The Hierarchy of Responsibility for Food Safety – the Case of Polish Consumers

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Abstract
Food safety is very important because it has a direct impact on human health. Food safety has to be assured at every stage of the food chain, from farm to fork. The food chain has many stages and actors: farmers, importers, food processing, storage, retailers, consumers. Lack of food safety can occur at any of these stages. Each food chain actor and institutions are responsible for food safety in the food chain.

The paper presents the results of a survey made in 2020 in Poland among 2,000 consumers. Consumers were asked to assess the hierarchy of responsibility for food safety. According to the results it was shown that consumers perceive food producers to have the biggest responsibility for food safety (73.6% of indications), then food safety authorities/institutions (51.6% of indications), distributors and retailers (69.7% of indications), and themselves (73.8%).

Keywords: consumers, food safety, food safety assurance

JEL Classification: P46, Q18, Q19

1. Introduction
Food chain is very complex with many actors such as: farmers, distributors, producers, retailers and finally consumers. Food safety authorities/institutions issue legal requirements and make inspections of the entities in the food chain. Each of them has the responsibility for food safety. Food safety hazards (biological, chemical, physical) may appear at each stage of the food chain. Entities in the food chain have the requirements that have to be fulfilled. For example, the obligatory food safety assurance systems should be implemented such as GHP, GMP and HACCP (excluding the primary production). The European Commission has implemented the farm to for strategy to ensure safety and healthy food in the whole food chain\(^2\). Farm to fork strategy now represents a wide approach to food. It consists of 4 main points: sustainable food production, sustainable food processing and distribution, sustainable food consumption, food loss and waste prevention (Trucker et al., 2006; Raspor, 2008).

Appearance of food hazard results in negative impact on human health and big loss for the economy, i.e. food withdrawing, image loss, healthcare expenses. It is very important for all of us because we all are food consumers. The food we consume influence our health. The World Health Organisation gives the most important facts about the food safety\(^3\): (1) access to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health, (2) unsafe food containing harmful bacteria, viruses, parasites or chemical substances, causes more than 200 diseases – ranging from diarrhoea to cancers, (3) an estimated 600

\(^2\) https://ec.europa.eu/food/horizontal-topics/farm-fork-strategy_pl#documents
\(^3\) https://www.who.int/news-room/fact-sheets/detail/food-safety
millions – almost 1 in 10 people in the world – fall ill after eating contaminated food and 420,000 die every year, resulting in the loss of 33 million healthy life years (DALYs), (4) US$110 billion is lost each year in productivity and medical expenses resulting from unsafe food in low- and middle-income countries.

“Safer food saves lives” is a sentence that opens the document of WHO on the global burden of foodborne diseases.

Each country has the institutions responsible for food safety. It is usually centered or not. 22 EU countries have a model with a single food safety authority or model with more institutions, where one of them has a dominant position, 5 EU countries (18.5%), including Poland – dispersed model with several authorities responsible for food safety. In Poland the model is multiinstitutional. Some activities were made to make it more centered, i.e. starting from 1 July 2020. The Agriculture and Food Quality Inspectorate took over that quality supervision from the Trade Inspectorate in retail trade. On the basis of the report made by the Supreme Audit Office in Poland in 2021 on food safety institutions it was concluded that: (1) consolidating institutional food control structures, (2) educating the society on healthy eating, (3) increasing efficiency and effectiveness of control activities, (4) taking measures to impact EU solutions. As Hadjigeorgiou et al. (2013) says many think that it is the government’s responsibility to satisfy the need for safe food for all. However, it is the responsibility for each of us. For example, if a consumer buys a safe food and storage it or prepare in an inappropriate way (not to obey hygienic rules) it may cause food risk.

Food producers are obliged to implement GHP, GMP and HACCP. These systems help to prevent food hazards. For example in the process of food production the Critical Control Points (CCPs) have to be identify and monitor, GHP and GMP describe the principle of hygienic behavior in the workplace. Moreover, food producers are obliged to implement the traceability to be able to recover the history of the food starting from the ingredients. Food law inter alia requires the name of the producer on the food label to identify it and also the best before date/expiration date that informs till when the food can be consumed. Food distributors and retailer are also obliged to implement HACCP and GHP,GMP in their activities. Consumers although do not have the legal obligations, they also should actively participate in the food safety assurance. An important source of food safety hazards are factors related to human behavior and the use of inappropriate practices during meals preparation at home (Powell et al., 2011; Redmond & Griffith, 2003; Milke et al., 2015). The main questions and issues to be considered about food safety along the food chain are presented in Table 1.

