

STUDIES ON PNEUMONIA, ATROPHIC RHINITIS, RATE OF GAIN,
BREED, AND THEIR INTERACTIONS IN FINISHING PIGS

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Occurrence and interaction of pneumonia, atrophic rhinitis (A.R.), rate of gain, and breed were studied in two groups of finishing pigs during two succeeding years at a test-station. Each year in the spring about 800 barrows of approximately 8 weeks of age and 20 kg weight were assembled from multiple sources and housed in a naturally ventilated, modified open front building with partially slatted floors. Pens measured 3 X 7 m and contained 20-25 pigs. Pigs were slaughtered in the fall when their average weight was 100 kg. Some of the pigs had been vaccinated with a Bordetella bronchiseptica bacterin prior to this study.

Pneumonia was assessed at slaughter and scored according to the percentage of lung tissue with pneumonic lesions. Atrophic rhinitis was scored by measuring nasal turbinate space in the snout which had been transected at the level of the second premolar. Turbinate atrophy was reported on a modified Done's scale which combined mm of space in the snout, septal deviation and turbinate asymmetry in a grading system of 0 to 5.

Ninety-one and one-half percent of the pigs examined in the first year had lesions of pneumonia at slaughter. When pneumonia was present, it involved from 1 to 35% of the lung tissue. The mean percent lung involved with pneumonia was 6.3%. Of the pigs examined in the second year, 98% had lesions of pneumonia at slaughter. The range and mean of pneumonia lesions in the lungs were 1-50% and 10.5% respectively. For both years the mean pneumonia scores by breed were compared. In the first year, Yorkshire and Hampshire pigs had significantly ($P < 0.05$) more pneumonia than did pigs of Duroc, Chester White, crossbred, Berkshire, Landrace, Poland China, or Spot breeds. In the second year, Yorkshire and Hampshire pigs had more pneumonia ($P < 0.05$) than did pigs of crossbred, Berkshire, Spot, Poland China, or Chester White breeds.

Scores of turbinate atrophy ranged from 0-5 on the modified Done's scale, with mean scores of 2.53 (S.D. 1.4) and 1.83 (S.D. 1.4) for the first and second years respectively. The percent of pigs that had a total space on both sides of the nose of 12 mm or less was 51% the first year and 80% the second year. A.R. by breed was examined by comparison of mean modified Done's score. In the first year Yorkshire and Duroc pigs were found to have significantly ($P < 0.05$) more turbinate atrophy than Berkshire and Landrace pigs. In the second year, Hampshire, Poland China, and Yorkshire pigs had more A.R. than Landrace pigs.

Correlation between degree of infection with pneumonia and degree of turbinate atrophy was determined. For the first and second years respectively, the correlations were 0.000 ($P = 0.992$) and 0.119 ($P = 0.006$). The relationship at slaughter of turbinate atrophy to pneumonia was further examined by performing a T-test of mean pneumonia score between pigs with turbinate scores of 0 and pigs with turbinate scores of 5. There was no significant difference between the two groups in the first year. In the second year, pigs with a turbinate score of 0 had a mean pneumonia involvement of 9%, while pigs with a turbinate score of 5 had a mean pneumonia score of 15%. These means were significantly different.

Correlations between average daily gain and turbinate score for both years were not significant: 0.055 ($P = 0.20$) in the first year, and 0.042 ($P = 0.29$) in the second year.

Degree of pneumonia involvement was found to be associated with growth rate. Regression of average daily gain on pneumonia score generated the following equations for the first and second years respectively.

$$ADG \text{ (kg)} = 0.7035 - (\% \text{ lung with lesions})(0.0037)$$

$$ADG \text{ (kg)} = 0.7129 - (\% \text{ lung with lesions})(0.0023)$$

Thus for approximately every 10% increase in lung tissue affected with pneumonia, average daily gain decreased by 3.2 to 4.6%.

The mean scores for turbinate atrophy, and the mean average daily gain between vaccinated and non-vaccinated pigs were not significantly different in either year.

Conclusions:

Infection with pneumonia reduced average daily gain in proportion to the amount of lung with lesions. Infection with atrophic rhinitis did not depress growth. There was no correlation or a low correlation between infection with A.R. and infection with pneumonia. Breed appeared to be a factor in susceptibility to respiratory disease. Pigs vaccinated against B. bronchiseptica did not show improved growth rate or turbinate scores compared to pigs that were not vaccinated.