

# MESSENGER-INQUIRER

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## Farm Update

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AGRICULTURE & NATURAL RESOURCES  
EDUCATION

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### Keep Cool in the Shade

Dr. Jeff Lehmkulher, University of Kentucky Extension Specialist for Beef Cattle Nutrition at Lexington, wrote the following concerning the impact of heat and importance of shade for a beef cattle herd in Kentucky.

Heat stress is the first environmental factor that will impact animal performance during the summer months. The effect of heat stress is exacerbated by the alkaloids produced by the endophyte in Kentucky 31 tall fescue. Animals compensate during heat stress with increased respiration rate, increased sweating, increased blood flow, decreased appetite which reduces internal heat production, and more time standing in the shade or water. Increased respiration rate leads to greater energy expended for contraction and relaxation of the diaphragm. Research has shown that cattle at normal temperature had respiration rates of about 23 breaths per minute. Under heat stress this increased to 54 breaths per minute. This increased respiration rate is a key response to heat stress as it increases blood flow to the outer extremities of the animal.

Skin evaporative energy loss was observed to be 50% greater under heat stress than normal temperature. However, when exposed to forage endophyte, sweating was not increased, which may be attributed to vasoconstriction, reduced blood flow. Accumulated heat load by animals can be dissipated later into the night when ambient temperatures decline. However,

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during periods of high humidity and lack of nighttime temperatures falling, animals do not have significant reductions in core body temperature before the next day begins. Successive days of heat stress and minimal dissipation of accumulated heat load leads to health concerns for cattle. Add into the mix the alkaloids from the wild endophyte in tall fescue leading to vasoconstriction reducing blood flow to the skin surface during these night hours. All these factors combine to increase animal maintenance requirements by 7-25%. If maintenance energy requirements represent 65% of normal daily intake, a 15% increase in maintenance requirements as a result of heat stress would reduce gains significantly.

Providing shade is the first management strategy to help mitigate heat stress during the summer months. Shade helps reduce heat loading from solar radiation. Additionally, ground surface temperatures under shade have been shown to be greatly reduced compared to unshaded areas. Shade can be natural, such as wooded areas, or man-made. Cattle will stand more during heat stress to allow more convection heat loss as air moves around the body. Shade should ideally provide sufficient room for cattle to stand in the shade without being crowded.

Often the question is how much shade should be provided. Consider the length from tip of nose to tail and width across the ribs of a mature cow. These measurements may be near 7' x 3', or 21 square feet, and these measurements will vary. Spacing between animals is important so the actual shade provided will be greater than the size of the animal. Actual allocated area under shade of 30-40 square feet per cow may be necessary. The University of Nebraska recommends 20-25 square feet per animal for voluntary shade use in feed yards and 25-30 square feet for high-risk feeders on arrival. For man-made structures, ensure there is sufficient distance between the back of the animal while standing and the bottom of the shade structure to facilitate air

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movement through the structure. When possible, having shade structures that are portable will minimize wallows, which can lead to high humidity under the shade from excessive urine and feces deposition.

Consider developing shade areas during periods of higher temperatures and humidity to maintain the performance of grazing cattle if wooded areas are not readily available. Temporary electric fencing can help in allocating different areas of wooded areas to minimize soil disturbance under trees and preventing development of wallows. Shade placed on ridges with greater wind speeds will aid in moving air through the structures and cooling cattle. Ensure cattle have access to fresh, clean water as losses from sweating and increased respiration rates increase water requirements. Additional information on shade structures can be found at

<https://www2.ca.uky.edu/agcomm/pubs/aen/aen99/aen99.pdf>.

## **Corn Fungicide Application Coverage Research Results**

Corn Fungicide Application Coverage Research Results meeting will be held at 6:30 p.m. June 20 at the Extension Office. This field-scale research project has data related to the success and limitations of application by ground sprayer, aerial helicopter and aerial autonomous drone fungicide application techniques.

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