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Continuation of Experiments in Pig Feeding.

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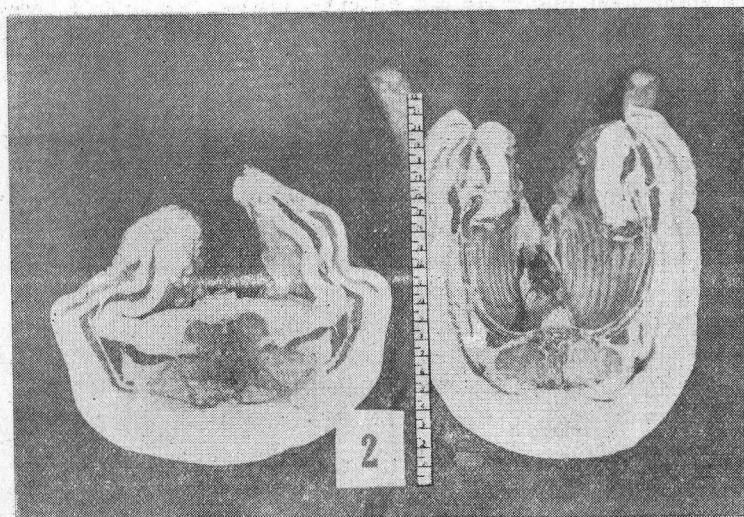
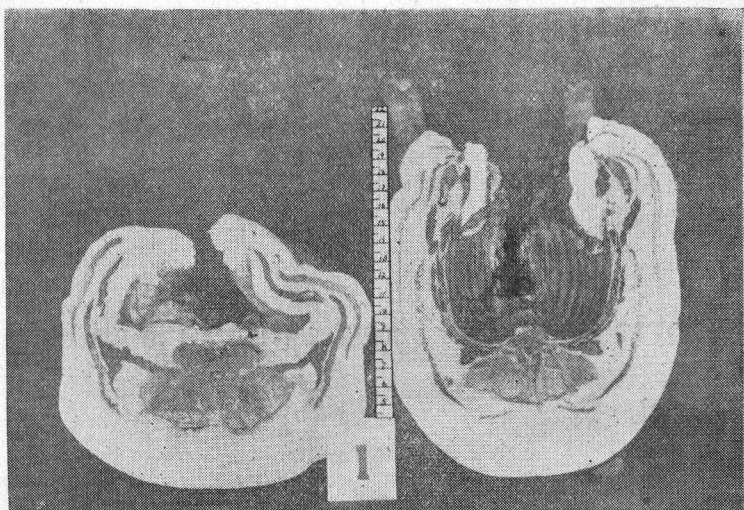
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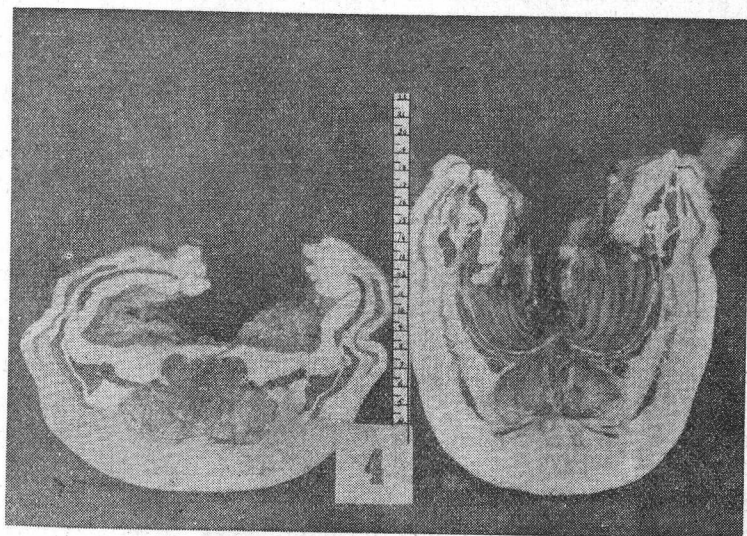
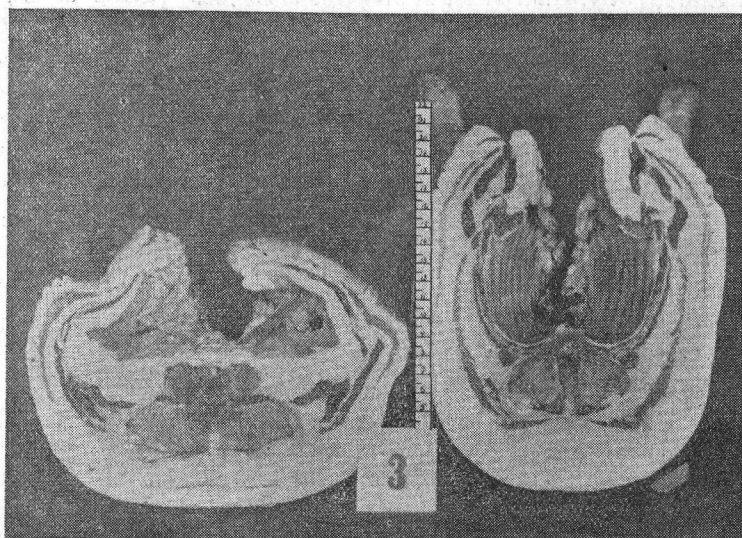
Reports on Experiments in Pig Feeding.

