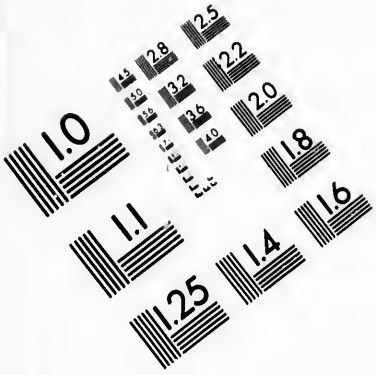

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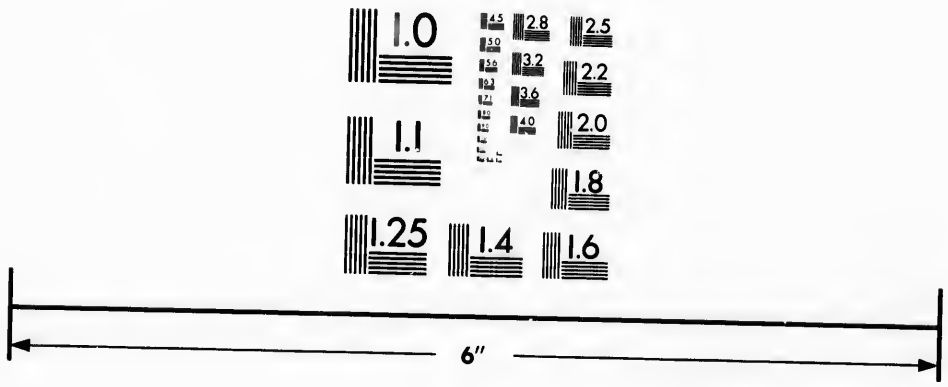

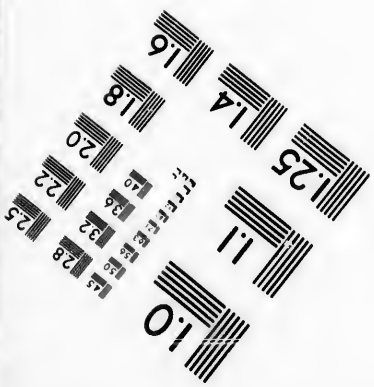

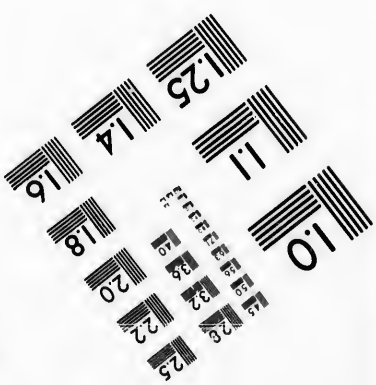

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CENTRAL EXPERIMENTAL FARM.

DEPARTMENT OF AGRICULTURE,

OTTAWA, - - - CANADA.

BULLETIN No. 15.

EXPERIMENTS IN THE FATTENING OF SWINE.

OCTOBER, 1892.

To the Honourable

The Minister of Agriculture.

Sir,—I beg to submit herewith for your approval the 15th bulletin of the Central Experimental Farm, which has been prepared under my direction by Jas. W. Robertson, Agriculturist of the Experimental Farm and Dairy Commissioner for the Dominion.

The subject of this bulletin, the economic fattening of swine, is one of particular importance to Canada at the present time. A general consumption by live stock of the coarse grains grown in all parts of the Dominion, would result in retaining to a great extent on the farms, those elements of fertility so essential to the continued growth of good crops. The use of frozen grain for fattening purposes, is also treated of in this bulletin, and the information given on that question is of special value to the farmers of Manitoba and the North-West Territories.

I have the honour to be

Your obedient servant,

WM. SAUNDERS,

Director, Experimental Farms.

Ottawa, October 29th, 1892.

CENTRAL EXPERIMENTAL FARM.

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DEPARTMENT OF AGRICULTURE.

