vaarst et al., 2011; Tremetsberger and Winckler, 2015).

Until now, attempts to improve dairy cattle health and welfare have focused on the reduction of negative health states. However, the scientific concept of animal welfare reflects a comprehensive view, including the animals' emotional state (Duncan, 1996) and their ability to behave naturally (Fraser et al., 1997). On-farm studies addressing welfare improvement in terms of the animals' behavior such as human–animal relationship (**HAR**) and social behavior are rare, however. To our knowledge, so far only Gratzer (2011) has considered these aspects in dairy health and welfare planning.

The aim of the present study was to carry out animal health and welfare planning on 34 Austrian dairy farms and to evaluate changes in a range of indicators that reflect the multidimensional nature of animal health and welfare.

MATERIALS AND METHODS

Study Design and Farm Selection

The study was conducted from December 2011 to April 2013 on 34 dairy farms in 3 federal states in Austria (Lower Austria, Upper Austria, and Styria). Because the aim was to motivate farmers to implement improvement measures, farmers had to express initial motivation to take part. Recruitment of farms took place through various channels: in 3 districts in Lower Austria, farms were provided with a one-page information leaflet distributed by the milk recording service or by 3 veterinary surgeons. Farmers interested in participating could then approach the researcher directly. Within each region, some farms were included in the study after they had been informed by participating farmers, following a so-called snowball approach (Micheel, 2010).

All participating farms were family-run and averaged 39 ± 21 ha (mean ± SD) in size. On all farms, dairy cows were kept in cubicle housing systems (average age of the housing system: 9.1 ± 5.3 yr). Cows did not have access to pasture, but 11 herds had permanent access to a concrete outdoor run. The predominant breed was Austrian Fleckvieh, with 25 herds consisting of more than 90% of this breed. The remaining 9 farms kept either Holstein Friesian (2 farms), Brown Swiss (3 farms), or a mixture of all 3 breeds (4 herds).

Data Collection

During the study period, 3 visits in total to each farm took place. Data collection was carried out by one researcher (LT). The baseline health and welfare status was assessed during the first farm visit (winter 2011–2012; year 0). A second farm visit 55 ± 26 d (mean ± SD) after the initial assessment was used for developing the animal health and welfare plan (winter/spring 2011–2012; see below), during which improvement measures were initiated (i.e., health and welfare planning). Final data collection took place 423 ± 29 d after the health and welfare planning visit (year 1). On average, 368 ± 11 d elapsed between the health and welfare planning visit and the final visit.

Data collection was based on the Welfare Quality assessment protocol for dairy cattle, which relies, largely, on animal-based measures (Welfare Quality, 2009). The measures can be grouped into parameters assessed directly on the animal (observation of social behavior, avoidance of an approaching human, and clinical examination of the animals) or assessed through routinely collected herd data (e.g., milk SCC, mortality rates). A detailed description of the assessment procedure and the definitions of the parameters can be found in Welfare Quality (2009). Beyond the Welfare Quality assessment protocol, data collection was complemented by indicators of metabolic health (e.g., percentage of animals with a milk fat:protein ratio >1.5 as indicator of risk of ketosis; Table 1). This was done to collect detailed information about herd health status needed for detailed feedback on the farms. Similarly, dirtiness of teats was recorded more in detail (slightly and severely dirty teats) to be more precise in discussing possible interventions for increasing teat cleanliness. Additionally, SCS and the percentages of animals with a SCC >100,000 and >400,000 cells/mL, respectively, were