EXPERIMENT NO. 2.

The details, connected with the work in experimenting on the methods of pig feeding, are set forth in this Bulletin, with the same object in view, as mentioned in Bulletin No. 20, to wit: that of establishing, if possible, the fact that pork can be successfully and profitably produced on the farms of Oregon, without the aid of corn. Where corn can be grown, as in some of the southern counties of the state, it will continue to be one of the chief food materials for fattening swine; but over a large portion of the State, it will never become of great importance in this work, owing to climatic conditions which hinder its growth and maturity. The results are such as to dispel all doubts from the minds of those who have thought that wheat could not be made to produce pork, equal in quality to corn fed pork. From the cuts made from photographs, which appear in this Bulletin, it will be seen that the fat is very heavy and thick; and, although not shown by the cuts, it is very firm in texture.

The lean meat was very juicy, and light in color, which characteristic has marked all of the results in feeding wheat to pigs, thus far carried on at our station. In the rate of gain produced, the results will compare favorably with those obtained from feeding corn. By referring to the table, showing results by periods, it will be seen that during the first period it required a larger amount of grain, to produce a pound





of gain in lot 1, than in lot 2; and this is the only period during which this is true. It was very noticeable also that the pigs did not enjoy the pure chopped oats. This fact was noted in previous experiments. The pigs do not like the coarse hulls which are present in such abundance in chopped oats. During the second period chopped wheat was substituted for the oats, and there is a much better showing in favor of this material.

During this period, there was $13\frac{1}{2}$ pounds of gain, for each bushel of wheat consumed. This is a significant fact, to those who are discussing the practicability of feeding wheat to pigs, instead of selling at present prices. During the third period, there was a slight increase in the amount of food required, to make a pound of gain in lot 1; but a still larger increase is required in case of the mixture. In this experiment, the mixture has not given as good results, as we had been led to expect from published reports of similar work. Our conclusion from present experience would be that, unless we can substitute a cheaper substance for a portion of the ration, that a mixture is not especially desirable in fattening pigs..

During the fourth period, the difference is still greater in favor of the chopped wheat. Lot 2 made very small gains, during the last period. The pigs in this lot, had passed the point of profitable feeding at the end of the third period. They did not get about as well as those in lot 1, after this time. Had they been slaughtered at the end of this period, there would have been less difference in favor of the wheat, in the amount of food required to make a pound of gain. Taking an average of the several periods we find that it required, 5.02 pounds of grain to make a pound of gain in lot 1; and 6.12 pounds in lot 2.

In round numbers lot 1 consumed $2447\frac{1}{2}$ pounds of grain, at a cost of \$19.41, or 3.9 cents for each pound of gain in live weight. In this case wheat was valued at 45 cents per bushel, the price paid at the time of threshing the grain. Oats were reckoned at 36 cents per bushel.

