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1 Challenges in using administrative enforcement measures in local food control

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21 **Abstract**

22 We surveyed Finnish local food control officials' opinions about the use and challenges of
23 administrative enforcement measures. Responses to the questionnaire were received from a total of
24 129 food control officials, covering 72.6% of the 62 local food control units in Finland. In the
25 opinion of 42.7% of the respondents, enforcement measures are not used often enough in their unit
26 to ensure food safety. Based on our results, large units have better practical tools such as templates
27 for enforcement decisions and guidelines that facilitate the use of enforcement measures than small
28 units, but uncertain practices and a lack of routine appear to impede the use of the measures in
29 many units. Particular challenges highlighted by the officials were related to laboriousness and
30 slowness of the administrative process and reasoning for using enforcement measures. Moreover,
31 impairment of cooperation with the food business operator as a consequence of using enforcement
32 measures was of concern for many officials. The officials assessed the expertise of the head of the
33 unit more positively in the units in which enforcement measures were used than in the units in
34 which enforcement measures were not used, and participation in trainings was the strongest
35 explanatory factor for the use of enforcement measures among the inspectors. Our results indicate
36 that development of operating procedures and provision of specific training on administrative
37 procedure with a practical approach play a key role in strengthening officials' expertise and
38 confidence in using enforcement measures. Moreover, merging the small units with the large ones
39 may promote uniform practices and better capabilities to use enforcement measures in all units.

40

41 **Keywords**

42 Enforcement measures; official food control; administration; efficacy; uniformity

43

44 **1. Introduction**

Prevention of foodborne illnesses by verifying food business operators' (FBOs) compliance with food safety regulations requires effective, risk-based and impartial official food control. If the FBOs, despite the advice, guidance and requests of the authorities, do not comply with food safety regulations, authorities shall take effective actions to ensure that food safety violations are corrected (EC No 882/2004; Food Act, 2011). These actions, called administrative enforcement (coercive) measures (hereafter referred to as "enforcement measures"), may include such measures as imposition of sanitation procedures, restriction or prohibition of placing a food on the market, suspension of operation or closure of all or part of the business concerned (EC No 882/2004, Food Act, 2011). Efficient intervention in the case of non-compliance is essential not only for food safety but also for preventing distorted competition between compliant and non-compliant FBOs (Hampton, 2004).

To ensure that the same legislative requirements are effectively enforced for all FBOs, all food control authorities should have similar principles and prerequisites for using efficient control measures. In some European Union (EU) Member States, the need for more training and guidelines for authorities on enforcement procedures has been recognized (Lepistö & Hänninen, 2011; European Commission, 2013). In the United Kingdom (UK) and in Finland, increased guidance has enhanced the use of enforcement measures (European Commission, 2013). Nevertheless, Finnish food control authorities' actions in cases of FBOs' non-compliances have been assessed as insufficient (FVO, 2014).

Previous studies have indicated that enforcement measures are effective in making FBOs correct their food safety violations (Kettunen, Nevas, & Lundén, 2015). In the UK, several aspects, such as the size, resources and location of the local authority and the relationship between the official and the FBO, have been discussed to affect enforcement practices (Hutter & Amodu, 2009). In Finland, administrative shortcomings in the enforcement process have been reported in local food control, probably due to officials' uncertainty concerning administrative procedures

(Lepistö, Nevas, & Hänninen, 2009; Lepistö & Hänninen, 2011). Moreover, official veterinarians seem to have poorer expertise in administrative procedures in slaughterhouses showing more severe non-compliances than other slaughterhouses (Luukkanen & Lundén, 2016). Despite relatively little research within this particular area, it seems that the characteristics of the control authority as well as food control officials' perceptions and knowledge may influence the use of enforcement measures, possibly leading to a situation where some authorities use enforcement measures when needed while others do not. This may result in unequal treatment of FBOs and, in the worst case, compromised food safety.

In Finland, enforcement measures can be used at the local level in 62 municipal food and environmental health control units (hereafter "units") consisting of one or more municipalities (Food Act, 2011). The units operate independently within their areas but are regionally guided by six Regional State Administrative Agencies. Nationally, official food control is coordinated and supervised by the Finnish Food Safety Authority Evira (Food Act, 2011). The jurisdiction to make enforcement decisions in the units lies within the municipal authority bodies, which are multimember bodies named by the municipalities within the control unit. The municipal authority bodies may delegate their jurisdiction to make enforcement decisions to the heads or inspecting officials of the units. In urgent cases of severe health hazard, all food control officials have the right to apply certain enforcement measures even if no jurisdiction is delegated within the unit (Food Act, 2011).

