

OFFICIAL CONTROL OF REMOTE TRADE IN FOODSTUFFS

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ABSTRACT

With the growing global population and the food and health crises of recent decades, ensuring sufficient and safe food resources is becoming increasingly important. In the European Union, the legislation in the field of agri-food chain management provides an effective and harmonized legal framework that lays down the requirements for raw materials and products at each stage of production, processing and trade, in accordance with the „from farm to fork” concept. At the same time, the consequences of Covid 19 for the food industry and public health, as well as modern trends in digitalization in all spheres of society, have led to new challenges in ensuring safety guarantees through the introduction of remote food trade. This study investigates the development and intensity of food e-commerce in one administrative region in the country for the period 2020–2024. Results showed a total of 33 food business operators registered for remote trade in the region, with plant-origin foods representing the most frequently offered category, particularly in 2021 and 2023. Several categories like products of animal origin, plant origin, cooked meals and food supplements were offered through a variety of online channels – social media (15.15% of the distribution chain), couriers (12.12%), electronic applications (15.15%) and company’s own website being the most utilized channel (45.45%) during the investigated period. An emphasis is made on the official control procedures of such business operators, indicating the scope of sanctions imposed in case of established violations that pose a risk to product safety. The research fills a gap in empirical data on regional implementation of official controls over e-commerce in foodstuffs and provides practical insights for improving risk-based monitoring and consumer protection.

Key words: food safety; official controls; remote trade; electronic distribution; food business operators.

Introduction

Food is a basic resource that is vital for maintaining living. With the world’s population expected to exceed 10 billion by 2080 (UN, n.d.), the issue of ensuring sufficient and safe food is of critical importance. Modern societies are witnessing serious food and health crises (Thompson, 2024; Fan *et al.*, 2021), which disrupt the security of the agri-food chain and lead to threats to public health (BMC Medicine. 2023; Gizaw, 2019). In the context of the „new normal” and the consequences of the Covid 19 pandemic, food business operators have faced the challenges of quickly and reliably providing and delivering food to consumers, including operation in a digital environment (Bittisnich, 2024; Osaili *et al.*, 2023). At the same time, the diversity of participants in the food chain, supply channels and intensive trade on a global scale requires the establishment of a strict legal basis to guarantee food safety. Such framework is developed by competent organizations at international level such as WTO (World Trade Organisation) (Divljak, 2022; Afzaal *et al.*, 2019) and WOA (World Organisation for Animal Health-OIE), FAO (Food and Agriculture Organisation), WHO (World Health Organization), UNEP (United Nations Environment Programme) within the framework of the One Health Joint Plan of Action (FAO, UNEP, WHO, and WOA).

2022). In Bulgaria, as an EU member state, the regulations of the European legislation on food control (EU, 2017; EU, 2002) are directly applied. Furthermore, specific legal acts are introduced at national level for the management of the agri-food chain, registration and requirements for business operators, etc. Food legislation also covers products sold remotely via the Internet and various digital platforms, the so-called "e-commerce". The share of goods subjected to online shopping in Bulgaria recorded a growth of up to 53% in 2023 (Lone & Weltevreden, 2023), of which food appeared as a widely represented category of sustainable products for European consumers (Weltevreden, 2024). The responsibility to ensure the safety of foodstuffs supplied through e-commerce is given to the Bulgarian Food Safety Agency (BFSA) that carries out regular control on business operators registered for remote food trade.

The aim of the present study is to analyze the scope and characteristics of remote food trade in the administrative region of Pleven for the period 2020-2024 and to assess how official controls are implemented in relation to this type of activity. Specifically, the research focus aims to determine the number and profile of food business operators registered for remote trade; to identify the main food groups offered through online supply channels; to examine the distribution channels used for delivery to final consumers; and to summarize the results of official control measures applied by the competent authority. Through this analysis, the study contributes to a better understanding of emerging risks and regulatory challenges associated with digital food commerce.

