



Incidence and characteristics of food-related criminal cases in Finland

Jasmin Joenperä^{a,*}, Tarja Koskela^b, Janne Lundén^a

^a Department of Food Hygiene and Environmental Health, Faculty of Veterinary Medicine, University of Helsinki, PO Box 66, 00014 University of Helsinki, Finland

^b Department of Law, Faculty of Social Sciences and Business Studies, University of Eastern Finland, PO Box 111, 80101, Joensuu, Finland

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ABSTRACT

Food fraud is an increasingly acknowledged problem that can cause unfair competition in the market, contribute to the grey economy, cause financial losses and threaten the health of consumers. Even so, little research exists on food-related criminal cases. The aim of this study was to characterize Finnish food-related criminal cases in order to improve understanding of the prevention of food-related crime. We investigated 127 cases resolved by the police, prosecutors, or district courts under the titles of food offence, health offence or marketing offence from 2008 to 2019. The analysis revealed that the incidence of cases was low and varied regionally, which may be due to varying abilities to detect cases and differences in reporting them to the police. The most common non-compliances in the cases we analysed were unapproved or unregistered premises or activities (43.3%), false or misleading information provided on food products (39.4%), and insufficient or incorrect, false or misleading documents (31.5%). Safety hazards were associated with 45.7% of cases, while 2.4% involved verifiable instances of illness, which demonstrates that preventing food crime is important for consumer safety. The majority of cases (51.2%) were detected during food control inspections, highlighting the importance of performing inspections on-site. In addition, tip-offs to food control authorities about possible food-related crime (29.1% of cases) were an important mode of detection and could possibly be even more important if Finland were to have a centralized anonymous whistleblowing system. In total, 59.8% of cases led to a conviction or a sanction, and the most common type of punishment was a fine. Nevertheless, the fines tended to be rather low, and the proceeds of crime were recovered in only a few cases. More training for food control inspectors on the detection of food-related crime, harmonized reporting practices, and increased legal praxis throughout the country could improve the detection and prevention of food crime in the future.

1. Introduction

In 2013, the horsemeat scandal brought food fraud to the attention of the public and the authorities (EC, 2014). In recent years, the number of reported food fraud cases has increased in Finland (FFA, 2020a) and elsewhere in the European Union (EU) (EC, 2020a). The European Commission (EC) currently maintains annual records on suspected cross-border food fraud cases. In 2019, the most common non-compliances in cases reported to the EC were the mislabelling of products, the replacement, dilution, addition, or removal of product ingredients, and unapproved food treatment or processes. The most common food categories were fats and oils, fish and fish products, and meat and meat products (EC, 2020a). Food fraud can significantly affect society and the food industry. Fraudulent food products or practices threaten consumer safety (EC, 2020b), weaken consumer trust (Barnett et al., 2016; Breitenbach et al., 2018) and cause unfair competition in

the market (EC, 2020c). Therefore, it is important to improve food fraud prevention.

Academic studies on food fraud cases are scarce. Among the few studies in the literature, Cadieux et al. (2019) found only 33 prosecuted Canadian food fraud cases from 2008 to 2018 and concluded that the number of cases had decreased but the severity of penalties had increased. In turn, researchers in the Czech Republic found a total of 550 food fraud cases by analysing all the administrative proceedings initiated by their national food authority in 2009 and 2013; they identified a 45.5% increase in the number of cases from 2009 to 2013 (Koubová et al., 2018). In Finland, food fraud cases have concerned, at least, origin, date labels and the composition of food products (FFA, 2020a). However, no systematic analysis of the characteristics of Finnish cases has been performed. For example, no prior knowledge exists on the geographical distribution of cases, the detection of fraudulent activities, and the type and seriousness of the related non-compliances. Further,

* Corresponding author.

E-mail address: jasmin.joenpera@helsinki.fi (J. Joenperä).

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with the exception of 12 Finnish cases from 2003 to 2012 presented in a previous study (Tähkää et al., 2015), the literature contains no information on the outcome of cases entering the legal system. Moreover, Finnish courts relatively seldom handle food crime cases, and therefore the legal praxis related to such cases is limited (Tähkää et al., 2015).

The control of food fraud and other criminal activities in the food chain presents new challenges for food control (FFA, 2020a). The Finnish Food Authority is the central authority responsible for food control, including national-level food fraud prevention (Food Act, 2006). In turn, local and regional food control authorities, namely municipal food control units and Regional State Administrative Agencies, are responsible for food control in their respective areas (Food Act, 2006). In addition, the Finnish Food Authority is responsible for veterinary border inspections of imported foodstuffs of animal origin and the Finnish Customs is responsible for the control of imported foodstuffs of non-animal origin (Food Act, 2006). Local food control authorities perform inspections on food establishments in their area (Food Act, 2006) and should, in order for enforcement to be effective, be able to detect fraudulent activities or fraudulent food products.

