

EVALUATION OF PERFORMANCES AND THEIR TIME TRENDS IN FOUR
BREEDS OF BOARS PERFORMANCE TESTED IN KOREA

Y. I. Park and K. S. Seo

College of Agriculture, Seoul National University
Suwon 441-744, Korea

SUMMARY

Data from 5,062 boars performance tested at the Korea Swine Testing Station from March, 1984 to November, 1989 were analysed by least squares method to evaluate the performance and the time trend in performance of Durocs, Hampshires, Landraces and Yorkshires. Durocs had a higher average daily gain than other breeds. Yorkshires and Durocs had a lower final age and were more efficient than other breeds. Durocs had the most thickness of backfat. The final age decreased significantly in Durocs during the 6-year period. The yearly decline in backfat thickness was .010, .009, .081 and .069 cm for Durocs, Hampshires, Landraces and Yorkshires, respectively. Regressions of feed efficiency on year of test were statistically insignificant in all four breeds, and the regressions of average daily gain on year of test were inconsistent among the breeds.

INTRODUCTION

Since the establishment of the Korea Swine Testing Station in 1984, it has been playing an important role in the genetic improvement of swine in Korea by selection and distribution of superior breeding stock and by encouraging the swine breeders to improve their breeding stock.

The purpose of this study was to evaluate the performances and their time trend in four breeds of boars entered in the Korea Swine Testing Station during the 6-year period from 1984 to 1989.

MATERIAL AND METHODS

The data for this study came from a total of 5,062 boars of Durocs, Hampshires, Landraces and Yorkshires performance tested at the Korea Swine Testing Station in Icheon, Korea from March, 1984 to November, 1989. A small number of boars of other breeds such as the Spotted were also tested. Since the numbers of boars of other breeds were so small that they were not included in this study. The boars tested at the Station were consigned by private swine breeding farms which met the qualification requirements on certain hygenic measures and on quality of breeding stock. Two littermate boars were housed in a pen. The test period was from 30 to 90 kg and the test ration containing 17.5% crude protein was full fed during the test period.

The traits examined in this study were final age, average daily gain, feed efficiency and backfat thickness. The final age was measured as the age in day when the boar finished the test which was approximately at 90 kg. Average daily gain during the test period was measured individually. Feed consumption and feed efficiency were measured on a pen basis. At the end of the test period the backfat thickness of each boar was measured at 3 locations, above the point of the elbow, the last rib and the stifle joint with an ultrasonic equipment, and the average of the 3 measurements was used (NSIF, 1987).

The data were statistically analysed by the least squares method using the linear model which includes the fitted mean, the effects of the breed, year of test, month of test, interaction between breed and year of test, regression on initial weight and random element (Harvey, 1979). The year and month of test were classified by the time when the test was finished. To evaluate the time trend in performances in the four breeds of boars entered in the test, the regression of each trait on year of test was computed with the least squares subclass means by breed and year of test estimated using the above mentioned linear model.

RESULTS AND DISCUSSION

The results of the analysis of variance and the test of significance showed that the effects of breed, year of test, month of test and interaction between breed and year of test were statistically significant for all four traits studied, final age, average daily gain, feed efficiency and backfat thickness. The regression of the trait on initial weight was significant for final age and average daily gain, and was not significant for feed efficiency and backfat thickness.

The least squares means of breeds for the various performance traits are shown in table 1. The results in table 1 indicate that Durocs had a higher average daily gain than other breeds. Durocs and Yorkshires had a lower final age, and were more efficient than other breeds. For backfat thickness, Durocs had the most thickness and Hampshires had the least thickness of backfat. However, the interpretation of the differences among the least squares breed means in table 1 should be made with caution, because the interaction between breed and year of test was statistically significant for all four traits. The regression of the performance trait on initial weight of the test was -1.38 ± 0.16 day for final age, 8.85 ± 1.06 g for average daily gain, 0.003 ± 0.002 for feed efficiency and 0.006 ± 0.003 cm for backfat thickness.

Table 1. Least squares means of breeds and the standard errors

Breed	Final age (day)	Ave. daily gain (g)	Feed efficiency	Backfat thickness(cm)
Duroc	142.4 ^c \pm .56	910 ^a \pm 3.8	2.71 ^c \pm .009	1.86 ^a \pm .010
Hampshire	150.3 ^a \pm .91	850 ^c \pm 6.2	2.86 ^a \pm .014	1.68 ^c \pm .017
Landrace	146.0 ^b \pm .62	852 ^c \pm 4.2	2.79 ^b \pm .010	1.74 ^b \pm .012
Yorkshire	143.4 ^c \pm .44	900 ^b \pm 3.0	2.69 ^c \pm .007	1.76 ^b \pm .008

a: Means with same superscripts do not differ within each column (P > .05).

Table 2 shows the regression coefficients of the performance trait on year of test. The final age decreased significantly in Durocs during the 6-year period. But the regressions of the final age on year of test were statistically insignificant in other breeds. The regression of average daily gain on year of test was positive in Durocs but was negative in other breeds. The regression of feed efficiency on year of test was statistically insignificant in all four breeds, although the regression coefficients showed a slight improvement in feed efficiency over the period.

Thickness of backfat declined over the 6-year period in all four breeds. The yearly decline in backfat thickness was .010, .009, .081 and .069 cm for Durocs, Hampshires, Landraces and Yorkshires, respectively. Thus, the rate of backfat reduction was higher in Landraces and Yorkshires than in Durocs and Hampshires. Neville et. al. (1976) reported that the yearly decline in backfat thickness in Durocs, Hampshires and Yorkshires was .116, .126, and .122 cm, respectively, based on the data from the Georgia Swine Test Station.

Table 2. Regression coefficients of performance trait on year of test and the standard errors

<u>Breed</u>	<u>Final age</u> <u>(day)</u>	<u>Ave. daily</u> <u>gain (g)</u>	<u>Feed</u> <u>efficiency</u>	<u>Backfat</u> <u>thickness(cm)</u>
Duroc	-1.44 + .24	6.0 + 2.8	-.003 + .014	-.010 + .009
Hampshire	-0.01 + .66	- 5.7 + 2.5	-.003 + .020	-.009 + .014
Landrace	-0.05 + .62	- 4.0 + 4.1	-.023 + .023	-.081 + .008
Yorkshire	-0.43 + .58	-12.8 + 4.0	-.010 + .016	-.069 + .013

The results obtained in this study indicate the possibility that the swine breeders selected and submitted to the Testing Station the boars with genetic potential for thinner backfat and that the genetic variation in backfat thickness within breeds was larger in Landraces and Yorkshires than in Durocs and Hampshires.

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