# Colonic Antibody Responses in Pigs With Swine Dysentery

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Swine dysentery (SD) is a mucohaemorrhagic colitis of pigs resulting from infection of the large intestine with the anaerobic intestinal spirochaete *Brachyspira hyodysenteriae*. The infection has been reported to result in the development of specific IgG, IgA and IgM antibodies in serum and the production of secretory IgA in the gut mucosa (Rees *et al.*, 1989). The hypothesis tested in this experiment was that colonic antibody levels can be used as a diagnostic tool to assist the diagnosis of SD. The experimental design involved testing samples from non-infected pigs to define appropriate cut-off values for the assays, and then using these in assays of serum and colonic samples from pigs that had been experimentally exposed to *B. hyodysenteriae*.

Colonic samples from 110 pigs from an SD-free farm, confirmed negative for *B. hyodysenteriae* by selective anaerobic culture and polymerase chain reaction (PCR), were obtained at slaughter. These were used to establish cut-off values for colonic antibodies, based on the mean ELISA reading plus three standard deviations. Commercial pigs (n=58) of ~25kg from the same farm then were purchased, bled and experimentally challenged with cultures containing 1010 cells of *B. hyodysenteriae*, over three successive days. The initial serum samples served as negative controls for establishing cut-off values. The pigs were killed when they developed signs of SD, or 30 d post-infection if they remained healthy. Serum and colonic samples were collected as previously described (Rees *et al.*, 1989), and tested in ELISAs using *B. hyodysenteriae* whole cell sonicates (2ug/ml) as the coating antigen, and appropriate conjugates to detect serum IgG and IgM, and colonic IgG and IgA.

**Table 1.** *Experimentally infected pigs (n=58) with positive antibody levels against Brachyspira hyodysenteriae.*

| | Serum ELISA | | Colonic ELISA | |
|---|---|---|---|---|
| | IgG | IgM | IgG | IgA |
| Pigs with disease (47) | 3 | 4 | 27 | 12 |
| Pigs without disease (11) | 3 | 0 | 2 | 1 |

Forty-seven (81%) pigs became culture positive and developed clinical signs of SD. Only six (10%) developed serum IgG ELISA values consistent with infection, while 29 (50%) developed colonic IgG levels exceeding the negative cut-off value at post-mortem. Antibody levels were not correlated to lesion severity in individual pigs. More than half of the diseased pigs had elevated colonic IgG values, but 2 of 11 (18%) challenged pigs that remained healthy and culture negative also had colonic IgG levels exceeding the cut-off. Measuring colonic IgG was more discriminatory for detecting diseased pigs than using colonic IgA. This observation has not been made previously, as colonic IgG was not measured in the study by Rees *et al.* (1989).

These results indicate that elevated colonic IgG levels are a useful indicator of recent infection with *B. hyodysenteriae*, and could be used as an adjunct to the diagnosis of SD at the individual pig or herd level.

REES, A.S., LYSONS, R.J., STOKES, CR. and BOURNE, F.J. (1989). *Research in Veterinary Science*. **47**:263-269.

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