

EFFICACY OF LINCOMYCIN ADMINISTERED IN THE FEED FOR
THE CONTROL OF MYCOPLASMAL PNEUMONIA IN SWINE

M.J. DeGeeter, J.A. Mercadillo*, J.H. Luchsinger
The Upjohn Company and Upjohn International Inc.
Kalamazoo, Mich. 49001 USA

INTRODUCTION

Lincomycin, an antibiotic produced by *Streptomyces lincolnensis*, when administered to swine in the feed, has been reported to be effective for the treatment and control of swine dysentery, treatment of mycoplasmal pneumonia of swine, and growth promotion. The antibiotic is absorbed and transported to the site of infection. The concentration of lincomycin in lung tissue is near or exceeds the minimum inhibitory concentration for *Mycoplasma hyopneumoniae* based on *in vitro* data.

Mycoplasma pneumonia of swine (MPS) is a prominent swine disease responsible for large economic losses to swine producers. A limited number of antibacterial agents have been evaluated for the treatment of MPS.

Macroscopic and microscopic MPS lesions have been described for both disease-free pigs in which the disease was induced and for pigs with natural infections. A high correlation between gross and microscopic lesions exists. The macroscopic lesions caused by *Mycoplasma hyopneumoniae* differ from the lesions caused by other bacterial agents which cause respiratory diseases.

The objectives of the experiments reported herein were to determine the effect of the addition of 0, 22, 44, or 88 mg of lincomycin per kg of swine feed on 1) lung lesions associated with MPS, 2) daily gain (G), and 3) feed utilization (F/G).

EXPERIMENTAL PROCEDURES

Data presented herein were collected and pooled from nine experiments conducted at five different locations where pigs were fed diets containing 0, 22, 44, or 88 mg of lincomycin per kg. Data are from a total of 776 pigs. Dietary treatments were replicated three or four times at each site with 16 to 24 pigs per treatment.

Parameters to assess efficacy were gross lesions associated with MPS when pigs weighed about 90 kg, daily gain and feed utilization during the period of growth from approximately 20 to 90 kg live weight.

Lung Lesion Data

Lungs were examined and the presence or absence of macroscopic lesions associated with MPS determined and expressed as the number of pigs with lesions per experimental unit or pen divided by the total number of pigs examined per experimental unit (PDIS).

The number of lung lobes with MPS lesions per experimental unit or pen per total number of lobes examined (number of pigs per pen times seven lobes per pig) designated as LOBE reflected the incidence of the infection within lungs, and the percent of a pig's lung with lesions per total number of pigs examined within an experimental unit (LUNG), was the variable used to indicate severity of the infection.

Performance Data

Average daily gain and average daily feed consumption were based on weight gain and

feed consumption of pigs within a pen divided by the number of pig days for the period (number of pigs in a pen times number of days in a period). If a pig died or was injured during the period and the cause was not related to treatment, i.e., prolapse, injury, porcine stress syndrome, etc., the weight change and feed consumption by the pig was determined and subtracted from the pen value. If the death was considered to be treatment related, the data for that pig was included with the data for other pigs within a pen.

Feed/gain ratio was calculated by dividing the total feed consumption per pen of pigs divided by the total gain by pigs within a pen.

Statistical Analysis

Data were subjected to least squares analysis of variance and pairwise comparisons were based on the least significant difference (LSD) test. Ratios were subjected to a Freeman Tukey transformation prior to analysis and values in percent were subjected to an arcsin transformation for analysis. Experiment by treatment (E*T) interaction term in the statistical model was tested against the error term, and if not significant, E*T was pooled with the error term for testing treatment effects.

RESULTS

MPS Lesions

The number of pigs with gross lesions associated with MPS was reduced by 13 or 16% when they received diets which contained 44 or 88 mg of lincomycin per kg, respectively. The number of infected lobes and the total amount of lung with lesions was significantly decreased by adding either 22, 44, or 88 mg of lincomycin to each kg of feed. The number of infected lobes was decreased by 21 to 24%. The percentage of the total lung affected was also decreased by 19 to 27%.

Performance

Daily gain throughout the growing-finishing period, 18 to 90 kg live weight, was 3% better by pigs fed lincomycin when compared with gain by non-treated pigs ($P < .10$). Feed utilization was not affected.

CONCLUSIONS

Feeding pigs diets throughout the growing-finishing period which contained lincomycin, resulted in improved health based on reduced incidence and severity of mycoplasmal pneumonia lesions. The minimum level of lincomycin required was dependent on the parameter used to assess efficacy and ranged from 22 to 88 mg/kg. 44 mg/kg resulted in fewer pigs with pneumonic lesions associated with MPS when compared with the results for pigs fed non-medicated diets. However, pigs fed diets which contained 22 mg of lincomycin per kilogram had less severe MPS and also grew faster than pigs fed diets void of antibacterials.