

South Dakota State University
**Open PRAIRIE: Open Public Research Access Institutional
Repository and Information Exchange**

Bulletins

South Dakota State University Agricultural
Experiment Station

5-1-1924

Potatoes as a Feed for Fattening Pigs

J.W. Wilson

A.H. Kuhlman

Follow this and additional works at: http://openprairie.sdstate.edu/agexperimentsta_bulletins

Recommended Citation

Wilson, J.W. and Kuhlman, A.H., "Potatoes as a Feed for Fattening Pigs" (1924). *Bulletins*. Paper 209.
http://openprairie.sdstate.edu/agexperimentsta_bulletins/209

This Bulletin is brought to you for free and open access by the South Dakota State University Agricultural Experiment Station at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in Bulletins by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact michael.biondo@sdstate.edu.

POTATOES AS A FEED FOR FATTENING PIGS

**ANIMAL HUSBANDRY DEPARTMENT
AGRICULTURAL EXPERIMENT STATION
SOUTH DAKOTA STATE COLLEGE OF
AGRICULTURE AND MECHANIC ARTS
BROOKINGS**

GOVERNING BOARD

Honorable T. W. Dwight, President.....	Sioux Falls
Honorable August Frieberg, Vice-President	Beresford
Honorable J. O. Johnsen	Watertown
Honorable Robert Dailey	Flandreau
Honorable Alvin Waggoner	Philip

STATION STAFF

Robert Dailey	Regent Member
T. W. Dwight	Regent Member
Charles W. Pugsley.....	President of College
C. Larsen.....	Dean of Agriculture
James W. Wilson.....	Director and Animal Husbandman
N. E. Hansen.....	Vice-Director and Horticulturist
A. N. Hume.....	Agronomist and Supt. of Substations
Harry C. Severin.....	Entomologist
B. A. Dunbar.....	Chemist
J. G. Hutton.....	Associate Agronomist, Soil Survey
Alfred Bushey.....	Agronomy Analyst
Matthew Fowlds.....	Assistant Agronomist, Seed Analyst
E. W. Hardies	Assistant Agronomist
Arthur H. Kuhlman.....	Associate Animal Husbandman
Thomas M. Olson.....	Assistant Dairy Husbandman
Knowlton Redfield	Veterinarian
George Gilbertson.....	Assistant Entomologist
C. F. Wells.....	Assistant Chemist
Paul W. Kieser.....	Bulletin Editor
R. A. Larson.....	Secretary
H. M. Crosby.....	Bulletin Clerk and Stenographer

POTATOES AS A FEED FOR FATTENING PIGS

James W. Wilson

Arthur H. Kuhlman

Many farmers of South Dakota who engage in the production of potatoes as a cash or market crop oftentimes have large quantities of cull or unmarketable potatoes at their disposal. In such cases much interest is manifested in the value of potatoes as a feed for livestock. Although potatoes have often been used for such purposes, very little experimental data is available for showing the feeding value of potatoes or the best method of utilizing them in rations for farm animals.

In the early studies made to determine the feeding value of potatoes, no mention is made of the use of any protein supplement and since the use of tankage or some other protein supplement is considered necessary in the use of carbohydrate feeds for hogs in order to secure maximum gains in weight as well as economy of production, these earlier trials do not always answer all questions raised by hog growers.

In order to obtain further information on the value of potatoes as a feed for growing and fattening pigs, four trials have been conducted since May 18, 1923, which are reported in this bulletin.

Plan of the Experiment

The experiment included four separate trials. In each trial the pigs in the various lots belonged to one breed and were selected to secure uniformity as to age weight, sex, and individual merit. Poland China pigs were used in each of the first three trials and Duroc-Jerseys in the fourth trial.

Weighing

In each trial all lots were weighed separately at the end of every week. All pigs were weighed individually every fourth week. The weighing was done regularly in the morning after the pigs had received their morning feed and water.

