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THE PHENOMENON OF FOOD TERRORISM – A CONTEMPORARY CHALLENGE FOR ENSURING GLOBAL FOOD SECURITY®

Zjawisko terroryzmu żywnościowego współczesnym wyzwaniem dla
 zapewnienia bezpieczeństwa żywnościowego na świecie®

Key words: food terrorism, food security, food industry.

The aim of this article is to discuss the phenomenon of food terrorism along with identifying threat factors and determining the potential consequences of its occurrence. Food terrorism is a new phenomenon which poses a challenge for the food industry in the 21st century. It consists in intentional contamination of food using biological, chemical and physical substances. Intentional food contamination may occur at any stage of food production. In order to achieve the goal, a literature study was conducted, on the basis of which it was stated that the issue of food terrorism is a new phenomenon in the economy, while the methods used by terrorists and the potential consequences of the threat are not fully known.

INTRODUCTION

Food is the primary source for human beings to satisfy their hunger by providing them with energy and taste sensations. Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 states that food „*is any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans*” [6].

The second half of the twentieth century and the beginning of the twenty-first century brought a new security threat to humanity. The world has faced a new challenge – terrorism [8]. The primary intention of terrorists is to intimidate the public and create feelings of terror and panic. One of the tools that terrorist organisations can use is food. For any country, the food sector and its production are important challenges for both the local and the global economy.

The development of terrorism is favoured by such factors as: globalisation, freedom of movement (of people and goods), lack of stability in many countries (both political and economic) e.g. Middle Eastern countries, religious conflicts [11].

Słowa kluczowe: terroryzm żywnościowy, bezpieczeństwo żywnościowe, przemysł spożywczy.

Celem artykułu jest omówienie zjawiska terroryzmu żywnościowego wraz ze wskazaniem czynników zagrożenia oraz określeniem potencjalnych skutków jego wystąpienia. Terroryzm żywnościowy to nowe zjawisko, które w XXI wieku stanowi wyzwanie dla przemysłu spożywczego. Polega na celowym skażeniu żywności przy wykorzystaniu substancji biologicznych, chemicznych i fizycznych. Na każdym etapie produkcji żywności może dojść do intencjonalnego skażenia żywności. Do zrealizowania celu przeprowadzono studium literaturowe, w oparciu o które stwierdzono, że zagrożenie terroryzmu żywnościowego jest zjawiskiem nowym w gospodarce, zaś metody wykorzystywane przez terrorystów oraz potencjalne skutki zagrożenia nie są do końca znane.

The above-mentioned factors result in food increasingly becoming an object of terrorism. Therefore, highly developed countries in recent decades have faced a new threat to food security – food terrorism.

Food terrorism can be defined as the deliberate contamination or pollution of food (or foodstuffs) using agents such as biological, chemical and radioactive [3].

Despite the events of 11 September 2001, not all people take into account the fact that they could be victims of an act of terrorism, including food terrorism. Food terrorism can occur at any stage of the food chain. Therefore, in May 2002, the World Health Organization (WHO) prepared a study called „*Terrorist Threats to Food. Guidance for Establishing and Strengthening Prevention and Response Systems*”. This document is intended to assist Member States in dealing with food terrorism attacks. It provides information and recommendations on how to prevent such attacks and how to respond when they occur [10].

The aim of the article is to discuss the phenomenon of food terrorism together with indicating the threat

factors and determining the potential consequences of its occurrence. Based on the main objective, the following specific objectives were defined to enable the realization of the research assumptions:

- to define the problem of food terrorism,
- to identify the threat factors identified by WHO,
- to define potential consequences of food terrorism.

DEFINITION OF THE PHENOMENON OF FOOD TERRORISM

With the progressive development of civilization in the world, new problems can be observed, which are challenging for modern leaders of states. One of such threats is terrorism, which negatively affects the security of states and the population [8]. Terrorism appeared in the 1960s and since then this phenomenon violates public order on a global scale and destroys the value of moral as well as legal norms [1].

Terrorism is of interest to many scholars and international organisations. In the literature, the term 'terrorism' is defined in many ways, so that there are around 100 different definitions. According to NATO (i.e. North Atlantic Treaty Organisation), terrorism is defined as „*the unlawful and threatening use of force or violence against individuals, and their property, to enslave or intimidate governments or societies in order to achieve political, religious or ideological aims*”. [2].

Following the events in the USA in 2001, international organisations and leaders of highly developed countries have turned their attention to the phenomenon of terrorism. Terrorists, in turn, are dynamically seeking new areas of human life that could become terrorist targets. Apart from political, military or religious goals, terrorists are increasingly interested in the food industry. If skilfully used, food can become a strong weapon [13].