Lot 2 consumed 2325 pounds of grain, which figures the same as in lot 1, \$19.41, or 4.66 cents for each pound of gain in live weight. The latter increase per pound, is due to a smaller total gain in live weight. Wheat and oats were figured at the same price, as in lot 1; and the bran at 75 cents per cwt.

and shorts at 90 cents. These prices make the by-products, bran and shorts cost more than wheat, which is the case at the present time.

As to the profits, lot 1 makes a very good showing; and there is no loss in lot 2, at a cost of 4.66 cents per pound of gain, with pork at 5 cents gross. With the small percent of shrinkage, as shown in table 5, the profits were materially increased by dressing and selling at $6\frac{1}{2}$ cents, which was easily obtained at the time of slaughtering.

The quality of the meat was all that could be desired in fat pork. There was a good thickness of fat, and at the same time a good distribution of lean meat. The meat was pronounced excellent, by all who had the pleasure of testing it.

The pigs were only eleven months old at the time of slaughtering. In lot 1, they made an average gain of 1.4 pounds per day from birth, while those in lot 2, made 1.3 from birth.

Previous to the experimental feeding the pigs were fed slops from the kitchen with a few shorts added. No effort was made to crowd them but simply to keep up a healthy and vigorous growth. The pigs were not permitted to run to pasture at any time. Small yards, in which the pigs can get to the ground, were connected with the pens. The pigs were fed twice each day, at eight in the morning, and five in the evening. Each ration was weighed out and allowed to soak until the time for the next feed. A handful of salt was added to each feed. Charcoal was given to them as they required a shovel full twice a week.

The breed of pigs used in this feeding test, was a cross of the Poland China and Berkshire, with the Berkshire predominating. The pigs were purchased for the experiment, and no definite knowledge could be ascertained as to their exact breeding. They were taken from a litter of nine and, at the beginning of the experimental feeding, were very uniform in size. This is shown in table giving weights at the beginning of the work.

Half-tone engravings of the meat are presented with these notes. These pictures will give a very good, and necessarily a true representation of the meat, as it appeared upon the block. The cuts were made through the loin, and between the 6th and 7th ribs. Nos. 1 and 2 are from lot 1, and Nos. 3 and 4 from lot 2. The Photo-engravings were made by Prof. E. F. Pernot, who is connected with this Station.

TABLES

Showing weight of pigs and amount of food consumed to make a pound of gain in periods of 4 weeks each..

Table 1.—First Period.

Name of Pig.	No. of Lot	Date of weighing.					Total gain.	Total food consumed.	Amt. food to make 1 lb. gain.	Remarks.
		Sep. 1	Sep. 8	Sep. 15	Sep. 22	Sep. 29				
Sam.....	1	216½	226½	244	254	266	49½			Chopped Oats.
Tom.....	1	238	241	262½	267½	278	40	425½	4.75	
Dick.....	2	215½	228½	253	270	281½	66			Mix. chop'd oats
Harry.....	2	239½	254½	279½	288	311	71½	532½	3.87	wheat sh r bran

Table 2.—Second Period.

		Sep 29	Oct. 6	Oct 13	Oct 20	Oct 27				
Sam.....	1	266	286½	308	328½	339	73	653½	4.44	Chopped wheat.
Tom.....	1	278	291½	327½	337	352	74			
Dick.....	2	281½	291½	314	328½	340½	59	654½	5.25	Same as preced-
Harry.....	2	311	327½	347½	366½	376½	65½			ing period.

Table 3.—Third Period.

		Oct 27	Nov 3	Nov 10	Nov 17	Nov 24				
Sam.....	1	339	364½	372	392½	411	72	687½	4.94	Chopped wheat.
Tom.....	1	352	375	382	402½	419	67			
Dick.....	2	340½	351½	362	371	379	38½	601	6.35	Mixt. chp'd oats
Harry.....	2	376½	394½	404	417½	432½	56			wheat & shorts.

Table 4.—Fourth Period.

