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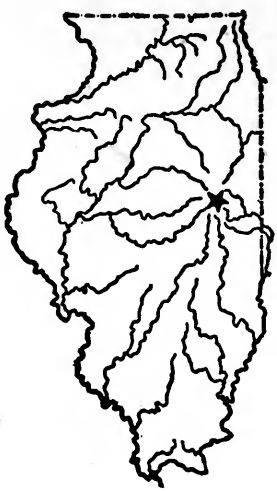
SWINE TYPE STUDIES

I. TYPE IN SWINE AS RELATED TO RATE AND ECONOMY OF GAIN

By W. E. Carroll, Sleeter Bull, J. B. Rice,
R. J. Laible, and R. A. Smith



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THIS series of bulletins on SWINE TYPE STUDIES includes the following:

I. TYPE IN SWINE AS RELATED TO RATE AND ECONOMY OF GAIN (*Bulletin 321*).

II. TYPE IN SWINE AS RELATED TO QUALITY OF PORK (*Bulletin 322*).

III. THE ENERGY AND PROTEIN REQUIREMENTS OF GROWING SWINE AND THE UTILIZATION OF FEED ENERGY IN GROWTH (*Bulletin 323*).

FOREWORD

The question of the type of swine that will make the most rapid and economical gains in the feed lot is one that has received the attention of progressive breeders for several decades. Recently the question of type as it relates to the desirability of the carcass produced has been seriously considered by many packers. Unfortunately most of the arguments for or against the various types have considered the matter from the standpoint of the producer only or from that of the butcher only, while, as with most problems in meat production, it is necessary to consider it from the standpoints both of producer and butcher.

Obviously the price the butcher can pay the producer for raw material is based directly on what the consumer will pay for the finished product, and the amount the consumer will pay depends on how close the product comes to meeting his requirements. The consumer's preference in the matter of pork products has undergone marked changes in the past decade. Small, lean cuts of choice quality are now demanded, and yet to have quality pork must be fat. These rather conflicting requirements may be met by producing a small, finished, but not overfat hog from which the butcher removes, for lard or other purposes, the excessive fat to which the consumer objects. Since the price of lard is relatively low, it is apparent that the amount of fat to be removed must not be great.

In order to help settle, on a scientific basis, the question of the type of lard hog that would most economically meet the foregoing requirements, the Illinois Agricultural Experiment Station in 1922 began a series of investigations. Five types of lard hog—*Very Chuffy, Chuffy, Intermediate, Rangy,* and *Very Rangy*—were used in the experiments. The results are discussed in three separate publications, as noted on the opposite page; facts concerning the rate and economy of gains being reported in this bulletin, those having to do with the quality of the carcass in another, and those bearing upon the science of nutrition in another.

By way of summary it may be said that in these experiments type proved not to be a controlling factor in the rate and economy of gains made. From the butcher's standpoint, however, that of quality of carcass, the Intermediate type (Fig. 3, page 346), either hand-fed or self-fed, proved the most desirable, tho the Rangy type was quite acceptable when self-fed. Taking all facts into consideration, the evidence thus points to the Intermediate type of lard hog as the one best suited for the present-day pork producer.

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TYPE IN SWINE AS RELATED TO RATE AND ECONOMY OF GAIN

By W. E. Carroll, Sleeter Bull, J. B. Rice, R. J. Laible, and R. A. Smith[1]

Type in animals has been described as "that combination of characters which makes an animal highly useful for a given purpose." Applied to swine this would mean an animal with power to convert, rapidly and economically, the ordinary swine feeds into pork products of high quality.

Of all farm animals swine have been the most plastic in the hands of breeders. Anyone acquainted with the changes in swine type that have occurred during the last twenty-five years will agree that this plasticity has been utilized to the fullest extent during that time.

While changes have occurred in all the major breeds of swine, those that have taken place in the Poland China breed are especially interesting because they first came, not from widely different blood lines, but from animals of the same breeding. The small type, with its great quality and refinement, reached the height of its development thru selections made among the offspring of the boar Chief Perfection 2d, farrowed October 16, 1896. This boar is reported to have been "an outstanding breeding boar, and produced as large, growthy offspring as any boar, but unfortunately, was the victim of a great craze for six white points by the breeder, and only the finer, smaller sons were kept for breeders."[2]

Chief Price, farrowed a year and a half later (April 10, 1898) is termed the "father of the big types."[3] A most interesting feature in the history of these two animals which founded such divergent types in the Poland China breed is the fact that the old boar Chief Tecumseh 2d, the paternal grandsire of Chief Perfection 2d, was also the great-grandsire of Chief Price. This is indeed a striking illustration of what may be accomplished by selection in swine breeding.

The type set by the small, refined offspring of Chief Perfection 2d became extremely popular and dominated the swine shows and sales for many years. During this time the breeders of the larger type of hog were forced to content themselves with the supposedly greater practical utility of their animals, as any extensive sale of breeding stock was limited largely to prospective performance in the show ring and judges were selected who favored the small type.

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[1] W. E. Carroll, Chief in Swine Husbandry; Sleeter Bull, Associate Chief in Meats; J. B. Rice, formerly Assistant Chief in Swine Husbandry; R. J. Laible, formerly First Assistant in Animal Husbandry; and R. A. Smith, formerly Assistant in Swine Husbandry.

[2] Davis, J. R., and Duncan, H. S. History of Poland China swine, 1, 26. 1921.

[3] *Ibid.*, 29.

It was not until 1908[1] that the combination of circumstances which had sustained the small-type boom began definitely to give way before the alleged utility of the larger, growthier hog. As is so frequently true, breeders were then not content until they had gone to the other extreme in type. This change from a short, thick, low-set, early-fattening animal to a long, narrow, upstanding, shallow-bodied, slow-maturing one was accomplished in a remarkably short time when once it got under way. All gradations between the two extremes have been popular and at the time this investigation was undertaken (1922) were to be found on farms in the corn belt.

If animal form and function are so related in swine that certain types are more efficient pork producers than others, the determination of the most efficient type would have an immensely practical bearing on costs and profits in pork production. It was the consideration of this fact which prompted these investigations.

OBJECTS OF THE INVESTIGATION

The principal objects of these experiments were to determine the differences in rate and economy of gain among swine of different types, the carcass value of various types of lard hogs fed under corn-belt conditions, and the composition of gains and of carcasses. The present bulletin reports the results of the first phase of the study—the rate and economy of gains of the different types. Bulletin 322 gives the results of the carcass study. Bulletin 323 covers the study of the composition of carcasses and of gains and in addition presents data on the maintenance requirements of the different types at different live-weight levels; on the basis of these data and of data on the amount, composition, and digestibility of the feed consumed, estimates of the net energy value of the ration are made.

No attempt was made in this study to compare the different types of animals for breeding purposes.

The plan of the entire experiment, as conducted for three years (1922-1924), is outlined below.

PLAN OF THE INVESTIGATION

ANIMALS USED

Purebred Poland China pigs were selected for the test in place of grades because it was felt that the performance of the purebreds would be somewhat more dependable and uniform. The Poland China breed was selected because of the wide variation in type within it when

[1] *Loc. cit.*, 86, 98, 178.

these studies were begun (1922). A great deal of time was spent and care exercised in selecting the pigs to have them truly representative of the different types being studied. To accomplish this, purebred Poland China herds over a wide area of Illinois and Indiana were visited and studied each year (1922-1924). As spring pigs were found that represented the types being tested, they were purchased and shipped to the University. Uniformity of size, vigor, and prospect, as well as type, were given consideration in these selections.

The pigs were of approximately the same initial weight thruout, and care was taken to have the animals in the same group as nearly uniform and true to the type of that group as possible. In spite of the fact that the pigs were selected when they were young, they remained rather uniformly true to type as they grew out.

Following is a brief description of the different types used in these tests.

The *Very Chuffy* pigs were extremely short-bodied, low-set, thick animals of a type capable of being fattened at an early age tho never attaining an extremely large size. Perfection in this type was exemplified by the famous old boar, Chief Perfection 2d. The popularity of this type covered the period from about 1895 to 1908. (Fig. 1)

The *Chuffy* pigs were the same general type of animals as the Very Chuffy tho they were much less extreme and showed considerably more size and growthiness. (Fig. 2)

The *Intermediate* pigs were longer in both body and legs and lacked the thickness of back and early fleshing qualities of the Very Chuffy and Chuffy types. Animals of this type were popular in the show ring from 1915 to 1917. Some very popular recent show winners have also been of this type. (Fig. 3)

The *Rangy* pigs showed still more length of body and leg, were leaner and more growthy, showed a stronger arch to their backs and carried somewhat more bone than pigs of the three types just described. This type also is popular in the show ring at the present time. (Fig. 4)

The *Very Rangy* pigs were what the term implies—ranginess carried to the extreme. They were very long, narrow, and shallow of body, with long legs and strongly arched backs. They were heavy-boned, in some cases even approaching coarseness. The Very Rangy pigs represented the type which was popular in the show ring the year they were included in the experiment (1923). (Fig. 5)

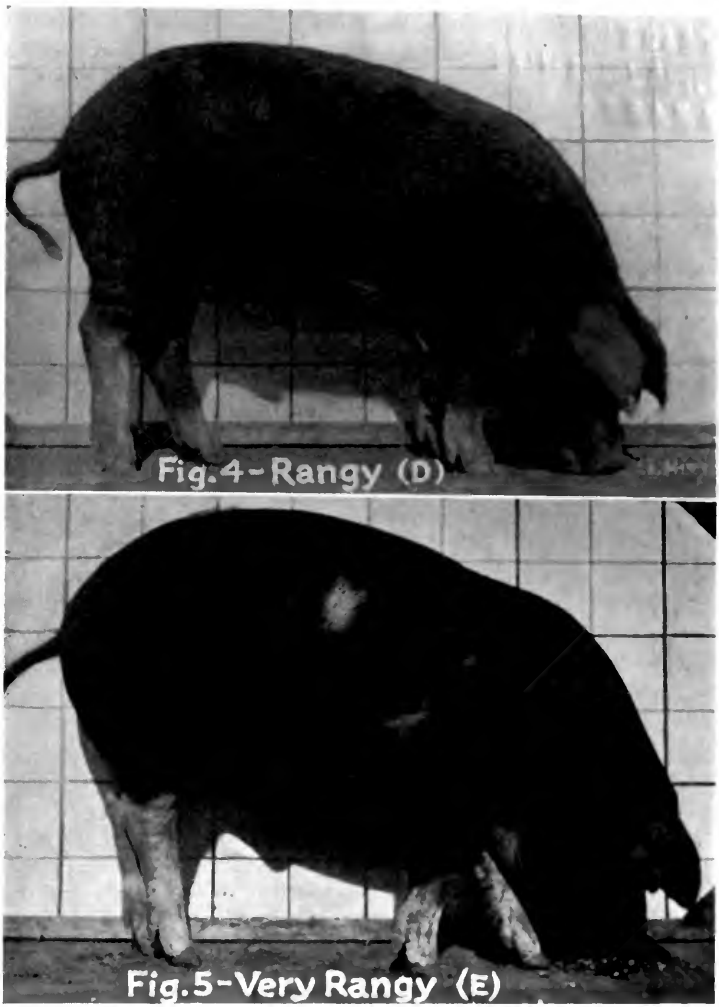
NUMBER AND DISPOSITION OF ANIMALS EACH YEAR

First Experiment. The experiment of the first year (1922-23) included 90 spring pigs, 30 of each of the three types, *Chuffy*, *Intermediate*, and *Rangy*.

Fig. 1-Very Chuffy (A)

Fig. 2-Chuffy (B)

Fig. 3-Intermediate (C)



FIGS. 1 TO 5.—REPRESENTATIVE PIGS OF EACH TYPE AT 225 POUNDS

The *Very Chuffy* pig represented here was fed individually as No. 17 in the second experiment. The *Chuffy* pig was self-fed as No. 1 in dry lot the same year, while Fig. 3 shows *Intermediate* pig No. 11 individually fed during the third experiment. The *Rangy* pig was fed individually as No. 5 in the second experiment, while the *Very Rangy* pig was No. 1 in the self-fed group the same year. Note the progressive change in length of leg, height of back, and length of body and a slight change in depth of body with increasing ranginess. A lower degree of finish was typical of the more rangy pigs at this weight.

Five representative pigs of each type were slaughtered as check pigs at the beginning of the test and their carcasses submitted to a detailed physical and chemical analysis. Five other representative pigs of each type were placed on a maintenance ration. At the completion of this maintenance trial they were slaughtered and analyzed, as were the check pigs.

The remaining 20 pigs of each type were fed individually to live weights of approximately 225 pounds. When they had reached this weight, 15 pigs of each type were submitted to detailed slaughter and cutting tests and physical and chemical analysis. The other five pigs of each type were put on a maintenance trial at a weight of approximately 225 pounds, after which they were slaughtered and analyzed chemically.

Second Experiment. The test of the second year (1923-24) was enlarged to include four groups of pigs self-fed in dry lot, in addition to the three types fed in individual feeding crates. Five different types were fed either individually or in groups this year.

The three types represented in the individual feeding were *Very Chuffy, Intermediate,* and *Rangy.* Five representative pigs of each of these types were slaughtered as checks and their carcasses analyzed chemically at the beginning of the test. A maintenance trial was conducted at the beginning of the test with five other representative pigs of these types. These animals were not slaughtered at the end of the trial as was done in 1922. Twenty pigs of each of these three types were put on feed in individual feeding crates. Of these, the following numbers were slaughtered and submitted to cutting tests and physical and chemical analysis at the live weights indicated:

	At approximate live weights of—		
	175 lbs.	225 lbs.	275 lbs.
Very Chuffy	6	3	2
Intermediate	3	7	4
Rangy	3	6	5

At the 225-pound weight 3 Very Chuffy pigs, 4 Intermediate pigs, and 5 Rangy pigs were put on a maintenance trial. They were not slaughtered at the close of the test. The pigs not accounted for in the above summary died of influenza during the course of the experiment.

The four groups of pigs self-fed in dry lot included 10 pigs each of the *Chuffy, Intermediate, Rangy,* and *Very Rangy* types. These pigs were fed to individual live weights of approximately 225 pounds. One Chuffy pig, one of the Intermediate type, and three Very Rangy pigs died before this weight was reached. The surviving pigs, except two Very Rangy pigs, were submitted to detailed slaughter and cutting tests, and the carcasses of five pigs of the Intermediate type were analyzed chemically. The two Very Rangy pigs were continued on

feed until they reached individual weights of approximately 275 pounds, at which time they were slaughtered and the carcasses studied.

A set of body measurements was taken of all pigs as they entered the test this year and of all pigs at the time they were slaughtered. This was done in order to determine whether a mathematical expression, or type index, could be established which would represent and vary with the type of the pig.

Third Experiment. In the third series of tests (1924-25) only two types of pigs were used, the *Intermediate* and the *Rangy*. These types were fed both in individual feeding crates in dry lot and self-fed in groups on alfalfa pasture. No pigs were slaughtered and analyzed as check pigs, and no maintenance trials were conducted; neither were the carcasses of the finished hogs submitted to chemical analysis.

