Summer management in dairy cattle and buffaloes

S.Jena, A. Kumari, M.Singhand V.P. Belsare

Department of Livestock Production Management, KCVAS, Amritsar

India ranks first in the milk production in the world, with 187.7MT of milk from192.49 million cattle, 109.85 million buffaloes. This contribution to the dairy world is possible by the scientific rearing and management of dairy cattle and buffaloes. According to the current census the exotic/crossbred cattle population in India is 50.42 million which has increased by 26.9% and the buffalo population is increased by 1.0% over pervious census.

In summers, the environmental temperature goes beyond Upper critical temperature (24°-26°C for Exotic and Crossbred cattle and 33°C for Zebu cattle and 36°C for buffaloes), body is unable to maintain the core body temperature through sweating and panting (evaporative heat loss mechanism). This coupled with rising body heat production rate leads to hyperthermia in the animals. Humiditalong with temperature plays a significant role in heat stress. The most common index of heat stress (temperature-humidity index or THI)is calculated from the temperature and relative humidity (RH).

What is heat stress?

Heat Stress indicates all high temperature related stress, which induces thermoregulatory changes in cattle and buffaloes. During extreme hot humid or hot dry weather the thermoregulatory capability of cattle and buffaloes to dissipate heat is compromised leading to heat stress. Severe heat stress causes rise in body temperature, increased pulse rate, increased peripheral blood flow, reduced feed intake, change in the metabolic rate / maintenance requirement and increased water intake.

Susceptible animals:

Though indigenous breeds of cattle are more thermo-tolerant, crossbred and exotic breeds of cattle are highly sensitive to heat stress. Buffaloes are more prone owing to their black skin that absorbs more solar radiations and fewer sweat glands (only1/6th that of cattle), compromising heat dissipation through evaporative heat loss.

Part of India	Comfortable months	Stressful months
Northern Part	November-February	May-September
Western Part	December-January	May-September
Southern Part	November-February	April-September
Eastern Part	November-February	April-October

Factors affecting the severity of heat stress are:

1. Level of production & feed consumed
2. Stage of lactation
3. Natural tendency of cooling like sweating, panting
4. Exercise requirements
5. Breed and body colour

Heat stress symptoms: In case of heat stress, the following symptoms are seen

1. Rapid and weak pulse
2. Rapid but shallow breathing
3. Abnormal vital parameters like elevated heart rate, respiration rate, rectal temperature etc.
4. Unusual salivation
5. Dizziness / unconsciousness
6. Skin becomes dull and cold
7. Heat stroke occurs when body temperature is very high– sometimes as high as 106 – 108°F

Temperature humidity Index (THI)THI is a simple combination of temperature and humidity and has been designed as a measure regions all over the world to estimate the cooling necessities of dairy animals in order to improve the efficiency of management strategies and to alleviate the negative effects of heat stress. It is calculated by the following equation

$$THI = 0.72 (W°C + D°C) + 40.6$$

Where, D°C = Dry bulb temperature in degree Celsius; W°C = Wet bulb temperature in Degree Celsius.

THI < 70 is considered comfortable. THI between 75-78 is considered stressful and a value more than 78 is considered extremely distressful to the animals. It is also stated that milk production is affected by heat stress when THI values are higher than 72 to the extent that milk yield declined by 0.2 kg per unit increase in THI when THI exceeded 72.

Managing Heat stress:

There are three intervention management which can be considered to reduce the heat stress. These are *genetic changes, environmental modification* and *nutritional strategies* which can be achieved by ensuring proper summer oriented housing, animal

cooling system, development of breeds tolerant to heat stress and high energy feeding.

Following steps have been outlined:

1. Ensure that the animals are kept under shade. The most effective source of shade is trees. If shade trees are not available, thatched roof of a minimum height of 9 feet should be provided. Agri-nets with 20% perforation are also useful.
2. Thatching the roof with materials like paddy straw etc., painting the roof with white paint or, providing a false ceiling insulation will help provide a cooler environment.
3. Create barriers against hot wind using thatched wall or wet gunny cloth/ gunny bags.
4. Ensure one ventilator of 3 x 1 feet per cow in covered shed. In these sheds heavy duty fan is best option to facilitate ventilation.
5. Misting/Fogging of water in the microenvironment of the animal at least thrice in an hour along with provision of fan is useful in hot dry weather. Auto Mister/ Fogger with mini pumps and cyclic timers are preferable.
6. Heat stress can also be managed by spraying/ sprinkling water directly on the body of animals for a period of 1 to 5 minutes at an interval of 10- 30 minutes.
7. Fans/ blowers should be used to induce evaporation from the skin of animals. With a provision of fan this method can work both in hot dry and hot humid condition.
8. The most effective way of combating heat stress in buffalo is wallowing in the water pond.
9. Ensure adequate round the clock fresh and cold drinking water to animals, which should be provided under shade.
10. Feeding should be practiced during early morning & evening.
11. Prefer grazing during early morning & late evening hours to avoid the scorching heat.
12. Ration density may be increased so as to provide same nutrients at reduced dry matter intake.
13. Diets with low-fibre and high fermentable carbohydrate have lower dietary heat increment compared to high fibre diets.
14. Ensure increased mineral supplementation during hot weather to meet the increased demand of minerals. Potassium rich mineral mixture should be preferred.

Conclusion

Unfortunately, there is no single approach that can completely alleviate heat stress. That said, region-appropriate combinations of strategies need to be applied to ensure better productivity, reproduction and health of the animals to overcome heat stress.