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*The Determinants of Trust in Food Safety from the Perspective of
Generation Z Students*

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Abstract

Theoretical background: Trust plays an important role in market relations and is a valuable bridge between the consumer and the producer. Given the importance of food, trust in its safety certainly plays a key role. There are many determinants affecting food safety trust. Due to its growing role in society, Generation Z (Gen Z) and its views on the subject should be taken into account. All the more so because this generation is skeptical, cautious, and sensitive in economic, environmental, cognitive, and social terms.

Purpose of the article: The objective of the study is to identify the determinants of trust in food safety among Polish students representing Gen Z consumers. A subsidiary objective is to identify whether trust in food safety is influenced by their socio-demographic and cognitive characteristics.

Research methods: A face-to-face survey method was used and 374 respondents were participating in the study. The influence of twelve determinants on trust in food safety was assessed. Cronbach's alpha statistics were used to assess the questionnaire scale's reliability. The KMO index (Kaiser–Meyer–Olkin) and Bartlett's test of sphericity were applied to know the appropriateness of performing factor analysis. To simplify and reduce the number of sources of confidence in food safety identified in the study, a factor analysis was conducted using the principal components method and Varimax rotation with Kaiser normalization. To find the relationship between sociodemographic variables and the studied variables multiple regression was applied. Statistical analyses were performed using IBM SPSS Statistics 29.

Main findings: The reliability of the questionnaire used in the study has been confirmed. We distinguished three groups of determinants influencing food safety trust, and these are: "Place of food production and sale", "The way of food production and supervision", and "External socio-economic environment". This type of classification can be considered our original contribution to the study, as well as the fact that among the individual determinants analyzed, we identified those with the highest importance in building food safety trust. These are the country of origin, the requirements of the country's legal and market system as well as the activities of consumer and producer organizations. It was shown that socio-demographic and cognitive characteristics play a role in perceptions of product safety and in inducing trust in food safety.

Introduction

Despite existing food safety regulations worldwide, food that endangers the health and lives of consumers comes to the market. This is evidenced by statistics provided by recognized agencies at the international (WHO, 2022) and European levels (*2021 Annual Report...*, 2022). Various food scandals occurring over the years, publicized by the media and reported by scientific researchers (e.g. Li et al., 2019; Garnier et al., 2023), undermine confidence in food and food companies. Safety is the basic feature of food products and its importance is growing as consumer knowledge and awareness increases. Food safety is important not only for consumers but for everyone in the food chain, from farm to table. If it is compromised, trust in the food, in the producer, and in the entire food control system decreases. The issue of consumer trust in food is an important factor in the stability of the European food sector (Kjærnes et al., 2007).

Trust, due to its mediating function in the relationship between the organization and the customer, is one of the decisive factors in the purchase of products (Maharani & Puspaningrum, 2023). Consumers' trust in food safety and the food business is crucial in food markets (Benson et al., 2020), and can be determined by a number of factors (Ngo et al., 2023). Trust is a dynamic and changing value, so information on the sources and determinants of this trust should be kept up to date. This is evidenced, among other things, by the changes in consumer behavior, including decreased trust in the label information, observed during the pandemic (Latip et al., 2020; Sahin & Gun, 2023). A quantitative survey of 20,326 consumers across 18 countries coordinated by the TrustTracker® team and the results of the survey presented in The EIT Food Trust Report (2021) confirm that Polish consumers are more

skeptical than other consumers across Europe. The report, however, only gives some overall picture of consumers' trust in food chain actors and the results do not show what the opinions are in individual age groups. Hence, it is interesting to recognize the opinions of people representing Generation Z (Gen Z), the largest consumer base through to 2030 (Ozdemir-Guzel & Bas, 2021). Therefore, the objective of the study is to identify the determinants of trust in food safety among Polish students representing Gen Z consumers. A subsidiary objective is to identify whether trust in food safety is influenced by their socio-demographic and cognitive characteristics.

The article fills a gap in research on consumer trust, mainly GenZ in Poland. So far, the research conducted has focused, i.a., on trust in ecological food (e.g. Żakowska-Biemans, 2011), in food companies, in general (e.g. Klimczuk-Kochańska, 2017), in food quality (Żakowska-Biemans & Gutkowska, 2018), in new types of food (Maciejewski, 2020), in official food control agencies (Franc-Dąbrowska et al., 2021). However, it was noted that there is a lack of a comprehensive analysis to consider more variables and determinants of this trust, especially when it comes to trust in food safety, and when referring specifically to Generation Z students. Above all, it seems important that there is a research gap regarding works dedicated to Gen Z university students. As Sfodera et al. (2022) convince, studies on Generation Z are still limited. Even more so, research within the university students of Generation Z. This is confirmed by a review of international scientific databases included in the home university's repository. Entering a phrase like "Gen Z university students" and "Generation Z university students" yielded only 35 records, of which, after removing duplicates, 12 were peer-reviewed scientific articles. Only one concerned food and was specifically focused on the consumption of daily fruits and vegetables in an emerging market economy, indicating young people's reasons to adopt a healthy diet (Pocol et al., 2021).