Municipal independence may generate differing practices and approaches in implementation of official food control. Many food safety requirements laid down in the EU and national food safety legislation allow case-dependent interpretation, thus, similar cases may result in different regulatory outcomes. The use of enforcement measures has been shown to vary among the units (Lepistö et al., 2009; Kettunen et al., 2015), and inconsistency has been reported also in other

control procedures and inspection practices among the units and inspecting officials (Läikkö-Roto, Mäkelä, Lundén, Heikkilä, & Nevas, 2015).

The aim of this study was to investigate the factors affecting the use of enforcement measures and related challenges in Finnish local food control units. The study was conducted through a survey exploring the current practices and perceptions of local food control officials and heads of control units regarding the use of enforcement measures. The results can be utilized in harmonizing official food control practices and developing enforcement procedures.

2. Material and methods

2.1. Questionnaire

We developed an electronic questionnaire (E-lomake, Eduix Oy) to explore the factors affecting the use of enforcement measures and to evaluate the perceptions of local food control units concerning the use of enforcement measures in food control. The questionnaire was designated for the heads and the inspecting officers (inspectors) of the local food control units ($n = 62$) in Finland, and it was partly tailored depending on whether the respondent was a head of the unit or an inspector. Prior to conducting the survey, the questionnaire was piloted with a head of one unit and three inspectors from two units. The questionnaire was sent in September 2015, and a reminder was sent three weeks later.

The semi-structured questionnaire included Likert-scale questions and multiple-choice questions. In addition, open-ended questions allowed respondents to elaborate on their answers to closed questions or to freely state their opinions about the topics of the survey. The questionnaire inquired about background information on the unit (e.g. labour resources designated for food control and the number of food premises in the unit's area), delegation of jurisdiction regarding the use of enforcement measures and availability of internal guidelines and templates for enforcement

decisions in the unit. If not indicated on the questionnaire, information about the labour resources of the unit and the number of food premises in the unit's area were collected from units' internet pages in cases where the information was publicly available. Respondents' education and opinions about the quality and adequacy of available training and national guidelines concerning enforcement measures were also requested. Furthermore, respondents were asked to assess the knowledge, skills and consistency of use of enforcement measures by themselves and in their unit.

2.2 Quantitative and qualitative analyses of the data

Data analysis was conducted by using quantitative dominant mixed methods, in which the priority is given to quantitative data, but elements of qualitative research are included to broaden and deepen the understanding on the research topic (Johnson, Onwuegbuzie, & Turner, 2007). The units were divided into groups based on the use of enforcement measures within the last three years (hereafter "enforcer units" and "non-enforcer units"), number of labour resources for performing official food control tasks and the education of the head of the unit. Units with labour resources equal to or less than the median of the responding units were categorized as small, and units with labour resources greater than the median were categorized as large. The respondents were categorized based on whether they were the heads of the unit or inspectors. The inspectors were further divided into groups based on whether they had used enforcement measures themselves within the last three years or not (hereafter "enforcer inspectors" and "non-enforcer inspectors").

To compare factors affecting the use of enforcement measures in the units, such as availability of templates and guidelines, each unit was scored based on six factors (Table 1). Each factor gave the unit one point (positive response) or zero points (negative response), and the overall scores for each unit were calculated as a mean of the unit's total points. Units with missing information in more than two factors were excluded from scoring. A sum variable "knowledge" was

created to compare the units based on their respondents' perceptions of their knowledge of using enforcement measures with respect to: a) food hygiene and safety, b) food safety legislation, c) administrative processes and d) whether it's clear when to use enforcement measures. The variables included in the sum variable were on a four-point Likert-scale (1 = fully disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = fully agree).

The statistical analyses of the data were carried out by using SPSS statistical software (IBM SPSS Statistics 22.0, NY, USA). As the variables used in the analyses appeared not to be normally distributed, non-parametric tests were used. The differences between enforcer and non-enforcer and large and small units in labour resources, number of food premises, scoring based on factors affecting the use of enforcement measures and sum variable "knowledge" were analysed with a two-tailed Mann-Whitney U test. Regional differences among the units in the scoring were analysed with Kruskal-Wallis test and in the use of enforcement measures with Pearson Chi-Square test. Fisher's exact test was used for comparison of groups with categorical variables, and Spearman's rho to examine the correlations between continuous variables. Cronbach's Alpha was used to examine the reliability of the created sum variable. To identify the variables of the units and inspectors explaining the use of enforcement measures among the enforcer and non-enforcer inspectors, a classification tree analysis based on the Chi-Squared Automatic Interaction Detection (CHAID) method, by using the likelihood-ratio Chi-Squared method due to the rather small sample size, was performed. By creating the possible cross tabulations for each defined independent variable (predictor), the CHAID analysis generates a classification tree model that illustrates how the independent variables best merge to explain the outcome in the given dependent (target) variable. The target variable was the use of enforcement measures by the inspector (yes/no), and the predictors included in the CHAID analysis were personal variables related to the inspectors (working experience in food control field and participation in a training regarding use of enforcement measures), inspectors' perceptions of the use of enforcement measures (Table 2) and

