Compliance in slaughterhouses and control measures applied by official veterinarians

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ABSTRACT

Implementation of well-functioning hazard analysis and critical control point (HACCP)-based self-checking systems (SCSs) is crucial for meat safety in slaughterhouses (SHs). However, if these SCSs fail, control measures used by official veterinarians (OVs) should be efficient enough to secure the safety of the meat. To examine the control measures used by the OVs and the cases of noncompliance in the implementation of SH SCSs, we issued a survey to the chief OVs in high-capacity SHs in Finland during spring 2014. The expertise of the OVs and the quality of guidance they received were also examined. Our results showed that the most common and severe cases of noncompliance in the implementation of high-capacity SH SCSs in Finland were associated with hygiene. Those SHs with high frequencies of noncompliance were all smaller high-capacity units in which written time limits for correction of noncompliance and enforcement measures were less commonly used. Most OVs felt that they did not receive sufficient competent guidance in performing food safety inspections, and in some SHs the expertise of the OVs in administrative procedures and food safety legislation should be improved. To further ensure meat safety, OVs, especially in SHs with high frequencies of noncompliance, should be encouraged to use more effective control measures.

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1. Introduction

Implementation of good hygiene practises and ensuring that the operations meet the requirements set in food safety regulations in slaughterhouses (SHs) are crucial for meat safety. In the European Union (EU), all food business operators (FBOs), including SHs, have to secure the safety of their products (European Commission (EC) No 852/2004) and implement self-checking systems (SCSs) based on basic hygiene aspects and the principles of the hazard analysis and critical control point (HACCP) concept (EC No 852/2004). Meat and meat products are important sources of foodborne infections with *Salmonella* spp., *Campylobacter jejuni/coli*, *Yersinia enterocolitica* and verocytotoxin-producing *Escherichia coli* (VTEC) because these organisms occur in the gastrointestinal tracts of food-producing animals (Nørrung & Buncic, 2008). The implementation of HACCP-based SCSs is considered essential for managing the risks in the SH (Nørrung & Buncic, 2008).

To ensure that the SCSs are properly implemented and that food

safety requirements for SHs are met, the competent authority must perform official controls and verify compliance (EC No 854/2004). In Finland, official veterinarians (OVs) of the National Food Safety Authority (NFSA) Evira are responsible for the official control of SHs, including meat inspection and food safety inspections (verification of the SH SCSs). If noncompliance occurs, OVs must apply control measures to ensure that the operator remedies the situation (EC No 854/2004). The use of control measures requires considerable expertise and should be dependent on the gravity of the noncompliance. Official control measures can range from guidance and negotiation to administrative enforcement measures, such as prescribing orders or prohibitions to the operator or ordering a recall of foodstuffs (EC No 854/2004). In Finland, the frequency of use of enforcement measures among OVs has been examined previously (Jokela, Vehmas, & Lundén, 2009) but the usage of various official control measures in SHs and their effect on noncompliance have not. To evaluate the effects of control actions in SHs it is crucial to know which official control measures are used and how they relate to noncompliance.

Comprehensive studies of noncompliance in SHs have not, to our knowledge, been published previously, although noncompliance can have severe consequences in meat safety (Anonymous,

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2006; Pennington, 2009). However, some knowledge of noncompliance in the SHs of many EU countries can be drawn from audit reports by the Food and Veterinary Office (FVO), in which the HACCP procedures used were assessed as insufficient (Alban, Steenberg, Stephensen, Olsen, & Petersen, 2011). Neither the frequency nor the severity of noncompliance in SHs has been systematically assessed (Alban et al., 2011), which would be crucial to development of official control in high-capacity SHs. To ensure that control resources are correctly targeted, the parts of the SCS with the most common and severe cases of noncompliance should be determined.

The aims of our study were to determine how well Finnish high-capacity SH operators' SCSs meet the requirements of food safety legislation and to examine cases of noncompliance in the implementation of the SCSs, their frequency and severity, as evaluated by the chief OVs. Although SHs have the main responsibility for the safety of their products, OVs and their methods of approach can affect the level of compliance. Therefore, we examined which control measures were used and how they affected the frequency and severity of noncompliance in SHs. The expertise of the OVs in matters relating to food safety legislation and administrative actions, together with the quality of guidance given by the NFSA to the OVs in food safety inspections were also explored.

