

## Antimicrobial susceptibility of recent Australian isolates of *Brachyspira hyodysenteriae*

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Swine dysentery (SD) is an important disease in Australia, causing considerable economic loss through reduced growth rates in grower/finisher pigs and control costs. Swine dysentery is characterized by mucohaemorrhagic colitis, resulting from infection with the anaerobic intestinal spirochaete *Brachyspira hyodysenteriae*. The diseases can be controlled, but worldwide there is concern about reduced susceptibility of many strains to the commonly available antimicrobials. Furthermore, antimicrobials are being withdrawn due to fears of transmission of resistance to human pathogenic microorganisms, or the presence of potentially toxic residues. The aim of this study was to examine the susceptibility of recent Australian *B. hyodysenteriae* isolates to commonly available antimicrobial agents.

Isolates (n=125) of *B. hyodysenteriae* recovered from diagnostic samples received at Murdoch University from farms across Australia between 2002-2007 were tested. Spirochaetes were confirmed as *B. hyodysenteriae* on the basis of their phenotypic properties and amplification in a specific polymerase chain reaction amplifying a portion of the nicotinamide adenine dinucleotide (NADH) oxidase gene (La *et al.*, 2003). All isolates were tested against tiamulin hydrogen fumarate, lincomycin hydrochloride, dimetridazole and tylosin tartrate. In addition, 36 isolates from 2006-2007 were tested against monensin, olaquinox, ampicillin and tetracycline hydrochloride. Serial dilutions of the drugs were made in Trypticase Soy agar with 5% ovine blood, and isolates (105 cells) were drop inoculated in duplicate at each dilution. Growth was assessed by the presence of haemolysis around the inoculum after five days anaerobic incubation. The minimum inhibitory concentration was recorded, and the isolates categorized as susceptible, intermediate or resistant to each antimicrobial (Rønne and Szancer, 1990).

Summary results for the four main antimicrobials tested are shown (Table 1). In addition, the 36 isolates from 2006-2007 were either susceptible (75%) or intermediate (25%) to monensin, resistant (100%) to olaquinox, susceptible (91%), intermediate (6%) or resistant (3%) to tetracycline, and either susceptible (97%) or resistant (1%) to ampicillin.

**Table 1. Antimicrobial susceptibility of 125 Australian isolates of *B. hyodysenteriae***

Antimicrobial	Susceptible	Intermediate	Resistant
Tiamulin	72 (58%)	42 (34%)	11 (9%)
Lincomycin	32 (26%)	81 (65%)	4 (3%)
Dimetridazole	119/119 (100%)	-	-
Tylosin	1 (1%)	1 (1%)	123 (98%)

Antimicrobial resistance patterns were variable. The presence of tiamulin resistant isolates was of concern, as none were found in a survey of pre-2002 isolates (Karlsson *et al.*, 2002). Unfortunately dimetridazole, the drug to which all the isolates were susceptible, is being withdrawn for use in the treatment of SD in Australia. Most of the recent isolates tested were still susceptible to monensin. To reduce current reliance on antimicrobials, the Australian pig industry needs to consider developing alternative methods to help control SD.

### References

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