In the EU, the operational criteria for food fraud comprise violation of EU rules, deception of customers, economic gain, and intention (EC, 2020b). By contrast, there is no definition of food fraud in Finnish legislation. However, a person breaking the Food Act shall be fined for committing a food offence unless a more severe penalty is permitted or required elsewhere in the law (Food Act, 2006). The sections of the Criminal Code that could apply to offences against food safety include marketing offence and health offence (Lähteenmäki-Uutela et al., 2016). All offences do not require intention: a person can be guilty of a food offence through negligence (Food Act, 2006) and a health offence through gross negligence (Criminal Code, 1889). Food control authorities are required to notify the police of a suspected offence unless the offence is insignificant and does not involve disobedience regarding prohibitions and orders issued by an authority (Food Act, 2006). If there is reason to suspect a crime, the police will conduct a criminal investigation (Criminal Investigation Act, 2011). In some cases, a police officer or prosecutor may impose a fine (Act on the Imposition of a Fine and a Fixed Fine, 2010) or waive the investigation (Criminal Investigation Act, 2011) or charges (Criminal Procedure Act, 1997). A food offence is punishable by a fine (Food Act, 2006) and health and marketing offences are punishable by a fine or imprisonment of up to six months and one year, respectively (Criminal Code, 1889). Fines are imposed as one to 120 day fines, depending on the severity of the offence, with the amount of one day fine depending on the fined person's income (Criminal Code, 1889). A legal person, such as a company, can be sentenced to pay a corporate fine for certain offences (Criminal Code, 1889). The sum of such fines can vary from 850 to 850 000 euros (Criminal Code, 1889). A court may waive punishment in certain cases, for example if the punishment is deemed unreasonable or futile in the case in question (Criminal Code, 1889). Any proceeds of a crime must be ordered forfeit to the state (Criminal Code, 1889).

Food fraud is a complex phenomenon, and research is required to improve food fraud prevention. Understanding the characteristics of previous cases helps food safety authorities focus food control on potentially high-risk establishments and activities and detect fraudulent practices and products. Knowledge of the progress of previous criminal investigations, trials, and the following penalties helps identify possible challenges to combating food-related crime. The aims of this study were to characterize food-related criminal cases in Finland in order to improve the prevention of food fraud.

2. Materials and methods

2.1. Food-related cases

The material consists of judgements and other documents of food-related cases from Finnish district courts, prosecutors, the police, and

food control authorities from 2008 to 2019. Documents from the police and prosecutors were from 2008 to 2018 and judgements from district courts were from 2008 to 2019. We requested information on all resolved cases under the titles of food offence (Food Act, 2006), health offence (Criminal Code, 1889), or marketing offence (Criminal Code, 1889) from all district courts, prosecutors' offices and police departments in Finland. Moreover, in district court cases where an appeal had been made, we requested judgements from the court of appeal. We also requested inspection reports, decisions regarding the use of administrative coercive measures, and requests for an investigation or reports of an offence related to cases from the food control authorities, including local food control units, Regional State Administrative Agencies, and the Finnish Food Authority. We chose to focus our search on food, health, and marketing offences because we estimated that most food-related cases were processed under one of these titles.

The search results differed somewhat, due to the separate registers used by our informants: we received a list of cases from the district courts where the most serious crime was either a food, a health, or a marketing offence, while the prosecutors' offices and police departments provided information on all cases including one of these offences (regardless of whether it was the most severe offence in that particular case). We received judgements, prosecutors' decisions or notices of investigation and investigation decisions in 127 individual cases resolved by one of these authorities. In addition, at least one of the following documents from the food control authorities was available in 78.7% of cases ($n = 100$): a request for investigation, a statement, at least one inspection report, a decision, other documentation. In some cases, however, documents from the food control authorities were unavailable because, for example, they had not been involved in the case.

In this study we cover all food-related cases, irrespective of whether they can be viewed as fraudulent acts. Alcohol offences were not included in the material, as neither alcohol production nor alcoholic products are within the jurisdiction of the local food control authorities or the Finnish Food Authority (Alcohol Act, 2017; Food Act, 2006).

