

## Citric acid and thymol influence gastrointestinal microflora in pigs at weaning

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(2007) Proceeding of ADSA-ASAS Joint Annual Meeting, July, 8-21, San Antonio, TX

Aim of this study was to investigate the role of citric acid (CA) and thymol on growth performance and gastrointestinal microflora in weaning pigs. Ninety-six Landrace × Duroc piglets weaned at 22 days of age ( $6.7 \pm 0.8$  kg BW) were divided into four groups of 4 replicates of 6 animals each and assigned to experimental dietary treatments: control diet (T1) or the control diet added with microencapsulated CA (T2), microencapsulated thymol (T3), and a microencapsulated blend providing the same amounts of CA and thymol of the other groups (T4) (EP 1391155B1; US 20040009206A1; Vetagro srl, Italy). Piglets were fed a two-phase diet (0-21 d, 22-42 d) and at 42 days 6 animals per treatment were sacrificed, the GI tract was removed and the contents of stomach, proximal jejunum, distal jejunum, caecum and colon were collected to be analysed for pH, NH<sub>3</sub>, VFA, and lactobacilli, coliforms, and *C. perfringens* counts. Live weight at 0, 21 and 42 days was recorded; average daily gain, feed intake and feed conversion rate between 0-21, 22-42 and 0-42 days were calculated. All data were analyzed by ANOVA and differences were considered statistically significant at  $P < 0.05$ . Thymol increased feed intake throughout the study (0-42d, +12.6% T3 vs T1,  $P < 0.05$ ); final weights were not different. Microencapsulated CA (T2) or thymol (T3) failed to change bacterial counts along the GI tract, whereas only the microencapsulated blend (T4) significantly reduced by 4 Logs coliforms in caecum compared to control fed piglets (T1=  $6.73 \pm 0.61$ , T4=  $2.81 \pm 3.12$ , Log CFU/g,  $P = 0.04$ ). These data suggests that microencapsulated thymol improved feed intake throughout the crucial 42 days of the post weaning period and that the individual microencapsulated compounds at the supplemented dose were not inhibitory, whereas properly coupled substances may exert a synergistic activity in modulating cecal microflora.

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