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TITLE

EFFECT OF A COMMERCIAL ORGANIC ACID BLEND ON GROWTH PERFORMANCE, GUT MORPHOLOGY, MICROBIOTA COMPOSITION AND METABOLIC FUNCTION IN NURSERY PIGS UNDER DIETARY AND ENVIRONMENTAL CHALLENGES

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CONTENT

Background and Objectives: Due to antibiotic resistance threat, global changes in regulations and consumer preferences, the swine industry is moving towards antibiotic-free feeding programs. Consequently, there is a potential of increasing incidence of post-weaning diarrhea, leading to reduced production performance and increased economic loss. The objective of this study was to investigate the effect of a commercial organic acid blend based on 2-hydroxy-4-(methythio)butanoate (HMTBa) on growth performance and gut health in nursery pigs.

Materials and Methods: A total of 520 weaning piglets (TR-4 × PIC C-22, BW = 6.40 ± 0.06 kg) were allotted to 1 of 2 treatments according to randomized complete block design, with 10 pens per treatment with 26 pigs per pen. The 2 dietary treatments included: 1) corn-soybean meal control diet without organic acid supplementation (CON); 2) CON diet supplemented 0.45% organic acids blend based on HMTBa (ACTIVATE® DA, Novus International Inc., St. Charles, MO) during phase 1 and 2 and 0.3% ACTIVATE® DA in phase 3 (ACTDA). The diets contained 37% soybean meal in phase 1 and 2. The pigs were raised for 42 d under dirty environment to reflect commercial condition and induce a gut health challenge.

Results: Pigs fed ACTDA tended to have greater ADG during d 0 to 42 ($P = 0.08$) and BW on d 42 ($P = 0.07$) compared with those fed CON. ACTDA supplementation increased villus height to crypt depth ratio in duodenum ($P < 0.01$), jejunum ($P < 0.01$) and ileum ($P = 0.02$) compared with CON. Additionally, ACTDA supplementation reduced abundance of Dialister succinatiphilus ($P = 0.05$), LPS biosynthesis protein ($P = 0.01$) and pores ion channels ($P = 0.02$).

Discussion and Conclusion: Results indicated that ACTDA supplementation could exert growth performance benefits, mediated via improving gut morphology, modulating gut microflora and metabolic function.