		Nov 24	Dec. 1	Dec. 8	Dec. 15	Dec. 22				
Sam.....	1	411	425	444½	459	469½	58½	681	5.97	Chopped wheat.
Tom.....	1	417	434	452	468	472	55½			
Dick.....	2	379	378½	393	402½	403	24	537½	9.03	Mixt. chp'd oats
Harry.....	2	432½	435	452½	465	468	35½			wheat & shorts.

Table 5, showing weight of various organs, live weight, dressed weight, after hanging 24 hours, and per cent of shrinkage.

No. of pig as shown in cut	Chopped wheat and oats				Mixture wheat oats shorts and bran.			
	Sam. 1		Tom. 2		Dick. 3		Harry. 4	
	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
Live weight.....	463		472½		453½		396½	
Dressed weight.....	404		406		384½		337½	
Amount shrinkage.....	59		66½		69		59	
Blood.....	8	9	7	14	9	10	9	8
Hair.....	3	6	3	14	4	12	3	15
Lungs.....	4	6	4	1	4	3	3	3
Spleen.....		7		6		8		6
Heart.....		17		10		16		14
Intestines.....	29	8	33	10	34	1	30	12
Bladder and Urethra.....		14		13		1		16
Kidneys.....		13		1		2		1
Tongue.....		13		8		16		13
Liver.....	4	3	4	11	5	6	3	15
Leaf Fat.....	18	11	23	7	21	10	18	13
Gut Fat.....	12	13	14	3	14	15	11	12
Per cent shrinkage.....		12.7		14.0		15.2		14.9
Average per cent shrinkage			13.	per cent.			15.	per cent.

Experiment No. 3.

This experiment was carried on, with a view of throwing some light upon the comparative value of wet and dry feed, in fattening pigs. Questions regarding the merits of these methods, have often been asked by the farmers of this State, hence the work was undertaken for the purpose of assisting at least, in solving the problem. Indirectly, this experiment will throw some light upon the question of pork production, as a source of profit to the farmers of Oregon.

CONDITIONS OF THE EXPERIMENTS.

Four well bred, Berkshire pigs were purchased, when about four weeks old for this feeding test. The feeding was begun July 1st, 1893. The pigs were $2\frac{1}{2}$ months old, when a record of the food began to be made, and they were weighed from this time, at regular interval of two weeks.

It will be seen, by referring to table 1, that there was only three pounds difference, in the weight of the pigs placed in each pen, at the beginning of the experiment. The pigs were of the same litter, and a sow and barrow was placed in each pen.

Previous to the experimental feeding, the pigs were fed on slops from the kitchen and shorts added, as they required. no special effort was made to crowd them, but simply to keep them in a vigorous growing condition.

Pen No 1 was fed on shorts, from July 1st, to Sept. 5th, at which time the food was changed to chopped wheat, oats, bran, and shorts, $\frac{1}{4}$ each by night. At the time the change was made, the pigs were very weak on their feet. They were loth to stand long enough to eat their feed. Soon after the change was made the difficulty disappeared, and no more trouble was experienced, during all of the time the animals were fed.

Our conclusions were, that the slops and shorts did not furnish enough bone forming substances, or if such substances were present, the animals were not able to assimilate a sufficient amount to strengthen the bones of the limbs.

All of the food given to the pigs in pen No. 1, was given to them dry, and the water was placed near by in a separate trough. Fresh water was placed in the trough every time the pigs were

fed. The pigs in this pen drank more water, than those in pen No. 2, including the water used in wetting the feed.

Pen No. 2, was fed on the same kind of food, and under exactly the same conditions, as Pen No. 1, except each ration was thoroughly wet with cold water, and allowed to stand from one feeding time to the next. The amount fed was governed by the appetite of the pigs. Each lot was given all they would eat, without leaving the food to stand in the trough too much. Every ration was weighed as it was fed. The food was placed in the troughs at eight o'clock in the morning, and five in the evening. These hours of feeding were strictly adhered to, for we believe that the best results in feeding any kind of stock, can be realized only when regularity, in the feeding and care of the animals, prevails.

Charcoal and ashes, were placed in the pens two or three times a week as required. The pigs were permitted to run in small yards, which were connected with the pens.

RESULTS.