2.2. Analysis

We collected the following information on each case: suspected offences, time and place the offence was committed, types of food establishments and food products involved, types of non-compliances, detection of the case, date and author of the report of an offence, evaluations of possible health hazards and food safety hazards, and the ruling on the case with justification and criminal sanctions. We compiled the information on an Excel-sheet and further analysed the data using SPSS software (IBM SPSS Statistics for Windows, Version 25.0, Armonk, NY: IBM Corp). We used Pearson's Chi-Square test to test for the statistical significance of the association between health and/or food safety hazards and the authority resolving the case. Statistical significance was accepted at a confidence level of 95% ($p < 0.05$).

The cases were categorized by offence type, resolving authority, whether a punishment was imposed in the case, and whether there was an associated health and/or food safety hazard. Food establishments were categorized by their area of activity regardless of their official status. For example, a restaurant that was operational but not registered with the food control authorities was still categorized as a restaurant, or a fish processing plant that had previously been approved but for which approval had been rescinded was categorized as a fish processing plant. Non-compliances were categorized such that each non-compliance in each case only fell within one non-compliance category. In turn, initial observations were defined as the way a food control authority or the police first detected or became aware of the case or associated non-compliances. A health or food safety hazard (henceforth, safety hazard) was deemed to be associated with the case if the court, prosecutor, police or food control authority had mentioned it in any of the available documents. According to the Criminal Code, a health offence is an act prone to endanger the life or health of another. By contrast, the

definitions of food offence or marketing offence contain no reference to safety hazards. Cases in which at least one offender received a conviction, fine or caution for at least one food-related offence were categorized as cases with punishment. Only cases with a single offence were used in the analysis of penalties.

3. Results

We found a total of 127 food-related cases, averaging 10.8 cases per year in 2008–2018 (range 6–14). The incidence of cases was 0.21 per 1000 food establishments per year (Table 1) and was highest in Southwestern Finland (0.32) and lowest in Lapland (0.04). These suspected crimes had occurred in the areas of 42 local food control units ($n = 62$). By contrast, 32.3% of food control units had no reported cases during the period of investigation.

At least one food offence was suspected in 83 cases (65.4%), a health offence in 43 cases (33.9%), and a marketing offence in eight cases (6.3%). More than one type of offence was suspected in 26 cases (20.5%). In total, 21.3% ($n = 27$) of cases were resolved by the police, 44.9% ($n = 57$) by prosecutors, and 33.9% ($n = 43$) by the district courts (Table 2). In total, 59.8% ($n = 76$) of cases led to a conviction or sanction (Table 2). Of the district court cases, 81.4% led to a conviction, while of those resolved by prosecutors or the police, 63.2% and 18.5% led to a punishment for at least one suspected offence, respectively (Table 2). No crime was suspected in 10 cases, the statute of limitations had expired in four cases, and prosecution was waived in 11 cases. An appeal had been made in six (14.0%) of the district court cases. In four, the previous judgement was not changed; in one, the previous punishment was changed, and in one the sum forfeit to the state for the proceeds of the crime was reduced.

The median duration of the suspected food offences, health offences and marketing offences ($n = 146$) as defined by the police or prosecutor was six days (range: from one day to almost 6 years). However, the duration of 26.7% of these suspected offences was longer than 6 months. The median time from the first observation of non-compliances related to the case to the report of an offence or the day when the police recorded the report was 36 days (range: from zero days to over 12 years) ($n = 100$). In 11.0% of cases, more than a year had elapsed before the case was reported.

The most common types of food establishments involved in the cases were mobile food premises and outdoor markets (23.6% of all cases), stores (15.0%), and food service businesses, including restaurants, cafés, and grills (11.0%) (Table 3). In total, 8.7% of cases involved a site of primary production and 7.1% a private household. The types of food products most commonly involved were meat and meat products (in 37.8% of cases), fruit and vegetables (24.4%), and fish and fish products (18.9%) (Table 4). Of the 127 cases, 15.7% included more than one type of food product.

The reported non-compliances most commonly concerned unapproved or unregistered premises or activities (in 43.3% of cases), false or misleading information provided on food products (39.4%), and

insufficient traceability or incorrect, false or missing documents (31.5%) (Table 5). The most common non-compliances in mobile food premises were that the premises or activities were unapproved or unregistered or that the information provided about food products was false, misleading or inadequate (60.0% of cases concerning mobile food premises) (Supplementary Table 1). Furthermore, the most common non-compliances in stores concerned traceability and documentation (52.6%), in food service establishments disobedience regarding prohibitions and orders issued by an authority (57.1%), and in fish processing plants unapproved premises or activities (61.5%) (Supplementary Table 1).

