

Feeding Cabbage Waste

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Introduction

One way farmers can feed quality ingredients at bargain prices is to use food waste in the ration. During sauerkraut production, leftover cabbage leaves and cores (called cabbage waste) can be fed in dairy cow and heifer diets.

What is cabbage waste?

Cabbage waste is a wet product (93% moisture) with nutrient composition (Table 1) similar in energy, lower in fiber and higher in protein contents than corn silage on a dry matter (DM) basis.

Cabbage waste might best be used to replace some of the corn silage in the ration.

Table 1. Nutrient composition of waste cabbage and corn silage.

Nutrient (% DM)	Waste cabbage	Corn silage
Dry matter	7.0%	35.0%
Crude protein	16.6%	8.5%
ADF	15.8%	24.0%
NDF	20.0%	43.0%
Sulfur	0.70%	0.13%
TDN	74.0%	72.0%
Net energy lactation (Mcal/lb)	0.77	0.74

How much should I feed?

Feeding too much too quickly may cause digestive upsets. It is recommended to start with one pound DM per cow per day and gradually increase until reaching the upper recommended limits provided in Table 2. For bred heifers, the feeding recommendation is 4 to 6 pounds DM per head per day. For dairy cows, the feeding recommendation is 2 to 3 pounds DM per cow per day.

Table 2. Recommended step-up program for feeding cabbage waste.

	Day 1	Day 4	Day 7
Cows	1 lb. DM	2 lb. DM	3 lb. DM
Bred heifers	1 lb. DM	4 lb. DM	6 lb. DM

How much does it cost?

The cost of cabbage waste depends on how far away the farm is from the plant. Trucking costs are currently \$4/mile. Currently, a 25-ton load of cabbage waste costs \$75. For example, if you live 20 miles from the plant, your total cost would be \$80 (trucking) plus \$75 (25 ton load of cabbage waste). This comes to \$6.20 per ton as fed or \$0.04 per pound dry matter (Table 3). A 12 ton straight truck load of cabbage waste is also available. **For more information, contact Jeff Handschke owner of North Point Transport at 920-810-1363.**

Table 3. Cost of cabbage waste.

Miles from plant	Cost/pound DM
20	\$0.04
40	\$0.06
60	\$0.08
80	\$0.10
90	\$0.11
100	\$0.12

When is it economical to feed?

It is economical to feed cabbage waste when the market price for corn silage is high. Currently, corn silage costs \$60-80 per ton as fed or \$0.09-0.11 per pound dry matter. This means that it is economical to feed cabbage waste if the farm is located 90 miles or less from the plant (Table 3).

Keep in mind that there are other potential savings when replacing corn silage with cabbage waste. For example, the higher nutritional value of cabbage waste may allow farmers to reduce or eliminate the use of some feed supplements. Consult with your nutritionist to see if this is the case for you.

Since bred heifers can be fed twice as much as cows, multiply Table 4 by two to calculate annual savings.

Table 4. Annual savings under current economic conditions when replacing 3 pounds corn silage with cabbage waste (dry matter basis) for cow rations.

Miles from plant	150 cows	500 cows	1000 cows	5000 cows
20	\$2,835	\$9,450	\$18,900	\$94,500
40	\$2,025	\$6,750	\$13,500	\$67,500
60	\$1,215	\$4,050	\$8,100	\$40,500
80	\$405	\$1,350	\$2,700	\$13,500
90	\$0	\$0	\$0	\$0
100	-\$405	-\$1,350	-\$2,700	-\$13,500

What else should I know about feeding waste cabbage to dairy cattle?

Availability. Cabbage waste is only available from the end of July through Thanksgiving. If there is a problem at the plant, cabbage waste may not be available that day. A back-up ration must always be available in this case.

With over 27,000 tons of cabbage waste produced at Great Lakes Kraut each year, there is an abundant supply to feed to dairy cattle. This makes it unlikely that extra charges would be applied since the supply far exceeds the current demand.

Agronomic benefits. Spreading cabbage waste on fields can cause diseases such as white mold and black rot. Feeding cabbage waste to dairy cattle decreases the amount spread on fields which could help manage these diseases.

Sulfur content. Cabbage waste is high in sulfur. It is not recommended to feed cabbage waste if there are other high sulfur ingredients in the diet (i.e. corn gluten feed or distillers grains), as this will increase the risk of sulfur toxicity. The NRC recommends feeding no more than 0.4% dietary sulfur (dry matter basis) to dairy cows. When feeding sulfur in excess, dietary additives may be included or increased (i.e. thiamine, molybdenum, 9-10, anthraquinone) to help manage this issue. However, the best way to manage hydrogen sulfide production is a good step-up program and feeding no more than the recommended limit.

Leachate. Due to the high moisture content of cabbage waste, leachate can occur. Therefore, cabbage waste must be fed up in 3 days. It is recommended to store cabbage waste where leachate can be gathered in the bunker silo.

Mixing and moving. Large quantities of cabbage waste in the mixer can cause “leaking”. Also, if you have to travel down public roads with the mixer, leaking from the wagon can occur. Lastly, farmers must be careful about heating and over-mixing the TMR.

Cheese-making/Off-flavors in milk.

Certain bulk roughages consumed by cows prior to milking (within 4-5 hrs) tend to impart a flavor to milk characteristic of the feed. Cabbage is high in sulfur content and high consumption of these products is expected to give milk a sulfury or eggy flavor. Indeed any cabbage left to rot or decompose will intensify the off-flavor imparted to milk as these flavors are volatile and are easily detected in the milk by smell. Milk products including cheese made from tainted milk may exhibit these off-flavors. However, in recent experiments with feeding low level (2-3 pounds dry matter) of cabbage waste (non-fermented cores and outer leaves) did not give milk or Cheddar cheese (at least through 6 months of aging) any off-flavors derived from the cabbage.

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