The rest of this paper is organized as follows. The next section discusses the study's theoretical background and is focused on the development of the research questions. This is followed by a section describing the research methodology. The results and their discussion are then presented, followed by a conclusion that describes the study's limitations and provides suggestions for future research.

Literature review

Consumer trust

The phenomenon of trust affects every sphere of human activity and is very complex. The issue of trust is being addressed by researchers from various disciplines, including economics, sociology, psychology, philosophy, anthropology, political science, and management (Bauer, 2021). Researchers indicate that different situations and management concepts require different types of trust. In some situations,

institutional/organizational trust prevails, while in others trust in individuals, leaders, suppliers, competencies, or the relationships that exist between different levels of authority is important (Lewicka et al., 2017; Rapp & Wilson, 2022; Truong et al., 2022; Erkutlu & Chafra, 2023).

Due to these considerations, the concept of trust is difficult to define unambiguously. Mayer et al. (1995) define trust as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that another party”. For Fukuyama (1997) trust is “a positive phenomenon, with favorable correlations with economic efficiency, as it increases the human propensity for risk and productive social exchange”. Trust is defined as an organizational resource (Gambetta, 1988), a state expressed in positive expectations about the motives of others (Lewicki & Bunker, 1996), an element of social capital (Prusak & Cohen 2001), the foundation of social interactions in organizations (Weber et al., 2005), and a psychological state (Pillutla, 2005). According to social theory, the underlying assumption of trust is the belief of a trustor (e.g. food consumers) in a trustee (e.g. food producers) who has competence in satisfying a trustor’s requirements honestly in a given context (Grandison & Sloman, 2003). The commitment-trust theory emphasizes that trust is a prerequisite for maintaining long-term relationships with the company (Pizzutti dos Santos & Von der Heyde Fernandes, 2008; Konuk, 2018).

Consumer trust can be defined as the consumer’s belief that a corporation will perform in accordance with expectations regarding its expertise, integrity, and goodwill (Khalid, 2021). In some papers, consumer trust is defined as a derivative of the willingness to be exposed to the outcomes of the uncertain actions of another party (Hasley et al., 2020). As Berg et al. (2005) argue, consumer trust is related to which food safety events have taken place and how this is represented in the public debates (in media); how the arrangements of the food system (market and regulatory bodies) work; and how this is viewed by consumers. Customer trust is the faith a consumer has in a company. It shows confidence in a company’s commitment to delivering on its promises and doing what is right for the customer (Bishop, 2023). In the service area, consumer trust is seen as the expectations held by the consumer that the service provider is dependable and can be relied on to deliver on its promises (Sirdeshmukh et al., 2002). Therefore, we assume that consumer trust in food safety can be understood as the belief that the consumption of food will not harm the health and safety of the consumer, and will give him/her a sense of confidence towards this food and its producer, contributing to the fact that he/she will purchase this food again, repeatedly.

Consumer trust will also promote that the consumer will fearlessly recommend the food product to other people, as well as become interested in other products from the same producer. With this in mind, one can show that trust relates to an individual’s confidence, expectations, and hopes for a specific product or element (Latip et al., 2020). Also important is the fact that it emerges after positive personal

experiences (Luhmann, 2000). Therefore, trust can be seen as a bridge between past experiences and the anticipated future (Paliszkiewicz & Klepacki, 2013). It depends on an individual's attitude to risk and perception of reality (Munikrishnan et al., 2023), and influences the loyalty to the seller (Cui et al., 2023). The researchers also mention factors such as product quality, service value, customer satisfaction, and price (Nguyen et al., 2013). The absence of the above values can reduce confidence in the manufacturer and the product and can lead to a decline in consumer trust in their ability to make informed food choices (Mcready et al., 2020). Therefore, it can be concluded that trust is an important determinant of success in B2C relationships (Mcready et al., 2020). In turn, in B2B relationships, trust is an important complement and sometimes a substitute for control (Abdullah & Khadaroo, 2020). Trust between companies reduces transaction costs by reducing negotiation and monitoring efforts (Qi et al., 2020), and promotes competitiveness (Casidy & Yan, 2020). In such relationships, trust is the belief of one side that the other side will not exploit their weaknesses (Kydd, 2000). When this condition is met, customer trust can lead to preferred outcomes, such as customer loyalty, repurchase intentions, and customer satisfaction (Ratasuk & Gajesanand, 2023).

