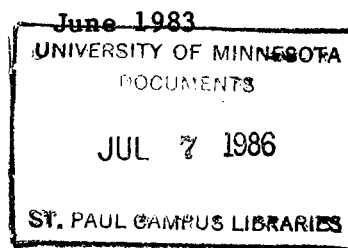


# Swine Update

Volume 1, issue #6

In this issue:

1. Studies on National Barrow Show Pigs
2. Animal Welfare - What Now



## 1. Studies on National Barrow Show Pigs

In 1980 and 1981, the pigs at the National Barrow Show were studied by University of Minnesota faculty, Barb Straw, Harvey Hilley, Chuck Christians and Al Leman. The following are four summaries of scientific manuscripts prepared for publication by Dr. Barb Straw.

These studies were partially funded by the Minnesota Pork Producers Council and the University of Minnesota Swine Center.

### Summary of 1980 National Barrow Show Pigs

Atrophic rhinitis and pneumonia were studied in 765 pigs of 8 breeds and crossbreeds brought together from multiple sources and finished in a central test station. At slaughter, turbinate atrophy was found in 46% of the snouts examined. Turbinate atrophy was scored on a scale of 0-5 on the basis of millimeters of space between the ventral turbinate and the floor of the nasal cavity, septal deviation, and turbinate asymmetry.

Degree of turbinate atrophy was not found to be correlated with rate of gain. Pneumonic lesions were recorded at slaughter by percentage of the lung with lesions. Such lesions were found in 700b (91.5%) of the pigs, and the distribution of affected pigs by increment of involvement was 1-5% (52%), 6-10% (22.5%), 11-15% (8.5%), 16-20% (3.5%), and 20% or more (5.0%). Mean daily gain decreased 5.3% for every 10% of the lung with pneumonic lesions. The relationship between turbinate atrophy score and percent of the lung with pneumonic lesions was examined by Pearson's coefficient of correlation for determination of correlation, but none was found. For pigs vaccinated with Bordetella bronchiseptica bacterin, neither the turbinate atrophy scores nor the mean daily gains were significantly different from the scores for those factors in pigs not vaccinated. The mean of turbinate atrophy and the mean percent lung with pneumonic lesions were compared between breeds. Yorkshire and Hampshire pigs had significantly more pneumonia than Duroc, Chester White, Berkshire, Spot, or Poland China pigs. Hampshire, Duroc, Spot, and Yorkshire pigs and significantly more turbinate atrophy than Chester White, Landrace, or Berkshire pigs.

### Summary of 1981 National Barrow Show Pigs

Pneumonia and atrophic rhinitis were studied in pigs at a test station. Pneumonia was found to reduce daily gain by 3.3% for every 10% of the pig's lungs that had lesions. Atrophic rhinitis did not affect daily gain. No

association was found between the occurrence of atrophic rhinitis and pneumonia. Pigs that were vaccinated for B. bronchiseptica did not have different turbinate atrophy scores, nor daily gains than pigs that were not vaccinated. Yorkshire and Hampshire pigs had higher prevalences and severity of pneumonia and atrophic rhinitis than pigs of other breeds.

#### Summary of Mortality in 1980 and 1981 Pigs

In two successive years, two groups of pigs at a test station were studied to test the effect of initial weight, weight change in the first week, age, breed, and distance the pig was transported on mortality. Total mortality was 5.3% in the first group and 6.3% in the second group. Deaths were due to pneumonia (24.7%), gastric ulceration (14.0%), enteritis (6.4%), trauma (4.3%), gastrointestinal displacement (4.3%), rectal stricture (3.2%), porcine stress syndrome (3.2%), brain abscess (2.2%), miscellaneous (6.5%), and undiagnosed (31.2%). More pigs died in the last 6 weeks of the 18-week finishing periods than in the first 6 weeks. Mortality rates were not different between pigs that lost weight and pigs that maintained or gained weight during the first week after arrival at the test station. The mean transportation distance to the test station was not different between the pigs that died and the pigs that survived. Transportation distance was not correlated with mean daily gain. Yorkshire pigs had a significantly higher mortality rate than crossbred, Poland China, Hampshire, Duroc pigs. Berkshire, Spot, and Chester White pigs had significantly higher mortality rates than Hampshire and Duroc pigs.

#### Summary

The relationship of chest conformation to growth rate, pneumonia, and breed was studied in 355 pigs weighing 85 to 100 kg for 8 breeds and crossbreeds. Two aspects of conformation were examined: shape and size. Shape, defined by the ratio of chest width to depth, was assessed by external measurement of the pig's chest and by internal measurement of the rib cage on the carcass after slaughter. Size was assessed by visual examination of the live animal by an experienced livestock judge. Neither chest shape nor size was associated with the growth rate or pneumonia. Chester White and Berkshire pigs had narrower internal rib cage shapes than the other breeds. Yorkshire pigs had a more rounded external shape than did Chester White, Duroc, Spot, Poland China, crossbred, or Hampshire pigs. Hampshire and Berkshire pigs had more chest volume in proportion to their body size than the other breeds evaluated.

## 2. Animal Welfare - What Now?

The issue of animal welfare and well-being continues to be an area of interest to producers and researchers. Now research results of several projects are becoming available and the arguments for and against animal welfare and well-being will at least be based on factual material.

Research at the University of Minnesota by Dr. W. Hall into the types of farrowing housing that may be the least stressful to the sow has recently been

completed. Three types of farrowing housing, pens with straw bedding for the sow and piglets with a separate creep area, standard raised crates and a modified raised farrowing crate designed by a Minnesota producer (the Compart crate) were included in the trial. During the test period the behavior of the sows was observed at the time the sows entered the crates or pens and again 2 and 4 weeks later. At the same time a physiological stress test was given to the sows. This involved giving a hormone (ACTH) to the sows and measuring the changes in the level of cortisol that were produced. Blood levels of cortisol have long been used as an indication of stress. In addition the productivity of the sows was measured at the time of farrowing and at the time of weaning.

The number of pigs weaned per sow was lowest in the pen system and highest in the standard crates. This is not surprising as the high mortality in pens was the initial impetus for the adoption of farrowing crates. The behavior of the groups of sows was not different between the three types of housing. The sows spent about the same percentage of time sleeping or lying down decreased once they were nursing but remained at the same level for each housing type. Comparison of behaviors in various systems can be difficult because in some systems the opportunities for specific behaviors may be absent. For example the sows in the pens with straw bedding obviously can engage in behaviors that the sows in standard raised crates cannot.

The results of the hormone testing did not indicate any difference between the housing types. This should not be taken as an indication that the systems didn't differ in their degree of stressfulness, although this is a possibility. It may be that the test is not sensitive enough to detect differences between the systems.

The assessment of welfare status and well-being is difficult. By combining measurements of behavior, production and stress it may be possible to measure these elusive states. In any case further research is needed to address this important issue.

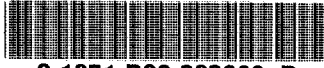
Prepared by A. D. Leman and W. Hall, Extension Swine Veterinarians

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