**Introduction**

- Enterotoxigenic *E. coli* (ETEC) are the most common type of *E. coli* that cause diarrhea in post-weaning piglets.
- Supplementation of *Bacillus* spp. probiotics reduces incidence of diarrhea and improves growth performance of post-weaning pigs. (Bhandari et al., 2008; Pan et al., 2017)
- Probiotics can reduce incidence of diarrhea, improve gut barrier integrity, and reduce systemic inflammation. (Bhandari et al., 2008; Yang et al., 2016)

**Objective**

- To investigate the effects of supplementation of *Bacillus* spp. probiotics on the growth performance, diarrhea, and intestinal health of weaned pigs experimentally infected with an enterotoxigenic F-18 *E. coli*

**Materials and Methods**

- Animals and facility
  - 48 weanling pigs (6.17 ± 0.40 kg)
  - Weaned at 21 d of age into 3 confinement nursery rooms
- F18 *E. coli* challenge
  - Enterotoxigenic F18 *E. coli* (LT, STb, SLT-2)
  - Oral inoculation, 10^10 cfu/dose with 3 doses
- Experimental design
  - Randomized Complete Block Design
  - Blocking factors: body weight x gender
- Dietary treatments: 12 pigs/treatment
  - Nursery basal diet without *E. coli* challenge (NC)
  - Nursery basal diet with *E. coli* challenge (PC)
  - PC + 50 mg/kg carboxad (AGP)
  - PC + 500 mg/kg *Bacillus* spp. (PRO)
- Data collection
  - Growth performance: Body weight (BW), Average Daily Gain (ADG), Average Daily Feed intake (ADFI) and Feed to Gain ratio (F:G)
  - Fecal sampling: d 0 before inoculation and d 3, 7, 14, and 21 post-inoculation (PI)

**Results**

- Daily diarrhea score: ranging from 1 to 5 (1, normal feces and 5, watery diarrhea)
- Tight junction proteins/proinflammatory cytokines mRNA expression in Jejunal and ileal mucosa
- Frequency of diarrhea
- Average daily gain
- Beta hemolytic coliforms
- Tight junction proteins
- Inflammatory mediators

**Conclusions**

- Compared to pigs without PRO supplementation, supplementation of PRO
  - Improved growth performance (BW and ADG)
  - Alleviated diarrhea and enhanced gut barrier function