Food terrorism is a phenomenon that can affect the entire food chain. In May 2002, WHO produced a document called „*Terrorist Threats to Food: Guidance for Establishing and Strengthening Prevention and Response Systems*”. In the document, WHO defines food terrorism as „*the act or threat of deliberate contamination of food for human consumption using chemical, biological or radiological agents, with the aim of causing harm or even death to civilians and/or disrupting social, economic and political stability*” [10].

Food terrorism can affect all areas of the food chain, which may include: agricultural production, plant and animal husbandry, feed production; transport and storage of raw material/feed; processing of raw material, production of products; storage and transport of products; distribution, retail and wholesale; catering services and home consumption of food [12]. In order to carry out a terrorist action, instead of food, terrorists may use raw material or animal feed for this purpose. There are two ways that terrorists use to realize a terrorist attack. The first is an attack by terrorists from outside, i.e. a production facility can be attacked using a computer network by terrorists. In the second case, the attack can take place inside the organisation, using employees. These are usually employees who declare dissatisfaction with their work or seasonal workers. The aim of such an attack is to cause damage to a particular establishment by contaminating food

by an employee [12]. Food terrorism is a threat, not only to the global economy, but also to all consumers. Therefore, everyone working in the food industry should be aware of the importance of food safety [13].

Making a literature study on the phenomenon of food terrorism, five characteristics were distinguished, which describe this issue. The description of the characteristics of food terrorism summarized in Table 1 indicates that it is a difficult phenomenon to identify. Therefore, the world should start reacting and implementing new systems of defence against food terrorism, so that every consumer can feel safe.

Table 1. Characteristics defining the phenomenon of food terrorism

Tabela 1. Cechy określające zjawisko terroryzmu żywnościowego

Characteristic of food terrorism	Description
lack of predictability of the social and scientific implications	This feature is considered by authors dealing with the phenomenon of food terrorism as one of the key ones. The lack of predictability is related to the possibility of an attack at any stage of the food chain. The difficulty in locating the threat and the lack of knowledge of the methods used by terrorists, as well as the lack of knowledge of the possible consequences, make both scientists and consumers fear food terrorism. Awareness that food may pose a threat causes concern, fear and panic among consumers.
the human factor	The phenomenon of food terrorism is caused by the human factor. It is the character, personality, aspirations, as well as the influence of others that can make a person capable of committing such an act.
wide range of terrorist activities	The scale of the phenomenon can reach any place on Earth, as food is consumed by everyone. Factors such as: freedom of movement of people and goods (including food) and the widely understood food chain mean that terrorists can easily attack anyone, anytime, anywhere. The scale of food terrorism can be described as very wide. The consequences will be borne by present and future generations because the substances used by terrorists affect the human body and the environment.
invisibility	The methods and substances used by terrorists are not yet fully known to current science, and are therefore difficult to detect quickly. Consequently, many consumers as well as food producers are not aware that food can be used for terrorist purposes.
equality	This feature of food terrorism shows that, regardless of factors such as age, education, gender, occupation or degree of affluence, one can become a victim of this phenomenon. Everyone needs food to satisfy the basic need, which is hunger. Therefore, everyone should realise that the phenomenon of food terrorism affects everyone.

Source: Own study based on [7, 12]

Źródło: Opracowanie własne na podstawie [7, 12]

FOOD TERRORISM RISK FACTORS IDENTIFIED BY WHO

The World Health Organization (WHO) in its document „*Terrorist Threats to Food. Guidance for Establishing and Strengthening Prevention and Response Systems*” indicates factors that may contribute to the occurrence of food terrorism and those that may serve to prevent this phenomenon [10]. Table 2 lists the threat factors as well as the prevention of food terrorism.

Table 2. WHO guidance on risk factors and prevention of food terrorism

Tabela 2. Wskazania WHO dotyczące czynników zagrożenia i zapobiegania zjawisku terroryzmu żywnościowego

Food terrorism risk factors	Forms that can minimise the risk of food terrorism
Raw materials and packaging	Risk awareness
Availability of the company	Corporate security
Production	Data security
Employees	Company procedures
Suppliers	
Hazardous substances on site	
Water	
Correspondence	
Distribution	

Source: Own study based on [10]

Źródło: Opracowanie własne na podstawie [10]

The raw materials used to manufacture a product, as well as the packaging used to protect the finished product, can contribute to the risk of food terrorism. Lack of awareness of the risk of terrorism among employees and suppliers may result in inadvertent actions leading to contamination of raw materials or packaging. Contamination of raw materials and packaging most commonly occurs during transport to the enterprise or through improper storage of raw materials or packaging within the enterprise. Therefore, to minimise the risk of contaminated raw materials or damaged packaging in the plant, a systematic inspection of all raw materials and packaging delivered to the plant should be carried out [5]. It is important that at the time of delivery, a qualified employee checks the protection of raw materials and packaging, the labelling of delivered materials and the verification of potential damage to raw materials and packaging [4].