A weekly feed record was kept of the amount of all feeds consumed by the various lots corresponding to the periods included in the weight records.

Shelter

All four trials were conducted under dry lot conditions. In the first, second and fourth experiments the pigs were stabled in roomy pens in a large half monitor house, each lot having access to a large well-cindered outdoor yard. In the third experiment the pigs were kept in large shed-roof houses and uncindered lots.

Preparation of Potatoes and Method of Feeding

Excepting for a few days at the beginning of the first trial all cooked potatoes fed in this investigation were prepared by cooking them in a barrel using a steam cooker or boiler. About 30 pounds of a cheap grade of soft coal were used to cook a barrel of potatoes.

Various means were used to induce the pigs to consume a maximum quantity of raw potatoes. At the beginning of the first trial, the potatoes were sliced in a root cutter such as is often used by sheep raisers for cutting roots. It was later found that the pigs consumed more of the raw potatoes when they were reduced to a pulp with a chopping device made for the purpose, which consisted of two heavy crossed blades of steel fastened to a handle. Only a few moments work were required to chop a single feed of raw or cooked potatoes with this tool. As far as it was possible to do so, the plan of the experiment was to feed such an amount of potatoes, both cooked and raw, as would replace one-half of the corn in a standard corn and tankage ration. According to this plan when the pigs were on full feed they consumed about four pounds of potatoes for every pound of corn allowed. The amount of potatoes consumed by each lot determined the amount of corn allowed daily for the respective lots throughout the experiment.

Table I—Chemical Composition of Potatoes

The following analyses of raw and cooked potatoes were made by C. F. Wells, Assistant Chemist. The analysis made in 1923 was made from a representative sample of the potatoes used in the first trial, during July, 1923. The analysis made in 1924 was of a sample of the potatoes fed during the last trial early in 1924.

Raw Potatoes—	1923	1924
Moisture	81.68 %	82.70 %
Protein	2.41	1.90
Ether Extract .....	.05	.05
Ash	1.02	.92
Crude Fiber	trace	trace
Nitrogen-free Extract	14.84	14.43
	<hr/> 100.00 %	<hr/> 100.00 %
Cooked Potatoes—		
Moisture	82.91 %	83.86 %
Protein	2.35	1.93
Ether Extract .....	.04	.01
Ash	1.11	.81
Crude Fiber	trace	trace
Nitrogen-free Extract	13.59	13.39
	<hr/> 100.00 %	<hr/> 100.00 %

Experiment I

The first feeding trial of this experiment began May 18, 1923, and ended July 13, 1923, a feeding period of 56 days. Twenty-eight Poland China pigs of fall farrow and choice feeder type purchased from two local breeders, were divided into four lots and fed as follows:

Lot 1—Corn and tankage (each self-fed in separate compartments).

Lot 2—Corn, tankage, and cooked potatoes (all hand fed).

Lot 3—Corn, tankage, and raw potatoes (all hand fed).

Lot 4—Corn and raw potatoes (hand fed).

Potatoes which had been stored for market purposes since the preceding fall were used in this trial.

TABLE II

Results of Experiment I—The Value of Cooked and Raw Potatoes
When Fed with Corn and Tankage.

RATION	Lot 1	Lot 2	Lot 3	Lot 4
	Corn, Tankage	Corn, Tankage, Cooked Potatoes	Corn, Tankage, Raw Potatoes	Corn, Raw Potatoes
Experiment begun		May 18, 1923		
Experiment ended		July 13, 1923		
No. of days fed	56	56	56	56
No. of pigs per lot	7	7	7	7
Average weight per pig—				
Initial weight	142.00	141.86	142.00	141.14
Final weight	259.86	235.00	178.71	163.71
Total gain per lot	825.00	652.00	257.00	158.00
Average daily gain per pig.....	2.10	1.66	.66	.40
Total feed consumed—	lbs.	lbs.	lbs.	lbs.
Corn	3074.00	1089.00	532.00	532.00
Tankage	152.00	146.00	146.00	
Cooked Potatoes		4070.00		
Raw Potatoes			1243.00	1207.00
Feed consumed for 100 pounds gain—				
Corn	372.61	167.02	207.00	336.71
Tankage	18.42	22.39	56.81	
Cooked Potatoes		624.23		
Raw Potatoes			483.66	763.92
Average daily ration per pig—				
Corn	7.84	2.78	1.36	1.36
Tankage .....	.39	.37	.37	
Cooked Potatoes		10.38		
Raw Potatoes			3.17	3.08

