

Critical Analysis of Pork QMRA Focusing on Slaughterhouses: Lessons from the Past and Future Trends

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INTRODUCTION

Foodborne microbial diseases have a significant impact on public health, leading to millions of human illnesses worldwide each year. Pork is one of the most consumed meats in Europe, but may also be a major source of pathogens introduced all along the farm-to-fork chain. Several quantitative microbial risk assessments (QMRA) have been developed to assess human health risks associated with pork consumption and to evaluate the efficiency of different risk-reduction strategies. This critical analysis aims to review pork QMRAs. The slaughterhouse has a key role to play in ensuring food safety.

METHODOLOGY

An exhaustive search was conducted following the preferred reporting items for systematic reviews and meta-analyses (PRISMA) methodology.

RESULTS

The literature search resulted in the identification of a collection of 2489 papers, including 42 on QMRA, after screening. Among them, a total of 29 studies focused on *Salmonella* spp., with clear concern on impacts at the slaughterhouse, modelling the spreading of contaminations and growth at critical stages, and potential reductions. In addition to strict compliance with good hygiene practices, several potential risk mitigation pathways were highlighted for each slaughterhouse step.

DISCUSSION

The slaughterhouse has a key role to play in ensuring the food safety of pork-based products, but it is necessary to consider the entire farm-to-fork chain to enable better control of bacteria. This review provides an analysis of pork meat QMRAs, to facilitate their reuse and identify gaps that can help guide future research activities.