Materials and Methods

For present study, official information available from the public registers of the Bulgarian Food Safety Agency (BFSA) was derived with regard to registered business operators for the production and trade of food at a distance - online trade in the territory of the Pleven administrative region. The information was obtained for the period 2020-2024. Data were subsequently aggregated at regional level and did not include personal identifiers or commercially sensitive details, thus observing ethical considerations. Aggregated data were further manually coded with numerical values in order to protect any personal data and ensure anonymity and confidentiality of individual operators throughout the research process. The coded operators were grouped based on the main categories of food and beverages offered by them, as per the definitions of § 1, item 4 of the Food Law (MAF, 2020) according to their origin and composition. The information derived from the BFSA public register included only food business operators with active registration status during the reference period. Operators with suspended, terminated or withdrawn registrations were not included in the analysis.

All obtained and summarized data were subjected to statistical processing with specialized software (IBM SPSS-Inc., 2019, SPSS Reference Guide 26 SPSS, Chicago, USA). Frequency distribution and chi-square analysis were performed. The chi-square test was selected because the analyzed variables – type of business operator and category of foodstuffs traded – are categorical in nature, making this method appropriate for assessing associations between them. Although several categories involved small sample sizes, the method was selected as an acceptable tool for the current exploratory research, where the objective is to identify general tendencies rather than to draw definitive conclusions.

The obtained values were considered significant at $p < 0.05$. Visually, the results were presented in diagrams in Excel (Windows 10).

Results

The study of relevant legislation in the field of food provides a categorical definition of „*remote food trade*” by defining it as the activity of „*offering and distributing food through means of distance communication - website, social media, telephone number, postal address, e-mail, etc., between food business operators or between a business operator and an end consumer, where the receipt of food can be carried out by direct delivery via postal, courier service or with the business operator’s or service provider’s own transport or by delivery to a place specified by the recipient*” (MAF, 2021).

Data from the public register showed that a total of 33 business operators in the territory of Pleven region were registered for distance food trade in the period 2020-2024, with their relative distribution by year being presented on Fig. 1.

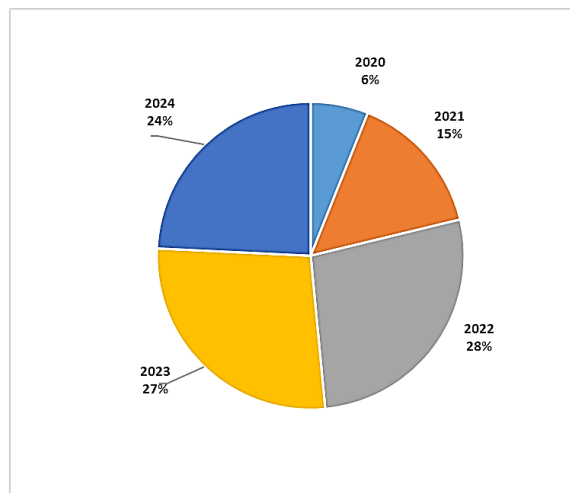


Figure 1: Distribution of registered distance food trade operators in Plevan region for the period 2020-2024

The wide range of products offered in e-commerce was summarized in 5 main categories: foodstuffs of animal origin (mainly meat and dairy products), foodstuffs of plant origin (cereals, fruits and vegetables in fresh and canned form and juices, cocoa, tea, coffee, etc.), foodstuffs prepared on site or fast food (sandwiches, salads, baked goods, confectionery, cooked meals), food supplements and combined goods, uniting several of the aforementioned groups. The frequency distribution of these foods in their remote offering to consumers is presented on Fig. 2. The majority of remotely traded products of plant origin had the largest share as an object of distance trading in 2021 and 2023.

