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Abstract
Duroc swine selected for muscling seemingly are more susceptible to stress than are ordinary pigs. The highly significant difference in serum creatine phosphokinase (CPK) levels (an average score of 30.07) in those pigs and levels (18.88) in control-line pigs indicates that pigs selected for increased muscling are more susceptible to stress because exercise causes CPK levels to be proportionately higher in their blood serum than would be the case were the pigs not under stress.; Swine Day, Manhattan, KS, November 10, 1977

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Stress Susceptibility in Pigs Selected for Muscling

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Summary

Duroc swine selected for muscling seemingly are more susceptible to stress than are ordinary pigs. The highly significant difference in serum creatine phosphokinase (CPK) levels (an average score of 30.07) in those pigs and levels (18.88) in control-line pigs indicates that pigs selected for increased muscling are more susceptible to stress because exercise causes CPK levels to be proportionately higher in their blood serum than would be the case were the pigs not under stress.

Introduction

Stress in swine results in the porcine stress syndrome (PSS) and pale, soft, exudative (watery) carcasses (PSE)--two serious, related problems of the swine and pork industries. Meat-type hogs, especially extremely lean and muscular pigs, are particularly susceptible to PSS and PSE. Currently we are testing Duroc pigs for their susceptibility to PSS and PSE by determining creatine phosphokinase (CPK) in their blood.

Procedure

We chose select-line swine for testing on the basis of an index that equally emphasizes maximum loin-eye area and minimum backfat thickness, as estimated by the An/Scan adjusted to 220 pounds live weight. Selection in the control line is done randomly.

Animals are physically stressed by running them 100 yards 6 to 10 hours before a blood sample is taken from each. The simple test consists of collecting a drop of blood from the animal's ear on a special filter-type paper and sending the paper to the Genetic Information Systems Laboratory in Elk Grove Village, Illinois, for analysis.

Scores of 30 or less indicate stress resistance; those of 30 to 80 indicate the possibility of stress susceptibility or some other pathological disorder; and a score exceeding 80 indicates the animal is stress prone or has some other pathological disorder affecting the skeletal-muscular system.

Results and Discussion

Using the CPK test to detect stress proneness has several advantages over using halothane gas, but one real disadvantage is that the CPK test requires that the pigs be physically stressed, which can kill susceptible pigs. One select-line gilt died after she had been stressed and before a blood sample was taken. Average CPK score for three of her full sisters was 70.3. One of the sisters later died from ulcers, just prior to farrowing. In the select line, 69% of the pigs scored below 30; 28% between 31 and 80; and 3% above 80. In the control line 88% scored below

30; 12% between 31 and 80; and none higher than 80. Average CPK scores for boars and gilts within the two lines are shown in table 43 .

Table 43. Average creatine phosphokinase (CPK) scores for serum of Duroc swine grouped by line and sex within line.[a]

Select		Control	
24 boars	37.33	17 boars	28.94
34 gilts	24.94	35 gilts	14.00
58 total	30.07	52 total	18.88

[a]Scores of less than 30 = stress resistance; 30 to 80 = possible stress susceptibility; more than 80 = stress prone.