The individual feeding was carried on with 40 pigs of the Intermediate type and 20 Rangy pigs. Twenty of the better Intermediate-type gilts were put in one group to be grown out for use in another project. While they were fed and handled exactly as the other pigs (except that none were slaughtered), their records of feed consumption and gains can hardly be considered strictly comparable with those of the other Intermediate pigs and will therefore not be presented here.

Eighteen pigs of each type, Intermediate and Rangy, were self-fed in two groups on alfalfa pasture.

The losses this year were not so heavy as those of the preceding year. One individual in the gilt lot was discarded because of failure to gain. Two Intermediate-type pigs, three of the individually fed Rangy pigs, and one self-fed Rangy pig died before the test was finished.

All pigs—those lot-fed as well as those fed in individual crates—were carried to individual weights of approximately 225 pounds. As the pigs reached this weight, they were submitted to detailed slaughter and cutting tests.

RATIONS USED AND METHODS OF FEEDING

Minor changes in the ration used were made from year to year, tho for any given year all types were fed the same ration. An attempt was also made to maintain all other conditions of the test as nearly uniform as possible, so that differences in type would be the only variable.

The individually fed pigs of each type were allowed to run together in a small dry lot except while they were being fed twice daily in individual feeding crates. Water was available in these lots. Movable houses were placed in each lot for shelter.

In the self-fed groups all the pigs of each type had access to the same self-feeder. These pigs were also sheltered in movable houses.

First Experiment. In the experiment of the first year all the pigs were hand-fed in individual feeding crates. They were started on a ration of corn and tankage. Each pig received 3 ounces of tankage once a day and what yellow shelled corn he would clean up twice daily. The tankage was not consumed readily, so at the end of eleven days it was mixed with wheat middlings in the proportion of 1 part tankage to 2 parts middlings. This mixture was fed once a day in amounts equal to one-half the daily corn consumption. Water was poured over the mixture as it was put into one section of the troughs, corn being fed in the other section. The evening feed consisted of shelled corn and water in separate sections of the troughs.

This proportion of feeds (2 of corn to 1 of the mixture) was continued until each pig reached a weight of 120 pounds. At this point the ration was changed to 4 parts corn to 1 part of the mixture, and this proportion was fed until the pigs reach weights of approximately 225 pounds or were removed from the test.

Second Experiment. In the experiment of the second year the ration of the pigs fed in individual feeding crates consisted of yellow shelled corn and a supplemental mixture of 8 parts wheat middlings, 4 parts tankage, and 1 part alfalfa meal. Until the pigs reached approximately 125 pounds, this mixture was fed once a day in amounts equal to one-third the daily corn consumption, as much yellow shelled corn being fed twice daily as the pigs would eat. (During the first 19 days the proportion was 2 parts of corn to 1 of the mixture.) Between the weights of 125 pounds and 225 pounds 1 part of the supplemental mixture was fed to each 4 parts of corn. The pigs that were carried to 275 pounds received 1 part of the mixture to 6 parts of corn after they reached the 225-pound mark. The method of feeding the corn, mixture, and water remained uniform thru the test and was the same as that followed the previous year.

The four groups of pigs self-fed in dry lot were allowed, thruout the test, free choice of yellow shelled corn and the same supplemental mixture used in the individual feeding; namely, 8 parts wheat middlings, 4 parts tankage, and 1 part alfalfa meal.

Third Experiment. In the third experiment the ration of the pigs fed in individual crates was again yellow shelled corn and a supplemental mixture. The mixture this year was composed of 8 parts wheat middlings, 5 parts tankage, and 1 part alfalfa meal. It differed slightly from the mixture fed the preceding year in that it contained 5 parts of tankage instead of 4 parts.

The proportion of corn to mixture fed from the beginning of the test until the pigs reached weights of approximately 125 pounds was 2 to 1. From this weight to the close of the test the pigs were fed

3 parts of corn to 1 part of the mixture. The methods of feeding were the same as in previous years.

In addition to the alfalfa pasture the self-fed groups received yellow shelled corn free-choice, with a mixture of 8 parts wheat middlings and 5 parts tankage.

A summary of the components of the rations fed during the three years is given in Table 1.

TABLE 1.—SUMMARY OF COMPONENTS OF RATIONS FED PIGS IN TYPE EXPERIMENTS

	Parts by weight		
	First experiment 1922-23	Second experiment 1923-24	Third experiment 1924-25
Rations hand-fed individually			
From beginning of test to live weight of 125 pounds[1]			
Yellow shelled corn	24	39	28
Mixed and fed wet			
Middlings	8	8	8
Tankage	4	4	5
Alfalfa meal	...	1	1
From live weight of 125 pounds to 225 pounds[2]			
Yellow shelled corn	48	52	42
Mixed and fed wet			
Middlings	8	8	8
Tankage	4	4	5
Alfalfa meal	...	1	1
Rations self-fed in groups			
In dry lot			
Yellow shelled corn	...	Self-fed	...
Mixed and fed free-choice with corn			
Middlings...8 parts Tankage....4 parts Alfalfa meal 1 part	...	Self-fed	...
On alfalfa pasture			
Yellow shelled corn	...	...	Self-fed
Mixed and fed free-choice with corn			
Middlings...8 parts Tankage....5 parts	...	...	Self-fed
Alfalfa pasture	...	...	Self-fed

[1]In the first experiment the pigs were fed 3 ounces of tankage per head daily, with shelled corn for the first 11 days of the test, at which time the mixture indicated was fed. The proportion of corn to mixture was changed at 120 pounds this year, instead of at 125 pounds. In the second experiment the feeds were fed in the proportion of 26 corn, 8 middlings, 4 tankage, and 1 alfalfa meal for the first 19 days of the test.

[2]In the second experiment, when some of the pigs were carried to a final weight of 275 pounds, the ratio between the corn and the mixture fed while the pigs were gaining from 225 pounds to 275 pounds was 6 to 1, or 78 parts of corn, 8 parts of middlings, 4 parts of tankage, and 1 part of alfalfa meal.

TABLE 2.—SUMMARY OF FEED CONSUMED AND GAINS MADE BY PIGS HAND-FED INDIVIDUALLY[1]
(All weights expressed in pounds)

To a weight of	125 pounds			175 pounds			225 pounds			275 pounds		
	Chuffy	Inter-mediate	Rangy	Chuffy	Inter-mediate	Rangy	Chuffy	Inter-mediate	Rangy	Chuffy	Inter-mediate	Rangy
First experiment, 1922-23												
Number of pigs	20	20	20	20	20	20	20	20	20	.....	.....	.....
Average days on test	70	74	92	111	112	132	141	142	166	.....	.....	.....
Average initial weight	70	62	62	70	62	62	70	62	62	.....	.....	.....
Average final weight	125	126	126	176	176	178	224	225	225	.....	.....	.....
Average total gain	55	64	64	106	114	116	154	163	163	.....	.....	.....
Average daily gain	.79	.86	.69	.95	1.02	.87	1.10	1.14	.98	.....	.....	.....
Feed for 100 pounds gain	376 (Very Chuffy)	347	385	390 (Very Chuffy)	365	388	388 (Very Chuffy)	376	406	.....	.....	.....
Second experiment, 1923-24												
Number of pigs	20	19	20	20	18	19	13	13	14	2	4	5
Average days on test	67	58	64	112	107	105	147	143	142	210	173	181
Average initial weight	71	73	70	71	73	70	71	72	70	71	74	70
Average final weight	124	126	128	177	177	175	224	227	225	275	276	274
Average total gain	53	53	58	106	104	105	153	155	155	204	202	204
Average daily gain	.80	.92	.91	.95	.98	.99	1.04	1.09	1.09	.97	1.17	1.13
Feed for 100 pounds gain	431	395	391	422	417	406	444	426	415	504	431	445
Third experiment, 1924-25												
Number of pigs	.....	20	20	.....	19	19	.....	17	18	.....	.....	.....
Average days on test	.....	43	47	.....	80	82	.....	114	121	.....	.....	.....
Average initial weight	.....	88	83	.....	88	83	.....	89	82	.....	.....	.....
Average final weight	.....	127	127	.....	176	172	.....	225	226	.....	.....	.....
Average total gain	.....	39	44	.....	88	89	.....	136	144	.....	.....	.....
Average daily gain	.....	.92	.93	.....	1.10	1.09	.....	1.19	1.19	.....	.....	.....
Feed for 100 pounds gain	.....	369	377	.....	383	385	.....	401	402	.....	.....	.....

[1]For the detailed data concerning the 125-pound pigs, see Tables 10 to 17 of the Appendix; for the 175-pound pigs, Tables 18 to 25; for 225-pound pigs, Tables 26 to 33; and for 275-pound pigs, Table 34.

RESULTS OF TYPE EXPERIMENTS WITH INDIVIDUALLY FED PIGS

In the tests in which the pigs were fed individually no wide or consistent variations in average daily gain or in feed required for 100 pounds gain appeared to accompany differences in type. A summary of the results of this group of experiments is given in Table 2.

A study of Tables 10 to 34 of the Appendix, from which Table 2 is derived, shows wide variations among the pigs of the same type in their feed consumption and in their power to make gains. A very general overlapping among different types in this respect is also shown; in fact, such overlapping is the rule. In the first experiment, for example, the average daily gains of the Chuffy pigs to a live weight of 175 pounds varied from .66 pound to 1.09 pounds, with an average for the 20 Chuffy pigs of .95 pound (Table 18). The average daily gain of the Intermediate-type pigs varied from .88 pound to 1.16 pounds, with an average for the type of 1.02 pounds (Table 19). The Rangy pigs the same year gained from .64 pound per head daily to 1.07 pounds, with a type average of .87 pound (Table 20).

In the experiment of the second year the average daily gains to a weight of 175 pounds varied between .86 pound and 1.14 pounds for the Very Chuffy pigs, with an average for all the pigs of this type of .95 pound (Table 21). For the pigs of the Intermediate type the lowest daily gain was .82 pound, the highest, 1.24 pounds, and the average, .98 pound per head (Table 22). The average daily gains made by the Rangy pigs varied from .82 pound to 1.20 pounds, with an average of .99 pound (Table 23).

The rates of gain for the two types fed in the third experiment were also very similar. For pigs of the Intermediate type fed to a weight of 175 pounds, the minimum daily gain was .82 pound, the maximum, 1.70 pounds, and the average for all pigs of this type, 1.10 pounds (Table 24). The average daily gain for all Rangy pigs this year was 1.09 pounds, with a minimum of .86 pound and a maximum of 1.31 pounds (Table 25).

What has been said relative to the overlapping of the daily gains of the different types is also true of their economy of gain, as shown by the amounts of feed required to make 100 pounds of increase in live weight (see Appendix tables as above).

RESULTS OF TYPE EXPERIMENTS WITH PIGS SELF-FED IN GROUPS

In the experiment of the second year 10 pigs of each of four types —Chuffy, Intermediate, Rangy, and Very Rangy—were self-fed in groups in dry lot. In the third experiment 18 pigs of the Inter-

TABLE 3.—GAINS MADE BY INDIVIDUAL PIGS OF DIFFERENT TYPES SELF-FED IN GROUPS IN DRY LOT: SECOND EXPERIMENT

Pig No. and sex[1]	Initial weight	Final weight	Total gain	Days in test	Average daily gain	Pig No. and sex	Initial weight	Final weight	Total gain	Days in test	Average daily gain
	Chuffy						Intermediate				
	lbs.	*lbs.*	*lbs.*		*lbs.*		*lbs.*	*lbs.*	*lbs.*		*lbs.*
1b	56	233	177	124	1.43	1s	65	220	155	103	1.50
2s	62	227	165	124	1.33	2b	58	214	156	116	1.34
3b	62	90	28	29[2]	.97	3s	71	221	150	103	1.46
4s	60	220	160	116	1.38	4b	73	203[5]	130	84	1.55
5b	73	229	156	116	1.34	5s	68	215	147	108	1.36
6s	70	236	166	163	1.02	6s	59	221	162	143	1.13
7b	50	237	187	124	1.51	7s	58	219	161	131	1.23
8b	69	218	149	108	1.38	8s	74	229	155	103	1.50
9b[3]	55	240	185	131	1.41	9b	68	233	165	108	1.53
10s	44	217	173	186	.93	10s	66	224	158	143	1.10
Average	60	229[4]	169[4]	132[4]	1.27	Average	66	220	154	114	1.35
	Rangy						Very rangy				
1b	73	228	155	131	1.18	1b	73	245	172	126	1.37
2b	54	229	175	131	1.34	2s	92	217	125	91	1.37
3b	64	218	154	93	1.66	3b	56	240	184	142	1.30
4s	64	234	170	131	1.30	4b	63	217	154	91	1.69
5b	85	226	141	93	1.52	5b	75	232	157	116	1.35
6s	76	223	147	116	1.27	6b	76	228	152	103	1.48
7s	67	230	163	131	1.24	7b	61	165[5]	104	84	1.24
8b	77	225	148	93	1.59	8b	53	114[5]	61	84	.73
9b	67	231	164	108	1.52	9b	53	242	189	113	1.67
10s	52	230	178	124	1.44	10b	50	165[5]	115	107	1.07
Average	68	227	159	115	1.39	Average	65	232[6]	162[6]	112[6]	1.34[7]

[1]b = barrow; s = sow. [2]This pig developed piles and was removed after being in the lot 29 days. [3]This pig was put in the lot 21 days after the test opened, replacing a pig that had lost 16 pounds during this time. [4]Average, omitting pig 3. [5]This pig died of "flu" before reaching the required weight. [6]Average, omitting pigs 7, 8, and 10. [7]The average daily gain of the seven very rangy pigs that completed the test was 1.45 pounds.

TABLE 4.—GAINS MADE BY INDIVIDUAL PIGS OF DIFFERENT TYPES SELF-FED IN GROUPS ON ALFALFA PASTURE: THIRD EXPERIMENT

Pig No. and sex[1]	Initial weight	Final weight	Total gain	Days in test	Average daily gain	Pig No. and sex	Initial weight	Final weight	Total gain	Days in test	Average daily gain
	Intermediate						Rangy				
	lbs.	*lbs.*	*lbs.*		*lbs.*		*lbs.*	*lbs.*	*lbs.*		*lbs.*
1b	93	229	136	69	1.97	1s	84	224	140	88	1.59
2s	100	222	122	63	1.94	2b	96	223	127	75	1.69
3b	92	225	133	80	1.66	3s	87	222	135	81	1.67
4b	96	228	132	63	2.10	4b	92	225	133	69	1.93
5s	102	225	123	73	1.68	5s	81	224	143	86	1.66
6s	87	224	137	75	1.83	6b	86	220	134	102	1.31
7b	103	233	130	75	1.73	7s	102	222	120	69	1.74
8b	93	224	131	80	1.64	8b	99	224	125	73	1.71
9b	111	236	125	58	2.16	9s	79	226	147	90	1.63
10b	102	227	125	69	1.81	10b	87	230	143	80	1.79
11b	101	224	123	73	1.68	11b	87	228	141	69	2.04
12b	91	227	136	90	1.51	12s	96	233	137	73	1.88
13b	82	225	143	93	1.54	13s	98	228	130	81	1.60
14b	82	231	149	97	1.54	14b	84	91[2]	7	25	.....
15b	83	227	144	81	1.78	15s	84	235	151	81	1.86
16s	74	224	150	88	1.70	16b	85	229	144	80	1.80
17b	70	225	155	93	1.67	17s	81	223	142	93	1.53
18b	100	226	126	58	2.17	18s	93	227	134	93	1.44
Average	92	227	135	77	1.76	Average	89[3]	226[3]	137[3]	81[3]	1.68[3]

[1]b = barrow; s = sow [2]Died after having been in the test 25 days. [3]Average, omitting Pig 14.

mediate type and a like number of Rangy pigs were self-fed in groups on alfalfa pasture. These group-fed pigs were carried until each pig reached a weight of approximately 225 pounds.

