Measures to monitor and improve claw health, lameness and animal welfare in Austrian dairy farms

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Summary

Good claw health is a prerequisite for safeguarding animal welfare as well as efficient and economic dairy production. In Austria, since 2006, veterinary diagnoses related to claw alterations and diseases of the lower limb are routinely recorded in the central cattle database (RDV) together with other production disease diagnoses. However, different studies showed that the veterinarian diagnoses mostly cover records of cows with severe claw disorders. In contrast, data from claw trimming proved to be a valuable source of information to map claw health in a more comprehensive and continuous way. With the aim to improve claw health and animal welfare efficiently, data pipelines for claw trimming data, cow individual data on lameness and other animal-based welfare indicators related to leg health in Austrian dairy herds are currently being established within the project “Klauen-Q-Wohl”. This program was initiated by the Federal Association of Austrian Cattle Breeders (ZAR) in cooperation with the Federal Association of Austrian Claw Trimmers (AÖK).

Data logistics are being established that allow a detailed documentation by the claw trimmers as well as recording claw trimming information on a more general way by the farmers. This information is incorporated in a scheme to monitor welfare and to advice on measures for improvement.

The tool to improve claw health and welfare with focus on claw health and lameness related welfare aspects is based on farm individual risk factors and results from benchmarking. The so far established infrastructure for ICAR-standardized, electronic documentation of claw trimming data enables claw trimmers to send claw disorders by a single click via an interface to the RDV. Next to this, the infrastructure allows claw trimmers to recall animal information covering animal-ID, lactation number and stage of their supervised farms to their claw documentation software before trimming. This feature accelerates electronic documentation and ensures correct animal identification. So far, forty trained and certified claw trimmers have joined the project.

First experiences indicate that the advice provided to farms as well as farm management gains in quality. Once the data has been stored in the RDV, the farmer has access to this data via online herd management programs and/or a mobile app at all times. Claw health and other welfare-related data will be used to provide practical herd management solutions for farmers to promote the improvement of animal health as well as for breeding value estimation for claw and claw-related health traits.

Keywords: claw health, animal welfare, lameness, claw trimming, herd management, decision support, data logistics, advisory tool, risk factors.

Introduction

Good claw health is a prerequisite for safeguarding animal welfare as well as efficient and economic dairy production. In Austria, claw diseases rank among the most frequent causes of culling in dairy cows, i.e. about 8% in 2018 (ZuchtData, 2019). Costs of lameness have been estimated to amount to up to 450 Euros per lame cow and year (Kofler, 2015). Healthy claws are thus not only important for animal welfare, but also of economic significance. An important success factor for targeted measures to improve claw health and welfare are data. Data from claw trimming has proved to be a valuable source of information to map claw health in a comprehensive and continuous way (Heringstad *et al.*, 2018). Lameness records are valuable auxiliary traits for early detection of claw health problems, but can also be used for genetic improvement of claw health (Koeck *et al.*, 2019). Digital programs for the documentation of claw trimming events offer an important basis for monitoring of claw health in cattle. The immediate analysis of the data brings benefits for claw trimmers and their supervised farms (Kofler, 2013). In Austria, various educational institutions offer certified training programs for claw trimmers. Electronic documentation of the findings has already become a fixed part of these training programs. However, the acceptance of these software solutions has lagged behind the potential so far. As a response to the increasing consumer awareness regarding animal welfare and health, on-farm assessments are of high significance to safeguard animal well-being. The choice of the parameters plays an important role in the quality of the assessment of the animals' welfare status (Winckler, 2019). The project "Klauen-Q-Wohl" has been initiated to set up national data pipelines and to develop targeted tools to improve claw health and animal welfare in Austrian dairy farms. The paper describes the steps taken to achieve these aims.

Approach: the Project Klauen-Q-Wohl

In 2017, the Austrian project "Klauen-Q-Wohl" started. The title represents the two main working areas focusing on claw health and claw health related animal welfare indicators in dairy cattle. The aim of the project is to develop an infrastructure for electronic documentation of ICAR-standardized claw trimming data, lameness and claw health related animal welfare indicators and new practical tools and benchmarks for herd management and animal welfare. The multi-disciplinary project team builds a bridge between science and practice: Representatives from the Federal Association of Austrian Cattle Breeders, Federal Association of Austrian Claw Trimmers, performance recording organisations, animal health organisations, provider of software solutions as well as practitioners (claw trimmers, farmers). The participative approach aims at achieving the highest possible practicability, dissemination and acceptance of the results.

