



A Shady Proposition

There are financial and marketing advantages for mitigating heat stress with shade.

by Troy Smith



It doesn't take a genius to figure out that spending long summer days in the hot sun can be uncomfortable for cattle, as well as for humans. High air temperatures combined with high levels of humidity set the stage for heat stress and its negative effect on cattle performance. Cattle-feeding operations located in the High Plains and southwestern states might enjoy the advantage of lower humidity, but the sun can bear down with mighty intensity. Heat stress still threatens performance. And regardless of geography, severe heat waves can and do contribute to increased mortality rates.

Veteran cattle feeders know all too well that really hot weather prompts elevated respiratory rates, heart rates and body temperatures among cattle. Opposite from typical human behavior, heat-stressed animals often show increased levels of activity, trying to find relief from their discomfort. Making feedyard managers really uncomfortable is reduced dry-matter intake (DMI) and lower average daily gain (ADG) typically exhibited by heat-stressed cattle.

The most basic step in mitigating heat stress is to make sure cattle have access to ample drinking water that's cooler than the air temperature. Many feedyards use water sprinklers or misters to wet the skin of cattle, so the cooling effect of evaporation can lower the animals' body temperatures. Some feedyards also erect structures to provide shade from the sun.

Shade vs. sprinklers

Sprinkler systems are often considered more cost-effective, since they are also used to alleviate dust. However, research discussed during the recent International Symposium on Beef Cattle Welfare suggests shade provides more relief from heat stress than wetting cattle with water. According to University of California–Davis animal scientist Frank Mitloehner, providing shade can have favorable effects on cattle behavior, feeding performance and carcass merit.

According to Mitloehner, sprinkling or misting is sometimes counterproductive, because it increases humidity. And, while adding water does settle feedyard dust, it also increases manure odor. Comparative studies showed misting is less effective for relieving heat stress because water mist droplets remain on the surface of the hair, while larger sprinkler droplets actually wet the skin. Even so, Mitloehner's research suggests any cooling effect from evaporation doesn't significantly relieve cattle discomfort — not enough to reduce a negative effect on performance.

In a setting that mimicked commercial feedyard conditions, cattle fed in unshaded

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pens were compared with cattle fed in an equal number of pens containing “tin roof” structures for shade. Mitloehner says shaded animals spent more time resting during the heat of the day. Less daytime activity meant less dust was stirred into the air. Ground surface moisture under the shades was slightly higher — just enough to reduce dust. Cattle without access to shade did not lie down as often or as long on the sun-heated ground.

“The effect of shade on the ground was to make it cooler, and cattle would lie down more during the day and dissipate body heat on the cooler ground,” Mitloehner explains. “At night, the cattle would spend more time eating and drinking.”

Respiration rates among cattle with access to shade was lower and, compared to cattle without shade, dry-matter intake and average daily gain were higher. Body weight at closeout was greater among shaded cattle. Feed efficiency was not significantly different between cattle in shaded pens and those in pens without shade.

“The improvement was equivalent to \$18 per head, in performance alone,” Mitloehner says. Also, shaded cattle posted greater hot carcass weights. A higher percentage of their carcasses graded Choice, and the percentage of dark-cutting carcasses was lower.

“Providing shade does improve cattle well-being, and it can improve performance and carcass characteristics,” Mitloehner says. “I can’t say it will be as effective in all areas, but providing shade has been shown effective in the southwestern U.S. and particularly in California, Arizona and west Texas.”

Even if cattle feeders strongly suspect that providing shade could significantly help alleviate heat stress among cattle they feed, Mitloehner warns against making a major new investment in shade for every pen. He advises them to start with just a few pens. Compare the behavior, performance and carcass value of shaded animals with cattle fed, at the same time, in adjacent pens without shade. Then decide if further investment holds promise for greater profitability.

There is something else to think about, even if the boost to profitability is minimal. As animal agriculture comes under increased public scrutiny, providing shade demonstrates the cattle feeder’s concern for animal welfare and sends a positive message to consumers.



Editor’s Note: *Information on the benefits of shade was presented at the International Symposium on Beef Cattle Welfare, developed and hosted by Kansas State University’s Beef Cattle Institute, in Manhattan, Kan.*