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Topics :

Public health issues and risk assessment or Foodborne pathogen epidemiology control strategies

**Oral colistin sulfate in pigs: pharmacokinetics and effect on fecal *Escherichia coli* excretion in weaned pigs challenged with enterotoxigenic *Escherichia coli* F4 (K88)**

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Colistin sulfate (CS), a polymyxin antibiotic, is used in Canada for the treatment of post-weaning diarrhea in pigs as an alternative to neomycin. The aim of the present study was to study the pharmacokinetics of CS and its effect on the evolution of the intestinal *Escherichia coli* population in pigs challenged with enterotoxigenic *E. coli* (ETEC): F4. A total of 14 weaned piglets were divided into two groups, a non-challenged, treated group (n=7) and a challenged, treated group (n=7). Both groups received a single oral dose of CS at 50,000 IU/Kg. Challenge was carried out by oral administration of 10<sup>9</sup> CFU of a hemolytic ETEC:F4 strain resistant to nalidixic acid. Blood samples were taken on 0, 5, 1, 2, 4, 6, 8, 12, 24, 36 and 48 hours post treatment from each pig, to quantify the CS concentration by LC-MS/MS. In the challenged group, severity of diarrhea was monitored and the presence of the ETEC:F4 strain in the feces was enumerated using 5% bovine blood agar plates containing nalidixic acid. In both groups, total *E. coli* counts were carried out using Petrifilm *E. coli*/Coliform count plates. In both groups, the plasma concentration of CS was less than the lower limit of quantification (20 ng/ml) by LC-MS/MS. After CS treatment, especially at 24 h post treatment, a decrease in the total *E. coli* and ETEC:F4 fecal counts were observed. The fecal consistency was not affected by CS treatment.

For the first time, a study of CS pharmacokinetics with a highly sensitive method showed that CS concentrations are not detectable in the systemic circulation following oral administration, and concurrent oral challenge with an ETEC strain did not affect CS absorption. A single dose of CS resulted in a reduced bacterial count of the total *E. coli* and ETEC:F4 populations in the feces.

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