



Heat stress and udder health

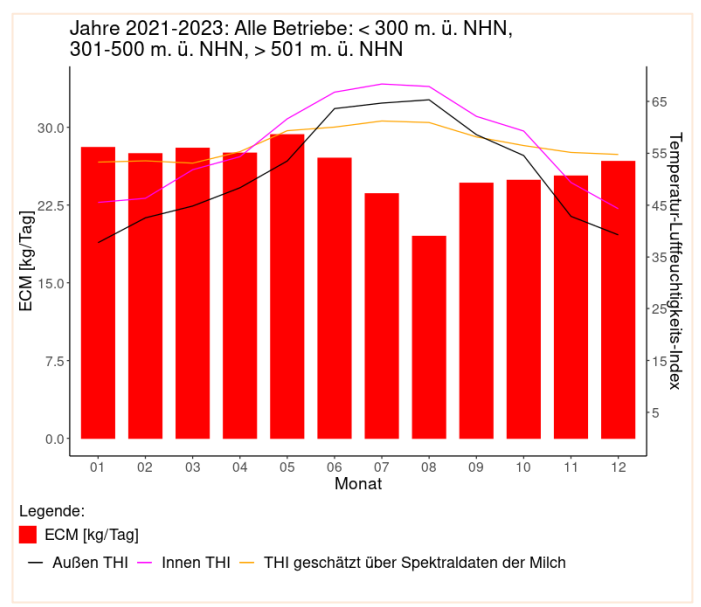
Due to climate change, periods of intense heat are becoming more frequent. These phases lead to heat stress in dairy cows, with consequences such as an increase in cell count, lower milk content, a drop in milk yield and mastitis.

How does heat stress cause mastitis?

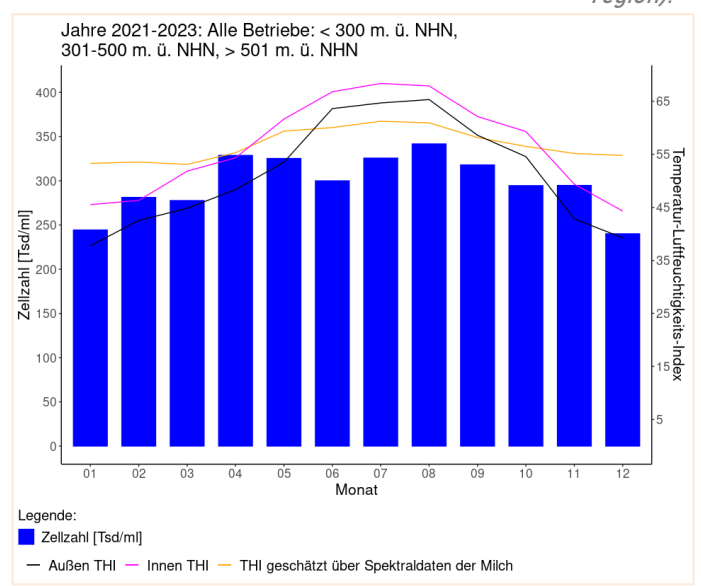
The increased outdoor temperatures and higher humidity of summer provide optimal conditions for increased pathogen growth, which increases infection pressure and ultimately the risk of clinical udder infections during summer.

The animals react with changes in physical, biochemical and biological processes.

- The higher the performance of the cows, the higher the stress at high temperatures. Performance losses of up to 20% in the case of severe heat stress!
- If the monthly mean values of the daily maximum temperatures reach values of 18 °C and more, the milk components fat and protein drop, followed by a drop in milk volume (see Fig. 1).
- reduced production performance and a lowered immune defence, which is reflected in an increased incidence of mastitis and a higher somatic cell count (see Fig. 2).
- As cow performance increases, heat regulation in the barn and prophylactic measures thus also become increasingly important.



▲ Fig. 1: Energy-corrected milk (kg/day) as a function of THI 2021-2023 (measured in 16 farms in the Upper Rhine region).



▲ Fig. 2: Cell count and temperature-humidity index (THI) 2021-2023 (measured in 16 farms on the Upper Rhine).

Measures in mastitis management

It is important to prepare for possible problems in the summer months and to control risks before udder health deteriorates. It is important to keep an eye not only on the milking process, but also on the housing and feeding of the animals. It is equally important to keep an eye on all animal groups (including dry cows and heifers).

In general, the control of udder health on the farm requires comprehensive and integrated mastitis management, in particular through:

- early detection of infected udder quarters and early intervention,
- identify and prioritise the most important risk factors,
- the implementation of preventive and curative measures that are tailored to the individual farm and can be adapted by the farmer himself. The most important points are summarised below.

Milking



Equipment maintenance and hygiene:

- Milking machine maintenance
- Milking hygiene
- Hygienic milking practices

To note:

- ✓ Annual inspection of the milking machine and the integrated milking cluster
- ✓ Follow the manufacturer's recommended change of liner
- ✓ Early detection: milk the first stream into the pre-milking cup and discard it
- ✓ Cleaning and disinfection of the teats (individual wipes, pre-dipping...): Milk let-down reflex and hygiene
- ✓ Disinfection of the teat rubbers between the individual cows
- ✓ Environmental risk: barrier products after milking (dip again)
- ✓ Classic alternation: acidic in the morning/alkaline in the evening
- ✓ no air supply (blind milking), during milking machine cleaning
- ✓ for automatic milking systems: Cleaning and changing the brushes, setting the number and duration of passes

