



Prerequisites for high-quality official control in Finnish slaughterhouses



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ABSTRACT

To ensure the safety of meat, official control, including meat and food safety inspections in slaughterhouses, should be of high quality. The prerequisites for high-quality official control were examined by sending a questionnaire to meat inspection personnel, slaughterhouse representatives, and officials who guide and organize the official control of slaughterhouses at the central level in Finland. The questionnaire inquired about the sufficiency of meat inspection personnel resources and its effects on official control. The post-mortem inspection skills of the official auxiliaries (OAs) and steps taken by the official veterinarians (OV) to evaluate OAs' performance in post-mortem inspection were explored. Furthermore, OAs' independence from the slaughterhouses in meat inspection, and further training and guidance provided to meat inspection personnel were surveyed. Our results showed that in most slaughterhouses at least occasional shortage of OVs was experienced, and it decreased especially the time dedicated to food safety inspections, meat inspection personnel's participation in further training, and guidance given to OAs by OVs. All but one chief OV considered the skills of the regular OAs in post-mortem inspection to be totally sufficient, whereas over a third of the chief OVs did not find the post-mortem inspection skills of the OA substitutes totally sufficient. In red meat slaughterhouses, the frequency of the observation of the post-mortem inspection performed by the OAs was variable, and one-third of the red meat OAs considered that their performance in post-mortem inspection was not sufficiently evaluated by the OVs. Although most of the meat inspection personnel agreed that OAs understand working independently from the slaughterhouse in meat inspection, a substantial number of poultry OAs in particular stated that the independency was not entirely clear to them. A majority of the chief OVs considered that the officials guiding meat and food safety inspections at the central level are unaware of the practical problems involved in OVs' work. Our results highlight the importance of practical experience for the officials guiding the official control in slaughterhouses and increased feedback between OVs and OAs in slaughterhouses. An adequate number of OVs should be guaranteed in all slaughterhouses. The practices to evaluate the red meat OAs' performance in post-mortem inspection should be standardized and the maintenance of the post-mortem inspection skills of OA substitutes improved.

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1. Introduction

For consumers' health and for the reliability of the meat industry, it is important that the official control (comprising meat inspection and food safety inspections) in slaughterhouses is of high quality and efficiently performed. Meat inspection, consisting of the inspection of food chain information (FCI), ante-mortem

inspection, and post-mortem inspection (EC No 854/2004), is performed to ensure the safety of meat, animal health and welfare, and prevention of transmissible animal diseases (Alban, Steenberg, Stephensen, Olsen, & Petersen, 2011; EC No 854/2004; EFSA, 2011, 2012). In slaughterhouses, official veterinarians (OVs) perform also food safety inspections to verify the slaughterhouse's own-check system, which is based on "hazard analysis and critical control point" (HACCP) principles and basic hygiene aspects (EC No 854/2004). A well-implemented own-check system is important, for instance, to ensure process hygiene in the slaughterhouse (Blagojevic & Antic, 2014; FAO, 2004), which is an essential contributing factor to meat safety (Blagojevic & Antic, 2014; Nørnung & Buncic, 2008).

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Meat inspection legislation in the EU requires that authorities have a sufficient number of qualified and experienced staff to carry out their inspection duties in all slaughterhouses (EC No 854/2004). In previous reports, an insufficient number of official meat inspection personnel has been assessed to lower the quality of official control in some European countries (EFTA Surveillance Authority, 2014; FVO, 2002). However, scientific research on the possible shortage of meat inspection personnel and how it affects the quality of the official control and different duties of the OV's in slaughterhouses, has not, to our knowledge, been published.

In the EU, OV's in meat inspection may be assisted by official auxiliaries (OAs), who in poultry and lagomorph slaughterhouses can be slaughterhouse staff (EC No 854/2004). In Finland, poultry OAs are employed by the slaughterhouse and red meat OAs by the Finnish Food Safety Authority Evira. The extent of the meat inspection training for the poultry and red meat OAs is the same in the legislation, and all OAs and OV's must participate in regular further training (EC No 854/2004). On a previous audit performed by the FVO in Finland, deficiencies in relation to poultry OAs' training were observed (FVO, 2009). Sufficient expertise is important for the quality of the meat inspection, and thus, it is essential to investigate the sufficiency of skills of the OAs and their substitutes, and the possibilities of the meat inspection personnel to participate in further training.