Feeding Value of Cooked Potatoes

A comparison of the data summarized in table I shows that the pigs in lots 1 and 2 made very satisfactory gains. The pigs in both lots were very thrifty throughout the entire feeding period and excepting for a difference of about 25 pounds in the average final weight per pig in the two lots, they showed no marked variations or differences. It is

quite likely that a part of the greater gains made by lot 1 may be due to the fact that this lot had access to a self feeder at all times while lot 2 was hand fed. Then, too, the fact that in no single week did lot 2 consume one-half as much corn as lot 1, may be another cause for the difference in gains between the two lots.

A comparison of the amounts of feed consumed for 100 pounds of gain made by lots 1 and 2 shows that 372.61 pounds of corn and 18.42 pounds of tankage were consumed by lot 1 for each 100 pounds of gain in weight, while lot 2 consumed 167.02 pounds corn, 22.39 pounds tankage, and 624.23 pounds cooked potatoes. Every 624.23 pounds of cooked potatoes plus 3.97 pounds tankage replaced 205.59 pounds of corn. With corn worth 56 cents per bushel and tankage \$60.00 per ton, 100 pounds of cooked potatoes would be worth 31 cents when fed in this manner.

Stating these results in another way, it may be said that in this trial 327 pounds of cooked potatoes replaced 100 pounds of shelled corn.

Feeding Value of Raw Potatoes

A comparison of the results obtained for lots 3 and 4 shows that when raw potatoes were used to replace some of the corn very poor results were obtained. The pigs in lot 3 receiving corn, tankage, and raw potatoes made an average daily gain of only 0.66 of a pound, while the pigs in lot 4 receiving corn and raw potatoes made a gain of only 0.38 of a pound daily. This very poor showing for both lots receiving raw potatoes was due to the fact that it was impossible to induce the pigs in either lot to eat sufficient amounts of the raw potatoes. The average daily amounts consumed by these two lots were less than one-third as much as the amount of cooked potatoes consumed by lot 2. It was virtually necessary to starve the pigs in both lots 3 and 4 during the entire period of the experiment in order to get them to eat the small amounts of potatoes that were consumed. With corn worth 56 cents per bushel and tankage \$60.00 per ton, raw potatoes were worth 10.4 cents per 100 pounds as fed in lot 3 and 11.9 cents per 100 pounds as fed in lot 4. These results when considered with the very low daily gains made by these pigs indicate that old potatoes fed raw cannot be rated very high as a feed for pigs, even when fed with concentrates like corn and tankage.

It was necessary to restrict the corn ration in both cases in order to force the pigs to eat even the very small amount of raw potatoes that was consumed.

Experiment II

The second experiment began October 17, 1923, and ended December 12, 1923. The pigs used in this trial, which continued for 56 days, were Poland China pigs farrowed in early summer and while all were of the old or small type, they were thrifty. Eight pigs were used in each lot and fed the following rations:

Lot 5—Corn and tankage (hand fed).

Lot 6—Corn, tankage, and cooked potatoes (hand fed).

Lot 7—Corn, tankage, and raw potatoes (hand fed).

In this trial all feeds used were hand fed. In all other respects the general plan was the same as in Experiment I. Tankage was fed at the rate of 0.25 pound daily per pig in all lots and potatoes at the rate of four pounds of potatoes to one of corn when the pigs were on full feed. Cull or small potatoes which were screened out of potatoes delivered for sale by farmers at a local elevator were used almost entirely in this trial.