From the out-set, the pigs fed on the wet feed, seemed to relish their food better than those fed on dry. Seemingly, it did not require so much effort on their part to eat their ration, as it did the dry fed lot. The pigs fed on wet food, would eat their feed in much less time than the others.

In the tables showing results by periods of two months each, it will be seen that, during the first period, Pen No. 2, gained $16\frac{1}{2}$ pounds more than pen No 1, upon $7\frac{1}{2}$ pounds less of food. During the second period, shown in table No 2, the gain is 21 pounds, but at the expense of $87\frac{1}{2}$ pounds more of food, than that consumed by Pen No 1. Yet, during this period the amount of feed required to make a pound of gain, is not as large as that required in some experiments, where corn was used as the principal food material. In the third period, or during the last two months, Pen No. 2 made 35 pounds more gain, than Pen No. 1, and consumed 122 pounds more of grain. One of the pigs in pen No. 1, did not make as good gains as the other by 44 pounds. This pig seemed to drop off in the amount of food eaten, and from all indications it had passed the point of profitable feeding.

By averaging the several periods we find, that it required

4.64 pounds of food to make a pound of gain in live weight in pen No. 1, or the dry fed lot, and 4.46 pounds in pen No. 2, or those fed on wet food

Both of the results are more encouraging than any we have reached before in our feeding experiments.

They are such as to insure a profit in feeding grain to pigs, at the present prices paid for pork, and grain products. We take it for granted that the grain is fed to good animals, and in a judicious manner. By judicious manner, we do not mean that the grain should be fed whole, in an open yard on the ground, or in the mud. Such conditions never prevail in Oregon; but they do occur in some of the neighboring States, it is safe to venture; and, possibly, in some of the Eastern States.

The pig appreciates good quarters and will pay for such accommodations in an increased product, just as quickly as any other breed of live stock.

These figures would indicate, that Oregon can successfully compete with the corn growing States, in producing a supply of these products sufficient at least to meet the demands of her own markets. And may she not supply the markets of this coast, that are now supplied from States east of the Rocky Mountains?

Lard has retailed, in the markets of Oregon, during a large portion of the past year, at from 15 to 17½ cents per pound. Wheat has been selling at from 45 to 60 cents per bushel. A bushel of wheat, as shown in the first part of this report, produced over twelve pounds of gain in live weight. We will leave the reader to draw his own conclusions.

In the table giving the summary, the cost of the food to produce a pound of live weight is given. In these figures, Shorts have been reckoned at \$18.00 per ton, Bran \$14.00, Oats 30 cents per bushel, and Wheat 45 cents. Shorts at the present time are quoted at \$16.00 per ton.

Pen No. 1 consumed 1142½ pounds of shorts, 197 of bran, 323½ of chopped oats, and 459½ of chopped wheat. Pen No. 2 used 1215½ pounds of shorts, 210 of bran, 368 of chopped oats, and 526 of chopped wheat.

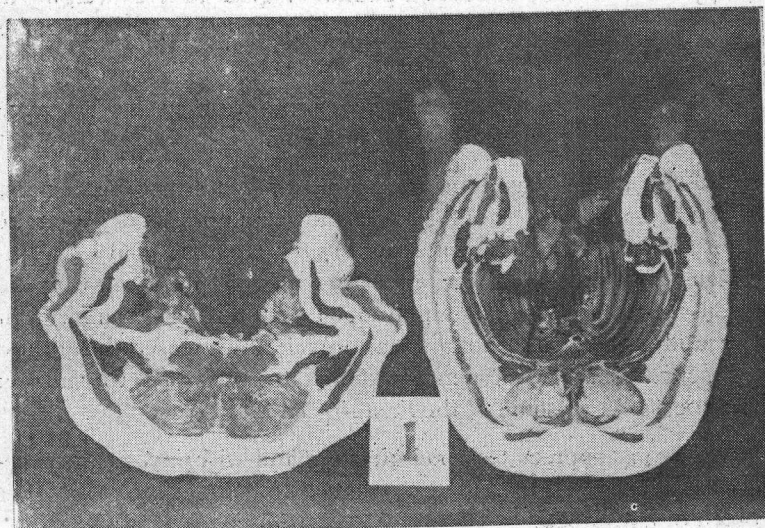


FIG. 1. Two cross-sections of a biological specimen, likely a mollusk shell, showing internal structures. The left section is labeled '1' and the right section is labeled '2'.

