**We market our products in Europe, the USA und many other countries around the world.
The knowledge we gain through this is compiled and given back to you in the form of helpful tips.
Send us your suggestions - we count on them to help us give you a better product!**

**Thank you very much from your KRAIBURG research & development**

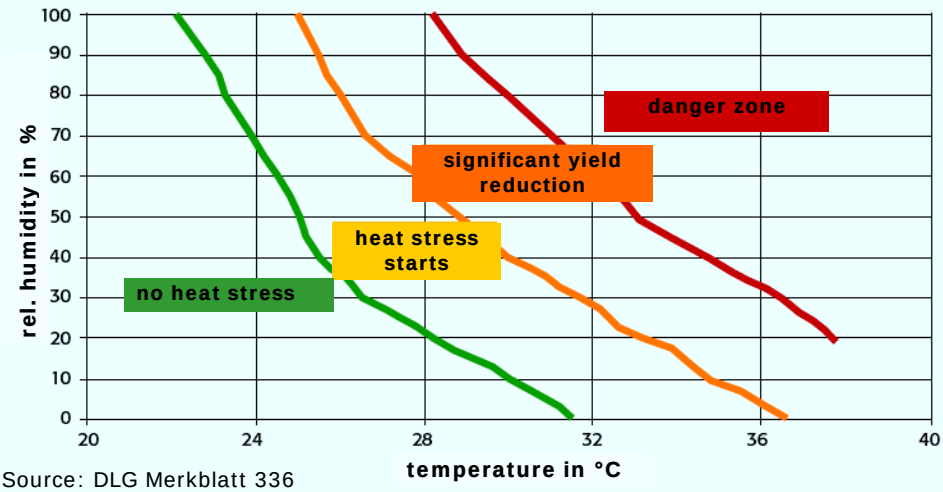
# HEAT STRESS

**The optimal temperature range for dairy cows is between 4° and 16°C**
→ rising summer temperatures cause heat stress on cows (symptoms: e. g. increased standing; rapid shallow breathing > 80/min; body temperature > 39°C; the animals accumulate at better ventilated spots)

**Problems from heat stress:**
- stress on metabolism → lower feed intake, reduced fertility and lower milk yield
- more standing → more load on the claws
- increased risk of lying damage through sweating and softening of the skin

**heat stress starts at 24°C; above 27°C there are significant reductions in yield**

**Heat stress on cows depending on temperature and humidity**




Source: DLG Merkblatt 336

**Air temperature and relative humidity must always be evaluated together**:
- the cow generates not only heat but also water vapour (15 l water per day at -1 °C and 30 l per day at 26 °C)
- the higher the humidity, the more cows react to heat stress, especially the high yield ones

→ **humidity should not be over 70 %, which means that high air change rates (60 to 100 times per h) are required!**

## TIP:
- maximize **water availability**
- optimize **feeding management** → feeding more often and at cooler times of the day
- **supporting ventilation** → dissipates heat **and** humidity**:**
  - o required at air speeds < 1 m/s
  - o highest cooling effect at 2.5 m/s air speed; harmless up to 5 m/s
  - o rule of thumb for ventilators: per 10 cm diameter 1 m range, common sizes: 12 – 15 m range, in twin block: 18 – 20 m
- **water cooling** (source: DLG-Merkblatt 336 [explanatory leaflet])
  - o **high pressure misting → principle "air cooling"**
    - technically difficult because of fine nozzles
    - per 1°C cooling, relative humidity increases by 5%!
  - o **low pressure atomizing → principle "soak the hide, cool the animals through evaporation":**
    - technically easier, e.g. horticultural irrigation systems are utilizable
    - only at temperatures > 24°C
    - 15 min intervals (3 min water spraying, 12 min for evaporation)
    - 1 l water/m² (and 3 min spraying)

**Keep in mind with non-insulated stables:**
- Non-insulated roof:
  → additional heat influx 165 – 990 W per cow possible!
- Lower temperature difference outside/inside:
  → the air can absorb less water vapour
  → higher air change rates required (in winter, too)

**Water cooling only up to 70 % rel. humidity, therefore humidity sensors are important!**

CAUTION

TIP



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