Another lot of pigs similar to those in lots 5, 6, and 7 was fed experimentally during the entire course of this trial but as it was concerned with the use of alfalfa hay in a ration for fattening pigs the results are not included in this report. Some of the pigs were, however, used with those selected from this experiment in the third trial.

TABLE III

Results of Experiment II—The Value of Cooked and Raw Potatoes
When Fed with Corn and Tankage

RATION	Lot 5	Lot 6	Lot 7
	Corn, Tankage	Corn, Tankage, Cooked Potatoes	Corn, Tankage, Raw Potatoes
Experiment begun .....Oct. 17, 1923			
Experiment ended .....Dec. 12, 1923			
No. of days fed	56	56	56
No. of pigs per lot	8	8	8
Average weight per pig—	lbs.	lbs.	lbs.
Initial weight	85.63	85.63	85.25
Final weight	132.50	134.50	110.50
Total gain per lot	375.00	391.00	202.00
Average daily gain per pig.....	.84	.87	.45
Total feed consumed—			
Corn	1915	887	505
Tankage	112	112	112
Cooked Potatoes		3426	
Raw Potatoes			1889
Feed consumed for 100 pounds gain—			
Corn	510.67	226.85	250.00
Tankage	29.87	28.64	55.45
Cooked Potatoes		876.21	
Raw Potatoes			935.14
Average daily ration per pig—			
Corn	4.27	1.98	1.13
Tankage .....	.25	.25	.25
Cooked Potatoes		7.65	
Raw Potatoes			4.22

Value of Cooked and Raw Potatoes in Experiment II

A comparison of the results secured for lots 5, 6, and 7 which are given in Table II shows that the average daily gains made by lots 5 and 6 are much lower than those secured by the corresponding lots in the first experiment. While gains of 0.84 and 0.87 of a pound are only fair gains, all pigs in lots 5 and 6 were thrifty and in normal condition. As has been stated, these pigs were of the old type of

Poland China, being rather short and "chuffy," which may account for the small gains made by them.

While the amounts of feed required for 100 pounds gain are much higher than for the corresponding lots in the first experiment, a comparison of the data for lots 5 and 6 shows that with corn at 56 cents per bushel and tankage at \$60.00 per ton, the cooked potatoes in this trial were worth 32.8 cents per 100 pounds, while the raw potatoes were worth 19.5 cents per 100 pounds. On this basis 305 pounds of cooked potatoes or 513 pounds of raw potatoes replaced 100 pounds of shelled corn.

Much better results were obtained for the raw potatoes in this trial than in the first one. This difference is largely due to the fact that the pigs in lot 7 consumed a larger amount of potatoes. The work of several investigators indicates that old potatoes contain chemical substances known as alkaloids while new potatoes are usually quite free from them. The presence of alkaloids in raw potatoes makes them unpalatable and probably explains in part why pigs do not like them. Cooking seems to break up or change the alkaloids in such a way that potatoes which have been in storage for months are apparently eaten as readily as those which have just been dug in the field.

Experiment III

The third trial began December 20, 1923, and ended January 29, 1924. a feeding period of 40 days. Eighteen pigs averaging about 150 pounds each were selected from the pigs used in the second experiment and divided into two lots. Good marketable potatoes which had been graded for shipment were used in this trial.

The two lots were hand fed the following rations:

Lot 8—Corn and tankage.

Lot 9—Corn, tankage, and cooked potatoes.

