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South Dakota State University Agricultural
Experiment Station

3-1-1928

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J.W. Wilson

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Recommended Citation

Wilson, J.W., "Staked Green Corn for Cattle" (1928). *Bulletins*. Paper 229.
http://openprairie.sdstate.edu/agexperimentsta_bulletins/229

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STACKED GREEN CORN FOR CATTLE



ANIMAL HUSBANDRY DEPARTMENT
AGRICULTURAL EXPERIMENT STATION
OF THE
SOUTH DAKOTA STATE COLLEGE OF
AGRICULTURE AND MECHANIC ARTS
BROOKINGS, S. D.

Summary

1. Stacking green bundle corn is one of the poorest ways of preserving the corn plant for feed in the winter time.

2. Unless a feed is highly palatable cattle will not do well, and will not even retain their original weight and condition when forced to subsist on a feed of this kind.

3. The results of this and other experiments at this station show that the value of corn fodder and corn silage as a feed during a preliminary feeding period depends on the condition of the corn plant, as to maturity, when cut for fodder or when put into the silo.

4. It is evident that when an animal is given a mere maintenance ration that the time is lost as far as fattening him in a shorter time than usual is concerned. While larger gains per head daily are shown, the finish of the animal is not as complete as though he had been gaining for a longer period. He utilizes his feed to better advantage in that he produces more gain for a bushel of corn fed than steers not kept under these conditions. He produces growth while on the poor ration but this additional growth is not an advantage when marketed.

5. As reported in a former bulletin of this station, steers made larger gains on a corn silage plus alfalfa ration than on a corn silage ration alone. These steers were in better condition at the end of the preliminary feeding period than steers in any other lot. When put on the full grain ration, during the fattening period, the gains were not the largest but were average and the superior quality of the cattle was noticeable.

Stacked Green Corn for Cattle

James W. Wilson

Since the introduction of the silo as a means of preserving the corn plant for feed, other methods have been suggested. Among these is the stacking of the bundle corn while green. To furnish information along this line an experiment was conducted during the winter of 1925 and 1926 to determine the feeding value of green corn stacked, green corn put into shocks, green corn put into the silo, and alfalfa hay. Each feed was to be fed for a preliminary period of 90 days.

It is the custom of many feeders to arrange for a stalk field, or to feed corn fodder, or corn silage or have an ungrazed pasture on which the cattle are turned for a short period before the more expensive feeds are given. In bulletin 160 of this station, edition exhausted, the results show that the cost of gain during a preliminary period of 91 days, when corn silage was fed, was \$4.03 per hundred pounds. By adding oil meal to the ration of corn silage at the rate of 3 pounds per head daily for an additional period of 101 days, the cost of gain for this latter period was \$6.10 per hundred. These costs were based on corn silage at \$3.00 a ton and oil meal at \$36.00 a ton. By dividing the cost of the feed for both periods by the total gain, the cost for the entire period of 192 days was reduced to \$5.01 per hundred.

In 1912, corn fodder was fed in an experiment to steers for a period of 90 days with an average daily gain per head of 1.94 pounds, while at the same time a similar bunch of steers were fed on corn silage and the average gain per head was 2.40 pounds. A third bunch of steers, that received one-half as much corn silage as the lot that was receiving corn silage alone and all the hay they wanted, made only 1.76 pounds per head daily.

There were 25 head of grade Hereford steers used in this experiment. They were divided into five different lots of five head each and weighed up for the test. This was probably the best bunch of steers ever used in an experiment in feeding at this station. All were sired by the same bull and were of similar quality and size.

The lots were fed the following rations:

Lot I. Green bundle corn stacked.

Lot II. Green bundle corn shocked.

Lot III. Green bundle corn cut in small pieces and put into the silo.

Lot IV. One-half as much corn silage as Lot III was receiving and all the alfalfa hay they would eat.

Lot V. All the alfalfa hay they would eat.

The results are reported in two periods, preliminary and fattening.

Preliminary Period

While the intention was to have a 90-day preliminary feeding period, the condition of the stack silage was such that the time had to be reduced to 56 days. There was a great waste in handling green corn in this manner. One would expect green corn stacked to keep and be equal, if not superior, to corn fodder for feeding cattle, but the results indicate that it is one of the poorest ways to preserve the corn plant for use as a feed.

