

# Interventions associated with feeding management practices and feed characteristics, and measures of *Salmonella* prevalence in live and slaughtered swine: A systematic review and summation of evidence

O'Connor, A.M. <sup>\*(1)</sup>, Denagamage, T., <sup>(1)</sup> Sargeant, J., <sup>2</sup> Rajic, A <sup>(3)</sup>, McKean, J., <sup>(1)</sup>

<sup>(1)</sup>Department of Veterinary Diagnostic and Production Animal Medicine, College of Veterinary Medicine, Iowa State University, Ames, 50011, IA, USA.

<sup>(2)</sup>Department of Clinical Epidemiology and Biostatistics, McMaster University, 1200 Main St. W., Hamilton, L8N 3Z5, ON, Canada.

<sup>(3)</sup>Public Health Agency of Canada and University of Guelph, Canada

\*corresponding author: oconnor@iastate.edu

## Abstract

The aim of this review is to evaluate and summarize the evidence for associations between feeding management practices and feed characteristics, and *Salmonella* prevalence in swine, which may represent opportunities for interventions. *Salmonella* prevalence in the reviewed literature was measured either by culture or by the presence of antibodies. A systematic review of the area was conducted, the goal being to minimize the impact of bias. Systematic reviews include an assessment of the quality of studies and exclusion of studies that fail to meet standards for published material. The review evaluated evidence for an association between feed withdrawal from swine prior to slaughter, acidification of feed, heat treatment of feed, pellet vs. mash, course vs. fine grind, and wet vs. dry. A large number of intervention studies were excluded from the review because they failed to report design features designed to limit the introduction of bias such as randomization and blinding. The majority of studies included were cross sectional studies, however these failed to provide strong evidence of an association because of the potential for confounding and the failure to document a temporal association between exposure to the risk factor and the outcome. The review concluded that the strongest body of work was available for pelleted feed and dry feed, however there was still uncertainty about the situations where this association may be effective. The conclusion was that there should be a *low level of comfort* among qualified scientists that the claimed association/relationship is scientifically valid. This ranking is primarily based on moderate to low quality studies, or insufficient numbers of tested individuals or herds, resulting in a low degree of confidence that results could be extrapolated to the target population.