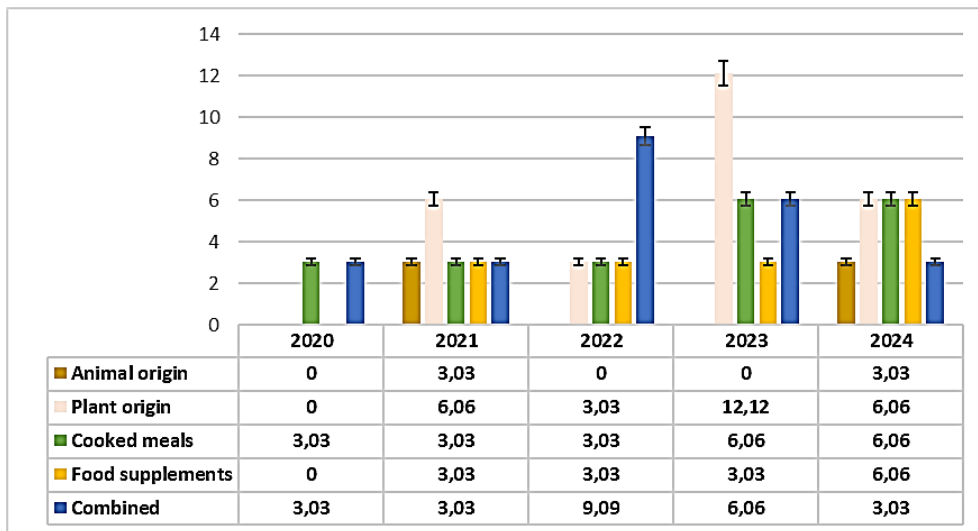


Figure 2: Dynamics of the main food groups subject to distance trading in 2020-2024 in Pleven region, in %

The main online channels used for the distance food trade are presented on Fig. 3. The registered business operators used several main mechanisms, among which their own website was the most preferred form for the entire period studied, followed by mobile applications (e.g. Takeaway) and social media (mainly Facebook). In 2022, 2023 and 2024, the business operators also resorted to the services of courier companies for logistics as a form of supply and delivery of products. The least used channel turned out to be e-mail.

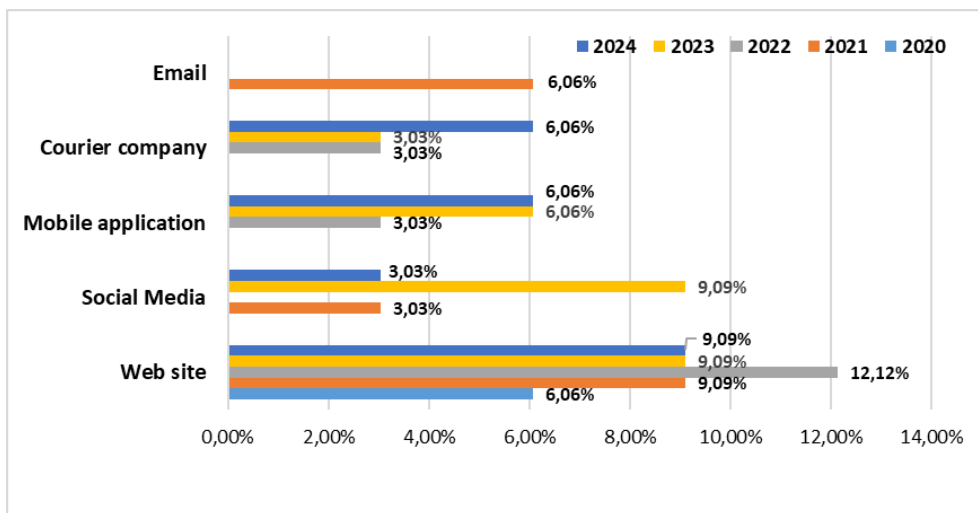


Figure 3: Main distribution channels used by business operators in the remote food trade, 2020-2024

A more detailed analysis of the registered business operators in the area for the study period showed that they could mainly be categorized as producers (e.g. slaughterhouse, dairy and vinegar

production), food/meal preparation and catering establishments, and wholesalers and retailers (Table 1).

Table 1: Distribution of business operator groups in relation to the food they offer for distance selling.

Business operators	Food group					Total	Chi-square
	Animal origin	Plant origin	Prepared on site	Food supplements	Combined		
Producers	40.0%	20.0%	0.0%	20.0%	20.0%	100.0%	χ^2 =28.741; df=8 p<0.05
Public meal catering	0.0%	38.5%	53.8%	0.0%	7.7%	100.0%	
Trade	0.0%	33.3%	0.0%	26.7%	40.0%	100.0%	

Producers registered for distance selling were mainly focused on foods of animal origin – 40%. For operators in catering establishments, the largest share took the prepared foods on site (53.8%) and plant-based foods, which reflected the specific activity of restaurants, canteens and other establishments with an emphasis on freshly prepared food. For wholesalers and retailers, the groups of combined foods (40%) and supplements (26.7%) took high shares, which is typical for warehouses, shops and chains.

