

Swine at Two Degrees of Fatness Fed to 220, 250 and 280 Pounds Live Weight: Feedlot Performance and Carcass Characteristics

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Story in Brief

Growth rate, feed efficiency and carcass characteristics of pigs of two degrees of fatness carried to final weights of 220, 250 or 280 pounds were measured on 200 crossbred gilts and barrows of Duroc, Hampshire, and Yorkshire breeding. Pigs were separated into lean and fat groups on the basis of litter average backfat probe at 150 pounds. Within each of the fat and lean groups, an equal number of pigs was taken to each of the designated weights.

At 150 pounds, the fat group had 0.08 inches more backfat than the lean group. At slaughter, the pigs in the fat group had 0.1 inches more backfat, 2.60 percent less lean and 3.10 percent more fat in the carcass than pigs in the lean group. There was virtually no difference between lean and fat groups for carcass length or loin-eye area. Fat and lean groups also had similar feed efficiencies throughout the growth period. Fat pigs did grow somewhat faster than lean pigs early in the growing period, but growth rate of fat pigs declined somewhat beyond 200 pounds while lean pigs maintained a nearly constant growth rate from 160 to 280 pounds.

Growth rates increased steadily as the pigs went from 40 to 160 pounds, but changed little as the pigs went from 160 to 220, 250 or 280 pounds. Feed efficiency, however, declined steadily as pigs increased in weight. However, there was very little difference in feed efficiency from 180 to 220, 250 or 280 pounds. In addition, almost no differences existed in percent lean and fat of pigs slaughtered at each weight; however, backfat, length and loin-eye area increased linearly as slaughter weight increased.

Introduction

Today the majority of slaughter hogs in the United States is marketed at approximately 220 pounds live weight. Carrying hogs to heavier weights would increase the total pounds of product per litter and reduce the number of animals needed to produce the same total pounds of market weight. However, whether or not hogs should be carried to heavy weights will depend on the

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decrease in feed efficiency to heavy weights and on differences in carcass composition of heavy hogs and 220 pound hogs. There has been limited research in the past to evaluate feedlot performance and carcass characteristics of hogs at different degrees of fatness at heavier weights.

In the fall of 1975 this study was initiated to evaluate feedlot performance and carcass characteristics of pigs fed to live weights of 220, 250 and 280 pounds. This report summarizes two seasons where pigs of two degrees of fatness fed to three weights were compared for feedlot performance and carcass characteristics.

Experimental Procedure

The feedlot performance records and carcass data of 200 barrows and gilts, representing 36 litters that were three-quarters of either Duroc, Hampshire or Yorkshire breeding were utilized. Pigs were farrowed in the Southwest Livestock and Forage Research Station swine facilities in the 1975-fall and 1976-spring farrowing seasons.

Litters were produced by backcrossing two-breed cross dams to purebred boars. For example, a Duroc boar was mated to Duroc x Hampshire and Duroc x Yorkshire dams so that pigs were three-fourths Duroc and one-fourth Hampshire or Yorkshire. Litters of three-fourths Hampshire and Yorkshire breeding were produced similarly.

Each season six backcross litters by each breed of sire, containing at least six pigs per litter, were randomly chosen and fed in litter groups of six pigs per pen. Pigs within litters were selected to keep the sex ratio as equal as possible. Litters were fed in solid concrete floor confinement facilities from nine weeks of age to a final weight of 220, 250, or 280 pounds. When each litter averaged 150 pounds, all pigs in the litter were probed for backfat and, within breed of sire, litters were sorted into the three lean and three fat litters on the basis of the litter's average backfat thickness. Within each of the lean and fat groups, the three litters were randomly designated to be slaughtered at 220, 250 or 280 pounds.

Individual pig weights and pen feed consumption were measured every 28 days for the first 112 days of the test. No pigs were removed from test before the end of the fourth 28-day period. Pigs were then removed from test weekly as they reached the designated slaughter weight and were transported to the University Meat Laboratory for carcass evaluation. Total feed consumed from the end of the fourth 28-day period to when the pen was emptied was also recorded.

