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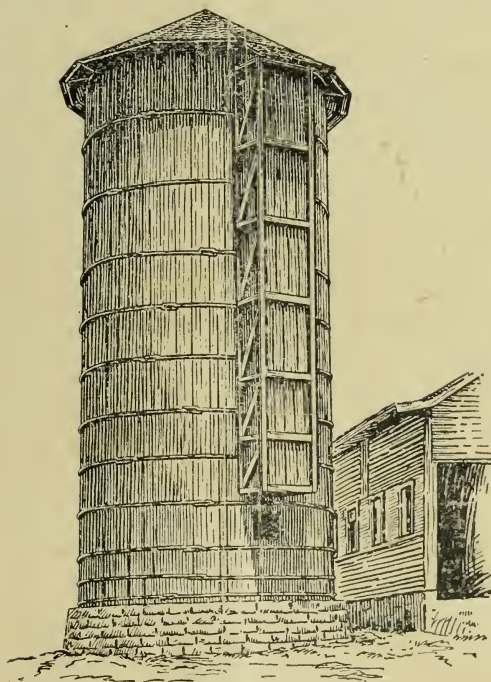
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Mississippi Agricultural Experiment Station.

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SILAGE vs. HULLS AND MEAL

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SILAGE vs. HULLS AND MEAL

A. K. RISSER AND R. R. WELCH.

During the past year the Dairy Division, Washington, D. C., in co-operation with the Mississippi Agricultural Experiment Station, has had a representative working with the dairymen of the State, instructing them in better dairy methods, helping them to raise the standard of their herds by weeding out the poor cows, in improving the quality of their product and thereby securing the best prices and giving suggestions and plans for dairy barns, dairy houses, and silos. Of those keeping individual records of cows, eight men have complete records of their herds for the year. One of these eight men had a silo, and it is the object of this Bulletin to present very briefly, the results of this herd fed on a silage ration as compared with the results of the other seven herds fed on the usual dairy ration of the South—hulls and meal.

PRODUCTION.

Dairymen who depend on pasture in summer and hulls and meal in winter, are usually doing only a summer business. During the winter months, November to February, their herds go into winter quarters and are frequently not paying for their keep, owing to the low average production in conjunction with a high average cost.

In the following table we compare the average production per cow per month, summer and winter, of seven herds containing 247 cows, with that of one herd of 23 cows. During the summer months May, June, and July, the cows of both groups were practically on the same ration, i. e., pasture supplemented with a little cotton seed meal. During the winter months, November, December, and January, the herd of 23 cows was fed on corn silage with cotton seed meal while the other herds were fed on hulls and cotton seed meal with the addition of some other feed, such as bran, shorts, alfalfa hay, etc.

MILK PRODUCTION.

	Cows.	Average production per Cow per month.				Decrease on Winter Ration.		Gain in Production due to Silage.
		Summer.		Winter.		Lbs.	Gals.	%
		Lbs.	Gals.	Lbs.	Gals.			
Dry Fed Herds	247	357.9	41.62	240.4	27.95	117.5	13.67	
Silage Fed Herd	23	364.9	12.43	335.9	39.05	29.0	3.38	
Differences.....		7.0	.81	95.5	11.10	88.5	10.29	36.81

From the table we learn that during the summer months, when the rations were about the same, the average production per cow per month for the two groups was almost the same; the average for the 23 cows being only .81 of a gallon above that of the 247 cows. During the winter months when the rations differed, the average production for the 247 cows dropped 117.5 pounds, or 13.67 gallons, while the average production of the 23 cows, fed on a silage ration, dropped only 29.0 pounds, or 3.38 gallons. Or, there is a net difference in favor of the silage ration of 88.5 pounds or 10.29 gallons per cow per month. Silage increased the production of the milk 36.81% or over one-third.

Let us consider what this would amount to in the three winter months in a herd of 20 cows. Each cow would increase 10.29 gallons per month. For the 20 cows this would in one month amount to 205.8 gallons, and in three months would equal 617.4 gallons. The average price received per gallon for milk by the owners of these herds was not less than 30 cents; at 30 cents per gallon, the 205.8 gallons are worth \$185.22. Where is the excuse for sending our dairy herds into winter quarters when instead each cow could be earning a profit of \$3.09 per month?