A statistically significant relationship was established between the type of business operator and the food group it offered, related to the clearly expressed nutritional profile considering the functions and needs of the operator ($p < 0.05$). Chi-square analysis among the listed categories indicated that the statistical significance was mainly driven by three distinct patterns: the predominance of animal-origin foods among producers, the high proportion of prepared foods within catering establishments, and the concentration of combined goods and food supplements among retail traders. These differences reflected the functional specialization of each operator category and confirm that online product portfolios were closely aligned with the core activities of the respective businesses.

Discussion

Ensuring food safety and wholesomeness is a key policy priority in the European Union and is guaranteed by the existing legal framework based on a package of regulations known as the „Hygiene Package” (European Commission, 2004a, 2004b). The regulatory provisions cover all stages of the food chain – from primary production, through processing, to the placing of food products on the market for final consumers.

According to Regulation (EC) No 178/2002, which introduces the principles of the Common Food Safety Policy in the EU, the primary responsibility for food safety is assigned to food business operators. They are obliged to ensure that the products they offer comply with all applicable hygiene, traceability and safety requirements (European Parliament & Council, 2002).

The principle of responsibility can only function effectively if there is efficient state control to ensure compliance with regulatory requirements. In this context, operators must maintain complete and accessible documentation, including information on critical control points, self-control procedures and traceability systems (Dudeja & Singh, 2017). Access to this information is essential for the performance of official controls by the competent authorities, as well as for timely action to be taken when deviations are detected (FAO, n.d.; Mania *et al.*, 2018).

The organisation of official food controls in the Member States of the European Union varies considerably due to historical, administrative and cultural differences. There are both centralised models, where controls are carried out by a single national agency – and decentralised systems, where controls are distributed between regional or local authorities (Rossi *et al.*, 2020).

Centralized models are characterized by a higher degree of coordination and unification of procedures, while decentralized ones offer greater flexibility and adaptation to local conditions. However, this structural heterogeneity creates challenges for harmonization and effective exchange of information between countries regarding food safety control (Barnes *et al.*, 2024; Abels & Kobusch, 2010).

For Bulgaria, the competent authority for the management and control of the food chain is the Bulgarian Food Safety Agency (BFSA), which operates under the centralized model. With regard to the implementation of official controls in distance food trade, the BFSA applies the requirements for registration of operators under the Food Law (MAF, 2020) and the specific norms under the Ordinance No. 21/ 18.11.2021 (MAF, 2021). The share of operators registered with the RFSD (Regional Food Safety Directorate) for distance trade with foodstuffs (including online traders) that are subjected to official control annually have to be 5%.

During the official control, documents proving the origin and safety of the food are checked, as well as compliance with temperature conditions for storage and delivery of food to the final consumers. In public catering establishments, additional checks are carried out on the thermal processing of food, personnel hygiene and disinfectants used (Tóth *et al.*, 2024; Garayoa *et al.*, 2017). If non-compliances are identified (Hartantyo *et al.*, 2023), administrative measures are taken, including prescriptions, orders to direct food for destruction or suspension of activity (Kettunen *et al.*, 2018). For 2024, after official checks of the food business operators registered for remote trade in Pleven region a total of 6 acts for administrative violations with effective penal decrees were drawn up and delivered, and one of the facilities subject to official control ended with terminated registration due to illegally carrying out activities outside the scope of the Food Act.

Given the increasing growth of food trade through online channels in many European countries (Weltevreden, 2024), a trend towards modernizing trade practices is emerging as part of a broader transformation in consumer behavior and digitalization in food supply chains (Alcedo *et al.*, 2022; Sgarbossa *et al.*, 2022). To a large extent, this change is due to the New Normal as a consequence of Covid 19 and the establishment of e-channel shopping habits by consumers for safety reasons (Latip *et al.*, 2021).