An important element of any plant is the production department. At the production stage, deliberate contamination of food may occur if specific safety measures are not met by the plant. The main risk factor in the production department is human beings who can intentionally or unknowingly contaminate the food produced [10].

One of the final factors that influence the food terrorism phenomenon is the distribution of products. Actions that can contribute to the risk of food terrorism in an establishment are:

- working with unqualified distributors who are unaware

that by improperly transporting raw materials or packaging, they may contribute to the increased threat of food terrorism,

- lack of supervision by an employee of the establishment over the documentation provided by distributors at the time of delivery [4, 5].

These actions can lead to an increased risk of food terrorism in a business. For this reason, plant management should also pay attention to product transportation, as terrorists can exploit this part of the food chain as well. It is important for plant management to work with distributors who have security measures for the products being transported and knowledge of distribution [4, 5, 10].

THE POTENTIAL IMPACT OF FOOD TERRORISM

Food terrorism is a phenomenon that affects the general public regardless of gender, age or skin colour. Therefore, every year the WHO records cases of illness and death in humans and/or animals due to a food attack. According to the US Center for Disease Control and Prevention (CDC), there are 76 million illnesses, 325,000 thousand hospitalizations and 5,000 thousand deaths annually in the United States due to contaminated food (WHO, 2008). Table 3 shows selected examples of food terrorism events and their consequences for society.

Table 3. Global food terrorism incidents

Tabela 3. Zdarzenia o charakterze terroryzmu żywnościowego na świecie

year	event	type of attack	happening
1991	Increased incidence of hepatitis A in Shanghai due to consumption of clams	Bioterrorism	Approximately 300 000 thousand people
2013	Poisoning of children in China due to consumption of yoghurt contaminated with rat poison and herbicides.	Food terrorism using a chemical agent	Nineteen children fell ill

Source: Own study based on [10, 12]

Źródło: Opracowanie własne na podstawie [10, 12]

Deliberate terrorist attacks can have devastating consequences. When terrorists use dangerous and unknown biological, chemical and radiological agents, human and/or animal morbidity and mortality can increase [10].

Food terrorism can affect the global economy as well as the local economy of a country. The main goal of terrorists is to cause economic losses to a company or a country. As a result of the conducted attack on food, there is a decrease in the consumption of a given product, loss of consumer confidence in a given commercial network. Such factors result in loss of profit and even liquidation of a particular assortment or shop which entails costs [10]. Table 4 summarises food terrorism cases that have caused economic and business impacts in the country and/or globally.

Table 4. Food terrorism events with economic impact**Tabela 4. Wydarzenia związane z terroryzmem żywnościowym o skutkach ekonomicznych oraz gospodarczych**

year	event	type of attack	happening
1997	Infection in the USA caused by contamination of meat with <i>Escherichia coli</i> O157:H7	Bioterrorism	About 11 million kilograms of ground beef recalled from US market
2009	Food and wine contamination using faecal matter. The incidents occurred in Tesco shops in the UK.	Food terrorism using a chemical agent	Approximately £700,000,000 loss as a result of the liquidation of goods; Shop closures

Source: Own study based on [10, 12]

Źródło: Opracowanie własne na podstawie [10, 12]

Another important consequence of food terrorism is the impact on health services. Terrorists may intend to obstruct or even paralyse the work of a particular hospital. To this end, terrorists use the food consumed by the population to make as many people as possible ill or to create an epidemic that can disrupt hospital operations. In many countries, the health service is insufficiently prepared to function in crisis situations. Even in highly developed countries, there is still no plan of action in the event of a food-related terrorist attack. This causes terrorists to use food to carry out attacks, creating panic and fear in society [10].

One of the most important goals that terrorists try to achieve is to create social and political instability. These phenomena interact with each other. When carrying out an attack, terrorists want to create fear and panic in society. In turn, fear and panic in society may cause a loss of trust in the government and the political system, which in turn leads to political instability. Economic problems, a fall in the incomes of various social groups, and a lack of trust in the government can only serve to deepen social and political instability. Therefore, terrorists use food that is widely available and necessary for the society. By contaminating or polluting food, terrorists can quickly create insecurity in society. In recent years, terrorists carried out an attack using the bacterium *Escherichia coli*, which contaminated vegetables sold in the European Union (EU). As a result of the incident, the EU has compensated farmers, totalling around €210 million. However, among consumers, as many as four thousand people became ill and about 50 people died [10, 12].