variables related to control unit (availability of templates for enforcement decisions and urgent enforcement decisions, discussion on the use of enforcement measures in the unit, availability of an internal guideline for the use of enforcement measures, delegation of jurisdiction to use enforcement measures, availability of juridical assistance in the unit). The “I don’t know” answers were categorized as missing in the analyses, and statistical significance was accepted with a confidence level of 95% (two-tailed p -values < 0.05).

The responses to two open-ended questions were analysed by applying the procedure of content analysis described by O’Cathain and Thomas (2004). The two questions analysed were 1) “Is there something you perceive as problematic, difficult or laborious in the use of enforcement measures?” and 2) “Freely express your opinions about enforcement measures.” The initial stages of the analysis, including familiarization with the data, manual coding of the answers and development of the initial themes, were conducted by one author independently. The identified themes and underlying codes were subsequently interpreted through discussions among all authors and a common agreement was achieved.

3. Results

3.1 The respondents

Responses ($n = 129$) were received from altogether 72.6% (45/62) of the control units from the regions of all six Regional State Administrative Agencies in Finland. Regional response rates of the units ranged between 40.0% - 88.9%. Of the respondents, 28 (21.7%) were the heads of the unit and 101 (78.3%) were inspectors. A total of 86.7% (39/45) of the units and 61.4% (62/101) of the inspectors had used enforcement measures in the last three years. Of the non-enforcer units ($n = 6$), one head of the unit and a total of seven inspectors responded. No regional differences were observed among the units in whether enforcement measures had been used or not (Pearson Chi-

Square $p = 0.878$). The median of the labour resources of the units was 4.0 person-years (range 1.0-33.0) in respondent units and 2.1 person-years (range 1.4 – 7.2) in non-respondent units. Among the respondent units, the share of the small and large units was 57.9% (22/38) and 42.1% (16/38), respectively. All large units (16/16; 100.0%) and 77.3% (17/22) of the small units had used enforcement measures. Among the inspectors ($n = 101$), 49.5% had a bachelor's degree, 36.3% a higher academic degree such as licentiate of veterinary medicine (13.1%) or a master's degree in another field (23.2%), and 14.1% had other education such as vocational education. The head of the unit had a veterinary education in 56.4% of the enforcer units, but in none of the non-enforcer units (Table 1).

3.2 Use of enforcement measures and factors affecting use in the units and among the inspectors

Among the enforcer inspectors, 83.8% (35/42) fully or partly agreed that the use of enforcement measures had improved food safety in food premises. However, 42.7% (47/110) of all respondents fully or partly agreed that enforcement measures are not used in their unit often enough to ensure food safety (Fig. 1). More than half of the respondents fully or partly agreed that food control authorities should more often report food safety violations to the police, and that the head of the unit should have a right to fine a FBO if severe food safety violations are observed (Fig. 1).

The overall scores of the units based on factors affecting the use of enforcement measures (median 0.67, range 0.17-1.00) were significantly higher in enforcer units than in non-enforcer units and in large units than in small units (Table 1). The scores of the units did not differ regionally (Kruskal-Wallis $p = 0.696$). With regard to the sole factors used in scoring the units, large units, compared with small units, had significantly more often templates for enforcement decisions and urgent enforcement measures and an internal guideline for the use of enforcement measures (Table 1). In addition, enforcer units had more often a positive response in all factors used

in scoring the units compared with non-enforcer units, although the differences were not significant (Table 1). However, as many as 40.0% (40/100) of the respondents of the enforcer units fully or partly disagreed that their unit has routine practices in the use of enforcement measures, and certain practical tools needed for the use of enforcement measures were also lacking in many enforcer units. For instance, templates for urgent enforcement decisions were available in 38.9% of the enforcer units and in none of the non-enforcer units (Table 1). Moreover, an internal guideline for use of enforcement measures existed in about half (54.1%) of the enforcer units and in only 33.3% of non-enforcer units (Table 1).

Among the inspectors (n = 101), participation in training regarding the use of enforcement measures within the last five years was the strongest explanatory factor for the use of enforcement measures in the CHAID analysis (Fig. 2). In addition, availability of templates for enforcement decisions in the unit and delegation of jurisdiction to use enforcement measures were also indicated as significant factors (Fig. 2). Of all respondents (n = 129), however, only 43.8% (49/112) considered available training for the use of enforcement measures as sufficient. Moreover, barely half of the respondents (65/129; 50.4%) had utilized the national guideline for the use of enforcement measures, and only 52.3% (34/65) of these respondents perceived the guideline to be useful in practice.

