



COW SENSE CHRONICLE

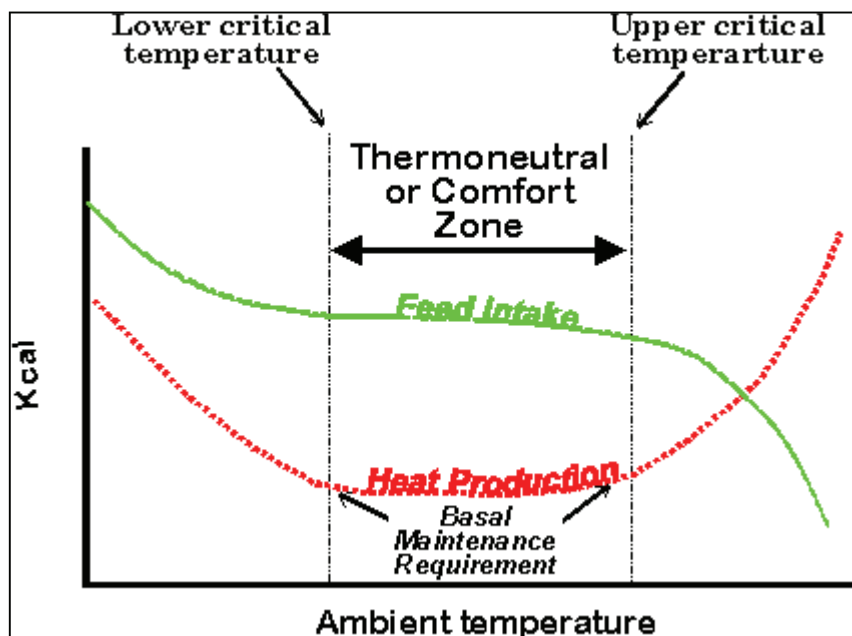
JANUARY 2015

COLD WEATHER FEEDING CONSIDERATIONS

Happy New Year! For this month's topic, I thought it might be timely to revisit the topic of cold weather feeding considerations for beef cattle.

We'll start with the interaction of temperature and energy requirements. When cattle (or any animals) are in the thermoneutral zone (see Figure 1), they don't have to expend any energy to maintain body temperature. When it gets warmer than the upper critical temperature, cattle have to use energy to cool down. When it gets colder than the lower critical temperature, cattle have to use energy to warm up.

Figure 1. The thermoneutral zone lies between the upper and lower critical temperatures.



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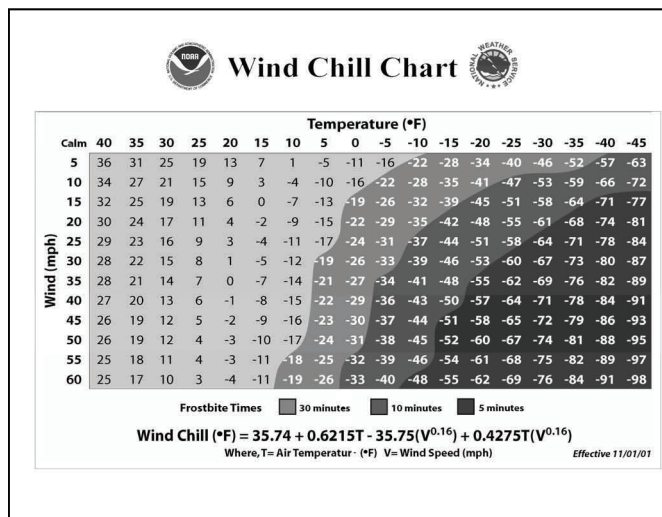
You might be wondering, “what *is* the lower critical temperature?” Like any good animal science question, the answer is, “it depends!” In this case, it depends on hair coat and weather conditions (see Table 1). With a summer hair coat, or a wet (to the skin) hair coat at any temperature, the lower critical temperature is quite warm at 59° F. On the other hand, the lower critical temperature for a cow with a heavy winter coat is 18° F.

Table 1. Estimated lower critical temperatures for beef cattle.
From *Beef Production and Management Decisions* (Field, 2007)

Coat Description	Critical Temperature
Summer coat or wet	59° F
Fall coat	45° F
Winter coat	32° F
Heavy winter coat	18° F

When a cow is experiencing cold stress, the major effect on nutrient requirements is an increased need for energy, which generally indicates the total amount of feed needs to be increased. A simple rule of thumb (more detailed information is available) is to increase the amount of feed 1% for every degree of coldness below the appropriate lower critical temperature.

For example, let’s say you have a 1400-pound cow with a heavy winter hair coat. It’s currently 10° F with a 20 mph wind and you normally feed 28 pounds of hay per day. The effective temperature with the wind chill is -9° F, and the appropriate lower critical temperature is 18° F. Subtracting -9 from 18 yields 27, so the amount of hay needs to be increased by 27%. This would be just over 7.5 pounds of additional hay for a total of 35-36 pounds.



In the short term, cattle can make behavioral changes to alter the effective temperature, such as finding protection from the wind. In the long term, the hair coat is their main defense against cold, in combination with those behavioral changes. Thick-hided cattle have lower requirements across all conditions compared to thinner-hided cattle. Energy requirements will increase with wet, windy, and/or cold-temperature conditions.

Questions for Rachel?
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