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Effects of Preservatives on Alfalfa Silage for Dairy Cattle

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Effects of Preservatives

Alfalfa is low in fermentable sugars, and thus may be hard to preserve. This is especially true under unfavorable conditions of packing and air removal, as may be found in bunker silos. The following findings and recommendations are based on a number of years of research with numerous feeding trials and upon experience in feeding alfalfa silage.

- 1. Wilting.** Wilt the alfalfa in the field before ensiling. Wilting resulted in much higher quality forage. In early trials, wilting from 73.8% moisture to 60.2% improved the carotene retention upon storage. More recent research shows that alfalfa should be wilted even lower than 60% moisture, possibly to 40 to 50% before ensiling.
- 2. Sodium metabisulfite,** added at 8 to 10 pounds per ton as the alfalfa was ensiled, was effective in cutting preservation losses by about one-half. Untreated alfalfa silage sealed in bunkers with plastic covers lost 20.9% of its value of the edible portion upon storage. Sodium metabisulfite-treated silage lost 11.1% of the feeding value of the edible silage upon storage. The sodium metabisulfite markedly increased the preservation of carotene. Milk production was not markedly improved, however, by feeding the bisulfite silages over the untreated silages. Strong odors were reduced by the sodium metabisulfite.
- 3. Common iodized stock salt,** or sodium chloride, did not improve alfalfa silage preservation, consumption, or milk production response. Salt did not influence the preservation of crude fiber, protein, nitrogen-free extract, or carotene of alfalfa silage.
- 4. Ground ear corn** helped to improve the dry matter and packing of wet silage. The corn increased the losses in preservation of alfalfa silage in a bunker silo, especially on the top 6 inches and at the sidewalls of the bunker. It is believed that oxidation of silage (like adding kindling to a fire) was increased at the surface where the silage was most exposed to air. Feeding trial data showed that at least 20% of the ground ear corn added at filling time was used up in preservation of the alfalfa silage. Ground ear corn added at silo filling time did not result in more palatable silage than did the addition of ear corn to silage at feeding

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(This summary is based on South Dakota Agricultural Experiment Station Bulletin 465, "Effects of Preservatives on Alfalfa Silage for Dairy Cattle.")

EFFECTS OF

preservatives on alfalfa silage

FOR DAIRY CATTLE

Cooperative Extension Service



time. The ground corn appeared to improve carotene preservation. Ground ear corn is recommended only for use during rainy weather when it is impossible to wilt the alfalfa sufficiently.

- 5. Dry matter losses** of edible silages totalled 15 to 20% during storage in bunkers if they were well sealed with weighted plastic covers. If not well sealed, top spoilage was much higher. Dry matter losses in bunkers were highest on top and, especially, at the top of the sidewalls of the bunkers. Losses were intermediate in the center, 4 feet high, and lowest in the center and bottom of the bunkers. This suggests that more packing by depth of silage, as is found in the tower silos, as well as more freedom from air are essential for alfalfa silage preservation than is present under poorly sealed bunker silos.
- 6. Body weight losses** were high in cows in some trials where high moisture alfalfa silage furnished a high proportion of the nutrient intake. Characteristic of alfalfa silage high in moisture was its objectional odor. Palatability of such silages was very low, and production declines were quite rapid. Reduction of the moisture content of the alfalfa before ensiling seems essential in improving its quality and feeding value.
- 7. Addition of concentrates.** The use of a 14% protein concentrate mixture with corn and cob meal, ground oats, wheat bran, soybean oil meal, and linseed oil meal fortified with 1% steamed bone meal and 1% iodized salt resulted in 1.2 pounds more milk daily per cow than did a ration of half corn and half oats, when alfalfa silage furnished

the only roughage for the cows. Ground corn alone resulted in even lower production than with corn and oats.

8. **Corn silage-alfalfa hay.** When cows were taken off alfalfa silage as their only roughage and placed

on a ration of excellent quality corn silage fed free choice with 12 pounds of top quality alfalfa hay per cow daily, total daily roughage intake increased 7 pounds per cow. Production declines were reduced, and body weight losses incurred on alfalfa silage were more than recovered.