According to 85.2% (23/27) of the heads of the units, municipal politicians had never attempted to affect the use of enforcement measures or particular enforcement decisions. However, four heads stated that the politicians or the members of the municipal authority body had seldom or occasionally tried to affect the decisions, for instance, by being in contact with the FBO or by questioning officials' assessments. In one open-ended answer, the head stated that the municipal authority body had given the FBO more time to correct the violations by postponing the decision rendered by the officials, although the FBO had operated without valid approval of the establishment.

According to the heads of the units, juridical assistance for the use of enforcement measures was available in 53.6% (15/28) of the units, all of which were enforcer units. In the opinion of 68.9% (82/119) of all respondents, lawyers acquainted with food legislation are needed in their unit.

3.3 Officials' perceptions of the enforcement process and its challenges

A total of 53/101 inspectors (52.5%) and 20/28 heads of the units (71.4%) responded to the open-ended questions regarding their thoughts about enforcement measures and the difficulties and challenges in their use. Among the answers, five main themes were identified: 1) necessity of enforcement measures, 2) inefficiency of the process, 3) arduousness of the procedure, 4) uncertainty in the use of enforcement measures and 5) FBO-related challenges. Many respondents highlighted the importance and need of enforcement measures for efficient official food control (n = 12), and two respondents stated that using enforcement measures is sometimes "the only choice" to get the non-compliance corrected. However, the slowness of the process (n = 14) and the lack of substantial consequences to a non-compliant FBO (n = 7) were perceived to impair the effectiveness of the measures. Five respondents debated whether fining the FBO would be a more efficient intervention. On the other hand, ten respondents considered negotiation with the FBO to be a preferable option to get the non-compliance corrected.

Regarding the arduousness of the process, the administrative formalities associated with several stages, such as hearing the FBO regarding the decision, were perceived to be laborious and complex (n = 26) and time-consuming (n = 14). The main reasons for uncertainty in use of enforcement measures were the lack of routine or common practices (n = 17), and ten respondents highlighted the need for more training and guidelines, especially with a practical approach on the use of enforcement measures. Deciding on whether or not to initiate an enforcement process and

which measure to apply (n = 10) as well as formulating and reasoning of the decisions (n = 19) were found to be problematic.

The most often mentioned FBO-related challenges concerned FBOs' lack of understanding of the enforcement decision or the requirements (n = 12) due to inadequate knowledge of food legislation or poor attitude towards compliance. Specifically, four respondents highlighted the existence of "cultural or language barriers" in communication with the FBOs, and four mentioned that the delivery of the decision to the FBO is often difficult due to the FBO's reluctance. Furthermore, among the inspectors, using enforcement measures was perceived to impair the cooperation between the inspector and the FBO significantly more often by the non-enforcer inspectors than by the enforcer inspectors (Fisher's exact test $p = 0.026$) (Table 2).

3.4 Inspectors' perceptions of their own and their superiors' expertise in using enforcement measures

A majority of both enforcer and non-enforcer inspectors perceived their own knowledge of food hygiene and safety and food safety legislation as sufficient for the use of enforcement measures (Table 2). However, the non-enforcer inspectors appeared to find their knowledge of the administrative process and their certainty about the use of enforcement measures as poorer than the enforcer inspectors, although the differences were not significant ($p = 0.053$ and $p = 0.088$, respectively) (Table 2).

When requested to assess the expertise of the head of their unit, the inspectors of the enforcer units assessed it as significantly more positively than the inspectors of the non-enforcer units. Almost all inspectors of the enforcer units fully or partly agreed that the head of their unit had sufficient knowledge of food hygiene and safety (83/86; 96.5%), food safety legislation (81/85; 95.3%) and administrative processes (85/86; 98.8%). By contrast, among the inspectors of the non-

enforcer units, the shares of fully or partly agreeing responses to these three sectors were 14.3% (1/7), 33.3% (2/6) and 42.9% (3/7), respectively (Fisher's exact test $p < 0.001$, $p < 0.001$ and $p = 0.010$, respectively). The more positively the inspectors assessed the head's expertise in these three sectors, the more they agreed that they would get support from him/her in using enforcement measures (Spearman's rho $r = 0.400$, $p < 0.001$; $r = 0.412$, $p < 0.001$; and $r = 0.455$, $p < 0.001$, respectively). A comparison between the inspectors also indicated significant differences in their opinions of the expertise of the head of their unit based on the education of the head. All inspectors of the units in which the head was a veterinarian fully or partly agreed that the head of their unit had sufficient knowledge of food hygiene and safety (56/56; 100.0%), food safety legislation (56/56; 100.0%) and administrative processes (55/55; 100.0%), whereas in units in which the head was not a veterinarian, corresponding proportions were 75.7% (28/37), 77.1% (27/35) and 86.8% (33/38) (Fisher's exact test $p < 0.001$, $p < 0.001$ and $p = 0.010$, respectively).