All OAs work under the OV's, who must ensure that meat inspection is done properly and independently from the slaughterhouse (EC No 854/2004). OV's are also required to administer performance tests for OAs who are slaughterhouse staff (EC No 854/2004). The frequency in which the OV's check the work of OAs should be sufficient in all slaughterhouses, and the OV's should be readily available to provide guidance to the OAs. In some countries in Europe, including Finland, insufficient supervision of meat inspection by the OV's has been reported (EFTA Surveillance Authority, 2014; FVO, 2002; 2009). However, a more thorough investigation on how the meat inspection personnel assess the sufficiency of supervision has not been performed in Finland.

Previous studies have highlighted the importance of guidance provided to the OV's (Kotisalo, Luukkanen, Fredriksson-Ahomaa, & Lundén, 2015; Lepistö & Hänninen, 2011; Luukkanen & Lundén, 2016). In Finland, OV's receive guidance from the officials in the control department of Evira, responsible for guiding and organizing official control in slaughterhouses. Slaughterhouses are divided regionally and each region has a director who is the immediate superior for the OV's and OAs, leads the meat inspection personnel in his or her region, and takes care of personnel administration (Evira, 2012). The chief OV's (one in each slaughterhouse) lead the OAs and possible other OV's and have the main responsibility for ensuring that official control is performed according to legislation. It has previously been demonstrated that the chief OV's in slaughterhouses were not satisfied with the guidance they received in relation to food safety inspections (Luukkanen & Lundén, 2016). Therefore, the quality of the guidance in meat and food safety inspections and possible targets for development should be investigated more thoroughly.

The aim of our study was to investigate the sufficiency, independence, further training, and guidance of the meat inspection personnel. Furthermore, the sufficiency of the meat inspection skills of the OAs and their evaluation were examined. Our results can be used to enhance the quality of official control in slaughterhouses.

2. Material and methods

2.1. Questionnaire

To evaluate the prerequisites of effective meat inspection and food safety inspections in Finnish slaughterhouses, we constructed

a questionnaire that contained open-ended questions, Likert scale questions, and other multiple-choice questions. The Likert scales used were from 1 to 4 (totally disagree to totally agree), with no midpoint. The questionnaire was tailored for the various respondent groups, but all questionnaires examined the following issues: a) information on the respondent (meat inspection personnel and slaughterhouse representatives were also asked to give the number of OV's, OAs, and slaughter animals per week in the slaughterhouse), b) sufficiency of meat inspection personnel, c) skills of the OAs and the uniformity of meat inspection, d) meat inspection personnel's participation in further training, e) steps taken to evaluate OAs' performance in post-mortem inspection f) meat inspection personnel's independence from the slaughterhouse, and g) quality of guidance received by the meat inspection personnel. Uniformity of the meat inspection was measured on a scale from 1 (very non-uniform) to 6 (very uniform), where scales from 1 to 3 (somewhat non-uniform) were considered non-uniform. In November 2014, respondents received electronic questionnaires, except for OAs who received a paper copy. One reminder was sent after three weeks.

2.2. Respondent groups

The questionnaire was sent to eight different respondent groups (Table 1). All full-time OV's (n = 45) and OAs (n = 110) performing meat inspection in 13 red meat and 4 poultry slaughterhouses in Finland received the questionnaire. Small slaughterhouses processing under 20 livestock units (one livestock unit = one bovine or five pigs) per week, under 1000 livestock units per year, or under 150 000 birds per year were excluded from the study (Anonymous, 2011). In addition to meat inspection personnel, one to four representatives in each slaughterhouse (n = 17) were sent the questionnaire. Slaughterhouse directors, foremen, or quality and production managers familiar with meat inspection issues in each slaughterhouse were included in the study. Officials (n = 17) in the control department of Evira, including the five regional directors, responsible for guiding and organizing official control in slaughterhouses also received the questionnaire (Table 1). All respondents were requested to answer from their own standpoint.

2.3. Statistical analysis

Statistical analysis was performed with SPSS 21.0. (SPSS IBM, Armonk, NY, USA). The 'do not know' answers were converted to missing. To analyse the significance of difference between respondent groups' answers, Fisher's exact test and non-parametric Mann–Whitney U test, which does not assume a normal distribution, were used. A confidence level of 95% was applied in evaluating the results.

3. Results

3.1. Respondents and categorization of slaughterhouses

The total response rate was 59% (116/198) (Table 1). Red meat slaughterhouse representatives had the highest response rate, whereas poultry slaughterhouse representatives had the lowest (Table 1). Still, we received representatives' answers from three of four poultry slaughterhouses. Of the OV's, 10 were chief OV's in red meat slaughterhouses and 4 in poultry slaughterhouses. According to the basic information given by the respondents (on the number of OV's, OAs, and slaughter animals per week in the slaughterhouse), we were able to divide the respondents into different slaughterhouses. From 11/17 of the slaughterhouses, we received answers from at least one respondent from each of the respondent groups

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