

Sunflower Meal in Beef Cattle Diets

INTRODUCTION

Sunflower meal is the fourth largest source of supplemental protein for livestock feeding behind soybean meal, cottonseed meal, and canola meal (Hesley, 1994). Nutrients in sunflower meal can vary depending on several factors including oil content of the seed, extent of hull removal, and efficiency of oil extraction. The amount of hull or fiber in the meal is the major source of variation in nutrient content of the meal (Table 1). Sunflower meal is commonly marketed and shipped as pellets and can be stored for extended periods of time. It is priced competitively with other co-product feeds and often is the lowest cost protein in regions where it is produced.

Table 1. Nutrient content of solvent extracted sunflower meal based on amount of hulls retained.

	No Hulls Removed	Partially Dehulled	Dehulled
Dry Matter, Percent	90	90	90
	Percent, dry matter basis		
Crude Protein	28	34	41
Fat	1.5	0.8	0.5
Crude Fiber	24	21	14
Ash	6.2	5.9	5.9
Calcium	0.36	0.35	0.34
Phosphorous	0.97	0.95	1.3
Potassium	1.07	1.07	1.07
Magnesium	0.8	0.79	0.79

Hesley (Ed.) National Sunflower Association, 1994



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PROTEIN IN SUNFLOWER MEAL

Most ruminants need supplemental protein at some stage of production. Sunflower meal is very useful in many beef cattle rations. Nitrogen required by rumen microbes can be provided in the form of rumen- degradable protein from sunflower meal. Sunflower meal is more ruminally degradable (74% of crude protein) than soybean meal (66%) or canola meal (68%; NRC, 1996; Table 2). This is important in low quality forage diets.

The NRC (1996) crude protein value reported for sunflower meal is lower than current commercial production (Table 2) so procurement criteria should be based on product analysis from respective plants.

ENERGY IN SUNFLOWER MEAL

The energy value of sunflower meal is lower than canola or soybean meal (NRC, 1996; Table 2) due to the fiber level from hulls included in the meal. Pre-press solvent extraction reduces residual oil to 1.5% or less (Hesley, 1994), but residual oil is valuable as an energy source in all cattle diets. The mechanical process of oil extraction leaves more residual oil in the meal, often 5-6% or more depending on the efficiency of the extraction process.

Table 2. Protein and energy fractions for sunflower meal, soybean meal, and canola meal.

Item	Oilseed Meal Source		
	Sunflower	Soybean	Canola
	Percent, dry matter basis		
Crude protein	26	49.9	40.9
	Percent of crude protein		
Rumen degradable	74	66	68
Rumen undegradable	26	34	22
	Percent, dry matter basis		
Crude fiber	12.7	7	13.3
Neutral detergent fiber	40	14.9	27.2
Acid detergent fiber	30	10	17
Digestible energy, Mcal/kg	2.87	3.7	3.04
Metabolizable energy, Mcal/kg	2.35	3.04	2.49
Net energy, maintenance	1.47	2.06	1.6
Net energy, gain	0.88	1.4	1
Total digestible nutrients	65	84	69
NRC, 1996			

SUNFLOWER MEAL IN GROWING AND FINISHING FEEDLOT DIETS

Sunflower meal can be used as the sole source of protein in a variety of feedlot rations (Richardson and Anderson, 1981). In trials comparing sunflower meal with other protein sources, equal animal performance is commonly observed with isonitrogenous diets. Younger calves require higher protein levels for optimal growth. Heifer calves fed high forage diets may benefit from added protein in sunflower meal. The degradable protein provides nitrogen for microbes in the rumen. Supplemental protein from sunflower meal in high forage diets increases the digestibility of the forage.

Sunflower meal is highly effective as a protein source in corn-based finishing diets providing adequate rumen degradable nitrogen to complement the undegradable nitrogen from corn (Milton et al., 1997).

SUNFLOWER MEAL IN DIETS FOR BEEF COWS

Cows consuming low quality forages such as winter range, crop aftermath, or other low quality forages usually need supplemental ruminal degradable protein to increase feed intake, forage digestibility, and performance (Kartchner, 1980; Gray, 1995). Least cost sources are critical to profitability and sunflower meal is often very price competitive per unit protein. Sunflower meal has been widely used in beef cow supplementation programs.

SUMMARY

Sunflower meal is a biologically and economically useful protein source for growing and finishing cattle. Similarly, beef cows can utilize supplemental protein from sunflower meal to improve forage intake and digestibility. Ruminants can utilize sunflower meal with its higher fiber levels more effectively than other species.



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