



FOOD FRAUD AND ITS IMPACT ON POPULATION HEALTH: THE CASE OF ROMANIA

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Abstract: Food fraud affects public health, food safety, and consumer trust through toxicological, microbiological, allergenic, and nutritional risks. This study highlights vulnerable food categories and emphasizes the importance of traceability, advanced detection methods, and risk-based controls for improving food authenticity and safety.

• Introduction

Food fraud is a major challenge for food safety and public health, involving practices such as adulteration, substitution, and false labeling for economic gain. Products such as honey, dairy, meat, fish, oils, spices, and premium beverages are particularly vulnerable. Therefore, effective traceability systems and advanced detection methods are essential for protecting consumers and ensuring food authenticity.



• Material and method

The study was conducted as an integrative literature review combined with a case study focused on Romania. Scientific articles and official reports published between 2007 and 2025 were collected from databases including Web of Science, Scopus, PubMed, ScienceDirect, and Google Scholar using keywords related to food fraud, adulteration, authenticity, and traceability.

The analysis focused on the main types of food fraud (dilution, substitution, false labeling, and documentary fraud), their impact on public health, vulnerable food categories, and modern authentication and traceability methods. Official documents from the European Commission, WHO, FAO, and ANSVSA were also included

• Results and discussions

Food fraud affects public health through toxicological, allergenic, microbiological, and nutritional risks. Products with high commercial value and complex supply chains, such as honey, dairy products, meat, fish, spices, oils, coffee, and premium beverages, are particularly vulnerable to adulteration, substitution, and false labeling. Advanced analytical methods, digital traceability, and risk-based official controls are essential for improving food authenticity, consumer protection, and market transparency. In addition, strengthening fraud detection strategies and harmonizing regulatory frameworks can significantly enhance food safety systems and increase consumer confidence in global food markets.

Food category	Common fraud practices	Potential public health impact	Common analytical methods
1 Honey	Addition of sugar syrups; false origin	Reduced authenticity; undeclared additives	IRMS, LC-MS, isotopic profiling
2 Dairy products	Dilution; fat substitution	Reduced nutritional quality; toxicological risk	FTIR, HPLC, compositional analysis
3 Meat and fish	Species substitution	Allergens; microbiological hazards	PCR, DNA barcoding, qPCR
4 Spices and herbs	Addition of undeclared plant material	Exposure to contaminants and allergens	FTIR, Raman spectroscopy, microscopy
5 Oils, coffee, beverages	False origin; undeclared mixtures	Consumer deception; authenticity loss	GC-MS, NIR, isotopic analysis

• Conclusions

Food fraud represents a significant challenge for food safety, public health, and consumer trust. Strengthening laboratory authentication methods, digital traceability systems, and cooperation between authorities, laboratories, and food operators is essential for reducing fraud risks and protecting consumers.