

The best biosecurity practices in European abattoirs in regards to Salmonella and hepatitis E virus

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INTRODUCTION

Salmonella and hepatitis E virus (HEV) are zoonotic pathogens which usually lead to subclinical infections in pigs. However, Salmonella frequently causes gastrointestinal infections in humans typically via the food chain. HEV infections can be fatal for humans and are an emerging zoonotic problem in Europe, with pigs thought to be the main source. Abattoir personnel can be at increased risk of infection of both pathogens due to their frequent contact with pigs and carcasses.

A subtask of the BIOPIGEE project ('Biosecurity practices for pig farming across Europe') was to collate relevant evidence on the impact of abattoir biosecurity practices, which might affect carcass contamination/cross-contamination. The aim was to define the best biosecurity practices that would reduce transmission of the pathogens to humans. A questionnaire was developed to collect information about the best biosecurity practices implemented to limit Salmonella and HEV contamination in and cross-contamination between European abattoirs.

METHODOLOGY

A literature review was compiled based on the keywords: Slaughter, Biosecurity, Abattoir, Pigs, Salmonella and HEV. In total, 67 sources of information proved to be useful. An online survey (limited to no more than 30 questions and no longer than 60 minutes in duration) was designed, based on the information gathered. The target audience was abattoir personnel responsible for implementing biosecurity. The survey was translated into Italian, German, Czech and Estonian in addition to English.

The questionnaire covered the following areas: General (no. of questions=3), Transportation (1), Lairage (4), Scalding (2), Singeing (1), Evisceration (4), Carcass splitter (2), Decontamination (1) and Chilling (2). Questions were mostly closed (multiple-choice) with an option to add comments.

In order to provide proof of principle on whether the level of contamination correlates with the biosecurity practices identified in the literature, abattoirs (n = 3) were visited and samples taken at specific locations (truck, lairage pens, scalding water tank, evisceration

step, outer surface of carcass after evisceration and before chilling). Samples were analysed for Enterobacteriaceae, coliforms/E. coli, Salmonella spp. and HEV.

RESULTS

In total, 27 questionnaires were collected from six countries: AT (n=3), CZ (10), EE (2), DE (6), IT (4) and NL (2). Most were multi-species abattoirs (n=13) while others were for a range of pig types (finishers, sows, etc.) or only finishers (both n=7).

Most of the responders (n=21, 78 %) collected more bacteriological samples than was required by legislation. Around half (49 %) had pigs stay in lairage for <2 hours before being slaughtered and pigs did not come into contact with pigs from other farms in 78 % of abattoirs.

None of the abattoirs inserted tracheal or anal plugs before scalding, while three used anal plugs after scalding. Vertical scalding was used in five abattoirs.

In most of the abattoirs, singeing lasted 5-15 seconds (n=17), while singeing lasted more than 15 seconds in six abattoirs.

A 2-knife system with 82°C water sterilisation was used in 23 abattoirs (85 %), of which 20 checked temperatures daily, whereas the rest checked temperatures on either a weekly or monthly basis.

During evisceration, most abattoirs took extra caution to avoid rupturing the lungs (85 %) and touching the tongue (67 %). Few used a slowed-down evisceration step ('branching') (11 %) and round-tip knives (22 %).

DISCUSSION

Currently, there does not seem to be a publicly available checklist for European abattoirs, with an emphasis on Salmonella and HEV and which has references to the latest scientific research. The findings from a literature review, in combination with our survey answers, will provide the basis for the development of a useful tool for biosecurity self-assessment in European abattoirs – especially by providing ideas on what further improvements can be made and how often these can be applied. However, as participation in the survey was voluntary, it is difficult to assess the extent to which the study population was representative. Additionally, there might be considerable differences between countries and regions, for example chilling is uncommon in Italy. At the time of publishing, abattoir samples were not yet fully analysed. The results will thus be published in the near future. The sample size should be increased in future studies in order to validate and identify the correlation of best biosecurity practices with bacteriological findings. However, results from the online survey indicate that there are considerable differences in terms of biosecurity practices and their implementation.