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# Effect of colistin sulfate on fecal *Escherichia coli* excretion and global health of weaned pigs challenged with *Escherichia coli* F4 (K88)

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Colistin sulfate (CS), a peptide antibiotic, is recommended in some countries for the therapy of gastrointestinal tract infections in pigs. This antibiotic is used off label in Canada for the treatment of post-weaning diarrhea. The aims of the present study were to validate the experimental *E. coli* F4-infection model and to evaluate the modification of *Escherichia coli* population. A total of 14 weaned piglets were used. At 28 days of age, pigs were challenged orally with 109 cfu of an ETEC F4 resistant to naladixic acid. Pigs were divided into two groups, control group (n=7) and a treated group (n=7) received a single oral dose of CS at 50,000 IU/Kg, given 3 days after inoculation. Severity of diarrhea was monitored using a fecal consistency scoring system. Bacterial counts were carried out by streaking faecal samples on to Petrifilm E. coli/Coliform count plates, and 5 per cent bovine blood agar plates, containing nalidixic acid, for detection of ETEC F4 strain. Faecal samples were collected before challenge and 24, 72, 84, 96, 108, 120 h post challenge. A necropsy was performed 120 h post challenge and ileal mucosa was collected to evaluate bacterial colonization. Level of dehydration was determined by measuring total protein (TP). In both groups, there was an increase in bacterial counts following challenge. After CS treatment, especially at 24 h post treatment there was a decrease in bacterial count as compared to the control group. The consistency, ETEC F4 attachment to the ileal mucosa and TP concentrations were not affected by antibiotic treatment.
In this pilot study, administration of a single dose of CS resulted in a reduced bacterial count of *E. coli* population and ETEC F4. However, scores of diarrhea, attachment of ETEC F4 to the ileal mucosa and dehydration were not affected by CS treatment. Further investigations with a complete therapeutic protocol and a quantitative real-time PCR are needed, to evaluate effect of CS on ETEC F4 diarrhea, total *E. coli* populations and on the intestinal microbiome.