A safety hazard was associated with 45.7% ($n = 58$) of all cases (Table 2). Of the different food establishments, a safety hazard was most commonly associated with stores (78.9% of stores) and food service businesses (64.3%) (Table 3). Of the different food products, a safety hazard was most commonly associated with meat or meat products and fish or fish products (50.0% of cases) (when only including cases where just one type of food product was involved and where that product type concerned more than 10 cases) (Table 4). An associated safety hazard was significantly more common in cases handled by the district courts (safety hazard in 79.1% of cases) compared to cases resolved by prosecutors (29.8%) or the police (25.9%) (Table 2) (Pearson's Chi-square, $p < 0.01$).

Three cases (2.4% of all cases) had verifiably caused ill-health due to the poor quality of food products. In these cases, the number of people who had fallen ill due to a foodborne pathogen varied from at least seven to over 500. These three cases led to a conviction. In addition, four more cases (3.1%) were suspected to be linked to cases of illness by the people who reported them to the food control authorities or the police, but these connections were, to our knowledge, not confirmed.

Most often, non-compliances were initially observed during inspections performed by local food control officers (in 45.7% of cases), through a notification to the food control authorities (in 29.1% of cases), or due to the suspicions or observations of a food control officer outside an inspection (in 7.9% of cases) (Table 6). Food-related non-compliances were also noticed during non-food-related inspections, such as animal welfare or animal marking and registration inspections (in 6.3% of cases). By contrast, laboratory results were the first stimulus in only five cases (3.9%) (Table 6). A request for investigation was most commonly made by local food control units (76.4% of cases) and other control authorities (9.4%).

A fine was the most common type of punishment (Table 7). In total, a fine was imposed on 84.6% ($n = 77$) of all punished offenders. Only 6.5% ($n = 6$) of offenders were sentenced to conditional imprisonment, two of them with a supplementary fine. The mean number of day fines was 13.7 for food offences ($n = 47$), 41.1 for health offences ($n = 18$) and 57.5 for marketing offences ($n = 2$) (Table 7). The proceeds of crime were claimed by the prosecutor in seven out of 43 district court cases (16.3%). The proceeds were ordered forfeit to the state in all of the cases that resulted in a conviction (5 out of 7), but in four out of five cases the sums were smaller than those claimed by the prosecutor.

Table 1

Number and incidence of cases per Regional State Administrative Agency during 2008–2018 classified by the deciding authority.

Regional State Administrative Agency	Number of cases				Number of establishments ^a	Incidence (cases/1000 establishments/year)
	Police	Prosecutor	District courts	Total		
Southwestern Finland	3	12	10	25	7028	0.32
Southern Finland	17	28	10	55	20 732	0.24
Western and Inland Finland	6	9	8	23	10 591	0.20
Northern Finland	0	3	6	9	4695	0.17
Eastern Finland	0	5	1	6	5555	0.10
Lapland	1	0	0	1	2248	0.04
Total	27	57	35	119	50849	0.21

^a Number of food establishments in year 2018. Data of food establishments per Regional State Administrative Agency were received from the Finnish Food Authority, 2021.

Table 2
Classification of the cases (n=127) by suspected offences, deciding authority, criminal sanctions, and associated safety hazard.

Title of suspected offences	Police		Prosecutor		District court		Total	
	Cases	Cases with safety hazard	Cases	Cases with safety hazard	Cases	Cases with safety hazard	Cases	Cases with safety hazard
Food offence ^a	16 (20.8)	3 (18.8)	44 (57.1)	13 (29.5)	17 (22.1)	8 (47.1)	77 (100)	24 (31.2)
Number of cases (%)	5 (31.3) ^c	2 (40.0)	32 (72.7)	9 (28.1)	13 (76.5)	6 (46.2)	50 (64.9)	17 (34.0)
Number of criminal sanctions or convictions (%) ^b	8 (20.0)	4 (50.0)	10 (25.0)	4 (40.0)	22 (55.0)	22 (100.0)	40 (100)	30 (75.0)
Health offence ^a	0	0	4 (40.0)	4 (100.0)	18 (81.8)	18 (100.0)	22 (55.5)	22 (100.0)
Number of cases (%)	3 (37.5)	0	2 (25.0)	0	3 (37.5)	3 (100.0)	8 (100)	3 (37.5)
Number of criminal sanctions or convictions (%) ^b	0	0	0	0	3 (100.0)	3 (100.0)	3 (37.5)	3 (100.0)
Marketing offence ^a	0	0	0	0	0	0	0	0
Number of cases (%)	0	0	1 (50.0)	0	1 (50.0) ^f	1 (100.0)	2 (100)	1 (50.0)
Number of criminal sanctions or convictions (%) ^b	0	0	0	0	1 (100.0)	1 (100.0)	1 (50.0)	1 (100.0)
Other offence	27 (21.3)	7 (25.9)	57 (44.9)	17 (29.8)	43 (33.9)	34 (79.1)	127 (100)	58 (45.7)
All cases	5 (18.5)	2 (40.0)	36 (63.2)	13 (36.1)	35 (81.4)	28 (80.0)	76 (59.8)	43 (56.6)

^a 12 cases also included other offences, for example providing false documents to a public authority, a registration offence or an aggravated animal welfare offence.

