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If Hay Mows Are Empty

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Dairymen Can Maintain Production With Silage by Supplementing It With Grain and Minerals

Dairy Cows fed plenty of silage, properly balanced with a grain mixture, will produce just as well and keep in as good condition as those fed both alfalfa hay and silage as roughage. In other words, apparently cows do not need a dry roughage along with silage. These are the conclusions we have reached following experiments in two different winters at the Dairy Farm of the Iowa Station.

If you find that your hay is not going to last through the season, but you have plenty of silage, then you can reduce the feeding of hay to a small amount or even if you run out, you can maintain the production of your cows if you will step up the protein content of the grain sufficiently to equal that which the cows would have got had they been fed grain, legume hay and silage.

There is no advantage to be gained in adding straw to the ration of silage and grain in order that your cows may have some dry roughage. Our experiment the second year demonstrated this.

Legume hay is not too plentiful during drouth years on some dairy farms—especially tenant farms—in the Corn Belt. Many of these farms have an abundance of silage. Because of this situation, we wanted to find out just how well dairy cows could get along, if necessary, with only silage and grain, instead of the usual silage, hay and grain ration.

Corn silage is much lower in protein than legume hay. So if corn silage entirely replaces hay, then extra protein must be supplied in the grain to make up the difference. Another problem presents itself in using corn silage as the sole roughage: Legume hays are much better supplied in minerals (calcium in particular) than corn silage. It therefore seemed wise to try adding minerals to the silage-grain ration to find out whether minerals would help.

Test Three Lots

The results which we obtained were from two trials, each lasting about 6 months. In the first trial we used three lots of cows. Each lot was made up of five cows, and the cows were carefully selected to try to eliminate differences which might occur because of age, breed,
stage of lactation, yield of milk and number of previous lactations.

One lot of cows got corn silage and this grain mixture: 8 parts ground yellow corn, 8 parts ground oats, 3 parts cracked soybeans, 3 parts soybean oilmeal and 1 percent of salt. Lot II got the same ration except to it was added bone meal. Each cow was fed 1/4 pound of bone meal daily (the bone meal was mixed with the grain). Lot III got corn silage, alfalfa hay, a grain mixture containing 4 parts ground corn, 4 parts ground oats, 1 part cracked soybeans and 1 percent salt.

The cows were fed all of the roughage they would eat. To Lot III, about 3 pounds of silage were fed to each 1 pound of hay. We adjusted the grain rations so that the total amount of protein which each lot received was about the same. The amount of bone meal fed to Lot II was considered sufficient to supply the same amount of calcium which the cows in Lot III got from their ration that included alfalfa.

In this test the cows were milked three times a day at about 8-hour intervals. Complete records were kept of all feed consumed, milk and butterfat yields. Weights of the cows were taken weekly. In the 6 months, the cows of Lot I produced 22,825 pounds of milk and 834 pounds of butterfat; Lot II with the same ration, except that bone meal was added, produced 26,550 pounds of milk and 972 pounds of butterfat from only grain and silage; Lot III with the usual ration of corn silage, alfalfa hay and grain produced 22,492 pounds of milk and 824 pounds of fat.

So in this first trial, corn silage, grain and bone meal appeared to be slightly superior in producing milk and butterfat to the silage-hay-grain ration.

The differences in weight gains of the three lots of cows were small but Lot III with alfalfa, silage and grain increased slightly more than the others.

**Straw Didn't Help**

A year intervened between the first and second trials because of uncontrollable circumstances. In the second trial we used two lots of cows, with five in each lot. Lot I got corn silage and a grain mixture of corn, wheat bran and soybean oilmeal. Lot II was fed exactly the same except that the cows were allowed to eat as much straw as they wished. Besides having access to their bedding, we tossed clean, bright oat and wheat straw into their mangers. In this second trial the grain mixture was supplemented in both lots by bone meal and oyster shell. One percent by weight of each of these mineral substances was added to the grain. Salt was added to the grain and was also offered free-choice the same as in the first experiment.

In this second experiment the grain mixture was: Ground corn (yellow) 4 parts, wheat bran 4 parts, soybean oilmeal 3 parts, salt 1 percent and bone meal 1 percent. The cows in both lots got all of the silage they would eat and were given enough grain to supply the necessary nutrients for maintenance and their milk flow.

The milk production of the cows getting silage as the sole roughage was 31,516 pounds milk and 1,049 pounds of butterfat for the 173 days of the test. In comparison, the cows getting straw in addition to silage and grain produced 29,725 pounds of milk and 958 pounds of fat—somewhat less than the cows getting only corn silage as roughage. Straw appeared to be of no especial value when fed along with silage.

The weights of both lots of cows increased during the trial, but those getting straw increased slightly more than the others.

Our conclusion from the two
tests is that cows fed silage, properly balanced with grain and minerals, will produce practically as well as similar cows fed hay along with silage and grain. We felt that probably the addition of bone meal in the first trial was responsible for some of the increase in milk and butterfat production over the other two lots of cows which got no mineral. The difference was small enough, however, that it might have been due to variations in the cows making up the lots and not to what they were fed.

Cows Were “Pushed”

In both of the trials no effort was made to limit the consumption of roughage, and grain was always fed in accordance with the milk production of each cow. The intention was to make the cows produce as heavily as possible on the rations used. When cows are not limited in feed, they sometimes gain in weight. In the first trial, Lot I gained a total of 43 pounds, Lot II lost 10 pounds and Lot III gained 31 pounds. Any of these changes might have been due to differences in fill and not to actual growth.

The second trial sustained the results of the first in that dry roughage is not necessary for satisfactory production and condition. At all times and in both trials, the cows which got no dry roughage appeared to be in excellent health. Their hides were pliable and their hair glossy. In both trials the milk yield was high—considerably above the average level of cows tested in the Iowa cow testing associations.

If you have a silo on your farm that provides an ample supply of silage, you need not worry much about whether you have hay or not, or just how much hay if you will supplement your silage with grain and minerals. The results which we got here at the Iowa Station are similar to those obtained in tests at the Ohio and some other stations.

Sweet Clover Builds Best

A comparison of the soil-building value of red clover, Hubam clover and biennial sweet clover over a period of 16 years at the Iowa Station has shown spring-plowed biennial sweet clover to be superior to red clover and Hubam as measured in yields of oats and corn.

The comparison was made in a 2-year rotation of corn and oats. One plot had no legume seeded with the oats and was used as a check against the plots in which one of the clovers was plowed under. Taking this check plot as having a 100-percent yield of corn for the 16 years, red clover had a value of 105 percent, Hubam 108 and biennial sweet clover 114.

Although the cows in the two experiments were allowed all of the silage and hay or straw they wanted, records were kept of how much was consumed by weighing it. Cows fed both silage and hay in the first experiment ate 3 pounds of silage to 1 of hay.