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## SAFETY AND QUALITY OF FOOD ON THE POLISH MARKET AFTER EUROPEAN UNION ACCESSION

Key words: food safety, food quality, food falsification

**ABSTRACT.** The aim of this study is to investigate how the level of food safety and quality in Poland has changed after European Union accession. Poland's accession to EU structures resulted in a number of economic, market and environmental changes. One of the most important areas of these changes is the food production and consumer supply sector. The conducted research is based on the results of controls performed by the main food control institutions in Poland. Research covers the areas of food quality and scale of irregularities revealed by control institutions, leading to changes in the level of food safety in terms of the health threats and economic security of consumers resulting from food falsification. Studies have shown that in the post-accession period, significant and multidirectional changes in the above-mentioned scope have taken place. Despite the proven presence of food with improper sanitary conditions, the Polish consumer is unlikely to be concerned about this. The situation is much worse in terms of economic security and food quality. The scale of irregularities in this respect is significant, and as the last years of the analyzed period show (after 2015), the phenomenon of decreasing food quality and even food falsification is growing.

### INTRODUCTION

Consequences of globalization – defined in literature and practice in many different ways – are visible in the economy as well as in social structures, politics or culture. They do not omit any human activity because, essentially, they connect a local event with an event elsewhere in the world [Giddens 1990]. These effects also have an impact on agribusiness and food.

Globalization has its positive and negative consequences. On the one hand, consumers are free from the problem of seasonality of supply of various food products, on the other hand, they are inevitably and permanently exposed to contact with products produced in very different systems and production, quality and sanitary regimes. The European Union (EU) treats issues related to food quality and safety with great importance. This area is covered by a significant part of the *acquis communautaire*. However, this does not mean that EU consumers, including Polish ones, are not exposed to the purchase of food that poses a threat to health and/or life, or adulterated food, thus negatively affecting their economic interest.

Recent decades have been characterized by a massive increase of food incidents, prompting the formulation of the so-called second wave theory. It is called second after the first wave of frauds that took place in the mid-nineteenth century. What is characteristic of the present wave is its place of occurrence. They are both poor, developing countries, which may be considered natural, but also the richest countries and regions, such as Europe, North America or Oceania [Kowalczyk 2016]. So, they are countries that have developed efficient food control systems counteracting falsification.

As a result of these processes, the scale of irregularities in the field of food quality and safety is currently enormous. In relation to EU countries, this has been demonstrated by the so-called horsemeat scandal, which took place in 2013. Controls conducted by the European Commission for the first time in the history of the EEC/EU on products declared as beef, revealed their adulteration in 22 out of 27 Member States, and also in two countries that voluntarily joined the programme (Switzerland and Norway), i.e. in 24 out of 29 countries participating in the study [Kowalczyk 2015].

The results of the 2013 EU audit were a direct impulse for the creation of a monitoring system and counteracting food falsification in the EU. Conceptual work related to the construction of the system called Administrative Assistance and Cooperation (AAC) began in March 2013. The AAC system has been operational since November 2015. It complements the fight against food fraud within the RASFF system – the Rapid Alert System for Food and Feed, responsible for food safety in the EU. Thus, a comprehensive system accountable for food safety in the EU was created consisting of two parts: RASFF – responsible for health security and AAC – responsible for economic security, that is combating food fraud. Ultimately, both systems will be integrated [EC 2018]. In 2018, 234 potential cases of food fraud were reported by Member States to the AAC system, compared to 157 cases in 2016 [EC 2019, p. 7]. The scale of food irregularities is also evidenced by, issued since September 2016, the Monthly Summary of Articles on Food Fraud and Adulteration. Each issue contains 10-15 cases of significant food adulterations identified by the Joint Research Centre based on media monitoring. In the first half of 2019, a total number of 75 cases of food fraud were identified in the EU [EC 2019].

