Dealing with Cold Stress in Beef Cattle
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One of my mom's favorite sayings when I was a kid revolved around the ever-changing weather conditions in Kansas.

"If you don't like the weather in Kansas just wait 5 minutes and it will change."

Here we are in early February and we have already had a roller coaster of temperatures this winter. Everything from nearly 70 degrees, to a foot of snow within the last few weeks. These weather variations create stress for producers and their livestock. Here are a couple things to remember during the next cold snap we have.

Cattle producers know and appreciate that cold weather increases nutrient requirements. However, the obvious questions that come to mind are "What is cold to a cow?" and "What nutrient increases are necessary (energy, protein etc.) and by how much?".

Cattle are most comfortable within the thermonuetral zone when temperatures are neither too warm nor cold. During the winter months cattle experience cold stress anytime the effective ambient temperature, which takes into account wind chill, humidity, etc., drops below the lower critical temperature. The lower critical temperature is influenced by both environmental and animal factors including hair coat and tissue insulation (body condition). The table below lists the estimated lower critical temperatures of cattle in good body condition with different hair coats. In wet conditions cattle can begin experiencing cold stress at 59°F, which would be a mild winter day. However, if cattle have time to develop a sufficient winter coat the estimated lower critical temperature under dry conditions is 18°F.

Estimated lower critical temperatures for beef cattle

Coat Condition	Critical Temperature
Wet or summer coat	59°F
Dry fall coat	45°F
Dry winter coat	32°F
Dry heavy winter coat	18°F

Cold stress increases maintenance energy requirements but does not impact protein, mineral or vitamin requirements. The general rule of thumb (for a cow in good body condition, BCS = 5 or greater) is to increase the energy density of the ration by 1% for each degree (Fahrenheit) below the lower critical temperature. The classic response to cold stress in confinement situations is an increase in voluntary intake. However, it has been documented that grazing beef cows may spend less time grazing as temperatures decline below freezing, which reduces forage intake (Adams et al., 1986) and makes the challenge of meeting the cow's nutrient requirements even greater. In many cases feeding a greater amount of low-quality hay will replace grazed forages but may not provide sufficient energy. Therefore, providing additional energy by feeding a relatively higher-quality hay or fiber-based supplement (DDGS, Corn gluten feed, or Soybean Hulls) may be required.

Our overall goal is to be aware of the increasing energy and protein needs of the cow as they enter the third trimester of gestation and the temperature declines. It is difficult to improve body condition during the third trimester when the gestating calf is rapidly growing and consuming nutrients while the cow is dealing with cold winter weather. It is even more difficult (almost impossible) to improve cow body condition once the calf is on the ground and nutrients are shifted toward milk production. The key to managing cold stress in pregnant cows is to keep body condition from slipping by providing additional energy when necessary.