

Heat stress of dairy cows and its effect on milk production and quality

BioTalks: Viable and resilient dairy farming

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Webinar



Allan Kaasik , *PhD*

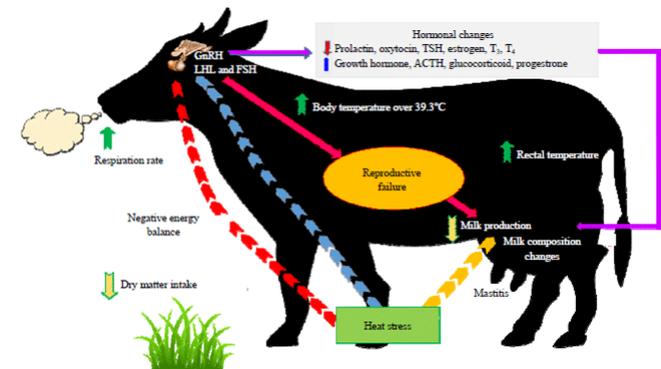
Institute of Veterinary Medicine and Animal Sciences

The heat stress of high-producing dairy cows and the resulting possible drop in production is becoming more and more important in the context of climate warming in the Scandinavian countries as well.



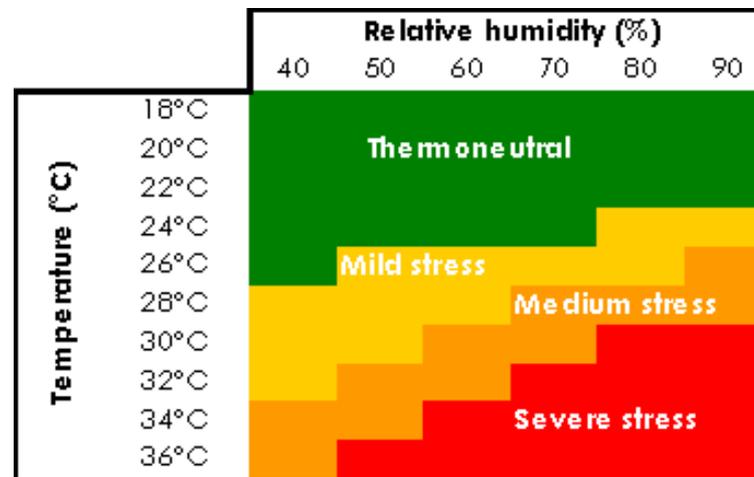
The cause of the problem stems from the thermoregulation processes of cattle.

The more the cow's body synthesizes milk, the more residual metabolic heat is generated. It must be removed from the body to prevent overheating. However, due to the peculiarities of cattle's thermoregulation (cattle lacks the ability to sweat), it is disturbed at high temperatures in the external environment.



<https://scialert.net/abstract/?doi=ijds.2017.1.11>

The comfort zone or thermoneutral zone for a dairy cow is wide varying from around -15°C to $+25^{\circ}\text{C}$. It directly depends on the production level, the higher the production, the lower the temperature the animals can tolerate without problems. At the same time, the tolerance of higher temperatures decreases.



<https://www.thecattlesite.com/articles/1053/heat-stress-in-dairy-cows-implications-and-nutritional-management>

- Population of dairy cows in Estonia in 2022 - 83 700
 - Average milk production – 10 144 kg/ per cow and year; 27,8 kg/per cow and day
- (Statistics Estonia)

Mainly large scale free-range and uninsulated barns for keeping dairy cattle. Dairy cows are not grazed, only slightly more than 1% of cows were on pasture during the summer period

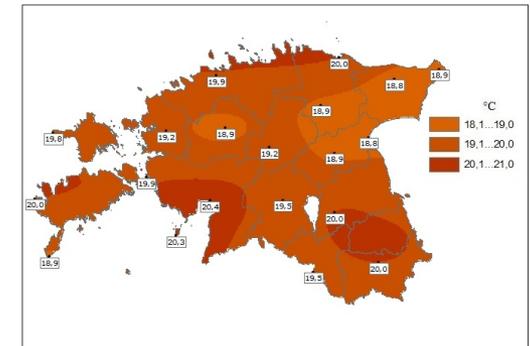
Summer temperature and heat waves

2022 two longer heat waves reached Estonia in the summer, there were a total of three heat waves in Southern Estonia.

The first came after Midsummer, on June 25th, and lasted until July 2nd. Maximum air temperatures rose to 27 °C or higher on three to eight consecutive days. A particularly dangerous heat wave (30 °C for three or more days) lasted three to five days in most places.

The second heat wave reached Estonia in August, it lasted from the 13th to the 20th. August. Maximum air temperatures rose to 27 °C or higher on three to seven consecutive days. A particularly dangerous heat wave (30 °C for three or more days) occurred in some places and lasted for three to five days.

The third heat wave was in southern Estonia on the 27th-29th. in August, when the maximum air temperature rose to 27 °C or higher.



Average monthly air temperature, August 2022
(<https://www.ilmateenistus.ee/kliima/kuukokkuvotted/>)

Heat stress is a problem for Estonian dairy cows in the summer months (June, July, August)

Some heat stress can occur even with an average daily temperature of 22°C

Prevention measures

Insulation of the roof of the livestock building - the animals are protected from direct sunlight, the heating of the barn air through the roof is reduced. (Common in Estonian dairy farms)

Increasing air movement speed, cooling animals with air flow. Special ventilators. (Common in Estonian dairy farms)



Cooling of animals by evaporation of water from the surface of the body. Showers on the animal movement paths and waiting areas (Used in some Estonian dairy farms)



Increasing animal feed consumption (feeding) in the evening and at night when the ambient temperature is lower (Used in some Estonian dairy farms)

Thank you!

Contacts: allan.kaasik@emu.ee