INTRODUCTION

- Antibiotics have been widely used as a growth promoter and to treat the diarrheal disease caused by enterotoxigenic Escherichia coli (E. coli), which are the most dominant type of pathogenic E. coli in both humans and livestock.
- Antibiotic resistance is one of the biggest health concerns that lead to tremendous economical loses and increased mortality of both humans and livestock (WHO, 2018).
- Subinhibitory antibiotics concentration enhanced bacterial selection for antibiotic resistance genes (Davies et al., 2006).

OBJECTIVE

- Investigate the effects of antibiotics growth promoters (AGP) on growth performance, diarrhea, fecal β-hemolytic coliforms, bacterial translocation, and blood parameters of weanling pigs experimentally infected with F18 E. coli.

MATERIALS & METHODS

Experimental design & treatments

- Animals: 34 weanling pigs (6.88 ± 1.03 kg BW)
- Experimental design: Randomized complete block design
- Housing: Individually housed in disease containment rooms
- Treatment: 3 treatments (11-12 pigs/treatment)
  - Control (CON)
  - Low dose AGP (carbadox), CON + 0.5 mg/kg AGP
  - High dose AGP (carbadox), CON + 50 mg/kg AGP

Sampling and data collection

- Pathogenic F18 E. coli challenge (LT, STb, SLT-2); oral inoculation, 10^{10} cfu/dose with 3 doses

RESULTS

- Body weight
  - CON Low AGP High AGP
  - d 0 d 5 Pl d 11 Pl

- Average daily gain
  - CON Low AGP High AGP
  - d 0 to 5 Pl

- β-hemolytic coliforms
  - CON Low AGP High AGP

- Diarrhea score
  - CON Low AGP High AGP

- Bacterial translocation
  - CON Low AGP High AGP

- Neutrophils
  - CON Low AGP High AGP

- C-reactive protein
  - CON Low AGP High AGP

- Haptoglobin
  - CON Low AGP High AGP

CONCLUSIONS

- Very low-dose antibiotic growth promoter supplementation exacerbated growth performance, diarrhea, and systemic inflammation of weaned pigs infected with a pathogenic E. coli.
- Nutritional intervention is required to avoid the adverse effects of removing antibiotics from humans and livestock.
- Exploring potential alternatives to antibiotics must be considered in both animal agriculture and human medicine.