Considering the above phenomena and their impact on the Polish food market, the aim of this study is to examine how the level of food safety and quality in Poland changed after EU accession. Research focuses on food quality and the scale of irregularities revealed by institutions of official food control, leading to changes in the level of food safety in terms of health threats and the economic security of consumers in the result of food falsification.

## MATERIAL AND RESEARCH METHODS

Food safety and quality are closely related concepts, but defined differently in the subject literature and legal regulations. According to EU law, official controls concern food, its safety, integrity, health values and the protection of consumer interests at every stage of food production, processing and distribution [Regulation 2017/625, Art. 1, point 2 (a)]. Therefore, they refer to both food safety, nutritional values and consumer interests. In turn, according to Regulation 178/2002, the EU food law aims to protect consumer interests

against fraudulent practices, food fraud and any practices that could mislead consumers [Regulation 178/2002, Art. 8]. Food safety, therefore, refers to threats resulting from the contamination and poisoning of food, hence health safety, as well as the consequences of food fraud, in particular food falsification, i.e. the economic security of food.

Health safety is determined by the so-called health and sanitary status of food. In the past, there was a definition of food health quality in Polish law. It was included in the Act on Health Conditions of Food and Nutrition, however, it was repealed in 2006 by the Act on Food Safety and Nutrition. This category is still used by the State Sanitary Inspectorate (PIS). Nowadays, however, this area of food-related issues is encompassed by food health safety.

Food quality, in this paper, is analyzed according to the concept of so-called commercial quality, comprising such elements as: (i) organoleptic characteristics of the food product, (ii) its physicochemical properties and (iii) labeling [Commercial Quality Act 2000].

The study was based on the actual results of controls conducted by institutions performing official food oversight. The analysis covered the state of health and economic security (scale of irregularities and adulterations) of food on the domestic market. In order to assess the state of health safety, the results from PIS and the European Food Safety Authority (EFSA) were applied, while quality and economic security assessment was performed based on the results of inspections carried out by the Agricultural and Food Quality Inspection (IJHARS) and the Trade Inspection, Office of Competition and Consumer Protection (IH/UOKiK).

To assess food health safety, PIS takes, on average 70-80 thousand food samples per year and controls the sanitary condition of 70-90 thousand food production plants (data for 2010-2017). IJHARS, in the years 2005-2018, carried out from 9 thousand to 35 thousand food controls, while IH/UOKiK, at that time, performed from 6 thousand to 9 thousand food controls annually (own calculations based on the reports of controlling institutions). Combined, IJHARS and IH/UOKiK annually collected from 8 thousand to 12 thousand food samples for laboratory tests. Thus, in total, about 80-90 thousand samples are collected annually to study the state of food safety and quality. Hence, it is currently the largest database on quality and food safety controls in Poland. The results obtained on its basis are the most representative for the food market in Poland.

The study analyzed the results of food controls performed by the above-mentioned institution in the adopted scope. Then, they were compared with the value of food on the Polish market in order to estimate the scale of food with an unsatisfactory level of health safety and inadequate quality. The basic statistical data used in the study concern the period after Poland's accession to the EU.

## RESULTS

## HEALTH SAFETY

The first, preliminary element of food safety is the sanitary state of the plants and food companies in which the production, storage and trade of food take place. This largely determines the safety of food itself. In recent years, a radical, positive change in this area in Poland is observed (Figure 1). In the period immediately preceding accession, objections to the sanitary conditions and conditions of food production and marketing were reported in the case of 14.5% of companies, i.e., more than every seventh company in the food industry. In the first year of Poland's membership in the EU (2004), in the case of 8.6% of companies since 2006, objections have concerned around 2.0% of companies, whereas from 2011 it has dropped below 2.0%, which is only one in fifty companies. The worst situation is currently in bakeries (3.5% of companies in the industry have improper sanitary conditions), milling industry plants (3.1%), food stores (2.7%) and confectioneries (2.5%). The biggest improvement occurred in vinegar, mayonnaise and mustard factories (a drop from 4.2% to 0% in 2016–2017), in milling industry plants (from 4.8% to 3.1%) and breweries and malt plants (from 1.3 % to 0%) [PIS 2018].