2. Material and methods

2.1. The questionnaire

An electronic questionnaire examining compliance in high-capacity red meat (n = 13) and poultry (n = 4) SHs in Finland was sent to the chief OVs (n = 17) of each SH in May 2014. All high-capacity SHs in Finland were included in the study, except one red meat unit that did not have a regular OV at that time. Red meat SHs process pigs, bovines, horses, sheep or goats, whereas high-capacity SHs in Finland process more than 1000 livestock units (one livestock unit = one bovine or five pigs) or 150,000 birds per year (Anonymous, 2011). In the questionnaire, SCS was divided into 26 parts, and the respondents were asked to report in which parts they had observed noncompliance in the SH during the previous year, how frequent and how severe these cases of noncompliance were in terms of meat safety. A Likert scale from 1 (seldom or very seldom when inspected/not severe) to 4 (almost always or always when inspected/severe) was used. The questionnaire also included queries about how well the self-checking plan fulfilled the requirements set in the food safety legislation, how important the SH operator considered the self-checking plan to be and the attitude of the SH operator towards official control, according to the OV. Here, a Likert scale from 1 (very poorly/very unimportant/very negative) to 6 (very well/very important/very positive) was used. We also asked about the application of various control measures by the OVs. Statements regarding the SCS, official control, professional skills of the OVs, guidance given by the NFSA to OVs, and interaction between OVs and the SH operator were also included. Respondents' views were measured on a Likert scale from 1 (completely disagree) to 4 (completely agree). Likert scales are commonly used in measuring opinions (Howitt & Cramer, 2005) and have been used in previous studies (Luukkanen, Kotisalo, Fredriksson-Ahomaa, & Lundén, 2015; Läikkö-Roto, Mäkelä, Lundén, Heikkilä, & Nevas, 2015; Nevas, Kalenius, & Lundén, 2013). Some open-ended queries were also included in the questionnaire, together with queries concerning information on the SH (animal species processed and number of OVs). One reminder was sent.

2.2. Statistical analysis

Statistical analysis was performed with SPSS 21.0 (SPSS IBM, Armonk, NY, USA). The 'do not know' answers were converted to missing before statistical analysis. Fisher's exact test and the nonparametric Mann–Whitney U test were used to analyse the significance of the differences between groups. Groups that were compared included: 1) red meat versus poultry SHs and 2) small versus large high-capacity SHs. SHs were categorized according to size based on the information on how many full-time OVs were employed in the SH. SHs with one or two OVs were categorized as small high-capacity (n = 8) and those with three to six OVs as large high-capacity units (n = 5). The number of animals slaughtered was not asked, because it could have been considered a commercial secret. To perform Fisher's exact test, the answers on a Likert scale from 1 (completely disagree) to 4 (completely agree) were divided in two: one or two disagreed and three or four agreed. Two-tailed p-values < 0.05 were considered statistically significant.

3. Results

3.1. Respondents and categorization of slaughterhouses according to noncompliance

Of the 17 chief OVs, 10 (77%) in red meat and 3 (75%) in poultry SHs responded to the questionnaire. The response rate was 76%. The chief OVs were located in SHs that processed only pigs (3/13), bovines (1/13), chickens (2/13) or turkeys (1/13) and SHs that processed two or more animal species (pigs, bovines, horses, sheep or goats) (6/13). Most SHs had one (4/13) or two (4/13) full-time OVs and the rest three to six OVs (5/13). Slaughtering occurred from 2 to 5 days per week. The red meat SH that was excluded from the study and all of the red meat SHs in which the chief OV did not respond to the questionnaire (3/14) were small high-capacity units. Still, 67% of the small high-capacity red meat SHs and all of the large high-capacity red meat units in Finland are represented in the results.

Two distinctly different groups were detected, according to the frequency of noncompliance observed: SHs (n = 3) in which noncompliance in six or more parts of the SCS was often or always observed when inspected (units with high frequencies of noncompliance) and SHs (n = 10), in which fewer than four cases of noncompliance were observed often or always. The SHs were also divided into two groups, according to the severity of noncompliance: six SHs showed somewhat severe or severe noncompliance in six or more parts of the SCS (units with high severity of noncompliance), whereas seven SHs showed noncompliance as severe in fewer than six parts of the SCS. Three SHs (small high-capacity units processing red meat) in which the OV observed most cases of noncompliance in various parts of the SCS were also those with high frequency and high severity of noncompliance. Additionally, one small high-capacity poultry SH and two large red meat high-capacity units showed high severity of noncompliance.

3.2. Assessment of the self-checking plan

All OVs felt that the self-checking plan of the SH operator met the requirements set in the food safety regulations at least somewhat well and according to the majority (9/13) well or very well. Most OVs also stated that the SH operator considered the self-checking plan as important (6/13) or very important (4/13). Only two OVs of small high-capacity SHs with high frequencies of noncompliance felt that the SH operator considered the self-checking plan as somewhat unimportant or unimportant. Although OVs were generally satisfied with the self-checking plans,