

Shade Sources for Beef Cattle

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Introduction

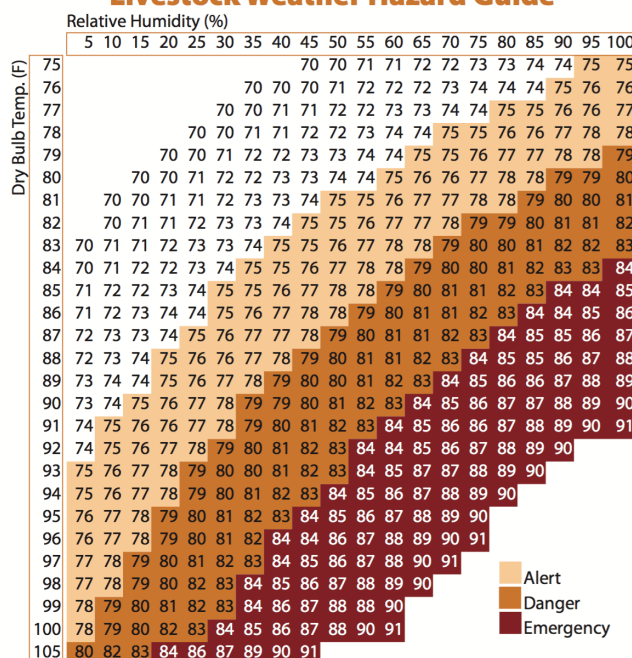
Beef cattle producers are all too familiar with the brutal heat and humidity of summer in the southeast. Humidity severely compounds effects seen during high temperatures, further increasing the stress level on livestock, even on more temperate days.

As depicted in the Livestock Weather Hazard Guide shown here, cattle may begin suffering from heat stress while temperatures remain in the 70s. A general rule of thumb is that extreme stress starts at around 84 F and 84% humidity.¹

It is important to note that not all animals handle stress equally. Brahman and Brahman-cross cattle are better adapted for dissipating heat than their English and Continental bred contemporaries. Furthermore, moderately conditioned cattle tolerate heat better than over-conditioned, and similarly light-hided cattle over dark hides.

A cow's comfort zone is between 41 F and 77 F. When temperatures dip below 41 F, cattle reprioritize caloric usage. In response to the temperature dropping below the animal's lower critical temperature, they begin burning calories to keep warm. Conversely, when an animal suffers from heat stress, calories are burned from increased panting and grazing is severely limited. Cattle limit grazing when their internal body temperature is elevated because the process of digestion produces extra heat. Aside from lowered average daily gain, producers can also expect to see a reduction in reproductive performance when temperatures are elevated.²

Livestock Weather Hazard Guide



Livestock Weather Hazard Guide. Illustration by the Noble Research Institute

Amount of Shade Needed

The two main tools cattle producers must combat the subtropical climate are water and shade. As temperatures increase, cattle's requirement for water increases.² A 1999 study from the University of Arkansas evaluated the impact of shade on cow performance. The three groups evaluated were housed in pastures with no shade, artificial shade and natural shade from mid-June to mid-August.³

Effect of shade on average daily gain.³

Group	Average Daily Gain
No Shade	1.95
Artificial Shade	2.04
Natural Shade	3.09

The results of this study clearly indicate that shade is necessary to safeguard the performance of your herd. While natural shade is generally preferred, there is nothing wrong with artificial shade if implemented correctly. The most important thing is to ensure that cattle receive adequate square footage of shade, which allows them to spread out for airflow to help dissipate their body heat.

Note: These recommendations are based upon limited U.K. research results and previous experience; additional research is needed regarding the benefits and optimum size to improve production, welfare and economics.

Suggested shade requirements for beef and dairy cattle (75% of optimum amount).⁴

Animal Type	Space Requirement (square feet/head)
400-pound calves	15-20
800-pound feeders	20-25
Beef cows	30-40
Dairy cows	40-50

Artificial Shade

There are two subsections of artificial shade: permanent and mobile. Permanent shade structures are things like pole barns and loafing sheds. These are great options for sources of shade for frequently used spaces like bull pens or feedlots. Mobile shade structures find more applications in a pasture setting because they can be moved with the cattle from one pasture to

another. They can also be rotated within the pasture to promote efficient forage utilization and ensure a more uniform distribution of manure and urine.

The same specifications that make a good permanent shade structure also apply to a good mobile shade structure. The canopy of the structure can be made of either a quality shade cloth or corrugated metal. If corrugated metal is used, the roof should be at least 12 feet tall to ensure adequate airflow. The recommended minimum height of shade cloth is a bit more forgiving as the shade cloth allows air to pass through while still blocking out around 80% of the sunlight. Shade cloth canopy height requirements are more forgiving since it allows air circulation while still blocking roughly 80% of sunlight.

The structure must also be large enough to cast sufficient shade for the number of animals you are housing. Portable shade structures must be large enough to cast a reasonable amount of shade but still small enough to fit through the gates on your ranch.

Portable shade structures can be used in open pasture. Photo by Tripp Morgan



Natural Shade

Natural shade is largely the preferred method for providing shade for the cattle in our state. Trees provide a reliable and somewhat maintenance-free source of shade for our cattle. The tree canopy is generally high enough to allow heat to dissipate well. However, just relying on natural shade sources can still come with some concerns. The biggest concern with adequate heat dissipation is underbrush growth impeding air flow. This can be easily addressed with both chemical and mechanical control methods.

There are a few additional concerns with natural shade. Excessive pressure from cattle can potentially expose tree roots and in extreme cases, damage the tree. When shade trees are near water, pressure from cattle can cause erosion that leads to reduced water quality. This can be managed by



Cattle benefit from the shade of a pine tree. Photo by Tripp Morgan

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allowing sufficient recovery time for these areas to regrow between grazing events. Another disadvantage of natural shade is availability. Unfortunately, you cannot plant an oak tree and expect it to be used for shade the following year. It takes years, sometimes up to a decade, for young trees to grow to a size there they can be utilized for shade. Excessive cattle pressure also applies to growth of young trees as they are easily damaged and their leaves may be eaten by both cattle and wildlife.

As hurricanes cause damage to our shade trees each summer and fall, and tornadoes and thunderstorms cause damage each spring, producers need to be planting trees that will be utilized by the following generations. One last hazard of relying on natural shade is the potential for oak poisoning. Each fall when the bulk of the acorn crop drops to the ground, cattle may encounter oak poisoning. This is something to be aware of when relying on primarily oak trees to provide your cattle shade into the fall.

Summary

Beef cattle require between 15 and 40 square feet of shade per head depending on their age and production stage. Inadequate amounts of shade may lead to heat stress and a reduction in cattle performance. Extreme heat and lack of shade may result in death loss. Both natural and artificial shade sources carry advantages and disadvantages. It is important for the rancher to evaluate their operation and utilize different shade strategies that will provide the most effective solution for their ranch. Your local extension agent can assist with shade options and requirements for your operation.

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