Table 1. Questions about food safety and responsibility

<table>
<thead>
<tr>
<th>Participant of the food chain</th>
<th>Main issues to be considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producers</td>
<td>1) Food producers should fulfill the requirements of food safety standards and collaborate with other entities in the food chain to increase the ability to assure food safety</td>
</tr>
<tr>
<td></td>
<td>2) Food producers should have procedures in case of food hazard/threat and the need to withdraw products from the market</td>
</tr>
<tr>
<td></td>
<td>3) Food producers should remember that lack of food safety causes big financial loss</td>
</tr>
</tbody>
</table>

4) Food producers should inform consumers about the proper way of the storage and preparation of their products, for example with the information on the food labels that should be clearly stated.

5) Standards and regulations regarding food safety and the responsibility should take small farmers into account and be a support for them.

Food providers and retailers

1) Food providers and retailers should implemented the food safety standards.

2) They should be aware of their role in food safety assurance as well as their responsibility for the food safety (for example storage and transport of food products).

3) They should be ready to collaborate with food authorities in the situation of food scares and the need for food withdrawal from the market.

Food authorities/institutions

1) The scope of the responsibilities if each institution should be clear.

2) Employees of these institutions should have a high level of competence.

3) Food authorities/institutions should participate in the education of consumers.

Consumers

1) Consumers have the impact on food safety and also are responsible for food safety by their purchase choices, by their way of food preparation and food storage, and hygienic practices.

2) There is a need for consumer education on food safety behavior, i.e. how to storage food, how to prepare food.

3) The source of information should be reliable.

4) Consumers should be aware of their active role in food safety, not just to transfer the responsibility on other participants of the food chain.

Source: own elaboration

2. Data and Methods

The research process consisted of the following stages:

- developing research methodology;
- consultation of the research tool;
- sample selection, implementation of the measuring phase of the survey;
- developing a statistical report;
- developing a final report.

The study was carried out using the CAWI (Computer Assisted Web Interviewing) technique based on conducting a computer-supervised internet survey in Poland in 2020. The questionnaire was built of 23 closed-typed questions. The sample consisted of 2000 people selected taking into account the place of residence (voivodship), gender and age. Respondents were also characterized in terms of education and material status. The exact distribution of the sample taking into account gender, age and place of residence is presented below. It reflects the structure of the population of adult Poles residing in the country.
Numeric variables were characterized using basic descriptive statistics: cardinality (N), arithmetic mean (mean), standard deviation (SD), median, lower and upper quartile (IQR), minimum and maximum values (range). Group comparisons were made using Chi-square test. The value of significance (p) was set at 0.05. Calculations were made in the R program (ver. 3.5).

The sample was representative for the whole country. 1049 women and 951 men were interviewed. Among the respondents, 42.4% were the sole decision-makers in the purchase of food products. About 49.7% of respondents said they make the majority of purchasing decisions for the household. The smallest group (7.9%) were people for whom someone else makes the majority of purchasing decisions. In the survey, respondents also specified their education, size of place of residence and net income per family member. Most respondents had secondary education (32.2%) and basic vocational education (30.7%). Persons with higher education constituted 26.9%, and the remaining 10.3% of respondents had primary / lower secondary education. Persons with a net income not exceeding PLN 1200 (about 300 €) per person constituted about 19.1% of the total number of respondents. One-fifth of survey participants (20.0%) indicated an income of PLN 1201 to 1600 (301 to 400 €), and respondents declaring income per person within PLN 1601-2000 (401 to 500 €) net constituted 20.7% of all respondents. Income in the amount of 2001-2400 (501 to 600 €) was indicated by 19.5% of respondents and 20.9% of respondents had income per one person exceeding PLN 2400 (+600 €) net.

People living in the village accounted for 19.9% of the total, while about 23.0% of the respondents were city dwellers up to 50,000 inhabitants.

