

# Official controls on traditional and ethnic butchers: evidence gathered to improve food safety

Giulia Bonifacino,<sup>1</sup> Amaranta Traversa,<sup>2</sup> Daniele Nucera,<sup>3</sup> Roberta Bervini,<sup>2</sup> Guido Bruatto,<sup>2</sup> Emanuele Coruzzi,<sup>2</sup> Maurizio Gilli,<sup>2</sup> Arianna Mendolicchio,<sup>2</sup> Emanuele Osella,<sup>2</sup> Francesca Rubinetti,<sup>2</sup> Enzo Stassi,<sup>2</sup> Claudio Biglia,<sup>2</sup> Tiziana Civera<sup>1</sup>

<sup>1</sup>Department of Veterinary Sciences, University of Turin; <sup>2</sup>Section Veterinary B, Department of Prevention, Local Health Unit, Turin; <sup>3</sup>Department of Agricultural, Forest and Food Sciences, University of Turin, Italy

## Abstract

Regulation 2017/625 allows and encourages the use of rating schemes as a means to increase transparency in the agri-food chain.

Correspondence: Giulia Bonifacino, Department of Veterinary Sciences, University of Turin, Largo Braccini 2, Grugliasco, Turin, Italy.

Tel: + (39) 3349708526.

E-mail: giulibonifacino@gmail.com

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Since its implementation, a need for greater fairness, consistency, transparency, and objectivity in official controls has been reported by member states. The present study compares the results of inspection activities concerning food hygiene principles in ethnic and traditional butcheries. The sample consists of 50 food business activities randomly selected from traditional and ethnic butcheries subject to official control in Turin from January to June 2019. Our objectives were to evaluate the degree of awareness and training of food business operators (FBOs) and to compare the written records drawn up by the competent authorities (CAs) during official inspections to evaluate their completeness and uniformity. The presence of old equipment is a common finding in both traditional and ethnic butchers. This could lead to ineffective cleaning operations and inappropriate functioning, which in turn could lead to a dangerous loss of control over products' temperatures. Ethnic butchers showed a higher number of non-compliances for documentary examination, the presence/correctness of self-control plans, and management aspects such as by-product disposal and personnel hygiene. Training is the key point for both CAs and FBOs; inspectors must maintain their professionalism but also adhere to harmonized and intellectually supported criteria, and FBOs must prevent improper behavior. Eventually, we propose strategies to increase the efficacy and homogeneity of records, together with suggestions on how to implement training both for consultants and operators.

## Introduction

The basic principle of the National and European Regulation 2017/625 concerning official controls in the food sector is that the food reaching the consumer is prepared under hygienic conditions (European Parliament and Council, 2017). In this way, hazards can be prevented, eliminated, or reduced to acceptable levels, pursuing a high level of protection for human life and health. The responsibility for safe food is shared among 3 actors: the food business operator (FBO), the competent authority (CA), and consumers. The role of the latter was not considered in this study. The FBO, as defined by Regulation 178/2002, is "the natural or legal person responsible for ensuring that the requirements of food law are met within the food business under their control" and must ensure compliance with the food safety prerequisites regardless of cultural factors (European Parliament and Council, 2002).

The principles that must be applied in food safety concern the management of the prerequisite program and the hazard analysis critical control point system. Moreover, the same Regulation 178/2002 affirms that member states must organize official controls to verify the application and compliance with the provisions of the law by the FBO (European Parliament and Council, 2002 - Article

17). According to Regulation 2017/625, CAs are required to carry out official controls that meet the criteria of fairness, consistency, and transparency and are conducted by qualified, trained, and updated personnel (European Parliament and Council, 2017).

The present study compares the results of the official controls performed in ethnic butcheries in Turin in the period between January and June 2019, for a total of 50 traditional and ethnic butcher shops (sale of meat with or without annexed cutting laboratory and preparation of meat products) within the territory of competence. The interest in ethnic establishments is linked to the specific nature of the city of Turin; recently, this city has seen an increase in the presence of numerous butcher shops run by and aimed at specific ethnic groups. We compared the results of the inspection activity with the application of the principles of food hygiene. The objectives of this study are: gaining evidence of the training and awareness of FBOs and obtaining a comparison on aspects such as the completeness and uniformity of the reports of the CAs.

