

## Practical experience from the implementation of a new udder health monitoring service through regular DHI testing

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This study aims to describe the practical experience of introducing a new udder health monitoring service in Estonia and Thuringia, Germany. This new service is based on the combination of somatic cell count (SCC) and differential SCC (DSCC) test day results obtained through regularly performed dairy herd improvement (DHI) services.

A new udder health report based on SCC and DSCC information was developed. It allows to categorised the udder health status of a cow into four different groups: Udder Health Group (UHG) A – healthy, SCC <200,000 cells/ml and DSCC ≤65%, B – onset of mastitis, SCC <200,000 cells/ml and DSCC >65%, C – (active) mastitis, SCC >200,000 cells/ml and DSCC >65%, D – chronic mastitis, SCC >200,000 cells/ml and DSCC ≤65%.

Regularly available DHI test results were used to investigate the performance and future development (e.g. high SCC at next test day, culling) of cows in the different UHG. Findings were used during the launch of the new udder health report as they contribute to provide evidence on the added value of the service based on local data. DHI service field staff was trained about the new service to support new herds enrolling to the new service. Different media and local events such as exhibitions and annual meetings were used to further promote.

Practitioners working with the new udder health report described that it helps them to improve their herd management, particularly cubicle management and milking routine, resulting in overall better udder health of the herd and lower consumption of antibiotics with regards to mastitis treatments.

*Keywords: Mastitis, SCC, milk recording, antibiotics.*

The companies EPJ and Qnetics offer various services to dairy farmers in Estonia and Thuringia, Germany, respectively. Among other things, these include the organisation and execution of DHI testing for dairy cows, ewe, and dairy goats, milk payment analysis, and advisory services for herd management, dairy cow nutrition and milk quality challenges.

### Abstract

### Introduction

## Dairy farming in Estonia and Thuringia, Germany

The total number of dairy cows is 80,000 and they are kept in approximately 400 herds, which translates into an average herd size of 200 cows. More than 96% of herds are enrolled to DHI services. The average annual production is at 10,484 kg milk, 394 kg fat, and 345 kg protein per cow.

There are 94,548 dairy cows on 282 dairy farms in Thuringia, Germany. The vast majority (98.2%) of these farms are utilising dairy herd improvement services on a regular basis. The average annual production is at 9,978 kg milk, 404 kg fat, and 345 kg protein per cow. The average herd size is at 335 cows and approximately 60% of all cows are kept on 25% of all farms.

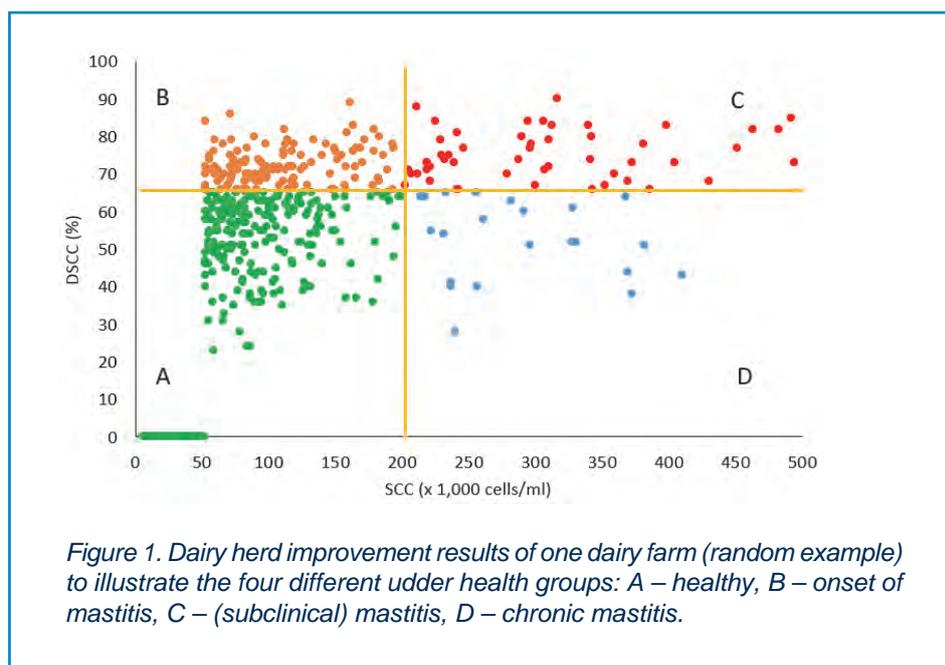
The key motivation of EPJ and Qnetics was to be able to provide farmers with better DHI-based services for managing udder health, in particular earlier detection of udder health issues.

