



Alternative Forages for Dairy Cattle: Soybeans and Sunflowers

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Oilseed crops such as soybeans and sunflowers may be harvested for forage when you have decided that dry conditions have shrunk their oilseed yield below your economic threshold for seed harvest or when you face a shortage of roughage. These alternative forages can help stretch your usual forages, whose yield most likely is also compromised under dry conditions.

How you will harvest alternative crops for forage depends on the individual crop and its stage of maturity.

Baled soybeans

Soybeans are a legume and can make good feed. Nutritive value of a soybean plant can be comparable to early-bloom alfalfa. Lactating dairy cows and growing heifers have similar performance when given either soybean hay or alfalfa forage. Palatability is not usually a problem (unless the forage is moldy).

Bale when pods are almost full of seeds and lower leaves are just starting to turn yellow but are not falling off. At this maturity stage, digestibility of the pods exceeds that of stems by as much as 25 percentage units, contributing significantly to the overall nutritive value of the whole plant.

The stems tend to dry slowly. Conditioning will achieve a similar dehydration rate of stems and leaves and bring total moisture below 25%. Rake no more than you must, as leaves and pods tend to shatter easily.

Soybean silage

Moisture content is important if you choose to ensile. The moisture recommendation is similar to that of alfalfa silage.

For soybeans, this occurs right before the pods are full. Waiting until complete maturity results in a forage of lower digestibility and can lead to fermentation problems due to the high oil content of the seeds.

Mixing one-third corn silage with the soybean silage avoids these problems. Corn provides soluble sugars to speed up the fermentation and dilutes the fat content in the soybeans.

Table 1. Nutrient composition of soybean silage

	Range
Crude protein, %	16.0 - 20.6
Neutral detergent fiber, %	38.3 - 48.3
Acid detergent fiber, %	27.3 - 37.3
Acid detergent lignin	6.0 - 7.4
Calcium, %	1.36 - 1.49
Phosphorus, %	0.26 - 0.31

Two varieties averaged over two years.

Adapted from Coffey et al. 1995. ARPAS 11:74.

Direct-cut soybeans may have DM contents between 22 and 30%. Ensiling at this moisture will result in higher effluent losses and a greater risk of undesirable fermentation (butyric). It is better to aim for 35-40% dry matter.

Buffering capacity of the crop is relatively high, potentially resulting in fermentation problems. Inoculants may help reduce these problems and hold down mold growth.

Always verify herbicide restrictions when using soybeans for forage (Table 2).

Table 2. Grain and forage restriction for soybean herbicides

	Application interval (days) forage/grazing allowed	
	Forage	Grazing
Basagran	30	30
Boundary	40	40
FirstRate	14	14
Lasso	No	Yes
Lexone	40	40
Prowl	Yes	Yes
Roundup-preharvest	25	25
Sencor	40	40
Treflan	Yes	Yes
Touchdown - preharvest	25	25

Harvesting sunflowers for forage

Again, your decision should be based on whether the crop is worth harvesting for seed or if it would be better to use it as forage source in place of more expensive forages. Although sunflower silage is lower in energy than corn silage, it can still help stretch out the total forage supply and keep feed costs under control while maintaining acceptable milk production.

Sunflower silage contains slightly more crude protein (12.5%) and considerably more fat (7.1 to 10.7% depending on the variety) and calcium than corn silage on a dry matter basis.

On the negative side, sunflower silage contains 1.5 to 2 times more fiber and up to 3 times as much lignin (indigestible) compared to corn silage. Due to this lower energy content it is important to feed sunflower silage to lower producing dairy cows, dry cows, or growing heifers.

Sunflower stalks contain a lot of water. Wait a couple of weeks after first killing frost before ensiling. At this point

the leaves should be pretty dry (bottom leaves will be yellowish in color) and the flowers should be bending over. At this maturity the silage will contain approximately 30% dry matter.

Milk production decreased by 8% in dairy cows fed sunflower silage in substitution for corn silage, according to research conducted at SDSU, but milk fat was 12% higher. At the University of Wisconsin, for cows producing 60 pounds milk, the substitution of corn silage with up to 66% sunflower silage did not affect milk and protein yields.

Partial replacement of corn silage with sunflower silage could be a viable option for lactating cows of moderate milk production.

Test for nitrates before you use sunflowers for forage, particularly during a drought. Sunflower samples analyzed at SDSU during the 2002 drought tested as high as 0.58% nitrate nitrogen.

Be aware of any herbicide restrictions before considering sunflowers as a potential feedstuff. Sunflowers treated with Assert, Gramoxone Extra, Prowl, Sonalan, and Ultima should not be used for animal feed. For more information on herbicide restrictions, see <http://www.ag.ndsu.nodak.edu/drought/ds-23-97.htm>

References

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