

HEAT STRESS AND BEEF CATTLE

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High temperatures raise the concern of heat stress on cattle. Heat stress is hard on livestock, especially in combination with high humidity. Hot weather and high humidity can reduce breeding efficiency, milk production, feed intake, weight gains, and sometimes cause death. Livestock should be observed frequently and producers should take precautions when hot and humid weather is forecast.

Major management options are providing shade, improved ventilation and a sufficient quantity of water. Shade for livestock can be provided by trees, buildings or sunshades. The temperature can be further reduced by spraying cool water across the roofs of buildings where animals are housed. Ventilation can be provided for air movement by fans and windows. Sunshades should be high enough to allow air movement.

Providing an adequate source of cool, clean drinking water is essential to help keep animal's internal body temperature within normal limits. It is thought that water temperature affects rumen temperature and thus blood temperature which affects brain centers that control feed consumption. Above-ground water lines should be provided shade by having taller grass cover them. Run lines in fields that are not be currently grazed to water troughs that are in fields being grazed. The manager should at least check the water temperature in the water trough. Temperature increases from 70°F to 95°F can increase total water requirements by about 2.5 times.

Producers using management intensive grazing might consider several options. One option is to rotate through fields at a more rapid rate. Taller grass tends to be a cooler surface to maintain cattle on than pastures with shorter grass stands. Another option is rotate cattle in the evening rather than the morning. The assumption is that the grass will be consumed in the evening and hopefully the "heat of fermentation" or digestion is mostly dissipated by mid-morning, thereby reducing the heat load produced by the animal. Another possible option is to graze paddocks that allow access to barns (shade) or trees during the heat of the day. This will reduce equal distribution of manure throughout the paddock but might be a suitable compromise during excessively hot weather.

Producers sometimes talk about "hot" feeds and "cool" feeds. We must discern whether the discussion is about energy content or actual heat production. Corn and other concentrates are sometimes called "hot" feeds. This is in reference to their higher energy content compared to hay or straw (cool feeds). However, corn and other concentrates contribute less to the heat of fermentation or digestion than hay. Therefore cattle actually produce less actual heat when consuming corn than when consuming hay. Further increasing the concentrate portion of a feedlot finishing diet may lead to acidosis problems. One option is to feed more frequently so as to keep the feed fresher (especially silage) and to feed a greater part the diet in the evening rather than in the morning. Similarly high quality forage produces less heat of fermentation than low

quality forage. This might be another argument for moving cattle to higher quality pasture or moving more frequently through paddocks.

An excessive level of protein during heat stress may be detrimental. The excess nitrogen supplied by the protein must be detoxified and prepared for excretion (via urine). This is a biochemical pathway that is very high in energy demands.

Increased water consumption will increase excretion of urine. This will also increase the loss of certain minerals, such as sodium (a part of salt), potassium, and magnesium. Free choice trace mineral salt should be provide in a location that the animals will consume it. Loose salt will be more readily consumed than block salt.

The weather service issues special forecasts during extremely hot weather to alert livestock producers of dangerous weather. The warnings are based on a temperature-humidity index, which increases as the temperature and humidity increase. The danger level is indicated by an index value of 79, which is reached in various combinations of temperatures above 85 degrees in combination with high humidity. As temperatures increase, slightly lower humidity can still create dangerous and emergency conditions.

The emergency levels begins at an index level of 84 and occurs at temperatures in the 90 and 100 degree range, increasing in danger as the humidity level increases.

Livestock producers should listen to local radio and television weather reports early in the day for warnings that heat stress may become a problem.