Two self-fed Very Rangy pigs in the second experiment were carried to final weights of approximately 275 pounds. This was done not so much to determine their gains and feed consumption as to get some indication of the weight at which they would present a suitable market finish. During the period of advance from an average weight of 236 pounds to one of 282 pounds these two pigs gained at the rate of 1.78 pounds each daily on a daily feed consumption of 9.53 pounds per head and required 534 pounds of total feed to produce 100 pounds of gain.

The individual weights and gains of the group-fed pigs are shown in Tables 3 and 4, while Table 5 gives a summary by types of the gains and feed consumption of these pigs. A glance at Table 5 suggests that the Chuffy pigs gained more slowly in dry lot than did pigs of the other types. However, when the individual gains are studied

TABLE 5.—SUMMARY OF GAINS AND FEED CONSUMPTION OF PIGS SELF-FED IN DRY LOT AND ON ALFALFA PASTURE

	Dry lot, second experiment				Alfalfa pasture, third experiment	
	Chuffy	Inter-mediate	Rangy	Very Rangy	Inter-mediate	Rangy
Number of pigs started	10	10	10	10	18	18
Number of pigs finished	9	10[2]	10	7	18	17
Total pig days	1 221	1 142[2]	1 151	1 057	1 378	1 408
Average days in test	132[1]	114[2]	115	112[1]	77	81[1]
	lbs.	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*
Average initial weight	60[1]	66	68	65	92	89[1]
Average final weight	229[1]	220[2]	227	232[1]	227	226[1]
Total gain	1 546	1 539	1 595	1 413	2 420	2 333
Average daily gain	1.27	1.35	1.39	1.34	1.76	1.68[1]
Average daily ration						
Corn	4.05	4.00	4.25	3.78	5.62	5.53
Tankage	.34	.45	.46	.51	.35	.28
Middlings	.69	.90	.91	1.03	.55	.44
Alfalfa meal	.09	.11	.11	.13	.....	.....
Total	5.17	5.46	5.73	5.45	6.52	6.25
Feed for 100 pounds gain						
Corn	320	297	307	282	320	333
Tankage	27	33	33	38	20	17
Middlings	54	67	66	77	31	27
Alfalfa meal	7	8	8	10	.....	.....
Total	408	405	414	407	371	377

[1]For pigs that finished. [2]Includes data for one pig to a weight of 203 pounds.

(Table 3), this low average gain for the type is seen to be due to two pigs—No. 3, which was removed from the test, and No. 10. Omitting these two pigs from the calculation, the average daily gain for

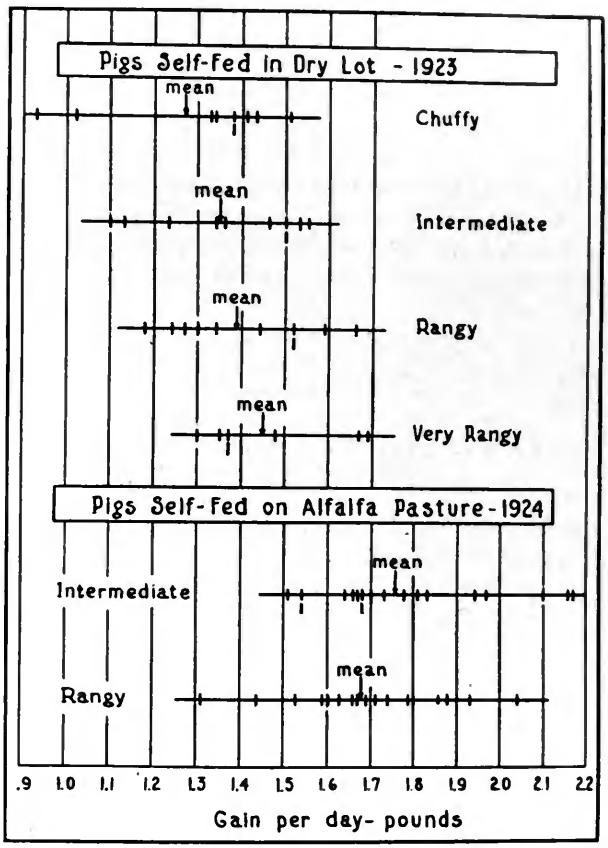


FIG. 6.—DISTRIBUTION OF AVERAGE DAILY GAIN OF THE PIGS SELF-FED IN GROUPS IN DRY LOT AND ON ALFALFA PASTURE

Aside from one or two extreme individuals the pigs each year are seen to have gained at much the same rate.

the group becomes 1.34 pounds, a gain well in line with that made by pigs of the other three types.

The amounts of feed required to produce 100 pounds of gain on pigs of the four types in dry lot are practically identical. The slight variations shown between types cannot be considered significant.

The group of Intermediate pigs self-fed on alfalfa pasture gained somewhat more rapidly than did the group of Rangy pigs fed under

similar conditions—1.76 pounds per head daily compared with 1.68 pounds. This difference is small, and in view of the individual variation in gains shown in Table 4 and the analysis which follows in the next section, can hardly be considered significant.

The two types of pigs, Intermediate and Rangy, required very nearly the same amounts of feed (other than pasture) to produce 100 pounds of gain.

The distribution of the average daily gains made by the individual pigs self-fed in groups is shown graphically in Fig. 6. A study of this figure emphasizes the fact that the differences between the mean daily gains of the different types of pigs are pretty largely the result of one or two extreme pigs. For example, the range in rate of gain of the dry-lot Chuffy pigs, if two slow-gaining pigs are omitted, is entirely covered by the range in the rate of gain of the pigs of the other three types.

Likewise, the rates of gain of the two types of pigs self-fed on pasture cover the same range, aside from a very few extreme animals.

DO THESE DIFFERENCES INDICATE SIGNIFICANT TYPE DIFFERENCES

To determine whether the differences in rate and economy of gain made by the pigs in these experiments are really significant of type differences, a mathematical analysis of the data was made. This analysis included the gains and feed consumption of the pigs hand-fed individually from an initial weight of approximately 70 pounds to a final weight of approximately 175 pounds. This final weight was chosen rather than the 225-pound weight because many of the pigs in the experiment of the second year were affected by "flu" before they reached this heavier weight. It is felt, however, that the gain made during this period is a true measure of the pig's capacity to gain.[1] The gains of the pigs self-fed in groups were also submitted to this mathematical study. As group feeding eliminates the possibility of knowing the feed consumption of each pig, the economy of gain made by the group-fed pigs cannot be treated in this manner.

ANALYSIS OF DIFFERENCES IN AVERAGE DAILY GAIN

The first step in the determination of the significance of such results is to compute the probable errors of the values obtained. The results of such a computation for the mean daily gain of the pigs of

[1] Correlating the rates of gain to 175 pounds with the rates of gain of the same pigs to a weight of 225 pounds gave a coefficient of $+.904 \pm .010$ for the 152 such records that are available from these experiments.

TABLE 6.—PROBABLE ERROR OF MEAN DAILY GAIN OF PIGS OF DIFFERENT TYPES

Experiment	Type	Number of pigs	Mean daily gain	Probable error of mean
Hand-fed individually to approximately 175 pounds				
First	Chuffy	20	.95	.014
	Intermediate	20	1.02	.010
	Rangy	20	.87	.017
Second	Very chuffy	20	.95	.012
	Intermediate	18	.98	.018
	Rangy	19	.99	.019
Third	Intermediate	19	1.10	.032
	Rangy	19	1.09	.020
Self-fed in dry lot to approximately 225 pounds				
Second	Chuffy	10	1.27	.043
	Intermediate	10	1.35	.034
	Rangy	10	1.39	.033
	Very rangy	10	1.34	.057
Self-fed on alfalfa pasture to approximately 225 pounds				
Third	Intermediate	18	1.76	.032
	Rangy	17	1.68	.029

each type hand-fed individually each year and those self-fed in groups are recorded in Table 6.

The probable error of the mean is a value above and below the mean such that if the test were repeated under the same conditions and with animals of the same capacities, there would be, on the average, equal chances that the mean would fall within or without this range. As an illustration, consider again the Chuffy pigs fed in the first experiment to a weight of 175 pounds. The average gain of these 20 pigs was .95 pound per head daily. The probable error of this mean is $\pm$.014 pound. This means that if the test were repeated under the same conditions which surrounded this experiment and with 20 similar pigs, there would be one chance in two that the average daily gain of the group would fall between .936 pound and .964 pound (.95 $\pm$ .014), with an equal chance also that it would fall outside these limits. In other words, the probable errors of the means given in the last column of the table indicate the variation to be expected among the mean results of a series of repetitions of this experiment but give no information concerning the differences between means representing the type differences with which the experiment is more directly concerned.

Whether these differences in daily gain between types are actually significant has been tested by computing the probable error of the

TABLE 7.—PROBABLE SIGNIFICANCE OF DIFFERENCES BETWEEN MEAN DAILY GAIN OF PIGS OF DIFFERENT TYPES

Experiment	Types compared	Difference in mean gain between types	Probable error of difference	Ratio of difference to probable error
Hand-fed individually to approximately 175 pounds				
First	Chuffy and Intermediate	.07	.017	4.1
	Chuffy and Rangy	.08	.022	3.6
	Intermediate and Rangy	.15	.020	7.5
Second	Very Chuffy and Intermediate	.03	.022	1.4
	Very Chuffy and Rangy	.04	.022	1.8
	Intermediate and Rangy	.01	.026	.4
Third	Intermediate and Rangy	.01	.038	.3
Self-fed in dry lot to approximately 225 pounds				
Second	Chuffy and Intermediate	.08	.055	1.4
	Chuffy and Rangy	.12	.054	2.2
	Chuffy and Very Rangy	.07	.071	1.0
	Intermediate and Rangy	.04	.047	.9
	Intermediate and Very Rangy	.01	.066	.2
	Rangy and Very Rangy	.05	.066	.8
Self-fed on alfalfa pasture to approximately 225 pounds				
Third	Intermediate and Rangy	.08	.043	1.9

difference between the means of each pair of types each year. This was done by taking the square root of the sum of the squares of the probable errors of the two means. The results of these computations are given in Table 7. For example, in the first experiment the average daily gain of pigs of the Intermediate type was .07 pound greater than that of the Chuffy pigs. The probable error of this difference is ±.017. The difference, therefore, is 4.1 times its probable error.

The significance of these differences in average daily gain between types depends upon their relation to their respective probable errors. A difference which is three times (or more) its probable error is considered significant, since the chances that the true value lies *within* the range set by three times the probable error are 21 to 1. If a difference is four times its probable error, the odds are 142 to 1 that the true value will not fall outside the limits set, and if the difference is as much as seven times its probable error, the odds are 420,000 to 1. In other words, this biometrical analysis of the significance of average differences in rate of gain between the different types of pigs is concerned with the question whether the difference in each comparison is or is not the result merely of the uncontrolled experimental conditions operating within each type group. If it may fairly be considered as due only to such variable factors, then the difference is not statistically

different from zero. On the other hand, if it appears improbable that these uncontrolled factors are alone responsible for the average difference in rate of gain, then the deliberately imposed difference between experimental groups, that of type, may be considered as operating.

The ratios of the differences between types to their respective probable errors, as given in the last column of the table, are not without inconsistencies. In the first experiment the differences in rate of gain between each two types compared were highly significant in all cases. Pigs of the Rangy type gained most slowly this year and those of the Intermediate type most rapidly. The difference in rate of gain of .08 pound between the Rangy and the Chuffy pigs is 3.6 times its probable error; the difference of .07 pound in average daily gain between the Chuffy and the Intermediate pigs is 4.1 times its probable error, while the difference of .15 pound between the rates of gain of pigs of the Rangy and the Intermediate types is 7.5 times its probable error. All these differences, therefore, appear to be highly significant.

If chuffiness were actually the cause of the slow gains in the first experiment, then the Very Chuffy pigs used in the second year should presumably have gained even more slowly in comparison with pigs of the Intermediate type because their chuffiness was more pronounced. As a matter of fact, the actual difference between the two types in the second experiment was less than half the difference between the Chuffy and the Intermediate in the first experiment, and the probable error of the difference is so large as to render the difference totally insignificant.

Instead of the difference in rate of gain of the Intermediate and the Rangy types of hand-fed pigs in the second experiment confirming the very significant difference between these types found in the first experiment, the Rangy pigs actually gained .01 pound more rapidly per head daily than did pigs of the Intermediate type. This difference, however, is not significant, as the probable error is even larger than the difference itself. Neither is the difference between the Very Chuffy and the Rangy pigs significant this year.

In the third experiment only two types of pigs were fed individually, the Intermediate and the Rangy. The pigs of the Intermediate type gained at a slightly more rapid rate than the Rangy pigs. The probable error of the difference between the two, however, is greater than the difference itself, and hence the difference cannot be considered significant.

The same lack of significance of differences in gain between types observed in the hand-fed pigs is seen to exist in the group-fed pigs, whether these were self-fed in dry lot or on alfalfa pasture. These results are given in the second and third sections of Tables 6 and 7.

ANALYSIS OF DIFFERENCES IN ECONOMY OF GAIN

A study similar to that made of the rate of gain of the different types of pigs was made of the feed they required to produce 100 pounds of gain. Since the feed consumption of group-fed pigs does not lend itself to such a study, the calculation of the significance of the differences in economy of gain are of necessity limited to the pigs fed individually. This study is summarized in Tables 8 and 9. The probable errors of the mean feed for 100 pounds gain as given in Table 8 were computed by the same method used for the probable errors of the mean daily gain given in Table 6 and discussed above, while the probable significance of these differences included in Table 9 was calculated by the method outlined above in connection with Table 7.

These calculations reveal the fact that pigs of the Intermediate type in the first experiment required significantly less feed to produce 100 pounds of gain than was required by the Chuffy or the Rangy pigs. These differences are 5.5 and 5.3 times their respective probable errors. The differences in feed requirements of the Chuffy and the Rangy pigs that year were not significant; neither were there any significant differences in feed requirements between types during the next two years. The small difference which did exist between the Intermediate and Rangy types the second year was in favor of the Rangy pigs rather than the Intermediate pigs, as it was the first year and was again the third year.

