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Effect of pneumonia on growth rate and feed efficiency of minimal disease pigs exposed to *Actinobacillus pleuropneumoniae* and *Mycoplasma hyopneumoniae**

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ABSTRACT

Straw, B.E., Shin, S.J. and Yeager, A.E., 1990. Effect of pneumonia on growth rate and feed efficiency of minimal disease pigs exposed to *Actinobacillus pleuropneumoniae* and *Mycoplasma hyopneumoniae*. *Prev. Vet. Med.*, 9: 287–294.

Pigs from a minimal disease herd were exposed to pneumonia through contact with pigs infected with *Actinobacillus pleuropneumoniae* and *Mycoplasma hyopneumoniae*. Growth rate, feed efficiency, extent of pneumonia lesions at necropsy and as determined radiographically, and clinical signs of appetite, coughing, sneezing, dyspnea and lethargy were recorded for each pig. Pneumonia occurred as an active, slowly progressive infection during the trial. Coughing was not a good indicator of severity of pneumonia. Increasing severity of pneumonia (measured radiographically or at slaughter) was negatively correlated with performance during the finishing period. Data from this trial support a model that had been developed to relate performance effect to severity of pneumonia.

INTRODUCTION

In annual surveys done by the American Association of Swine Practitioners (1985), pneumonia consistently has been ranked as the most economically important disease in finishing pigs. The monetary losses because of pneumonia result from depression in growth rate, worsening of feed efficiency and increased marketings of undersized or cull pigs. Individual farm outbreaks of acute pneumonia have been associated with mortality rates of up to 25%, however, greater economic losses to the industry are probably incurred in the chronically infected herds (Leman et al., 1982). A number of studies have examined the effect of pneumonia on performance. In work with experimen-

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tally induced pneumonia, Zimmerman et al. (1973) reported reductions in growth rate of up to 26% and deterioration of feed efficiency up to 20%. The extent of pneumonia in the U.S. swine population was reported in an extensive survey of 9500 slaughtered hogs in 12 states. Seventy percent of the animals examined were affected to some degree with pneumonia (Muller and Abbott, 1986).

The methodology of cost determination for diseases affecting productivity has been documented (Madison et al., 1984). General equations describing production and profit impacts that occur because of disease have been described (Fetrow et al., 1985). In general, economists recommend that the costs of treatment should be compared with the part of the losses which can be avoided, determined through a partial budgeting composed of four sections: (1) additional revenue realized from the treatment; (2) reduced cost as a result of the treatment; (3) revenues forgone as a consequence of the treatment; and (4) extra cost incurred because of treatment. However, in these equations the important constants and associations between production and disease parameters have been approximated only roughly. Before reliable economic analysis can be performed, the effect of pneumonia on production parameters must be known.

In a preliminary attempt to calculate the cost of pneumonia, Straw et al. (1990) used two relationships inferred from data reported in the literature. First, when pneumonia was graded as the percent of the lung occupied by lesions, mean daily gain was decreased by 37.4 g for every 10% of the pig's lungs affected by pneumonia. Second, when depression in growth rate was known, depression in feed efficiency (expressed as kg of gain per kg of feed consumed) could be calculated according to the following formulae.

For *Mycoplasma*: % depression in feed efficiency

$$= 1.11\ (\%\ \text{depression in mean daily gain}) - 5.33.$$

For *Actinobacillus*: % depression in feed efficiency

$$= 0.77\ (\%\ \text{depression in mean daily gain}) - 0.29.$$

The data reported here were from a prospective study conducted to examine the effects of naturally occurring pneumonia on performance and to test the model proposed by Straw et al. (1990). Specifically, the goals of this study were to: (1) measure growth rate and efficiency of feed utilization in finishing pigs before, during and after natural infection with pneumonia involving *Mycoplasma hyopneumoniae* and *Actinobacillus pleuropneumoniae*; (2) determine if there is an association between the degree of depression in growth rate and the degree of change in efficiency of feed utilization; and (3) determine whether the relationship between pneumonia, growth rate and feed ef-