



Information Sheet

Protein Supplements for Beef Cows on Winter Range



Information on sources of supplemental protein for range-fed beef cows.

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Why should cows be offered a protein supplement during the winter months?

Most beef cows in the Rocky Mountain Region are maintained on low-quality dormant forages (where pasture grasses can run < 7% Crude Protein on a dry-matter basis) from late summer through the winter months. Supplemental protein offered to ruminants consuming low-quality forages is an effective way to maintain or increase body weight and body condition and support last trimester fetal calf growth. According to the National Research Council (NRC, 2000), during the last trimester of pregnancy, mature beef cows require approximately 840 grams of crude protein each day (pregnant replacement heifers require an additional 60 grams of crude protein). Assuming that the average 1200 lb. cow during late gestation would consume ~1.5% of her body weight in range forages (on a dry-matter basis) each day, low-quality range forage would provide only 490 grams of protein, leaving a gap of roughly 350 grams. Feeding 3.8 lbs of a 20% protein supplement, would fill that gap (with the needed ~350 grams of supplemental protein) and meet that cow's minimum protein needs during the most critical period of fetal calf development. When the protein content in beef cow diets declines below 7%, both forage intake and digestion are suppressed and animal performance is reduced.

What are the most common sources of protein available in the Rocky Mountain region for beef cows during the winter months?

The types of ingredients that can be used for (dry) protein supplementation (whether it is in tubs, blocks, cake, or pellets) for the beef cow herd is largely influenced by the types of by-products that are available in the local market at a competitive price. In our area, those ingredients are primarily cull beans, dried distillers grains with solubles (**DDGS**), sunflower meal (**SFM**), cottonseed meal (**CSM**), dehydrated alfalfa (**dehy**), and soybean meal (**SBM**). Occasionally, other protein-based ingredients, such as feather meal, fish meal, corn gluten feed, split peas, peanut meal, and canola meal are competitively priced and can be used as alternative protein sources for beef cows. All of these sources of protein would be considered "all-natural" (**AN**) and would provide the cow with varying combinations of rumen degradable (**RDP**) and rumen undegradable (**RUP**) sources of protein. Often times, urea can be used as a source of non-protein nitrogen (**NPN**), which provides the rumen microbial population with a readily-available source of nitrogen. Urea is most effective as a source of nitrogen when the cows also have access to an adequate supply of readily available carbohydrates (as would be found in corn or crop aftermath / corn stalks). For this reason, while urea will often decrease the cost of feed per unit of protein, supplementing the cow's diet with urea does not appropriately fit every scenario. As a rule of thumb, urea should not exceed 2-3% of the total diet (or 25-30% of total dietary nitrogen).

Does research indicate that one is better than another?

Yes. Most research points to those protein supplements that offer higher levels (or percentage) of RDP being of higher quality (i.e. of more nutritional value to the beef cow). The first priority in supplementing cows maintained on low-quality dormant winter range should be to provide additional protein with a higher % RDP. Doing so will stimulate rumen microbial cell protein turn-over, increase dry-matter intake, sustain forage intake, thus maintain or improve cow body weight and condition. A chart indicating the fractions of RDP vs RUP in common protein supplements is shown on the back of this page. It is worth noting, that while cull beans have a high RDP value relative to most other protein supplements, they have been found to depress palatability and can therefore result in feed refusals. For this reason, we limit the amount of cull beans used in protein supplements manufactured at Ranch-Way Feeds.

Figure 1. Dietary crude protein (CP) can be categorized into two parts: that which is degraded in the rumen by microorganisms, ruminally degradable protein (RDP), and that which escapes the rumen without being altered by the microbes, ruminally undegradable protein (RUP). The first priority in supplementing cows maintained on low-quality, dormant winter range should be to provide additional RDP. *Book-values derived from the Beef NRC (2000) and Dairy NRC (2001).*

Protein Source:	% CP	% RDP	% RUP
Urea	281	100	0
Cull Beans	22	90	10
SFM	30	80	20
SBM	46	65	35
Winter Range	5	63	37
CSM	41	57	43
DDGS	26	45	55
Feather Meal	85	30	70