OTTAWA, - - - - - - CANADA.

EXPERIMENTS IN THE FATTENING OF SWINE.

By Jas. W. Robertson, *Agriculturist.*

Experiments in the feeding of swine were commenced at the Central Experimental Farm in December, 1890. Particulars of the different sorts of feed, of the quantities of feed consumed, and of the increase in the live weight of the animals under the tests, were given in the Annual Report for 1891.

The objects of these first investigations were,—(1) to discover the difference, if any, in the quantity of grain required to produce every pound of increase in the live weight of the swine, *when it was fed steamed and warm*, and *when it was fed raw and cold;* (2) to obtain a record of the comparative quantities of grain required to produce every pound of increase in the live weight of swine during different stages of the fattening period.

The mixture of grain used in the tests was one composed of equal parts of pease, barley and rye, which had been ground. It was saturated with water and fed wet in all cases.

Cold water was given to drink, and a mixture of salt and wood ashes was put in a box on the floor of every pen, where the pigs had access to it at will.

The quantities of feed consumed were weighed every day, and the swine were weighed once every week.

The following Table shows the quantities of feed consumed per pound of increase in live weight, during six feeding periods in four pens :—

TABLE I.

	Pen 1.	Pen 2.	Pen 5.		Pen 6.	
	4 Swine, fed steamed and warm.	4 Swine, fed raw and cold.	4 Swine, fed steamed and warm, plus Sugar Beets.		4 Swine, fed raw and cold, plus Sugar Beets.	
	Lbs. of Grain.	Lbs. of Grain.	Lbs. of Grain.	Lbs. of Sugar Beets.	Lbs. of Grain.	Lbs. of Sugar Beets.
Dec. 9 to Jan. 5.....	3·31	3·30	4·69	0·61	3·17	0·84
Jan. 5 to Feb. 2.....	3·07	3·07	2·46	2·09	2·76	2·23
Feb. 2 to Mar. 2	3·79	4·43	3·46	2·00	3·81	2·32
Mar. 2 to Mar 31.....	5·00	7·07	5·40	3·63	3·15	2·13
Mar 30 to Apr. 27.....	7·06	5·68	4·88	4·08	9·51	8·25
Apr. 27 to May 18.....	8·53	5·71	4·17	3·31	6·58	6·00
Average	4·16	4·25	3·86	+ 2·46	3·89	+ 2·73

Conclusions,—These two sets of experiments indicate that :—

(1.) There is no appreciable difference in the number of pounds of grain required to produce a pound of increase in the live weight of swine, when it is fed steamed and warm, as compared with it when fed raw and cold ;

(2.) On the average there is a gradual and great increase in the quantity of grain consumed for every pound of increase in the live weight of swine, after the second month of the fattening period, and after the average live weight exceeds 100 lbs. ;

(3.) It is economical to market swine to be slaughtered when they weigh from 180 to 200 lbs., live weight ;

(4.) The consumption of feed per day is *greatest* at or near the period of their fattening, when the quantity of feed consumed per pound of increase in weight, is *smallest*.

It may be added that to produce an increase of 3,231½ lbs. in the live weight of 24 swine, 4·14 lbs. of a mixture of equal parts of ground pease, barley and rye were required for every pound of increase in the live weight.

EXPERIMENTS IN FEEDING GRAIN, UNGROUND, GROUND AND WITH SKIM-MILK.

During the winter of 1891–2 experiments were begun to discover the effect of feeding swine upon a ration of grain only (unground and ground) as compared with a ration composed of grain and skim-milk. For the purpose, four pens of pigs were selected and sorted into lots as nearly alike as they could be obtained. In each of the four pens were put two pigs out of a Poland-China sow by an Improved Large Yorkshire boar. With them were put three grade pigs in each of the three first pens; and in the fourth pen two pigs out of a Berkshire sow by an Improved Large Yorkshire boar, were put with the two cross bred Poland-China-by-Yorkshire pigs.