TABLE IV

Results of Experiment III—The Value of Cooked Potatoes When Fed with Corn and Tankage

RATION	Lot 8	Lot 9
	Corn, Tankage	Corn, Tankage, Cooked Potatoes
Experiment begun .....Dec. 20, 1923		
Experiment ended .....Jan. 29, 1924		
No. of days fed	40	40
No. of pigs per lot	9	9
Average weight per pig	lbs.	lbs.
Initial weight	150.66	150.44
Final weight	195.11	194.44
Total gain per lot	400.00	396.00
Average daily gain per pig	1.11	1.10
Total feed consumed—		
Corn	2410.00	1394.00
Tankage	104.00	104.00
Cooked Potatoes		3830.00
Feed consumed for 100 pounds gain—		
Corn	602.50	352.02
Tankage	26.00	26.26
Cooked Potatoes		967.20
Average daily ration per pig—		
Corn	6.69	3.87
Tankage .....	.29	.29
Cooked Potatoes		10.64

Table III shows that both lots of pigs in the third experiment made uniform and similar gains. At the close of the trial both lots were in excellent condition and well finished. On the basis of feed required for 100 pounds gain with corn and tankage valued at the prices used before, namely, corn at 56 cents per bushel and tankage at \$60.00 per ton, 100 pounds of cooked potatoes were worth 25.8 cents in this trial. Based on these results, 387 pounds of cooked potatoes were needed to replace 100 pounds of corn.

Experiment IV

Duroc-Jersey pigs farrowed in September, 1923, were used in the fourth experiment, which began December 27, 1923.

Two lots of five pigs each were used in this trial and fed as follows:

Lot 10—Corn and tankage (both self fed).

Lot 11—Corn, tankage, cooked potatoes (all hand fed).

This experiment was continued until the pigs in each of the two lots reached an average weight of 200 pounds.

TABLE V

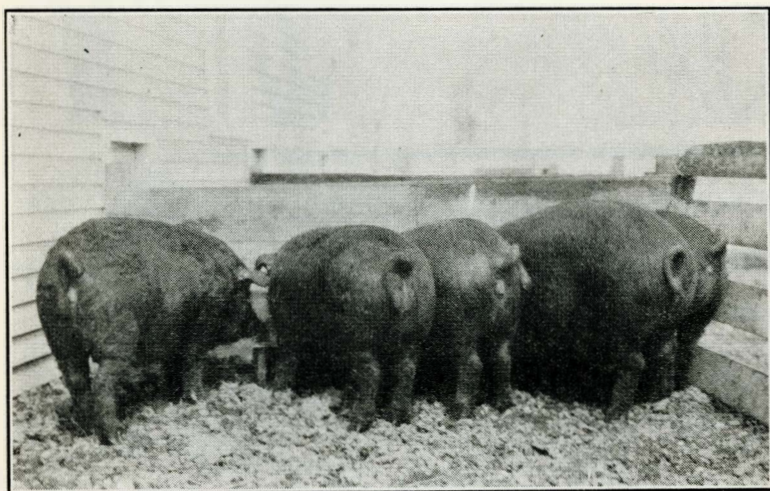
Results of Experiment IV—The Value of Cooked Potatoes When Fed with Corn and Tankage Under Winter Conditions

RATION	Lot 10	Lot 11
	Corn, Tankage	Corn, Tankage, Cooked Potatoes
Experiment begun	Dec. 27, 1923	
Experiment ended	Mar 21, 24	Apr 15, 24
No. of days fed	86	110
No. of pigs per lot	5	5
Average weight per pig	lbs.	lbs.
Initial weight	72.8	72.4
Final weight	199.8	200.4
Total gain per lot	634.0	640.0
Average daily gain per pig	1.47	1.16
Total feed consumed—		
Corn	2369	1613
Tankage	293	161
Cooked Potatoes		3898
Tankage, Oilmeal, Alfalfa Hay mixture.....		156
Feed consumed for 100 pounds gain—		
Corn	373.66	252.01
Tankage	46.21	25.16
Cooked Potatoes		609.06
Tankage, Oilmeal, Alfalfa Hay mixture.....		24.38
Average daily ration per pig—		
Corn	5.51	2.93
Tankage .....	.68	*.46
Cooked Potatoes		7.09
Tankage, Oilmeal, Alfalfa Hay mixture.....		**7.78

*Fed first 70 days only.