4. Discussion

Almost half of the respondents perceived that enforcement measures are not used often enough in their control unit to ensure food safety. Based on our results, lack of routine and unclearly defined practices in the units appear to hinder the use of enforcement measures and its consistency both at the unit level and among the inspectors. Although most inspectors seem to perceive their knowledge of food hygiene and food safety legislation as sufficient for the use of enforcement measures, not all are confident with the enforcement procedure in practice. Particularly, certainty in deciding when enforcement measures should be used and knowledge of administrative procedures were more positively assessed by enforcer than non-enforcer inspectors. The lack of confidence and routine in the enforcement process may have had a restrictive effect on the non-enforcer inspectors' willingness to use enforcement measures, leading to non-use of enforcement measures even when

312 their use is necessary. Officials' dissimilar knowledge about and preconditions for using
313 enforcement measures will presumably cause inequality among the FBOs.

314 Participation in trainings related to the use of enforcement measures was the strongest
315 explanatory factor differentiating enforcer and non-enforcer inspectors in the CHAID analysis. Also
316 at the unit level, the inspectors of enforcer units had more commonly taken part in trainings than
317 inspectors of non-enforcer units. Despite the reported positive influence of the new guidelines and
318 an increase in training on the use of enforcement measures (European Commission, 2013), the
319 availability or utilization of the provided guidance still appears inadequate. As wished by many
320 officials, more training with a practical approach and example cases, particularly for the non-
321 enforcer inspectors, could be supportive in deciding which situations and which enforcement
322 measures should be applied. Specifically, education on administrative procedure and formulating
323 and reasoning of the enforcement decisions appears to be needed as officials found these issues to
324 be problematic. To maintain and develop their professional skills, personnel's capability to
325 participate in trainings should be ensured in all units.

326 Based on scoring of the units and the use of enforcement measures, large units appear
327 to have better prerequisites and practical tools, such as templates and internal guidelines, for using
328 enforcement measures and are more likely to use enforcement measures than small units. Large
329 units, compared with small units, may have better abilities to allocate labour and expertise for
330 development of operational procedures within the unit, thus enhancing the use of enforcement
331 measures. Internal guidelines and templates probably facilitate the use of enforcement measures by
332 decreasing the time needed for the process and by unifying the practices within the unit.
333 Simplifying and expediting the initiation of an urgent enforcement process are crucial in case of an
334 immediate health hazard. Pre forma templates and checklists have previously been shown to
335 enhance the quality and efficacy of restaurant inspections (Läikkö-Roto et al., 2015). The existence
336 of operating procedures on paper does not, however, alone guarantee inspectors' commitment to

joint practices, but the adoption of written guidelines requires well-functioning communication and opportunities to discuss the issues jointly (Läikkö-Roto, Lundén, Heikkilä, & Nevas, 2016). Similar factors to those revealed in our study related to control authority's resources and officials' experience have also been reported to be challenges in the enforcement of e.g. environmental regulation (IMPEL, 2015). To share enforcer units' good practices and to mitigate the uncertainty in the use of enforcement measures in non-enforcer units, development of cross-audits and other forms of benchmarking among the units is recommended. In addition, merging the small units with the large ones could promote consistent practices and equal capabilities to use enforcement measures in all units.

Many respondents considered juridical assistance to be necessary for the use of enforcement measures in their units. In many units, however, there are no specialized lawyers for food control issues, resulting in food control officials needing to deal with food safety legislation as well as the administrative process. Previously, shortcomings in the implementation of administrative procedures and fulfilment of good governance have been identified among Finnish control authorities (Lepistö et al., 2009). Since good governance is a precondition for the efficacy of enforcement measures and official food control, as it safeguards the legitimacy of the decisions and the removal of health hazards (Lepistö et al., 2009), adequate training in administrative skills and sufficient juridical assistance for food control officials should be ensured.

In the vast majority of both enforcer and non-enforcer units, jurisdiction to use enforcement measures was delegated from the municipal body to the food control unit, either to the head or to the inspectors. If the decisions can be made in the unit, instead of taking it before a municipal body, the initiation of an enforcement process would be more smooth and its threshold lower, which probably explains why the delegation appeared as a selective factor among the enforcer and non-enforcer inspectors in the CHAID analysis. Although municipal politicians' attempts to influence the use of enforcement measures appear to be only occasional, political

interests or views of the members of the municipal authority bodies may, in some cases, diverge from the interpretation of the food control officials. To ensure equal treatment of the FBOs and safeguard effective intervention in food safety violations, it is important that the decisions are made based on the legislative requirements, independently of political or business interests.

