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Safety and Preliminary results

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Swine plasma immunoglobulins for prevention and treatment of post-weaning diarrhoea: Safety and Preliminary results

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Background
Post-weaning diarrhoea (PWD) is a common condition in intensive swine production, resulting in reduced welfare of weaners, high consumption of antibiotics and zinc oxide, and economic losses for the farmer as a result of pig disease and death, and associated treatment costs.

Aim
To develop an antibiotic alternative, based on natural antibodies (immunoglobulins) derived directly from inexpensive raw material (swine blood plasma) for oral provision, and protection against PWD.

Conclusions
• Purified pig plasma immunoglobulin (ppIgG) binds PWD-inducing Enterotoxigenic Escherichia coli (ETEC), and inhibits ETEC adhesion to porcine intestinal epithelial cells in vitro.
• Experimental ETEC infection was cleared significantly faster in weaner piglets given a ppIgG feed supplement.
• Based on next-generation sequencing data, ppIgG inhibits ileal adhesion of bacteria from the family Enterobacteriaceae.
• No adverse side effects were observed by using ppIgG as a feed supplement.
• These results suggest that ppIgG could be used for treatment of PWD and reduce antibiotic consumption.

Figure 1: Purified porcine IgG (ppIgG)

Figure 2: ppIgG reacts with relevant bacteria in vitro

A: Indirect (whole cell ELISA)

B: Competitive ELISA

C: Inhibition of ETEC adhesion

Figure 3: ppIgG binds PWD-inducing ETEC, and inhibits ETEC adhesion to porcine intestinal epithelial cells in vitro.