The 9 grade pigs which were put in the first three pens with the 6 crossbred Poland-China-by-Yorkshire pigs, were purchased outside. Their breeding was not known but they appeared to be grades of Chester White or Yorkshire blood. The p[illegible] in the several pens, considered as lots, were as nearly as practicable equal as to breeding, quality, age and size.

The experiment began on January 4th and ended on May 2nd. The feed consumed was weighed every day and the swine were weighed once every week. The following Tables have been arranged to show the average results at four different times in the fattening period.

TABLE II.

Pen 1 contained 5 swine, as described above—3 grades and 2 cross bred Poland-China-by-Yorkshire. They were fed upon

a mixture of equal parts of pease, barley and rye, *not ground*, and soaked in cold water for 48 hours.

——	Jan. 4.	Feb. 1.	Feb. 29.	Mar. 28.	May 2.	Totals.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Live weight	346	386	502	646	780	....
Increase in weight	....	40	116	144	134	434
Feed Consumed	....	378	490	544	538	1930
Do. per lb. of increase in live weight	....	9·49	4·13	3·77	4·01	4·45

Table III.

Pen 2 contained 5 swine similar to those in Pen 1. They were fed upon a mixture of equal parts of pease, barley, and rye, *ground* and soaked in cold water for 12 hours.

——	Jan. 4.	Feb. 1.	Feb. 29.	Mar. 28.	May 2.	Totals.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Live weight	346	430	580	741	865	—
Increase in weight		84	150	161	124	519
Feed consumed		461	572	657	576	2,266
Do. per lb. of increase in live weight		5·48	3·81	4·08	4·64	4 36

Table IV.

Pen 3 contained 5 swine similar to those in Pens 1 and 2. They were fed upon an allowance of the same mixture as those in Pen 2, (viz. : equal parts of pease, barley and rye, *ground* and soaked in cold water for 12 hours), plus all the skim-milk they would drink.

——		Jan. 4.	Feb. 1.	Feb. 29.	Mar. 28.	May 2.	Totals.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Live weight		346	434	590	768	1,017	—
Increase in weight			88	156	178	249	671
Feed consumed.	Meal		230	286	432	704	1,652
	+ Milk		1,081	2,078	2,649	3,537	9,345
Do. per lb. of increase in live weight.	Meal		2·61	1·83	2·42	2·82	2·46
	+ Milk		12·28	13·32	14·88	14·20	13·92

Table V.

Pen 4 contained 4 swine, 2 crossbred Poland-China-by-Yorkshire and 2 crossbred Berkshire-by-Yorkshire. They were fed upon an allowance of the same mixture as those in Pens 2 and 3, (viz. : equal parts of pease, barley and rye, *ground* and soaked for 12 hours), plus all the skim-milk they would drink.

——	Jan. 4.	Feb. 1.	Feb. 29.	Mar. 28.	May 2.	Totals.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Live weight	306	395	520	675	842	—
Increase in weight	.....	89	125	155	167	536
Feed consumed. Meal	.....	332	385	514	626	1,857
Feed consumed. + Milk	.....	610	481	551	938	2,580
Do. per lb. of increase in live weight. Meal	.....	3·73	3·07	3·31	3·74	3·46
Do. per lb. of increase in live weight. + Milk	.....	6·85	3 84	3·54	5·61	4·81

Conclusions,—From these tests which continued seventeen weeks, it appears that :—

(1.) 4·45 lbs. of grain were consumed per lb. of increase in live weight, when it was fed *unground* and soaked for 48 hours ;

(2.) 4·36 lbs. of grain were consumed per lb. of increase in live weight, when it was fed *ground* and soaked for 12 hours ;

(3.) 1 lb. of grain was the equivalent of 6·65 lbs. of skim-milk in increasing the live weight ;

(4.) The swine, which were fed upon a ration containing skim-milk, were lustier and more robust in appearance, than those which were fed upon grain only.