Such apparently conflicting results it would seem may be due either to the fault of the statistical method of analysis or to the method of selecting or managing the pigs in successive years. The statistical method is based upon such secure logic, however, that it would be rash to impeach it on the basis of a limited series of experimental results. It seems far more probable, therefore, that, for some reason not

TABLE 8.—PROBABLE ERROR OF THE MEAN FEED REQUIRED FOR 100 POUNDS GAIN BY PIGS OF DIFFERENT TYPES HAND-FED INDIVIDUALLY FROM APPROXIMATE WEIGHTS OF 70 POUNDS TO 175 POUNDS

Experiment	Type	Number of pigs	Mean for lot	Probable error of mean
First	Chuffy	20	390	3.54
	Intermediate	20	365	2.80
	Rangy	20	388	3.28
Second	Very chuffy	20	422	4.93
	Intermediate	18	417	4.70
	Rangy	19	406	3.11
Third	Intermediate	19	383	5.09
	Rangy	19	385	5.48

TABLE 9.—PROBABLE SIGNIFICANCE OF DIFFERENCES BETWEEN AVERAGE AMOUNTS OF FEED REQUIRED TO MAKE 100 POUNDS OF GAIN ON PIGS OF DIFFERENT TYPES

Experiment	Types compared	Difference in mean feed required between types	Probable error of difference	Ratio of difference to probable error
First	Chuffy and Intermediate	25	4.51	5.5
	Chuffy and Rangy	2	4.83	.4
	Intermediate and Rangy	23	4.31	5.3
Second	Very Chuffy and Intermediate	5	6.81	.7
	Very Chuffy and Rangy	16	5.83	2.7
	Intermediate and Rangy	11	5.64	2.0
Third	Intermediate and Rangy	2	7.48	.3

apparent, the second and third experiments were not, in truth, repetitions of the first, either because of gross differences in the experimental treatment of the pigs or in their selection.

The feeding of the pigs varied slightly in the individual experiments, but these differences seem entirely incapable of explaining the apparently inconsistent outcome of the statistical analysis. The other experimental conditions relating to shelter, confinement, etc., were the same from year to year. The weather conditions, of course, varied, but it appears improbable that actual type differences in rate and economy of gains, if such existed, would be obliterated or reversed by such ordinary differences in weather that existed among the three experimental years.

Hence the most probable explanation of the situation would seem to be in the selection of the pigs in the different years. The results obtained in the second and third experiments are sufficient basis for the conclusion that the differences in type existing among these experimental groups of pigs are not necessarily associated with differences in the rate or economy of gains.

Hence the apparently significant differences noted in the first experiment among the different groups of pigs are in all probability related not to their type but to some other characters for which they were unconsciously selected. In the first experiment, for example, the Intermediate-type pigs, to a considerably greater extent than the other types, may have been selected from herds possessing greater vigor and hence greater avidity for food, or possessing more phlegmatic temperament and hence smaller maintenance requirements. These characteristics, it is evident, are not necessarily associated with any particular conformation of body. However, they may conceivably be modified by different methods of breeding and very probably by different methods of feeding the mother sows or the weanling pigs.

SUMMARY AND CONCLUSIONS

The fifteen-year period following 1908 witnessed the development and the growing popularity of a new type of hog within the standard breeds of swine in the United States. In this new type, length of body and leg and strength of the arch of back were emphasized at the expense of depth and width of body and strength of constitution. When this work was undertaken in 1922 pigs of all gradations in type from the extremely short, thick, low-set, chuffy animal to the long, tall, narrow, shallow-bodied, rangy one were to be found on farms in the corn belt.

If animal form and function are related in swine to the extent that certain types are more efficient pork producers than others, to determine the most efficient type would have an immensely practical bearing on costs and profits in pork production. It was the consideration of this fact which prompted these investigations.

A total of 316 spring pigs of 5 different types were studied during the years 1922-1924 to determine if rate and economy of gain are correlated with type in swine. Pigs of different types were full hand-fed in individual feeding crates and self-fed in groups in dry lot and on alfalfa pasture. The rations fed consisted of yellow shelled corn and a supplemental mixture of tankage and wheat middlings. During the second and third years the mixture fed in dry lot contained alfalfa meal.

A majority of the pigs were fed from an initial weight of approximately 70 pounds to a final weight of approximately 225 pounds. Some were fed only to a weight of 175 pounds, and a few were carried to a final weight of 275 pounds.

Records are presented of the gain made by each pig in each test. Individual feed records are presented for all pigs except those which were fed in groups, in which case the feed consumption of the group is given.

There was some evidence during the progress of these experiments tending to indicate that hogs of the Intermediate type made somewhat more rapid and economical gains than those of either extreme. When submitted to statistical analysis, however, the data show that these apparent differences are not significant, with the possible exception of the inferiority of pigs of the Chuffy type.

The conclusion that type in swine is not a controlling factor in either their rate or economy of gain seems, therefore, to be justified. The reader is reminded, however, as stated in the Foreword, that in the study of type as related to quality of pork produced (Bulletin 322), the Intermediate type of pig produced a carcass that proved definitely superior to those of the other types when judged by the de-

mands of the present-day pork market. This was particularly true under hand-feeding.

Since the Intermediate type of pig makes as rapid and as economical gains in the feed lot as do the other types and at the same time produces a carcass that more nearly meets the demands of the market, it seems reasonable to recommend it to the producer as superior to the other types studied.

APPENDIX

Individual data for—

TABLE 10.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE CHUFFY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 125 POUNDS: FIRST EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1b	2b	3b	4s	5s	6s	7b	8s	9b	10b	11b	12b	13s	14s	15b	16b	17b	18b	19b	20b	Aver.
Days to reach weight	56	56	112	70	84	84	56	70	70	70	70	70	84	56	70	70	56	70	70	56	70
Initial weight	73	75	72	59	62	65	72	68	61	76	75	68	64	77	65	71	76	65	77	81	70
Final weight	130	124	123	118	132	132	121	122	116	124	133	131	127	127	126	124	124	124	125	125	125
Total gain	57	49	51	59	70	67	49	54	55	48	58	63	63	50	61	53	48	59	48	44	55
Average daily gain	1.02	.88	.46	.84	.83	.80	.88	.77	.79	.69	.83	.90	.75	.89	.87	.76	.86	.84	.69	.79	.79
Total feed consumed																					
Corn	142	125	187	141	168	174	129	134	137	141	161	167	159	124	155	134	121	146	142	126	146
Tankage	22	19	29	22	25	25	20	21	21	20	23	24	25	19	24	21	19	23	21	19	22
Middlings	39	34	56	40	45	47	35	38	38	36	41	44	46	34	45	39	33	42	38	34	40
Total	203	178	272	203	238	246	184	193	196	197	225	235	230	177	224	194	173	211	201	179	208
Average daily ration																					
Corn	2.54	2.23	1.67	2.02	2.00	2.07	2.30	1.92	1.96	2.01	2.30	2.39	1.89	2.21	2.22	1.91	2.16	2.08	2.03	2.25	2.08
Tankage	.39	.34	.26	.31	.30	.30	.36	.30	.30	.29	.33	.34	.30	.34	.34	.30	.34	.33	.30	.34	.32
Middlings	.70	.61	.50	.57	.53	.56	.63	.54	.54	.51	.58	.63	.55	.61	.64	.56	.59	.60	.54	.61	.57
Total	3.63	3.18	2.43	2.90	2.83	2.93	3.29	2.76	2.80	2.81	3.21	3.36	2.74	3.16	3.20	2.77	3.09	3.01	2.87	3.20	2.97
Feed for 100 lbs. gain																					
Corn	249	255	366	239	240	260	263	248	249	293	277	265	252	248	254	253	252	248	296	287	263
Tankage	39	39	57	37	36	37	41	39	38	42	40	38	40	38	39	39	39	39	44	43	40
Middlings	68	69	110	68	64	70	72	70	69	75	71	70	73	68	74	74	69	71	79	77	73
Total	356	363	533	344	340	367	376	357	356	410	388	373	365	354	367	366	360	358	419	407	376

TABLE 11.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE INTERMEDIATE TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 125 POUNDS: FIRST EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1s	2s	3b	4b	5b	6b	7b	8b	9s	10b	11b	12s	13s	14s	15s	16s	17b	18b	19b	20s	Aver.
Days to reach weight	70	70	70	56	70	70	70	70	70	84	56	70	70	98	70	70	98	84	84	84	74
Initial weight	58	55	69	65	67	69	63	64	59	57	72	64	59	52	61	68	66	51	63	54	62
Final weight	121	118	124	119	127	126	120	135	128	126	129	121	124	130	122	131	133	122	132	126	126
Total gain	63	63	55	54	60	57	57	71	69	69	57	57	65	78	61	63	67	71	69	72	64
Average daily gain	.90	.90	.79	.96	.86	.81	.81	1.01	.99	.82	1.02	.81	.93	.80	.87	.90	.68	.85	.82	.86	.86
Total feed consumed																					
Corn	147	138	149	118	148	144	142	166	155	181	131	129	150	183	146	155	194	171	171	180	155
Tankage	24	22	22	18	22	20	22	24	24	27	20	21	23	28	23	23	30	28	25	26	24
Middlings	44	40	39	33	39	37	40	44	44	51	36	39	42	53	42	41	57	51	45	49	43
Total	215	200	210	169	209	201	204	234	223	259	187	189	215	264	211	219	281	250	241	255	222
Average daily ration																					
Corn	2.10	1.97	2.13	2.11	2.12	2.05	2.03	2.37	2.22	2.15	2.34	1.84	2.14	1.87	2.08	2.21	1.98	2.04	2.03	2.15	2.09
Tankage	.34	.32	.31	.32	.31	.29	.31	.34	.34	.32	.36	.30	.33	.28	.33	.33	.31	.33	.30	.31	.32
Middlings	.63	.57	.56	.59	.56	.53	.57	.63	.63	.61	.64	.56	.60	.54	.60	.59	.58	.61	.54	.58	.58
Total	3.07	2.86	3.00	3.02	2.99	2.87	2.91	3.34	3.19	3.08	3.34	2.70	3.07	2.69	3.01	3.13	2.87	2.98	2.87	3.04	2.99
Feed per 100 lbs. gain																					
Corn	233	219	271	219	246	253	249	234	225	262	230	227	231	234	239	246	289	211	248	250	242
Tankage	38	35	40	33	37	35	39	34	35	39	35	37	35	36	38	37	45	39	36	36	37
Middlings	70	63	71	61	65	65	70	62	64	74	63	68	65	68	69	65	85	72	65	68	68
Total	341	317	382	313	348	353	358	330	323	375	328	332	331	338	346	348	419	352	349	354	347

TABLE 12.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE RANGY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 125 POUNDS: FIRST EXPERIMENT

(All weights expressed in pounds)

Pig number and sex ..	1b	2b	3b	4b	5b	6b	7b	8b	9b	10b	11b	12b	13b	14b	15s	16b	17b	18b	19s	20b	Aver.
Days to reach weight	84	70	112	98	84	126	84	112	84	84	70	84	84	84	112	84	84	140	98	70	92
Initial weight	58	59	58	57	64	59	69	51	70	65	67	70	65	74	52	60	66	56	63	66	62
Final weight	122	122	131	117	124	130	132	134	127	126	128	121	130	122	123	124	130	125	124	123	126
Total gain	64	63	73	60	60	71	63	83	57	61	61	51	65	48	71	64	64	69	61	57	64
Average daily gain	.76	.90	.65	.61	.71	.56	.75	.74	.68	.73	.87	.61	.77	.57	.63	.76	.76	.49	.62	.81	.69
Total feed consumed																					
Corn	163	148	203	167	154	187	157	215	156	156	161	158	186	127	180	156	173	223	160	151	169
Tankage	26	24	31	27	26	30	23	33	23	24	25	25	26	20	30	26	26	33	26	22	26
Middlings	48	43	58	49	48	56	42	63	42	43	46	45	47	37	56	47	48	64	48	41	49
Total	237	215	292	243	228	273	222	311	221	223	232	228	259	184	266	229	247	320	234	214	244
Average daily ration																					
Corn	1.94	2.12	1.81	1.70	1.83	1.49	1.87	1.92	1.86	1.86	2.30	1.88	2.21	1.51	1.61	1.86	2.06	1.59	1.63	2.16	1.83
Tankage	.31	.34	.28	.28	.31	.24	.27	.30	.27	.28	.36	.30	.31	.24	.27	.31	.31	.24	.27	.31	.28
Middlings	.57	.61	.52	.50	.57	.44	.50	.56	.50	.51	.65	.53	.56	.44	.50	.56	.57	.46	.49	.59	.53
Total	2.82	3.07	2.61	2.48	2.71	2.17	2.64	2.78	2.63	2.65	3.31	2.71	3.08	2.19	2.38	2.73	2.94	2.29	2.39	3.06	2.64
Feed for 100 lbs. gain																					
Corn	254	235	278	278	257	264	249	259	274	256	264	310	286	264	254	244	270	323	262	265	267
Tankage	41	38	43	45	43	42	36	40	40	39	41	49	40	42	42	41	41	48	43	38	41
Middlings	75	68	79	82	80	79	67	76	74	71	75	88	72	77	79	73	75	93	79	72	77
Total	370	341	400	405	380	385	352	375	388	366	380	447	398	383	375	358	386	464	384	375	385

TABLE 13.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE VERY CHUFFY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 125 POUNDS: SECOND EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1s	2s	3s	4b	5s	6b	7b	8b	9s	10s	11b	12s	13s	14b	15b	16s	17b	18b	19b	20s	Aver.
Days to reach weight	70	70	56	70	70	70	70	56	79	79	56	63	70	56	49	70	79	56	65	70	67
Initial weight	71	75	70	67	73	69	71	69	69	67	70	71	70	73	73	71	74	74	73	72	71
Final weight	127	119	120	121	125	133	130	124	130	126	120	125	121	121	120	123	127	119	132	120	124
Total gain	56	44	50	54	52	64	59	55	61	59	50	54	51	48	47	52	53	45	59	48	53
Average daily gain	.80	.63	.89	.77	.74	.91	.84	.98	.77	.75	.89	.96	.65	.86	.96	.74	.67	.80	.91	.69	.80
Total feed consumed																					
Corn	185	166	143	184	180	184	190	164	187	241	146	161	196	150	136	174	190	128	179	175	173
Tankage	18	16	14	18	17	18	19	16	19	24	14	16	20	14	15	17	19	13	17	18	17
Middlings	36	32	28	35	35	37	39	33	38	48	29	33	40	29	29	33	38	25	35	35	35
Alfalfa meal	4	4	4	4	4	5	5	4	5	6	4	4	5	4	4	4	5	3	4	4	4
Total	243	218	189	241	236	244	253	217	249	319	193	214	261	197	184	228	252	169	235	232	229
Average daily ration																					
Corn	2.64	2.37	2.55	2.63	2.57	2.63	2.71	2.93	2.37	3.05	2.61	2.56	2.48	2.68	2.78	2.49	2.41	2.29	2.76	2.49	2.59
Tankage	.26	.23	.25	.25	.24	.26	.27	.29	.24	.30	.25	.26	.25	.25	.31	.24	.24	.23	.26	.26	.26
Middlings	.51	.45	.50	.50	.50	.53	.56	.59	.48	.61	.52	.52	.51	.52	.59	.47	.48	.45	.54	.50	.52
Alfalfa meal	.06	.06	.07	.06	.06	.07	.07	.07	.06	.08	.07	.06	.06	.07	.08	.06	.06	.05	.06	.06	.06
Total	3.47	3.11	3.37	3.44	3.37	3.49	3.61	3.88	3.15	4.04	3.45	3.40	3.30	3.52	3.76	3.26	3.19	3.02	3.62	3.31	3.43
Feed for 100 lbs. gain																					
Corn	331	377	286	341	346	287	323	299	307	409	292	298	384	313	289	334	358	284	303	364	326
Tankage	32	36	28	33	33	28	32	29	31	41	28	30	39	29	32	33	36	29	29	38	32
Middlings	64	73	56	65	67	58	66	60	62	81	58	61	79	60	62	63	72	56	59	73	65
Alfalfa meal	7	9	8	7	8	8	8	7	8	10	8	7	10	8	8	8	9	7	7	8	8
Total	434	495	378	446	454	381	429	395	408	541	386	396	512	410	391	438	475	376	398	483	431

