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Pig Feeding in South Dakota

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South Dakota Agricultural College

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EXPERIMENT STATION

SOUTH DAKOTA.

IN CONNECTION WITH THE

SOUTH DAKOTA AGRICULTURAL COLLEGE.

PIG FEEDING IN SOUTH DAKOTA.

DEPARTMENT OF ANIMAL HUSBANDRY.

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PIG FEEDING IN SOUTH DAKOTA.

DEPARTMENT OF ANIMAL HUSBANDRY.

EDGAR A. BURNETT.

INTRODUCTION.

The object of this experiment was to obtain some more practical data concerning the feeding value of some of our common food stuffs, and to gather data regarding the cost of production of pork, produced under favorable conditions upon our common grains. It was thought that an accurate statement of the cost of producing pork upon our cheap grains would encourage our farmers to raise larger numbers of hogs and to feed more of our cheap grains, such as barley and corn, instead of selling them at prices which are little, if any, above the cost of production.

From this and other experiments I am convinced that during the past few years of extremely low prices for barley and corn, any good farmer by feeding well-bred pigs could have realized from 30c to 35c per bushel for these grains. He need only to have raised good hogs in sufficient numbers to consume the products and place them upon the market in prime condition at about 200 pounds weight.

A few statistics will show how greatly deficient the state of South Dakota is in the production of swine, when compared in swine and grain production with adjacent states. According to the report of the U. S. Department of Agriculture the quota of hogs in the various states January 1, 1897, was as follows:

	NUMBER	VALUE
South Dakota.....	158,463	$ 696,128
Minnesota	521,690	2,560,977

	NUMBER	VALUE
Iowa	3,737,970	$21,182,330
Nebraska	1,263,931	6,026,422

If we take the same statistics for the amount of grain produced of the four leading cereals, viz.: corn, wheat, barley and oats, we find the following aggregate production for the year 1897, viz.:—

South Dakota	68,039,496 bushels
Minnesota	136,120,314 bushels
Iowa	346,126,923 bushels
Nebraska	321,395,592 bushels

It will be seen from this statement that while Iowa produces about five times as much grain of the four leading cereals as does South Dakota, she raises twenty-three times as many hogs, and other lines of livestock in nearly equal proportion. If we exclude the wheat crop on the ground that none of it is used for production of pork, and exclude the oat crop because not specially adapted to pork production, we still have Iowa producing ten times as much corn and barley as South Dakota and twenty-three times as many hogs. The proposition to exclude the wheat is unjust because wheat shorts are conspicuously adapted to the growing of hogs and, Minnesota and the Dakotas are conspicuous as wheat producing states. Again, it is unfair to reject the oat crop from comparison because of its value to mix with heavier grains as a ration for brood sows, and for growing pigs.

The fact that the production of corn and barley in South Dakota is only one-tenth that of Iowa, need cause no jealousy or disparagement on our part, because, with no profitable market, our energies have been turned away from these grains toward wheat production. The development of the swine and livestock industry in the state will furnish a stable market for these grains and will largely increase their production.

Our farmers have seemingly failed to realize the advantage they possess for the production of pork on account of the small amount of disease found among our hogs, their

ability to utilize grains of damaged quality, aud to consume residues which are too cheap to pay the cost of freight to market centers.

South Dakota is eminently fitted to produce the "bacon hog" now so much talked of and so badly needed. Our conditions are at least favorable to the production of strong growthy animals. There is no excuse for our reducing the vitality of our hogs and decreasing the size and bone of our breeding animals by excessive corn rations. On the other hand, our abundance of oats, barley, shorts, and our forage crops, furnish ideal conditions for the development of bone and muscle, and vigorous constitution in our breeding animals. With proper selections for good form, with extreme length of body, heavy bone, good full even quarters and early maturity, we can secure a type of animal which is an ideal feeder, and au economical producer of pork. It was with this belief that the experiments here reported were planned. We hope that the facts disclosed may encourage the pork-producing industry.

FOODS USED IN THE EXPERIMENT.

Corn meal, ground barley and wheat shorts were fed separately to different lots and in different combinations, as follows:—

Lot 1. Received corn meal.

Lots 2 and 13. Received wheat shorts.

Lots 3 and 11. Received corn meal and wheat shorts, equal parts by weight.

Lots 4, 7, 8 and 9. Received barley meal and wheat shorts, equal parts by weight.

Lots 5 aud 10. Received corn meal and ground barley, equal parts by weight.

