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## Comparative efficacy of chlortetracycline and oxytetracycline administered in feed against experimental pleuropneumonia in pigs.

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**Introduction** Chlortetracycline (CTC) and oxytetracycline (OTC) are thought to be clinically equivalent when orally administered. A recent meta-analysis of pharmacokinetic literature revealed that the oral bioavailability CTC in pigs is significantly greater than that of OTC. In consequence, their clinical efficacy could be different. We used an *Actinobacillus pleuropneumoniae* (APP) experimental disease model to compare the prophylactic efficacy of varying feed dosages of CTC and OTC in pigs.

**Experimental design** Barrows of 10.5 kg of bodyweight were given a drug-free diet (n=36) or diets providing 22, 44, 66 or 88 mg/kg/day of Aureomycin® granular CTC or OTC (n=8 pigs per dosage per drug). Medicated meals (2% BW) were given at 12-h intervals for 7 consecutive days. Prior to the multiple dose regimen, drugs were given intravenously and in-feed to determine their bioavailabilities. On Day-6 of treatment, pigs were challenged with an APP serotype-1 isolate whose MIC was 2 µg/ml for both drugs. A blood sample was taken 1 h before challenge. Clinical signs were recorded 4 and 16 h after challenge, and the type and extent of lung lesions was recorded at necropsy, 22 h after challenge. Concentrations of CTC and OTC in plasma were determined with a validated HPLC technique. A Kruskal-Wallis test was used at the 0.05  $\alpha$ -level to compare the proportion of damaged lung between groups.

**Results and discussion** Plasma kinetic profiles of feed-administered CTC and OTC were different and their oral bioavailabilities were 28±9% and 5±2% respectively (p<.0001), which is higher than in previous reports. Ranges of plasma concentrations of CTC and OTC prior to challenge were respectively

[0.63—4.44] and [0.14—0.80] µg/mL and linearly increased with dose.

A significant difference (p=.0001) was found for the median extent of lung lesions in the CTC, OTC and control groups (Figure 1: 1%, 11% and 21% respectively). Clinical signs and lesions were almost completely prevented with the CTC 44 mg/kg/day feed dosage. In pigs dosed with OTC, clinical signs were evident even at the highest dosage level. However, they experienced a less severe form of the disease as compared to control pigs.

These results show that feed-administered CTC and OTC are not equally bioavailable and do not offer similar degrees of protection against systemic bacterial diseases.

### References:

1. del Castillo JRE, Elsener J, Martineau GP. 1998. Pharmacokinetic modeling of in-feed tetracyclines in pigs using a meta-analytic compartmental approach. Swine Health Prod., 6:189-202.
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Figure 1. Distribution of the extent of lung lesions (%) in pigs challenged with APP as a function of treatment

