

dry for the silo it was found to be an advantage to wet it with water. There was considerable difference of opinion as to whether planting in hills or drills gave the best results, but the advocates of hills brought forth some strong arguments, such as: (1) Easier handling in cutting. (2) More thorough cultivation and a better chance to clean the land. (3) Better quality of corn. Having more sunlight would give earlier, sweeter, richer corn, with a larger amount of grain per acre.

Mr. Zavitz, B. S. A., O. A. C., gave the results of several years' experiments with regard to this point—hills vs. drills: (a) A little larger total yield per acre from drills. (b) A little larger yield of grain per acre from hills.

Mr. D. M. McPherson, of Lancaster, had best results from Mammoth Cuban and a sugar corn obtained from Omaha, raising, it was claimed, over thirty tons of corn per acre in 1895 from highly manured land.

Pastures.—In some localities, especially in rocky, stony lands, the natural grasses of the country were highly prized, it being found that the milk, butter, and cheese produced from such pasture had a superior flavor to the common timothy and clover pastures. Some of the best farmers advocate the application of a top dressing of farmyard manure annually. The results obtained by Mr. McPherson in 1895 are so extraordinary that it would be well to give his rotation: First year—Corn for silo on sod heavily manured. Second year—Oats or barley seeded very heavily with mixed grasses and clovers. Third year—Hay. After the hay was cut, as soon as convenient, usually in July, top dress with farmyard manure. Keep all stock off this land. The grass soon comes with a rush and covers the manure, keeping it constantly wet. It soon decomposes, furnishing food for the grass, which gets a very strong root and is able to stand the winter well and starts strong and vigorous as soon as spring opens. On thirty-five acres of pasture treated as above, Mr. McPherson pastured seventy cows the summer of 1895. It is only fair to add that they had an abundance of rain.

Manures.—We found that very few farmers are using artificial fertilizers, it being found more profitable to buy the fertilizers in the form of bran, oil cake, cotton-seed meal or other rich foods; feed them, have some profit on the operation, and have the manure for less than half the cost of commercial fertilizers. As to application of farmyard manure on lands not subject to wash or overflow, the leading farmers favor drawing and spreading on the land as soon as made. After the snow is, say, six inches deep, drop in small piles. If spread when snow is very deep it is liable to wash away when a thaw comes. If dropped in small heaps before the snow comes it will freeze solid to the earth and hold the frost for weeks beneath the heaps in the spring.

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Corn Silage for Milch Cows.

Although the present prospects for abundance of growth are good, changes come about so suddenly that the lessons learned from the experience of the last few years in the matter of stock fodder should not be forgotten. Nor is it likely to be for some time, after a winter of such close feeding as has just past. Elsewhere in this issue, "F. J. S." makes some good points in favor of green fodder as opposed to silage for summer feeding. We herewith give a brief summary of what the New York (Geneva) Experiment Station has found to be true regarding corn silage for milk cows. The points made are as follows:—

For sustaining the milk flow a succulent food is especially desirable. Fresh and tender pasture, natural and efficient food for this purpose, is available but a short time during the year.

Corn is one of the best foods when mature, and besides gives heavy crops. In ordinary seasons it can be fed fresh when at its best for only a few weeks. In the form of silage the crop can be stored and fed as cheaply as by any other methods that have been as thoroughly tested. The average results of a number of feeding trials may be summarized as follows:—

1. When corn silage replaced some other food or the amount of silage in the ration was increased,—

- (1) There followed in seven instances a decrease in the cost of milk, once an increase, and in one instance little change in cost.
- (2) There followed an increase in the yield of milk in six instances, and in three instances a decrease.
- (3) There followed a decrease in the cost of fat in six instances, an increase twice, and little change once.
- (4) There followed an increase in the amount of fat in five instances, a decrease in one, and little change in three instances.
- (5) There followed an increase in the percentage of fat in the milk in six instances, a decrease in two instances, and little change once.

2. When the change was from a ration containing corn silage to one containing less silage or not any,—

- (1) There followed an increase in the cost of milk in four instances and little change in one.
- (2) There followed a decrease in the milk yield in four instances and little change once.

- (3) There followed an increase in the cost of fat in five instances.
- (4) There followed a decrease in the amount of fat in three instances and little change in amount twice.
- (5) There followed a decrease in the percentage of fat in the milk in two instances, an increase in two instances, and little change once.