All pigs were held off feed and water for 36 hours prior to slaughter. Following slaughter of the pigs produced in the first season (1975-fall), the right half of each carcass was separated into separable fat, lean and bone. Carcasses from the animals produced in the second season (1976-spring) were

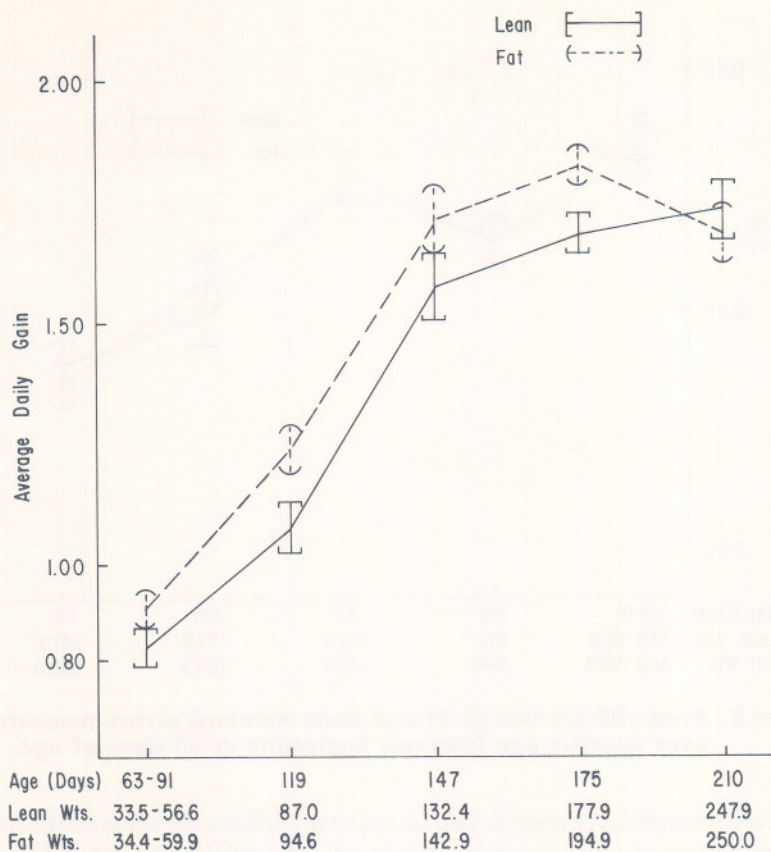


Figure 1. Average daily gain and their standard errors measured over specific age intervals beginning at 63 days of age.

separated into closely trimmed lean cuts (shoulder, loin and ham). In addition, standard carcass measurements were taken.

Results

Average daily gains, when compared on an age to age basis (Figure 1), were somewhat higher at young ages for the fat group than for the lean group. Rates of gain increased steadily for the lean and fat groups from 0.83 and 0.91 to 1.68 and 1.83 pounds per day, respectively, between 91 and 175 days of age. However, when the pigs in the fat group reached 175 days of age their rate of gain decreased while growth rate for the lean group remained virtually constant for the duration of the test.

