Microencapsulated feed additives to reduce Salmonella shedding

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The reduction of Salmonella prevalence in food animals in Europe is regulated by EU Reg. 2160/2003, EU Reg. 1003/2005 and others. The purpose of these regulations is to detect and control Salmonella strains that represent a threat to public health and to ensure that preventive measures at each stage of production are taken. In this context, tailored nutritional strategies are now a priority, along with improved management and biosecurity. Aim of the study was to investigate the efficacy of an experimental microencapsulated blend of sorbic acid and naturally identical compounds (SAB) against S. Typhimurium in pigs. The active principles of SAB were dissolved in TSB and serial dilutions were prepared to reach final concentration of: 0, 200, 400, 600, 800, 1000, 2000, 3000, 4000, and 5000 mg/L. Each dilution tube was inoculated with S. Typhimurium at 106 CFU/ml initial concentration. Compared with controls, after 24 h of incubation, SAB at 2000 and 3000 mg/L reduced (P < 0.05) Salmonella growth by 4–5 Log10, respectively, and SAB at 4000 and 5000 mg/L completely inhibited (P < 0.05) its growth. Forty (n = 40) pigs housed in 20 pens were assigned to 4 dietary treatments: control group (challenged, not treated), and 3 treatment groups treated with 300, 3000, 30000 g/ton of SAB, respectively. After 1 week of adaptation pigs were challenged with 107 cfu of S. Typhimurium mixed to the feed and a second challenge was repeated via gavage after 7d. After 2d, and every 4d thereafter, fecal samples were collected from each pig and analyzed for S. Typhimurium qualitatively and quantitatively. Results demonstrated that 3000 and 30,000 g/ton SAB reduced (P < 0.05) S. Typhimurium prevalence by 40% and 50% after 2 wk, and at the end of the third week 100% of the animals in the same groups resulted negative for S. Typhimurium. This study demonstrated that intestinal delivery of microencapsulated sorbic acid and naturally identical compounds can result in a reduction of S. Typhimurium prevalence and fecal shedding in pigs. In-field trials are currently under exploitation to confirm our preliminary small-scale observations.