Quantitative microbiological risk assessment on Salmonella in slaughter and breeder pigs

Background

A quantitative microbiological risk assessment (QMRA) evaluates the exposure level and risks to human health due to pathogens. This European Food Safety Authority (EFSA) project with FSA part-funding aimed to develop a QMRA for *Salmonella* in slaughter and breeder pigs encompassing the entire European farm-to-fork chain.

Research Approach

A literature review, a call for information and a workshop were conducted to compile information. A QMRA for *Salmonella* was constructed with regard to farming, transport, lairage, animal slaughter, carcass processing, meat preparation and consumption of pig products. The effects of interventions in terms of a reduction of Salmonella on pig meat at retail and on the number of human *Salmonella* cases were investigated.

Results

From the current evidence, it would appear that specific slaughterhouse interventions are currently best placed to produce consistently large reductions in the number of human cases of *Salmonella*. For Member States where pig breeding is prevalent, reducing infection in breeders would seem to be an important control measure and this has been successfully implemented by the poultry industry. However, the hypothetical reductions and multiple interventions investigated here suggest that Member States can achieve larger reductions by targeting farm and slaughterhouses together.

Reducing the prevalence at farm level is also considered important for preventing the transmission of Salmonella from pigs to other livestock species such as laying hens and broilers, where the prevention and control efforts are focused on the farm. Comparison of the current QMRA model against similar national QMRAs for *Salmonella* in pigs highlights the following conclusions across all model results:

- slaughterhouse decontamination interventions are effective in reducing risk
- reducing prevalence of infection in slaughter pigs is also an effective risk reduction strategy
- low *Salmonella* contamination rates at retail

In summary, despite a much more complicated scope and framework, the generic EU Member States QMRA model predicts similar results to the national QMRA models, but incorporates a much wider selection of interventions, and in turn these interventions can be implemented for a wide range of production systems across the EU.

It is important to recognise that this has been one of the most ambitious QMRAs ever developed in terms of both the complexity of the model (which has been built to maximise the potential for the consideration of current and future interventions) and also the requirement to produce a model that can represent all Member States within the EU. Capturing variability within a single Member State is in itself a challenge. However, by trying to capture variability between Member States the area of QMRA has been taken to a new level.

Research report

England, Northern Ireland and Wales

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