

Microencapsulated Sorbic Acid and Pure Botanicals Affect Salmonella Typhimurium Shedding in Pigs: A Close-Up Look from Weaning to Slaughter in Controlled and Field Conditions

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The aim of this study was to assess the efficacy of a combination of sorbic acid, thymol, and carvacrol in reducing the prevalence and shedding level of Salmonella Typhimurium in pigs either in a controlled challenge environment or in a production setting. In the first study, 24 weaned piglets were separated in 4 isolation units (6 piglets/isolation unit). Each unit received either a basal diet (no treatment) or a microencapsulated mixture of sorbic acid, thymol, and carvacrol at 1, 2, or 5 g/kg of feed. After 21 d, pigs were orally challenged with 6 log₁₀ colony-forming units of Salmonella Typhimurium. Blood samples and feces from rectal ampullae were collected every week. On d56 of the study, pigs were euthanized and necropsied to collect intestinal contents (jejunum through colon) and ileocecal lymph nodes. Samples were analyzed for Salmonella Typhimurium and serological analysis was also conducted. In the second study, an all-in-all-out multisite pig farm that was positive for monophasic Salmonella Typhimurium was followed throughout a production cycle from weaning to slaughter. Pigs received either a basal diet or the basal diet including 5 g/kg of the microencapsulated additive. Environmental, fecal, and blood samples were collected monthly, and cecal contents and ileocecal lymph nodes were collected at slaughter to isolate and enumerate Salmonella. The results indicate that the additive at 5 g/kg tended to reduce Salmonella fecal prevalence in both a controlled challenge ($p = 0.07$) and in production conditions ($p = 0.03$). Nevertheless, the additive did not reduce the number of pigs seropositive for Salmonella, nor it reduced the Salmonella prevalence at slaughter. The data indicate that these additives are not effective alone but must be used in conjunction with appropriate containment measures at lairage in order to prevent reinfection in pigs and to reduce the number of pigs carrying Salmonella entering the food chain.

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