




Housing technology for heat stress management

Topic	Topic
Technical efficiency 	Animal welfare, Environment  

Background

Heat stress negatively affects the performance, reproduction, nutrition, health, and welfare of dairy cattle. Selection for increasing milk yields is lowering the minimum temperature-humidity index (THI) at which heat stress starts to depress milk production. Housing design, including cooling systems, is the primary way to reduce heat stress. Fans and water soakers or misters increase evaporative cooling effectiveness.

How does the strategy work?

Heat stress in cattle is brought on by a combination of high temperature and high humidity. The optimal outside temperature for dairy cattle is between -5°C and 18°C. Effects of heat stress can include:


- **Reduction in dry matter (DM) intake**
- **Reduction in milk yield with lower fat and protein levels**
- **Reduced fertility – decline in conception rate**
- **Increased water consumption**
- **Increase in lameness**
- **Behavioural changes** (such as bunching in the pens)

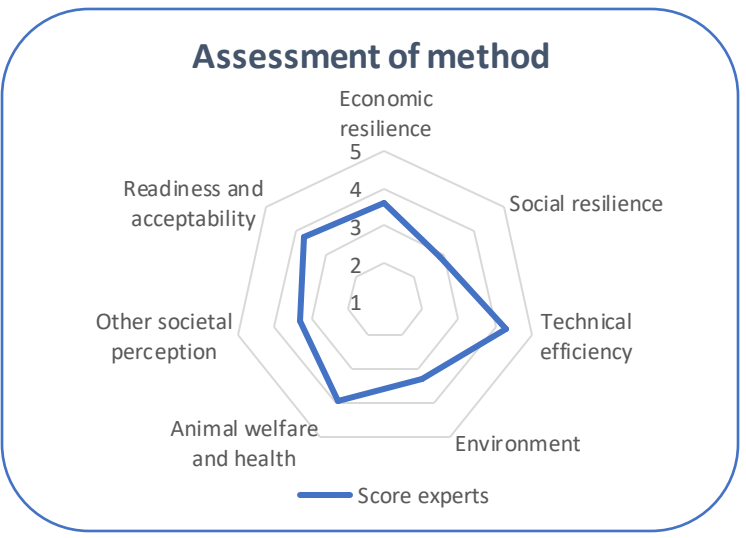
The severity of heat stress in dairy cattle in relation to the THI index.

- ### Positive features
- Solving heat stress is the primary challenge of current dairy farming under hot climatic conditions
 - Fans and sprinklers or soakers are the cheapest method of cooling
 - Cooling dairy cows is advantageous in the summer months

- ### Be careful, especially on these points
- Roof and shading
 - Bed cooling
 - Ventilation and evaporative cooling
 - Ensuring access to clean water
 - To have valuable tools for tracking individual cows entering heat stress

- ### Specific advises
- It is essential that high traffic areas are well supplied with clean fresh water
 - Cows need ventilation to cool off
 - Natural side-ways ventilation in open-sided barns, together with mechanical ventilation from 20°C and higher, is the most effective ventilation method
 - Modify your herd's feeding regime by feeding your cows more often, during cooler parts of the day.

- ### Equipment involved? Investment?
- Tools to assess and deal with the risk of heat stress:
- Thermal parameters - use of Temperature Humidity Index (THI), Wind speed, Solar radiation, Black globe temperature, Integrated measurement, use of infrared thermography (IRT)
 - Animal response – Sweating rate, Respiration rate, Heart rate, Rectal temperature, Skin temperature, Vaginal temperature, Lying patterns,
 - Production management system – body mass, feed intake or dry matter intake, milk yield, conception rate
 - Fans and sprinklers
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Quote of a farmer:

“Managing heat stress in the herd of dairy cows is important for animals and farmers”