Approximately 29.0% of respondents were residents of cities with 50 to 250 thousand inhabitants, and 14.7% lived in cities with 250 to 500 thousand inhabitants. The least 13.5% of respondents lived in cities with over 500,000 inhabitants (Table 2).
Table 2. Characteristics of the respondents

<table>
<thead>
<tr>
<th>Voivodship</th>
<th>Woman (age)</th>
<th></th>
<th></th>
<th></th>
<th>Man (age)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18-29</td>
<td>30-39</td>
<td>40-49</td>
<td>50-59</td>
<td>60-69</td>
<td>+70</td>
<td>18-29</td>
<td>30-39</td>
</tr>
<tr>
<td>Dolnośląskie</td>
<td>12</td>
<td>16</td>
<td>13</td>
<td>11</td>
<td>15</td>
<td>13</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Kujawsko-pomorskie</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Lubelskie</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Lubuskie</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Łódzkie</td>
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<td>12</td>
<td>11</td>
<td>10</td>
<td>13</td>
<td>13</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Małopolskie</td>
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<td>18</td>
<td>15</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>Mazowieckie</td>
<td>23</td>
<td>29</td>
<td>25</td>
<td>20</td>
<td>25</td>
<td>25</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>Opolskie</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Podkarpackie</td>
<td>10</td>
<td>11</td>
<td>9</td>
<td>9</td>
<td>11</td>
<td>11</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Podlaskie</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Pomorskie</td>
<td>11</td>
<td>12</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>9</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Śląskie</td>
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<td>23</td>
<td>21</td>
<td>20</td>
<td>22</td>
<td>21</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>Świętokrzyskie</td>
<td>6</td>
<td>6</td>
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<td>6</td>
<td>6</td>
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<td>5</td>
</tr>
<tr>
<td>Warmińsko-mazurskie</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Wielkopolskie</td>
<td>16</td>
<td>18</td>
<td>16</td>
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<td>14</td>
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<td>19</td>
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<tr>
<td>Zachodniopomorskie</td>
<td>7</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>172</strong></td>
<td><strong>197</strong></td>
<td><strong>172</strong></td>
<td><strong>155</strong></td>
<td><strong>181</strong></td>
<td><strong>172</strong></td>
<td><strong>176</strong></td>
<td><strong>200</strong></td>
</tr>
</tbody>
</table>

Source: own elaboration
3. Results and Discussion

During the survey, respondents were asked who, in their opinion, is responsible for food safety. Most often, the respondents indicated the producer in the first place (73.5% of indications), followed by official control (17.1% of indications). Consumers and distributors / market were indicated as entities less responsible for food safety. Detailed information is presented in the table below.

Table 3. Food safety responsibility – opinion of the respondents

<table>
<thead>
<tr>
<th>Entity responsible for food safety</th>
<th>Percentage of people indicating 1st place</th>
<th>Percentage of people indicating 2nd place</th>
<th>Percentage of people indicating 3rd place</th>
<th>Percentage of people indicating 4th place</th>
<th>Average position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer</td>
<td>73.5%</td>
<td>17.9%</td>
<td>6.2%</td>
<td>2.7%</td>
<td>1.3</td>
</tr>
<tr>
<td>Official control institutions</td>
<td>17.1%</td>
<td>51.6%</td>
<td>22.7%</td>
<td>8.5%</td>
<td>2.2</td>
</tr>
<tr>
<td>Consumer</td>
<td>6.0%</td>
<td>7.8%</td>
<td>11.4%</td>
<td>73.8%</td>
<td>3.5</td>
</tr>
<tr>
<td>Retailer/market</td>
<td>3.5%</td>
<td>22.8%</td>
<td>59.7%</td>
<td>15.1%</td>
<td>2.8</td>
</tr>
</tbody>
</table>

On the basis of the research it was shown that consumers perceived themselves as they have little responsibility for food safety. It is not true. As Redmond (2002) says consumers should be educated about their role in food safety because in many cases they are unaware of it. Consumers should be educated how to improve their behavior to prevent foodborne diseases. Evans and Redmond (2019) showed in their research that older consumers perceived themselves as less responsible for food safety than other consumers.