The following cut shows the per cent of spoiled feed. All outside of the white tape line was spoiled so cattle would not eat it.

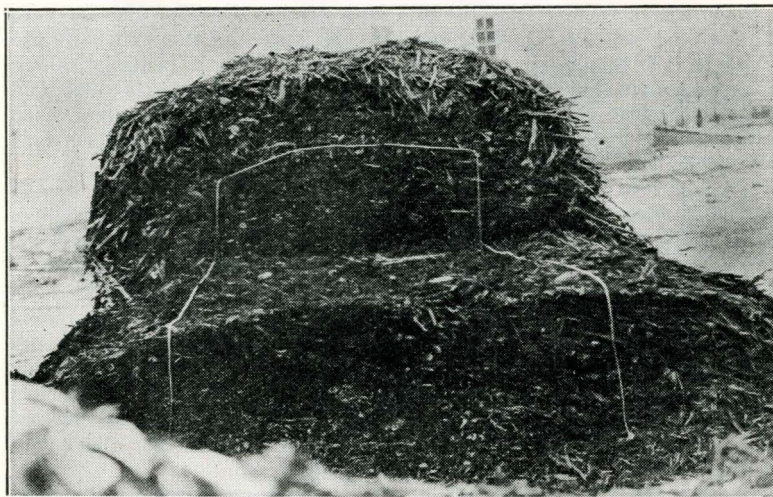


Fig. 1.—View of stacked green corn used in experiment.

The ears of the corn from which these feeds were made were not all in the glazed stage, the condition found to be the best for making corn silage; hence gains for steers that were receiving corn silage were not as large as gains reported in former experiments by this and other stations. However, the condition of the corn when cut was the same for all lots. The factor of palatability was an important feature in this experiment. While the spoiled part of the stack silage was not fed, the remaining part was not as palatable as feeds in other forms. The kernels on the ears were dark in color, due to heating in the stack and the aroma was not as pleasant as that of the same kind of corn shocked or put into the silo.

The average daily ration per head fed to the lot receiving stacked corn was 38 pounds, as compared to 61 pounds for the lot receiving corn silage. An average of 3 pounds was weighed back daily as refused, while with the corn silage lot all was consumed.

Table I.—CHEMICAL ANALYSIS OF FEEDS USED IN EXPERIMENT

	Moisture	E. E.	Ash	Protein	C. F.	N. F. E.
Corn Silage.....	70.02%	.73%	1.39%	2.79%	6.83%	18.24%
Silage—Stack Silo	64.99	.55	1.91	2.83	9.08	20.64
Corn Fodder	5.98	1.34	4.42	7.44	27.90	52.92
Alfalfa Hay	5.80	1.42	5.53	13.12	33.73	40.40

The analysis of the feeds in Table I shows that there was more acid in the corn silage than in the stack silage, that it contained more moisture, more ether extract or fat; less protein and yet was a superior feed. Perhaps the digestibility coupled with the palatability were responsible for the corn silage being a superior feed.

Fattening Period

All lots were put on a fattening ration consisting of shelled corn, oil meal, corn silage and alfalfa hay and fed for a period of 148 days. The object of doing this was to ascertain the effect the preliminary feeding had on gains during the fattening period.

The shelled corn was purchased in the local market a load at a time and was cleaned. The quality was not the best as each load contained immature kernels.

Enough pigs were put in each lot to pick up the waste. In this case, four head of hogs weighing from 110 to 120 pounds were needed for each lot of steers of five head.

One-tenth as much oil meal by weight was fed as the lot was eating shelled corn and was mixed with the corn. Each lot received all the corn silage and alfalfa hay the steers wanted in separate troughs.