In summary, food terrorism can have effects at many levels. The project „*SecuFood - Security of European Food Supply Chain*” was concerned with analysing the phenomenon of food terrorism by collecting information from 1950 to 2008. The programme was implemented with funding from the European Commission in 2010 [12]. According to the data collected by the „*SecuFood*” project, food attacks have occurred at least 450 times in the last fifty years. The most frequent phenomenon of food terrorism occurred in North America (about 38% of all cases - Figure 1). As many as 152 food attacks have occurred in the United States. The study

shows that terrorists most often use chemical substances to contaminate food (about 335 attacks out of 450). In second place, a biological agent is used to contaminate food. Based on research conducted by the „*SecuFood*” project, 75% of all food terrorist attacks involved consumers, about 24% involved food sales, and 1% involved product packaging [9, 12].

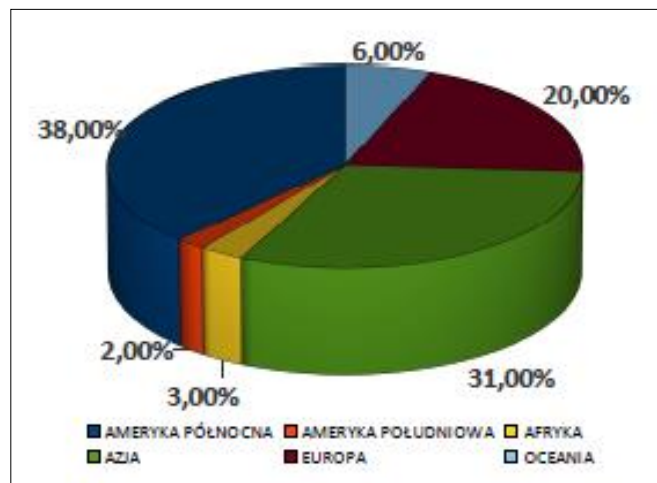


Fig. 1. Geographical distribution of incidence of food terrorism in the food chain, 1950–2008.

Rys. 1. Geograficzne rozmieszczenie występowania terroryzmu żywnościowego w łańcuchu żywnościowym w przedziale lat 1950–2008.

Source: Own study based on [9]

Źródło: Opracowanie na podstawie [9]

CONCLUSION

Based on the literature study on the issues related to the phenomenon of food terrorism, the following conclusions are drawn:

1. Food terrorism is a dangerous phenomenon because food, which is available to everyone, is used to carry out a terrorist attack.
2. The phenomenon of food terrorism is global and can affect any country in the world.
3. Food terrorism can have many unforeseen consequences that can negatively affect the functioning of an individual (consumer), a food-producing company and a national or global economy.
4. A key element in ensuring food safety is raising awareness among food producers of new threats in the food industry (e.g. food terrorism).

Food terrorism is an issue that is a new problem in the food industry and is not yet well defined and understood. The phenomenon of food terrorism has a decisive impact both on food consumers and on the economies of countries and the world economy, while the consequences of the occurrence of this phenomenon are unpredictable and affect many aspects of human life.

In conclusion, it can be said that the phenomenon of food terrorism is one of the most important threats of the modern world. The problem of food terrorism is an innovative and topical issue, which is why it is important to pay even more

attention to this phenomenon in order to make modern food producers and governments aware of the significance of the problem.

PODSUMOWANIE

W oparciu o studium literaturowe dotyczące zagadnień związanych z zjawiskiem terroryzmu żywnościowego sformułowano następujące wnioski:

1. Terroryzm żywnościowy jest niebezpiecznym zjawiskiem, gdyż w celu przeprowadzenia ataku terrorystycznego wykorzystuje się żywność, która jest dostępna dla wszystkich.
2. Zjawisko terroryzmu żywnościowego ma charakter globalny i może dotyczyć każdego państwa na świecie.
3. Terroryzm żywnościowy może powodować wiele nieprzewidywanych skutków, które mogą negatywnie wpłynąć na funkcjonowanie pojedynczej jednostki (konsumenta), przedsiębiorstwa produkującego żywność oraz gospodarki krajowej lub światowej.

4. Kluczowym elementem w zapewnianiu bezpieczeństwa żywności jest podnoszenie świadomości wśród jej producentów w zakresie nowych zagrożeń w przemyśle spożywczym (np. terroryzm żywnościowy).

Terroryzm żywnościowy to zagadnienie będące nowym problemem w przemyśle spożywczym, które nie zostało jeszcze dokładnie zdefiniowane i poznane. Zjawisko terroryzmu żywnościowego ma decydujący wpływ zarówno na konsumentów żywności jak i na gospodarkę krajów oraz gospodarkę światową, zaś skutki wystąpienia tego zjawiska są nieprzewidywalne i dotyczą wielu aspektów życia człowieka.

Podsumowując można stwierdzić, że zjawisko terroryzmu żywnościowego jest jednym z najważniejszych zagrożeń współczesnego świata. Problematyka terroryzmu żywnościowego jest nowatorskim oraz aktualnym zagadnieniem, dlatego ważne, aby temu zjawisku poświęcono jeszcze więcej uwagi, tak aby uświadomić współczesnych producentów żywności i rządy państw o istotności problemu.

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