The present study showed that among the registered remote operating food business entities, the group of producers mainly offers food of animal origin, which is expected given the specifics of the production process. At the same time, the development of the food sector also marked the possibility of direct deliveries of primary production from farmers to the end consumer (Micheli *et al.*, 2019). These results coincide with the observations of Dorneich *et al.* (2024), who emphasize that producers in agriculture and the food industry more often maintain traditional product lines and support local food systems with established and familiar taste qualities – in this case meat and dairy products. Similar are the results of a previous study of online food trade after the Covid epidemic in Bulgaria, which found that dairy and meat products were the main focus among the products of animal origin (Balieva, 2023). Since this type of online sales of products of animal origin represents a serious challenge for the competent authorities and public health, Di Carlantonio *et al.* (2024) propose that official control of such operators should be carried out in two stages: by examining the

website of the trader-producer, as well as by physically checking on-site at the address registered for the online food business.

Catering establishments offering deliveries to consumers through e-channels, on the other hand, rely mainly on prepared foods and plant-based products – a result that confirms data from research by Hillier-Brown *et al.* (2017), according to which catering establishments adapt their menus regarding the demand for healthier and freshly prepared food, especially for online deliveries (Han, 2024). This group also includes baked goods and confectionery offered for remote sale by business operators, which is in line with the results of the demand for delicacies and confectionery products by online consumers in the last few years in Bulgaria (Balieva, 2023).

Wholesalers and retailers in the online food supply chain in this study mainly focus their scope of activity on combined goods and food supplements. This is in line with the analysis of Nakano (2023) and Gupta *et al.* (2023), that indicates that in online commerce, retailers often combine product categories to satisfy a wide range of consumer needs and optimize logistics processes.

Regarding the supply channels for remote trade in foodstuffs, the most commonly used forms of commerce appear to be business websites, followed by mobile applications and social networks. Similar trends are reported by Fernandez & Raine (2021), who emphasizes the importance of digital infrastructure and consumer trust in online food purchases. The rare use of email and traditional means (such as telephone) can be interpreted as a desire for more interactive and visually appealing platforms. In general, all e-channels used by the surveyed business operators in distance food trade in this study fall within the scope of the EU-defined tools for online food sales EC-SANTE (2018): *own website of producer, trader (intermediary) or retailer's website and online platforms while retailers and individuals without a website may sell their products via sales platforms or social media networks*. Additionally, the strong development in the digital environment of mobile devices with wireless technologies has accelerated the implementation and use of online food ordering and delivery applications (Hatim *et al.*, 2019).

The present study has several limitations that should be acknowledged. First, the analysis is based on a relatively small sample size of 33 registered operators, which restricts the possibility for broader generalization. Second, the research focuses on only one administrative region of Bulgaria, and therefore regional differences within the country were not explored. Third, the study relies exclusively on publicly available register data and does not include information from on-site inspections or consumer surveys. Despite these limitations, the results provide an initial empirical overview of remote food trade and official control practices at regional level.

Further research could expand the analysis by comparing multiple administrative regions in order to identify geographical, demographic, economic differences in online food trade. Additional studies investigating consumer behavior, risk perception and satisfaction with remote food delivery would provide valuable findings and insights on development of food e-commerce. Risk-based assessments of specific food categories traded online, particularly highly perishable products, would also contribute to more targeted and effective official control strategies.

Conclusion

The analysis of remote food trade in the Pleven region for the period 2020–2024 highlights the growing diversification and specialization among food business operators engaging in e-commerce. The regulatory framework provides a clear definition and structured approach to distance trade of food, ensuring compliance and consumer protection. The study reveals that foodstuffs of

plant origin dominate the online market, particularly in 2021 and 2023, while business operators tend to select product categories that align closely with their core activities and operational functions. Producers focus primarily on animal-based products, catering establishments emphasize freshly prepared and plant-based foods, and retail businesses offer a wide range of combined goods and supplements. The preference for self-managed websites and mobile applications, alongside the use of courier services, reflects evolving digital strategies within the food sector. These findings support the need for enhanced digital monitoring tools, improved data exchange mechanisms and harmonized control procedures for remote food trade in order to strengthen consumer protection and food safety in the rapidly expanding e-commerce environment.

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