TABLE 14.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE INTERMEDIATE TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 125 POUNDS: SECOND EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1b	2b	3s	4s	5s	6s	7s	8s	9b	10s	11b	12b	13b	14b	15b	16b	17b	18s	19b	20s	Aver.
Days to reach weight	93	56	70	56	56	56		56	56	63	56	56	56	49	56	42	56	56	56	56	58
Initial weight	69	69	73	72	74	76		71	73	68	76	78	69	71	69	77	72	78	72	73	73
Final weight	133	118	131	119	127	129		121	128	121	128	129	134	123	122	119	130	134	126	125	126
Total gain	64	49	58	47	53	53		50	55	53	52	51	65	52	53	42	58	56	54	52	53
Average daily gain	.69	.88	.83	.84	.95	.95		.89	.98	.84	.93	.91	1.16	1.06	.95	1.00	1.04	1.00	.96	.93	.92
Total feed consumed																					
Corn	224	150	177	162	153	150		154	155	157	153	149	163	148	146	109	165	162	142	159	156
Tankage	23	15	18	16	17	17		17	17	16	17	16	18	16	16	13	18	18	14	18	17
Middlings	45	31	36	32	34	34		34	34	31	34	33	36	32	32	25	36	36	29	36	34
Alfalfa meal	6	4	4	4	4	4		4	4	4	4	4	4	4	4	3	5	4	4	4	4
Total	298	200	235	214	208	205		209	210	208	208	202	221	200	198	150	224	220	189	217	211
Average daily ration																					
Corn	2.41	2.68	2.53	2.89	2.73	2.68		2.75	2.77	2.50	2.73	2.66	2.92	3.02	2.61	2.59	2.95	2.90	2.54	2.84	2.71
Tankage	.25	.27	.26	.29	.30	.30		.30	.30	.25	.30	.29	.32	.33	.29	.31	.32	.32	.25	.32	.29
Middlings	.48	.55	.51	.57	.61	.61		.61	.61	.49	.61	.59	.64	.65	.57	.60	.64	.64	.52	.64	.58
Alfalfa meal	.06	.07	.06	.07	.07	.07		.07	.07	.06	.07	.07	.07	.08	.07	.07	.09	.07	.07	.07	.07
Total	3.20	3.57	3.36	3.82	3.71	3.66		3.73	3.75	3.30	3.71	3.61	3.95	4.08	3.54	3.57	4.00	3.93	3.38	3.87	3.65
Feed for 100 lbs. gain																					
Corn	350	306	305	345	288	283		308	282	296	294	292	251	284	276	259	284	290	263	305	293
Tankage	36	31	31	34	32	32		34	31	30	33	31	28	31	30	31	31	32	26	35	31
Middlings	71	63	62	68	64	64		68	62	58	65	65	55	62	60	60	62	64	54	69	63
Alfalfa meal	9	8	7	8	8	8		8	7	8	8	8	6	8	8	7	9	7	7	8	8
Total	466	408	405	455	392	387		418	382	392	400	396	340	385	374	357	386	393	350	417	395

Removed after 8 weeks on feed without gain

TABLE 15.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE RANGY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 125 POUNDS: SECOND EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1s	2b	3b	4b	5b	6b	7s	8b	9s	10b	11b	12b	13b	14b	15b	16b	17b	18b	19b	20b	Aver.
Days to reach weight	56	72	77	63	63	63	77	70	56	70	56	56	56	56	63	56	56	63	93	56	64
Initial weight	70	67	71	66	68	67	69	70	72	70	72	71	71	70	69	76	72	70	68	73	70
Final weight	119	126	128	129	125	121	130	137	127	130	125	126	134	123	124	136	129	131	139	124	128
Total gain	49	59	57	63	57	54	61	67	55	60	53	55	63	53	55	60	57	61	71	51	58
Average daily gain	.88	.82	.74	1.00	.90	.86	.79	.96	.98	.86	.95	.98	1.13	.95	.87	1.07	1.02	.97	.76	.91	.91
Total feed consumed																					
Corn	141	173	176	165	165	164	190	193	152	185	161	159	163	152	166	166	161	178	215	154	169
Tankage	16	17	18	18	16	16	20	20	17	19	18	18	18	17	18	18	18	19	22	17	18
Middlings	32	34	36	35	33	32	40	39	34	37	36	35	36	33	35	36	35	38	43	34	36
Alfalfa meal	4	4	4	4	4	4	5	5	4	5	4	4	4	4	4	5	4	5	5	4	4
Total	193	228	234	222	218	216	255	257	207	246	219	216	221	206	223	225	218	240	285	209	227
Average daily ration																					
Corn	2.52	2.40	2.29	2.61	2.61	2.61	2.47	2.75	2.72	2.64	2.88	2.84	2.92	2.72	2.63	2.97	2.88	2.83	2.31	2.75	2.64
Tankage	.29	.24	.23	.29	.26	.25	.26	.29	.30	.27	.32	.32	.32	.30	.29	.32	.32	.30	.24	.30	.28
Middlings	.57	.47	.47	.56	.53	.51	.52	.56	.61	.53	.64	.63	.64	.59	.56	.64	.62	.60	.46	.61	.56
Alfalfa meal	.07	.06	.05	.06	.06	.06	.06	.07	.07	.07	.07	.07	.07	.07	.06	.09	.07	.08	.05	.07	.07
Total	3.45	3.17	3.04	3.52	3.46	3.43	3.31	3.67	3.70	3.51	3.91	3.86	3.95	3.68	3.54	4.02	3.89	3.81	3.06	3.73	3.55
Feed for 100 lbs. gain																					
Corn	288	292	309	261	289	304	311	289	276	308	303	289	259	287	301	277	282	292	302	302	291
Tankage	33	29	32	29	28	30	33	30	31	32	34	33	29	32	33	30	32	31	31	33	31
Middlings	65	58	63	56	58	59	66	58	62	62	68	64	57	62	64	60	61	62	61	67	62
Alfalfa meal	8	7	7	6	7	7	8	7	7	8	8	7	6	8	7	8	7	8	7	8	7
Total	394	386	411	352	382	400	418	384	376	410	413	393	351	389	405	375	382	393	401	410	391

TABLE 16.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE INTERMEDIATE TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 125 POUNDS: THIRD EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1b	2b	3b	4s	5s	6b	7b	8s	9s	10b	11s	12s	13b	14b	15b	16b	17b	18b	19b	20s	Aver.
Days to reach weight	28	14	28	56	56	56	28	50	42	28	42	70	28	42	42	28	42	84	56	42	43
Initial weight	99	98	101	94	74	86	97	82	82	93	78	65	83	80	90	96	97	75	95	86	88
Final weight	124	120	129	133	134	125	127	130	127	131	121	136	127	127	127	125	131	130	121	122	127
Total gain	25	22	28	39	60	39	30	48	45	38	43	71	44	47	37	29	34	55	26	36	39
Average daily gain	.89	1.57	1.00	.70	1.07	.70	1.07	.86	1.07	1.36	1.02	1.01	1.57	1.12	.88	1.04	.81	.65	.46	.86	.92
Total feed consumed																					
Corn	68	40	80	106	131	120	72	126	99	84	97	162	84	105	98	66	78	174	95	92	99
Tankage	12	7	14	18	23	21	13	21	18	15	17	27	15	19	17	12	14	29	17	16	17
Middlings	19	11	22	29	37	34	20	33	28	23	27	44	24	30	28	19	22	46	27	26	28
Alfalfa meal	2	1	3	4	5	4	3	4	4	3	3	5	3	4	3	2	3	6	3	3	3
Total	101	59	119	157	196	179	108	184	149	125	144	238	126	158	146	99	117	255	142	137	147
Average daily ration																					
Corn	2.43	2.86	2.85	1.89	2.34	2.14	2.58	2.52	2.35	3.00	2.31	2.31	3.00	2.50	2.34	2.36	1.86	2.07	1.70	2.19	2.29
Tankage	.43	.50	.50	.32	.41	.38	.46	.42	.43	.53	.41	.39	.53	.45	.40	.43	.33	.35	.30	.38	.40
Middlings	.68	.79	.79	.52	.66	.61	.71	.66	.67	.82	.64	.63	.86	.71	.67	.68	.53	.55	.49	.62	.64
Alfalfa meal	.07	.07	.11	.07	.09	.07	.11	.08	.10	.11	.07	.07	.11	.10	.07	.07	.07	.07	.05	.07	.08
Total	3.61	4.22	4.25	2.80	3.50	3.20	3.86	3.68	3.55	4.46	3.43	3.40	4.50	3.76	3.48	3.54	2.79	3.04	2.54	3.26	3.41
Feed for 100 lbs. gain																					
Corn	272	181	285	273	219	308	240	262	220	221	225	228	191	223	265	227	229	316	365	256	248
Tankage	48	32	50	46	38	54	43	44	40	39	40	38	34	40	46	42	41	53	65	45	43
Middlings	76	50	79	74	62	87	67	69	62	61	63	62	54	64	76	65	65	84	104	72	69
Alfalfa meal	8	5	11	10	8	10	10	8	9	8	7	7	7	9	8	7	9	11	12	8	9
Total	404	268	425	403	327	459	360	383	331	329	335	335	286	336	395	341	344	464	546	381	369

TABLE 17.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE RANGY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 125 POUNDS: THIRD EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1b	2s	3s	4b	5b	6b	7b	8s	9s	10s	11b	12s	13s	14b	15s	16s	17s	18b	19b	20s	Aver.
Days to reach weight	28	28	42	42	42	56	42	42	56	56	56	56	42	42	70	42	42	42	42	70	47
Initial weight	103	100	86	80	84	83	91	82	71	74	74	73	83	87	81	78	89	77	84	80	83
Final weight	128	131	121	120	130	135	125	119	129	126	126	134	122	123	131	127	121	125	128	130	127
Total gain	25	31	35	40	46	52	34	37	58	52	52	61	39	36	50	49	32	48	44	50	44
Average daily gain	.89	1.11	.83	.95	1.10	.93	.81	.88	1.04	.93	.93	1.09	.93	.86	.71	1.17	.76	1.14	1.05	.71	.93
Total feed consumed																					
Corn	67	75	101	110	113	126	91	102	133	118	126	147	103	86	152	113	84	102	112	143	110
Tankage	10	13	18	19	20	22	16	18	24	21	22	26	18	15	27	20	15	18	20	23	19
Middlings	16	21	28	31	32	35	26	29	38	33	36	42	29	24	43	32	24	29	32	38	31
Alfalfa meal	2	3	4	4	4	4	3	4	5	4	4	5	4	3	5	4	3	4	4	5	4
Total	95	112	151	164	169	187	136	153	200	176	188	220	154	128	227	169	126	153	168	209	164
Average daily ration																					
Corn	2.39	2.68	2.40	2.61	2.69	2.25	2.17	2.42	2.37	2.11	2.26	2.63	2.45	2.05	2.17	2.69	2.00	2.42	2.66	2.05	2.35
Tankage	.36	.46	.43	.45	.48	.39	.38	.43	.43	.37	.39	.46	.43	.36	.39	.48	.36	.43	.48	.33	.41
Middlings	.57	.75	.67	.74	.76	.63	.62	.69	.68	.59	.64	.75	.69	.57	.61	.76	.57	.69	.76	.54	.66
Alfalfa meal	.07	.11	.10	.10	.10	.07	.07	.10	.09	.07	.07	.09	.10	.07	.07	.10	.07	.10	.10	.07	.08
Total	3.39	4.00	3.60	3.90	4.03	3.34	3.24	3.64	3.57	3.14	3.36	3.93	3.67	3.05	3.24	4.03	3.00	3.64	4.00	2.99	3.50
Feed for 100 lbs. gain																					
Corn	268	241	289	275	245	243	268	276	229	227	243	241	265	239	304	231	263	213	255	286	253
Tankage	40	42	51	47	43	42	47	49	41	40	42	43	46	42	54	41	47	38	46	46	44
Middlings	64	68	80	78	70	67	76	78	66	63	69	69	74	67	86	65	75	60	72	76	71
Alfalfa meal	8	10	11	10	9	8	9	11	9	8	8	8	10	8	10	8	9	8	9	10	9
Total	380	361	431	410	367	360	400	414	345	338	362	361	395	356	454	345	394	319	382	418	377

TABLE 18.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE CHUFFY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 175 POUNDS: FIRST EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1b	2♀	3b	4s	5s	6s	7b	8s	9b	10b	11b	12b	13s	14s	15b	16b	17b	18b	19b	20b	Aver.
Days to reach weight	98	98	154	112	126	126	112	112	112	112	98	98	112	98	112	112	112	112	112	98	111
Initial weight	73	75	72	59	62	65	72	68	61	76	75	68	64	77	65	71	76	65	77	81	70
Final weight	180	174	174	173	187	169	184	171	173	187	174	171	163	182	169	173	183	178	181	173	176
Total gain	107	99	102	114	125	104	112	103	112	111	99	103	99	105	104	102	107	113	104	92	106
Average daily gain	1.09	1.01	.66	1.02	.99	.83	1.00	.92	1.00	.99	1.02	1.05	.88	1.07	.93	.91	.96	1.01	.93	.94	.95
Total feed consumed																					
Corn	329	293	351	311	328	330	335	294	306	330	291	297	271	301	301	293	311	323	316	273	309
Tankage	37	33	43	36	38	38	37	34	37	36	33	35	34	34	37	35	35	38	35	32	36
Middlings	70	62	83	69	72	73	69	65	69	68	63	66	64	64	69	65	65	72	66	59	68
Total	436	388	477	416	438	441	441	393	412	434	387	398	369	399	407	393	411	433	417	364	413
Average daily ration																					
Corn	3.36	2.99	2.28	2.77	2.61	2.62	2.99	2.63	2.73	2.95	2.97	3.03	2.42	3.07	2.68	2.62	2.78	2.89	2.82	2.78	2.78
Tankage	.38	.34	.28	.32	.30	.30	.33	.30	.33	.32	.34	.36	.30	.35	.33	.31	.31	.34	.31	.33	.32
Middlings	.71	.63	.54	.62	.57	.58	.62	.58	.62	.61	.64	.67	.57	.65	.62	.58	.58	.64	.59	.60	.61
Total	4.45	3.96	3.10	3.71	3.48	3.50	3.94	3.51	3.68	3.88	3.95	4.06	3.29	4.07	3.63	3.51	3.67	3.87	3.72	3.71	3.71
Feed for 100 lbs. gain																					
Corn	307	296	344	273	263	317	299	286	273	297	294	288	274	287	289	287	290	285	304	297	292
Tankage	35	33	42	32	30	37	33	33	33	33	33	34	34	32	36	34	33	34	34	35	34
Middlings	65	63	82	60	57	70	62	63	62	61	64	64	65	61	66	64	61	64	63	64	64
Total	407	392	468	365	350	424	394	382	368	391	391	386	373	380	391	385	384	383	401	396	390