Lots 6 and 12. Received ground barley.

All feed was purchased at the market price which by chance did not differ for the different foods. We paid $8.00 per ton for corn meal, for ground barley and for wheat shorts.

Ground corn was used to make it better comparable with the shorts and ground barley.

During the early part of the first experiment in 1897, cold water from a hydrant was used to moisten the food in the trough. The food was weighed, placed in the trough, and the water poured upon and mixed with it before allowing the pigs access. The water was not weighed, but about sixteen to twenty pounds of water was used to moisten twelve or thirteen pounds of feed, and the amount was kept nearly constant. No other water was given and no other food.

On November 14th, 1897, the weather having turned cold, we commenced to warm the water used to moisten the feed, and after that time we used water varying in temperature from 100° F. to 125° F. The object of the warm water was to prevent the feed from freezing in the trough, and to encourage larger consumption which was secured by this method.

Lot 5 was more inclined to leave food uneaten than the other lots and probably the cost of their gains was increased somewhat from their leaving small quantities of feed. This was not weighed back as it was small in amount and wet with water, but it may help to account for the rather larger consumption of food of Lot 5 for each pound of gain.

SELECTION OF HOGS.

Thirty pigs were selected for the first experiment from those being raised for breeding purposes. They varied in age from 130 to 160 days, and weighed on an average about 114 pounds each. All these pigs were pure-bred and eligible to registry. Of the thirty, thirteen were Duroc Jersey; nine were Chester White, and eight were Poland China. The slightly greater average weight and age of the Duroc Jersey were not considered as indicating greater maturity. Lots 1 and 2 were made up of Duroc Jersey. Lot 3 was made up of Chester White. Lot 4 contained four Chester White and one

Duroc Jersey. Lot 5 contained four Poland China and one Chester White. Lot 6 contained four Poland China and one Duroc Jersey.

TYPES.

These hogs were much alike in type. The Duroc Jersey were rather fine and quick maturing, they were of moderate length, but deep and blocky and possessed good bone and feeding quality. Their dams were prolific, two young sows having farrowed and raised twenty pigs at the first litter. The Chester White pigs were also medium fine, having rather better length than the Duroc Jersey, but were rather finer bone. They were good form, very growthy and excellent feeders. They were from prolific sows, two sows having raised twenty pigs at first litter. The Poland China pigs were from sows which were rather finer and less growthy than the others, but of good form and bone. They were from smaller litters, two sows having farrowed and raised ten pigs at first litter. The fact that all of these pigs were well-bred, and that they had been well fed but not overfed before going into the experiment, must have influenced the results, but none of them were from extremely high priced stock and any of them could be duplicated so far as breeding and quality is concerned by any enterprising farmer.

It should be borne in mind that these pigs were fed at a profitable age and that they were turned off before they had stopped growing and had become boarders. They were, however, of prime quality and commanded a price above the average market price on account of this quality.

FOOD PREVIOUS TO EXPERIMENT.

These pigs had run on green pasture after about June 1st, twenty of them being farrowed after that time. They had received ground barley and shorts with a quantity of separator skim milk. The pasture from June to September 1st, was a mixture of peas, sorghum, Dwarf Essex rape and some other fodders. On September 15, they were turned on a field

of newly sown oats where they were pastured until they went into the pens October 15th.

On October 15th, they were sorted and placed in six pens of five pigs each. Each lot had a pen about 8 by 12 feet, with floor and feed trough and an adjoining yard about 8 by 16 feet.

For six days previous to the beginning of the test they were fed on the various rations which they were to receive during the experiment. Each lot received a limited amount of soft coal and salt, and at various times during the experiment the salt was mixed with copperas and sulphur, and fed in limited quantities. The copperas was given as a germicide and disinfectant without apparent effect upon the nutritive value of the food.

On October 21st, all lots were weighed and continued upon their respective rations. Weights were taken every seven days for fifty-six days. The periods are reported as fourteen days each.

TABLE I.

LOT 1. FIVE RED PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed Corn Meal.
1st period	14	630	729	99	418
2d period	14	729	860	131	503
3d period	14	860	985	125	545
4th period	14	985	1060	75	486
Total	56			430	1950

Gain per day, 1.53. Food consumed per pound of gain, 4.53.

LOT 2. FIVE RED PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed Shorts.
1st period	14	600	722	122	393
2d period	14	722	850	128	461
3d period	14	850	930	80	509
4th period	14	930	1030	100	522
Total	56			430	1885

Gain per day, 1.53. Food consumed per pound of gain, 4.38.