Measures

Central database

To enable comparisons between farms and genetic evaluation, it is important that data are centrally available. For improvement of claw health in terms of prevention, herd management and genetics as well as for monitoring of claw health and welfare, it is important that the claw health data can be linked to production data from the central cattle database (RDV). As the RDV is the common comprehensive cattle database in

Austria, the logistics for recording claw health and welfare within Klauen-Q-Wohl and agreements for data processing, according to the general data protection regulation, is based on the RDV.

Documentation and data recording of claw trimming data

Claw trimmers

An interface has been set up between the RDV and the claw trimming software program Klauenmanager. At the same time, ICAR-standardized definitions of claw disorders have been established on both sides. In order to advance documentation, claw trimmers are being financially supported in purchasing hardware and software. In return, they send the documented claw trimming data to the RDV. In the beginning of 2019, the project involved nearly 40 certified claw trimmers, who actively provide documentation to their farmers. To ensure data quality, regular training sessions including comparison of observers are held. The Klauenmanager program offers very precise documentation of foot and claw disorders (all ICAR claw lesions) covering severity and location on cow, leg and claw zone level as well as trimmed cows without disorders (scored healthy).

Farmers

A large number of farmers in Austria trim their cows' claws by themselves. Furthermore, there are claw trimmers who are not interested in the documentation, even if their farmers demand it. For this group of farmers the performance-testing organisation offers a herd management app and computer program with access to the animal list, which can be used to record claw trimming information at a more general level (main ICAR claw lesions). Data processing takes place directly within the central cattle database. A more attractive online and offline app especially for claw trimming practice is currently being developed.

Veterinarians

Veterinary diagnoses related to claw diseases are routinely recorded in the central cattle database (RDV) either electronically by the veterinarian or by the performance recording organisations. The diagnosis code currently covers only four claw-related diagnoses. The integration of the ICAR claw lesions in the RDV will also enable veterinarians to document claw diagnoses in a more precise way.

Documentation and data recording of lameness and claw health related animal welfare indicators

The measures to monitor claw health related animal welfare indicators cover the following areas:

- Animal-based welfare parameters: This includes parameters such as lameness scoring, BCS, claw position score, alterations of integument, cleanliness of upper and lower limb and production traits like fat/protein ratio.
- Management- and resource-based parameters which are also referred to as risk factors cover parameters such as stocking density, claw trimming interval, hygiene, feeding regime, access to pasture as well as descriptors of the housing equipment (e.g. cubicles, floor properties).

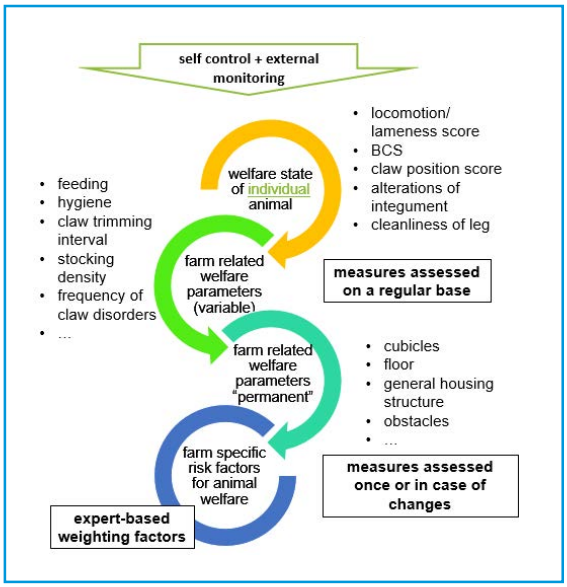

Figure 1. Different measures and factors aimed at assessing and improving animal welfare.

Some of the welfare measures mentioned above are assessed regularly while others are assessed only once or in case of changes (see Figure 1). For some welfare measures, existing data stored in the central cattle database are going to be used. Data logistics are being established that allow assessing animal welfare and other farm related parameters via mobile app and software programs.

