Baby, it's warm

As heat and humidity levels increase during summer and the UK sees the typical high-temperature spikes, what are the effects on the next generation of milkers and what steps can producers take to mitigate them?

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Heifers are a blind spot when it comes to heat stress on UK dairy units. So says Cargill's calf specialist Bianca Theeruth, adding that producers are becoming more aware of the impact of heat stress on the health, fertility and productivity of milking cows. "But there's some catching up to do with calves and young stock."

The critical temperature humidity index THI – the industry benchmark for accessing heat stress in livestock systems – has been well defined for cows. The threshold at which heat stress affects performance is often quoted to be a THI of 68. In the UK the humidity is almost always more than 60%, so this THI would be triggered at 22°C. "But this trigger point is less well defined for calves – producers need to consider the needs of young stock as ambient temperatures and relative humidity rise," says Miss Theeruth.

Recently published research shows that heat stress begins when the THI is between 78 and 82, based on several indices of heat stress such as respiration rate, rectal temperature, air temperature, heart rate, and salivary cortisol. In typical UK humidity this would be a temperature of 28°C. "Researchers at University of Florida have found that dry matter intakes and, therefore, daily liveweight gains reduced when temperatures increased above the threshold. This then has a knock-on effect on heifer development and age at first calving, and how heifers perform in the milking herd. So it's not something to be ignored," she stresses.

Heat-stress signs

Older calves will show symptoms of heat stress by seeking shelter and 'bunching' to seek shade from other animals, changing posture (standing versus lying), turning away from the sun and moving less during hot times of the day. "When it gets colder, producers can

outside

feed more milk, provide more bedding and even use calf jackets to help mitigate the effects of cold stress in young calves," says Miss Theeruth.

But heat is trickier to manage. Calf and heifer performance is impacted by heat stress and Miss Theeruth says that it's also important to understand that this can actually begin before the calf is born – in utero.

"The dry period is crucial in many ways for determining future lifetime milk production and the insults received to the unborn calf, during the six to eight week period before calving, may only be realised two years later when that calf/heifer joins the milking herd," she explains.

"If the unborn foetus is impacted by heat stress on the dam, this has far reaching and long term 'epigenetic' effects that will stay with the heifer throughout its life."

Birth weight may be reduced by up to 4kg LW, and the calf will not grow and develop during the first 12 months in the same way as a calf born from a dam that wasn't heat stressed in the close-up period.

"Heat stress during this period can alter the way that the calf absorbs colostrum, and, for a heifer calf, can also impact on her subsequent fertility. Data shows that it requires more inseminations to get these heifers in calf and this, by default, will push up age at first calving."

Miss Theeruth says that there's also work to show that in-utero heat stress can 'alter' heifer development – particularly that of the udder – which will then impact on her future productivity.

So managing and mitigating heat stress in calves and heifers begins with keeping close-up dry cows. Productive cows come from productive calves that were carefully reared from birth to calving.

Air movement

Once producers have that covered, they must look to managing heat stress in these young stock. Ventilation in calf housing really is the key here. It's all about air quality and air movement. Miss Theeruth likes to see ventilation systems, ideally with fans, in calf housing – particularly during the summer.

Straw bedding is excellent in winter, but it's the warmest bedding type in summer and also supports fly populations. Other alternatives include shavings, wood chips and sand, but these are not always practical and easy to keep clean. Ensure adequate drainage and calf comfort, whatever material is used."

Rescheduling the time of day when calves are fed can also help in warm weather. "Calves are excitable at feeding time, which generates heat, and the milk is also warm. So feed earlier in the morning, when it's cooler, if possible. And if it's very warm and calves are drinking less milk as a result, producers could look to increasing the concentration of calf milk replacer – much as they would in colder weather – to compensate for any nutrient shortfall until starter feed increases."

Pointers for **keeping calves cool**

- Water – clean, ad libitum and changed daily
- Feed – little, often, fresh and palatable
- Indoor – use of fans or mechanical ventilation, where possible
- Hutches – block UV rays
- Structures – fans, trees, shelter or shade cloths for grazing calves/heifers
- Adjust feeding times to feed cooler times of day
- Reposition hutches – opening side away from weather on well drained ground
- Limit activities such as disbudding, vaccination, changing pens to cooler times of the day

For the same reason, producers should look to carry out routine management tasks in cooler conditions – or during cooler times of the day – such as de-horning and vaccinating. "Early in the day, rather than midday is preferable."

Where calf hutches are used, she urges producers to check that they're positioned with the open side 'away from the weather' and certainly never in full sun.

"The hutch provides shelter and shade, but it still has to have good air movement. Ensure that rear hatches are open and that fresh air can pass through. And elevating the rear of the hutch will also reduce indoor temperature and improve air quality, resulting in greater turnover of air in the hutch."

Growth rates

As for older heifers, particularly those out grazing, make sure they also have access to shade.

"Something as simple as a shade cloth can make all the difference here. Heifers will make use of shady areas on hot, sunny days.

"And never forget water. It must be fresh and clean and all young stock must have access to sufficient water at all times," stresses Miss Theeruth.

"Taking simple steps to ensure that young stock, at all stage of development, are kept cool and stress free when temperatures rise should will help to contribute to good health, efficient growth rates that meet daily liveweight gain targets, and see heifers calve for the first time at 24 months old." |

Bianca Theeruth:

"Heat stress effects heifer development and age at first calving"