

Using Sugarbeet Pulp in Rations for Beef Cows

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This NebGuide describes how sugarbeet pulp can be an economical, high-energy byproduct in the beef cow diet.

As forage resources become more difficult to locate and more expensive to acquire, cattle producers are looking for ways to maintain cowherds using fewer traditional resources. Feeding high energy byproducts and crop residues, such as wheat straw or cornstalk residue, has been shown to be an effective way to reduce dependency on pastures and hay. Research at the University of Nebraska–Lincoln Panhandle Research and Extension Center has determined sugarbeet pulp also can be an economical, high energy byproduct that can be included with poor quality residues to maintain beef cows.

Sugarbeet pulp is a byproduct resulting from the extraction of sugar from sugarbeets. It is typically available in western Nebraska from October through February, but it can be stored for later use. Contracts need to be acquired in

early spring prior to subsequent fall harvest. The nutrient content of sugarbeet pulp is typically 24 percent dry matter (DM), 10 percent crude protein (CP), 44 percent neutral detergent fiber (NDF), and 80-90 percent total digestible nutrients (TDN), making it an excellent energy source. Additionally, the energy in beet pulp comes from highly digestible fiber rather than starch. This makes beet pulp a great energy source in high roughage diets because it does not have negative effects on fiber digestion.

Beet Pulp in Limit Fed Diets for Confined Cows

In UNL Panhandle Research and Extension research studies, late gestation beef cows have been maintained on limit-fed diets containing 20:20:60 wet distillers grains:beet pulp:wheat straw (DM basis; 18.6 lb DM/head/day) or 20:45:35 wet distillers:beet pulp:wheat straw (DM basis; 15.3 lb DM/head/day; *Table 1*). Cows were also supplemented with 0.3 lb of limestone/day to achieve the calcium:phosphorus (Ca:P) ratio at 1.2:1. Cows were maintained between body condition scores

(BCS) 5 and 6. For more information on BCS see *Body Condition Scoring Beef Cows: A Tool for Managing the Nutrition Program for Beef Herds*, EC281 (<http://www.ianrpubs.unl.edu/sendIt/ec281.pdf>). Limit feeding means that cows are not full-fed a ration, but are fed less than a full feeding. Although cows are not fed all they can eat, the ration meets all their nutrient needs. When limit feeding cows a ration, management is critical to ensure accurate weighing of



Figure 1. Beet pulp can be stored in a pile and fed as needed throughout the winter.



Figure 2. Beet pulp spoilage will occur throughout the winter.

ingredients, enough mixing to ensure delivering a uniform mix, and ample bunk space per cow.

The proportions of these ingredients producers choose to use will depend on the availability and price of commodities. For some producers acquiring ethanol byproducts may be more challenging than acquiring beet pulp. Wheat straw and cornstalk residue are bulky, require grinding, and can have limited availability in some areas. Being able to reduce the roughage to 35 percent of the diet DM can improve diet handling and reduce the amount of residue needed. The upper limit of beet pulp inclusion in mature beef cow diets is not well defined. As previously stated, recent research trials have included beet pulp in the ration at 45 percent DM without adverse effects. In the research trial, balancing the diet for the protein requirement of the cow limited the beet pulp to less than 50 percent DM. In many operations, it is more convenient for producers to procure dried distillers grains rather than wet. Unfortunately, dried distillers grain is easily sorted out in a dry residue based diet. The moisture content of beet pulp likely will improve ration mixing and reduce sorting when dried distillers grain is used as the protein source.

Beet pulp can also be used as a way to stretch hay resources. An example of a limit-fed diet using summer annual hay as the base diet and alfalfa as a protein source is shown in *Table I*. This diet could be used if these

commodities were more economical or accessible for producers than ethanol byproducts. The example diets are for non-lactating, pregnant cows. Producers should contact their UNL Extension beef personnel for ration balancing assistance to make sure the cow nutrient requirements are met for a given stage of production and the most cost effective feedstuffs are included.

Limit feeding cows in confinement does not necessarily mean that cows are in a feedlot. Cows can be maintained on pivot corners, fields of crop residues, or other areas off pastures that may need recovery time from grazing. Cows limit-fed in confinement need at least 2 feet of bunk or feeding space and another 1½ ft. for calves if they are confined with their mothers. Allow at least 350-400 square feet per cow if they are confined and, if possible, separate young cows from older cows. It is important to have a way to mix and deliver feed as accurately as possible. More information on limit feeding production cows in confinement is available in NebGuide G2237 *Management Considerations for Beef Cows in Confinement*, <http://www.ianrpubs.unl.edu/sendIt/g2237.pdf>.

Feeding Beet Pulp in a Supplement on Pasture

A mixture of distillers grains, sugarbeet pulp, and crop residues could also be fed as a supplement on pasture to

Table I. Limit-fed diets containing beet pulp for maintaining beef cows.

<i>Ingredient</i>	<i>percent in diet (DM basis) Actual lb/ton</i>		<i>percent in diet (DM basis) Actual lb/ton</i>		<i>percent in diet (DM basis) Actual lb/ton</i>	
Beet pulp	20	751	45	1284	30	1228
Wet distillers grains	20	591	20	424	0	0
Wheat straw	60	658	35	292	0	0
Sorghum/Sudan hay	0	0	0	0	55	607
Alfalfa hay	0	0	0	0	15	165
<i>Diet Analysis</i>						
Mixture DM, percent	49		37		49	
Crude protein, percent	9.4		11.7		11.8	
TDN, percent	60		73		61	
Mcal/day	11		11		12.7	
DM lb/head/day	18.6		15.3		18.6	
As is lb/head/day	38.8		41.2		37.9	

0.3 lb limestone added to diets containing distillers grains to balance Ca:P ratio.

reduce consumption of grass. Crop residues and beet pulp both increase gut fill and have a tendency to reduce forage intake in a pasture. Research has shown feeding combinations of distillers grains and low quality hay or residues on pasture replaced grazed forage (see NebGuide G2099, *Crop Residues or Low Quality Hay Combined with Byproducts as a Forage Substitute*, <http://www.ianrpubs.unl.edu/sendIt/g2099.pdf>). Including beet pulp in a similar ration could be an economical way to reduce grazing needs.

Storing Beet Pulp

Producers unable to use beet pulp in a timely manner or who want to have an available feed resource throughout summer should consider storing it in an agricultural bag or bunker, the same process as making corn silage, to minimize oxidation and spoilage. Mixing the pulp with a roughage source prior to bagging or bunkering is also an acceptable storage method. Packing and reducing oxygen content help eliminate spoilage of stored product. The best dry matter content to achieve this would be 50 percent or less. The diets including beet pulp in *Table I* are all less than 50 percent DM, making them ideal for storage.

Summary

A combination of beet pulp and crop residues can be an economical substitute for hay, silage, or pasture in beef cow diets. Beet pulp contains highly digestible fiber making it a nice complement to poor quality residues or forages. It can be used as a component of a supplement or as an ingredient of a complete diet.

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