Inspectors appear to feel confident in the support of the head of their unit and their colleagues. However, the head's expertise in food hygiene, food safety legislation and administrative issues was assessed more positively by the inspectors of enforcer units than by the inspectors of non-enforcer units. Use of enforcement measures in the unit likely develops the head's knowledge and certainty about the process, but, on the other hand, having a more experienced head may promote the use of enforcement measures in the unit. In addition, the inspectors of the units led by a veterinarian evaluated the expertise of the head more positively than the inspectors of non-veterinarian-led units. This may result from the strong emphasis on food safety and administrative procedures in Finnish veterinary education (Faculty of Veterinary Medicine, 2016). Regardless of the education, the head's good knowledge and conversance with food safety issues and enforcement procedures likely promote inspectors' capabilities of using enforcement measures and should therefore be maintained and further developed in all units.

Impairment of the cooperation between the FBO and the inspector after using enforcement measures appears to be of concern for many food control officials. The non-enforcer inspectors' significantly stronger perceptions of impairment of the cooperation may decrease their willingness to use enforcement measures. To avoid unequal treatment of the FBOs and to ensure compliance, the use of control measures should be uniform and consistent across the control units and the inspectors, despite officials' personal perceptions. As previously reported among restaurant business operators (RBOs), the interaction between the RBO and the inspector affects the RBOs' attitudes towards food hygiene and official food control (Läikkö-Roto & Nevas, 2014). In difficult control situations and despite the compulsory nature of the enforcement decisions, cooperative

skills of the food control official are of particular importance and should be enhanced by appropriate training provided for the officials.

FBOs' lack of understanding of the enforcement decision and the required actions was highlighted among the FBO-related challenges perceived by the food control officials. As previously reported by Fairman and Yapp (2005), especially small-scale FBOs have difficulties in distinguishing the difference between administrative documents and other letters received from the authorities. If the FBOs do not understand the legislative difference between a notification and an order, the efficacy of using enforcement measures is impaired. Proper reasoning behind the control measures should be emphasized as it has been reported to help FBOs understand the relevance of the food safety violations detected by the inspector (Nevas, Kalenius, & Lundén, 2013) and to improve the correction of non-compliance in restaurants (Läikkö-Roto & Nevas, 2014).

Cultural and language-related challenges in communication with the FBOs were a stated concern of a few respondents and, along with globalization and increasing immigration, are likely to become more and more emphasized in all public affairs. Officials' understanding of cultural diversity and their skills in multicultural settings are crucial for efficient delivery of services to diverse target groups (Rice, 2007). For instance, FBOs with an immigrant background may benefit from special assistance, e.g. translated guidelines on the national legislative requirements. To enhance food control officials' abilities to communicate with FBOs from diverse cultural backgrounds, cultural competency skills should be incorporated in officials' vocational education and further training. The influence of multiculturalism on compliance and interactions between officials and FBOs would also be interesting research topics.

Although enforcement measures were considered to have improved food safety and to be necessary tools for official food control, a notable number of the respondents seems to be somewhat dissatisfied with the efficacy of their use. In our previous study, the median duration of enforcement processes until verified correction of non-compliance was almost two months but

412 ranged from one day to nearly three years (Kettunen et al., 2015). The long durations of
413 enforcement processes are partly explained by the administrative stages of the procedure, but may
414 also, as indicated by our results, reflect a lack of routine, inadequate guidance and unclear
415 operational procedures in the units, decreasing the effectiveness of the procedure. The perceived
416 slowness of the enforcement process and the lack of substantial consequences are the most likely
417 reasons for approximately half of the respondents wishing for stricter interventions in the event of a
418 severe non-compliance. More regular reports of severe food safety violations to the police by food
419 control authorities could improve the preventive aspect of official food control (Lepistö &
420 Hänninen, 2011). Moreover, in Denmark, for instance, food control authorities may impose an
421 administrative fine as a control measure in response to FBO's non-compliance (FVO, 2013; The
422 Danish Veterinary and Food Administration, 2016). As suggested by many respondents and also
423 previously discussed by Lepistö (2008) as an option to enhance the efficacy of control actions, the
424 preconditions and potential of food control units issuing FBOs fines could be investigated in
425 Finland as well. In addition, the costs and officials' working hours spent on enforcement procedures
426 are unknown and would be an important topic for future research.

