Antimicrobial Susceptibilities of *Escherichia coli* Isolates from Food Animals and Wildlife Animals in Sarawak, East Malaysia

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Abstract: A total of 133 *E. coli* strains isolated from different food animals and wildlife sources in Sarawak, Malaysia were screened to determine their antibiotic-resistance pattern using the disk diffusion methods. The animal sources were broiler and village chickens, cattle, bats and rodents. All *E. coli* isolates were tested for their resistance patterns towards 12 commonly used antibiotics: ampicillin, carbenicillin, cephalothin, chloramphenicol, gentamicin, nalidixic acid, neomycin, nitrofurantoin, ofloxacin, streptomycin, sulfamethoxazole-trimethoprim and tetracycline. In general, the most frequently encountered form of resistance in all samples was resistance to tetracycline (41.35%) and sulphamethoxazole-trimethoprim (19.55%). Low levels of resistance were for gentamicin, nitrofurantoin and ofloxacin, which demonstrated less than 7% resistance of the total samples being assessed. The Multiple Antibiotic Resistance (MAR) indices were highest for broiler chicken isolates (0.479) and low for bat isolates (0.013). All isolates from both broiler chicken samples were multidrug-resistant *E. coli*. A high percentage of the isolates from bat (84.62%) and rodent (68.57%) samples were not resistant (totally susceptible) to all the antibiotics tested. The results in this study thus suggest that wildlife do not present a high risk of spreading antibiotic-resistant *E. coli* to the environment. The higher value of MAR indices as well as prevalence of multiple-resistance patterns of *E. coli* isolates from food animals demonstrated that indiscriminate use of antibiotics should be discouraged in food animals to overcome future resistance problem.

Key words: Antimicrobial agents, MAR indices, *Escherichia coli*, wildlife, Sarawak

INTRODUCTION

Normal intestinal microflora of humans and animals comprise enormous reservoir of resistance genes for potentially pathogenic bacteria. Thus, these bacteria may serve as major indicators of selection pressure exerted by antibiotics use in veterinary and human medicines (Okoli *et al.*, 2005). Indiscriminate usage of antibiotic is probably the most important factor that leads to the emergence selection and dissemination of antibiotics resistant microorganisms especially *E. coli* strains to antimicrobial agents used in animal husbandry and for human prescription (Witte, 1998; Van de Bogaard and Stobberingh, 2000). The problem of such resistant organisms evolving and being transmitted, like zoonotic bacteria, through the food chain from food-producing animals to man is becoming increasingly important throughout the world.

The fate and safety of food-animal products in Malaysia, especially those supplied by backyard industries and when antimicrobial agents are indiscriminately used are of serious concern due to high multidrugs resistant strains being reported by Son *et al.* (1999). Resistance to antimicrobial drug can

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