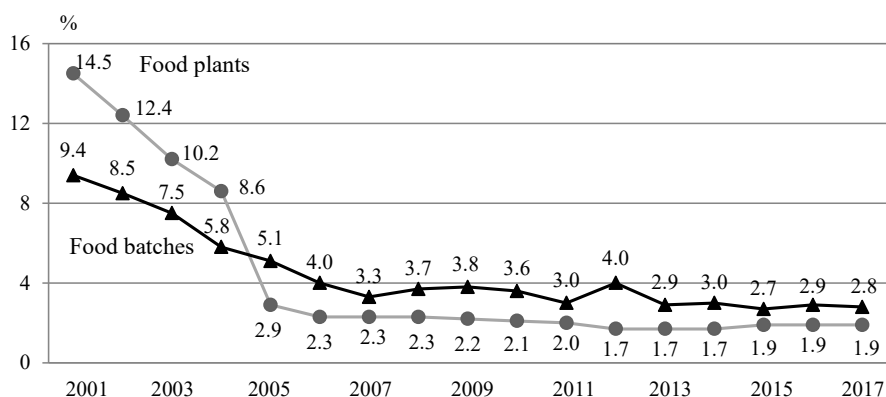


Figure 1. Share of food batches with improper health quality as well as food and nutrition plants with sanitary conditions not in line with requirements in 2001-2017

Source: own study based on the results of the PIS audit in 2001-2017

The second element of food safety is related to the level of pesticide residue in food production, mainly in primary production (raw materials of plant and animal origin). The presence of these substances in ingredients used for food production translates into their inevitable transfer to the final product, which is foodstuff. The average share of food samples exceeding Maximum Residue Level (MRL) in the European Economic Area (EEA) in 2017 amounted to 2.6% (2.4% in 2016) [EFSA 2019]. Ten countries were at an EU or above average level, including, among others, Cyprus (5.7), Greece (4.4), France

(4.1) and Poland (3.6). The share of samples with a legal permissible pesticide residue level averaged 40.8% in 2017 (43.9% in 2016). Samples from seven countries crossed this level, but were still at an acceptable MRL level. They included, among others, Belgium (62.9), Spain (54.3), Portugal (50.8) and the Netherlands (50.3). In Poland, the share of such samples equaled 36.6%.

As a result of the above situation, in many countries, the share of food without pesticide residue is at a level of 35.0-50.0% of total lots, including: in Belgium – 33.9%, Spain – 43.4%, Portugal – 45.3%, the Netherlands – 46.5% and Germany – 50.2%. The most favorable situation is observed in: Finland, where the share of food without pesticide residue is – 85.5%, in Iceland – 85.0% and Estonia – 82.1%.

In Poland, the share of food samples free of pesticide residue in 2017 was 59.8% (52.5% in 2016). However, in 2013, it was as much as 70.6%. So, although the situation has improved in the last period, compared to the situation from five or six ago, Poland still requires a lot of work.

The third element of health safety is to examine food to determine its sanitary condition. After Poland's accession to the EU, the situation, in this regard, has improved significantly. While in 2001, the health condition of food on the Polish market was questioned in the case of 9.4% of the samples tested (in 2000, it was even 10.6% i.e., more than every tenth sample), in the year of EU accession (2004), it amounted to 5.8%, while in 2006-2012 this level ranged from 3.0% to 4.0% of samples. Since 2013, it has been below 3% (Figure 1).

In the case of some food assortment groups, however, the level of food consignments with an incorrect health status is higher. This most often applies to such articles as: milk and milk products (7.2% of consignments with incorrect health quality in 2017), sugar (5.3%), dietary supplements (6.3%), salt (78%), poultry and processed products (3.2%) and mineral water (4.2%) [PIS 2018].