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## Materials and Methods

To carry out this study, 50 written records of official controls were analyzed. Official staff (official veterinarians and public health food safety technicians) collected such evidence during the routine inspection of butcheries located in the area of competence of the Local Public Health Authority (whose abbreviation in Italian is ASL) of Turin, Piedmont Region. A list of 50 fixed-location retail establishments, excluding open market areas, was randomly selected from the regional register portal “VETALIMENTI”. All samples had been subjected to official inspections from January to June 2019. Ethnic butcheries included both Halal ones, in which the FBOs operate according to the Islamic rite, and those in which the operators do not, originating from Eastern Europe, Eastern Asia, or Northern Africa. By “ethnic butcheries”, the authors mean the representatives of a specific gastronomic culture, traditionally not part of Italian dietary habits. 25 traditional and 25 ethnic butcheries were selected; the examined butcheries became 48 because 2 of them were closed during the study period.

The selection was made following the criterion of distance in km, calculated by entering the precise address on Google Maps and setting the minimum distance between a traditional and an ethnic butcher’s shop. This is to eliminate possible confounding factors due to a different social context that might influence consumers’ choices and expectations. The minimum distance between butchers belonging to the same pair was 44 meters, while the maximum distance was 3 km. Official controls were conducted following Regulation 2017/625. In the period considered, this activity was performed by 4 veterinarians and public health food safety technicians: they carried out periodic comparisons of the collected evidence to train themselves on how to operate homogeneously. Incomplete and/or significantly different reports in terms of evidence collection were therefore excluded from the study.

All inspections have been conducted either by a pair of inspectors, both official veterinarians qualified to perform official controls and other official activities, or by an official veterinarian paired with a public health food safety technician. Working in pairs is due to provide a comprehensive assessment of the evidence collected and to reduce the chances of FBOs’ subjective judgments. Previous records from 2016 to 2019 were also reviewed (data not included) before data analysis to acknowledge the history of each inspected reality.

Table 1 lists variables subject to statistical analysis and related parameters, according to current sector legislation (European Parliament and Council, 2002, 2004a, 2004b, 2009; Conferenza Stato-Regioni, 2012a, 2012b) to consider whether the aspect assessed by the inspector is compliant or not. For the qualitative variables considered, a value of 0 is given if the factor is compliant, and 1 if it is not compliant. The numerical differences in non-compliances (NCs) between the 2 groups (variable n. 13) were compared using the Wilcoxon signed rank test. To compare the binary-coded variables, McNemar’s test (*i.e.*, an association test for paired data) was used. Analyses were conducted with SPSS for Windows, version 25 (IBM SPSS Inc, Chicago, IL, USA). Statistical significance was attributed when  $p < 0.05$ , while probable significance when  $p < 0.1$ . Tending toward significance are all results that cannot be considered significant because the  $p$  value is a few points higher than the standard 5% level, but lower than 10%.

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## Results

A significant difference between the analyzed butcher shops was seen in the NCs detected. These are more associated with ethnic butcher shops for personnel, and processing hygiene (variable 8;  $p = 0.04$ ), and by-products (variable 11;  $p = 0.02$ ). The most frequently reported NC for variable 8 relates to incorrect locker management resulting in a lack of separation between civilian and work clothes, as observed for 24% of ethnic butchers and 8% of traditional ones. The main causes of NC for variable 11 include 48% of ethnic butchers not relying on an authorized company dealing with the disposal of by-products, and 8% of ethnic butchers and 12% of traditional ones displaying the absence of a correctly identified dedicated container equipped with a lid for the collection of animal by-products awaiting delivery to an authorized disposal company. A tendency towards the significance of NCs was reported for ethnic butcheries in self-control plans, accuracy of written information subject to prescriptions (variable 4;  $p = 0.08$ ), and cleaning and sanitizing conditions (variable 6;  $p = 0.09$ ). Some examples of the main causes of NC for variable 4 include: in 12% of ethnic butcheries and 4% of traditional ones, the plan is stored elsewhere at another location; in 8% of ethnic butcheries, the operator reports never formulating any plan; and in 4% of ethnic butcheries, although a self-control plan is present, the FBOs admitted never having read it.