Gen Z consumers

Mróz (2013) stresses that consumers of the 21st century have transformed into "trysumers" ("trying consumer" – a consumer who tries, seeks), i.e. such consumers who personally verify market offerings, look for new options to satisfy needs and rely on their own or other users' experiences to make decisions. Their trust is built on experience. The same author emphasizes that this is first and foremost a basic characteristic of Generation Z consumers. Generation Z is also referred to as "iGen", "Homelanders", "Digital Natives", and most commonly as "Gen Z" or "Gen Zers". Depending on the sources, Gen Z covers people born between 1995 and 2012 (Pichler et al., 2021) or 1996 and 2010 (Ozdemir-Guzel & Bas, 2021). Members of Gen Z are identified with social Internet networks, which represent a significant part of their social life. They are characterized by the need for urgent satisfaction, which usually manifests itself in a tendency to shorten the time necessary to achieve a goal. They value and trust only those products that they will check themselves beforehand. They also count on the opinions of their friends or relatives when choosing products. They are a serious challenge to retailers. They are focused on their choice and engaged as consumers. They often compare the quality and prices of different products, with the goal of choosing the best option for themselves. Gen Zs are among the smart online consumers who can find the best offer. They need to be successful and want to have quality things. They do not believe what companies try to tell them, or what retail chains offer them (Šramková & Sirotiaková, 2021). As Grabiwoda points out, Gen Z consumers are making more conscious and ethically responsible consumer

choices. Their confidence in the product and the manufacturer depends on whether they receive more personalized products and services, tailored to individual needs, that highlight their uniqueness and originality (Grabiwoda, 2019). Similarly, Mazurek-Łopacińska (2018) believes that GenZ consumers are very rational. Most of them look for information about a product on the Internet and compare different offers before buying, looking for the most advantageous ones. Gen Zs are impatient, independent, skeptical, and sensitive as customers. They pay attention to companies' values, including such issues as treating employees fairly, the interests of local suppliers, or an ethical approach to production. As Paczka (2020) convinces, Gen Z consumers negate mindless consumption and move away from expressing their personality through the unbridled pursuit of accumulating goods. They are transforming into conscious and responsible buyers who are characterized by concern for the environment natural environment and a decline in confidence in the ethical side of companies' business practices. They are more ethical, sensitive, and careful when it comes to spending money and purchasing decisions (Squires & Ho, 2023). According to McKinsey & Company report (Francis & Hoefel, 2018), Gen Z trust depends on the truth accompanying the product and on the credibility of companies. The authors of the report argue that Gen Z consumers make decisions and relate to institutions in a highly analytical and pragmatic way. Additionally, they are aware of green lifestyles and know their responsibility towards the environment (Noor et al., 2017); and are seeking green services and products, that promote social responsibility, implement environmental protection, and adopt specific measures in order to support local communities and protect employees (Dabija & Bejan, 2017). GenZ consumers are, as a rule, less trusting and more reserved about different brands, products, and services (Uță, 2022; Pradhan et al., 2023). As modern food enthusiasts, Gen Zs find and shop for the latest products, ingredients, and food services mainly for food that brings a "good impression" (Szakály et al., 2018). This expectation motivates Gen Zs to actively seek out trustworthy and honest food sources and to buy brands and goods that live up to their expectations (Kamenidou et al., 2018). Their favorable perception of food is influenced by various factors, including ambiance, food quality, and service quality (Yi et al., 2018).

The determinants of consumer trust in food safety

In general, researchers discuss various determinants of consumer confidence in food safety, and such issues are noted as food labeling, food quality systems implementation, production technology, or the physical appearance of the product (Wu et al., 2021; Whitworth, 2021; Macready et al., 2020). These can be defined as product-related determinants. Another group of determinants has to do with the manufacturer, the place of production, and the method of distribution and covers, for example, the country of origin, the place to buy food, the food manufacturer/

farmer, and food producers' organizations (Rupprecht et al., 2020; Macready et al., 2020; Wardani et al., 2022; Watanabe et al., 2020; Yu et al., 2021). Researchers also point to the existence of legal requirements, including a traceability system, and supervision by official inspections and/or independent certification bodies (Watanabe et al., 2020; Aung & Chang, 2022; Lang & Conroy, 2022; EIT Food Trust Report, 2021). These determinants are related, in general, to the food system. Not without significance are also such determinants as activities of consumer organizations, the SARS-CoV-2 pandemic, armed conflicts, safety incidents (Kubatko et al., 2023), sociodemographic characteristics (Ngo et al., 2023), and the type of customer, or his/her risk perception or general skepticism (Rajkumar et al., 2021; Zanetta et al., 2022; EIT Food Trust Report, 2021). The latter two groups of determinants can be conventionally described as related to the sociodemographic features, and socio-economic environment, and related to the cognitive characteristics of the consumer.

With this in mind, the following research questions were posed:

Q1. Are the country of origin and food manufacturer important determinants of Gen Z students' trust in food safety?

