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Feeding Corn Silage to Farm Animals

Abstract

The silo has, for a long time, been proving its value to the live stock farmer. It should form a part of the permanent improvements of every live stock farm. Experienced feeders from all parts of the country testify to the good qualities of silage.

Information concerning the use of this feed is being sought from every available source. In answer to the many questions that are being daily received at the Iowa Agricultural Experiment Station, this bulletin has been prepared. Corn silage only is discussed herein because it is the staple silage of Iowa.

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FEEDING CORN SILAGE TO FARM ANIMALS

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Animal Husbandry Section



Ames - Iowa

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FEEDING CORN SILAGE TO FARM ANIMALS

Breeding Herd of Beef Cattle, Fattening Lambs, Yearling Sheep, Horses and Hogs. By W. H. Pew.

Fattening Cattle, Wintering Ewes and Lambs. By John M. Evvard.

Dairy Cattle. By H. H. Kildee.

The silo has, for a long time, been proving its value to the live stock farmer. It should form a part of the permanent improvements of every live stock farm. Experienced feeders from all parts of the country testify to the good qualities of silage.

Information concerning the use of this feed is being sought from every available source. In answer to the many questions that are being daily received at the Iowa Agricultural Experiment Station, this bulletin has been prepared. Corn silage only is discussed herein because it is the staple silage of Iowa.

Breeding Beef Herd Cows

The feeding of the breeding herd of beef cows during the winter months must be governed by the condition of the cows at the time of going into winter quarters. If the cows are dry at the beginning of the winter they must necessarily be fed somewhat differently than if nursing calves.

Assuming that the cows are in thrifty condition after the calves are weaned in the late fall, and that they are to drop calves again in the early spring, the feed should be such as to keep them gaining until this time. For cows in such condition corn silage may make up the greater part of the ration and will be found to be one of the best feeds available. It should be supplemented with such other roughages as alfalfa or clover hay and corn stover or oat straw. For the dry cows a ration of thirty to thirty-five pounds of corn silage, five to eight pounds of clover or alfalfa hay, together with what corn stover or oat straw they will eat, will prove very satisfactory. Such a ration should keep the cows gaining at the rate of more than one pound per day.

If the cows are nursing fall-born calves, silage will so stimulate the milk flow that larger and more thrifty calves will be the result in the spring. Some concentrated feed should now be fed in conjunction with the silage. Cottonseed meal, one and one-half to two pounds per day for each 1,000 pounds live weight, together with silage and other roughage makes a very satisfactory ration. Oats (at the present prices) can well be used in the ration.

By the liberal use of silage the cost of wintering the breeding herd of beef cows can be cut down nearly one-third; also the cows will come through the winter in better condition.

Heifers and Bulls.

As soon as the calves are weaned in the fall, silage should be given them quite as freely as they will eat it. Necessarily for best results they should have grain of a growing character, together with clover or alfalfa hay.

During the second winter the heifers to be used in the herd for breeding purposes will do very well on the following ration:

Silage, 20 to 25 pounds.

Clover or alfalfa hay, 8 to 10 pounds.

Corn stover or straw, what they will consume.

If desired to have the heifers in somewhat high condition it will be necessary to feed some extra grain.

As a rule the young breeding bulls are required to be in higher condition than the heifers, hence it will be necessary to give them grain in amounts to suit the conditions. Silage can be utilized in the ration to good advantage.

It is not usually desirable to keep the aged herd bull in high condition. His winter ration can be made up of silage and other roughages at hand, preferably clover or alfalfa hay and mixed grain in amounts needed for the required condition. If the bull is necessarily closely confined, the amount of silage had best be considerably reduced.

FATTENING CATTLE

Corn silage should be put into the feeding program of every Iowa beef producer if he wants to fatten cattle economically and efficiently. That corn silage is our most profitable cattle roughage has been clearly demonstrated at the Experiment Station as well as upon hundreds of Iowa farms.

The addition of corn silage to the ration not only decreases very materially the cost of gains, but usually makes them more rapidly. The steers are finished more quickly and ordinarily sell for a higher price than where clover is used as the roughage.

Fattening cattle of all ages utilize silage as their roughage ration. It is as good for the calf and yearling as for the two and three year old. All profit from its use.

Silage is practically one-third to two-fifths as valuable as clover hay for beef production. Silage at \$3.20 a ton and clover hay at \$7.66 a ton were equally efficient in fattening two-year-old steers in 1911-12 in our station tests. Ordinarily when clover is selling from \$10 to \$15 per ton, silage is worth from \$3.50 to \$6.00.

