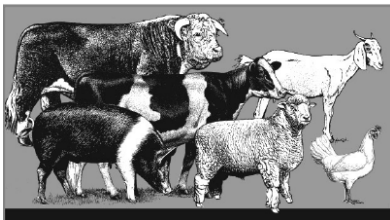

Impacts of Heat Stress in Cattle

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Heat stress is a very costly to the cattle industries. Heat stress in cattle can be clinical or subclinical. Clinical heat stress can be debilitating and even deadly and there are health and production impacts from subclinical heat stress. Managing heat stress is crucial, and while that is easier said than done in Louisiana, ignoring it is not an option.

Animals can dissipate heat in four ways:

- Radiation
- Convection
- Conduction
- Evaporation

The first three mechanisms only work if air temperature is less than the body temperature. During summer when air temperatures are either approaching or above body temperature, evaporation (sweating, respiration) is the only mechanism left. And at high humidity, evaporative cooling decreases. That is why the Temperature Humidity Index (THI) is an important measure in predicting heat stress in cattle.

Diurnal temperature patterns are also important in predicting the impact of heat on animals. If nighttime temperatures drop into the 60s cattle are much better able to handle high temperatures during the daytime hours. In late July through August and early September, the nighttime temperatures in Louisiana stay in the upper 70s for weeks on end, making heat stress highly likely unless preventive measures are taken.

There are two types of clinical heat stress: acute and chronic. Acute heat stress is more likely to occur when animals are moved, processed or overcrowded. The signs can be sudden and severe, often resulting in downers or death, even if treated promptly. Chronic heat stress is more subtle. It occurs when low-grade stress occurs over days to weeks as discussed above. One of the first outward signs that an animal is suffering from heat stress is drooling. They may also start to open-mouth breathe. Weakness or a wobbly back end may also be seen.

With subclinical heat stress, cattle may not show any outward signs, but the impacts to productivity are devastating. No matter the age of the cattle, heat stress depresses the immune system, making them more susceptible to other diseases.

In mature cattle, the biggest negative influence is likely on reproduction. Heat stress can cause infertility and abortion in females and infertility in males. Heat stress-induced infertility in bulls can be permanent, so breeding soundness exams each year on breeding males is essential to make sure they have recovered. Excess body condition increases heat stress in general and causes bulls to lay down more fat in the scrotum, further increasing risk of infertility. Bulls need to be maintained at an adequate but not excessive body condition score of 5 to 6.

In calves, heat stress leads to decreased weight gains from a combination of decreased dry matter intake and decreased milk yield in dams. In fall-calving herds especially, heat stress in late summer and early fall negatively impacts colostrum quality. Poor-quality colostrum leads to increased sickness and decreased growth in calves.

Decreased reproduction and productivity in calves also occurs when pregnant cattle undergo heat stress and the fetus is impacted. This is called fetal programming. Growth of the reproductive organs, muscle and fat cells, and the immune system of the fetus, all of which are important to future health and productivity, are negatively impacted by heat stress. There is also evidence that maybe temperament is also negatively impacted.

Both genetics and the environment influence the impact of heat stress on cattle, so it is important to consider both when planning preventive strategies. From an environmental standpoint, cattle need adequate shade and unlimited access to fresh, clean water. Water should be close to shade since they may not leave the shade to drink and will actually die of dehydration. Cool water is best if possible. Trough sources need to have enough capacity to handle cattle numbers, but not so much that water sits and gets hot. Good turnover in a trough will help keep water cool and clean, which encourages water intake and keeps animals cooler. Forage quality also influences heat stress. The more mature forages get, the more heat they produce during digestion. Grazing management practices that maximize forage quality will also help combat the heat. This will also help keep intakes up which impacts milk production.

Adequate shade that prevents bunching of cattle is important. Recommendations for shade for different size cattle are:

- 15 to 20 square feet per 400-pound calf.
- 20 to 25 square feet per 800-pound feeder calf.
- 30 to 40 square feet for mature beef cows.

Genetic selection of heat-tolerant cattle is also important. *Bos indicus* cattle, like Brahmans, are more heat tolerant than *Bos taurus* breeds because they have more sweat glands (lots of loose skin), and their sweat glands are larger. Body temperature starts to increase in *Bos taurus* cattle between 70° and 79°F and in *Bos indicus* cattle at 90°F. If *Bos indicus* genetics do not fit your business model, then consider selecting *Bos taurus* cattle from herds that have been developed over several years in the South.

Black-hided cattle absorb more solar radiation and have a harder time managing heat load. Manage coat color in the cow herd to reduce or eliminate darker coat colors. For black-hided animals, providing adequate shade is absolutely crucial. The ability of cows to shed their winter coat is also heritable, and studies have shown that animals that shed earlier also have calves with higher weaning weights.

In the future, genetic selection tools that help select for heat-tolerant animals may be available. Until then, careful examination of health and production records from cattle raised and bred in the South can help identify cattle that thrive in our hot, humid environment.

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