REDUCING EFFECT OF FLAVOMYCIN® ON SALMONELLA SHEDDING AND ANTIBIOTIC RESISTANCE IN PIGS

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Abstract The demand for food from pork origin is strongly influenced by the consumers’ concern for healthy and safe food. The topic of food safety mainly concentrates on Salmonella contamination and is recently joined by the topic of antimicrobial resistance due to the use of antimicrobial growth promoters (AMGP’s) in animal feed. Recent studies on Flavomycin (flavophospholipol), registered as AMGP for pigs, describe a reducing effect on Salmonella shedding and antibiotic resistance. Flavophospholipol does not induce an antibiotic resistance to antibiotics, which are used for veterinary or human therapy as it is not related to any antibiotic used for these purposes. Furthermore, it is capable of reducing Salmonella shedding and antibiotic resistance to other antibiotic, which are two major benefits to food safety.

Introduction The demand for food from pork origin is strongly influenced by the consumers’ concern for healthy and safe food. The topic of food safety mainly concentrates on Salmonella contamination and is recently joined by the topic of antimicrobial resistance due to the use of antimicrobial growth promoters (AMGP’s) in animal feed. Recent studies on Flavomycin (flavophospholipol), registered as AMGP for pigs, describe a reducing effect on Salmonella shedding and antibiotic resistance. This product was not affected by the EC ban on AMGP’s in 1999, as of 01/01/2006, the class of AMGP will be deleted from the European feed additive legislation. The product is not banned, but the complete class is. Flavomycin is not related to any antibiotic used for veterinary or human therapy.

Reduction of Salmonella Shedding The Fifth Amendment of the Feed Additive Directive (70/524/EEC) requires the submission of information on the possible effect of feed additives on the excretion of food-borne pathogenic bacteria like Salmonella and Campylobacter. Accordingly a study was conducted in broilers to satisfy the requirement for the commercial product Flavomycin®. Results show that Flavomycin® reduced significantly (P< 0.05) the level of Salmonella-shedding and the number of broilers shedding S. enterica at slaughter age. These results confirm previous studies in pigs in which a reduction of the duration and prevalence of Salmonella-shedding was observed. In this study a non medicated control group was compared to a group that was fed a Flavomycin-supplemented feed. At 6 weeks of age all pigs were inoculated by gavage with 2.5 X 1011 of a multi-resistant Salmonella Typhimurium strain. Fecal samples were taken from all pigs on days 2, 4, 7, 10, 12, 14, 21, 28, 35, 42 and 49.

The percentage of pigs shedding Salmonella is summarized in figure 1. Comparing the proportion of all animals having positive Salmonella-counts by group for all time periods, as presented in Figure 1, illustrates that Salmonella was more prevalent (P < 0.01) in the non-medicated group for the 2–35 day period.

Reduction of Antibiotic Resistance The concern on antibiotic resistance is that the plasmids carrying this antibiotic resistance may be transferred by a plasmid bridge (pylus) from non pathogenic intestinal bacteria in animals to human pathogens. Flavophospholipol interferes in the biosynthesis of this pylus and therefore prevents this genetic transfer and actually reduces the number of resistance carrying bacteria. This reducing effect of Flavomycin® on plasmid-bound antibiotic resistance has already been described since the early 70’s. A recent study conducted in pigs by van den Bogaard confirmed the reducing effect of Flavomycin on antibiotic resistance. Summary results are presented in figures 2 and 3.

These results clearly indicate that Flavophospholipol significantly reduces vancomycin resistance in enterococci (VRE) and antibiotic resistance in E. coli.
Conclusions Flavophospholipol does not induce an antibiotic resistance to antibiotics, which are used for veterinary or human therapy as it is not related to any antibiotic used for these purposes. Furthermore it is capable of reducing *Salmonella* shedding and antibiotic resistance to other antibiotics, which are two major benefits to food safety.

References