Table II.—WEIGHTS AND GAINS, BOTH PERIODS

Lot I									
Preliminary, 56 Days				Fattening, 148 Days					
No. Steer	Wt. Dec. 1	Wt. Jan. 26	Gain	Av. Gain Per Head Daily	Wt. June 23	Gain	Av. Gain Per Head Daily	Total Gain 204 Days	Av. Gain Per Head Daily Both Periods
46-----	921	926	5		1426	500	3.37	505	2.47
24-----	743	714	-29		1208	494	3.33	465	2.27
7-----	838	844	6		1409	565	3.81	571	2.79
23-----	876	910	34		1391	481	3.25	515	2.52
14-----	858	822	-36		1407	585	3.95	549	2.69
Total-----	4236	4216	-20		6841	2625		2605	
Average----	847	843	-4		1368	525	3.54	521	2.55

Lot II									
30-----	824	886	62	1.10	1447	561	3.79	623	3.05
27-----	854	904	50	.89	1501	597	4.03	647	3.12
19-----	853	884	31	.55	1428	544	3.67	575	2.81
12-----	758	818	60	1.07	1322	504	3.40	564	2.76
26-----	922	968	46	.80	1581	613	4.14	659	3.23
Total-----	4211	4460	249		7279	2819		3068	
Average----	842	892	49	.88	1445	563	3.80	613	3.00

Lot III									
6-----	817	892	75	1.33	1315	423	2.85	498	2.44
33-----	997	1110	113	2.01	1597	487	3.29	600	2.94
32-----	788	890	102	1.82	1351	461	3.11	563	2.75
89-----	810	912	102	1.82	1358	446	3.01	548	2.68
8-----	814	892	78	1.39	1384	492	3.32	570	2.79
Total-----	4226	4696	470		7005	2309		2779	
Average----	845	939	94	1.67	1401	461	3.12	555	2.72

Table II. (Continued)—WEIGHTS AND GAINS, BOTH PERIODS
Preliminary, 56 Days Lot IV Fattening, 148 Days

No. Steer	Wt. Dec. 1	Wt. Jan. 26	Gain	Av. Gain Per Head Daily	Wt. June 23	Gain	Av. Gain Per Head Daily	Total Gain 204 Days	Av. Gain Per Head Daily Both Periods
40-----	832	966	134	2.39	1251	285	1.92	419	2.05
20-----	843	976	133	2.37	1448	472	3.18	605	2.96
21-----	800	908	108	1.92	1404	496	3.35	604	2.96
35-----	866	992	126	2.25	1411	419	2.83	545	2.67
5-----	891	1014	123	2.19	1531	517	3.49	640	3.13
Total-----	4232	4856	624		7045	2189		2813	
Average----	846	971	124	2.22	1411	437	2.95	562	2.75

Lot V

2-----	799	900	101	1.80	1426	526	3.55	627	3.07
29-----	810	900	90	1.60	1398	498	3.36	588	2.88
25-----	832	924	92	1.64	1386	462	3.12	554	2.71
44-----	876	986	110	1.96	1447	461	3.11	571	2.79
34-----	925	1018	93	1.66	1433	415	2.80	508	2.49
Total-----	4242	4728	486		7090	2362		2848	
Average----	848	945	97	1.73	1418	472	3.19		2.79

Table of Weights and Gains

A study of Table II shows that steers of Lot IV made the most uniform gains during the first period and steers of Lot II the largest average daily gains for the fattening period, that steers of Lot I were unable to make up the gains not made during the preliminary period.

There was a big difference in the quality of the steers at the close of the fattening period. Those of Lot I and V were more upstanding, showing that much growth had been made as compared to their half-brothers in the other three lots.

It does not pay to feed a ration to fattening animals that does not produce fat, because the final condition of the animal on the market is the most important factor to keep in mind.

Lot I

These steers received stack silage without further roughage or grain during the preliminary feeding period of 56 days. The grain was in this silage but due to the bacterial and chemical changes that took place, the stack leaves and ears were changed from the nice green condition when cut to a coffee brown color. The kernels of corn were soft and mealy much on the order of the kernels of corn found in corn that has been preserved in the silo. The cattle did not like this feed. It was not palatable and had a disagreeable odor. The following results show that it furnished little more than a maintenance ration.

