

Beef Management Update

by Glenn Selk, OSU Extension Cattle Reproduction Specialist

Managing the Cold Weather

The major effect of cold on nutrient requirement of cows is increased need for energy. To determine magnitude of cold, lower critical temperature for beef cows must first be estimated. For cows with a dry winter hair coat the lower critical temperature is considered to be 32 degrees F. In general, researchers have used the rule of thumb that cows' energy requirements increase 1% for each degree the wind chill is below the 32 degree lower critical temperature. Therefore the calculation example for a cow with a winter dry hair coat would be:

Step 1: Cow's lower critical temperature is 32 degrees F.

Step 2: Expected wind-chill from weather reports (let's use 4 degrees wind chill in this example).

Step 3: Calculate the magnitude of the cold: 32 degrees - 4 degrees = 28 degrees.

Step 4: Energy adjustment is 1% for each degree magnitude of cold or 28%.

Step 5: Feed cows 128% of daily energy amount. (if a cow was to receive 16 pounds of high quality grass/legume hay; then feed 20.5 pounds of hay during cold weather event).

Research has indicated that energy requirements for maintenance of beef cows with a wet hair coat is much

greater. Cows that are exposed to falling precipitation and have the wet hair coats are considered to have reached the lower critical temperature at 59 degrees F. In addition, the requirements change twice as much for each degree change in wind-chill factor. In other words, the energy requirement actually increases 2% for each degree below 59 degrees F. To calculate the magnitude of the cold when the cow is wet would be the difference between 59 degrees minus 4 degrees = 55 degrees. True energy requirements to maintain a wet cow in this weather would be 2% X 55 degrees or 110 % increase in energy (which would mean in turn that 210% of normal energy intake is needed.) This amount of energy change is virtually impossible to accomplish with feedstuffs available on ranches. In addition this amount of energy change in the diet of cows accustomed to a high roughage diet must be made very gradually to avoid severe digestive disorders. Therefore, the more common-sense approach is a smaller increase in energy requirements during wet cold weather and extending the increase into more pleasant weather to help regain energy lost during the storm.

Cows that were consuming 16 pounds of grass hay per day and 5 pounds of 20% range cubes could be increased to 20 pounds of grass hay offered per day plus 6 to 7

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pounds of range cubes during the severe weather event. This is not a doubling of the energy intake but by extending this amount for a day or two after the storm may help overcome the energy loss during the storm and done in a manner that does not cause digestive disorders.

Severity Of Winter And Impact On Calf Birth Weights

Does the severity (coldness or mildness) of the winter have an impact on spring-born calf birth weights? Ranchers have asked that question during many springs and veterinarians have speculated for years. The debate rages on! This is obviously a difficult subject to research because you cannot have a "control" group of cows to compare to a "treatment" group that is exposed to a cold winter while still running on the same pasture. Therefore research data on this subject is limited. University of Nebraska researchers have done the next best thing. They have monitored the birth weights of genetically similar calves across three different winters and have related average winter temperatures to birth weights. This research is summarized in more detail in the University of Nebraska Beef Research Report for 1996; available on line at

<http://animalscience.unl.edu/beef/beefrpt/COL-BURN.htm>

Other data that may shed some light on this subject, comes from Oklahoma State University in 1990. Birth weights of 172 fall born calves and 242 spring born calves were compared. These calves were the result of AI matings using the same bulls and bred to similar crossbred cows. The fall born calves averaged 4.5 pounds lighter at birth than their spring-born counterparts (77.7 versus 82.2). One possible explanation for this phenomenon, the changing of blood flow patterns of cows gestating in hot weather versus cold weather. During hot weather blood is shunted away from internal organs toward outer extremities to dissipate heat, while the opposite is the case in very cold weather with blood flow directed toward internal organs in an effort to conserve heat and maintain body temperature. This change in maternal blood flow may impact fetal growth in a small way, but result in a measurable difference.

Of course, ranchers cannot control the weather. However, the weather may help explain some of the differences that have been observed in year to year variation in calving difficulty when the same sires were used in the same cow herd. ■