



Indian Farmer
Volume 8, Issue 05, 2021, Pp. 348-350.
Available online at: www.indianfarmer.net
ISSN: 2394-1227 (Online)

POLICY PAPER



Heat stress and its management in farm animals

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Article Received: 20 May 2021

Published: 25 May 2021

Heat stress occurs when an animal's heat load is greater than its capacity to lose heat. Several factors are responsible for causing heat stress and major factors are high ambient temperature and high humidity. Amongst the environmental factors, high ambient temperature has significant impact on the productive and reproductive performance of farm animals. During hot summer weather, milk production may decrease by as much as half of the actual milk production, and reproductive proficiency of lactating dairy cows is greatly reduced. Some data indicate that only 10 to 20 percent of inseminations in "heat stressed" farm animals result in pregnancies. So, managing the heat stress in farm animals is of utmost importance to reap profit even in harsh hot and humid climate in tropical country like India.

Signs of Heat stress

Common symptoms of heat-stressed animal include

- Animal moves toward shade
- Water intake get increased while feed intake is reduced
- Prefers standing than lying down
- Increased respiration rate and body temperature
- Increased salivation
- Open-mouth breathing and short depth breathing

Mostly animals suffer due to heat stress when they are kept in poor ventilated, congested housings or under trees with scanty shade and penetrating rays of sunlight.

Reproductive and Production Challenges

Heat stress challenges the production and reproduction performance of dairy animals. The milk production declines due to heat stress. Milk composition like milk fat%, SNF%

are also affected. Heat stress negatively affects follicular development and estrous cycle which leads to poor reproductive performance.

Strategies to reduce the negative effects of heat stress

Breeding Management

As cows exhibit lesser heat symptoms during heat stress zones as compared to thermal comfort periods, therefore it is necessary to adopt a good heat detection program to detect cows with marginal heat symptoms. It is always advisable to continue AI breeding instead of using bulls because in natural breeding both bull and cows suffers infertility due to heat stress. Genetic selection of heat tolerant animals and inclusion of heat tolerance as a trait in selection programme will be a boon to the farms. Most of the Indian breeds are well adapted to harsh climatic condition and can withstand higher temperature when compared with temperate pure breed animals.

Cooling systems in the farm

Fans in combination with water sprinkling facility or use of desert coolers provide the best cooling option. While choosing the cooling system at the farm, one must consider the humidity level. Depending on that evaporative cooling mechanisms or other available options can be adopted. Excessive sprinkling should never be practised as it can result into wet bedding making animal prone to mastitis and other diseases. The farm should be well ventilated.

Feeding Management

Heat stressed animals are more likely to have poor reproductive and productive performance. Feeding high quality forages and balanced rations will decrease some of the effects of heat stress and will boost performance of the animals. Some nutritional management tips to manage heat stress are:

- Provide high quality feeds like total mixed rations
- Ensure supply of fresh green fodder
- Increase the frequency of feedings
- Feed during cooler times of the day
- Keep feed fresh as much as possible
- Provide high-quality forage
- Provide adequate fibre
- Use of by-pass proteins can enhance the milk yield and protein content.
- Potassium is secreted along with sweat in Cattle and buffaloes. So, it's level decline rapidly during heat stress which needs to be replenished with supplementation of electrolyte mixture of potassium and sodium salts or electrolytes available in market to reduce heat stress.
- Fresh and cool drinking water should be available all the time. Intake of sufficient cool water is probably the most important strategy for animals to undertake during heat stress.

- To counter developed acidosis, alkaline salts of sodium and potassium are helpful.

Providing natural or artificial shade area

Plantation around the farm will help in alleviating heat load from the animals. But, in today's commercial dairy sector, it is not always practicable. Therefore, provision of artificial shade area by shade cloth or a naturally well-ventilated structure with open sidewalls can keep the animals away from direct solar radiation.

Selection of heat tolerant animals

Genetic selection of animals based on specific molecular genetic markers for heat tolerance will be a boon to alleviate heat stress in cattle and buffaloes by identifying the heat tolerant animals.

Conclusion

Heat stress in dairy animals can challenge the reproductive and production potential of the animals. Implementing proper breeding programs, cooling strategies at farm with better feeding programs can help to minimize some of the negative effects of heat stress.