TABLE 19.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE INTERMEDIATE TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 175 POUNDS: FIRST EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1s	2s	3b	4b	5b	6b	7b	8b	9s	10b	11b	12s	13s	14s	15s	16s	17b	18b	19b	20s	Aver.
Days to reach weight	112	112	112	98	112	98	112	112	98	112	98	112	112	140	112	98	126	126	112	126	112
Initial weight	58	55	69	65	67	69	63	64	59	57	72	64	59	52	61	68	66	51	63	54	62
Final weight	183	180	182	169	185	168	168	172	173	165	175	175	172	187	177	169	177	180	172	184	176
Total gain	125	125	113	104	118	99	105	108	114	108	103	111	113	135	116	101	111	129	109	130	114
Average daily gain	1.12	1.16	1.02	1.06	1.05	1.01	.94	.96	1.16	.96	1.05	.99	1.01	.96	1.04	1.03	.88	1.02	.97	1.03	1.02
Total feed consumed																					
Corn	322	315	333	278	325	263	289	300	275	294	290	292	295	367	328	277	337	364	286	361	309
Tankage	38	37	37	32	36	30	37	35	34	37	33	35	35	43	38	33	42	44	34	42	37
Middlings	72	70	69	60	68	56	71	65	65	69	62	66	67	82	72	61	80	83	64	79	69
Total	432	422	439	370	429	349	397	400	374	400	385	393	397	492	438	371	459	491	384	482	415
Average daily ration																					
Corn	2.88	2.81	2.97	2.84	2.90	2.68	2.58	2.68	2.81	2.62	2.96	2.61	2.63	2.62	2.93	2.83	2.68	2.89	2.56	2.87	2.76
Tankage	.34	.33	.33	.33	.32	.31	.33	.31	.35	.33	.34	.31	.31	.31	.34	.34	.33	.35	.30	.33	.33
Middlings	.64	.63	.62	.61	.61	.57	.63	.58	.66	.62	.63	.59	.60	.58	.64	.62	.63	.66	.57	.63	.62
Total	3.86	3.77	3.92	3.78	3.83	3.56	3.54	3.57	3.82	3.57	3.93	3.51	3.54	3.51	3.91	3.79	3.64	3.90	3.43	3.83	3.71
Feed for 100 lbs. gain																					
Corn	258	252	295	267	275	266	275	278	241	272	282	263	261	271	283	274	304	282	262	278	272
Tankage	30	30	33	31	31	30	35	32	30	34	32	32	31	32	33	33	38	34	31	32	32
Middlings	58	56	61	58	58	57	68	60	57	64	60	59	59	61	62	60	72	65	59	61	61
Total	346	338	389	356	364	353	378	370	328	370	374	354	351	364	378	367	414	381	352	371	365

TABLE 20.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE RANGY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 175 POUNDS: FIRST EXPERIMENT

(All weights expressed in pounds)

Pig number and sex ..	1b	2b	3b	4b	5b	6b	7b	8b	9b	10b	11b	12b	13b	14b	15s	16b	17b	18b	19s	20b	Aver.
Days to reach weight	126	112	140	140	126	168	126	140	126	126	112	126	126	126	154	112	126	182	140	112	132
Initial weight	58	59	58	57	64	59	69	51	70	65	67	70	65	74	52	60	66	56	63	66	62
Final weight	179	176	168	180	188	169	179	165	175	176	178	182	187	185	182	163	190	172	178	186	178
Total gain	121	117	110	123	124	110	110	114	105	111	111	112	122	111	130	103	124	116	115	120	116
Average daily gain	.96	1.04	.79	.88	.98	.65	.87	.81	.83	.88	.99	.89	.97	.88	.84	.92	.98	.64	.82	1.07	.87
Total feed consumed																					
Corn	327	322	325	338	355	330	307	335	313	316	346	346	351	311	379	275	347	386	318	331	332
Tankage	40	39	41	42	43	42	35	43	36	37	41	40	39	36	46	36	40	46	39	37	40
Middlings	75	73	78	79	81	80	67	82	67	69	77	76	74	68	89	67	76	90	74	70	76
Total	442	434	444	459	479	452	409	460	416	422	464	462	464	415	514	378	463	522	431	438	448
Average daily ration																					
Corn	2.59	2.88	2.32	2.42	2.82	1.96	2.44	2.39	2.48	2.51	3.08	2.75	2.78	2.47	2.46	2.45	2.75	2.13	2.27	2.96	2.52
Tankage	.32	.35	.29	.30	.34	.25	.28	.31	.29	.29	.37	.32	.31	.28	.30	.32	.32	.25	.28	.33	.30
Middlings	.60	.65	.56	.56	.64	.48	.53	.59	.53	.55	.69	.60	.59	.54	.58	.60	.60	.49	.53	.62	.57
Total	3.51	3.88	3.17	3.28	3.80	2.69	3.25	3.29	3.30	3.35	4.14	3.67	3.68	3.29	3.34	3.37	3.67	2.87	3.08	3.91	3.39
Feed for 100 lbs. gain																					
Corn	270	276	296	275	286	300	279	293	298	285	312	309	287	281	292	267	280	332	277	276	288
Tankage	33	33	37	34	35	38	32	38	34	33	37	35	32	32	35	35	32	40	34	31	35
Middlings	62	62	71	64	65	73	61	72	64	62	69	68	61	61	68	65	61	78	64	58	65
Total	365	371	404	373	386	411	372	403	396	380	418	412	380	374	395	367	373	450	375	365	388

TABLE 21.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE VERY CHUFFY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 175 POUNDS: SECOND EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1s	2s	3s	4b	5s	6b	7b	8b	9s	10s	11b	12s	13s	14b	15b	16s	17b	18b	19b	20s	Aver.
Days to reach weight	105	112	112	105	112	93	126	126	119	126	112	119	119	91	105	105	119	112	105	107	112
Initial weight	71	75	70	67	73	69	71	69	69	67	70	71	70	73	73	71	74	74	73	72	71
Final weight	181	176	184	175	176	172	179	178	180	178	175	180	172	177	173	178	181	175	176	170	177
Total gain	110	101	114	108	103	103	108	109	111	111	105	109	102	104	100	107	107	101	103	98	106
Average daily gain	1.05	.90	1.02	1.03	.92	1.11	.86	.87	.93	.88	.94	.92	.86	1.14	.95	1.02	.90	.90	.98	.92	.95
Total feed consumed																					
Corn	345	347	352	348	357	300	368	399	351	442	324	345	346	315	347	339	356	295	326	335	347
Tankage	30	30	30	30	31	27	33	35	31	39	28	30	31	27	31	29	31	25	28	29	30
Middlings	60	59	60	60	62	55	67	69	62	78	57	61	62	54	62	58	62	51	57	59	61
Alfalfa meal	8	7	8	8	8	7	8	9	8	10	7	8	8	7	8	7	8	6	7	7	8
Total	443	443	450	446	458	389	476	512	452	569	416	444	447	403	448	433	457	377	418	430	446
Average daily ration																					
Corn	3.28	3.10	3.15	3.31	3.19	3.22	2.93	3.16	2.95	3.51	2.89	2.90	2.91	3.46	3.30	3.22	2.99	2.64	3.10	3.13	3.11
Tankage	.29	.27	.27	.29	.28	.29	.26	.28	.26	.31	.25	.25	.26	.30	.30	.28	.26	.22	.27	.27	.27
Middlings	.57	.53	.54	.57	.55	.59	.53	.55	.52	.62	.51	.51	.52	.59	.59	.55	.52	.46	.54	.55	.54
Alfalfa meal	.08	.06	.06	.08	.07	.08	.06	.07	.07	.08	.06	.07	.07	.08	.08	.07	.07	.05	.07	.07	.07
Total	4.22	3.96	4.02	4.25	4.09	4.18	3.78	4.06	3.80	4.52	3.71	3.73	3.76	4.43	4.27	4.12	3.84	3.37	3.98	4.02	3.99
Feed for 100 lbs. gain																					
Corn	314	344	309	322	347	291	341	367	316	399	308	316	339	303	347	317	333	292	317	342	328
Tankage	27	30	26	28	30	26	31	32	28	35	27	28	31	26	31	27	29	25	27	30	29
Middlings	55	58	53	56	60	54	62	63	56	70	54	56	61	52	62	54	58	50	55	60	58
Alfalfa meal	7	7	7	7	8	7	7	8	7	9	7	7	7	7	8	7	7	6	7	7	7
Total	403	439	395	413	445	378	441	470	407	513	396	407	438	388	448	405	427	373	406	439	422

TABLE 22.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE INTERMEDIATE TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 175 POUNDS: SECOND EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1b	2b	3s	4s	5s	6s	7s	8s	9b	10s	11b	12b	13b	14b	15b	16b	17b	18s	19b	20s	Aver.
Days to reach weight	126	112	124		103	91		112	107	119	91	91	93	119	112	84	112	84	112	126	107
Initial weight	69	69	73		74	70		71	73	68	76	78	69	71	69	77	72	78	72	73	73
Final weight	172	173	184		172	170		177	186	177	173	180	184	183	175	174	172	173	184	180	177
Total gain	103	104	111		98	94		106	113	109	97	102	115	112	106	97	100	95	112	107	104
Average daily gain	.82	.93	.90		.95	1.03		.95	1.06	.92	1.07	1.12	1.24	.94	.95	1.15	.89	1.13	1.00	.85	.98
Total feed consumed																					
Corn	352	348	373		303	284		359	353	327	300	308	323	390	352	290	341	289	348	404	336
Tankage	32	30	33		28	27		33	32	28	28	28	30	35	32	27	32	28	30	36	31
Middlings	65	60	65		57	54		66	65	57	57	57	61	70	64	53	63	55	60	72	61
Alfalfa meal	8	8	8		7	7		8	8	7	7	7	8	9	8	7	8	7	8	9	8
Total	457	446	479		395	372		466	458	419	392	400	422	513	456	377	444	379	446	521	436
Average daily ration																					
Corn	2.80	3.10	3.01		2.94	3.12		3.21	3.30	2.74	3.29	3.38	3.47	3.35	3.15	3.46	3.04	3.44	3.11	3.20	3.16
Tankage	.25	.27	.27		.27	.30		.29	.30	.24	.31	.31	.32	.29	.29	.32	.29	.33	.27	.29	.29
Middlings	.52	.54	.52		.55	.59		.59	.61	.48	.63	.63	.66	.59	.57	.63	.56	.66	.53	.57	.57
Alfalfa meal	.06	.07	.06		.07	.08		.07	.07	.06	.08	.08	.09	.08	.06	.08	.07	.08	.07	.07	.07
Total	3.63	3.98	3.86		3.83	4.09		4.16	4.28	3.52	4.31	4.40	4.54	4.31	4.07	4.49	3.96	4.51	3.98	4.13	4.09
Feed for 100 lbs. gain																					
Corn	342	334	336		309	302		339	312	300	309	302	281	350	332	299	341	304	311	378	322
Tankage	31	29	30		29	29		31	28	26	29	27	26	31	30	28	32	30	27	34	29
Middlings	63	58	59		58	58		62	58	52	59	56	53	63	60	55	63	58	53	67	59
Alfalfa meal	8	8	7		7	7		8	7	6	7	7	7	8	8	7	8	7	7	8	7
Total	444	429	432		403	396		440	405	384	404	392	367	458	430	389	444	399	398	487	417

"Flu" interfered with this pig reaching a weight of 175 pounds.

See Table 14.

TABLE 23.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE RANGY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 175 POUNDS: SECOND EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1a	2b	3b	4b	5b	6b	7a	8b	9a	10b	11b	12b	13b	14b	15b	16b	17b	18b	19b	20b	Aver.
Days to reach weight	126	105	119	105	110	119	110	112	91	112	91	91	91	93	119	91	91		112	93	105
Initial weight	70	67	71	66	68	67	60	70	72	70	72	71	71	70	69	76	72		68	73	70
Final weight	178	183	178	169	179	171	166	175	176	167	178	174	180	171	173	174	181		171	176	175
Total gain	108	116	107	103	111	104	97	105	104	97	106	103	109	101	104	98	109		103	103	105
Average daily gain	.86	1.10	.90	.98	.93	.87	.82	.94	1.14	.87	1.16	1.13	1.20	1.09	.87	1.08	1.20		.92	1.11	.99
Total feed consumed																					
Corn	365	338	341	322	351	347	330	340	302	329	333	314	314	307	340	299	328		303	326	328
Tankage	33	29	30	30	30	30	31	31	28	30	31	29	30	29	31	28	30		28	30	30
Middlings	65	59	61	59	60	60	61	62	56	59	62	59	59	57	62	57	61		56	61	60
Alfalfa meal	8	7	8	7	8	8	8	8	7	7	8	7	7	7	8	7	8		7	8	7
Total	471	433	440	418	449	445	430	441	393	425	434	409	410	400	441	391	427		394	425	425
Average daily ration																					
Corn	2.90	3.22	2.87	3.06	2.95	2.92	2.77	3.04	3.32	2.93	3.06	3.45	3.45	3.30	2.86	3.28	3.60		2.71	3.50	3.12
Tankage	.26	.27	.25	.29	.25	.25	.26	.28	.31	.27	.34	.32	.33	.31	.26	.31	.33		.25	.32	.28
Middlings	.52	.56	.51	.56	.50	.50	.51	.55	.61	.53	.68	.64	.65	.61	.52	.63	.67		.50	.66	.57
Alfalfa meal	.06	.07	.07	.07	.07	.07	.07	.07	.08	.06	.09	.08	.08	.08	.07	.08	.09		.06	.09	.07
Total	3.74	4.12	3.70	3.98	3.77	3.74	3.61	3.94	4.32	3.79	4.77	4.49	4.51	4.30	3.71	4.30	4.69		3.52	4.57	4.04
Feed for 100 lbs. gain																					
Corn	338	291	319	313	317	333	340	324	290	339	314	305	288	304	327	305	301		295	317	313
Tankage	31	25	28	29	27	29	32	29	27	31	29	28	28	29	30	29	28		27	29	29
Middlings	60	51	57	57	54	58	63	59	54	61	58	57	54	56	59	58	56		54	59	57
Alfalfa meal	7	6	7	7	7	8	8	8	7	7	8	7	6	7	8	7	7		7	8	7
Total	436	373	411	406	405	428	443	420	378	438	409	397	376	396	424	399	392		383	413	406

