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Cold Hardy Cattle

Extreme swings in temperature have existed for thousands of years, but today's instant information, digital world, with headlines like "Historic Siberian Polar Vortex and Intense Bomb Cyclone Blizzard" scare people into believing this is unprecedented weather. I tend to like to interact more with cows than mainstream media as they have more practical sense. I can't recall a winter when the herd didn't grow in a winter hair coat, so believe preparing for these events is just part of livestock DNA. The cows might have a winters coat on now, but are they ready for weather like we've experienced lately?

Surviving harsh winter weather boils down to a few main issues; temperature, moisture and windspeed, mainly. Lower Critical Temperature (LCT) outside of the Thermal Neutral Zone (TNZ) is something referenced in discussions around cold weather. Essentially this is the point the when a resting animal must increase its metabolic rate to meet environmental demands for heat. When animals reach this point and don't make up for increased energy demands from feed, body storage reserves are used. Cows in good body condition, BCS of 5 to 6, with good thick, heavy, winter hair coats have a lower critical temperature around 19° F.

To illustrate how much of an impact moisture has on LCT, a cow with a wet hair coat to the hide will have a lower critical temperature in the mid to high 50s°F compared to 19°F. Shelter from wind and bedding will help in keeping coats drier and lowering LCT for cattle. The general rule of thumb is that for every degree of cold stress a cow faces, energy requirements increase by 1%. This energy need would double to 2% if the animal is wet to the hide. For example, windchills at 0°F equates to a 30-40% increase in energy demand, just to keep the cow in a maintenance status. Crop residues, grass hay or other lower quality forage cows have been doing well on in a mild fall, will simply not meet energy requirements in periods below LCT.

Cattle can gradually adapt to changing temperatures with more success than sudden changes that often accompany low pressure storm fronts. However, cows tend to lose their acclimation to cold weather with series of nicer thermoneutral days. When cows get below their lower critical temperature and get into cold stress, they can adapt by increasing feed consumption to increase their base metabolic rate, which increases the heat of rumen fermentation. Research has shown that this can be up to 125% of expected intake, but if conditions are extreme enough, intake actually decreases. This creates an even more problematic situation, as animals eat less and may not leave the comfort of shelter from wind.

As we discussed for heat stress this summer, the Kansas Mesonet Animal Comfort Index is a good tool to see cold stress levels for livestock. Adding supplemental energy to diets in these cold stress times is critical. So how much extra nutrition? The classic Extension answer is that it depends! Knowing the nutrient value of feedstuffs you have on hand is important and we can help you run scenarios at the Extension office with our ration balancer software.

A good energy value to refer to is total digestible nutrients or TDN. High quality alfalfa hay usually has a TDN of 58-60% and should meet requirements for dry, good body condition animals at windchill temperatures into the below 0°F range. Corn is a very good and generally available, high energy option (88% TDN) but caution should be given to work it up in a diet slowly to prevent rumen upset. Transition diets with corn need to step up to around 0.3-0.4% of body weight consumed, over 2-3 weeks. Unfortunately, neither of these options are "cheap" this year, but you can't afford NOT to supplement either. A good resource for more information on this topic is the [K-State Beef Cow Nutrition Guide](#) C735, found at the KSRE online bookstore.