LOT 3. FIVE WHITE PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed Corn & Shorts.
1st period	14	525	652	127	414
2d period	14	652	800	148	503
3d period	14	800	915	115	524
4th period	14	915	1030	115	529
Total	56			505	1970

Gain per day, 1.80. Food consumed per pound of gain, 3.90.

LOT 4. THREE WHITE & TWO RED PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed—Barley & Shorts.
1st period	14	569	681	112	415
2d period.....	14	681	815	134	503
3d period.....	14	815	920	105	542
4th period.....	14	920	1030	110	529
Total	56			461	1989

Gain per day, 1.64. Food consumed per pound of gain, 4.29.

LOT 5. FOUR BLACK AND ONE WHITE PIGS	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed—Barley & Corn Meal
1st period	14	542	654	112	417
2d period.....	14	654	780	126	503
3d period.....	14	780	870	90	518
4th period.....	14	870	935	65	483
Total	56			393	1921

Gain per day, 1.44. Food consumed per pound of gain, 4 86.

LOT 6. FOUR BLACK AND ONE RED PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed Barley.
1st period	14	547	664	117	403
2d period.....	14	664	795	131	503
3d period.....	14	795	900	105	535
4th period.....	14	900	975	75	519
Total	56			428	1960

Gain per day, 1.53. Food consumed per pound of gain, 4.58.

EXPERIMENT—1898.

The pigs in the experiment of 1898 were farrowed between May 1st and May 13th, except that a litter of nine Chester White pigs farrrowed March 31, figures in some of the feeding trials of pigs weighing less than 100 pounds.

The pigs in the later tests were of the following numbers and ages:

Pure Duroc Jersey pigs from two year old dam, eight pigs farrowed May 1, 1898. Cross-bred Chester White and Duroc Jersey pigs from two yearling sows, eighteen pigs farrowed May 5 and 6. Pure Poland China pigs from two year old dam, eight pigs farrowed May 13, 1898. Pure Chester White pigs, in earlier experiments, from two year old dam, nine pigs farrowed March 31, 1898.

These pigs were kept on a pasture of barley and oats or of rape and sorghum until September 26, 1898, when twenty-

eight of them were placed in the feeding pens used in the 1897 experiment. In the period prior to being placed in the pen they had been fed liberal rations of a mixture of equal parts by weight of corn meal, ground barley, wheat shorts and, after July 15th, equal weight of wheat bran was added. A small quantity of skim milk had been fed in addition as will be seen from early experiments. On a few occasions the grain ration varied slightly from the proportions indicated and during the last two or three weeks before being put in the feed lot ground wheat was substituted for corn, and green corn stalks were fed in the field, so that the record from August 26 to September 26, is not given as it does not represent accurate results.

The food eaten from May 5 to July 4, includes that eaten by four sows while nursing thirty-five pigs. As these sows neither gained nor lost weight all the food consumed is charged against the pigs.

The following results were obtained for the earlier feeding periods:

TABLE II.

	Days in period.	Number of pigs.	Average weight at beginning of period.	Average weight at close of period.	Aver. daily gain.	Grain eaten per day in pounds.	Milk eaten per day in pounds.	Total grain eaten	Total milk eaten	Cost of 1 pound of gain in grain eaten.	Cost of 1 pound of gain in milk eaten.
May 5	....	35	6.17	.....	.....	.....	.....	.....	.....	.....	.....
July 4	30	35	.....	63.2	1.90	3.22*	3.66*	3385*	3847*	2.24	2.63
July 14	....	37	44.7†	.....	.....	.....	.....	.....	.....	.....	.....
August 26	43	....	.....	83.	1.00	3.	1.04	4717	1654	2.98	1.04

*Including food of dams while suckling pigs.

†On July 4th eight smaller pigs were added, and on July 14th six larger boars were withdrawn, thus preventing a comparison of records from July 4th to July 14th.

On September 26, four Duroc Jersey, eighteen cross-bred Duroc Jersey-Chester White, and six Poland China pigs were chosen from the above lot and placed in the feeding pens in seven lots of four each. The seven lots or pens were numbered from seven to thirteen, so as to compare with the work of the previous year, and were made up as follows:

Lot 7. Four cross-bred, Duroc Jersey-Chester White pigs. Feed, ground barley and shorts.

Lot 8. Four Duroc Jersey pigs. Feed, ground barley and shorts.

