1-1-1899

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J. H. Stewart

Horace Atwood

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WEST VIRGINIA
AGRICULTURAL EXPERIMENT STATION,
MORGANTOWN, W. VA.

BULLETIN 59.

JUNE, 1899.

Whole Corn Compared With Corn Meal
for Fattening Hogs.

BY J. H. STEWART AND HORACE ATWOOD

[The Bulletins and Reports of this Station will be mailed free to any citizen of West Virginia upon written application. Address Director of Agricultural Experiment Station, Morgantown W. Va.]

MORGANTOWN:
NEW DOMINION STEAM PRINTING HOUSE,
1899.

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WHOLE CORN COMPARED WITH CORN MEAL AS A FOOD FOR FATTENING HOGS.

EXPERIMENTS IN 1897.

The practical question often arises whether it will pay a farmer to go to the trouble and expense of grinding his corn before feeding it to his hogs. Even though somewhat more pork may be produced by feeding corn meal, yet this increased gain in weight may be obtained at a financial loss, and it may be better to feed the whole grain, even though less pork is produced. To answer this question a series of experiments were planned, the first of which is here reported.

Nine hogs about six and one-half months old were available for the experiment. All of them had previously been fed on a well balanced ration of ground feed, and were in good condition when the test began. They were divided into three lots of three each. The pigs in lots I and II were from a litter resulting from a cross of a Poland China boar on a Duroc Jersey sow. The pigs in lot III were a cross of the same boar on a Berkshire sow.

The hogs were fed for two periods of two weeks each and then butchered. The following table gives the weight of the individual hogs at the beginning of each period and the gain made:

TABLE I. FIRST PERIOD—TWO WEEKS.

	Lot I. Whole Corn.		Lot II. Corn Meal.		Lot III. Corn Meal.	
	Weight.	Gain.	Weight.	Gain.	Weight.	Gain.
	248.6	14.4	247.0	42.0	164.3	31.7
	253.5	20.5	201.6	37.4	163.3	35.7
	215.5	12.5	235.5	44.5	160.0	32.0
Total...	717.6	47.4	684.1	123.9	487.6	99.4

SECOND PERIOD—TWO WEEKS.

	Lot I. Whole Corn.		Lot II. Corn Meal.		Lot III. Corn Meal.	
	Weight.	Gain.	Weight.	Gain.	Weight.	Gain.
	263.0	32.0	289.0	37.5	196.0	18.0
	274.0	39.0	239.0	14.0	199.0	21.0
	228.0	23.0	280.0	24.5	192.0	23.0
Total...	765.0	94.0	808.0	76.0	587.0	62.0
Total gain for both Periods.		141.4		199.9		161.4

It is seen from an inspection of this table that the lot fed whole corn during the first period gained only about one-third as much as lot II which was fed corn meal, while in the second period the lot fed whole corn gained more than either of the other lots. These seemingly contradictory results may have been due in part to the fact that lot I, having been previously fed on ground feed, did not take kindly to its new ration of dry, hard corn, and only later became accustomed to it; also, the evening before the hogs were weighed, to determine the amount of gain made during the first period, lot I had been fed more corn than was consumed during the night, and as some still remained in the trough in the morning, they were not fed any more by the foreman. Hence, the actual gain made by the hogs fed corn during the first period is somewhat greater than is shown by the table. As the conclusions are based, however, on the average of the two periods, the final results are not altered.

The following table shows the amount of grain consumed by the different lots during each of the two periods. The hogs were fed three times each day, all that they would consume:

TABLE II. FIRST PERIOD—TWO WEEKS.

	Lot I. Whole Corn	Lot II. Corn Meal	Lot III. Corn Meal.
Consumed of grain.....	413.30	477.00	396.40
Gained in live weight.....	47.40	123.90	99.40
Pound feed for one pound gain....	8.71	3.84	3.98

SECOND PERIOD—TWO WEEKS.

	Lot I. Whole Corn	Lot II. Corn Meal	Lot III. Corn Meal.
Consumed of grain.....	406.00	474.00	352.00
Gained in live weight.....	94.00	76.00	62.00
Pounds feed for one pound gain...	4.32	6.23	5.68

FIRST AND SECOND PERIODS.