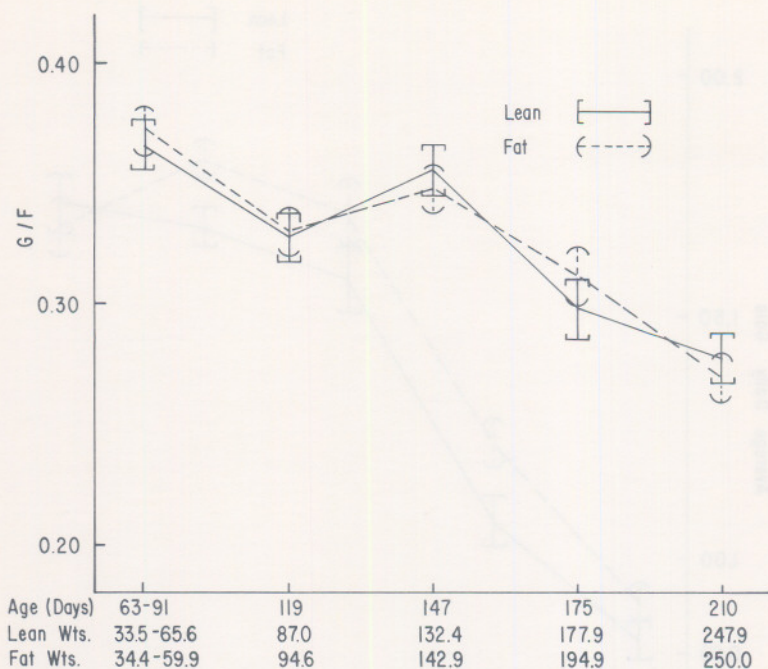


Figure 2. Feed efficiencies (G/F) and their standard errors measured over specific age intervals beginning at 63 days of age.

Feed efficiencies (Figure 2) had no apparent differences between the lean and fat groups at any age-period measured. The efficiencies did decrease, however, from 0.368 to 0.305 pounds of gain per pound of feed (averaged over lean and fat groups) between 91 and 175 days of age, respectively. In the final period it required 3.52 pounds of feed per pound of gain from 187 to 220 pounds live weight, while 3.89 pounds of feed was required to produce a pound of gain from 220 pounds to 250 or 280 pounds.

To better illustrate growth rate to weights of 220, 250 and 280 pounds, average daily gain, on a weight to weight basis, is presented in Figure 3. Although average daily gains were not significantly different for any weight range measured, the pigs in the fat group tended to gain at a faster rate during the earlier stages of growth (40 to 160 pounds) and the lean group tended to have a more rapid gain in the later stages of growth (160 to 280 pounds). The fat group's rate of gain increased from 1.18 to 1.84 pounds per day between 40 to 100, and 100 to 160 pounds live weight, respectively, but steadily decreased to 1.60 pounds per day between 250 and 280 pounds. The rate of gain in the lean group increased from 1.10 to 1.89 pounds per day between the weights of 40 to 100 and 100 to 220 pounds, respectively. After 220 pounds the pigs in the

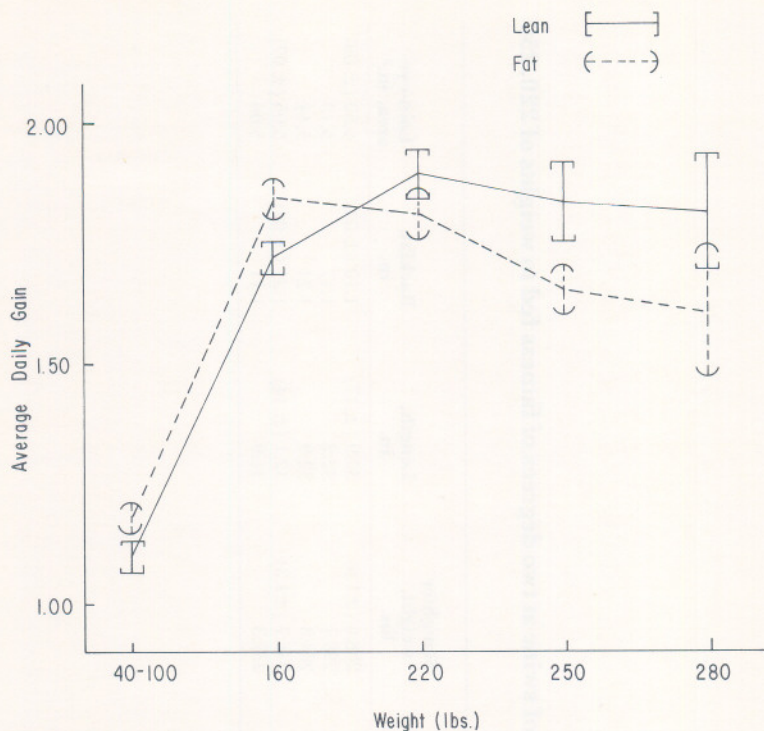


Figure 3. Average daily gains and their standard error measured from weight to weight beginning at 40 pounds.

lean group had a virtually constant rate of gain (1.82 pounds per day) to 280 pounds live weight.