427 It can be deliberated whether non-enforcer units have been more effective in enforcing
428 food safety regulations by using soft control methods instead of enforcement measures. Considering
429 the perceived arduousness and slowness of enforcement process, it may be more efficient to get
430 non-compliances corrected by using negotiation and guidance. However, soft control measures are
431 not always adequate to remove severe or recurrent food safety hazards. In most cases in which
432 enforcement measures have been used, the FBO had not corrected the food safety violations
433 although a request to correct the non-compliance had been given before initiating an enforcement
434 process (Kettunen et al., 2015). Thus, it is important that food control authorities have the
435 preparedness to use enforcement measures when needed.

The ultimate aims of official food control are to prevent foodborne illness among consumers by ensuring food safety and to safeguard FBOs' equal operating conditions by high-quality and impartial enforcement (EC No 882/2004; Food Act, 2011). However, direct impacts of inspections and the use of enforcement measures on the occurrence of foodborne illnesses are difficult to determine. For example, conclusions of the studies on correlations between inspection results and foodborne illness are conflicting (e.g. Cruz, Katz, & Suarez, 2001; Jones, Pavlin, LaFleur, Ingram, & Schaffner, 2004; Simon, Leslie, Run, & Jin, 2005). On the other hand, a study in Finland has indicated that food control units' resources and level of official food control are related to the number of food- or waterborne outbreaks in the units' areas, highlighting the significance of a well-functioning official food control system for public health (Tähkäpää, Maijala, Hörman, Poutiainen-Lindfors, & Korkeala, 2008). Yet additional research is needed to detect measurable indicators to link official food control performance to public health.

Comparison of the proportion of units using enforcement measures in this study (86.7%) with that of our previous study in 2008-2011 (65.6%) (Kettunen et al., 2015) suggests an increase in the use of enforcement measures in Finland. As responses were received from the majority of the units, presumably because local food control officials perceive the development of the use of enforcement measures as important, the representativeness of the study can be considered to be good. Reasons for regional variation in the units' response rates are unclear, but the low median of labour resources of non-respondent units suggests that there may be non-enforcer units among non-respondents, possibly explaining why officials from those units were not eager to respond. Conclusively, our findings indicate that several challenges remain and should be considered in unifying and developing use of enforcement measures.

5. Conclusions

More than 40% of the local food control officials perceived that enforcement measures are not always used in their unit when needed to ensure food safety. Large units had used enforcement measures more commonly than small units and appear to have better availability of practical prerequisites, such as guidelines and templates, for using enforcement measures. In many units, however, a lack of routine, uncertain practices and laboriousness of the administrative procedure pose challenges for using enforcement measures. To harmonize practices and to ensure that use of enforcement measures is a true option in all units, further development and effective adoption of operating procedures to implement enforcement measures are essential. To overcome the hurdles to use enforcement measures and to improve food control officials' confidence in using enforcement measures, specific training on the administrative procedures and reasoning of the decisions with a practical approach and example cases should be provided. Moreover, merging the small units with the large ones may unify the practices and promote the capabilities to use enforcement measures in all units.

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Table 1

Table 1. Factors related to control units (N = 45) grouped by the use of enforcement measures in the last three years and by the labour resources of the unit.

Factor related to the control unit	Enforcer ^a units	Non-enforcer ^a units	Significance of the difference between groups	
			Large units ^b	Small units ^b
Overall scores ^c (mean of the unit [range])	0.71 [0.17, 1.00]	0.37 [0.20, 0.50]	0.82 [0.17, 1.00]	0.58 [0.17, 1.00]
			Mann-Whitney U test p = 0.001	Mann-Whitney U test p = 0.002
Templates for enforcement decisions are available in the unit (% (N))	67.6 (37)	20.0 (5)	87.5 (16)	50.0 (22)
			Fisher's exact test p = 0.061	Fisher's exact test p = 0.036
Templates for urgent enforcement measures are available in the unit (% (N))	38.9 (36)	0.0 (6)	73.3 (15)	9.1 (22)
			Fisher's exact test p = 0.083	Fisher's exact test p < 0.001
Use of enforcement measures is discussed in meetings or otherwise in the unit (% (N))	74.4 (39)	40.0 (5)	75.0 (16)	72.7 (22)
			Fisher's exact test p = 0.144	Fisher's exact test p = 1.000
At least one of the respondents of the unit has participated in training related to the use of enforcement measures (% (N))	86.8 (38)	60.0 (5)	87.5 (16)	85.7 (21)
			Fisher's exact test p = 0.180	Fisher's exact test p = 0.633
Internal guideline for use of enforcement measures exists in the unit (% (N))	54.1 (37)	33.3 (6)	75.0 (16)	36.4 (22)
			Fisher's exact test p = 0.412	Fisher's exact test p = 0.025
Jurisdiction for using enforcement measures is delegated from the municipal organ to the head of the unit and/or to the inspectors (% (N))	92.1 (38)	83.3 (6)	93.8 (16)	95.5 (22)
			Fisher's exact test p = 0.456	Fisher's exact test p = 1.000
Head of the unit is a veterinarian (% (N))	56.4 (39)	0.0 (6)	75.0 (16)	36.4 (22)
			Fisher's exact test p = 0.022	Fisher's exact test p = 0.025