Summing up, it can be concluded, on the basis of the conducted research, that food safety on the Polish market after EU accession has improved significantly. This applies to both the sanitary state of food plants and food itself. A less favorable image only concerns the scale of pesticide residue in food. In this respect, the situation has deteriorated, especially after 2010. It is difficult to clearly determine the reasons for such a state, it is only necessary to express the hope that this is a transitional situation.

## QUALITY AND ECONOMIC SAFETY OF FOOD

In the scope studied here, the situation on the Polish market after accession is very diverse. This is illustrated both by the results of IJHARS control (Figure 2) and by IH/UOKiK (Figure 3). The most favorable situation is definitely in the area of organoleptic properties of food. If, immediately after EU accession, the level of irregularities in this regard amounted to 7.9%, in subsequent years of the discussed period, it decreased to an average level of 1.5% (Figure 2). A slight deterioration was only recorded in 2017-2018 (2.0-2.5%). This means that, in this respect, only every 50-60 food batch was questioned (in 2005 – every 12th).

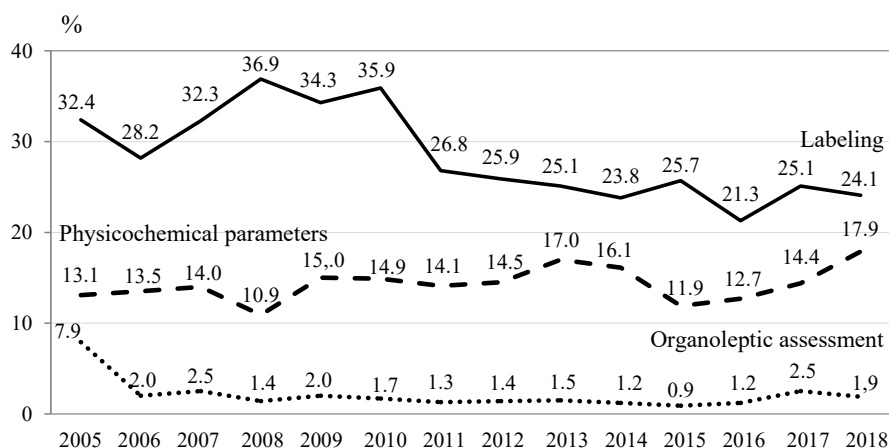


Figure 2. The share of food batches inspected by IJHARS with identified irregularities, by individual quality control areas in 2005-2018

Source: own study based on results of the IJHARS audit in 2005-2018

When looking at laboratory tests of physicochemical parameters of food, which is the essence of quality assessment, the situation is much less favorable. In the years 2005–2018, IJHARS usually questioned from 13.0 to 17.0% of controlled batches. In 2018, it was almost 18.0 %. In turn, according to the IH/UOKiK control, improvement took place after 2010 and inappropriate physicochemical parameters concerned about 11.0-13.0% of food batches, in the period immediately after accession – around 20.0% of batches. In the entire analyzed period, an average of about 15.0% of food batches had incorrect physicochemical parameters. However, the situation regarding food labeling was and still is definitely the worst.

In the analyzed period, the share of incorrectly labeled food ranged from 21.3% in 2016 to 36.9% in 2008, according to IJHARS controls, and from 9.2% in 2008 to 25.1% in 2015 in the case of IH/UOKiK controls. Taking into account the results of both control institutions and the number of controls carried out by them, this means that, in the analyzed period, on the Polish market, there was, on average, 20.0-25.0% improperly labelled batches on the market.

Differences in the results of quality and food safety controls that occur between IJHARS and IH/UOKiK are mainly a consequence of the place (stage) in the food chain. IJHARS controls food production companies and so, in the first place, it controls processed products, in unit packaging, functioning in long supply chains. In turn, IH/UOKiK controls distribution and trade channels, mainly bulk products (in 2017, they accounted for 45.0% of all lots inspected by IH/UOKiK), without unit packaging, intended for quick delivery to the final consumer.



