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BREEDING HOGS WITH LESS BACKFAT

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A Duroc inbred line has been maintained in the South Dakota Station Swine Breeding project since 1947. Until 1953 selection of breeding animals was based on a performance index as well as the usual attention to individuality, especially body length, underlines and soundness of feet and legs.

Beginning with the 1953 season, all pigs were probed to determine live backfat thickness and this information made a part of selection emphasis.

Procedure

Litters were farrowed in central facilities during March and April. Sows and litters were moved to brome-alfalfa pasture, in groups of six or seven, as soon as weather permitted. Sows were self fed and pigs had access to a creep feeder until weaning at 56 days. Pigs remained on pasture until reaching a market weight of 200 pounds. They were self fed a complete mixed growing-fattening ration in accordance with current recommendations.

At or near 200 pounds all pigs were probed at two sites--just behind the shoulder and over the mid loin, and about $1\frac{1}{2}$ " off the mid line of the back. Probing was accomplished by opening the skin with a sharp knife, then inserting a $\frac{1}{2}$ " by 6" steel ruler graduated in inches and tenths of inches. Backfat thickness was read directly, the two measurements being averaged for each pig. In order to make comparisons between pigs, all average measurements were adjusted to 200 pounds.

Consistent with performance indexes and individuality, the least fat pigs were used for breeding purposes.

Results and Discussion

A summary of the backfat data by year and sex is shown in Table 1.

Sex differences in backfat are consistent, showing that in the same pig crop boars are least fat, gilts intermediate and barrows fattest. These results show the necessity of using boars with minimum fat in order to produce market hogs with a desirable finish. In these data barrows averaged almost three-tenths inches more backfat than boars. Using boars with more than 1.3 inches backfat is likely to produce barrows too fat for today's market.

Of most interest in these results is whether selection has made it possible to produce pigs with less backfat. In every season, the boars and gilts selected for breeding averaged less backfat than the average of all pigs that season. Over all seasons, breeding animals had .14 inches less backfat than the average of all pigs. Successive seasonal backfat averages are not regular reductions in backfat thickness. However, if averages for 1953 and 1959 are compared, there appears to have been a reduction in backfat thickness over the period of .17, .16 and .14 inches for boars, gilts and barrows respectively. The change is not large. A large change cannot be

Table 1. Average Backfat by Year and Sex
South Dakota Station Duroc Line

Year	Boars		Gilts		Barrows		Total	
	No. Pigs	Probe Adjusted to 200# Live Wt.	No. Pigs	Probe Adjusted to 200# Live Wt.	No. Pigs	Probe Adjusted to 200# Live Wt.	No. Pigs	Probe Adjusted to 200# Live Wt.
1953	12	1.27	31	1.38	28	1.53	71	1.42
1954	11	1.24	70	1.32	61	1.50	142	1.40
1955	24	1.31	61	1.50	32	1.56	117	1.48
1956	14	1.24	37	1.32	16	1.56	67	1.38
1957	15	1.33	54	1.44	16	1.59	85	1.44
1958	14	1.00	38	1.34	32	1.55	84	1.37
1959	8	1.10	47	1.22	19	1.39	74	1.25
Weighted Mean	98	1.23	338	1.37	204	1.52	640	1.40

expected in consideration of the fact that each season there was selection for several other traits besides backfat. Whatever selection there may have been for backfat was diluted by attention to performance and individuality. This points up the necessity of selecting for as few traits as possible in order to make noticeable progress.

Concurrent carcass data were collected each season on samples of pigs from the line. A summary of these data is shown in Table 2.

Table 2. Carcass Summary, South Dakota Station Duroc Line
1953 through 1959

Number Carcasses	Slaughter Weight	Average Backfat	Average Carcass Length
8	206	1.82	28.8
29	211	1.66	29.1
19	206	1.63	28.6
16	201	1.54	29.2
9	203	1.59	29.1
30	213	1.67	29.4
34	202	1.50	29.9

Carcass numbers are limited in at least two seasons. However, there is a strong suggestion that market pigs have become less fat. At the same time there has been an improvement in carcass length. Again there are non-consistent seasonal changes for both these traits. Loin eye measurements are available for some of the carcasses. These suggest that there has been an associated improvement in loin eye area.

A heritability estimate of the order of .40 has been calculated from these data. An estimate of this size indicates that about 40 per cent of the observed differences in backfat are due to genetic differences among animals for backfat. This estimate is among those with the higher values for performance traits of swine. It says that when selecting for less backfat alone, observable progress in reducing backfat should be made.

Conclusions

1. Six seasons of selection for less backfat in a closed Duroc line has resulted in little reduction.
2. Boars, gilts and barrows differ significantly in backfat thickness. Therefore, boars with minimum fat must be used for breeding to produce slaughter hogs with desirable finish.
3. A heritability estimate from these data of the order of 40 per cent indicate that backfat can be reduced by selection, if few other traits are selected for at the same time.