Q2. Are the requirements of the country's legal and market system (quality assurance and quality management systems) important determinants of trust in food safety for Gen Z students?

Q3. Does the socio-economic environment, including the activities of consumer and producer organizations, affect Gen Z students' trust in food safety?

Q4. Do the socio-demographic characteristics of Gen Z students have a significant impact on the evaluation of individual determinants of food safety trust?

Q5. Do the cognitive characteristics of Gen Z students have a significant impact on the evaluation of particular groups of food safety trust determinants?

Research methods

Students were chosen for the study because this group of Gen Z consumers is the most accessible to the author and these individuals are already making or will soon be making food-purchasing decisions. The purchasing power of Gen Z (Ameen et al., 2022; Guo & Luo, 2023), including students (Amit-Talai, 2022; Leisen Pollack, 2023), is evident. Moreover, an upward trend in student participation in consumer behavior psychology research has been recorded since the end of the last century (Simonson et al., 2001). The participation of students in our study reflects a trend observed in papers by Wang et al. (2021) and Franc-Dąbrowska et al. (2021). Similar to other studies (e.g. Maciejowski, 2020), the decision to opt for non-random sampling was dictated primarily by the lack of a suitable sampling frame (in our case – of Gen Z students) and the need to reduce survey costs. The use of a convenience sampling method is a major limitation of this study and this was considered in the interpretation of the results (Wiśniewska et al., 2022). The utilization of a convenience sample, as with many approaches that

use an opportunity sampling method (Quoquab et al., 2019; Rees et al., 2019), limits the scope of the conclusions and the generalisability of the results. However, as Jager et al. (2017) argue, when researchers are limited to convenience samples, they should consider homogeneous convenience samples as a positive alternative to convenience samples. In our case, this homogeneity was guaranteed by focusing on students coming from one university, meeting the criteria for belonging to Gen Z.

To avoid systematic error, the research was conducted taking into account the ethical principles of the Helsinki Declaration (Francuz & Mackiewicz, 2007). Next, the questionnaire was consulted with three experts in the fields of market research, food consumption, and food quality and safety management, respectively. In addition, a pilot study was performed on a sample of 30 respondents to verify the readability, sequence, and correctness of the questions and scale (Sztabiński, 2011), as well as the definitions contained in the questionnaire.

The students took part in the study on an optional basis. Participation in the study was in no way related to their studies and they were not evaluated for this reason. Their behavior during the study did not have the slightest impact on their grades during normal academic classes. The survey was addressed to students from five departments of one of the large universities in Poland. Respondents who provided incomplete answers were omitted from the analysis. A total of 374 properly completed questionnaires were received. The number of people taking part in the survey met the predetermined minimum sample value (Babbie, 2004), taking into account the number of students in the academic year (GUS, 2022) in which the survey was conducted. The Wald–Wolfowitz series test was conducted to check whether the results of the survey met the postulate of the randomness of the sample. Based on the results of this test, the null hypothesis stating that the selection of individuals for the sample is random was confirmed.

The research was carried out using a face-to-face survey method from March to May 2022. The survey questionnaire was in Polish and was divided into two sections. The first included metrics questions describing the respondents in terms of gender, age, family size, income per family member, place of residence, and socio-economic background of the household head, who decides on food purchases, the main place where food is purchased, sources of information on food safety, self-assessment regarding the overall level of trust and attitude to risk, and type of customer (profligate, economical, independent, family-oriented, sensitive, impulsive, sustainable, skeptical, tentative, determined, analytical). The second section included a question related to food safety determinants of consumer trust. The question was: To what extent would you express your trust in light of a given determinant, with the leading statement being: “I have trust in...”. Hence our scale was from “definitely not”, to “definitely yes”, along with middle scales (“not”, “moderately”, “yes”). Having in mind the literature background, and research questions posed, twelve food safety determinants were evaluated, as follows: 5a – country/region of origin, 5b – information on the label, 5c – control of official inspections, 5d – the place to buy food, 5e – food

manufacturer, 5f – farmer, 5g – quality assurance systems used, 5h – independent certification bodies, 5i – applicable legal requirements, 5j – producers’ organizations, 5k – activities of consumer organizations, 5l – SARS-CoV-2 pandemic.

The following terms were also explained at the end of this section:

– Food – “any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans” (Regulation (EC) No. 178/2002).

– Food safety – “assurance that food will not cause an adverse health effect for the consumer when it is prepared and/or consumed in accordance with its intended use” (PN-EN ISO 22000, 2018).

– Consumer trust in food safety – as proposed earlier by the authors of the paper (“the belief that the consumption of food will not harm the health and safety of the consumer, and will give him/her a sense of confidence towards this food and its producer, contributing to the fact that he/she will purchase this food again, repeatedly”).

