Don't Sweat It

Missouri research studies Angus heat stress.

by ***Barb Baylor Anderson***

PHOTOS COURTESY OF UNIVERSITY OF MISSOURI

►**Left:** A technician measures the sweat rate of a cow.

Safeguarding **Animal Health**

Heat stress can be a major factor limiting the growth and reproductive capabilities of Angus cattle. Researchers at the University of Missouri and elsewhere are trying to determine not only how Angus and some other cattle breeds handle heat stress differently, but also what can ultimately be done to minimize its effect on cattle performance.

"Different breeds sweat at different levels when exposed to heat," says Don Spiers, associate professor of animal science at the University of Missouri. "We also know animals from the same breed from different parts of the country react differently to heat when moved to new locations. We compared sweat rates and corresponding body temperatures of three groups of cattle to see what we could learn from them."

In the research performed with the U.S. Department of Agriculture's (USDA's) Agricultural Research Service (ARS) in Florida, Spiers and fellow researchers evaluated Angus and Romosinuano cattle from Florida and Angus from Missouri. The three groups were evaluated at the university's Brody Environmental Center, which is one of two such chambers set up for heat studies in the United States.

"The animals are slowly put into the heat within the chamber and responses measured," Spiers says. "Romosinuanos are noted for their heat tolerance, which is why we looked at that breed and compared them to Angus. We are interested in the critical sweat rate of these cattle, why some cattle sweat more than others and whether there is a genetic link."

Findings

Spires' research found the Romosinuano and Florida Angus performed well in the heat. Body temperatures in both instances went up only half a degree. But when the Angus from Missouri were placed in the

CONTINUED ON PAGE **166**

More sweat studies

Don Spiers, University of Missouri associate professor of animal science, is involved with several other research projects related to the initial sweat study, including a project that will look at the effect of dehydration on Angus performance.

"We do not know much about dehydration. No research has been done with restricted water and cattle since the 1960s," he says. "What we do know is that if water is present, the dominant animals do not let other animals get water, and the weaker animals may die. We plan to evaluate how dehydration affects the sweat rate, food intake, body temperature and various hormones as they are related to water balance."

Spiers is also working with Australian scientist John Gaughan to correlate sweat rate with body water content to better understand the effect of water balance on performance in the heat. A new device, called the bioelectric impedance meter, will be used to determine regional body water content.

A separate study will explore why animals with fescue toxicosis do not sweat. Cattle will be tested in the Brody Environmental Center, put on infected pasture for two to three months, and retested in the chamber for results.

Don't Sweat It CONTINUED FROM PAGE 164

chamber, their body temperatures went up several degrees. The Missouri Angus sweat rate was not as high as the Florida Angus group.

The research also revealed cattle sweat the first few days and then the rate drops. "We need to determine ways to bring down sweat rate versus body temperature because water and minerals lost during sweating are important to performance," he says. "We were not surprised the Romosinuanos had lower body temperatures, sweat rates and respiration levels than Missouri Angus. They must do something else to lower body temperature."

Spiers surmises that since Romosinuano cattle are small, lanky and slower-growing, they may possibly have a lower metabolic rate. "You can't alter metabolism or heat production, since this would reduce productivity (e.g., growth). What we can do is look for genetic markers in cattle and manage hydration to help improve heat tolerance," Spiers continues, adding that they are only in the early stages of the research.

Softening heat's blow

Spiers advises producers to recognize the importance of access to plenty of water during hot days. "When the body temperature rises, water is critical. Cows sweat a lot during heat stress," he says. "The cattle will adapt to the heat, but the first few days of heat are the most important. You have to have shade and water for the cattle."

Cow-calf producers with cattle on pasture are most vulnerable. Spiers says animals can lose water rapidly and must have access to streams and shade.

"That is the easiest and best way to manage heat stress. After four or five days, it is not as critical," he says. "The other scenario to watch is when the weather goes quickly from a cool period right into the heat. It is hard for cattle to adapt to extreme temperature changes."

Spiers says the question they must address

now is how to help cattle adapt in the long run.

"If we find that mineral balance is an issue, we may be able to develop additional recommendations," he says. "Researchers plan to look for genetic markers in the animals that perform best in the heat, and evaluate sweating as one of the key parameters. Once we find the genetic markers for heat sensitivity, we may be able to breed heat-related problems out of the cattle. We are looking at this, but we have a long way to go."

AJ

►These cattle are the subjects of a sweat study being conducted at the Brody Environmental Center, one of two such chambers in the United States, at the University of Missouri.