

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.

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