

## PORK SAFETY

**Title:** Effect of Drug Combinations and Regimens on Antibiotic Resistance  
**NPB#98-208**

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- I. **Abstract:** In 2 replicate trials, 144 weaned pigs were used to test the effects of antibiotic dosing schemes on resistance in bacteria. Pigs were inoculated with the foodborne pathogen, *Salmonella typhimurium*, and the swine pathogen, K88 *E. coli* prior to being treated with feed- and water-based antibiotics. Treatments included maximum label use, rotation of similar and non-similar antibiotics, increasing gradient doses, and pulse doses of antibiotics for a period of 2 weeks following pathogen challenge. Fecal samples were obtained prior to initiation of treatments, and on various days during the treatment phase and throughout the grow-finish phase. The challenge organisms and non-pathogenic *E. coli* were recovered from fecal samples and tested against all antibiotics used in the study to determine effects on resistance patterns. Antibiotic resistance was affected to a greater extent in non-pathogenic *E. coli*, compared to *Salmonella typhimurium*. Greater ( $P < .0001$ ) resistance occurred when similar antibiotics (apramycin, gentamicin, neomycin) were used in rotation compared to other treatments. Significant ( $P < .05$ ) Time by Treatment interactions also occurred, with the greatest resistance occurring during or just following rotational treatment with similar antibiotics, compared to samples collected later and from other treatment groups. Pigs on the control and pulse dose treatments produced bacteria with lower resistance compared to other groups.

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