BEAT THE HEAT!

WHY SHADE MATTERS

BY JESSICA GRAHAM



Shade plays a critical role in protecting cattle from heat stress. When cattle are exposed to high temperatures and direct sunlight, they work harder to stay cool, which creates stress. Heat stress reduces feed intake, lowers fertility, and slows weight gain, all of which directly impact animal performance and producer profitability. Research consistently shows that providing shade improves cattle comfort and helps maintain productivity in both feedlot and cow/calf systems. By reducing heat load, shade allows cattle to eat more consistently, stay healthier, and perform more efficiently during periods of warm or extreme weather.

FEEDLOT BENEFITS

The dangers of heat stress in feedlot cattle became very clear during the extreme heat event that struck western Kansas in June of 2022. During that event, an estimated 2,000 to 10,000 feedlot cattle died after temperatures climbed above 100°F while humidity remained high and wind speeds stayed low. Many of the cattle affected were near-market-weight feeder calves that were already producing large amounts of heat. University and veterinary experts described the event as a "perfect storm" created by sudden temperature swings, warm nighttime temperatures, high humidity, and the inability of cattle to cool themselves effectively. Researchers from the University of Nebraska–Lincoln have reported that heat stress in feedlot cattle can result in "extreme cases, death," with dark-hided and heavier cattle facing the greatest risk.

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Since cattle do not sweat like we do, they mainly use respiration to release body heat. During intense heat, especially when nighttime temperatures remain high, cattle have a tough time cooling down. Their body temperatures continue to rise, leading to rapid panting, dehydration, reduced blood oxygen levels, organ failure, collapse, and eventually death. The University of Minnesota Extension states that temperatures above 90°F place feedlot cattle at high risk for severe heat stress and possible mortality.

Providing shade in feedlots can play a major role in reducing these losses. Shade lowers the amount of direct solar radiation cattle absorb and can reduce surface temperatures by several degrees during extreme summer conditions. Research conducted by USDA and university scientists has shown shaded cattle maintain lower body temperatures, lower respiration rates, and reduced stress indicators compared to cattle without shade access. By reducing overall heat load and improving cattle comfort, shade structures can help lower mortality risk during dangerous heat waves while also improving cattle health and performance throughout the feeding period.

Cattle experiencing heat stress use extra effort trying to cool themselves. When shade is provided, we see energy conservation, which leads to improved feed efficiency. This means cattle gain more weight on the same amount of feed, and use it better directly impacting profitability.



We see this shown in a study led by Associate Professor David Miller, from Murdoch University's School of Agricultural Sciences. This study was conducted in Southern Australia and monitored over 900 head of cattle. The conclusion to this study showed shaded cattle had almost a .29 lb. average daily gain across when compared to non-shaded cattle. This study analyzed the data over a 70-day feedlot period. As you can see, the average rate of gain was higher in shaded cattle.

Additionally, The University of Nebraska research found shaded feedlot cattle had greater dry matter intake and higher average daily gain during heat events. A 2023 study reported shaded cattle gained more weight and produced carcasses that were over 17 lbs. heavier per animal. Texas Tech researchers reported shade improved feedlot heifer performance and reduced stress behaviors.

COW/CALF PAIR BENEFITS

Providing shade for cow/calf pairs offers

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several important benefits during the heat of summer. Heat stress can affect fertility in both cows and bulls. Research reviews from Colorado State University have shown that reducing heat load through shade can help support reproductive performance in beef cattle systems. Cows that stay cooler are more likely to cycle normally and maintain better conception rates during summer breeding seasons. Added stress is hard on cattle, and can wear down their immunity and discourage them from coming into heat. If you're managing your calving window, a heat spell can disrupt that cycle.