**Fed last 40 days only.

If corn is again valued at 56 cents per bushel and tankage, as well as the tankage, oilmeal and alfalfa hay mixture, at \$60.00 per ton, a comparison of the results obtained for lots 10 and 11 as given in Table V shows that in this trial the cooked potatoes were worth only 18.4 cents per 100 pounds. On the basis of these results 545 pounds of cooked potatoes were necessary to replace 100 pounds of corn. These are the lowest returns obtained on the feeding value of cooked potatoes in the entire investigation.



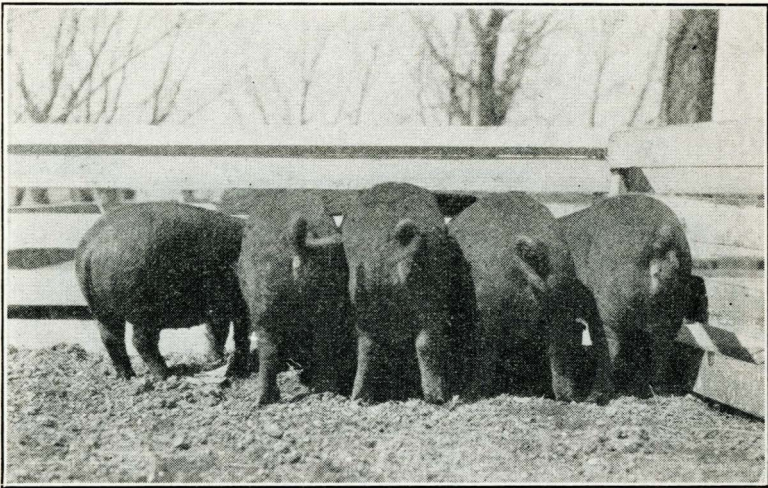
Lot 10. Fed corn and tankage

Since the behavior of the pigs in lot 11 differed so markedly from those which received the same ration in preceding trials and some indications also apparently suggest the influence of direct sunlight and nutrition as factors influencing the appearance of rickets in swine, a detailed account of this trial is given.

On account of their age, vigor, and thriftiness at the beginning of the trial the pigs used in the fourth trial were considered the most promising of any that had been used in this investigation. For two weeks both lots made about the same gains, with lot 11 just a little in the lead. In a few weeks the pigs in lot 11 began to show signs of unthriftiness. Feed consumption, which had gradually increased during the first four weeks, became irregular and

decreased considerably. The smooth, glossy coats of hair and healthy appearance of the skins of all of the five pigs were replaced by coarse, curly coats and dry skins, which were not improved by occasional applications of oil.

About February 15 one of the pigs, No. 811-812, a very promising gilt, began to show signs of stiffness in both fore legs. This condition became worse during the next few weeks and it became necessary to assist her to the scales on weekly weighing days on February 21, 28, and March 6.



Lot 11. Fed corn, tankage, and cooked potatoes

After February 21 all pigs of this lot were driven from their pen in the large hog barn and forced to spend an hour or more in the sunlight on every clear day. During this period gilt No. 811-812 showed many symptoms of rickets. Several of the other pigs in the lot occasionally became slightly lame for a few days at a time but while they did not develop such extreme stiffness of legs as the gilt, they were even more unthrifty in appearance.

On March 6 a mixture of 50 pounds tankage, 25 pounds oilmeal and 25 pounds chopped alfalfa hay was substituted for the tankage in the ration of this lot and the average amount of protein supplement fed daily per pig was increased from .46 pound to .78 pound. The modified ration was fed during the next six weeks and in addition all

pigs were forced to spend a portion of each clear day in direct sunshine.

As a result of the combined effect of the exposure to direct sunlight and the alfalfa hay in the ration the appearance of the pigs improved considerably, the gilt which had been so very stiff regained use of the joints in her forelegs and when the experiment closed on April 15 had improved and developed to such an extent that she was selected and retained as a member of the breeding herd.

