Critical review of interventions against *Salmonella* in the farm-to-processing pork production continuum

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The purpose of this study was to identify, evaluate and summarize the available scientific literature on the effectiveness of interventions against *Salmonella*, in the farm-to-processing pork production continuum, following the principles of systematic review methodology. A comprehensive computerized and hand literature search was conducted using pre-determined search terms. Publication abstracts were screened for relevance, and those retained were assessed for quality using pre-determined inclusion/exclusion criteria. Data were extracted from the publications using a structured protocol. Among 1,126 potentially relevant references, 173 were found relevant and 76 met necessary quality criteria. On-farm interventions included vaccinations, antibiotics, sodium chlorate, probiotics/competitive exclusion, acidification of feed or water, management related strategies, feed related control, and novel strategies, e.g. bacteriophages. Eight intervention categories were identified at the transport, lairage and slaughter levels. A large heterogeneity among the studies was observed for all intervention categories precluding pooled analyses of data from individual studies. More consistent, beneficial effects in controlling *Salmonella* in swine were observed for vaccines, feeding coarse mash feeds, acidification of feed, carcass treatment with lactic acid, water, chlorine and chilling. For fermented liquid feed, antibiotics, sodium chlorate, competitive exclusion, the results were less consistent. This review also revealed the lack of studies on the effectiveness of certain bio-security practices that have been identified in observational studies as potential interventions for *Salmonella* in swine and are often recommended to swine producers, e.g. limiting visitors to the farm, changing clothes and boots for visitors. Further investigations are needed in these areas and in those that showed promising results in controlling *Salmonella*, e.g. prebiotics, probiotics, and bacteriophages. Systematic review approach provided transparent, structured and replicable format for identifying effective interventions, gaps in the current knowledge and future research needs. Furthermore, evidence-based inputs were generated for a complementary risk assessment.

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