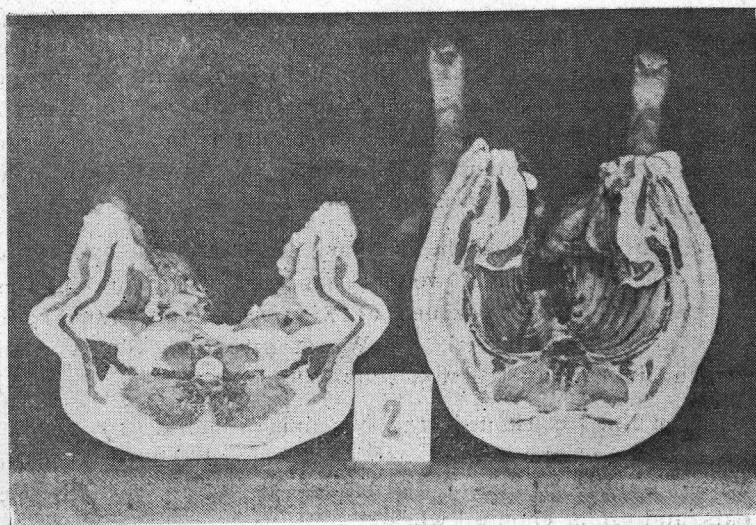
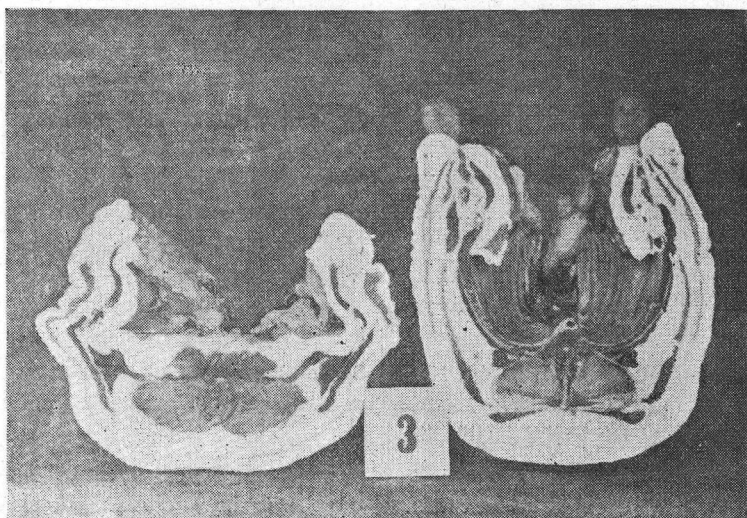


FIG. 2. Two cross-sections of a biological specimen, likely a mollusk shell, showing internal structures. The left section is labeled '1' and the right section is labeled '2'.



Tables showing results by periods of two months each.

Table No. 1.—First Period.

No. of Pig.....	Dry shorts		Wet shorts	
	Pen No. 1		Pen No. 2.	
Date of weighing.....	1 lbs	2 lbs	3 lbs	4 lbs
July 1st.....	57	68½	62½	60
July 15th.....	84	101	92½	94
July 29th.....	102	123	115½	118
August 12th.....	125	145½	129	139
August 26th.....	139½	164	158	160
Total gain.....	82½	95½	95½	100
Total food.....	588		582½	
Amount of food for a pound of gain	3.3		2.97	

Table No. 2.—Second Period.

No. of Pig.....	1		3	
	lbs	lbs	lbs	lbs
August 29th.....	139½	164	158	160
September 9th.....	153½	177½	168	175
September 23d.....	166½	195½	186	198½
October 7th.....	189½	211½	217½	221
October 21st.....	206	219½	221	240
Total gain.....	66½	55½	63	80
Total food.....	624½		712	
Amount of food for a pound of gain	4.73		4.98	

Table No. 3.—Third Period.