Labour resources designated for food control (mean of the unit in person-years [range])	6.5 [1.7, 33.0]	2.6 [1.0, 4.0]	Mann-Whitney U test p = 0.031	-
Sum variable "knowledge"(mean of the unit [range]) (n of variables = 4, Cronbach's Alpha = 0.809)	3.30 [2.00, 4.00]	2.68 [1.00, 3.75]	Mann-Whitney U test p = 0.079	3.46 [3.00, 4.00] Mann-Whitney U test p = 0.145
Number of food premises in the unit's area (mean [range])	992 [180, 5320]	340 [313, 379]	Mann-Whitney U test p = 0.092	1574 451 Mann-Whitney U test p < 0.001

^a Units in which enforcement measures had been used within the last three years were defined as "enforcer units", and units in which enforcement measures had not been used were defined as "non-enforcer units".

^b Small unit defined as a unit with labour resources designated for food control equal to or less than 4.0 person-years, and large unit as a unit with labour resources greater than 4.0 person-years.

^c One point is gained from each positive response to each factor listed below the overall scores. The overall scores for each unit were calculated as a mean of the unit's total points.

Table 2

Table 2. Inspectors' (N = 101) perceptions of their expertise and attitudes towards the use of enforcement measures grouped by whether they have used enforcement measures.

Claim	Use of enforcement measures by the inspector ^a % (N)		Significance of the difference between groups (Fisher's exact test)
	Enforcer inspectors	Non-enforcer inspectors	
	Totally or somewhat agree	Totally or somewhat agree	
Expertise			
I have sufficient knowledge of administrative processes ^b	82.3 (62)	63.9 (36)	p = 0.053
It is clear to me when using enforcement measures is reasonable ^b	88.7 (62)	74.3 (35)	p = 0.088
I have sufficient knowledge of food hygiene and safety ^b	90.2 (61)	81.1 (37)	p = 0.229
I have sufficient knowledge of food safety legislation ^b	88.7 (62)	85.7 (35)	p = 0.752
Challenges			
Use of enforcement measures impairs the cooperation between the inspector and the FBO ^b	55.9 (59)	79.4 (34)	p = 0.026
Enforcement measures are difficult to implement	71.0 (62)	82.6 (35)	p = 0.228
I would get support from my superior in using enforcement measures	94.9 (59)	86.1 (36)	p = 0.151
I would get support from my colleagues in using enforcement measures	98.3 (59)	91.9 (37)	p = 0.295
The document management systems of our control unit are easy to use ^b	55.0 (60)	42.3 (26)	p = 0.350
Enforcement processes are too slow for ensuring food safety	78.7 (61)	87.9 (33)	p = 0.401
Enforcement measures are laborious	95.1 (61)	91.7 (36)	p = 0.667
Enforcement measures are unnecessary	3.3 (61)	2.6 (38)	p = 1.000

^a Inspectors who had used enforcement measures themselves are defined as "enforcer inspectors", and inspectors who had not used enforcement measures themselves are defined as "non-enforcer inspectors".

^b Claim used as a predicting variable in the CHAID analysis explaining the use of enforcement measures by the inspectors.

Figure 1

Figure 1.

Figure 2

Figure 2.

^a Inspectors who had used enforcement measures themselves are defined as “enforcers”, and inspectors who had not used enforcement measures themselves are defined as “non-enforcers”.

Figure captions

Figure 1. Respondents' (N = 129) opinions about the adequacy of using enforcement measures in their unit and the need for stricter measures to intervene in food safety violations.

Figure 2. Classification tree created with a CHAID analysis for the factors explaining the use of enforcement measures by the inspectors (N = 101).

^a Inspectors who had used enforcement measures themselves are defined as “enforcers”, and inspectors who had not used enforcement measures themselves are defined as “non-enforcers”.

Highlights

- Enforcement measures are not used often enough in the opinion of 43% of the officials.
- Lack of routine and uncertain practices impede the use of enforcement measures.
- Large units seem to have better practical prerequisites for using enforcement measures.
- Impairment of cooperation with FBO due to enforcement measures concerns officials.
- Specific training on using enforcement measures should be provided for officials.