Tools to improve claw health and welfare

Based on the recorded information the current situation of the farm in regard to claw health and animal welfare can be assessed and monitored. Benchmarks to compare farms and claw trimmers across their trimmed herds will be provided in near future. A tool supporting analysing risk factors and developing targeted measures for improvement is under research.

Current state

The data flow shown in Figure 2 shows that the efforts in the project are successful. In March 2019, approximately 5000 claw-trimming records have been submitted to the RDV, and the trend is increasing. The main seasons for claw trimming are autumn and spring, which is well indicated by the shape of the curve. With increasing public relations activities and the provision of technology for documentation, the willingness of farmers for electronic documentation also increases.

The data interface described above is not a one-way street. Claw trimmers have the possibility to recall the daily updated animal-ID list of their farms. Benchmarks between claw trimmers and across their trimmed herds will be provided in near future. Once the data has been stored in the RDV, the farmer has access to this data via online herd management programs and the mobile app at any time. A claw health module embedded in the existing herd management program for farmers and veterinarians,

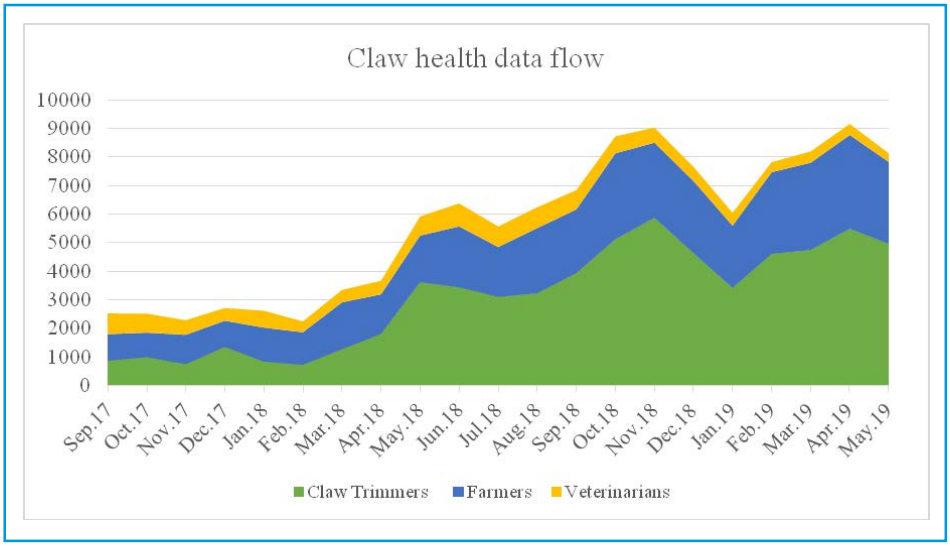

Figure 2. Monthly claw health data flow electronically documented by claw trimmers (including historic data), farmers and veterinarians, and sent to the Austrian central cattle database (RDV) since the start of the project "Klauen-Q-Wohl".

processing data from various sources, with evaluations within and across herds is already being programmed. Based on literature findings and expert opinion, a risk factor tool has been developed, which is currently being tested using the data from several pilot farms. As visualised in Figure 1, the state of individual animal welfare as well as farm related welfare parameters and benchmarks feed into this tool. In order to be able to better reflect the individual farm situation (strength/weakness), the evaluations take the results of claw trimming (predominantly infectious or non-infectious diseases) into account. This practical herd management solution, designed for farmers (self-control) and advisors (external monitoring), is intended to promote the improvement of claw health and animal welfare in Austrian dairy farms. The valuable data basis generated within the framework of project "Klauen-Q-Wohl" will be used for breeding value estimation for claw and claw related health traits to additionally support long-term improvement of animal health.

Conclusion

Considering the frequency of claw disorders in dairy herds worldwide, prevention and early detection of claw disorders is an important welfare topic. Documentation and central recording is the precondition for monitoring claw health and animal welfare. Central availability of data is needed for benchmarking and very valuable for targeted prevention and improvement programs. Above all, central data processing avoids double recording and enables synergies in use of data e.g. data for claw health and welfare assessment can also be used for genetic evaluation.

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