

Characteristics of different welfare assessment tools and use of milk quality parameters for welfare detection of dairy cows

Partners

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Background

The welfare of production animals has risen as a growing concern for consumers, producers and legislators alike in the past decades (e.g. Eurobarometer 2016). To provide tools for improving the living conditions of farmed animals, many national governments and the European Community have initiated actions that aim at developing standardized tools to assess the welfare of farm animals and to convey that information to different stakeholders. For instance, in the European Welfare Quality[®] (WQ) project welfare assessment protocols were developed for pigs, poultry and cattle (Blokhuys et al. 2013). The WQ protocols apply the latest scientific knowledge on animal welfare, including the emphasis on animal-based measures (ABMs). However, conducting the assessments is very laborious and time consuming (e.g. de Jong et al. 2014, van Eerdenburg et al. 2014).

Some effort has been put in the welfare scheme to combine parts or ideas of the WQ to existing health or welfare evaluation systems, and to utilize data that is otherwise routinely or automatically collected. Indirect or “iceberg” indicators of welfare, possibly ABMs that are easy to perform, could reduce the time used for welfare assessment and work as tools for early detection of problems (Heath et al. 2014). These kind of welfare indicators could include for instance milk yield (Coignard et al. 2014) and properties such as somatic cell count, fat and protein content, fertility and mortality figures of the herd (Sandgren et al. 2009), and qualitative behavioral assessment (Andreasen et al. 2013). For instance, Coignard et al. (2014) found that while milk yield is not directly associated with overall welfare as assessed with WQ in French dairy herds, some welfare components such as occurrence of aggressive behavior and negative emotional state were connected to lower milk yields.

In the LETKA-project (Health and welfare of dairy cows in Finland and their relationship with farm profitability, University of Eastern Finland and Natural Resources Institute Finland), it was recently discovered that the welfare assessment included in the Finnish healthcare scheme for cattle (Naseva) does not give compatible results on

the welfare of dairy cattle when compared with Welfare Quality. The further development and modification of the Naseva system is currently in planning, and experience and insights from other national welfare assessment projects are very valuable in this work.

The Italian National Animal Welfare Reference Centre (CReNBA) has developed a welfare assessment system for dairy cattle that, similarly to the Finnish system, is conducted by veterinarians (Bertocchi and Fusi, 2014). The evaluation takes a maximum of half a day to be conducted and considers the different animal groups (lactating and dry cows, young stock) at the farm. Currently a study is being conducted at CReNBA that looks for milk quality parameters that would correlate with the welfare of dairy cows. A similar database, including welfare results with WQ and milk yield and quality along with fertility measures from dairy herds will be analyzed in the Finnish LETKA-project.

Results from these studies could in the future help to develop automatic monitoring systems of ABMs at farm level. These devices, integrated for example in automated milking systems, could be used to give warnings and recommendations concerning the welfare of the herd and help the farmer to make informed decisions in the farm management, such as changing the feed composition or litter management.

The current search for animal welfare indicators and new technological solutions for the welfare assessment and improvement process has led to a wealth of research, but also many different animal welfare evaluation systems being used in Europe and globally. There is thus a need for more understanding and dialogue between the different systems as well as stakeholder and developer groups to improve harmony and to find the most efficient methods for welfare assessment.

Aims of STSM

The main aims of the scientific mission were to:

- Exchange knowledge and experiences on different welfare evaluation methods
- Compare welfare evaluations of dairy cattle in Finland and Italy
- Look for milk quality parameters and other animal based measures that have a connection with animal welfare
- Learn how to use and analyze the milk parameter data
- Invoke collaboration between research groups with the same scope of interest

Activities conducted during the STSM

- Getting to know CReNBA welfare assessment protocol for dairy cows through farm visits and discussions with CReNBA researchers
- Sharing results from Finland: Welfare Quality results and comparison with Naseva (Finnish national health and welfare protocol)
- Welfare Quality assessments on six Italian dairy farms, where also CReNBA protocol was applied on the same day
- Participation in training of veterinarians for CReNBA veal calf welfare assessment

- Participation to a meeting led by CReNBA's staff for using expert opinion elicitation for risk assessment applied to the welfare of fattening pigs
- Visit to the IZSLER milk laboratory with introduction to the different services and analyses for farmers and companies, along with insights of the data the laboratory offers to researchers and veterinarian practitioners
- Analyzing herd level data from milk samples and production records
- Discussions on relative welfare measures for each country considering differing management practices, and limitations of each approach

Results of the scientific mission

The data from CReNBA assessments was treated in two distinct ways to enable comparison with WQ assessments in the case of the six farms that were evaluated with both systems on the same day: 1) CReNBA scores were recalculated with only data of lactating and dry animals and 2) "principle scores" were formulated from CReNBA data, by grouping together measures that correspond to the themes of the four WQ principles (Good feeding, Good housing, Good health and Appropriate behavior). Measures for heifers and calves were excluded in both cases, with the exception of disbudding practices. Correlation analysis was then performed to these re-calculated scores and WQ principle scores. The preliminary results indicate that CReNBA assessment gives somewhat different results when comparing with the overall welfare score and principles of the Welfare Quality protocol. Further analyses are needed, however, to properly assess the link between these two systems.

Herd characteristics related to welfare, milk production, management and health will be gathered from both the Italian and Finnish data. Our aim is to find groups of similar farms (in terms of production, housing and management or other herd parameters such as bulk milk SCC) and to explore the differences in welfare scores (CReNBA or WQ) between these groups.

The fieldwork was terminated on the last days of the STSM visit, so all data has not been analyzed at this point. Work on the milk and production data will continue in April and May, as will analysis of the similarities and differences of welfare status of Finnish and Italian dairy herds. In this way, collaboration between the involved institutions continues also after the STSM, promoting the exchange of ideas and skills also in the future.

The STSM helped me to understand the different approaches in welfare assessment protocols and to appreciate how they affect the perception of welfare level when these assessments are used. This knowledge and experience will be extremely valuable when the Finnish Naseva system is remodeled, and also when I defend my PhD-thesis. Exploring the connections in herd level welfare, production and milk data will also accumulate my experience in varying statistical methods.

The results of the CReNBA/WQ protocols comparison will be published in the next possible DairyCare conference, and the Welfare Quality results from Italian farms also in the Italian peer review journal *Large animal review*.

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Attachments

Execution letter from the host

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