A study of the local weather record for the period covered by this experiment shows that in January and February, 1924, a combination of many cloudy days, prolonged periods of very cold weather and considerable snow compelled the pigs to remain in the barn much of the time.

Both lots were subject to the same conditions but the gains made by the pigs in lot 10 were uniform and consistent throughout the entire experiment and no conditions similar to those observed in lot 11 were noticed at any time. Furthermore, eight other lots of five pigs each were on a feeding experiment during this same period. Six of these lots consisted of purebred Duroc-Jersey pigs and two of cross-bred Chester-Durocs. All pigs, purebred and cross-bred, were sired by the same Duroc-Jersey boar. In not a single case excepting in lot 11 did any symptoms of rickets appear. The most outstanding difference between the rations of these ten lots was that lot 11 was the only one in which the allowance of yellow corn was limited.

During the ten weeks period from December 27, 1923, to March 6, 1924, the five pigs in lot 10 consumed 1808 pounds of yellow corn and 259 pounds of tankage, while the five pigs in lot 11 consumed 803 pounds of corn, 161 pounds of tankage and 2438 pounds of cooked potatoes.

It would appear that under the conditions which obtained in his experiment, that while a ration of yellow corn and tankage produced uniform and consistent gains, a ration containing a mixture of approximately 5 pounds of yellow corn, 1 pound of tankage and 15 pounds of cooked potatoes fed during a period of limited sunshine was not suitable for maintaining thriftiness and avoiding a rachitic condition.

The observations made in this experiment are interesting because they apparently indicate that a lack of exposure to direct sunlight or a deficiency in the antirachitic vitamin in the ration may affect hogs in much the same manner as has been found to be the case in chickens, as determined by E. B. Hart,¹ or in the case of rats according to H. Goldblatt.² Further work is, of course, necessary in order to determine the influence of these factors on the growth and development of hogs.

Cooked potatoes apparently do not contain as much of the antirachitic vitamin as does yellow corn, and when they form an important part of the ration during a season of the year when there is a lack of sunshine or when, on account of weather conditions, pigs must be confined in barns away from direct sunlight, it may be well to feed liberally of such feeds as alfalfa hay.

References cited:

- ¹E. B. Hart: "Advanced Feeding Information," Hoard's Dairyman, Vol. 66, No. 23.
- ²H. Goldblatt, "Development of Experimental Rickets in Rats," Experiment Station Record, Vol. 50, No. 3, p. 264.

SUMMARY

1. In two trials in which raw potatoes were fed, results were obtained which indicate that when new potatoes were fed in connection with tankage, 513 pounds replaced 100 pounds of yellow corn, but when old potatoes were fed in the same way it was necessary to feed 962 pounds of potatoes to replace 100 pounds of corn.

2. Raw potatoes are not palatable and it is difficult to get pigs to consume large quantities of them.

3. Cooked potatoes are palatable and in three separate trials during early summer, early fall and early winter conditions, pigs receiving cooked potatoes with corn and tankage made very satisfactory gains.

4. In three trials 326, 305 and 386, or an average of 339 pounds of cooked potatoes replaced 100 pounds of shelled corn.

5. For best results cooked potatoes should replace not more than one-half of the corn that would be consumed if corn alone were fed, or for each pound, the proportion of cooked potatoes to corn should not be greater than four to one.

6. If cooked potatoes are fed during the winter months when there is little sunshine and pigs are forced to remain under cover most of the time, it may prove advisable to feed alfalfa hay in addition to corn and tankage.

7. Whether or not farmers can afford to feed cooked potatoes to hogs depends on the market price of potatoes, facilities for cooking on the farm, the availability of cheap fuel and the cost of labor.

8. No farmer can afford to grow potatoes as a feed for hogs, but under certain conditions hogs will furnish a home market for potatoes that are not saleable and yield a small return from what would otherwise be a total loss.