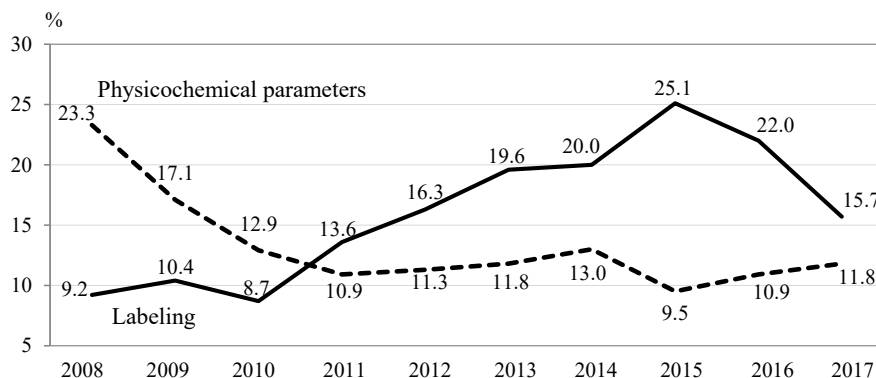


Figure 3. The share of food batches inspected by IJHARS with identified irregularities, by individual quality control areas in 2008-2017

Source: own study based on the results of the IJHARS audit in 2008-2017

A detailed analysis of the results of individual official controls indicates that the irregularities found can be classified into two main groups: intended and unintended. In the case of physicochemical parameter assessment, intentional irregularities most often consist of a replacement of higher quality ingredients (raw materials) with lower quality components in order to obtain economic benefits. Unintended irregularities are usually a result of errors and technological and production defects in the food production process. In terms of labeling, deliberate irregularities are usually a consequence of the desire to hide the actual composition of the foodstuff and mislead the consumer, while unintentional ones are an effect, for example, of ignorance of the current provisions on foodstuff labeling.

Controlling institutions state that in the case of physicochemical parameters, intended irregularities constitute about 60-70% of all irregularities, while food labeling anomalies – 70-80% (the author, in this respect, is basing mainly on the analysis of controls carried out by IJHARS). Therefore, if the results of food controls regarding food safety and quality, conducted in the analyzed period by IJHARS and IH/UOKiK, are weighed by the number of controls by each institution, the average share of adulterated food on the Polish market during these years equaled 8.5-10.0% in the field of adulteration of physicochemical parameters (the composition of the food product) and within 15.1-17.3% in the area of labeling.

In general, this means that the situation in terms of quality and economic safety of food on the Polish market is much worse than in the area of health safety. On average, every seventh/eighth batch of food has a composition that does not correspond to the producer's declaration, and every fifth batch is incorrectly labeled. Carefully estimating, at least 10.0-15.0% of all lots are falsified, either due to composition or labeling.



## FOOD OF IMPROPER QUALITY AND SAFETY ON THE POLISH MARKET

Official control results, in relation to the value of food on the market, enable the assessment of the scale of existing irregularities (Table 1). Referring to the results of PIS controls to the value of food on the market (precisely including the sales value of food and beverages) in the years 2006-2018, it can be stated that, on average, the food found to be in improper sanitary conditions was worth from PLN 4.0 to 6.0 billion. This food should not be placed on the market, as it poses a threat to the health and lives of consumers.

Table 1. Value of food sales in total\* and food with improper health and commercial quality in Poland in 2006-2018

Specification	Value of food sales [mln PLN]						
	2006	2008	2010	2012	2014	2016	2018
The value of sold production	126,435	147,003	158,945	198,168	200,398	215,124	247,249
Inappropriate health quality**	5,100	5,400	5,700	7,900	6,000	6,200	6,900
Inappropriate commercial quality ***	17,100	23,900	22,400	25,300	29,600	26,600	44,300
Incorrect labeling	35,700	36,700	39,200	41,000	44,400	46,100	59,600

\* The value of sales of food and beverages. Foreign trade in food and sales in gastronomy are not included