BUTTER-FAT PRODUCTION.

In averaging the butter-fat production, several herds were omitted as the product was sold as whole milk and no records of butter fat production was made. We have, however, the average of 149 cows to compare with the average of the 23 cows.

BUTTER-FAT PRODUCTION.

	Cows.	Average butter-fat per Cow per month.		Decrease on Winter Ration.	Gain in Production due to Silage.
		SUMMER	WINTER		
		Lbs.	Lbs.	Lbs.	%
Dry Fed Herds	149	17.12	12.09	5.03	
Silage Fed Herd	23	17.58	16.70	.88	
Differences.....		.46	4.61	4.15	34.32

During the summer, the average production of butter-fat per cow of the two groups differed only by .46 pounds, while during the winter months, there is a net difference of 4.15 pounds in favor of the silage ration. Silage increased the production of butter-fat 34.32%, or one-third.

COST.

We have found a very pronounced gain in the production of both milk and butter-fat where silage was fed but before we draw our conclusions, let us compare the relative cost of the two rations. The dry ration, as previously stated, consisted principally of hulls and meal, with the addition of some other feeds, some feeding one kind, others another. The following are the rations fed during November, December and January, with the cost per ton for each kind of feed.

RATIONS.

Herd A:	AT PER TON.
3-6 lbs. Cotton Seed Meal.....	\$25.00
10-15 lbs. Hulls	6.25
Hay, occasionally,	8.00
Good cane pasture.	
Herd B:	
1/2-2 1/2 lbs. Cotton Seed Meal	\$23.50
14.6 lbs. Hulls	6.50
3-10.8 lbs. Bran	31.00
6-8 lbs. Alfalfa.....	20.00

Herd C:

AT PER TON.

4-6 lbs. Cotton Seed Meal	\$25.00
20 lbs. Hay	8.00

Herd D:

2-4 lbs. Cotton Seed Meal.....	\$28.00
4-10 lbs. Hulls	5.00
1-4 lbs. Bran	28.00
5-15 lbs. Hay	8.00

Herd E:

1½-2½ lbs. Cotton Seed Meal	\$24.00
10-25 lbs. Hulls	6.00
3-10 lbs. Corn Meal	30.00

or

2-10 lbs. Shorts	33.00
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Herd F:

3½-7 lbs. Cotton Seed Meal	\$23.60
15 lbs. Hulls	8.10
10 lbs. Hay.....	8.00
1 pint Molasses at 15c per gal.	

Herd G:

1½-6 lbs. Cotton Seed Meal	\$23.00
3½-13 lbs. Hulls	4.00
1-3 lbs. Bran	27.00
12 lbs. Hay	6.00

Silage-fed Herd:

1-5 lbs. Cotton Seed Meal	\$27.00
30-50 lbs. Silage	3.00
4 lbs. Shredded Fodder	10.00

The price of hulls in some cases appears low but most of the men had contracts with their dealers securing a special rate. The value put on corn silage, \$3.00 per ton, it should be noted, is very high. Silage does not ordinarily cost over \$1.50 per ton. The cost of the two rations is compared in the following table:

COST OF PRODUCTION.

	Cows.	Average Cost per Cow per Month.	Cost of producing one Gallon Milk.	Cost of producing one Pound Butter-Fat.	Reduction in Cost due to Silage Ration.
Dry Fed Herds	247	\$4.10	\$0.1468	\$0.2993	Milk, 39.03%
Silage Fed Herd	23	3.50	0.0895	0.2098	Butter-fat, 29.90%
Differences.....		\$0.60	\$0.0573	\$0.0895	

From the table we note that the dry ration cost 60c per month more than the silage ration, regardless of the fact that the silage is figured at \$3.00, and the hulls at about \$6.00 per ton.

The most interesting feature of the table, however, is the relative cost of producing a gallon of milk on the two rations. Silage reduced the cost of producing a gallon of milk 39.03%; almost half. The cost of producing a pound of butter-fat was reduced 29.90%; almost a third.