Preliminary Period

Average weight at beginning -----	Pounds 847
Average weight at close of 56 days -----	843
Average gain for period -----	
Average gain per head daily -----	
Average silage consumed per head daily -----	30

Fattening Period

Gain during fattening period, 148 days	2625
Average gain per head daily during fattening period	3.54
Shelled corn for pound of gain	6.41
Corn silage for pound of gain	2.76
Alfalfa hay for pound of gain	1.17
Oil Meal for pound of gain	.64
Average gain per head daily of hogs following cattle	.75
Average gain per head daily for both periods	2.55

Lot II

The five steers in this lot received corn fodder during the preliminary feeding period. This fodder was cut and shocked shortly after the green corn was stacked for Lot I. The feeding of corn fodder in the late fall after the grass has become frosted is a practice followed in some localities. In 1911 a bunch of yearling steers were fed corn fodder for a period of 90 days and made an average gain per head daily of 1.76 pounds, while in this experiment the average gain per head daily was only .88 of a pound. The difference no doubt was due to the condition of the corn when cut for fodder.

Preliminary Period

	Pounds
Average weight at the beginning	842
Average weight at close of 56 days	892
Average gain for period	49
Average gain per head, daily	.88
Average fodder consumed per head daily	28

Fattening Period

Gain during fattening period of 148 days	2819
Average gain per head daily	3.80
Shelled corn for pound of gain	6.35
Corn silage for a pound of gain	2.24
Alfalfa hay for a pound of gain	1.19
Oil meal for pound of gain	.63
Average gain per head daily of hogs following cattle	.86
Average gain per head daily for both periods	3.00

Lot III

The corn silage fed to these steers was made from the same kind of corn as for other lots. The largest gain ever made at this station, with a single ration of corn silage, was in 1911 with yearling steers. These yearlings made an average gain per head daily of 2.40 pounds. To get this gain silage was made of a short early maturing variety of corn, which was put into the silo when the ears were well dented and the leaves still green. In sections where silos are found the corn silage alone ration is followed and if the corn silage is good, good results are secured.

Preliminary Period

	Pounds
Average weight at the beginning	845
Average weight at close of 56 days	939
Average gain for period	94
Average gain per head, daily	1.67
Average silage consumed per head, daily	61

Fattening Period

Gain during fattening period, 148 days	2309
Average gain per head daily	3.12
Shelled corn for a pound of gain	7.52
Corn silage for a pound of gain	2.62
Alfalfa hay for a pound of gain	1.03
Oil Meal for a pound of gain	.75
Average gain per head daily of hogs following cattle	1.04
Average gain per head daily for both periods	2.72

Lot IV

These steers received one-half as much corn silage as steers of Lot III were eating and all the alfalfa hay they wanted. This ration proved to be the best during the preliminary period because the gains were more uniform and larger than for any other lot. Bulletin 160 of this station (edition exhausted) reported that a corn silage plus alfalfa ration produced larger gains daily than with corn silage alone for a period of 91 days. The cattle were in better condition at the end of the preliminary period than cattle of any of the other lots.

Preliminary Period

	Pounds
Average weight at the beginning	846
Average weight at close of 56 days	971
Average gain for period	125
Average gain per head, daily	2.22
Average silage consumed per head, daily	30
Average hay consumed per head daily	14

Fattening Period

Gain during fattening period, 148 days	2189
Average gain per head daily	2.95
Shelled corn for a pound of gain	7.95
Corn silage for a pound of gain	3.03
Alfalfa hay for a pound of gain	1.31
Oil Meal for a pound of gain79
Average gain per head, daily of hogs following cattle97
Average gain per head daily for both periods	2.75

Lot V

This lot received all the alfalfa hay they would eat for the 56 day period. While the gains were second best of any of the lots, the steers made a big growth. They were leggier than steers of other lots and it was evident that their ration was not the best. The gains were similar to those made by steers receiving corn silage alone but the quality of steers was not as good as steers in the silage lot.

Preliminary Period

	Pounds
Average weight at beginning	848
Average weight at close of 56 days	945
Average gain for period	97
Average gain per head, daily	1.73
Average hay consumed per head, daily	26

Fattening Period

Gain during fattening period, 148 days	2362
Average gain per head daily	3.20
Shelled corn for a pound of gain	7.08
Corn silage for a pound of gain	3.99
Alfalfa hay for a pound of gain87
Oil Meal for a pound of gain70
Average gain per head daily of hogs following cattle82
Average gain per head daily for both periods	2.79