Bulls also benefit from reduced heat stress, as cooler body temperatures help maintain semen quality and breeding performance. They can experience reduced semen quality and libido during periods of heat stress, impacting breeding success. Providing shade helps to mitigate these detrimental effects by keeping the animals' core body temperatures lower and reducing the physiological stress they experience. According to the UK Martin Gatton College of Agriculture, just adding access to shade can reduce heat stress on cattle by up to 30%. This is a significant reduction, and can be invaluable when temperatures pose a threat to cattle.

Beyond reproduction and growth, shade also plays a crucial role in bolstering the immune system of cattle. Chronic heat stress can suppress the immune system, making animals more susceptible to diseases and infections. By reducing the overall stress load on the animals, shade helps them maintain a stronger immune response, leading to fewer health issues and reduced veterinary and vaccine costs. A healthy herd is a more productive herd, requiring less intervention and contributing to a more robust and resilient operation.

Shade also plays a major role in calf health. Young calves are especially sensitive to high temperatures because they have a harder time regulating body heat. When shade is available, calves spend less energy trying to stay cool and can direct more energy toward growth and immune function. Reduced heat stress also lowers the risk of dehydration, heat exhaustion, and other stress-related health issues that commonly



occur during periods of extreme summer heat.



Cow/calf pairs with access to shade often maintain better grazing behavior throughout the day. During hot conditions, cattle without shade tend to reduce grazing activity and spend more time standing and panting in an effort to cool themselves. With proper shade, cows and calves are more comfortable, spend more time grazing and ruminating, and typically maintain better feed intake. This can contribute to improved milk production in cows and heavier weaning weights in calves.

Mortality risk is another major concern during extreme heat events. Young calves are particularly vulnerable to heat-related illness and death, especially during periods of high humidity and warm nighttime temperatures when cattle cannot adequately cool down. Providing natural or artificial shade helps reduce body temperature and overall heat stress, lowering the risk of heat exhaustion, dehydration, and mortality in both cows and calves during dangerous summer weather conditions.

ADVANTAGES OF SHADE

The advantages of providing shade extend far beyond simply preventing death loss. Providing shade can impact the overall health, well-being, and productivity of cattle. This all leads to financial gains for cattle producers.

The benefits of shade also extend to the quality of the final beef product. Studies have shown that heat stress can negatively impact meat quality, potentially leading to darker meat and reduced tenderness. By reducing heat stress, providing shade can contribute to a higher quality, more consistent end product. This is becoming increasingly important as consumer demand for high-quality beef grows and producers seek ways to maximize the returns on their investment.

TYPES OF SHADE

Implementing shade can look different, depending on your land, budget, the size of the herd, and availability. Natural shade,

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from mature trees and timber, is often the most cost-effective option. However, you're not going to get the shade you need right away, you will have to wait for the trees to mature if you're planting new trees. You might have timber on your land available to cattle. You will notice they hang out there on the hottest days. However, you might not have trees in your pastures or feed lots, so you might consider either a permanent or mobile shade unit.

Artificial shade structures might be a better fix for shade right away. They offer a reliable alternative. These can range from simple shade cloth stretched over frames to more permanent structures built with wood or metal. Portable shade structures can be built on skids to allow movement, especially if you exercise rotational grazing. The frames are usually steel or welded pipe. The downside is that you should consider the wind in your area. Overall, these are pretty durable, but a heavy straight-line wind could flip or damage the structure. They are relatively cheaper than putting up a permanent structure.

You might decide that in some locations, a permanent shade structure is a better fit. They can be provided by building barns or sheds. For the most part, you don't have to worry about weather prematurely beating up on your structure. However, it's the most expensive route to go, and it can't follow your cattle around from pasture to pasture. They for sure have their place, you should weigh the pros and cons specific to you, and decide which option is the best. The initial investment in artificial shade structures is often recouped through improved productivity and reduced mortality.

In conclusion, the evidence overwhelmingly supports the multiple benefits of providing shade for cattle. From dramatically reducing mortality during heat waves to improving feed efficiency, reproductive performance, and immune function, the advantages are substantial. ■



