

Cattle Business in Mississippi – June/July 2004
“Beef Production Strategies” article

Helping the Herd Beat the Heat

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As the thermometer rises, the likelihood of experiencing cattle production losses from heat stress increases. Heat stress occurs when cattle cannot adequately dissipate body heat. Heat stress can lower feed and forage intake, reduce growth performance, depress milk production, negatively affect reproductive performance, and even result in death under extreme circumstances. The high humidity experienced throughout Mississippi only makes hot conditions worse. Water evaporation from cattle decreases when the humidity climbs making body heat dissipation more difficult. During periods of hot weather and high humidity, observe cattle frequently and take precautions to prevent heat stress-related losses.

Effects of Heat on Cattle Performance

Signs of overheating can appear suddenly. Cattle release heat by sweating, panting (taking rapid breaths to evaporate water from the lungs), and increasing blood flow to skin surfaces. Panting usually begins once rectal temperatures reach 104 degrees F or higher and may be accompanied by drooling. Water intake also increases, especially if cool water is available. Heat stress depresses appetite and feed intake in beef cattle, reducing animal growth performance.

Total heat load in cattle is a combination of environmental heat, metabolic heat (heat produced by the animal's body processes), and fermentation heat (heat produced in the rumen as part of digestion). High-energy diets contribute to metabolic heat load in cattle. In addition, low quality forages with more fiber produce more heat than less fibrous forages during fermentation.

Feeding cattle at least two hours after the peak environmental temperature of the day will stagger heat produced from digestion until after the hottest part of the day. Nebraska researchers suggest that limit-feeding cattle during early summer is an effective tool for lowering metabolic heat load and improving animal comfort. Switching from a morning to afternoon feeding has also been shown to provide benefits under heat stress conditions, particularly when cattle are fed late in the afternoon and feed bunks have been empty for several hours.

In bulls, heat stress can negatively affect proper sperm production. Adequate temperature regulation of the testes is essential for sperm production. Increases in scrotal temperature can lead to a decreased proportion of progressively motile (properly moving) and morphologically normal (properly shaped) sperm. Development and maturation of new sperm cells takes approximately eight weeks to complete. Bulls experiencing heat stress may need at least two months to recover fully. A bull evaluated

for breeding soundness one month after undergoing severe heat stress may not yet have adequate sperm motility and morphology for good reproductive performance.

Bulls fed high-energy diets postweaning may be at greater risk for increased scrotal temperatures than bulls fed only moderate-energy diets. In addition, British breed bulls may be more susceptible to detrimental effects on sperm production of high-energy diets after weaning than Continental x British cross bulls. Florida and Oklahoma researchers report that heat stress can negatively impact conception rates and embryo survival as well.

Toxic endophyte-infected tall fescue pasture and hay common on North Mississippi farms creates an additional concern during hot weather. Cattle grazing toxic endophyte-infected tall fescue during warm weather have a reduced ability to dissipate heat through the skin and experience dramatic increases in body temperature (sometimes approaching 107 degrees F). On toxic tall fescue pastures, cattle consume less forage and spend more time standing instead of lying in an attempt to dissipate more heat with increased skin exposure to airflow.

Hot Weather Management Tips

Water

Cattle need access to clean water and a proper mineral supplement at all times. Cattle should not have to travel long distances for water. Water requirements of cattle depend on a number of factors including air temperature, water temperature, milk production level, pregnancy status, physical activity, growth rate, diet type, moisture level in the diet, salt intake, and dry matter intake. Temperature increases from 50 degrees F to 90 degrees F can increase daily water requirements by 2.5 times.

Shade

Ample shade should be provided (at least 30 to 40 ft² per head for mature cows on pasture). If cattle crowd too closely together, limited shade can be worse than no shade at all. Shade options include natural (trees), permanent (barns and sheds), and portable shades. Strategic planting of trees along the west side of a pasture will help provide afternoon shade. If a metal roof is used on a permanent shade, make sure that it is insulated and does not radiate heat like an oven. Portable shades are usually less expensive than permanent shades and can be moved to accommodate different grazing systems. Shade placement should be strategic since it will affect cattle distribution and forage utilization. Shades need to be high enough (at least 10 feet off the ground) to allow adequate airflow. Good ventilation and airflow is also recommended for confined cattle.

Kentucky researchers have reported higher average daily gains in cow-calf pairs grazing toxic endophyte-infected tall fescue with shade than without shade. Feedlot studies conducted by Texas Tech University have shown that providing shade is effective in decreasing heat stress and lowering the negative effects of heat on cattle performance. Shaded heifers had higher dry matter intake and average daily gain than

unshaded heifers. The incidence of dark cutters was decreased approximately in half in carcasses from shaded versus unshaded heifers.

Cattle Working Strategies

Arrange to work cattle during cooler parts of the day instead of during the heat of the day. While working cattle in the late evening may seem like a good idea, cattle build up a heat load during the day and need at least six hours to dissipate heat and cool down from an extremely hot day. Researchers have observed cattle body temperatures reaching daily maximums at 10 p.m., well after outside temperatures peaked. If possible, try to work cattle early in the morning before the temperature rises to uncomfortable levels.

Make an effort to limit the amount of time cattle must spend in a confined area with limited air movement when working cattle. If cattle remain in a confined area for an extended period, then attempt to provide access to fresh, cool water. Very excitable cattle are particularly prone to heat stress. Practices that reduce cattle stress are beneficial during hot weather.

Implementing a few precautionary measures to help the herd beat the heat can make the difference in avoiding production losses associated with heat stress.

Cattle Nutrition Short Course

The Mississippi State University Extension Service will conduct a Cattle Nutrition Short Course for beef and dairy producers later this summer. This day and a half long short course will be held on Tuesday, August 17, 2004 and the morning of Wednesday, August 18, 2004. It will be broadcast over interactive video from Mississippi State University to multiple distance education sites throughout Mississippi. Topics will include understanding the ruminant digestive system, overview of nutrients, feed ingredients, feed analysis, understanding feed tags, cattle nutrient requirements, nutritional disorders, and management decisions. Registration information is available online at http://msucares.com/livestock/beef/beef_calendar.html or by contacting your local Extension office.