Raspor (2008) and Janjic et al. (2018) emphasize the role of consumers in food safety and characterize food handling in the households as “the last line of defence” in food production and consumption. That’s why food hygiene during food preparation by consumers has a crucial role. The World Food Safety Day 2019’s theme was that food safety is everyone’s business what shows the fact that everyone is responsible for food safety. FAO Director-General José Graziano da Silva said “Whether you are a farmer, farm supplier, food processor, transporter, marketer or consumer, food safety is your business”\(^5\). It also can be said that food safety is a shared responsibility. It is a shared responsibility because each food chain actor is responsible for food safety and if food safety is not maintained in previous stage of the food chain, then it will be no food safety in the next stage. People have the tendency to perceive themselves as less responsible than others.

Karabasil et al. (2017) characterize the role in food safety in hierarchical order as: food authorities, producers and consumers. Food law place food producers on the first place in food safety responsibility.

Of course, looking from the legal side food producers have the biggest responsibility for food safety but we should remember that we all are responsible for food safety. Because of this it is very important that each actor of the food chain should understand their role in food safety. Without this awareness and collaboration in the food chain it will be difficult to assure food safety. As Jen (2017) emphasizes that food safety is not the responsibility of one person, one

group of people, nor of an industry or a government agency. It is the shared responsibility of many people and organizations, in fact everyone. The food industry and government agencies have a major responsibility for food safety. Academia and media have their special responsibilities. Every consumer and everyone who eats food has to share responsibility for food safety. The shared responsibility for food safety and the need to be aware of the shared responsibility for food safety is mentioned by many authors (Ramsingh and Wallace, 2014; Powell et al., 2011; Rawluk, A. et al, 2021).

The overall responsibility for food safety can be seen in case of food hazard/threat and the need of collaboration between various food chain actors (Islam & Cullen, 2021). As Rodriguez-Salvador and Dopico (2020) say consumers play a key role in the efficiency of traceability. According to the research made by Erdem et al. (2012) it can be stated that the perception of the responsibility for food safety among food chain actors is varied, i.e. consumers tend to think farmers are more responsible for ensuring meat safety than farmers do. Similarly, farmers tend to think consumers have a greater degree of responsibility than consumers believe they have themselves.

Thanks to the traceability requirement it is possible to identify and withdraw hazardous food product from the market. Traceability gives many advantages (Montet & Ray, 2018): 1) for consumers it satisfies their needs for food safety in terms of health and well-being and their expectations in terms of information, 2) for professionals within food chain it gives a better risk management, a tool of crisis management, a way to better define their limits of liability, and a tool to allow the establishment of relationship of trust with consumers, 3) for authorities the traceability constitutes a means of risk prevention and a means of localization and expertise in case of food crises.

4. Conclusion

In many studies it was shown that producers are perceived to have the biggest responsibility for the food safety. Food producers do have the responsibility for food safety, they have to implement obligatory food safety standards and are controlled by food safety authorities. However, during the food processing process food producers/owners of the business have to delegate the responsibility to the employees. The employees should have the knowledge about the hygienic requirements, process parameters, food hazards preventions etc. Food safety authorities also should play an active role in food safety assurance and responsibility by their ability to issue requirements and decisions from the inspections. Food retailers and distributors also have to implement food safety standards and have the responsibility for the food safety. It is worth to emphasize the fact that all of the abovementioned entities are the participants of the food chain so have the responsibility for food safety and the obligation to respect food safety requirements. Although consumers perceive themselves as the least responsible for food safety, they also have the responsibility for the food safety by their behaviour during meals preparation, food storage, hygienic behavior. Consumers should be aware of their role in food safety and their responsibility. Another good example of the complex responsibility for food safety is a situation of food hazard or food threat and the need to withdraw the food products from the market. Then the system of traceability should work. Traceability system is built of three components: a step back (supplier), process (internal traceability) and one step forward (consumer). Traceability allows to identify the history of the products (suppliers of the ingredients) and to inform then about the hazardous products. It also allows to identify the markets, distributors to whom this product was sold so they can withdraw the product from the
market. The traceability principles show the need of collaboration between food chain actors as well as the responsibility of each of them for food safety.

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References