3. In general there was found an increase in milk flow accompanying the use of corn silage in the ration, and at the same time an increase in the amount of fat produced, the percentage of fat in the milk not diminishing.

4. At the relative prices ordinarily holding for different foods, milk was generally produced at lower cost, and the cost of fat production was lower when corn silage constituted part of the ration than when many other rations were fed.

Ensilage as Summer Feed in the Dairy.

BY F. J. S.

There are signs of a coming boom in the use of ensilage as summer feed. Why? First, and chiefly, because of that profit-preventing, success-debarring system, that careless, shiftless, ne'er-do-well practice, that ever-increasing, never-decreasing evil—sole dependence upon pasture. Secondly, because ensilage is a very profitable food, unquestionably the cheapest known winter feed, under our conditions. And, thirdly, because little, comparatively, is known of other summer foods.

Presumably, summer feeding begins when we stop feeding winter rations, which usually means turning out to grass. Now, our ordinary grass pasture is our cheapest summer feed—while it remains plentiful and in good, succulent condition—for about six weeks, or less; or till about July 1st. We are well aware that there is the possibility that on very valuable land it will not pay to pasture at all. Thus far these cases are rare, and it would be comparatively easy to prove that under our average conditions grass is king as stock food during its season. Where it is not profitable to grow grass or clover, then some kind of ensilage will doubtless be a necessary thing at this period; meanwhile, we maintain that it has no place while grass and clover are in their prime.

From the failure of grass until corn is again ready is a crucial period. When green corn is available, ensilage made from corn grown the previous year is no longer the cheapest nor most satisfactory fodder. That corn gains nothing by being ensiled is certain. Not only so, but a pound of silage costs more than a pound of green fodder corn. Further, it is not the easiest thing to keep corn in a silo during our hot July and August weather in as good condition as during cold weather. It will usually get too sour before being fed, as presumably no more animals are fed from the silo, and the surface is not removed fast enough to offset the higher temperature. Under these conditions it is patent that silage is not our best, nor yet our cheapest fodder after corn comes in. But when does corn come in? Flint corn may be ready for use, in an average season, about the middle of August, occasionally earlier; dent varieties a little later. Sweet corns are available two weeks earlier than either of the others. As a rule, by a proper selection of varieties, green corn fodder may be had by August 1st, or at least quite early in that month. Granting all this, there is still a period of four or five weeks, from July 1st forward, that is really the decisive test of the season. Here, if anywhere, silage finds its place as a cheap and useful summer fodder.

Which are our best available fodders at this season? Without doubt, a mixture of our common cereals and legumes. Lucern, where it can be well established, is excellent at this period, but our common grains are our chief reliance. Peas and oats, vetches and oats (that incomparable milk-producing fodder), or all three are most excellent combinations. These as a basis, with perhaps a sprinkling of barley in the first sowing, to hasten to maturity, and a little two-rowed barley or spring wheat in the second sowing, make most desirable rations for any class of stock. In any case we always wish one or other of the legumes present. Variety is more than the spice of life in the fodder of farm stock.

And now for a comparison of the value by weight of this mixture of green fodder and corn ensilage. We much regret that exact, practical experimental data is not available to assist us in this respect; but perhaps our experimental stations will waken up and give us this soon, since there is not a more important question in the whole range of our animal husbandry. By composition, these fodders stand thus:—

	Albumi- noids.	Carbo- hydrates.	Fat.	N. R.
Oats and peas.....	1.9	8.0	.25	1:4.8
Corn.....	.9	7.0	.3	1:8.5
Clover.....	1.7	8.7	.4	1:5.7

The above are, of course, the digestible constituents. A reliable analysis of corn silage not at my hand. I have substituted that of fodder corn, which will tend to give a rather more valuable composition than really belongs to silage. We have appended the composition of green clover to more thoroughly attest the value of these green cereals and legumes as stock food. It will be noted that the total digestible nutrients are but slightly in favor of clover. The composition of peas and oats (vetches are superior to peas in point of composition), as here quoted from reliable analyses, proves

their superiority to corn, and in actual practice we find this abundantly borne out. That other factor governing fodder values—palatability—is also materially on the side of the fresh green fodder. We would not attempt to place an actual dollar-and-cent difference on their value, but from experience we are convinced that they are worth materially more at this season, for milk, beef, mutton or pork production, than an equal weight of our average corn ensilage.