Cronbach’s alpha statistics were calculated to assess the scale reliability. A scale is considered reliable if Cronbach’s alpha coefficient is ≥ 0.700 . The KMO index (Kaiser–Meyer–Olkin) and Bartlett’s test of sphericity were applied to know the appropriateness of performing factor analysis. To simplify and reduce the number of sources of confidence in food safety identified in the study, a factor analysis was conducted using the principal components method and Varimax rotation with Kaiser normalization. The following stage used multiple regression to find the relationship between sociodemographic variables (independent variables) and the studied variables (dependent variables). Only significant variables ($p < 0.05$) were considered to find the relationship between variables. Statistical analyses were performed using IBM SPSS Statistics 29.

Results and discussion

The survey conducted made it possible to determine the characteristics of the respondents, as presented in Table 1.

Table 1. The characteristics of the respondents (%)

Characteristics		Women	Men	Total
Number of persons in the household	1	1.7	6.7	2.9
	2	12.5	7.9	11.5
	3	22.4	27.0	23.4
	4 or more	63.4	58.4	62.2
Total	100.0	100.0	100.0	
Per capita income in the family	Up to PLN 1,000	17.4	18.0	17.5
	PLN 1,001–2,000	47.1	23.6	41.6
	PLN 2,001 or more	35.5	58.4	40.8
Total	100.0	100.0	100.0	

Characteristics		Women	Men	Total
Permanent place of residence	Up to 1,000 residents	37.2	39.3	37.7
	1,000–10,000	24.2	21.3	23.6
	10,000–50,000	15.7	14.6	15.4
	50,000–100,000	9.2	5.6	8.4
	above 100,000	13.7	19.1	14.9
Total		100.0	100.0	100.0
Socio-economic group	Family of a worker in a labor position	44.2	38.2	42.8
	Family of a worker in a non-manual position	11.3	12.4	11.5
	Farmer's family	19.9	29.2	22.0
	Family of a pensioner	7.5	2.2	6.3
	The self-employed family	16.8	16.9	16.8
	Family living from non-profit sources	0.3	1.1	0.5
Total		100.0	100.0	100.0

Source: Authors' own study.

The sample was predominantly female (76.9%), and the age of respondents ranged from 19 to 28 years, with an average of 22 years. Among the respondents, 62.2% were from 4-person households. More than 82% of the respondents had per capita family incomes of more than PLN 1,000, and nearly 41% – PLN 2,000 or more. The largest group of respondents lived in small towns of up to 1,000 residents, nearly 24% in towns of 1,000–10,000 residents, and 15% in cities of more than 100,000 residents. 43% of respondents described their family's socioeconomic group as a worker in a laborer position. 42% of respondents said they are the decision-makers for their family's food purchases, and 58% of other people make the family's food purchase decisions. Nearly 76% of respondents mainly buy food products at the supermarket. The main sources of information on food safety are labels for one in two respondents (52.5%), for 42% family, and for 41% social media. The largest percentage of respondents (54%) said they “neither trust nor distrust”, and more than 30% described themselves as trusting. Among the respondents, more than 61%, when expressing their general attitude toward risk, said they avoid risk, and more than 20% like risk, while more than 10% dislike it. Most often, respondents described themselves as a frugal customer (53%), autonomous (47%), balanced (45%), analytical (39%) or determined (34%). They were least likely to describe themselves as a skeptical (17%), impulsive (18%), sensitive (18%), uncertain (19%), or profligate (19%) customers.

The next step was to determine the value of Cronbach's alpha. As can be seen from Table 2, this value is 0.836 and confirms that the research tool used, in the form of a questionnaire with a set of questions, measures correctly what it is supposed to measure.

Table 2. Cronbach's alpha statistic

	Reliability statistics		
	Cronbach's alpha	Cronbach's alpha based on standardized items	Number of items
Trust, $N = 374$	0.836	0.840	12

Source: Authors' own study.

The next stage of the research proceeded to determine the level of trust in the listed determinants. Respondents' answers show that the most important determinant of trust in food safety is information on the label, in addition to the control of official inspections and independent bodies certifying production methods or quality and food safety management systems. Our results, therefore, do not coincide, for example, with the results of Zanetta et al. (2022) according to whom the decisive issues, in particular, are such as concern for food safety and risk perception. On the other hand, the results are similar to the findings of Rupprecht et al. (2020), who confirmed that the usefulness of food product label information depends on consumers' trust. Wardani and Nugraha (2022), in turn, showed the high importance of a product's country of origin in purchasing decisions. In addition, in our case, the ongoing coronavirus pandemic at the time of the survey is considered "definitely not" important. Meanwhile, Sahim and Gul (2023) confirmed that during the pandemic period, there was a decrease in trust among food consumers, such as in information on food labels. A fairly high share of "definitely not" indications were also obtained for the activities of consumer and producer organizations and the country/region of origin (see Table 3). This indicates that the activities of both bodies to popularize aspects of food safety are not very effective. Such a situation certainly calls for intensifying the process of consumer education, which should be the responsibility of not only typical educational institutions but the aforementioned consumer and producer organizations. Due to their importance in the market (Falkowski & Ciaian, 2016; FAO, 2021), their activity should be more visible and noticeable. According to Berg et al. (2005), however, higher levels of education may lower consumer trust.