Carcass data, presented in Table 1, show that the fat and lean groups had similar carcass lengths (32.1 and 31.9 in., respectively) and loin-eye areas (5.05 and 5.06 in.², respectively). However, the fat group did have significantly more carcass backfat (0.10 ± 0.02 in.) than the lean group. Carcass lengths (30.9, 32.2, and 32.9 in.), carcass backfat (1.10, 1.17, and 1.21 in.) and loin-eye areas (4.60, 5.13, and 5.44 in.²) increased linearly as the pigs went to 220, 250 and 280 pounds, respectively.

Averaged over slaughter weights, the fat group had 2.60 percent less lean and 3.10 percent more fat than the lean group (Table 2), but essentially the same percent bone and percent closely trimmed cuts. Also, the three slaughter-weight groups (220, 250 and 280 pounds) all had similar percent lean, fat, and bone, but percent closely trimmed lean cuts (58.2, 58.0, and 56.4 percent, respectively) tended to decrease as weight increased.

These data suggest that feed efficiency decreases as weight increases and that fat pigs gain at a faster rate than lean pigs at lighter weights, while lean

Table 1. Off-feed weights and carcass characteristics of swine at two degrees of fatness fed to weights of 220, 250 or 280 pounds

Group	No. pigs	Probe backfat at 150 lbs. in.	Off feed weight, lbs.	Slaughter weight, lbs.	Length, in.	Backfat, in.	Loin-eye area, in. ²
220 (S.E.)	67	0.893 (± 0.014)	221.9 (± 1.6)	208.6 (± 1.6)	30.9 (± 1.7)	1.10 (± 0.03)	4.60 (± 0.09)
250	62	0.890	250.5	238.1	32.2	1.17	5.13
280	71	0.880	278.3	264.3	32.9	1.21	5.44
Fat (S.E.)	102	0.929 (± 0.011)	250.5 (± 1.3)	236.7 (± 1.3)	32.1 (± 1.4)	1.21 (± 0.02)	5.05 (± 0.07)
Lean	98	0.846	250.0	237.3	31.9	1.11	5.06

Table 2. Percent lean, fat, and bone and percent closely trimmed lean cuts of swine at two degrees of fatness fed to weights of 220, 250 or 280 pounds

Group	No. litters	Percent lean ^a	Percent fat ^a	Percent bone ^a	Percent closely trimmed lean cuts ^b
220 (S.E.)	6	55.6 (\pm .92)	31.0 (\pm 1.3)	13.5 (\pm .40)	58.2 (\pm .53)
250	6	56.3	29.9	13.7	58.0
280	6	55.8	31.3	13.0	56.4
Fat (S.E.)	9	54.6 (\pm .75)	32.3 (\pm 1.1)	13.2 (\pm .33)	57.6 (\pm .43)
Lean	9	57.2	29.2	13.6	57.5

^aPercent lean, fat and bone or carcass weight were obtained in the 1975-fall season.

^bPercent closely trimmed lean cuts of carcass weight were obtained in the 1976-spring season.

pigs have more rapid gains at heavier weights. They also indicate little difference in percent lean, fat and bone as weight increases from 220 to 250 and 280 pounds live weight. Percent closely trimmed lean cuts declined somewhat, however, as pigs reached 280 pounds live weight.

Response of Growing Boars to Lysine Supplemented Corn-Soybean Meal Diets

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Story in Brief

A trial was conducted involving 108 growing boars to measure the effect of lysine supplementation on rate of gain, feed conversion, daily feed intake, backfat thickness, and loin eye area. The boars were fed either an 18 percent crude protein ration, a 16 percent crude protein + 0.16 percent added lysine, or a 14 percent crude protein + 0.32 percent added lysine ration from approximately 48 to 120 pounds. The protein level was then reduced 2 percent for each treatment from approximately 120 to 220 pounds body weight. The added lysine resulted in equivalent lysine levels for all treatments during