Managing dairy cattle in a hot climate

THE COMFORT zone of dairy cows is in the range 10-24°C. High temperatures have a marked effect on the performance of dairy cattle. This effect can be seen at relatively cool temperatures of only 25°C, and gets worse as temperatures rise to 30°C or more.

Hot weather causes the body temperature of cows to increase. As a result, the cows have a lower feed intake. This is associated with a decline in milk yield, fertility, and growth rate.

Not only is the air temperature a cause of overheating of dairy cows. When the sun is shining, the roofs of livestock barns may become very hot. This exposes the animals in the barn to high levels of radiant heat.

Hot weather has more impact on dairy cattle when the air is humid. Air temperatures of only 24°C may affect milk production, if the air is very humid (80% relative humidity (RH)). Wind helps the cows to lose heat. Even a light breeze is beneficial.

Lower milk yields and generally poor performance are seen in all dairy cows in hot weather. However, the effect of high temperatures is more marked in high-performance cows with a high milk yield. Their milk production and daily feed intake begins to drop at lower temperatures, because of their higher metabolic rate.

Methods of modifying the air temperature

Shade

Simply providing some shade is a good way of protecting cows from the direct rays of the sun during the day. The most effective shade is from trees and other vegetation. They not only protrect the cows from sunlight, but also create a cooling effect by the evaporation of moisture from their leaves.

Fans

Air movement increases the rate of heat loss from the cow's body surface, but only if the air temperature is lower than the skin temperature of the cows.

Fig. 1. Shed for dairy cattle equipped with fans. Note the open sides of the shed to promote ventilation

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Mist and fan system

Mist particles are sprayed onto the body of the cow, to wet the hair. A fan is then used to evaporate the moisture, as a way of cooling the cow.

Night grazing

Cattle sheds may remain hot even after the sun goes down. Letting the dairy cows graze out in the pasture at night is a good way of helping them lose heat.

Adjusting the feed rations

The energy needs of cattle rise in hot weather, which means they need more feed for energy and maintenance. However, at the same time, feed intake tends to fall.

During hot weather, the diet of dairy cattle should have a higher protein content and a lower roughage content than in cooler weather. The use of fatty feeds, or calcium salts of fatty acids, may also benefit dairy cows in hot weather.

Precautions

- Fans and water sprays are much more effective when they are used together. Either kind of cooling method used on its own is not very effective
- Mist and spray systems are expensive to install. They will only give a profit if the extra milk yield covers the installation cost. Economic analysis has shown that the breakeven point for this system in Japan is an increase in milk production of 0.81 kg/day.

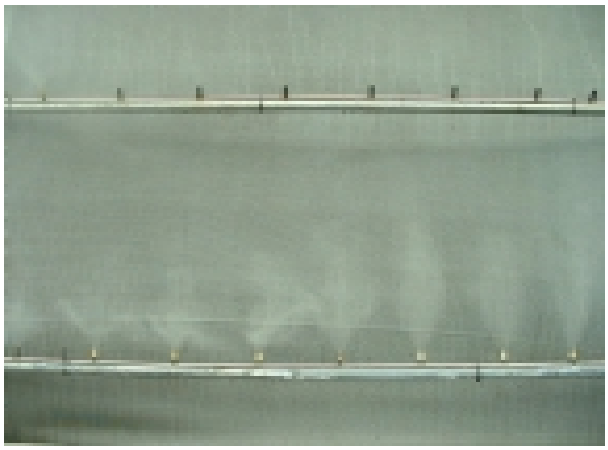

Fig. 2. Sprinkler system for cattle shed (1)

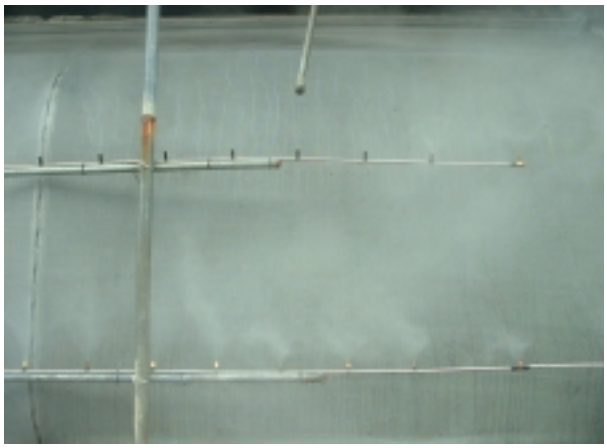

Fig. 3. Sprinkler system for cattle shed (2)

Fig. 4. Computerized controls for fans and a sprinkler cooling system for dairy cattle