\*\* Estimation based on the results of the PIS audit

\*\*\* Applies to physicochemical parameters of food and drinks that do not comply with the manufacturer's declaration. The value of food with improper commercial quality (improper physicochemical parameters) and improper labeling do not add up. Estimation based on IJHARS and IH controls. For 2006 and 2018, estimates based solely on IJHARS controls

Source: own calculations based on the results of control institutions and GUS data

Food with improper quality parameters<sup>1</sup> and food which is badly labeled is much more common than food that does not comply with sanitary standards, which generally misleads consumers when making decision to buy such a product. The value of food with incorrect parameters in the analyzed period amounted to PLN 25.0-30.0 billion, on average, and incorrectly labeled – PLN 35.0-45.0 billion. Since a significant part of controlled food batches show irregularities both in terms of ingredients (physicochemical parameters) and labeling, and assuming that this applies, on average, to every second batch of food in the analyzed period, food with abnormal commercial quality or even falsified was worth PLN 30.0-35.0 billion. It is worth noting that while in the first period after EU accession (in 2005-2012) the situation in terms of food safety and quality was slowly but steadily

<sup>1</sup> In Table 1, this category has been defined as “inadequate commercial quality”, which is not completely correct because the product's labeling in accordance with Polish legislation also constitutes an element of food quality.

improving, in the subsequent period (after 2012) these positive trends slowed down, and even deteriorated in relation to food quality parameters. The main reasons for that are crisis market conditions, the progressive globalization of supply chains, but also, despite numerous weaknesses, the increased effectiveness of control services.

## CONCLUSIONS

The conducted research confirmed significant changes in the field of food safety and quality, which have taken place on the Polish market after EU accession. At the same time, these changes have shown that the evolution of processes and phenomena is not always beneficial to the Polish consumer. Despite the proven presence of food with improper sanitary conditions, the Polish consumer is unlikely to be concerned about this. The situation is much worse in terms of economic security and food quality. The scale of irregularities in this respect is significant, and as the last years of the analyzed period show (after 2015), the phenomenon of decreasing food quality and food falsification is growing. This area, therefore, requires constant research, especially since it is particularly sensitive to the safety of consumers and their economic interests.

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## BEZPIECZEŃSTWO I JAKOŚĆ ŻYWNOSCI NA RYNKU POLSKIM PO AKCESJI DO UNII EUROPEJSKIEJ

Słowa kluczowe: bezpieczeństwo żywności, jakość żywności, fałszowanie żywności

### ABSTRAKT

Celem opracowania jest zbadanie, jak zmieniał się poziom bezpieczeństwa i jakości żywności w Polsce po akcesji do Unii Europejskiej. Akcesja Polski do UE wprowadziła wiele zmian gospodarczych, rynkowych oraz środowiskowych. Jednym z bardziej istotnych obszarów tych zmian jest sektor produkcji żywności oraz zaopatrzenia konsumentów. W badaniach wykorzystano wyniki kontroli głównych instytucji urzędowej kontroli żywności w Polsce. Podstawowym obszarem badawczym były kategoria jakości żywności oraz skala nieprawidłowości ujawnionych przez instytucje kontrolne, prowadzących do zmian poziomu bezpieczeństwa żywności w zakresie zagrożeń zdrowotnych oraz bezpieczeństwa ekonomicznego konsumentów w następstwie fałszowania żywności. Badania wykazały, że po akcesji Polski do UE następowały i w dalszym ciągu następują znaczne i wielokierunkowe zmiany w powyższym zakresie. Jednocześnie wykazały, że ewolucja zachodzących procesów i zjawisk nie zawsze była i jest korzystna dla polskiego konsumenta. Pomimo wykazanej obecności żywności o niewłaściwym stanie sanitarnym, polski konsument nie ma powodów do obaw w tym zakresie. Zdecydowanie gorsza sytuacja istnieje w zakresie bezpieczeństwa ekonomicznego i jakości handlowej żywności. Skala nieprawidłowości w tym zakresie jest znacząca, a jak wykazują dane, po 2015 roku powiększa się zakres zjawiska zaniżania jakości żywności oraz jej fałszowania.

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