	Lot I. Whole Corn	Lot II. Corn Meal	Lot III. Corn Meal.
Consumed of grain.....	819.30	951.00	748.40
Gained in live weight.....	141.40	199.90	161.40
Pounds feed for one pound gain...	5.79	4.75	4.63

During the first period lot II produced a pound of gain on less than half the feed that was required by lot I, while in the second period these conditions were reversed and lot I produced a pound of gain more economically. If we consider the average of the two periods we find that lot I, fed whole corn, required 5.79 pounds of feed for one pound of gain, while lot II required 4.75 pounds, and lot III 4.63 pounds. It would consequently appear that if corn meal were as cheap as whole corn that it would be better to feed meal.

The difference in the cost of these two feeding stuffs depends on circumstances. If a farmer lives, say four or five miles from a mill, it is worth about \$2.00 to take a load of 40 bushels of shelled corn to the mill and draw it back home. With corn at 40 cents per bushel it would cost then just about one-eighth of the value of the corn to haul it. The miller is also entitled by law to one-eighth of the corn for grinding the remainder, and consequently it would cost many farmers one quarter of their corn to get it ground.

The lot which was fed whole corn consumed during the two feeding periods 819.3 pounds of corn, and gained 141.4 pounds in weight. If this corn had been ground, allowing one-quarter for

hauling and grinding, there would have been 614.5 pounds of meal. Now, 951 pounds of meal fed to lot II produced 199.9 pounds of gain; consequently one pound of meal produced .2102 pounds of gain, and 614.5 pounds of meal would have produced 129.1 pounds increase in live weight. The whole corn, however, actually produced 141.4 pounds of increase, hence, there was a gain from feeding the whole corn of the difference between 141.4 pounds actually gained, and 129.1 pounds which would have been gained had the corn been ground into meal and then fed. This difference, then, of 12.3 pounds of increase in live weight is in favor of feeding the whole corn, and we may assume that there would have been a greater difference in favor of the corn fed lot had they not suddenly been changed at the beginning of the experiment from a ground feed ration to whole corn which they did not at first relish.

As it is of interest in this connection to bring together the results of all of the experiments which have been performed in this country to determine whether it is better practice to feed corn or corn meal the following table has been compiled showing the more important details of these experiments:

Experiment where Performed	No. of Animals Fed	Average weight at beginning	Daily Gain.		Total Grain Eaten.		Total Gain.		Feed for 100 lbs. gain.		No. of Days Fed.
			Corn.	Meal.	Corn.	Meal.	Corn.	Meal.	Corn.	Meal.	
Ala. Sta. (Canebrake)	4	79	.75	1.4	292	397.5	63.5	122	439	323	42
Maine Station.....	6	164	1.07	1.0	1272	1272	271	252	409	501	84
Wisconsin .....(1888)...	10	253	1.40	1.76	1815 90.7 { Milk } 5314	2004 100.2 { Milk } 5333	420	528	.....	.....	30
"(1896).....	18	350	1.96	2.13	633 shorts 3960 { Milk } 5314	635 shorts 4537 5333	1235	1348	481	142.5	70
"(1896).....	20	224	1.12	1.53	633 shorts 3960 { Milk } 5314	635 shorts 4537 5333	789	1076	591	487	70
"(1897) (a)	18	211	1.30	1.78	705 shorts	699 shorts	.....	.....	501	442	.....
"(1897) (a)	14	190	1.25	1.30	.....	.....	.....	.....	424	462	.....
New York (Geneva)...	8	111	.....	.....	Equal quantities	.....	174	252	.....	.....	.....
Kentucky Station.....	4	100	1.44	1.39	780	758	182	175	429	430	63
Missouri Station.....	8	155	1.90	2.04	2864	3196	594	638	482	501	.....
" "	8	85	.35	.54	1239	1612	164	250	755	645	.....
Ohio Station.....	6	202	1.20	1.14	2039	2116	404	383	505	552	.....
West Va. 1897.....	6	233	1.67	2.38	819	951	141	199	579	475	28
West Va. 1898..... (b)	12	95	1.65	1.73	2138	2384	555	581	385	410	56

(a) One-third middlings fed.
(b) Corn soaked until soft.

