QUALITATIVE RISK ASSESSMENT FOR THE USE OF ANTIBIOTICS IN POULTRY PRODUCTION – HUMAN HEALTH IMPLICATIONS:
AVILAMYCIN RISK ASSESSMENT

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For many years there has been some measure of concern in the public health community that the use of antibiotics in food animals could select for antibiotic resistant bacteria that would cause food borne disease, or transfer their resistance genes to human pathogens, and result in decreased efficacy for similar types of human use antibiotics. In Australia, the Joint Expert Technical Advisory Committee on Antibiotic Resistance issued a report in 1999 with specific recommendations to address the issue. Recommendation 1 required a risk assessment for the use of antibiotics used as growth promoters and was to follow the Australian Pesticides and Veterinary Medicines Agency (former National Registration Authority) Part 10 qualitative risk assessment outline. Additionally, the scheduling of all antibiotics to S4 status (prescription only) was to be evaluated (Recommendation 6).

The Part 10 process of risk assessment includes hazard identification, evaluation of exposure, impact and benefit-risk assessment to guide risk management options. Avilamycin, used in poultry production to enhance feed efficiency and improve weight gain in broilers, was evaluated for potential human health impact. Avilamycin (actually compromised of several related factors) is primarily active against Gram positive bacteria. Throughout the1990s, a related human-use clinical candidate, everninimicin, was in the development phase with a leading pharmaceutical company, however, due to human toxicity, it was abandoned in 2000. The potential for cross-resistance in enterococci (which causes endocarditis in humans) between the two molecules was therefore non-existent and eliminated the potential for compromising a new antibiotic for human use. The remaining possibility that co-resistance selection in chickens (i.e., use of avilamycin could select for persistence of another resistance gene) and subsequent transfer to “human” strains of enterococci in the human intestine was the basis of the hazard identification. The exposure component of the assessment evaluated surveillance data from chickens and humans in Europe, chicken contamination and dose-response relationships and literature reports of gene transfer, as well as the prevalence of nosocomial enterococcal infections in Australia. The conclusion was that risk to human health was negligible; and that based on the benefits to animal production, the continued use of avilamycin as a non-S4 product was recommended. In the minutes of the October, 2003, National Drugs and Poisons Scheduling Committee meeting this recommendation was upheld, based on advice from the Expert Advisory Group on Antibiotic Resistance, that 1) everninimicins were not used in human medicine, 2) there was no evidence that avilamycin promoted co-resistance with vancomycin resistant enterococci, and 3) it has a low and acceptable risk of promoting antibiotic resistance in humans. Risk assessment offers drug sponsors and regulatory authorities a defined path to provide the necessary information.

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