Table 3. Level of trust in food safety related to the listed determinants (% of indications)

Trust to*	Definitely not	Not	Moderately	Yes	Definitely yes
5a	14.3	16.7	31.5	28.4	9.1
5b	1.6	9.7	25.8	42.8	20.1
5c	2.1	11.8	26.8	36.5	22.8
5d	4.4	12.0	33.6	36.2	13.8
5e	4.2	11.2	33.7	36.6	14.4
5f	6.3	11.5	38.5	30.5	13.3
5g	2.1	10.2	32.3	38.5	16.9
5h	2.9	10.8	27.6	37.8	21.0
5i	3.4	12.5	28.9	37.5	17.7
5j	8.4	21.7	40.7	22.5	6.8
5k	10.7	20.8	39.3	22.4	6.8
5l	35.0	20.4	26.9	12.8	5.0

* 5a – country/region of origin, 5b – information on the label, 5c – control of official inspections, 5d – the place to buy food, 5e – food manufacturer, 5f – farmer, 5g – quality assurance systems used, 5h – independent certification bodies, 5i – applicable legal requirements, 5j – producers' organizations, 5k – activities of consumer organizations, 5l – SARS-CoV-2 pandemic.

Source: Authors' own study.

To simplify and reduce the number of items (determinants of trust in food safety identified in the study) and to facilitate interpreting the results, a factor analysis was conducted. The factors found were represented by 60% of the total variance (see Table 4). The KMO index was 0.833, indicating an excellent relationship between the variables. In addition, Bartlett's test of sphericity was significant ($p < 0.001$), so the factor analysis model was adequate. Factorial loads were between 0.592 and 0.830, so all factorial loads were above the critical value of 0.50 suggested by Hair et al. (2010). Based on it, three groups of determinants (components) affecting trust in food safety were identified (see Table 5).

Table 4. Total explained variance – trust

Component	Sums of squares of loads after rotation		
	Total	% of variance	% cumulative
1	2.556	21.300	21.300
2	2.526	21.047	42.347
3	2.059	17.162	59.508

Method of extracting factors – principal components.

Source: Authors' own study.

Table 5. Matrix of rotated components – trust

Determinant of trust*	Group of determinants		
	1	2	3
5a	0.604	-0.086	0.337
5b	0.641	0.301	-0.144
5c	0.526	0.587	-0.192
5d	0.701	0.100	0.192
5e	0.706	0.230	0.253
5f	0.592	0.061	0.337
5g	0.246	0.711	0.228
5h	0.057	0.830	0.150
5i	0.047	0.778	0.299
5j	0.180	0.346	0.733
5k	0.221	0.310	0.725
5l	0.129	0.029	0.668

Method of extracting factors – principal components. Rotation method – Varimax with Kaiser normalization.

* factors signs as in Table 3.

Source: Authors' own study.

The first component explaining 21.2% of the variation primarily included factors related to the food producer and where the food was purchased (5d, 5e). The country/region of origin of the food and label information, as well as the food producer at the primary production stage – the farmer – also had smaller factor loadings, but the highest among the other components (5a, 5b, and 5f). The second component,

explaining 21% of the variation in results, included factors related to the food system (5h, 5i, 5g, and 5c). In the third principal component, the highest factor loadings were recorded for the activities of consumer and producer organizations and other sources related to the coronavirus pandemic (5j, 5k, and 5l). This component explained 17.2% of the variation in results.

Therefore, the above analyses provided positive answers to the first three research questions (Q1, Q2, and Q3). We were able to confirm the importance of the determinants pointed out by other researchers (e.g. Rupprecht et al., 2020; Wu et al., 2021; Whitworth, 2021; Macready et al., 2020; Wardani & Nugraha, 2022; Watanabe et al., 2020; Yu et al., 2021; Aung & Chang, 2022; Lang & Conroy, 2022; Rajkumar et al., 2021; Zanetta et al., 2022; EIT Food Trust Report, 2021). Thus, the analysis made it possible to distinguish the following three groups of determinants that build Gen Z students' trust in food safety, such as:

1. Group I – includes determinants related to the food producer and the place of distribution – “Place of food production and sale”.

2. Group II – refers to legal and market requirements, including implemented quality systems – “The way of food production and supervision”.

3. Group III – includes determinants such as the activities of producer and consumer organizations and external factors, such as a pandemic – “External socio-economic environment”.