That the corn grain which is put into the silo is not wasted our feeding records clearly show. Cattle receiving silage do not eat as much grain as hay fed cattle, the decrease being approximately equal to the amount of corn found in the silage.

For a short feed, silage is preeminently our most abundant and efficient roughage. The gains are not only more rapid than where clover or alfalfa is fed, but are made more cheaply. Furthermore, the selling price is markedly enhanced. Actual experiment has shown that as compared to clover in a ninety-day feed, silage cattle, rightly fed, will sell from ten to seventy-five cents higher per hundred weight.

For a long feed silage is quite efficient, producing, as compared to clover, both cheaper gains and a higher quality of finish.

Protein supplements must be fed with silage in order to make it an efficient fattening food. Cattle cannot be fattened economically on corn and corn silage. It is imperative and absolutely essential that protein concentrates such as cottonseed meal, cold pressed cottonseed cake, linseed oil meal or similar feeds be fed.

Some very good rations which have been tested out and found highly efficient, follow:

For calves.—Corn, full feed; linseed or cottonseed meal, 3 pounds per thousand pounds of live weight daily; clover or alfalfa at free will; oat straw at free will; corn silage twice daily, all that they will clean up in from thirty minutes to an hour.

The addition of dry roughages to the silage ration is profitable as all cattle seem to crave a certain amount of dry rough feed. Although clover and alfalfa are desirable oat straw may be profitably used in their absence.

Yearlings and two year olds or older will require about the same ration as calves with the exception that the protein supplement may be decreased somewhat. Two year olds should receive about two and one-half pounds of linseed or cottonseed meal per thousand pounds of live weight daily; yearlings about two and three-quarters pounds.

The average daily silage, hay and grain consumption of a two-year-old

steer weighing 1,000 pounds at the start, during a five-month full feeding period will approximate:

Shelled corn, 13 to 16 pounds.

Cottonseed meal or linseed meal, 2.7 to 3.6 pounds.

Clover or alfalfa hay, 3 to 5 pounds.

Corn silage, 22 to 35 pounds.

With silage as lone roughage the consumption will be about 28 to 35 pounds. It requires practically one and three-quarters to two and three-quarters tons of corn silage for a five months' feed for a two year old.

In the absence of any dry roughage such as clover, alfalfa or oat straw, corn silage may be used as the lone roughage. Some dry corn stover should be utilized if possible. In case of lone silage feeding, however, one had best increase the protein concentrates slightly.

In what quantities throughout the feeding period shall we feed silage? Our experience clearly shows that silage should be fed very heavily in the early part of the feeding period to insure most efficient results. The grain at this time may be somewhat limited. We put our steers upon a full feed of good quality silage the very first day and have never had any difficulty. Silage is a roughage and may be so handled without danger. To insure quick and economical finishing, the silage is best decreased somewhat at the close of the feeding period and the grain increased accordingly. Cattle, when nearly finished, tend to eat too much of the bulky, watery, palatable silage, thus leaving too little room for concentrated grains, a consumption of which is highly imperative at this time.

The shrinkage of silage fed cattle is not heavy as is ordinarily supposed. Silage fed cattle do not shrink any more than dry hay fed ones. Our results clearly indicate that cattle receiving both silage and dry roughage during the feeding period, shrink less than those fed on either dry feed or silage alone.

SILAGE FOR DAIRY CATTLE

The value of silage was first realized by dairy farmers for nowhere is the silo so much a necessity as upon the dairy farm. And no dairy farm is complete in its equipment that does not have at least one silo for winter feeding and one with a smaller diameter for summer feeding.

The characteristics of good corn silage make it preeminently a feed for dairy cattle. It is palatable, succulent, bulky, beneficial to the digestive tract, and economical. These are among the leading characteristics of the ration which is essential to the largest and most economical flow of milk. In fact, most dairy farmers in the corn belt realize that to secure the largest possible profits from a herd of cows they must feed corn silage. In regions where corn cannot be grown successfully for silage, many dairy men have silos in which they cure other crops.

Experiments carried on at the different experiment stations show conclusively that silage is far superior to shock corn or hay in milk production. Silage fed cows produced from eleven to thirteen per cent more milk than cows fed fodder from the same acreage.

Effects of Silage on Milk.

Contrary to the opinion formerly held the milk from silage fed cows is not inferior in flavor or odor to the milk from cows fed dry feed. The condensed milk companies which formerly did not favor milk from silage fed cows, are now advising their patrons to put up silos.

