

PERFORMANCE TRENDS OF TESTED BOARS AT THE OKLAHOMA SWINE EVALUATION STATION

D.S. Buchanan¹ and W.G. Luce²

Story in Brief

Performance data from 2263 boars tested from 1971 to 1983 at the Oklahoma Swine Evaluation Station were used to evaluate time trends for average daily gain, age at 230 pounds, backfat thickness, and loin eye area. There has been a general improvement in growth rate and feed efficiency. Both backfat thickness and loin eye area have decreased over time. To the extent that these results reflect the changes in genetic merit in the Oklahoma Swine industry they indicate improvement in all traits measured except for loin eye area.

Introduction

Swine testing stations aid in the identification of superior boars by providing a constant environment under which boars from various herds can be tested together. Examination of the time trends at such a station will illustrate the performance changes that have occurred during the life of the station. These changes are partially due to the changes in genetic merit of the herds that test boars at the station. The purpose of this study was to evaluate the changes in performance of boars tested at the Oklahoma Swine Evaluation Station.

Materials and Methods

The Oklahoma Swine Evaluation Station was built in 1970. The station originally had one barn with 24 open-front pens measuring 5 by 15 ft. A second barn was constructed in 1975 which increased capacity to 48 pens. Pens of three boars and one barrow or two boars and two barrows were tested until 1974. From 1975 to 1981 all pens contained three boars. In 1982 and 1983 each pen contained either three boars or two boars and a barrow. Pigs within a pen were progeny of one sire. One test in the spring and one in the fall were conducted from 1971 to 1974 and in 1982 and 1983. There were two tests conducted each season from 1975 to 1981. Pigs were put on test when the pen averaged 70 lb. There was a change in off-test weight from 220 lb to 230 lb in 1975.

When the pigs reached off-test weight average daily gain and pen feed efficiency were measured. In addition there was a scanogram (Ithaco Scanogram, Model 721) estimate of back fat thickness and loin eye area obtained. Feed efficiency for pens containing barrows was adjusted to a boar-equivalent basis. Backfat thickness was the average of measurements taken at the shoulder, the last rib and the last lumbar vertebra. Loin eye area was measured at the tenth rib. Backfat thickness and loin eye area were adjusted to 230 lb with adjustment factors recommended by the National Swine Improvement Federation.

¹Associate Professor ²Professor

These results describe the performance of 2263 Chester White, Duroc, Hampshire, Spot and Yorkshire boars tested from 1971 through 1983. The number of boars of each breed for each year is shown in Table 1. Berkshire, Landrace and Poland China boars were also tested at the station but were excluded from these analyses due to the small number of boars from these breeds.

The analysis procedure allowed estimation of yearly means and the average yearly change in performance for each breed. The means were adjusted for the effects of season and test group.

Table 1. Number of boars tested at the Oklahoma Swine Evaluation Station

Year	Breed				
	Chester White	Duroc	Hampshire	Spot	Yorkshire
1971	11	31	28		6
1972	8	34	29	9	17
1973	11	42	32	23	20
1974	17	43	17	21	25
1975	38	62	32	37	39
1976	42	66	50	49	60
1977	31	71	28	61	58
1978	30	90	43	28	53
1979	20	94	27	34	75
1980	14	93	19	12	94
1981	35	64	33	13	54
1982	17	33	16	5	23
1983	9	33	15	9	30

Results and Discussion

The trends for average daily gain and age at 230 lb are shown in Figures 1 and 2. There has been a general improvement in growth rate over the 12 years shown. The improvement has been most pronounced in the Hampshire and Yorkshire breeds. The breeds are not substantially different in growth rate overall except that the Chester White boars were consistently the slowest growing. Feed efficiency generally improved at the station over the 13 years of this study although the trend lines show considerable fluctuation (Figure 3).

All breeds showed a decrease in backfat thickness through the 1970's (Figure 4). This trend appears to have levelled off or has possibly reversed in the recent years. There has been a large decrease in loin eye area in all breeds (Figure 5). There were few differences between breeds for these traits except that Hampshire boars generally had the least backfat and the largest loin eye area.

Regressions of performance on time are shown in Table 2. These tell the average change per year for each trait in each breed. They are consistent with the graphs presented previously. There has been a significant improvement in average daily gain in all breeds except Chester White. The improvement in Age at 230 pounds was significant only in the Hampshire boars. Feed efficiency showed significant

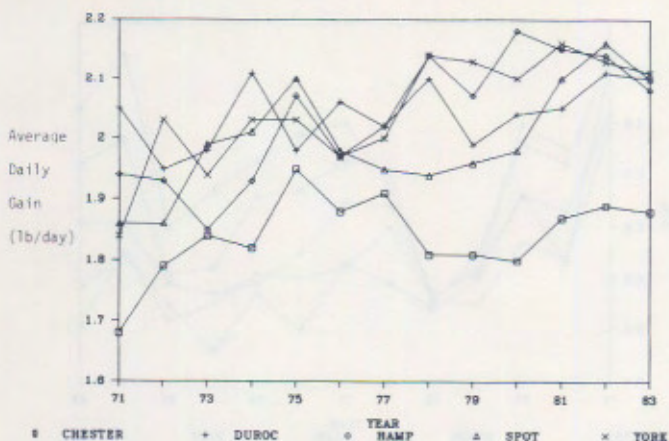


Figure 1. Average daily gain (lb/day).