Lot 9. Four Poland China pigs. Feed, ground barley and shorts.

Lot 10. Four cross-bred Duroc Jersey-Chester White pigs. Feed, ground barley and corn.

Lot 11. Two Poland China and two cross-bred pigs. Feed, corn and shorts.

Lot 12. Four cross-bred Duroc Jersey-Chester White pigs. Feed, ground barley.

Lot 13. Four cross-bred Duroc Jersey-Chester White pigs. Feed, shorts.

The object of feeding lots 7, 8 and 9 on the same ration, was to test the relative feeding qualities of the different lots which were of different breeds and crosses. With these three pens as a standard, we proceeded to compare the other pens and combinations, and also the results of the previous year's work, to see whether or not the work of the year 1898 would confirm the work of the previous year.

TABLE III.

LOT 7. FOUR CROSS-BRED PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed—Barley & Shorts.
1st period	14	485	565	80	338
2d period	14	565	650	85	423
3d period	14	650	750	100	473
4th period	14	750	835	85	437
Total	56			350	1671

Gain per day, 1.56. Food consumed per pound of gain, 4.77.

LOT 8. FOUR DUROC JERSEY PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed—Barley & Shorts.
1st period	14	560	630	70	338
2d period	14	630	735	105	430
3d period	14	735	845	110	576
4th period	14	845	955	110	563
Total	56			395	1907

Gain per day, 1.76. Food consumed per pound of gain, 4.82.

LOT 9. FOUR POLAND CHINA PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed—Barley & Shorts.
1st period	14	390	455	65	297
2d period	14	455	565	110	387
3d period	14	565	645	80	453
4th period	14	645	745	100	424
Total	56			355	1561

Gain per day, 1.58. Food consumed per pound of gain, 4.40.

LOT 10. FOUR CROSS-BRED PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed—Corn & Barley.
1st period	14	485	560	75	338
2d period	14	560	645	85	421
3d period	14	645	765	120	474
4th period	14	765	865	100	467
Total	56			370	1700

Gain per day, 1.65. Food consumed per pound of gain, 4.51.

LOT 11. TWO CROSS-BRED AND TWO POLAND CHINA PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed Corn & Shorts.
1st period	14	475	535	60	297
2d period	14	535	620	85	362
3d period	14	620	725	105	422
4th period	14	725	810	85	421
Total	56			335	1502

Gain per day, 1.50. Food consumed per pound of gain, 4.48.

LOT 12. FOUR CROSS-BRED PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed Barley.
1st period	14	460	545	85	338
2d period	14	545	620	75	421
3d period	14	620	745	125	487
4th period	14	745	835	90	467
Total	56			375	1713

Gain per day, 1.67. Food consumed per pound of gain, 4.56.

LOT 13. FOUR CROSS-BRED PIGS.	Days.	Weight at Beginning of Period.	Weight at Close of Period.	Gain for Each Period.	Food Consumed Shorts.
1st period	14	480	535	55	297
2d period	14	535	640	105	379
3d period	14	640	710	70	440
4th period	14	710	775	65	408
Total	56			295	1524

Gain per day, 1.31. Food consumed per pound of gain, 5.17.

FINANCIAL STATEMENT.

A financial statement of the several lots, charging hogs at selling price per pound when put into the experiment, and grains at market price, viz., $8.00 per ton, would show as follows. In this statement a shrinkage of four per cent is made on weights of hogs from weights given at close of the experiment, which was an average shrinkage on the lot as they were weighed out to the purchaser. The price used is the actual selling price which though apparently low was

above the average market price at the time of sale, December 20, 1897.

LOT 1.

To 5 hogs 630 lbs. at $3 10	$19 53	
To 1,950 lbs. corn meal at $8.00 per ton	7 80	
By 1,020 lbs. hogs at $3.10		$31 62
To profits on Lot 1	4 29	
	$31 62	$31 62

LOT 2.

To 5 hogs 600 lbs. at $3.10	$18 60	
To 1,885 lbs. shorts at $8.00 per ton	7 54	
By 990 lbs. hogs at $3.10		$30 69
To profits on Lot 2	4 55	
	$30 69	$30 69

LOT 3.

To 5 hogs 525 lbs. at $3.10	$16 27	
To 1,970 lbs. corn and shorts at $8.00 per ton	7 88	
By 990 lbs. hogs at $3.10		$30 69
To profit on Lot 3	6 54	
	$30 69	$30 69

LOT 4.