^b Including criminal sanctions or convictions for food-related offences only.

^c Cautioning only.

^d 10 cases also included other offences, for example an animal welfare offence, environmental infraction or food offence.

^e 5 cases also included other offences, for example a health offence, food offence or forgery.

^f Food offence as a secondary penal order.

Table 3
Types of food establishments involved in the cases (n = 127).

Type of food establishment	Cases involving a food establishment (%) ^a	Unapproved or unregistered premises or activities in establishment (%)	Safety hazard in establishments (%)	Related establishments (number of establishments)
Mobile food premises and outdoor market sales	30 (23.6)	18 (60.0)	8 (26.7)	
Store	19 (15.0)	9 (47.4)	15 (78.9)	Transport (4), mobile premises (1)
Food service (restaurant, café, grill)	14 (11.0)	4 (28.6)	9 (64.3)	Bakery (1)
Fish processing plant	13 (10.2)	8 (61.5)	7 (53.8)	Outdoor market (2)
Primary production	11 (8.7)	4 (36.4)	4 (36.4)	Transport (1)
Wholesale and agencies	10 (7.9)	0	3 (30.0)	
Private household/person (no food establishment)	9 (7.1)	5 (55.6)	4 (44.4)	
Meat processing plant	9 (7.1)	4 (44.4)	5 (55.6)	Factory store (1)
Other ^b	9 (7.1)	2 (22.2)	3 (33.3)	
Transport	4 (3.1)	1 (25.0)	2 (50.0)	
Unknown ^c	4 (3.1)	0	1 (25.0)	

^a Four cases involved 2 to 3 types of establishments.

^b Including vegetable handling, warehouse, water packaging, cheese production, production of ready-to-eat foods, and other company than food business.

^c The information was not available.

Table 4
Food products involved in the cases (n = 127).

Food product ^a	Number of cases (%)	Cases involving only one type of food product (n = 107)	
		Number of cases	Number of cases with safety hazard (%)
Meat or meat products	48 (37.8)	30	15 (50.0)
Fruit, vegetables, berries and mushrooms	31 (24.4)	24	6 (25.0)
Fish or fish products	24 (18.9)	18	9 (50.0)
Dry foods, packaged foods with a long shelf life, grain products	10 (7.9)	4	0
Milk or milk products	9 (7.1)	4	1 (25.0)
Unknown	8 (6.3)	NA	
Pastries, bakery products	7 (5.5)	4	2 (50.0)
Restaurant food	6 (4.7)	6	4 (66.7)
Non-alcoholic beverages and drinks, incl. packaged water	5 (3.9)	2	0
Byproducts	5 (3.9)	0	0
Ready-to-eat foods	4 (3.1)	2	1 (50.0)
Spices	3 (2.4)	2	2 (100.0)
Live animals	3 (2.4)	1	0
Eggs	2 (1.6)	0	0
Others ^b	2 (1.6)	2	1 (50.0)

NA = not applicable.

^a Different food types may be involved in one case.

^b Including dietary products and unspecified frozen foodstuffs.

Table 5
Suspected non-compliances in the cases (n = 127).

Category of non-compliance ^a	Number of cases (% of cases)
Unapproved/unregistered premises or activities	55 (43.3)
False or misleading information provided on food products	50 (39.4)
Mislabelling	48 (37.8)
Incorrect marketing, false health claims	3 (2.4)
Insufficient traceability and incorrect, false or missing documents	40 (31.5)
Disobedience regarding prohibitions or orders issued by an authority	39 (30.7)
Inadequate quality of food products	38 (29.9)
Food products unfit for consumption	30 (23.6)
Foodstuffs with forbidden substances, foreign bodies etc.	7 (5.5)
Allergens and intolerances	2 (1.6)
Inadequate own-check	34 (26.8)
Plan and record-keeping	34 (26.8)
Sampling	2 (1.6)
Unsuitable premises or equipment	21 (16.5)
Unhygienic manufacturing, storage, and handling practices	21 (16.5)
Temperature abuse	18 (14.2)
Providing false information or failing to provide information to authorities	17 (13.4)
Poor maintenance and cleaning	16 (12.6)
Handling or sale of uninspected meat	14 (11.0)
Other ^b	14 (11.0)
Actions and training of personnel	7 (5.5)
Unknown ^c	1 (0.8)

^a There were non-compliances from one to ten different categories in each case.