Due to a lack of information, it was not possible to analyze the separation between poultry and other meat in the showcase (variable 9) and traceability (variable 12).

All unmentioned variables did not show any significant difference between traditional and ethnic butcheries. Unlike the above, the aim of the evaluation of variable 5, relating to temperature control, was to compare if the control was performed more often in ethnic butcher shops than in traditional ones. No difference was observed.

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## Discussion

However, it is worth recalling, regarding the management of by-products, that often, based on consumer requests, meat is sold with bones in ethnic shops. For this reason, operators often declare that they do not need a contract with a disposal company and therefore a dedicated, specific storage container. This FBO’s declaration,

during official control activities, can be accepted by the CA if the FBO can demonstrate appropriate and long-lasting management of animal by-products by exhibiting the documents certifying the transfer/sale of the bones to customers (record of receipts showing purchase total weight).

Concerning the correctness of the information in the self-control plan, the evidence is also probably linked to a lack of knowledge among FBOs of such ethnic activities about current legislation. An inadequate food safety culture is observed among FBOs. A similar consideration was made by Saccarese *et al.* (2014), who considered 24 retail establishments belonging to the Chinese population of Prato, Italy. If consultants share the same nationality as FBOs, they can act as intermediaries in the transmission of information, but, like their clients, they may be less aware of local regulations. Cultural factors could influence the applicability and interpretation of the legal requirements of the standard. 8% of the ethnic butchers' NCs regarded the correctness of the information in their own self-control plan. Even though the plan was present, the FBOs admitted having never read it; difficulties in understanding the Italian language were evident.

A higher number of NCs were observed among ethnic FBOs regarding staff hygiene and sanitation conditions, probably due to cultural differences. The most frequently described NC concerns the presence of extraneous objects in the butcher's business within the marketing or production premises. For example, personal or household care items were placed for sale above the refrigerated bench, or the presence of non-recent organic material was found by visual inspection on the equipment in use, in particular cutting boards. The following scientific publications, published by Ismail *et al.* (2013) and Papadopoulou *et al.* (2012), deal with the issue of

cross-contamination caused by work tools, equipment, and surfaces, all of which have not undergone proper sanitization, as this is crucial to food safety. Despite the results of the statistical analysis regarding cleaning and sanitizing conditions, which indeed showed NCs more frequently associated with ethnicities, it is common in both realities to observe obsolete types of equipment. Dated refrigerators are of particular concern, as they tend to be less easy to clean and sometimes do not function properly, making it difficult to maintain the cold chain.

Concerning ethnic butchers, according to the experience of the City of Turin Veterinary Service, the feedback is often due to the rapid turnover of business owners/managers. Commercial activities, including equipment, are sold or leased with great frequency. In traditional butcher shops, the lack of economic sources is decisive for food safety as, due to either the strong competition in the sector or, in the case of operators who have reached the end of their careers, the lack of prospects, it negatively influences appropriate food management. This is particularly important if the equipment in place contributes to the correct maintenance of the cold chain. In the butcher shops under study, no NCs were found concerning temperature control; however, in the event of unsatisfactory temperatures, the officers of the Department of Prevention, Section Veterinary B, Turin Local Health Unit, demand the monitoring of core temperatures to be repeated daily for 10 days by the operator himself, with the contextual sending of photographic evidence *via* WhatsApp (Meta Platforms, Menlo Park, USA). This method has been adopted as detailed in Regulation 2017/625 (European Parliament and Council, 2017 - Article 9, Paragraph 5), which specifies the need to reduce administrative burdens to a minimum during official control activities. However, the transmission of