Multiple regression found a relationship between sociodemographic variables and the studied variables in each group of determinants (see Table 6a, b, c, d, 7a, b, c, and 8a, b, c). Significant factors differentiating respondents' opinions in the first group (“Place of food production and sale”) were the overall level of trust (see Table 6a, b, c), type of customer (see Table 6a, d), source of information on food safety (Table 6a, b, d), in addition to gender (see Table 6d), and number of people in the household (see Table 6b).

Table 6a. Impact of sociodemographic variables on variables in the first group

Variable	Beta	Country of origin	
		t	Sig.
M11	0.168	3.245	0.001
M13/j	-0.142	2.759	0.006
M9/a	0.135	2.611	0.009
Constant		6.991	0.000
F-statistic		9.101	
Sig.		<0.001	
R ²		0.072	

M11 – the overall level of trust, M13/j – customer type – determined.

M9/a – the source of information on food safety – family.

Source: Authors' own study.

Table 6b. Impact of sociodemographic variables on variables in the first group

Variable	Beta	Label information	
		t	Sig.
M11	0.201	3.910	0.000
M3	-0.162	-3.150	0.002
M9/e	0.141	2.732	0.007
Constant		11.659	0.000
F-statistic		11.552	
Sig.		<0.001	
R ²		0.090	

M11 – the overall level of trust, M3 – number of persons in the household.

M9/e – the source of information on food safety – labels.

Source: Authors' own study.

Table 6c. Impact of sociodemographic variables on variables in the first group

Variable	Beta	Place of purchase	
		t	Sig.
M11	0.109	2.054	0.000
Constant		12.425	0.041
F-statistic		4.219	
Sig.		0.041	
R ²		0.012	

M11 – the overall level of trust

Source: Authors' own study.

Table 6d. Impact of sociodemographic variables on variables in the first group

Variable	Beta	Food producer	
		t	Sig.
M9/b	-0.158	-3.059	0.002
M1	-0.162	3.121	0.002
M13/c	-0.122	2.349	0.020
Constant		17.686	<0.001
F-statistic		8.394	
Sig.		<0.001	
R ²		0.067	

M9b – the source of information on food safety – TV/radio, M1 – gender, M13/c – customer type – family-oriented.

Source: Authors' own study.

In the second group of determinants (“The way of food production and supervision”), the significant characteristics differentiating the respondents' opinions on food safety were the type of customer (see Table 7a, b), the source of information on food safety (see Table 7a, b, c), the number of people in the household (see Table 7a, b) and the general attitude to risk (see Table 7c).

Table 7a. Impact of sociodemographic variables on variables in the second group

Quality applied systems			
Variable	Beta	t	Sig.
M13/e	0.148	2.824	0.005
M3	-0.113	-2.166	0.031
M13/g	0.122	2.341	0.000
M9/b	-0.112	-2.130	0.020
Constant		17.477	0.034
F-statistic		5.344	
Sig.		<0.001	
R ²		0.058	

M13/e – customer type – sensitive, M3 – number of persons in the household.

M13/g – customer type – sustainable, M9/b – the source of information on food safety – TV/radio.

Source: Authors' own study.

Table 7b. Impact of sociodemographic variables on variables in the second group

Independent certification bodies			
Variable	Beta	t	Sig.
M9/b	-0.155	-2.942	0.003
M13/e	0.148	2.818	0.005
M3	-0.113	-2.166	0.030
Constant		17.570	0.000
F-statistic		6.837	
Sig.		<0.001	
R ²		0.056	

M9/b – the source of information on food safety – radio/TV, M13/e – customer type – sensitive.

M3 – number of persons in the household.

Source: Authors' own study.

Table 7c. Impact of sociodemographic variables on variables in the second group

Current legal requirements			
Variable	Beta	t	Sig.
M12	-0.152	-2.868	0.004
M9/h	-0.106	1.998	0.046
Constant		18.894	<0.001
F-statistic		5.469	
Sig.		0.005	
R ²		0.030	

M12 – overall attitude to risk, M9/h – the source of information on food safety – others.

Source: Authors' own study.

Factors significantly differentiating respondents' opinions on determinants of trust in food safety from the third group ("External socio-economic environment") were the type of customer (see Table 8a, b, c), the overall level of trust (see Table

8c), place of permanent residence (see Table 8c) and use of special dietary allowances (see Table 8a).

Table 8a. Impact of sociodemographic variables on variables in the third group

Producer organization			
Variable	Beta	t	Sig.
M13/e	0.122	2.303	0.022
M10	0.117	2.217	0.027
Constant		46.770	0.000
F-statistic		4.827	
Sig.		0.009	
R ²		0.027	

M13/e – customer type – sensitive, M10 – dietary intake.

Source: Authors' own study.