"Flu" interfered with this pig reaching a weight of 175 pounds

TABLE 24.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE INTERMEDIATE TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 175 POUNDS: THIRD EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1b	2b	3b	4s	5s	6b	7b	8s	9s	10b	11s	12s	13b	14b	15b	16b	17b	18b	19b	20s	Aver.
Days to reach weight	84	56	70	84	84	98	70	98	84	56	84	98	56	84	84	70	84		98	84	80
Initial weight	99	98	101	94	74	86	97	82	82	93	78	65	83	80	90	96	97		95	86	88
Final weight	177	172	178	163	166	174	183	182	175	174	177	185	178	183	178	172	177		180	176	176
Total gain	78	74	77	69	92	88	86	100	93	81	99	120	95	103	88	76	80		85	90	88
Average daily gain	.93	1.32	1.10	.82	1.10	.90	1.23	1.02	1.11	1.45	1.18	1.22	1.70	1.23	1.05	1.09	.95		.87	1.07	1.10
Total feed consumed																					
Corn	248	195	249	194	226	271	238	291	237	205	250	285	232	265	259	214	217		255	244	241
Tankage	34	29	34	29	35	39	33	40	34	30	35	42	33	38	37	30	30		36	34	34
Middlings	54	47	55	46	56	63	53	64	54	48	56	67	53	60	59	48	49		57	55	55
Alfalfa meal	7	6	7	6	7	8	7	8	7	6	7	8	7	8	7	6	6		7	7	7
Total	343	277	345	275	324	381	331	403	332	289	348	402	325	371	362	298	302		355	340	337
Average daily ration																					
Corn	2.95	3.48	3.55	2.31	2.69	2.77	3.40	2.97	2.82	3.66	2.97	2.91	4.14	3.16	3.09	3.05	2.59		2.60	2.91	3.00
Tankage	.41	.52	.49	.34	.42	.40	.47	.41	.41	.53	.42	.43	.59	.45	.44	.43	.36		.37	.40	.43
Middlings	.64	.84	.79	.55	.67	.64	.76	.65	.64	.86	.67	.68	.95	.71	.70	.69	.58		.58	.66	.68
Alfalfa meal	.08	.11	.10	.07	.08	.08	.10	.08	.08	.11	.08	.08	.12	.10	.08	.09	.07		.07	.08	.09
Total	4.08	4.95	4.93	3.27	3.86	3.89	4.73	4.11	3.95	5.16	4.14	4.10	5.80	4.42	4.31	4.26	3.60		3.62	4.05	4.20
Feed for 100 lbs. gain																					
Corn	318	264	323	281	245	308	277	291	255	254	253	237	244	257	294	282	271		300	271	274
Tankage	44	39	44	42	38	44	38	40	36	37	35	35	35	37	42	39	38		43	38	39
Middlings	69	63	72	67	61	72	62	64	58	59	57	56	56	58	67	63	61		67	61	62
Alfalfa meal	9	8	9	9	8	9	8	8	8	7	7	7	7	8	8	8	8		8	8	8
Total	440	374	448	399	352	433	385	403	357	357	352	335	342	360	411	392	378		418	378	383

"Flu" interfered with this pig reaching a weight of 175 pounds.

TABLE 25.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE RANGY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 175 POUNDS: THIRD EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1b	2s	3s	4b	5b	6b	7b	8s	9s	10s	11b	12s	13s	14b	15s	16s	17s	18b	19b	20s	Aver.
Days to reach weight	70	70	84	84	70	84	84		84	84	84	84	84	84	98	70	84	84	70	98	82
Initial weight	103	100	86	80	84	83	91		71	74	74	73	83	87	81	78	89	77	84	80	83
Final weight	166	185	173	184	164	174	187		165	164	170	172	175	168	175	170	163	178	173	164	172
Total gain	63	85	87	104	80	91	96		94	90	96	99	92	81	94	92	74	101	89	84	89
Average daily gain	.90	1.21	1.04	1.24	1.14	1.08	1.14		1.12	1.07	1.14	1.18	1.10	.96	.96	1.31	.88	1.20	1.27	.86	1.09
Total feed consumed																					
Corn	210	250	255	305	217	246	272		236	228	249	259	263	225	263	229	210	261	233	220	244
Tankage	27	35	36	43	32	37	38		36	34	37	40	37	32	40	34	30	37	34	32	35
Middlings	43	56	58	68	52	59	60		58	54	59	63	60	51	65	54	48	59	55	52	57
Alfalfa meal	5	7	7	9	6	7	8		7	7	7	8	7	6	8	7	6	7	7	6	7
Total	285	348	356	425	307	349	378		337	323	352	370	367	314	376	324	294	364	329	310	343
Average daily ration																					
Corn	3.00	3.57	3.04	3.63	3.10	2.93	3.24		2.81	2.72	2.97	3.08	3.13	2.68	2.69	3.27	2.50	3.11	3.33	2.24	2.98
Tankage	.39	.50	.43	.51	.46	.44	.45		.43	.41	.44	.47	.44	.38	.41	.49	.36	.44	.48	.33	.43
Middlings	.61	.80	.69	.81	.74	.70	.71		.69	.64	.70	.75	.72	.61	.66	.77	.57	.70	.79	.53	.69
Alfalfa meal	.07	.10	.08	.11	.09	.08	.10		.08	.08	.08	.10	.08	.07	.08	.10	.07	.08	.10	.06	.09
Total	4.07	4.97	4.24	5.06	4.39	4.15	4.50		4.01	3.85	4.19	4.40	4.37	3.74	3.84	4.63	3.50	4.33	4.70	3.16	4.19
Feed for 100 lbs. gain																					
Corn	333	294	293	293	271	270	283		251	253	260	262	286	278	280	249	284	258	262	262	273
Tankage	43	41	41	41	40	41	40		39	38	39	40	40	40	43	37	40	37	38	38	40
Middlings	68	66	67	65	65	65	63		62	60	61	64	65	63	69	58	65	58	62	62	64
Alfalfa meal	8	8	8	10	8	8	8		7	8	7	8	8	7	8	8	8	7	8	7	8
Total	452	409	409	409	384	384	394		359	359	367	374	399	388	400	352	397	360	370	369	385

"Flu" interfered with this pig reaching a weight of 175 pounds.

TABLE 26.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE CHUFFY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 225 POUNDS: FIRST EXPERIMENT

(All weights expressed in pounds)

Pig number and sex ..	1b	2b	3b	4s	5s	6s	7b	8s	9b	10b	11b	12b	13s	14s	15b	16b	17b	18b	19b	20b	Aver.
Days to reach weight	126	126	194	137	151	165	143	143	143	137	129	129	143	126	143	137	137	137	140	129	141
Initial weight.....	73	75	72	59	62	65	72	68	61	76	75	68	64	77	65	71	76	65	77	81	70
Final weight.....	223	228	218	220	225	223	224	223	223	228	227	220	225	230	217	223	232	229	222	227	224
Total gain.....	150	153	146	161	163	158	152	155	162	152	152	152	161	153	152	152	156	164	145	146	154
Average daily gain....	1.19	1.21	.75	1.18	1.08	.96	1.06	1.08	1.13	1.10	1.18	1.18	1.13	1.21	1.06	1.11	1.14	1.20	1.04	1.13	1.10
Total feed consumed																					
Corn.....	469	429	534	449	455	510	480	444	458	455	455	455	437	442	442	434	452	464	453	437	458
Tankage.....	49	44	57	48	48	53	49	47	49	46	47	48	48	46	48	46	46	49	46	45	48
Middlings.....	94	84	112	91	93	103	93	89	95	88	90	92	92	87	92	88	89	95	88	86	92
Total.....	612	557	703	588	596	666	622	580	602	589	592	595	577	575	582	568	587	608	587	568	598
Average daily ration																					
Corn.....	3.72	3.40	2.75	3.28	3.01	3.09	3.36	3.11	3.20	3.32	3.53	3.53	3.05	3.51	3.09	3.17	3.30	3.39	3.23	3.38	3.25
Tankage.....	.39	.35	.29	.35	.32	.32	.34	.33	.34	.34	.36	.37	.34	.36	.34	.34	.33	.36	.33	.35	.34
Middlings.....	.75	.67	.58	.66	.62	.63	.65	.62	.67	.64	.70	.71	.64	.69	.64	.64	.65	.69	.63	.67	.66
Total.....	4.86	4.42	3.62	4.29	3.95	4.04	4.35	4.06	4.21	4.30	4.59	4.61	4.03	4.56	4.07	4.15	4.28	4.44	4.19	4.40	4.25
Feed for 100 lbs. gain																					
Corn.....	312	280	366	279	279	323	316	287	283	299	299	299	271	289	291	286	290	283	312	299	297
Tankage.....	33	29	39	30	30	34	32	30	30	30	31	32	30	30	32	30	29	30	32	31	31
Middlings.....	63	55	77	56	57	65	61	57	59	58	59	60	57	57	60	58	57	58	61	59	60
Total.....	408	364	482	365	366	422	409	374	372	387	389	391	358	376	383	374	376	371	405	389	388

TABLE 27.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE INTERMEDIATE TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 225 POUNDS: FIRST EXPERIMENT

(All weights expressed in pounds)

Pig number and sex ..	1s	2s	3b	4b	5b	6b	7b	8b	9s	10b	11b	12s	13s	14s	15s	16s	17b	18b	19b	20s	Aver.
Days to reach weight	137	137	137	129	137	137	151	137	129	143	126	137	140	179	140	126	165	158	143	161	142
Initial weight.....	58	55	69	65	67	69	63	64	59	57	72	64	59	52	61	68	66	51	63	54	62
Final weight.....	227	230	222	224	230	226	225	222	221	219	228	226	222	227	222	226	229	224	218	225	225
Total gain.....	169	175	153	159	163	157	162	158	162	162	156	162	163	175	161	158	163	173	155	171	163
Average daily gain....	1.23	1.28	1.12	1.23	1.19	1.15	1.07	1.15	1.26	1.13	1.24	1.18	1.16	.98	1.15	1.25	.99	1.09	1.08	1.06	1.14
Total feed consumed																					
Corn.....	448	440	473	434	466	461	477	488	432	469	433	431	436	538	470	422	560	551	439	528	467
Tankage.....	49	47	48	45	48	47	53	46	47	51	45	46	47	56	50	45	60	59	47	55	50
Middlings.....	93	90	92	86	92	89	102	88	90	99	86	89	90	108	95	85	117	114	89	106	95
Total.....	590	577	613	565	606	597	632	572	569	619	564	566	573	702	615	552	737	724	575	689	612
Average daily ration																					
Corn.....	3.27	3.21	3.45	3.36	3.40	3.37	3.16	3.20	3.35	3.28	3.44	3.14	3.11	3.01	3.35	3.35	3.40	3.49	3.07	3.28	3.28
Tankage.....	.36	.34	.35	.35	.35	.34	.35	.34	.36	.36	.36	.34	.34	.31	.36	.36	.36	.37	.33	.34	.35
Middlings.....	.68	.66	.67	.67	.67	.65	.68	.64	.70	.69	.68	.65	.64	.60	.68	.67	.71	.72	.62	.66	.67
Total.....	4.31	4.21	4.47	4.38	4.42	4.36	4.19	4.18	4.41	4.33	4.48	4.13	4.09	3.92	4.39	4.38	4.47	4.58	4.02	4.28	4.30
Feed for 100 lbs. gain																					
Corn.....	265	252	309	273	286	293	294	277	266	289	278	266	268	307	292	267	343	318	284	309	287
Tankage.....	29	27	32	28	30	30	33	29	29	32	29	28	29	32	31	28	37	34	30	32	30
Middlings.....	55	51	60	54	56	57	63	56	56	61	55	55	55	62	59	54	72	66	57	62	59
Total.....	349	330	401	355	372	380	390	362	351	382	362	349	352	401	382	349	452	418	371	403	376

TABLE 28.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE RANGY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 225 POUNDS: FIRST EXPERIMENT

(All weights expressed in pounds)

Pig number and sex ..	1b	2b	3b	4b	5b	6b	7b	8b	9b	10b	11b	12b	13b	14b	15s	16b	17b	18b	19s	20b	Aver.
Days to reach weight	158	159	179	173	151	208	173	179	173	165	137	151	151	151	194	143	147	220	173	129	166
Initial weight.....	58	59	58	57	64	59	69	51	70	65	67	70	65	74	52	60	66	56	63	66	62
Final weight.....	219	223	226	232	229	230	236	224	222	224	225	223	220	224	228	225	224	224	219	221	225
Total gain.....	161	164	168	175	165	171	167	173	152	159	158	153	155	150	176	165	158	168	156	155	163
Average daily gain....	1.02	1.03	.94	1.01	1.09	.82	.97	.97	.88	.96	1.15	1.01	1.03	.99	.91	1.15	1.07	.76	.90	1.20	.98
Total feed consumed																					
Corn.....	481	498	517	505	507	536	533	544	489	505	491	503	489	445	579	455	454	601	474	424	501
Tankage.....	52	53	57	56	55	59	54	60	50	52	53	53	51	47	63	51	49	66	52	45	54
Middlings.....	100	102	110	107	106	114	103	116	96	100	101	102	97	90	123	98	94	126	101	86	104
Total.....	633	653	684	668	668	709	690	720	635	657	645	658	637	582	765	604	597	793	627	555	659
Average daily ration																					
Corn.....	3.05	3.14	2.89	2.92	3.36	2.58	3.08	3.04	2.83	3.06	3.58	3.33	3.24	2.94	2.99	3.18	3.09	2.73	2.74	3.28	3.03
Tankage.....	.33	.33	.32	.32	.36	.28	.31	.33	.29	.31	.39	.35	.34	.31	.32	.36	.33	.30	.30	.35	.32
Middlings.....	.63	.64	.61	.62	.70	.55	.60	.65	.55	.61	.74	.68	.64	.60	.63	.68	.64	.57	.58	.67	.63
Total.....	4.01	4.11	3.82	3.86	4.42	3.41	3.99	4.02	3.67	3.98	4.71	4.36	4.22	3.85	3.94	4.22	4.06	3.60	3.62	4.30	3.98
Feed for 100 lbs. gain																					
Corn.....	299	304	308	289	308	313	319	314	322	317	311	329	315	297	329	276	287	358	304	274	309
Tankage.....	32	32	34	32	33	35	32	35	33	33	33	34	33	31	36	31	31	39	33	29	33
Middlings.....	62	62	65	61	64	67	62	67	63	63	64	67	63	60	70	59	60	75	65	55	64
Total.....	393	398	407	382	405	415	413	416	418	413	408	430	411	388	435	366	378	472	402	358	406

TABLE 29.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE VERY CHUFFY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 225 POUNDS: SECOND EXPERIMENT

(All weights expressed in pounds)

Pig number and sex ..	1s	2s	3s	4b	5s	6b	7b	8b	9s	10s	11b	12s	13s	14b	15b	16s	17b	18b	19b	20s	Aver.
Days to reach weight	133		140	140	161		154	189		154	140	147	154	119	130		147				147
Initial weight	71		70	67	73		71	69		67	70	71	70	73	73		74				71
Final weight	217		226	227	229		224	230		217	224	229	224	231	210		222				224
Total gain	146		156	160	156		153	161		150	154	158	154	158	137		148				153
Average daily gain	1.10		1.11	1.14	.97		.99	.85		.97	1.10	1.07	1.00	1.33	1.05		1.01				1.04
Total feed consumed																					
Corn	484		505	564	581		527	660		621	496	498	546	493	470		517				536
Tankage	40		42	46	48		45	54		53	41	42	44	40	40		43				44
Middlings	80		83	91	96		91	107		106	81	84	88	81	80		87				89
Alfalfa meal	10		10	11	12		11	13		13	10	10	11	10	10		11				11
Total	614		640	712	737		674	834		793	628	634	689	624	600		658				680
Average daily ration																					
Corn	3.64		3.61	4.03	3.61		3.43	3.49		4.03	3.55	3.39	3.54	4.14	3.62		3.52				3.65
Tankage	.30		.30	.33	.30		.29	.28		.35	.29	.28	.29	.34	.31		.29				.30
Middlings	.60		.59	.65	.60		.59	.57		.69	.58	.57	.57	.68	.62		.59				.61
Alfalfa meal	.08		.07	.08	.07		.07	.07		.08	.07	.07	.07	.08	.07		.08				.07
Total	4.62		4.57	5.09	4.58		4.38	4.41		5.15	4.49	4.31	4.47	5.24	4.62		4.48				4.63
Feed for 100 lbs. gain																					
Corn	332		324	352	372		345	410		414	322	315	354	313	343		350				350
Tankage	27		27	29	31		29	34		35	27	27	29	25	29		29				29
Middlings	55		53	57	61		60	66		71	53	53	57	51	58		59				58
Alfalfa meal	7		6	7	8		7	8		9	6	6	7	6	8		7				7
Total	421		410	445	472		441	518		529	408	401	447	395	438		445				444

"Flu" interfered with this pig reaching a weight of 225 pounds.

