

1977

Stress susceptibility in pigs selected for muscling

J.D. Wheat

Donald H. Kropf

Robert H. Hines

Follow this and additional works at: <https://newprairiepress.org/kaesrr>

 Part of the [Other Animal Sciences Commons](#)

Recommended Citation

Wheat, J.D.; Kropf, Donald H.; and Hines, Robert H. (1977) "Stress susceptibility in pigs selected for muscling," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 10. <https://doi.org/10.4148/2378-5977.3527>

This report is brought to you for free and open access by New Prairie Press. It has been accepted for inclusion in Kansas Agricultural Experiment Station Research Reports by an authorized administrator of New Prairie Press. Copyright 1977 Kansas State University Agricultural Experiment Station and Cooperative Extension Service. Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned. K-State Research and Extension is an equal opportunity provider and employer.



Stress susceptibility in pigs selected for muscling

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

Keywords

Swine day, 1977; Kansas Agricultural Experiment Station contribution; no. 78-101-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 312; Swine; Stress; Muscling; Creatine phosphokinase (CPK)

Creative Commons License



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

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

^aScores of less than 30 = stress resistance; 30 to 80 = possible stress susceptibility; more than 80 = stress prone.