The average of the twelve experiments in which the amount of feed required for 100 pounds gain in live weight is given, shows that 505 pounds of corn, and 472.9 pounds of corn meal were required for 100 pounds of gain, or in other words in these experiments it required about 6 per cent less corn to produce 100 pounds gain when it was ground than when it was fed unground.

The average of these different experiments and our own results indicate that unless a farmer is located very close to a mill, or has one upon his own farm that at present prices it will not pay to grind corn for hogs.

SOAKING CORN FOR HOGS.

EXPERIMENTS IN 1898.

Nearly all of the pork which is produced in the United States is derived from corn-fed hogs, yet very few experiments have ever been performed to determine the best and most economical way of feeding corn.

The following experiment was planned to determine whether soaking corn in water affects in any way its food value.

Poland-China-Duroc-Jersey and Poland-China-Berkshire cross bred pigs were used in the experiment. They were divided into two lots similar in respect to size, breed and sex.

From a car load of western corn sufficient was procured for the experiment. A portion of this was ground into meal and the remaining shelled corn was soaked in water, as needed, until the grains were soft. The meal was mixed with water before being fed. No attempt was made to feed the same quantities of meal and soaked corn, but each lot was fed all that it would eat up clean.

The following tables give the weights of the different animals at the beginning of the experiment and at the end of each 14 day period, together with other details of the experiment:

WHOLE CORN LOT.

Number of Animal.	Weight Oct. 10, '98	October 24	November 7	November 21	December 5	Total
69						
a. c.	96.5	131.6	149.	178.5	199.5	.....
43						
a. c.	80.5	107.1	119.	136	150.5	.....
39						
a. d.	96.	123.5	140.5	166	184.5	.....
68						
a. d.	102.	135.	152.5	180.5	202	.....
32						
b. c.	106.	141.2	164.	195	212	.....
71						
b. d.	88.5	114.6	131.	157	176	.....
Total						
Weight.	569.5	753.0	856.0	1013.	1124.5	.....
Total Gain		183.5	103.0	157	111.5	555
Food Consumed...		527	489.	576	546	2138

a—Sow.

b—Barrow.

c—Poland-China-Durac-Jersey.

d—Poland-China-Berkshire.

CORN MEAL LOT.

Number of Animal.	Weight Oct. 10, '98	October 24.....	November 7.....	November 21....	December 5.....	Total
94						
a. c.	91	113	141.5	164	181.5	.....
67						
a. c.	88	115.8	137	164	184	.....
74						
a. d.	98	116.4	146.5	180.5	200	.....
53						
a. d.	110	136	160.5	189.5	207	.....
55						
b. c.	88.5	116.8	134.5	167	188	.....
100						
b. d.	95	123	144.5	171	191	.....
Total						
Weight.	570.5	721.0	864.5	1036.	1151.5	.....
Total Gain		150.5	143.5	1715.	115.5	581
Food Consumed...		500	625	676	583	2384.

a—Sow.

b—Barrow.

c—Poland-China-Durac-Jersey.

d—Poland-China-Berkshire.

The lot fed soaked corn consumed 2138 pounds of corn and gained in weight 555 pounds. For 100 pounds in live weight they consequently required 385 pounds of corn. The lot fed on corn meal required 410 pounds of meal for 100 pounds gain, therefore the soaked corn produced the more economical gain, to say nothing about the extra expense of grinding the corn.

As very few experiments have ever been performed to determine the effect of soaking grain upon its digestibility, the subject requires further study. The result of our experiment indicates, however, that it is good practice.

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- No. 44. Practical Entomology.
- Special Bulletin No. 2. Proceeding connected with the celebration upon the completion of the Station Building and the organization of the Sheepbreeders and Wool-Growers' Association and the State Horticultural Society.
- Third Annual Report, 1890.
- No. 51. Commercial Fertilizers, Jan. '98.
- No. 52. Strawberries.
- No. 53. Commercial Fertilizers, Dec. '98.
- No. 54. Nursery Hints.
- No. 55. Sugar Beet Investigation.