^b For example non-compliances related to byproducts, use of plant protectants, and live animals.

^c Non-compliances not evident based on available materials.

4. Discussion

In 2018 alone, the food control authorities performed more than 25 000 inspections at over 20 000 food establishments in Finland (excluding primary production) (FFA, 2019). Of these, 0.6% resulted in

Table 6
Initial observations leading to a report to the police or a criminal investigation (n = 127).

Observation ^a	Number of cases (%)
Food control inspection	65 (51.2)
Local food safety control	58 (45.7)
Customs	6 (4.7)
Finnish Food Authority	1 (0.8)
Notification to competent food control authorities	37 (29.1)
From a private individual	21 (16.5)
From an unspecified source	7 (5.5)
From another food establishment	5 (3.9)
From health care	2 (1.6)
From the food business operator ^b	2 (1.6)
Food control officer's suspicion or observation other than during inspection at the premises	10 (7.9)
Unknown	10 (7.9)
Notification to police	6 (4.7)
From a private individual	3 (2.4)
From a current or former employee	2 (1.6)
From another food establishment/entrepreneur	1 (0.8)
Other inspection ^c	8 (6.3)
Laboratory result	5 (3.9)
Observed by police or known through another investigation	2 (1.6)

^a There may be one or two different observations in each case.

^b The food business operator themselves informed the authority about the non-compliance.

^c For example an animal welfare investigation, animal marking and registration inspection, and police restaurant inspection.

a poor grade, which means that the observed non-compliances jeopardized food safety or considerably misled the customer (FFA, 2019). Compared to these figures, the annual and total number of food-related criminal cases in the period investigated appear low. Moreover, as indicated by previous studies, only a small number of cases lead to a prosecution, because many remain undetected (Cadieux et al., 2019; Grey economy & economic crime, 2018). In addition to undetected cases, some incidents might not be reported to the police, as the Food Act allows the food control authorities to use discretion over which suspected offences to report (Food Act, 2006). Thus, one fruitful avenue of research could be to study how food control officers assess different types of non-compliances and why and when they do or do not report them to the police. This could be a valid research topic in other countries too, as we were unable to find any previous research on the issue, despite its potentially important consequences for food fraud prevention.

In our study, cases were found in all the regions of mainland Finland, but their incidence varied greatly. It is especially noteworthy that, for a third of local food control units, no cases were reported during the period of investigation. Interestingly, a previous Finnish study found that one-third of local food control units had failed to use administrative coercive measures (Lundén, 2013), while another observed that a lack of routines and practices hindered the use of enforcement measures (Kettunen et al., 2017). Similar to the use of administrative coercive measures, the readiness to report cases to the police may also be influenced by the culture of the food control unit. Additionally, a recent study also showed that restaurant inspection grades varied between different regions (Lundén et al., 2021). The authors found that mean overall grades were higher in Lapland and Eastern Finland than in other regions. These regions also had the lowest incidence of reported criminal cases in our study, which is an interesting finding. Thus, while the incidence of cases in each area may reflect the actual incidence of food-related criminal cases, it may also reflect both the ability of the local food control authorities and the general public to recognize suspicious actions and also practices of reporting suspected cases to the police. The ability to detect and recognize possibly fraudulent practices should be enhanced throughout the country, and reporting suspicions to the police should be encouraged and harmonized by nationwide guidelines. In Sweden, a

Table 7
Punishments imposed on offenders (n = 91) for food-related offences in cases leading to a conviction or punishment (n = 76).

Offence	Police		Prosecutor		District courts		
	Number of offenders that were cautioned	Number of offenders that received day fines	Mean of day fines (range)	Number of offenders that received day fines	Mean of day fines (range)	Number of offenders that received a suspended sentence	Mean days of suspended sentence (range)
Food offence	5	32	12.2 (6–30)	15	16.9 (5–50)	NA	
Health offence	0	1	20	17	42.4 (20–60)	4 ^a	55 (20–90)
Marketing offence ^b	0	0		2	57.5 (50–65)	0	
Other offence	0	1	20	0		0	
Food offence & other offence(s)	0	1	23	2	35.7 (15–60)	2	138 (35–240)
Health offence & other offence(s) ^c	0	3	23.3 (15–30)	2	52.5 (45–60)	0	
Marketing offence & other offence(s)	0	0		1	25	0	
Total	5	38	13.8 (6–30)	39	33.2 (5–65)	6	83 (20–240)

NA = not applicable.