No. of Pig.....	1		3	
	lbs	lbs	lbs	lbs
October 21st.....	206	219½	221	240
November 4th.....	223½	235½	240	254½
November 18th.....	246½	246½	266	276
December 2d.....	265	256½	287	302½
December 16th.....	288½	269	309	318
December 30th.....	304½	274	318	331
Total gain.....	98½	54½	97	91
Total food.....	903		1025	
Amount of food for a pound of gain	5.9		5.45	

Table No. 4.—Summary.

	No. of pen.	Wt. July 1st.		Total gain.	Average gain per day.	Total food consumed.	Cost per pound of gain.	Remarks.
		lbs	lbs					
Sow.....	1	57	304½	247½	1.35	2115½	3.9c	Shorts @ \$18 per ton. Bran \$14 Oats 30 cents per bu. Wheat 45 cents per bu.
Barrow..	1	68½	274	205½	1.12			
Sow.....	2	62½	318	255½	1.39	2319½	3.6	
Barrow..	2	60	331	271	1.48			Pen No. 1 Dry feed. Pen No. 2 Wet feed.

Table No. 5, showing weight of various parts in pounds and ounces, and the per cent of shrinkage after hanging 24 hours.

	Pen No. 1		Pen No. 2	
	Sow.	Barrow.	Sow.	Barrow.
No. of Pig as shown in cuts.....	lbs oz	lbs oz	lbs oz	lbs oz
*Gross weight.....	300	274	311	322½
Net weight.....	249½	230	258½	266
Blood.....	5	5 10	7 4	7 8
Hair.....	1 14	2 2	1 14	2
Tongue.....	8	6	9	6
Liver.....	4	3 2	3 6	4 3
Heart.....	9	6	8	9
Lungs.....	2 6	2 8	2 15	3 5
Spleen.....	4	2	2	4
Kidneys.....	11	10	12	9
Intestines.....	22 9	15	19 5	21 12
Fat from Intestines.....	6 1	7 6	7 14	11 8
Leaf Fat.....	13 2	14 8	13	18
Per cent shrinkage.....	.167	.160	.169	.175
Average shrinkage.....		.163		.172

*The gross weight was taken 24 hours after feeding.

There is a fraction of a cent, in favor of the wet feed, in the cost of producing a pound of gain. At the end of the first two months, the difference in favor of the wet feed, was much greater. As the feeding progressed this difference gradually became less, on account of the increased amount of material eaten by the pigs fed on wet food. While there is not much in favor of the wet food, on the ground of economy as a whole, yet there is a marked increase, in the growth and weight of the pigs, in favor of this method.

Further experiments will be carried on along this line, with a view of throwing more light upon the subject, thereby enabling the farmers of Oregon, to enter into the work of feeding pigs, with a wider knowledge of the conditions which will largely determine the profits and losses.

In table 5, showing the weight of various organs and parts of the pigs, it will be seen that there is a small per cent. in favor of Pen No. 1 in the shrinkage by dressing. It was remarked by several, that those fed on wet food would shrink much more than the other lot, basing their opinion, upon the apparently much larger amount of abdominal viscera. The difference is not as great however, as this condition indicated before slaughtering.

EARLY MATURITY

The pigs at the time of slaughtering were 8½ months old;

and the average live weight at the close of the feeding, December 30th was 306.8 pounds. This is not a marvelous weight by any means; but it is probably above the average. This fact is mentioned, for the purpose of inducing more interest, if possible, in the matter of early maturity. What might be profit, is complete loss many times, in feeding animals which have been grown, or allowed to come up, and *then* fat ened. Proper care and feeding should begin before the animal is born, and continue until it has reached the shambles.

While these thoughts are not new to many, they are too often overlooked by those who ought to heed them most carefully.

Half-tone engravings of the meat, as it appeared on the bench are presented in connection with these notes. Upon examining these cuts it will be seen, that there is a very large per cent of lean meat. The fat was lighter colored, than that produced before; but further than this, there were no special characteristics. Cuts on pages 36 and 37 belong to experiment No. 2, and those on pages 44 and 45 to experiment No. 3.

I wish to acknowledge the efficient and pains taking work of Mr. C. D. Thompson, in feeding the animals during the experiment.

H. T. FRENCH
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