



**2A-111: An investigation into the extent of occurrence of novel pathogenic *Brachyspira* species, including newly recognised agents of swine dysentery, in Australian pig herds**

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**Project Participants:** Dr Tom La and Dr Nyree Phillips

**Aims and Objectives:**

The main aim of this project was to determine to what extent novel agents of swine dysentery, distinct from the classical agent *Brachyspira hyodysenteriae*, including “*Brachyspira suanatina*” and “*Brachyspira hampsonii*” are present in Australian pig herds. A subsidiary aim was to investigate the distribution, diversity, antimicrobial susceptibility and predicted virulence of strains of *Brachyspira hyodysenteriae* in Australian herds, including those with mild or no obvious disease.

**Key Findings:**

During the 12 month study, *B. hyodysenteriae* was detected in 27 of the 89 herds examined. Of the 27 herds, six were reported as not showing signs of disease and five showed some mild signs of uncertain significance and aetiology. “*B. hampsonii*” and “*B. suanatina*” were not found in any of the samples tested.

Genotyping a subset of the *B. hyodysenteriae* isolates revealed that they were diverse and distinct from earlier Australian isolates or those from overseas. Related isolates were found in some herds with epidemiological links through movement of pigs.

Resistance to the important antimicrobials tiamulin, tylosin, lincomycin and olaquinox occurred and was more common than in Australian isolates tested in previous years. Three distinct multi-drug resistant isolates were identified from different herds.

Application of a test for virulence showed a high agreement between the test result and origin of the isolates from herds with no disease or only mild disease. This test appears to be a good predictor of strains that are less able to colonise and cause disease, and can be recommended for more wide-scale diagnostic use.

**Application to Industry:**

This study has demonstrated that “*B. hampsonii*” and “*B. suanatina*”, the newly described agents of swine dysentery in North America and Europe, are not likely to be present in Australia. On the other hand the classical agent *B. hyodysenteriae* is relatively common and widespread. The strains that are currently circulating generally are different from those found in the past, and are different from strains from other countries. Evidence was found for the likely transmission of strains between piggeries that are linked through movement of pigs. More strains showed antimicrobial resistance than in the past, and of particular concern was the identification of three different multi-drug resistant strains.

A major finding was identification of *B. hyodysenteriae* in farms that had no disease, or only mild disease of previously unknown aetiology. Strains from these farms were shown to lack some genes, which potentially may reduce their ability to colonise. These results support the usefulness of testing isolates for these genes, but also emphasize the need for routine testing of herds to check whether they carry *B. hyodysenteriae*.

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