But what of the relative cost of production, as it is these two, cost and value, that determine the matter? The cost of corn silage is usually estimated at about \$1 per ton to \$1.50, with a crop of about fifteen tons per acre. We will estimate it at \$1.25. This includes seed, rent, and labor of cultivation and of filling the silo. It does not allow for cost of silo, not an unimportant item. But what is the cost of a ton of our cereal and legume combination? We think it is as easy to grow four and a half tons of green fodder as fifteen tons of corn. We offer an estimate of the cost of an acre of green fodder:—

Rent of land.....	\$2 00
Seed (1½ bus. oats and 1 bus. peas).....	1 00
Cultivation (twice harrowed, once cultivated and drilled in).....	50
Cutting and drawing to barn.....	1 50
Four and a half tons cost.....	\$5 00
One ton costs.....	\$1 11

If this is correct, the cost per ton of green fodder and of silage grown twelve months earlier is in favor of the green fodder. But let us not forget that a year has been lost in the case of the silage. Under existing conditions we have now enough idle capital in farm practice, and this feature of summer ensilage is one to be strongly discountenanced. There is more than euphony in the oft-quoted statement, "Small profits and quick returns." Both, then, in value per pound and cost per pound, as well as in economical business practice, green fodder leads. We placed the rent rather lower in our estimate than is usual with corn, remembering that this green fodder will not occupy the land the whole season. But let us look further.

The month of September has become the busiest in the farmer's year. Fall wheat seeding, corn cutting and siloing, grain threshing, exhibitions, closing up summer work and preparing for fall work, supplying stock with fodder, etc., all saddle the farmer heavily at this season. To add to this, by siloing an extra quantity of corn for a year ahead is intrinsically bad. Corn depletes the soil immeasurably more than green fodder, and while this fertility is largely returned, it requires a richer soil for full returns than the other. There is less likelihood of failure in getting a stand of grain than of corn on all heavy soils. To depend upon silage between June 1st and October 1st, we are convinced is, in the main, radically wrong.

Separator Cream vs. Deep-Setting.

SIR,—I do not quite understand the drift of "Invicta's" two questions about cream and fat, but I know, on the authority of good men, that the per cent. of cream raised by deep-setting bears no fixed relation to the per cent. of butter-fat in the milk, while a given per cent. of cream by centrifugal separator has a fixed relation to the per cent. of butter-fat in milk. Since the Babcock test was used many interesting tests of this per cent. of cream have been made; Gurler found a difference of 25 per cent. in the butter value of milk that showed the same per cent. of cream in the glass test tube. The milk of fourteen different creamery patrons was tested by the Babcock test, also by the cream gauge, and showed:—

Per Cent. Cream.	Per Cent. Fat.	Per Cent. Cream.	Per Cent. Fat.
8	3.80	17	4.30
8	3.00	17	3.30
10	4.05	17	3.85
10	3.70	16	3.85
10	3.50	16	3.80
10	3.60	15	3.40
14	3.50	15	3.00

Then, he gives records of individual cows giving milk testing 5.4 per cent. fat and 18 per cent. cream, another 4 per cent. fat and 18 per cent. cream, and another 3.30 per cent. fat and 18 per cent. cream, which shows the cream test is not reliable, and that a given quantity of cream raised by deep-setting does not represent a given quantity of butter, even if raised from milk testing same per cent. of fat, or, that two inches of cream in one can may mean one pound of butter, while two inches of cream in another can, raised from milk of same butter value, may mean one and one-quarter pounds of butter. Then we are asked to suppose "that 5 per cent. of the whole milk is taken as cream by both processes." I would ask, Where is the farmer who takes 5 per cent. of his whole milk as cream by deep-setting? I don't think it is ever done except in shallow pans. Deep-setting, as shown above, gives from 14 to 18 per cent. of the whole milk as cream, so to make comparisons we must stick to practice, and not give deep-setting the advantage of rich cream which it is not entitled to. But with the separator we can take such per cent. of the whole milk as cream as will best suit our purpose. Now, it is a fact that cream containing 35 per cent. of fat can be churned, if properly handled and ripened, at a temperature of 50° to 52°, and give the most exhaustive churning in 45 minutes (I mean the buttermilk to be drawn at that temperature); the butter will be very free