Throwing Shade on Your Herd

It pays to do something about heat stress.

by Morgan Boecker, Certified Angus Beef LLC

The last anyone knew, heat stress cost the U.S beef industry $369 million a year — but much has changed since the 2003 study. That's why a Colorado State University (CSU) scientist is working now to quantify the need for shade throughout the beef supply chain.

Heat stress occurs when an animal can't dissipate heat as fast as it's incurred. Any stress can affect performance and health but also well-being and behavior, a special focus for CSU's Lily Edwards-Callaway. Her team's literature review found shade benefits vary by geographic location, structure type and weather patterns.

When it's hot and sunny, cattle look for shade. Nature often provides trees to fill that need at the cow-calf level, but shade can be scarce in feedyards. That's where Edwards-Callaway focuses her research.

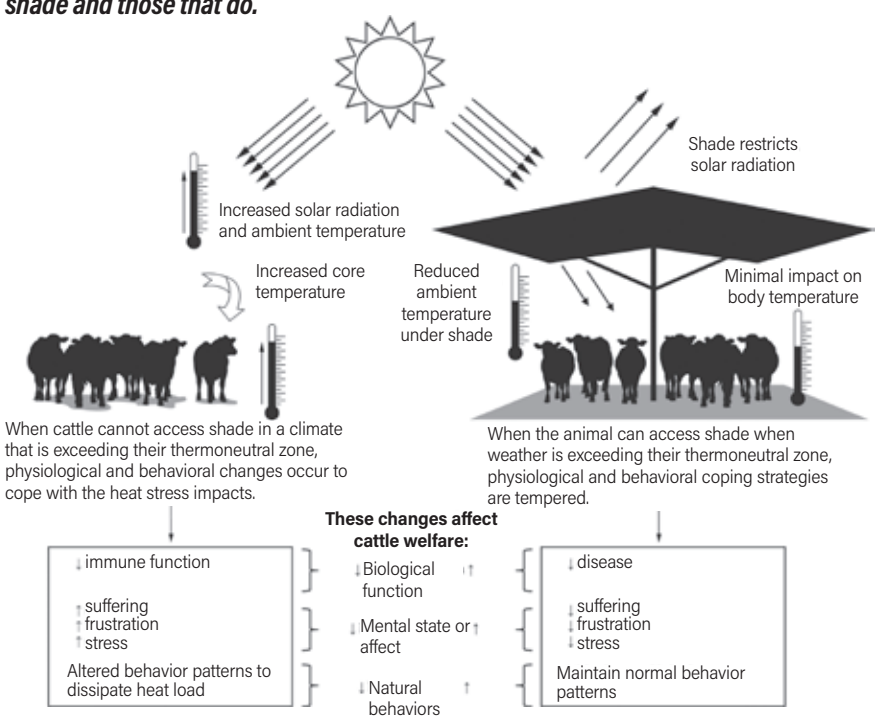
"We want to provide animals a good quality of life where positive experiences outweigh negative," she says. "If there is an economic relationship to animal welfare pointing toward improvement, there's no reason not to get better."

In the 2020 paper titled "Impacts of shade on cattle well-being in the beef supply chain," Edwards-Callaway says animal welfare has three parts: biological function, natural behavior and affective (mental) state.

When feedyard cattle get all they need to thrive, they realize their full potential in life and then produce the highest-quality beef possible. Providing shade when needed is one way to mitigate stress and ensure more good days.

"Cattle management practices have progressed and technology has changed," Edwards-Callaway says. "I'm sure producers have a lot of innovative, cost-effective ways to shade cattle to improve performance. I think there's a great need to dig a little deeper."

Figure 1: ***Heat stress occurs when an animal can't dissipate heat as fast as it's incurred. This diagram depicts the effects on cattle that do not have access to shade and those that do.***



A closer look

Key indicators in shade studies include cattle performance, health, behavior and mortality rates in groups provided with shade vs. none. Shade systems differ across the studies as they do in feedyards. Still, no matter the system, results favor the shaded groups. Effectiveness wasn't based on having "the best" shade, but simply any shade at all.

Weather complicates matters. The easiest place to identify as needing shade is where it's hot and humid, but need doesn't always mean a practice is adopted.

"We just don't know how much people are really using shade," Edwards-Callaway says.

The economics of need in feedlots adds to the complexity. Environments change through the seasons, influencing how long — or even if — a shade structure can withstand those changes. Over time, shade becomes less expensive as long as it's maintained.

Daniel Clark, meat scientist with the *Certified Angus Beef*® (CAB®) brand, collaborated on the paper.

"The variability in the climate really skews the data we looked at," he says. "A big takeaway is to just be prepared."

Know your environment, and you know if your cattle would benefit from shade, the scientists suggest.

Get a price for setting up feasible shade infrastructures to compare those against the production and welfare losses from just one extreme heat event.

A 1995 heat event in Iowa led to 4.8% death loss in nonshaded feedyard pens, compared to 0.2% in shaded pens. With increasing temperature trends, those are likely conservative estimates today, Edwards-Callaway says.

Extreme weather fluctuation affects final carcass quality, too, but Clark says the extent of mild and severe weather change varies. More predictably, extreme heat brings high mortality.

"If you're trying to gain every benefit of high-quality beef that you can, then you probably need to think about adding some shade and protecting cattle for when there is a major weather event," Clark says.

At what cost?

The CSU research didn't examine cattle characteristics in the studies, but future work could explore other factors such as whether shade benefits newly arrived feedlot cattle or those in hospital pens.

Problems arise when there is no heat mitigation as needed, and that becomes an animal welfare issue, too.

"What can we do that's innovative and cost effective to provide some alleviation from heat stress?" Edwards-Callaway asks.

She's already working with packing plants to see what kind of effect shade may have right before slaughter. This ongoing project is looking at distance cattle travel to the plant and time waiting to unload and reach the point of harvest. It's also tracking pen density and weather and their effects on mobility, bruising and carcass characteristics.

Animal welfare is connected to every outcome, she says. Basic health and production factors ensure cattle perform to their highest potential. Cattle are motivated toward certain behaviors, such as lying, seeking shade, water, food and even playing, which overlap with performance.

"Do producers think shade is important?" Edwards-Callaway wonders. "Why or why not? What factors dictate whether cattlemen want to use shade or not?"

The answers affect everything from productivity and profitability to beef's image with consumers, she adds. AJ

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