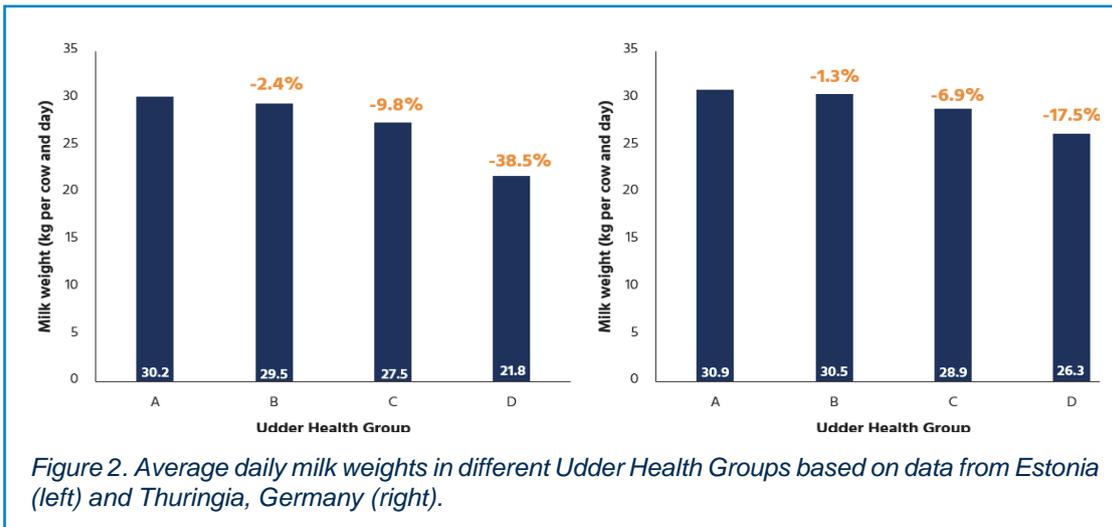
## Udder Health Group concept

Regularly available DHI samples are analysed on CombiFoss 7 DC. The SCC and DSCC test day results are then used to categorise the udder health status into four different udder health groups (UHG, Figure 1):

- A – healthy: SCC <200,000 cells/ml and DSCC ≤65%,
- B – onset of mastitis: SCC <200,000 cells/ml and DSCC >65%
- C – (subclinical) mastitis: SCC >200,000 cells/ml and DSCC >65%
- D – chronic mastitis: SCC >200,000 cells/ml and DSCC ≤65%

The SCC cut-off of 200,000 cells/ml used is according to IDF recommendations (IDF, 2013). The DSCC cut-off of 65% has been identified as optimal cut-off in a study where the actual udder health status of cows as defined by bacteriological testing was available (Schwarz *et al.* 2020a).





Comparing milk weights in the different UHG (Figure 2) based on data from Estonia and Thuringia, Germany, interesting differences were found. These differences, in turn, indirectly confirm the interpretation of the four groups. Cows in group A showed the highest performance, which was to be expected as they are healthy based on their low SCC and low DSCC test day results. Cows in group B showed a significantly lower performance than those in group A, which is explainable based on inflammatory processes (i.e. high DSCC values) consuming energy that is then not available for milk production anymore. This confirms that cows in group B might be in the early stage of mastitis. Presences of mastitis pathogens and inflammatory processes has been described in such cows before (Schwarz *et al.*, 2011a,b; Pilla *et al.*, 2012; Schwarz *et al.*, 2020a). Lower performance of cows with elevated SCC have been described before, but we could observe significant differences between cows in groups C and D. Those in group D performed significantly worse than cows in group C. Cows in group D are considered to experience chronic mastitis and it is well-know that such chronic infections lead to destruction of milk producing tissue explaining the low performance. All results have been published in detail elsewhere (Schwarz *et al.*, 2020b).

Above-described results have been presented to dairy farmers at various events and contributed to create a lot of interest because most farmers would be interested in optimising the performance of their herds and understand the distribution of their cows among the 4 UHG.

New udder health reports to visualize and process the combined results of SCC and DSCC were implemented in Estonia and Germany, respectively. Besides a graphical overview of test day results, a benchmarking table (Figure 3) is core of this report. The table provides a detailed overview on number and percentage of cows in each of the four UHG, target values, and average results of all herds tested. Percentage numbers are colour-coded to simplify the interpretation of the results.

**New udder health report introduced**

## Experience from the field

Herds working with the new udder health report agree that “the information provided through the new report and the arising possibilities aid in improving animal health and, at the same time, lead to better usage of resources and higher animal performance.” It allowed them to, among other things, fine-tune their cubicle management and milking hygiene and helped them to document improvements. This, in turn, was invaluable because staff could be motivated to do some extra effort and apply known measures used to prevent mastitis. Often in collaboration with veterinarians, herds also based selective dry cow therapy decisions on the information provided through the new udder health report. As a result, the number of antibiotic treatments and the volume of wasted milk were reduced.

In EU, a new Animal Health Law (<http://data.europa.eu/eli/reg/2016/429/2021-04-21>) has been introduced recently and is in force now. The livestock industry is supposed to avoid unnecessary use of antimicrobial treatments and, instead, focus on prevention of diseases. In this context, veterinarians appreciate the new udder health report because it helps them to convince herd managers to improve in terms of prevention of mastitis.

A comparison of herds with different proportions of cows in UHG A has been conducted (Schwarz *et al.*, 2022). A key finding was that average daily production was significantly higher and bulk tank somatic cell count and number of antibiotic mastitis treatments were significantly lower in herds with high compared to herds with low proportions of cows in UHG A.



## Conclusion

Mastitis is still a huge challenge on dairy farms and is one of the key reasons for premature culling of dairy cows. The new SCC and DSCC-based udder health report helps dairy herds to better manage udder health as it provides further insights in herd management. We have already observed improvements in terms of dairy cow health, welfare, performance, and a reduced number of antibiotic mastitis treatments. It is expected that the percentage of herds utilising the new service will continue to increase and that longevity and milk quality will improve in the long run as well.

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