^a In two cases also a supplementary fine (50 day fines).

^b In one case also a corporate fine.

^c Compensation for damages for two offenders.

stricter obligation to report suspicions of environmental crime has increased the number of reported environmental crimes (Sahramäki & Kankaanranta, 2014).

The cases we studied involved different types of food establishments, the most common being mobile food premises and outdoor markets, stores and food service businesses. It is unclear why the cases were most prevalent in mobile food premises and outdoor markets, but the result may reflect possible differences in food safety culture among food business operators (FBOs). Interestingly, cases in mobile food premises and stores together were almost four times more common than in food service establishments, even though the latter are the most common and also the most commonly inspected type of food establishment in Finland (FFA, 2020a). Nevertheless, our results highlight the importance of being aware of possible fraud in all types of food establishments.

In addition, several different food products were involved in the cases, with meat, fruit and vegetables, and fish being the most common types of food in our data. This result is in line with cases reported to the EC in 2019 (EC, 2020a), with the exception of fats and oils, which did not appear in our data. Previous findings have also shown meat to be a common target of fraud (EC, 2020a; Koubová et al., 2018; Tähtkääpää et al., 2015). However, some food products were involved in just a small number of cases, even though previous data indicates their susceptibility to fraud. For example, food supplements were involved in only one case, although they have quite commonly been rejected by customs officials due to non-compliances in composition and labelling (Customs, 2019; FFA, 2020a).

Most cases came to the attention of the food control authorities during an inspection of the premises or due to a tip-off from the public. This not only shows the importance of food control inspections in detecting food-related crime but also underlines the need to take any reported suspicions into account. Unlike the UK (FSA, 2021), Finland currently lacks a centralized anonymous whistleblowing system for food fraud, but developing one could potentially increase the number of tip-offs as employees of the food sector as well as members of the public may hesitate to report their suspicions if there is a risk of their identity being revealed. This study also demonstrates the importance of paying attention to food-related matters even when they are not the primary purpose of the inspection, as cases were identified during other inspections, such as animal welfare and animal marking and registration inspections. Officers who perform animal welfare inspections in Finland are also competent in food control and are therefore well equipped to notice food-related non-compliances. Additionally, FBOs that experience problems complying with food laws commonly face issues with taxes and other payments (Tax administration, 2018) and an increasing number of cases of labour exploitation and human trafficking have been revealed in the agriculture and restaurant sector (FRA, 2015; Jokinen et al., 2011). Therefore all other authorities that control or visit primary production sites and food businesses, such as restaurants, should be aware of the possibility of fraud and be able to report their observations and suspicions to the relevant officials. These different authorities include not only tax authorities, but also authorities responsible for occupational safety and health, the use of chemicals, farming subsidies, environmental protection, and the fisheries sector.

Interestingly, only a small number of cases stemmed from laboratory results, even though previous research has demonstrated the effectiveness of laboratory testing in food fraud detection (Koubová et al., 2018). It is clear that laboratory testing should be greater utilized in food fraud prevention; however, the cost of laboratory analyses may be one factor limiting their use. Nevertheless, the possibility of products being subject to testing, thereby increasing the likelihood of the detection of fraud, could reduce the incentive to adulterate products or provide misleading information.

In our data, the median time from the first observation of the case to it being reported to the police was about five weeks, although several cases were reported more than a year after they had first been detected. In some cases, the food control authorities had requested the FBO to

correct non-compliances and even used enforcement measures for years before reporting the case to the police. In Finland, the statute of limitations for food offences, health offences, and marketing offences is quite short, at only two years (Criminal Code, 1889). Therefore, in order to prevent the continuance of possible criminal activity and avoid expiry of the statute of limitations, cases should be reported to the police within a reasonable period after they have been observed.

Unapproved or unregistered premises or activities were the most common type of non-compliance in our data. Unknown establishments are problematic, as they operate outside official control, and the authorities are thus unable to evaluate the possible hazards related to them. The food control authorities could potentially identify these businesses early on by, for example, following possible advertising and social media posts and encouraging tip-offs from other FBOs and the public. In turn, it is likely that possible unauthorized spaces and activities on premises that are otherwise properly registered can also be detected during inspections. Other commonly reported non-compliances in our data, such as false or misleading information and problems with traceability and documentation, were also among the most common non-compliances reported to the European Commission in 2019 (EC, 2020a).