To 5 hogs 569 lbs. $3.10	$17 64	
To 1,989 lbs. barley and shorts at $8.00 per ton	7 38	
By 990 lbs. hogs at $3.10		$30 69
To profit on Lot 4	5 07	
	$30 69	$30 69

LOT 5.

To 5 hogs 542 lbs. at $3.10	$16 80	
To 1,921 lbs. barley and corn at $8.00 per ton	7 68	
By 900 lbs. hogs at $3.10		$27 90
To profit on Lot 5	3 42	
	$27 90	$27 90

LOT 6.

To 5 hogs 547 lbs. at $3.10	$16 96	
To 1,960 lbs. barley at $8.00 per ton	7 84	
By 936 lbs. hogs at $3.10		$29 02
To profit on Lot 6	4 22	
	$29 02	$29 02

Lots 7 to 13 were sold at 3 cents per pound, without shrinkage, which would render the following financial statement:

LOT 7.

Compare with Lots 4, 8, and 9.

To 4 pigs 485 lbs. at $3.00	$14 55	
To 1,671 lbs. corn and shorts at $8.00 per ton	6 68	
By 4 pigs 835 lbs. at $3.00		$25 05
To profit on 4 pigs, 56 days feeding	3 82	
	$25 05	$25 05

LOT 8.

Compare with Lots 4, 7, and 9.

To 4 pigs 560 lbs. at $3.00	$16 80	
To 1,907 lbs. barley and shorts at 18.00 per ton	7 63	
By 4 pigs 955 lbs. at $3.00		$28 65
To profit on 4 pigs for 56 days	4 22	
	$28 65	$28 65

LOT 9.

Compare with Lots 4, 7, and 8.

To 4 pigs 390 lbs. at $3.00	$11 70	
To 1,561 lbs. barley and shorts at $8.00 per ton	6 24	
By 4 pigs 745 lbs. at $3.00		$22 35
To profit on 4 pigs for 56 days	4 41	
	$22 35	$22 35

LOT 10.

Compare with Lot 5.

To 4 pigs 485 lbs. at $3.00	$14 55	
To 1,700 lbs. corn and barley at $8.00 per ton	6 80	
By 4 pigs 865 lbs. at $3.00		$25 95
To profit on 4 pigs for 56 days	4 60	
	$25 95	$25 95

LOT 11.

Compare with Lot 3.

To 4 pigs 475 lbs. at $3.00	$14 25	
To 1,500 lbs. corn and shorts at $8.00 per ton	6 00	
By 4 pigs 810 lbs. at $3.00		$24 30
To profit on 4 pigs for 56 days	4 05	
	$24 30	$24 30

LOT 12.

Compare with Lot 6.

To 4 pigs 460 lbs. at $3.00	$13 80	
To 1,713 lbs. barley meal at $8.00 per ton	6 85	
By 4 pigs 835 lbs. at $3.00		$25 05
To profit on 4 pigs for 56 days	4 40	
	$25 05	$25 05

TABLE IV.