Returning to our herd of 20 cows, if these cows are put on a silage ration instead of on dry feed, we reduce the cost of feed per cow per month 60c. For the 20 cows this would in three months amount to \$36.00. Add this to the increased value of your production and we find that during the months of November, December and January, the man with a silo increases his profits on a herd of twenty cows by \$221.22 over the man who feeds without a silo. This amount would in a short time pay for a complete silo equipment.

This Experiment Station, through Bulletins and the Farmers' Institutes, has frequently advocated the silo and has offered some convincing results obtained with the Station herd. The results reported here, however, are not from the Station, but are from actual conditions as found on the farms of the State. A few years ago when good hulls, meal and bran were available at lower prices, there was a chance for a profit on a dry ration, but at the present prices of feeding

stuffs, care and judgment must be exercised in order to secure a profitable ration. For the economical production of either milk or butter-fat the silo is indispensable.

THE SILO.

Anticipating some of the queries that will arise, we offer the following information for those who are interested:

Size.—A 90-ton silo, 14x30, will feed a herd of 25 cows six months, allowing 40 pounds per day to each cow. If your herd is smaller than 20 cows, the diameter of the silo should be reduced. There is no question as to whether silage can be used successfully in this climate but builders must be cautioned against using silos of too great diameter.

Wood or Concrete.—If your barn is a permanent structure and if you have access to cheap gravel and sand the concrete silo is to be recommended. It will cost about 25% more than the wood silo but it is durable, permanent, and does not require the attention that a wood silo demands. The best wood silo will, in a few years, need repairs, and then there is always the danger from storms. If you can get good lumber cheaply and if you might wish later to change the location of your buildings, then it may be wiser to build a wood silo. At the close of this paper we show the bills of quantities for both kinds of silos.

Crops for the Silo.—Corn is considered the best crop for the silo. If you can grow seven or more tons of corn to the acre, this crop is to be preferred. If you are not able to grow this amount of corn, then plant sorghum and cow peas, or sorghum and Soy beans. They generally make a heavy yield and can be grown anywhere in the State.

Machinery Necessary.—An eleven or thirteen inch cutter with elevator and an eight or ten horse-power engine are necessary. The cutters with blower elevator attachment are to be preferred, but the carrier style will do the work. The engine may in some communities be hired to do the job, and in this way the cash outlay can be reduced several hundred dollars.

How to Build the Silo.—If you decide to build either the wood or concrete silo, start getting your material together at once. Do not leave this part of the work until your crop is nearly ready to harvest.

If you have the mechanical ability, try building the silo yourself. The Department's representative in charge of this co-operative field work has had experience in building silos and if desired he will assist you in the work. If you are interested in the silo and wish further information, or if you wish to secure the services of the Department's expert along this line, address the Director of the Experiment Station, Agricultural College, Miss.

Bill of Quantities for 90-Ton Stave Silo:

FOUNDATION:

- 3 3/4 cubic yards rock.
- 2 cubic yards sand.
- 4 1/4 bbls. cement.

SILO PROPER - LUMBER:

- 133 pieces 2"x4"x16'.
- 133 pieces 2"x4"x14'.

HARDWARE:

- 8 rods 3/4 inch diameter, 11 ft., 6 inches long;
- 8 rods 5/8 inch diameter, 11 ft., 6 inches long;
- 20 rods 1/2 inch diameter, 11 ft., 6 inches long;
- 18 malleable iron lugs;
- 50 pounds 40d spikes;
- 64 bolts 3/8 inch, 4 inches long;
- 133 pieces galvanized sheet iron, No. 22, 2 inches wide by 4 1/4 in. long.

Bill of Quantities for 90-Ton Concrete Silo, 14x30:

- 38 bbls. cement;
- 17 cubic yards of sand;
- 29 cubic yards rock (gravel or brick bats).
- 538 ft., 30 inch fencing for re-inforcing;
- Lumber for forms and scaffolding.

Estimated Cost of a Complete Silo Equipment:

Materials for a 90-Ton Concrete Silo.....	\$160.00
11 inch cutter with blower elevator.....	100.00
8-HP. engine.....	350.00
Freight and extras.....	25.00
<hr/>	
Total.....	\$635.00

Labor of building silo is not estimated.