Great care should be taken, however, to prevent the odor of silage from contaminating the freshly drawn milk which takes up odors very quickly. It is best to feed the silage after milking and just what will be eaten up clean at that feed. The silos should be shut off from the barn proper. The idea still held by some, that corn silage will destroy the teeth and digestive tract of the cow and induce such diseases as tuberculosis, is erroneous.

Silage in the Winter Ration.

The principal reason why a dairy cow increases her milk flow when she is turned out to pasture in the spring is that she is receiving

a succulent feed. Thus if we wish to secure a large and persistent flow of milk during the winter months we must feed some succulent feed that will take the place of the pasture grass of summer. The two most common succulent feeds for winter are corn silage and roots. Experimental work has proved that the silage yields more heavily per acre, costs less and gives equal results from similar weights of dry matter.

One of the chief reasons why so many of our cows are unprofitable is that they lack persistency or do not keep up their flow of milk for a long period. While this is largely due to inherited characteristics, yet if all cows were properly fed on corn silage and other desirable feeds, much less trouble would be experienced in trying to keep cows up to their normal flow. Silage and alfalfa or clover hay should form the basis of our rations for dairy cows in winter. A good ration would be twenty-five to forty-five pounds of good corn silage, all the alfalfa or clover hay the cows wish, or ten to fifteen pounds, and seven pounds of grain for each pound of butter fat, or one pound of grain for each two and one-half pounds to four pounds of milk produced, depending upon the amount and richness of the milk.

Summer Feeding.

During the latter part of July and the month of August, the pastures are usually very short, due to hot weather and lack of rainfall. If we are to keep up the flow of milk at this critical time we must supply additional feed. There are many soiling crops which will supply the necessary feed in acceptable form, but most of them require more labor in getting them to the animals than the average farmer can spare at this busy season of the year. Therefore, a silo small in diameter filled for summer use is the most satisfactory and economical solution of this problem, on the average farm. The value of silage at this season does not lie solely in the temporary increase in milk flow, but we know that if a cow once declines in her milk flow it is practically impossible to bring her back to normal for the remainder of her lactation period.

Feeding Young Dairy Animals.

Silage also plays a very important role in the most economical and efficient ration for young, growing dairy animals. It has a very beneficial effect upon the system in keeping the digestive organs in the best of condition and as an aid in developing large digestive capacity. In attaining this last effect it is materially aided by alfalfa or clover hay. When these feeds are given it is not necessary to feed very much grain to the animals after the end of the first year.

A good winter ration for yearling dairy heifers is corn silage, fifteen to twenty pounds, alfalfa or clover hay, eight to ten pounds, grain mixture consisting of equal parts corn, oats and bran, two pounds.

Silage for Bulls.

Dairy farmers are practically unanimous in the opinion that a too liberal ration of silage should not be fed to the herd bull. When so fed the animal is usually rather heavy middled, sluggish and slow in breeding. The large amount of silage distends the middle unduly and does not supply the balance of nutrients necessary to keep the animal vigorous and active in service.

BREEDING FLOCK

Is corn silage a safe feed for the ewe carrying lamb? Yes, if intelligently fed. There has been some prejudice against corn silage as a pregnant ewe roughage, but our experimental results have clearly shown that silage is not only an efficient roughage, assisting in the production of strong, healthy lambs, but is a cheap feed.

Three bunches of 150-pound ewes were wintered in 1910-11 upon rations in which clover was compared with silage. The results briefly are as follows:

Lot 1.—Clover, 2.5 pounds, plus .9 pounds of a grain mixture of corn, 4 parts; oats, 2 parts; bran, 1 part. The lambs averaged 8.192 pounds each at birth, 100% of which were strong.

Lot 2.—1.84 pounds of clover, plus 3.25 pounds of silage in addition to .3 of a pound of a grain mixture of corn, 1 part; oats, 2 parts; bran, 1 part. The lambs averaged at birth 8.636 pounds each, 100% of which were strong.

Lot 3.—5.6 pounds of silage, plus ½ pound of a mixture of oats and bran, equal parts. These lambs averaged 7.8 pounds each at birth and 100% of them were strong.

Counting shelled corn at 40 cents a bushel, oats at 30 cents, bran at \$1.25 per cwt., clover at \$10.00 a ton and silage at \$2.50 a ton, and crediting the gains made upon the ewes at 5 cents a pound, the daily maintenance cost in the clover lot was 1.37 cents; where both clover and silage was used, 1.02 cents; and where silage was used alone with bran and oats, .78 cents.