	Number of pigs fed.	Ration per day per pig.	Ration per day per 1000 lbs. live weight.	Digestible nutrients per day per 1000 pounds live weight.	Digestible protein per day per 1000 lbs. live weight.	Digestible carbo-hydrates and fat per day per 1000 lbs. live weight.	Digestible protein per 1 lb. gain in live weight.	Digestible carbo-hydrates and fat consumed for 1 lb. gain in live weight.	Water free substance required to produce 1 lb. gain in live weight.	Digestible nutrients for 1 lb. gain in live weight.	Grain eaten for 1 lb. gain in live weight.
LOT 1.....	5	Corn meal									
1st four weeks		6.57	44.1	32.76	3.08	29.68	.208	3.13	.....	3.338	4 00
2d four weeks.....		7.25	38.3	28.45	2.68	25.77	.360	3.462	.....	3.822	5 06
Average.....		6.90	41.2	.....	.....	.....	.....	.....	4.03	.....	4 53
LOTS 2 AND 13.....	9	Shorts									
1st four weeks		6.07	41.81	27.60	5.10	20.90	.470	2.08	.....	2.56	3.80
2d four weeks.....		7.42	41.17	27.17	5 02	22.14	727	3.52	.....	4.25	5.96
Average.....		6 74	41 49	.....	.....	.....	.....	.....	4.15	.....	4 70
LOTS 3 AND 11.....	9	Corn & Shorts									
1st four weeks		6.25	46.10	36. 39	4 63	28.77	.376	2.33	.....	2.71	3 75
2d four weeks.....		7.52	41.54	30.08	4 17	25.91	.....	.....	.....	3 27	4.51
Average.....		6.88	43.42	.....	.....	.....	.....	.....	3.54	.....	4 01
LOTS 4, 7, 8, 9.....	17	Barley & Shorts									
1st four weeks		6.58	47.82	33.93	5.00	28.93	.430	2.49	.....	2.92	4.10
2d four weeks.....		8.40	45 48	32.04	4.75	27.51	.529	3.02	.....	3.55	5 00
Average.....		7.49	46 65	.....	.....	.....	.....	.....	4.04	.....	4.54
LOTS 5 AND 10.....	9	Barley & Corn									
1st four weeks		6.66	49.75	38.50	4.13	34.38	.355	2 91	.....	3.27	4.00
2d four weeks.....		7.70	43 02	33.30	3.57	29.73	.430	3.57	.....	4 00	5.17
Average		7.18	46.38	.....	.....	.....	.....	.....	4.22	.....	4 74
LOTS 6 AND 12.....	9	Barley									
1st four weeks		6.61	49 10	37 67	4.27	33 40	.335	2.74	.....	3 08	4.08
2d four weeks.....		7.97	44.58	33.76	3.87	29.69	.442	3 46	.....	3 90	5 08
Average.....		7.29	46.99	.....	.....	.....	.....	.....	4.07	.....	4.57

COST OF GAINS ON DIFFERENT FEEDS.

Lot 1 consumed 1,950 pounds corn meal, and gained 430 pounds. The cost of gain per 100 pounds was $1.81.

Lots 2 and 13 consumed 3,409 pounds of shorts, and gained 725 pounds. The cost of gain per 100 pounds was $1.88.

Lots 3 and 11 consumed 3,472 pounds of corn and shorts, and gained 840 pounds. The cost of gain per 100 pounds was $1.60.

Lots 4, 7, 8 and 9 consumed 7,128 pounds of barley and shorts, and gained 1,561 pounds. The cost of gain per 100 pounds was $1.82.

Lots 5 and 10 consumed 3,621 pounds of barley and corn, and gained 763 pounds. The cost of gain per 100 pounds was $1.90.

Lots 6 and 12 consumed 3,673 pounds of ground barley, and gained 803 pounds. The cost of gain per 100 pounds was $1.83.

COMPARISON OF FOODS.

In comparing the feeding value of the six rations, it will be noticed that the range of variation in cost of production is small. Corn and shorts have given the best results on the average, but in the 1898 experiment, one lot on barley and shorts made as cheap gains, and one lot of smaller pigs gave slightly cheaper gains on barley and shorts than the lot on corn and shorts.

In comparing the value of shorts in the year 1897 and 1898, a large variation in cost of gains is noticed, (see tables 1 and 3) which indicates a considerable variation in the value of shorts for fattening hogs. This difference is equivalent to a variation of ten or twelve per cent in comparing the results of the two years.

If we compare all the rations containing corn with all those not containing corn, we find a variation in favor of a part corn ration. The cost of gain per 100 pounds where a corn, or a part corn ration was fed was $1.78, as against $1.84 in all the rations where no corn was fed.

CONCLUSIONS.

First. All foods and rations used in the experiment produced gains at a cost considerably below the market price of hogs at the time they were fed.

Second. All lots made the cheapest gains before reaching 150 pounds weight, but continued to make profitable gains up to or slightly past 200 pounds weight.

Third. The largest consumers of food according to weight made the cheapest gains.

Fourth. Corn and shorts made the cheapest gains, and all the rations containing corn gave better average results than all the rations containing no corn.

Fifth. Counting gains in weight at the market price of $3.10 per hundred, the foods consumed brought the following prices:

Lot 1. Corn meal sold in the form of pork $13.60 per ton, or thirty-eight cents per bushel.

Lots 2 and 13. Wheat shorts sold in the form of pork for $13.20 per ton.

Lots 3 and 11. Corn meal and wheat shorts sold in the form of pork for $15.46 per ton.

Lots 4, 7, 8 and 9. Barley and shorts sold in the form of pork for $13.70 per ton.

Lots 5 and 10. Barley and corn sold in the form of pork for $12.04 per ton.

Lots 6 and 12. Barley sold in the form of pork for $13.60 per ton, or thirty-three cents per bushel.