Slaughtered at the 175-pound weight.

Slaughtered at the 175-pound weight.

Exhibited at International Livestock Exposition Record only to the 175-pound weight.

Slaughtered at the 175-pound weight.

Slaughtered at the 175-pound weight.

Slaughtered at the 175-pound weight.

TABLE 30.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE INTERMEDIATE TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 225 POUNDS: SECOND EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1b	2b	3s	4s	5s	6s	7s	8s	9b	10s	11b	12b	13b	14b	15b	16b	17b	18s	19b	20s	Aver.
Days to reach weight	168	140						140	131	154		140		140	143	140	147	126	135	152	143
Initial weight	69	69						71	73	68		78		71	69	77	72	78	72	73	72
Final weight	221	225						220	226	230		238		223	227	227	227	235	229	227	227
Total gain	152	156						149	153	162		160		152	158	150	155	157	157	154	155
Average daily gain	.90	1.11						1.06	1.17	1.05		1.14		1.09	1.10	1.07	1.05	1.25	1.16	1.01	1.09
Total feed consumed																					
Corn	557	515						504	478	506		539		526	518	499	525	519	492	557	518
Tankage	47	43						44	42	42		44		45	44	42	44	45	41	47	44
Middlings	93	85						87	83	84		89		89	88	85	88	90	82	94	87
Alfalfa meal	12	11						11	10	10		11		11	11	11	11	11	10	12	11
Total	709	654						646	613	642		683		671	661	637	668	665	625	710	660
Average daily ration																					
Corn	3.32	3.68						3.60	3.65	3.29		3.85		3.75	3.62	3.56	3.57	4.12	3.65	3.66	3.63
Tankage	.28	.31						.31	.32	.27		.31		.32	.31	.30	.30	.36	.30	.31	.31
Middlings	.55	.60						.62	.63	.55		.64		.64	.61	.61	.60	.71	.61	.62	.61
Alfalfa meal	.07	.08						.08	.08	.06		.08		.08	.08	.08	.07	.09	.07	.08	.08
Total	4.22	4.67						4.61	4.68	4.17		4.88		4.79	4.62	4.55	4.54	5.28	4.63	4.67	4.63
Feed for 100 lbs. gain																					
Corn	366	330						339	313	312		337		346	327	333	339	331	314	361	334
Tankage	31	28						30	27	26		27		30	28	28	28	29	26	31	28
Middlings	61	54						58	54	52		56		58	56	57	57	57	52	61	57
Alfalfa meal	8	7						7	7	6		7		7	7	7	7	7	6	8	7
Total	466	419						434	401	396		427		441	418	425	431	424	398	461	426
			Slaughtered at the 175-pound weight.	See Table 22	Slaughtered at the 175-pound weight.	Used for metabolism test at a weight of 170 pounds.	See Table 14				Used for metabolism test at a weight of 173 pounds.		Slaughtered at the 175-pound weight.								

TABLE 31.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE RANGY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 225 POUNDS: SECOND EXPERIMENT

(All weights expressed in pounds)

Pig number and sex	1s	2b	3b	4b	5b	6b	7s	8b	9s	10b	11b	12b	13b	14b	15b	16b	17b	18b	19b	20b	Aver.
Days to reach weight	161	128	147	133	147	147	147	135	137	147	147		140			137			140		142
Initial weight	70	67	71	66	68	67	69	70	72	70	72	Used for a metabolism test at a weight of 174 pounds.	71	Slaughtered at the 175-pound weight.	Slaughtered at the 175-pound weight.	76	"Flu" interfered with this pig reaching a weight of 225 pounds.	See Table 23	68	Slaughtered at the 175-pound weight.	70
Final weight	223	224	225	221	226	220	220	222	229	220	223		236			229			227		225
Total gain	153	157	154	155	158	153	151	152	157	150	151		165			153			159		155
Average daily gain	.95	1.23	1.05	1.17	1.07	1.04	1.03	1.13	1.15	1.02	1.03		1.18			1.12			1.22		1.09
Total feed consumed																					
Corn	531	490	507	466	517	505	489	474	502	526	563		521			492			471		503
Tankage	44	41	43	40	43	42	43	41	43	44	47		45			43			41		43
Middlings	89	82	86	80	86	84	85	82	86	89	95		90			85			82		86
Alfalfa meal	11	10	11	10	11	10	11	10	11	11	12		11			11			10		11
Total	675	623	647	596	657	641	628	607	642	670	717		667			631			604		643
Average daily ration																					
Corn	3.30	3.83	3.45	3.50	3.52	3.43	3.33	3.51	3.67	3.58	3.83		3.72			3.59			3.36		3.54
Tankage	.27	.32	.29	.30	.29	.29	.29	.31	.31	.30	.32		.32			.32			.29		.30
Middlings	.55	.64	.59	.60	.58	.57	.58	.61	.63	.61	.65		.64			.62			.59		.60
Alfalfa meal	.07	.08	.07	.08	.08	.07	.07	.07	.08	.07	.08		.08			.08			.07		.08
Total	4.19	4.87	4.40	4.48	4.47	4.36	4.27	4.50	4.69	4.56	4.88		4.76			4.61			4.31		4.52
Feed for 100 lbs. gain																					
Corn	347	313	329	301	327	330	324	311	320	351	373		316			321			296		325
Tankage	29	26	28	26	27	27	29	27	27	30	31		27			28			26		28
Middlings	58	52	56	52	55	55	56	54	55	59	63		54			56			52		55
Alfalfa meal	7	6	7	6	7	7	7	7	7	7	8		7			7			6		7
Total	441	397	420	385	416	419	416	399	409	447	475		404			412			380		415

TABLE 32.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE INTERMEDIATE TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 225 POUNDS: THIRD EXPERIMENT

(All weights expressed in pounds)

Pig number and sex ..	1b	2b	3b	4s	5s	6b	7b	8s	9s	10b	11s	12s	13b	14b	15b	16b	17b	18b	19b	20s	Aver.
Days to reach weight	119	90	119	126	128		100		119	84	128	132	88	116	116	100	124		132	124	114
Initial weight	99	98	101	94	74		97		82	93	78	65	83	80	90	96	97		95	86	89
Final weight	220	224	225	226	222		225		225	228	225	228	225	221	223	221	226		225	229	225
Total gain	121	126	124	132	148		128		143	135	147	163	142	141	133	125	129		130	143	136
Average daily gain	1.02	1.40	1.04	1.05	1.16		1.28		1.20	1.61	1.15	1.23	1.61	1.22	1.15	1.25	1.04		.98	1.15	1.19
Total feed consumed																					
Corn	389	353	442	376	409		386		396	366	441	420	394	402	405	370	390		408	420	398
Tankage	50	48	57	50	56		51		52	49	57	58	52	53	54	48	51		54	55	53
Middlings	81	76	91	79	90		81		83	79	92	93	84	85	86	77	81		86	89	84
Alfalfa meal	10	10	11	10	11		10		10	10	11	12	10	11	11	10	10		11	11	11
Total	530	487	601	515	566		528		541	504	601	583	540	551	556	505	532		559	575	546
Average daily ration																					
Corn	3.27	3.92	3.72	2.98	3.19		3.86		3.33	4.36	3.45	3.18	4.48	3.47	3.49	3.70	3.15		3.09	3.39	3.48
Tankage	.42	.53	.48	.40	.44		.51		.44	.58	.44	.44	.59	.46	.47	.48	.41		.41	.44	.46
Middlings	.68	.85	.76	.63	.70		.81		.70	.94	.72	.71	.96	.73	.74	.77	.65		.65	.72	.74
Alfafla meal	.08	.11	.09	.08	.09		.10		.08	.12	.09	.09	.11	.09	.09	.10	.08		.08	.09	.09
Total	4.45	5.41	5.05	4.09	4.42		5.28		4.55	6.00	4.70	4.42	6.14	4.75	4.79	5.05	4.29		4.23	4.64	4.77
Feed for 100 lbs. gain																					
Corn	322	281	357	284	276		302		277	271	300	258	277	285	304	296	302		314	294	293
Tankage	41	38	46	38	38		40		36	36	39	36	37	38	41	38	39		42	38	39
Middlings	67	60	73	60	61		63		58	59	63	57	59	60	65	62	63		66	62	62
Alfalfa meal	8	8	9	8	7		8		7	7	7	7	7	8	8	8	8		8	8	7
Total	438	387	485	390	382		413		378	373	409	358	380	391	418	404	412		430	402	401

"Flu" interfered with this pig reaching a weight of 225 pounds.

Same as No. 6

See Table 24

TABLE 33.—FEED CONSUMED AND GAINS MADE BY EACH PIG OF THE RANGY TYPE HAND-FED INDIVIDUALLY TO A LIVE WEIGHT OF APPROXIMATELY 225 POUNDS: THIRD EXPERIMENT

(All weights expressed in pounds)

Pig number and sex ..	1b	2s	3s	4b	5b	6b	7b	8s	9s	10s	11b	12s	13s	14b	15s	16s	17s	18b	19b	20s	Aver.
Days to reach weight		93	124	119	98	126	119		126	137	126	124	124	128	137	98	132	124	100	137	121
Initial weight		100	86	80	84	83	91		71	74	74	73	83	87	81	78	89	77	84	80	82
Final weight		225	230	230	222	225	228		224	229	224	225	232	223	222	220	225	233	226	221	226
Total gain		125	144	150	138	142	137		153	155	150	152	149	136	141	142	136	156	142	141	144
Average daily gain		1.34	1.16	1.26	1.41	1.13	1.15		1.21	1.13	1.19	1.23	1.20	1.06	1.03	1.45	1.03	1.26	1.42	1.03	1.19
Total feed consumed																					
Corn	"Flu" interfered with this pig reaching a weight of 225 pounds.	370	429	476	363	433	428	See Table 25	420	458	441	450	432	418	433	373	417	443	398	382	420
Tankage		49	57	63	50	59	56		58	61	60	62	57	55	61	51	55	58	54	52	57
Middlings		78	91	101	79	94	90		93	98	96	100	92	88	97	81	87	93	86	83	90
Alfalfa meal		10	11	13	10	12	11		12	12	12	12	11	11	12	10	11	12	11	10	11
Total		507	588	653	502	598	585		583	629	609	624	592	572	603	515	570	606	549	527	578
Average daily ration																					
Corn		3.97	3.46	4.00	3.70	3.43	3.60		3.33	3.34	3.50	3.63	3.48	3.26	3.16	3.80	3.16	3.57	3.98	2.79	3.48
Tankage		.53	.46	.53	.51	.47	.47		.46	.45	.47	.50	.46	.43	.44	.52	.42	.47	.54	.38	.47
Middlings		.84	.73	.85	.81	.75	.76		.74	.71	.76	.80	.74	.69	.71	.83	.66	.75	.86	.61	.75
Alfalfa meal		.11	.09	.11	.10	.10	.09		.10	.09	.10	.10	.09	.09	.09	.11	.08	.10	.11	.07	.09
Total		5.45	4.74	5.49	5.12	4.75	4.92		4.63	4.59	4.83	5.03	4.77	4.47	4.40	5.26	4.32	4.89	5.49	3.85	4.79
Feed for 100 lbs. gain																					
Corn		296	298	317	264	305	312		274	296	294	296	290	308	307	263	307	284	280	271	292
Tankage		39	39	42	36	42	41		38	39	40	41	38	40	43	36	40	37	38	37	39
Middlings		63	63	67	57	66	66		61	63	64	66	62	65	69	57	64	59	61	59	63
Alfalfa meal		8	8	9	7	8	8		8	8	8	8	7	8	9	7	8	8	8	7	8
Total		406	408	435	364	421	427		381	406	406	411	397	421	428	363	419	388	387	374	402

TABLE 34.—FEED CONSUMED AND GAINS MADE BY EACH PIG HAND-FED INDIVIDUALLY TO A FINAL WEIGHT OF APPROXIMATELY 275 POUNDS: SECOND EXPERIMENT

(All weights expressed in pounds)

Type	VERY CHUFFY			INTERMEDIATE					RANGY					
Pig number and sex	5s	8b	Aver.	10s	12b	16b	17b	Aver.	1s	3b	6b	10b	13b	Aver.
Days to reach weight	196	223	210	189	161	168	175	173	196	182	175	188	163	181
Initial weight	73	69	71	68	78	77	72	74	70	71	67	70	71	70
Final weight	275	275	275	278	280	273	275	276	272	275	274	275	273	274
Total gain	202	206	204	210	202	196	203	202	202	204	207	205	202	204
Average daily gain	1.03	.92	.97	1.11	1.25	1.17	1.16	1.17	1.03	1.12	1.18	1.09	1.24	1.13
Total feed consumed														
Corn	798	857	828	724	700	672	716	703	734	736	703	788	687	729
Tankage	59	64	61	53	52	51	54	53	55	55	53	58	54	55
Middlings	119	127	123	106	105	102	108	105	110	110	107	116	107	110
Alfalfa meal	15	16	16	13	13	13	14	13	14	14	13	14	13	14
Total	991	1064	1028	896	870	838	892	874	913	915	876	976	861	908
Average daily ration														
Corn	4.07	3.84	3.95	3.83	4.35	4.00	4.09	4.06	3.75	4.05	4.02	4.19	4.21	4.03
Tankage	.30	.29	.29	.28	.32	.30	.31	.29	.28	.30	.30	.31	.33	.30
Middlings	.61	.57	.59	.56	.65	.61	.62	.61	.56	.60	.62	.62	.66	.61
Alfalfa meal	.08	.07	.07	.07	.08	.08	.08	.08	.07	.08	.07	.07	.08	.08
Total	5.06	4.77	4.90	4.74	5.40	4.99	5.10	5.04	4.66	5.03	5.01	5.19	5.28	5.02
Feed for 100 pounds gain														
Corn	395	416	406	345	347	343	352	346	364	361	339	384	340	358
Tankage	29	31	30	25	26	26	27	26	27	27	26	28	27	27
Middlings	59	62	60	51	52	52	53	52	54	54	52	57	53	53
Alfalfa meal	8	8	8	6	6	7	7	7	7	7	6	7	6	7
Total	491	517	504	427	431	428	439	431	452	449	423	476	426	445