Experiments in feeding frozen wheat.

The first test in this series was undertaken to discover, (1) what results could be obtained from the fattening of large-sized swine upon a ration of frozen wheat, and (2) how frozen wheat compared with a mixture of equal parts by weight of pease, barley and wheat for increasing the live weight of the animals.

Twelve grade swine were purchased ; their age and breeding were not known. The average weight at the commencement of the test was 186 lbs. each. They were sorted into 3 lots, which were nearly even as to weight, quality and appearance.

The frozen wheat was procured from the branch Experimental Farms at Brandon, Man., and Indian Head, N.W.T. It was graded "No. 2 frozen," "No. 3 frozen," and "unmarketable."

TABLE VI.

Pen 1 contained 4 swine. They were fed upon frozen wheat *ground* and soaked in cold water for 12 hours.

—	Dec. 28.	Jan. 25.	Feb. 22.	Mar. 14	Totals.
	lbs.	lbs.	lbs.	lbs.	lbs.
Live weight	739	847	969	1100	.....
Increase in weight	.....	108	122	131	361
Feed consumed	.....	701	650	565	1916
Do. per lb. of increase in live weight	.....	6·49	5·33	4·28	5·30

TABLE VII.

Pen 2 contained 4 swine. They were fed upon frozen wheat, *unground* and soaked for an average of 42 hours. (During the first 2 weeks of the test, the wheat was soaked for only 12 hours ; that may account for the unusually large quantity consumed per lb. of increase in weight).

—	Dec. 28.	Jan. 25.	Feb. 22.	Mar. 14.	Totals.
	lbs.	lbs.	lbs.	lbs.	lbs.
Live weight	745	784	958	1091	.....
Increase in weight	.....	39	174	133	346
Feed consumed	.....	697	945	640	2282
Do. per lb of increase in live weight	.....	17·87	5·42	4·81	6·59

TABLE VIII.

Pen 3 contained 4 swine. They were fed upon a mixture of equal parts by weight of wheat, barley and pease, *unground* and soaked for an average of 42 hours.

—	Dec. 28.	Jan. 25.	Feb. 22.	Mar. 14.	Totals.
	lbs.	lbs.	lbs.	lbs.	lbs.
Live weight	747	816	963	1114	.....
Increase in weight	.....	69	147	151	367
Feed consumed	.....	673	935	620	2228
Do. per lb. of increase in live weight	.....	9·75	6·36	4·10	6·07

Conclusions,—From these tests with heavy swine, it appears that :—

(1.) When the frozen wheat was fed, *ground* and soaked for 12 hours, 11·3 lbs. of increase in the live weight were obtained per bushel of wheat ;

(2.) When the frozen wheat was fed *unground* and soaked for 12 and 42 hours, 9·1 lbs. of increase in the live weight were obtained per bushel of wheat ;

(3.) When the frozen wheat is to be fed *unground*, it should be soaked for at least 42 hours ;

(4.) Leaving out of the reckoning, the weeks during which the frozen wheat *unground*, and the mixture of wheat, barley and pease *unground*, were soaked for only 12 hours, 5·24 lbs. of frozen wheat were consumed per lb. increase, and 5·22 lbs. of the mixture of wheat, barley and pease were consumed per lb. of increase in the live weight.

The second test in this series was made with younger and and smaller swine to discover, (1) the quantity of frozen wheat consumed per lb. of increase in live weight, and (2) the quantity of skim-milk which would be the equivalent of a pound of frozen wheat in increasing the live weight of the swine.

Table IX.

Pen V contained 5 swine bred at the Experimental Farm; they were out of a Poland-China sow by an Improved Large Yorkshire boar. They were fed upon frozen wheat *ground* and soaked for 12 hours. During the last 3 weeks of the test, they were fed upon the lowest quality of frozen wheat only, which has been graded "unmarketable."