The rations that contained the largest proportions of silage were clearly the cheapest. The size of the lambs, as well as their general thrift and vigor, etc., was greater where both silage and clover was allowed as compared to either alone.

The silage was tested again in 1911-12, being compared with clover and alfalfa. The results show clearly that the silage rather tended to increase the vigor of the lambs as well as their size at birth. Where the large proportion of silage was fed the cheapest lambs were produced.

A very effective and safe ration for 150-pound breeding ewe would consist of the following:

Corn silage, 3 to 4 pounds.

Clover or alfalfa, ½ pound.

Oats, ½ pound.

If the feeder wishes to use more silage it would be advisable to secure some oil meal or cottonseed meal, the former preferred, to feed in conjunction.

Silage fed ewes giving too much milk at lambing time should be allowed a limited ration of silage previous to the time of birth. The flock master must always bear in mind that silage is a milk producer and govern his feeding accordingly. No such difficulties have been experienced in the Experiment Station flock.

The feeding of corn silage as an exclusive roughage for the wintering ewe is not to be advised. Some dry roughage should be always provided, preferably the legumes, clover or alfalfa. Soy bean or cowpea hay is good, oat straw is fair. However, if other rough feeds than silage are not available, a ration of five pounds silage, plus one-half to two-thirds of a pound of grain mixture of shelled corn, one part; oats, two parts and oil meal one part, will give good results. Cottonseed meal may be supplemented for oil meal, but ordinarily is not so good pound for pound.

How shall we winter the ewe lamb that is to become a member of the breeding flock? We have compared rations of clover versus clover and silage versus silage and find that where both clover (alfalfa, soy bean or cowpea hay would do as well) and silage is allowed in conjunction with a suitable grain ration that the cost is not only decreased but that the lambs are brought through the winter in better shape than if clover alone is used.

Last year we fed two lots of lambs upon the same grain ration of: oats, nine parts, and oil meal, one part, one lot receiving clover hay alone and the other clover and silage. Their gain and feed record is given:

Silage is Added to Clover With Profit.

	Daily gain	Daily grain	Daily Roughage
Clover.....	.224	1.34	1.34
Clover and Silage.....	.233	1.34	1.00 Clover .80 Silage

Notice that .8 of a pound of silage replaced .34 of a pound of clover. At this rate a ton of silage is equal to practically two-fifths of a ton of clover or, in other words, two and one-half tons of silage is equivalent to a ton of clover. The lambs getting silage in addition gained somewhat more rapidly

and came through in the spring much thriftier than the clover alone lot. The time has come when every corn belt farmer who is in the sheep business should preserve a part of his corn crop in the silo. It means much in the efficient production of mutton.

FATTENING LAMBS AND YEARLING SHEEP

Some prejudice is found in feeding silage to fattening sheep, but when it is found that gains are increased by the silage ration and also materially cheapened, this prejudice will not long remain. Some care must be exercised in getting lambs onto feed when silage is used, so as to prevent scouring. The amount of the daily ration will depend upon the size of the lamb. For lambs weighing sixty-five to seventy pounds, shelled corn or mixed grain (depending upon the price of feeds) one and one-fourth to two pounds, corn silage, one and one-half to two pounds, alfalfa or clover hay, one-half to one and one-fourth pounds will make a satisfactory fattening ration.

Yearling sheep will require more feed both of grain and roughage. A daily ration of one and one-half to two and one-fourth pounds of grain, two to three pounds of silage and three-fourths to two pounds of clover or alfalfa hay would prove satisfactory.

HORSES

Much discussion has arisen concerning the feeding of silage to horses. At the outset a good quality of silage, absolutely free of mold, is required. Some farmers have fed silage to brood mares and horses at rest during the winter with good results. On the other hand, some have lost horses on account of the molds which silage sometimes contains. If fed to horses of this kind, five to ten pounds per day with grain and other roughage is all that should be fed until more data is at hand.

The Pennsylvania Experiment Station fed silage to fattening geldings with quite satisfactory results. It is hardly to be expected that silage would prove efficient for horses at heavy work.

HOGS

Silage is too bulky, too fibrous and low in digestible nutrients to prove satisfactory for growing and fattening swine. The hog has a digestive apparatus suited largely to concentrated feeds. Old sows will eat some silage; however, if fed to them, it should constitute only a small portion of their ration.