Our results show that almost half the cases contained an associated safety hazard. Consequently, the prevention of food fraud is important not only for advancing fair trading practices but also for protecting the safety of consumers. Moreover, it appears that such safety hazards influenced the criminal process, as significantly more cases with an associated safety hazard were resolved in the district courts than at earlier stages of the criminal process. This highlights the importance of describing the possible safety hazard when reporting a case to the police. Out of the different food establishments in our data, an associated safety hazard was most common in stores and food service businesses, which is somewhat unexpected, as they are not generally considered high-risk from a food safety perspective and are therefore inspected less frequently than some other establishments. The food control authorities are instructed to inspect stores and food service establishments less than once a year to a maximum of three times a year, depending on the extent of their operations (FFA, 2020b). This rather low inspection frequency sets high demands on inspectors, as they should be able to detect possible food fraud during one short visit to the premises. The possibility of detecting food fraud is probably highest during inspections performed without prior notice. Preannouncement of the inspection allows the FBO to correct some non-compliances or conceal any unauthorized activities or products. However, a recent study shows that one fourth of restaurant inspections in Finland are preannounced (Kaskela et al., 2021).

In our data, the accused was found guilty in about 80% of cases handled by the district courts, which is lower than the 96% for animal welfare offences reported in a recent study (Väärikkälä et al., 2020). This discrepancy might be due to the small number of cases studied in our research; however, it may also be the result of food legislation being special legislation and therefore possibly unfamiliar to the police, prosecutors, and the courts, and of food crime being a relatively new phenomenon within the legal system. In our dataset, a fine was the most common punishment, while a custodial sentence was imposed in only a few cases, despite it being a possible punishment for health and marketing offences. The number of day fines was also rather small: for example, the fines imposed for food offences by district courts were lesser than those imposed for nature conservation violations (Suvantola, 2019), which is a comparable offence punishable by fine alone.

The proceeds of crime were claimed by prosecutors in only one-sixth of the district court cases. A recent study shows that proceeds are difficult to recognize and estimate in environmental crime (Koskela et al., 2020), and the same may be true of food-related crime. The proceeds of crime may consist of illegally attained profit or savings accrued when requirements are neglected, for example when premises are not maintained to sufficient standards or when mandatory laboratory testing is not performed. As food-related crime is part of the grey

economy, the proceeds of crime should be recognized and efficiently recovered. Therefore, the possible proceeds of crime should be carefully assessed when investigating food-related cases.

Due to the limitations and differences in the data systems used by different authorities, it is unlikely that we identified every food-related case from the period of investigation. For example, we were largely unable to recover food-related cases that were not handled as a food offence, health offence, or marketing offence. Additionally, as the district court data system only allows searches for the most serious offence in each case, some relevant cases where the most severe crime was non-food related may have been missed. Moreover, our analysis is based on available documents, and therefore dependent on inclusions or omissions to these documents in each case. Finally, the cases reported to the police are likely to be only a fraction of the true number of cases, due to both under-detection and underreporting.

In conclusion, this study demonstrates that food-related crime is a regular but rarely reported occurrence in Finland. Based on our findings, food-related crime is committed in different types of food establishments, and various food products are vulnerable. Such cases commonly involve a safety hazard, and therefore the prevention of food-related crime is necessary to protect consumer health. Food control inspections are important for detecting cases, but the possibility of food-related non-compliances should be borne in mind during other inspections as well, for example when performing an animal welfare inspection at a primary production site. The incidence of reported cases showed large geographical variation, suggesting inconsistencies in the detection and reporting of cases. Therefore, more training in the detection of cases and greater harmonization of reporting practices are required. In addition, the punishments imposed in food-related criminal cases appeared rather lenient and the proceeds of crime were seldom reclaimed, indicating that food crime may be viewed as a lucrative practice. An increased number of food-related cases brought to the criminal procedure would develop legal praxis and thereby also improve food fraud prevention.

Research permits

The National Police Board of Finland, the National Prosecution Authority, and the District Courts of Helsinki and Oulu required and granted research permits for this study.

CRediT authorship contribution statement

Jasmin Joenperä: Investigation, Conceptualization, Data curation, Formal analysis, Writing – original draft. **Tarja Koskela:** Writing – review & editing. **Janne Lundén:** Conceptualization, Funding acquisition, Supervision, Project administration, Writing – review & editing.

Declaration of competing interest

The authors have no competing interests to declare.

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Appendix A. Supplementary data

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