—	Feb. 1.	Feb. 29.	Mar. 28.	Mar. 2.	May 30.	Totals.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Live weight	506	470	595	724	827	.....
Increase in weight	.....	164	125	129	103	521
Feed consumed	.....	565	508	551	580	2,204
do per lb. of increase in live weight	.....	3·44	4·06	4·27	5·63	4·23

Table X.

Pen VI contained 4 swine bred at the Experimental Farm; they were out of a grade Berkshire sow by an Improved Large Yorkshire boar. They were fed upon an allowance of frozen wheat, *ground* and soaked for 12 hours, plus as much skim-milk as they would drink.

—		May 2.	May 31.	June 27.	Totals.
		lbs.	lbs.	lbs.	lbs.
Live weight		415	519	577*	.....
Increase in weight		.....	104	141	245
Feed consumed	Wheat	.....	327	322	649
	Milk	.....	1,601	1,465	3,066
do. per lb. of increase in live weight.	Wheat	.....	3·14	2·28	2·65
	Milk	.....	15·39	10·39	12·51

* 3 swine only.

Conclusions,—From these tests with swine weighing an average of 61 lbs. each in the one pen and an average of 104 lbs. each in the other pen, it appears that :—

(1.) When the frozen wheat was fed *ground* and soaked for 12 hours, 14·18 lbs. of increase in the live weight were obtained, per bushel of wheat ;

(2.) In the feeding of swine from an average weight of 61 lbs. each, until they reached an average weight of 145 lbs. each, 15·46 lbs. of increase in the live weight were obtained, per bushel of wheat ;

(3.) 1 lb. of frozen wheat was the equivalent of 7·91 lbs. of skim-milk in increasing the live weight ;

(4.) The swine which were fed upon a ration containing skim-milk were lustier and more robust in appearance, than those which were fed upon grain only.

The swine from Pens V and VI were slaughtered ; and the hams, sides and shoulders were cured in pickle by an Ottawa pork-dealer and ham-curer. The bacon and hams were pronounced excellent in quality, by many who examined them and afterwards purchased them for their own tables.

The parts of one side, from a pig of the lot which were fattened upon frozen wheat exclusively, were sent for opinion to Wm. Davies, Esq., of The Wm. Davies Co., Limited, Toronto, who have one of the largest and best known establishments for the curing of swine products in Canada. The following is the sum of the verdict of Mr. Davies upon its quality.

"It is excellent, rather too salt but very rich and luscious. I consider it superior to hogs fed on peas alone. The complaint regarding pea-fed bacon in England, is that the lean is hard and this is the case to some extent with the fat also. It would be well if farmers in Canada would mix the grain and grind it, then give it to the hogs with whey, butter-milk or skim-milk."

GENERAL REMARKS.

In those parts of Canada, where a less or greater quantity of wheat may be injured by frost or other climatic conditions, the farmers should fortify their positions by providing means whereby

to market, in the best way, this product which cannot be sold at paying prices in the form of grain. From 9·1 lbs. to 15·46 lbs. of increase in the live weight of swine have been obtained per bushel of frozen wheat consumed.

When swine are fetching 5 cents per lb. live weight with an allowance of five per cent. deducted for shrinkage, the frozen wheat, fed under the least favourable of ordinary conditions, may realize 43¼ cents per bushel. At the same price for swine, the frozen wheat, fed under favourable conditions in the quality and age of the swine and the preparation of the feed, may realize 73·45 cents per bushel.

The conditions required for the profitable feeding of swine are (1) clean, dry, warm quarters protected from wind and draughts, (2) as much wholesome feed—if grain preferably *ground* fine—as they will eat clean, three times a day, and (3) free access to a mixture of salt and ashes, to sods, or to soil.

To meet the requirements of foreign markets, swine with lean meat are wanted ; larger numbers of them should be fed and fattened during the summer months ; and they should be sold alive by the farmer or feeder in order that they may be slaughtered at packing houses, where the carcasses can be cut and cured in a uniformly satisfactory manner, suited to the preferences of different buyers.