

# P09

## Effects of a novel plant extract administered through drinking water on the post-weaning gut health of piglets after exposure to E. Coli

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**Abstract** Phytogenic feed additives are a group of plant-derived ingredients used to improve production efficiency and maintain health of agricultural livestock in the absence of antibiotics. The objective of this study was to evaluate the effects of a novel plant extract derived from common food plants (Grazix, LiveLeaf Bioscience) on the performance and health of weaned piglets fed a mixed diet and then challenged with E. coli. At weaning, a total of 144 piglets were allocated to two post-weaning rooms; half of the piglets received the novel plant extract (PE) in their water, the other half did not (control). On day 9 of the trial, half of the piglets were injected orally with a 4 mL solution containing 10<sup>9</sup> colony-forming units of E. coli. The piglets' growth performance and fecal scores were recorded weekly. On days 0, 14, and 35, fecal samples were collected for microbiological analysis, while on days 0, 6, 19, and 35, blood samples were obtained from one pig per pen. At the end of the trial (day 35), 24 animals (12 from the control group and 12 from the PE group) were slaughtered and their distal ileum collected and examined in order to assess the ileum micro-anatomical structure, to perform histometry and immunohistochemistry, and to measure intestinal inflammatory parameters. When the data were analyzed, it was noted that piglets given the PE supplement had an increased average daily gain during the last week of the study (p=0.007) and reduced feed conversion rate during the second (p=0.009) and last weeks (p=0.04), and over the entire study period (p=0.01) when compared to piglets in the control group. Also a lower fecal score was observed in the piglets given the PE solution (p<0.01). On day 35, fecal E. coli and Enterobacteriaceae concentrations were lower in animals given the PE when compared to controls (p=0.02 and p=0.009, respectively). Ileum crypts from piglets in the PE group were deeper in E. coli challenged animals than in non-challenged ones (p<0.05), while the number of mucosal macrophages was higher in control piglets challenged with E. coli (p<0.05). The number of mucosal macrophages present in PE piglets challenged with E. coli was comparable to the number present in piglets that were not exposed to E. coli. Use of the PE supplement increased glutathione peroxidase plasma concentration at day 6 (p=0.02), lowered malondialdehyde value at day 6 (p=0.07), and increased total antioxidant capability value at the end of the trial (p=0.07). The use of plant extracts improved the gut lining and increased innate immune response.

**Keywords** plant extract; E. Coli; piglets; gut health