Table 8b. Impact of sociodemographic variables on variables in the third group

Consumer organization			
Variable	Beta	t	Sig.
M13/e	0.153	2.926	0.004
M13b	0.130	2.479	0.014
Constant		32.740	0.000
F-statistic		7.500	
Sig.		<0.001	
R ²		0.041	

M13/e – customer type – sensitive, M13/b – customer type – economical.

Source: Authors' own study.

Table 8c. Impact of sociodemographic variables on variables in the third group

SARS-CoV-2 pandemic			
Variable	Beta	t	Sig.
M11	0.138	2.609	0.009
M13/i	0.114	2.165	0.031
M5	-0.108	-2.061	0.040
Constant		5.556	0.000
F-statistic		5.118	
Sig.		0.002	
R ²		0.042	

M11 – the overall level of trust, M13/i – customer type – tentative, M5 – permanent residence.

Source: Authors' own study.

These results, in turn, provide answers to research questions Q4 and Q5. We were able to confirm that the socio-demographic characteristics of Gen Z students have a significant impact on the evaluation of individual determinants of food safety trust (see also Zanetta et al., 2022; Ngo et al., 2023), but first of all when it comes to the number of people in the household. The more people there were in the household,

the less important such determinants of trust were: the sources of information on food safety, quality systems in place, and the supervision of independent certification bodies. This result may be influenced by the fact that a larger number of people is associated with a lower per capita income and, thus, with different priorities when shopping, e.g. sensitivity to product price. This group of recipients, that is, for example, families with many children, should be persuaded about food safety in other ways, such as increased activity by consumers'/producers' organizations. All the more so because this type of action, despite its potential (Fałkowski & Ciaian, 2016; FAO, 2021), is not effective enough.

We also received a positive response to question Q5 about the impact of the cognitive characteristics of Gen Z students on the evaluation of particular groups of food safety trust determinants. The impact of these aspects has been also signaled by Rajkumar et al. (2021), Zanetta et al. (2022), and Ngo et al. (2023), among others. In our case, such a feature turned out to be a consumer identified as vulnerable. It is this type of consumer that should be taken into account when forming opinions and building trust in food safety. It appeared that a vulnerable consumer is more susceptible to the message determining that trust. Our results are therefore consistent with the image of the Gen Z consumer reported by Uță (2022), Pradhan et al. (2023) or Squires and Ho (2023). According to the authors, Gen Z consumers are more economical and price-sensitive, and compared to older age groups, Gen Z shoppers are less likely to trust companies. The same observations were made in The EIT Food Trust Report (2021).

Conclusions

Trust plays an important role in market relations and is a valuable bridge between the consumer and the producer. In the paper, we presented many opinions on the phenomenon of trust and offered an author's definition of consumer trust in food safety. We pointed out that consumer trust in food safety can be influenced by a number of determinants. First of all, we confirmed that the questionnaire used in the study meets the reliability condition. Next, the statistical tests carried out made it possible to distinguish three groups of such determinants, and these are: "Place of food production and sale", "The way of food production and supervision", and "External socio-economic environment". This type of classification can be considered our original contribution to the study, as well as the fact that among the individual determinants analyzed, we identified those with the highest importance in building food safety trust. These are the country of origin, the requirements of the country's legal and market system as well as the activities of consumer and producer organizations. In our research, we additionally showed that socio-demographic and cognitive characteristics also play a role in perceptions of product safety and in inducing trust in food safety. Interesting, in our opinion, is the observation indicating that the more people there were in a household,

the less important were sources of information about food safety, quality systems in place, and supervision by certification bodies. To change this situation and inspire trust in food safety, for example, relevant consumer or producer organizations and certification bodies can be involved and appropriate information campaigns can be prepared. Information about the importance of the country of origin should certainly play a key role in this process. Another insight that manufacturers can put into practice when planning their marketing strategy focused on Gen Z representatives is that they should take into account the needs of a consumer who is sensitive and otherwise susceptible to different types of information stimuli, such as those contained on product packaging or other product information media. In our opinion, the article fills a gap in research on consumer trust, mainly among GenZ students in Poland. So far, there has not been such a comprehensive analysis of a number of different characteristics that determine trust, in particular when it comes to food safety.

However, there are limitations associated with our research. Above all, there is too little or invisible work on food safety trust among Gen Z, including students. Hence, we could not compare the results of our study with other results conducted among a similar group of respondents and in a similar subject area. So far, in general, food trust, *per se*, is mainly studied. A second limitation may be the fact that the study was conducted with students, in addition, from a single university. Hence, future research should include, for comparison, students from other academic centers. Additionally, it is worth considering a study among Gen Z non-students. We also believe that future research could focus on trust in food safety of particular types of food, such as organic, processed, unprocessed, etc. A survey planned and implemented in this way can provide greater and more objective insight into understanding this important phenomenon.

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