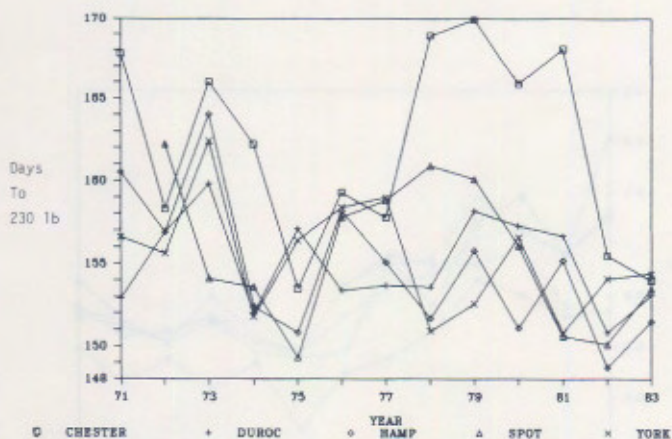


Figure 2. Days to 230 lb.

improvement in Duroc, Hampshire and Yorkshire boars. There was a significant decline in both backfat thickness and loin eye area in all breeds. The regression coefficients do not illustrate the large amount of year to year fluctuation that was present, especially for age at 230 pounds and feed efficiency.

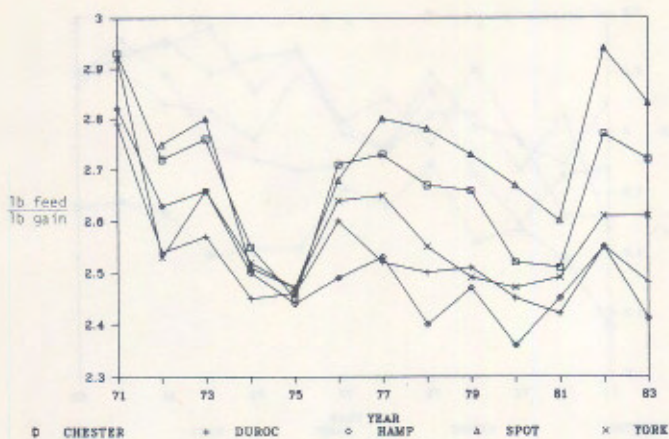


Figure 3. Feed efficiency $\frac{\text{lb feed}}{\text{lb gain}}$

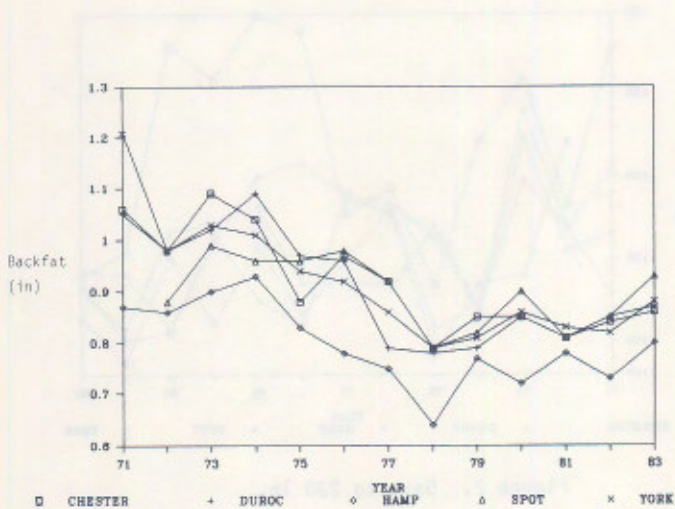


Figure 4. Backfat (in)

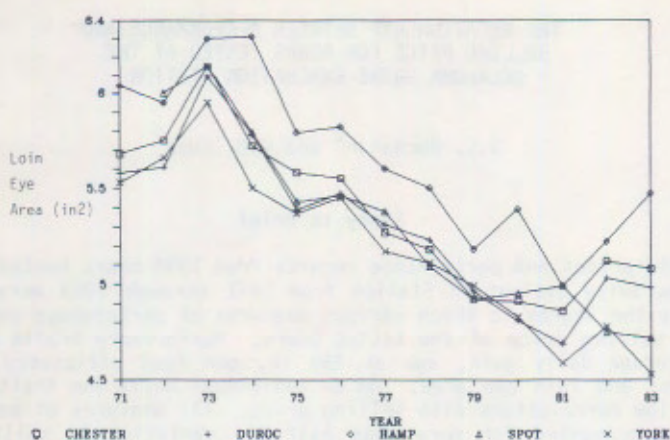


Figure 5. Loin eye area (in²)

Table 2. Average yearly change in performance of boars at the Oklahoma Swine Evaluation Station.

Trait	Breed				
	Chester White	Duroc	Hampshire	Spot	Yorkshire
Avg. daily gain (lb/day)	.007	.007**	.022**	.007**	.019**
Days to 230 lb	-.367	-.131	-.733**	-.191	-.371
Lb feed/lb gain	-.009	-.013**	-.023**	.007	-.013**
Backfat (in)	-.021**	-.021**	-.013**	-.004**	-.024**
Loin eye area (sq in)	-.088**	-.089**	-.091**	-.064**	-.104**

**p<.01

These changes may be due to several factors including real genetic changes in herds that have supplied boars for the Evaluation Station. The breeders that bring boars to be tested may have learned the characteristics or management of young boars that will enable them to perform well in the station or they may have simply decided that it is worthwhile to bring some of their superior boars to the station.

If these changes are the result of genetic changes in the Oklahoma swine industry they are generally encouraging. They indicate that pigs in commercial herds that purchase boars from the Evaluation Station should be faster growing, more efficient and leaner than pigs of 10 to 15 years age. They also indicate that they will have a smaller loin eye measurement.