Measures in mastitis management

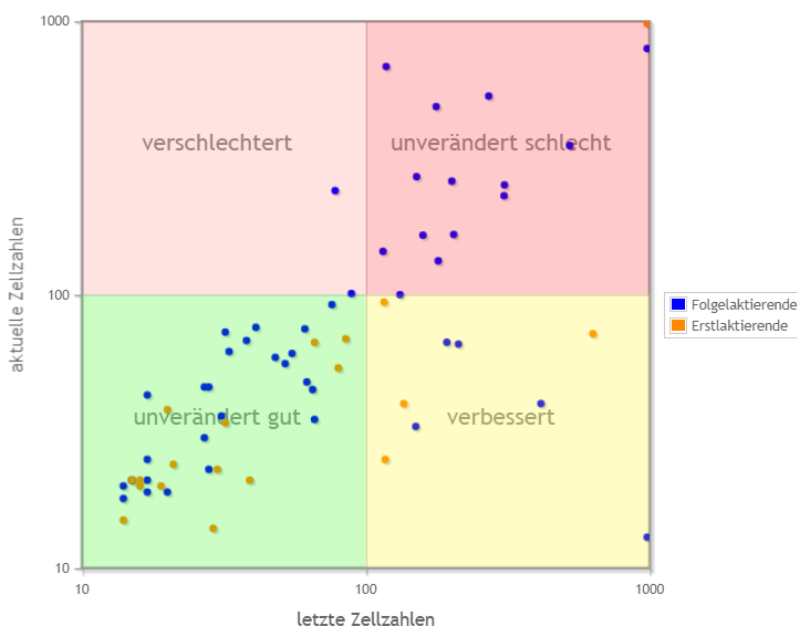
Livestock management

Observation and monitoring of results and targets:

- Heifer management
- Animal monitoring: observation, detection, analysis
- Lactation and drylot treatments
- Observe culling guidelines

To note:

- ✓ Prevent udder sucking between heifers
- ✓ Twice daily observation of udders or robot parameters (conductivity, production, cells, etc.)
- ✓ Control of infection incidence in the LKV Herd Manager (Fig. 3)
- ✓ Bacteriological analysis before treatment
- ✓ Monitoring the cell content of each individual cow at least once a month
- ✓ Treatment strategies with the veterinarian, hygiene and disinfection
- ✓ Carrying out or not carrying out vaccinations in the herd according to the veterinarian's recommendations (cost-benefit ratio)
- ✓ Two-phase dry-off: fibre-containing ration during the dry-off period, ration in preparation for calving with negative cation-anion balance (DCAB) in the last 3 weeks
- ✓ The aim is to achieve a body condition score between 3 and 3.5 at calving



MLP-Datumsauswahl: 12.04.2023

Statistik			
Quadrant	Anzahl Kühe	% Kühe	% Ziel
unverändert gut	39	60	> 65
verbessert	10	41,67	>4,88
verschlechtert	2	4,88	< 15
unverändert schlecht	14	21,54	< 5

▲ Fig. 3: Infection events lactation (LKV herd manager)

Measures in mastitis management

Feeding

An indirect effect:

- Energy/nitrogen, mineral and vitamin balance of the rations
- Management of the transit phase
- Water quantity and quality

To note:

- ✓ Avoid nitrogen surplus: Balanced ration energy/protein/fibre
- ✓ Avoid energy deficits (animals are more susceptible to diseases)
- ✓ Avoid excess potassium, sodium and energy before calving (risk of udder oedema).
- ✓ ensure an adequate intake of vitamin E and selenium
- ✓ Changeover during silo change, access to pasture...
- ✓ 10cm trough length/cow
- ✓ at least 1 annual water analysis for well water, bacteriological and physico-chemical examinations (good functioning of the disinfection of the circuits and teat cup inserts).

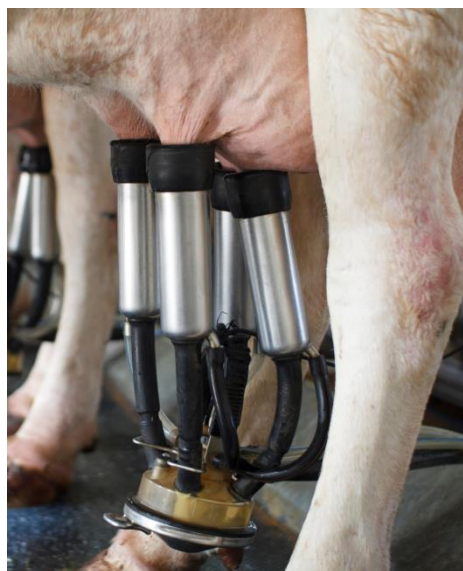
Lodging

Clean cows during lactation and the dry period:

- Quality of the bedding
- Cleaning of the exercise and lying areas
- Stable ventilation and lighting

To note:

- ✓ Straw of high quality in large quantity depending on slurry/fertiliser system
- ✓ (twice daily) maintenance of the exercise and lying areas
- ✓ Area per cow (1 cubicle/cow, 7 m² to 8 m² per cow)
- ✓ Clean and dry bedding (no wet straw surfaces, replacement at >35°C in 10 cm depth, a water-absorbing desiccant does not replace a good straw mattress...).
- ✓ The same attention to the cleanliness of the cows during dry period and lactation.



Conclusion

Implementing these measures throughout the year in the entire herd is essential. Mastitis occurs regardless of the season. In summer, however, cows are additionally confronted with heat stress, which can have significant effects on the animals. The consequences are manifold and economically significant. It is therefore worthwhile to take appropriate measures to minimise heat stress for dairy cows. Often this can be done with very simple measures. The important thing is to start in good time and to be consistent. In the leaflet "Heat stress in dairy cattle" you will find further useful advice on how to survive this risky period.