**Table 1.** Variables subjected to statistical analysis and related conditions of compliance.

Variables subjected to statistical analysis	Conditions of compliance (value of 0)
1) Notification of starting activity (NIA), or other authorizing documentation	Compliance in case of presence and correctness
2) Own-check plan	Compliance in case of presence
3) Plan temperature control: procedure and information	Compliance in case of presence and correctness
4) Plan: accuracy of other information that is subject to prescriptions	This column includes all the conditions not mentioned elsewhere in which the plan has been subject during controls. Compliance in case of correctness
5) Temperature control	The temperature measured by the calibrated official probe thermometer placed in contact with the meat (core temperature) is often made during controls. Moreover, the inspectors can check the temperature shown on the display of the refrigeration counter and/or of the cold storage. Compliance in case of conducted observation
6) Cleaning and sanitation conditions	Compliance in case of evidence of satisfaction obtained by feedback on locations
7) Facilities and equipment maintenance	
8) Personnel and processing hygiene	
9) Showcase: separation of poultry and other meats	
10) Management of raw materials/finished products	
11) By-products	Compliance in case of evidence of satisfaction obtained by feedback on locations and presence of documentary examination
12) Traceability	
13) Number of NCs	The comparison is based on the total number of NC
14) Provisions	Unlike the previous, these were distinguished based on penal or administrative measures and were counted for each butcher shop where present

NC, non-compliance.

evidence by FBOs is only possible if indicative shared control cooperation between FBOs and CAs has been previously agreed upon. In the event of any suspicion, further official controls are carried out, and all suitable measures are applied in the event of a false declaration.

This aspect of the self-monitoring plan is almost always assessed during inspections; similarly, as reported in various scientific publications by Lundén *et al.* (2014) and Niyonzima *et al.* (2018), temperature control is an aspect of fundamental importance for food safety and, at the same time, an aspect in which NCs have often been reported by CAs. Concerning temperature control, the scientific community has repeatedly attempted to find a solution, indicating as a critical issue that no constant periodic monitoring is necessary but only sporadic control during inspections by official veterinarians and technicians is sufficient, as reported by Lundén *et*

*al.* (2014). During the inspection, veterinarians or technicians measure temperatures with official calibrated thermometers placed inside the meat (core temperature). In addition, inspectors can check the temperatures reported by the displays of refrigeration counters and/or cold rooms to see if they are the same as those measured at the core. This comparison is very useful to know the efficiency of the equipment in bringing and maintaining the meat to the right temperature. This check should be done regularly by FBOs; however, in both realities, it is rarely done.

The results suggest that spending more time in dialogue between veterinarians and operators (perhaps supported by the intervention of cultural mediators) is a useful strategy. The analysis of the inspections following the one in which the prescriptions were issued often shows improvements based on the correct information that veterinarians have previously dispensed, according to the

**Table 2.** Semi-open checklist results of official control.

Results of official controls
Documentary examination
Notification of starting activity
Presence:
Date of release:
Kind of activity:
Kind of production:
Own-check plan
Presence:
Edition/review date:
Edited by:
Simplified plan:
Temperature monitoring, presence
Specification of limits:
Type of check:
Frequency:
Cleaning and sanitizing procedure, presence
Indication of facilities:
Technical sheets:
Frequency:
(If applicable) other procedures examined:
By-products agreement
Presence:
Last bill:
Contracted with:
Traceability
Presence:
Collected evidence
Sale location
Cleaning, maintenance:
Sale location equipment - cleaning, maintenance:
Showcase - cleaning, maintenance:
Temperatures measured by display showcase:
Temperatures measured by ASL thermometer at core of products:
Separation of white meat from other meat:
Cold room
Cleaning and maintenance, indicate if there are several cold rooms:
By-product container, correctly identified and with lid:
Laboratory
Cleaning, maintenance:
Laboratory equipment - cleaning, maintenance:
Sanitary facilities
Cleaning, maintenance:
Interiors:
Exclusive:
Washbasin with non-manual control:
Presence of disposable tissue and soap:

experience of the Department of Prevention, Section Veterinary B, Turin Local Health Unit. A single-operator approach, given the considerable number of activities located in the City of Turin, would not be sustainable with the current resources, according to the estimated presence of 470 butcher shops in operation in 2019 in Turin. This observation leads us to consider the organization of periodic training meetings, held by official veterinarians and addressed to groups of FBOs and their advisors, as appropriate. This proposal is supported by the results reported in scientific studies carried out by Vaz *et al.* (2005) and Roberts *et al.* (2008), in which staff and process hygiene criteria were evaluated before and after a training course offered to butchers in several countries, including Brazil, Portugal, and the United States, Kansas. In light of the bibliography reported by Vaz *et al.* (2005), it would be appropriate to conduct periodic operator training and not limit it to a single training session. In the study, a slight increase in NCs concerning the cleanliness and sanitization of the facilities was observed 6 months after the course was offered to butchers due to the decrease in awareness of the course topics, whereas after 1 month the number of NCs was significantly reduced when compared to the results obtained before attending the course. The study conducted by Roberts *et al.* (2008) reveals that NCs related to aspects observed during the inspection are lower for topics that were discussed in the course not only theoretically but also with practical demonstrations. Obtaining uniform official controls is complex. However, the enforcement of Regulation 2017/625 introduced a system of reporting and evaluation of FBOs based on rating. According to the aforementioned regulation, the rating process is a classification of operators that must be fair and consistent and based on assessments of their conformity with objective and transparent rating criteria driven by the outcome of official controls (European Parliament and Council, 2017). From this perspective, rating is a way to increase transparency in the agri-food chain. This target can be fully achieved only if the controls are standardized, based on objective data, and, therefore, comparable with each other. The analysis of the reports following official inspections adopted by the Department of Prevention, Section Veterinary B, Turin Local Health Unit, shows a certain unevenness in the compilation of the report. This difference was observed by the operator who organized the data for statistical analysis. Periodic meetings have been held to standardize the gathering of evidence. Despite this, veterinarians use no rigid scheme to write the report, so subjectivity can create sensible differences among reports.

When comparing reports written by the same official inspector and veterinary technicians, a similar approach can be detected, which is not the case when written by other officers. Again, this difference was observed by the operator who organized the data for statistical analysis. Often, there is a tendency to give more emphasis to the non-compliant aspects while leaving out detailed information on the compliant ones. In addition, understandably, a certain subjectivity is evident in the fact that each official inspector focuses on certain aspects with more emphasis, and the officer's perception may not be necessarily shared by other colleagues. Based on the information collected and analyzed in our study, we propose a useful semi-open checklist (Table 2) with fixed parameters to be systematically verified by official inspectors, together with extra space for annotations where further notes can be reported.

## Conclusions

Given that the requirements of FBOs are comparable in both

realities, the analysis of the reports highlights specific concerns that prompted the proposal of direct supervisory interventions in the future. The dialogue between inspectors and FBOs could result in improved awareness of hazards and, consequently, better food safety. The strategy we propose is to spend more time in productive dialogue between veterinarians and operators to prevent them from engaging in improper behavior, although an approach addressed to a single FBO could not be sustainable. Therefore, it would be appropriate to organize periodic training meetings addressed to groups of FBOs. Considering the social inhomogeneity, training sessions could be organized for both FBOs and consultants in different languages (perhaps supported by the intervention of cultural mediators), in written form, or *via* the internet. Providing photographic material could be an example of practical information to be given to operators when applying for a start-up.

Training is the key point for CAs. Staff performing official controls have the right to maintain their own beliefs and professional approach, but they are also expected to adhere to instructions from above to standardize and harmonize their behavior according to criteria of fairness, consistency, transparency, and objectivity. Considering the goal of making the aforementioned official control findings more uniform, the use of a semi-open checklist is proposed. Its application, even though it might initially take longer to compile, can ensure both greater uniformity of the findings collected by CAs and a form of guarantee for FBOs, especially considering the formulation of the rating system according to Regulation 2017/625 (European Parliament and Council, 2017).

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