For convenience in comparing the various lots concerned with the same problem in the four trials, Tables VI and VII have been arranged from the data in preceding tables.

TABLE VI
Summary Record Comparing Corn and Tankage with Corn, Tankage, and Cooked Potatoes

RATION	Lot 1	Lot 2	Lot 5	Lot 6	Lot 8	Lot 9	Lot 10	Lot 11
	Corn, Tankage	Corn, Tankage, Cooked Potatoes	Corn, Tankage	Corn, Tankage, Cooked Potatoes	Corn, Tankage	Corn, Tankage, Cooked Potatoes	Corn, Tankage	Corn, Tankage, Cooked Potatoes
Experiment begun	May 18, 1923		Oct. 17, 1923		Dec. 20, 1923		Dec. 27, 1923	
Experiment ended	July 13, 1923		Dec. 12, 1923		Jan. 29, 1924		Mar 21, 24	Apr 15, 24
No. of days fed.....	56	56	56	56	40	40	86	110
No. of pigs per lot	7	7	8	8	9	9	5	5
Average weight per pig—	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Initial weight	142	142	85.63	85.63	150.66	150.44	72.8	72.4
Final weight	259.86	235	132.50	134.50	195.11	194.44	199.8	200.4
Total gain per lot.....	825	652	375	391	400	396	634	640
Average daily gain per pig....	2.10	1.66	.84	.87	1.11	1.10	1.47	1.16
Total feed consumed—								
Corn	3074	1089	1915	887	2410	1394	2369	1613
Tankage	152	146	112	112	104	104	293	161
Cooked Potatoes		4070		3426		3830		3898
Tankage, Oilmeal, Alfalfa								
Hay mixture								156
Feed consumed for 100 pounds gain—								
Corn	372.61	167.02	510.67	226.85	602.5	352.02	373.66	252.01
Tankage	18.42	22.39	29.87	28.64	26.00	26.26	46.21	25.16

Cooked Potatoes		624.23		876.21		967.20		609.06
Tankage, Oilmeal, Alfalfa								
Hay mixture								24.38
Average daily ration per pig								
Corn	7.84	2.78	4.27	1.98	6.69	3.87	5.51	2.93
Tankage .....	.39	.37	.25	.25	.29	.29	.68	*.46
Tankage, Oilmeal, Alfalfa								
Hay mixture								** .78
Cooked Potatoes		10.38		7.65		10.64		7.09

*First 70 days.

**Last 40 days.

TABLE VII
Summary Record Comparing Corn and Tankage with Corn, Tankage, and Raw Potatoes

RATION	Lot 1	Lot 3	Lot 4	Lot 5	Lot 7
	Corn, Tankage	Corn, Tankage, Raw Potatoes	Corn, Raw Potatoes	Corn, Tankage	Corn, Tankage, Raw Potatoes
Experiment begun	May, 18, 1923			Oct. 17, 1923	
Experiment ended	July 13, 1923			Dec. 12, 1923	
No. of days fed	56	56	56	56	56
No. of pigs per lot	7	7	7	8	8
Average weight per pig—	lbs.	lbs.	lbs.	lbs.	lbs.
Initial weight	142.00	142.00	141.14	85.63	85.25
Final weight	259.86	178.71	133.71	132.50	110.50
Total gain per lot	825.00	257.00	158.00	375.00	202.00
Average daily gain per pig	2.10	.66	.40	.84	.45
Total feed consumed—					
Corn	3074	532	532	1915	505
Tankage	152	146		112	112
Raw Potatoes		1243	1207		1889
Feed consumed for 100 pounds gain—					
Corn	372.61	207.00	336.71	510.67	250.00
Tankage	18.42	56.81		29.87	55.45
Raw Potatoes		483.66	763.92		935.14
Average daily ration per pig—					
Corn	7.84	1.36	1.36	4.27	1.13
Tankage .....	.39	.37		.25	.25
Raw Potatoes		3.17	3.08		4.22