

Feeding Carrots And Sugar Beets To Cattle

Steven Rust and Dan Buskirk
Michigan State University

Root crops such as carrots and sugar beets can be fed to beef cattle. The nutrient contents are shown in Table 1. Root crops can have ash contents greater than listed in the table due to soil contamination. Long term storage may be a problem with root crops.

Table 1. Comparison of nutrient composition of carrots and sugar beets to corn silage, hay and corn grain.

Feed	DM, %	TDN, %	ME, Mcal/lb	CP, %	Fat, %	Ash,%	Ca,%	P, %	K,%	S,%
Carrots	12	84.0	1.35	9.9	1.4	8.2	.40	.35	2.80	.17
Sugar beets	20	75.1	1.23	6.8	.6	5.5	.24	.24	1.52	.06
Hay ^b	88	57	.94	15.5	2.4	9.7	.83	.25	1.78	.28
Corn silage	35	72.0	1.18	8.7	3.1	3.6	.25	.22	1.14	.12
Corn	85	90.0	1.48	9.8	4.1	1.5	.09	.29	.44	.11

^a All nutrients except DM expressed on a DM basis

^b Alfalfa brome mixture (50:50)

Sugar Beets

It is recommended to process the sugar beets prior to feeding to eliminate the possibility of one lodging in the esophagus and causing bloat. This is likely more of a problem with small rather than large sugar beets. Mashing the sugar beets by driving over them with a tractor may be sufficient processing. Sugar beets have a nutrient profile similar to corn silage. They may be more suited for use in cow and backgrounding/growing diets. The high sugar content may limit the use in backgrounding/growing diets to 20% of the DM. Up to 50% of ration DM could be used in cow diets.

Carrots

Carrots are quite palatable and readily consumed by cattle. Carrots have 91% the metabolizable energy value of corn. There is a popular press report that indicates 40% of a feedlot diet DM as carrots did not cause any deleterious affects. Feeding high levels of fresh carrots may cause some scouring which can be minimized by storage for a few weeks. Carrots can also serve as an energy source in cow diets. A report indicated cows will eat up to 35 lb of carrots per day.

Pricing the Root Crops

Both root crops contain a lot of water so make sure the price reflects that. It is recommended to value these root crops on a dry matter (DM; water free) basis and similar weight units. For example, suppose you were offered carrots at \$20/ton and you wanted to compare it to \$5.70/bu corn. The value of carrots is a function of the energy content and moisture level. The first step is to convert corn price to

\$/ton. There are 35.7 bu/ton (2000/56) of U.S. # 2 corn (56 lb/bu). Therefore, a ton of corn costs \$203.49/ton (as is) or \$239.40 (\$203.49/.85) on a DM basis. The cost of carrots on a DM basis is \$166.67/ton (\$20.00/.12). The carrots have an energy content of 1.35 Mcal of ME/cwt of DM and a moisture level of 88%. Corn has 148 Mcal of ME/cwt of DM and a 15% moisture level. The cost (\$) per Mcal of ME from corn and carrots would be \$.81 (\$239.40/(148*20)) and \$.62 (\$166.67/(135*20)), respectively. In this price comparison, carrots were a better buy. The conclusion may change when the price relationship between corn and carrots is different. Tables 2 and 3 present the values of carrots and sugar beets at different corn and hay values. In the tables, no price adjustments were made for protein differences in the diets.

Table 2. Value of carrots and sugar beets as a replacement for corn in cattle diets with various corn prices.

Value of corn				Value of carrots		Value of sugar beets	
\$/bu (as-is)	\$/ton (as-is)	\$/ton DM	\$/Mcal ME/cwt	Equiv. price \$/ton DM	\$/ton (as-is)	Equiv. price \$/ton DM	\$/ton (as-is)
3	107.10	126.00	.04	114.93	13.79	104.72	20.94
4	142.80	168.00	.06	153.24	18.39	139.62	27.92
5	178.50	210.00	.07	191.55	22.99	174.53	34.91
6	214.20	252.00	.09	229.86	27.58	209.43	41.89
7	249.90	294.00	.10	268.18	32.18	244.34	48.87

^aCorn DM=85%; carrot DM= 12% and; sugar beet DM=20%

Table 3. Value of carrots and sugar beets as a replacement for hay in cattle diets with various hay prices.

Value of hay			Value of carrots		Value of sugar beets	
\$/ton (as-is)	\$/ton DM	\$/Mcal ME/cwt	Equiv. price \$/ton DM	\$/ton (as-is)	Equiv. price \$/ton DM	\$/ton (as-is)
60.00	68.18	.04	97.92	11.75	89.22	17.84
80.00	90.91	.05	130.56	15.67	118.96	23.79
100.00	133.64	.06	163.20	19.58	148.69	29.74
120.00	136.36	.07	195.84	23.50	178.43	35.69
140.00	159.09	.08	228.48	27.42	208.17	41.63

^aHay DM=88%; carrot DM= 12% and; sugar beet DM=20%