

INNOVATIVE FOOD PRODUCTS IN THE EYES OF POLISH YOUNG CONSUMERS

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Abstract. This article discusses the acceptance of innovative food products – i.e. new and unconventional products that have not been widely consumed so far. The aim of the article is to determine the level of acceptance of innovative food products by young Poles. We put a thesis that innovative food products are not readily accepted and that consumers do not perceive them as worth more than typical food products. Thus, food products are difficult to be subjected to major innovations. The research methodology was based on the literature review summarizing scholarly literature on the chosen research topic, a questionnaire survey, comparative analysis and logical construction research methods. This study is essential from at least two perspectives: 1) acceptance of novelties is important for the authorities shaping social policies regarding sustainable development and food security; 2) understanding the customers is important for food industry companies that want to introduce new products to the market.

Food preferences are often tied to cultural traditions, which can make it difficult for new or unfamiliar foods to gain traction. This is confirmed by the results of the study elaborated in the article: the approach of respondents to innovative food products is ambiguous - they agree that such products are beneficial for people and the Earth's resources, but not always they are ready to use them themselves. The research also shows that innovative products would not be accepted immediately and consumers would need time to get used to them. Therefore, the authorities shaping social policies regarding sustainable development and food security, as well as food producers, should plan educational campaigns explaining the benefits of alternative food sources and innovative food products.

Key words: behaviour of young Poles, culture, food consumption, innovative products.

JEL code: D11, E2, M3, O3

Introduction

An innovative product is one that introduces something new or significantly improves upon an existing solution. Innovation can take many forms, such as a new technology, a new design, a new way of using an existing product or a combination of these (Ziemnowicz, 2013). One of the approaches to innovation says that the most important thing is that the product is evaluated as new or innovative by consumers.

An innovative product can offer unique benefits that differentiate it from competitors or existing solutions in the market. These benefits can include enhanced functionality, improved user experience, increased efficiency, reduced costs, and environmental sustainability. It can also make the consumer feel more responsible for the environment and the earth's resources.

Innovation is important in business because it helps companies stay competitive, attract customers, and stay relevant in an ever-changing market. It means that an innovative product can create a competitive advantage for a company, leading to increased revenue and growth. For all this to happen, consumers must be positive about innovation. However, innovative products are often more expensive than those existing on the market. This is due to the costs that have to be incurred to develop a new product, and it is also due to the costs of introducing it to the market. This may deter the average consumer from purchasing.

The article concerns the acceptance of food novelties. **The aim of our work is to determine the degree of acceptance of innovative food products among young consumers.** We put a thesis that innovative food products are not readily accepted and that consumers do not perceive them as worth more

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than typical food products. This is a slightly different approach than to non-food products, as consumers generally agree that an innovative product should cost more (Sadik-Rozsnyai, 2016). Thus, food products are difficult to be subjected to major innovations.

This article is the first part of a larger study covering Latvia, Poland and Spain, and we are convinced that the results can be applied in each of these countries as well as in other European ones. Especially, that this topic is important from at least two perspectives: 1) acceptance of novelties is essential for the authorities shaping social policies regarding sustainable development and food security; 2) understanding the customers is important for food industry companies that want to introduce new products to the market.

Research methodology

At the beginning of 2023, an online questionnaire survey was conducted with 10 questions on innovative solutions related to food. Respondents were asked to evaluate various product innovations: vertical home gardens (vertical small shelves with plants) - a new kitchen functionality that allows consumers to grow certain edible plants at home; smoothies made from **vegetable waste (e.g. watermelon rinds); functional snacks with detailed information on** beneficial nutrients; plant-based meat substitutes - products that taste like meat, but are made from plants; a new use of cannabis, in the form of hummus or pesto; alternative proteins from plants and microorganisms added to food products; "ugly products" made from natural ingredients and waste; adult soft drinks disguised as alcohol; farmed insects and worms as a food ingredient; and finally, beer based on water recovered in a sewage treatment plant. All these products really exist and can be found on the European market. Respondents rated the given innovations on a Likert scale of 1 to 5, evaluating the statements: I think it's a great idea; I think it's good for everyone; I think it's good for the Earth; it's worth buying even if the price is higher than average. The questions were arranged in order from total rejection to total acceptance (Encyclopedia Britannica, n.d.). At the end of the questionnaire, respondents could say what they thought the average consumer would think of such innovations in an open question.

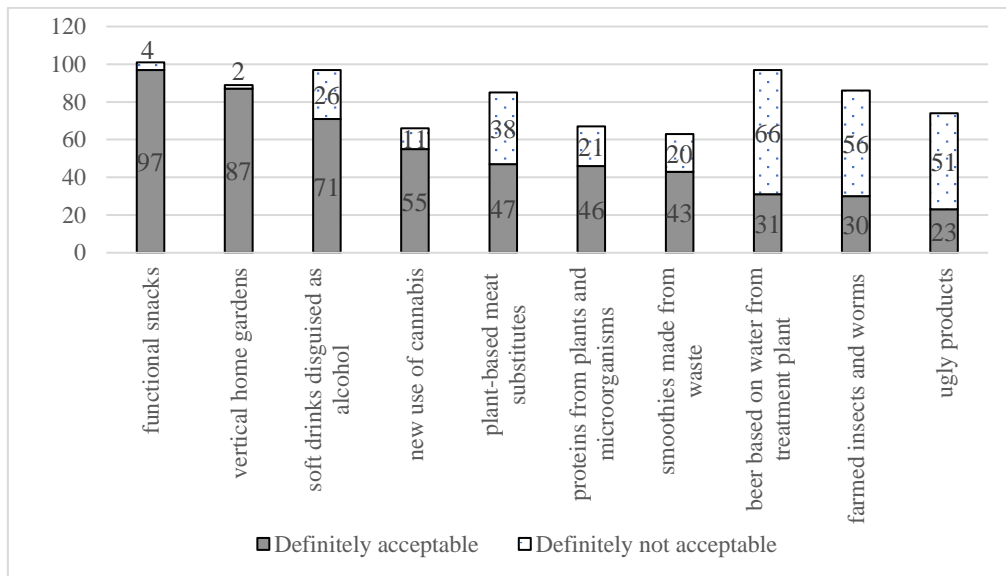
185 questionnaires were obtained, of which 90 came from women, 90 from men, and 5 people did not want to give their gender. 73% of respondents are under the age of 30, which is not surprising considering that the survey was conducted online. However, the structure of the sample does not reflect the structure of the whole society, therefore the obtained results should be related mainly to young people. The income of the respondents is also important information - in relation to the average earnings, 54% of the respondents earn below and 46% above the average income (in 2022 in Poland the average earnings was PLN 4,900 net, which is equal to EUR 1,046⁵).

Results

First of all, the respondents were asked about the acceptance of a given innovation. The answers are shown in Figure 1. It is very interesting that in a few cases the respondents are firm in their assessments - 3 innovations obtained a definite acceptance, 3 - strong rejection, the remaining ones evoke mixed feelings. Thus, the innovations which gained the greatest acceptance were: functional snacks (97 positive indications, which is 52.4%), vertical home gardens (87 indications, 47%), and alcohol-free drinks (71 indications, 38.4%). Negative reactions, however, got beer based on water from treatment plant (66 negative indications, which is 35.7%), farmed insects and worms (56 negative indications, 30.3%) and ugly products (respectively, 51 indications and 27.6%). Mixed feelings were obtained by products such as plant-based meat substitutes, proteins from plants and microorganisms or smoothies made from waste.

⁵ PLN 1 = EUR 0.2135, according to the average exchange rate of the National Bank of Poland on March 9, 2023.

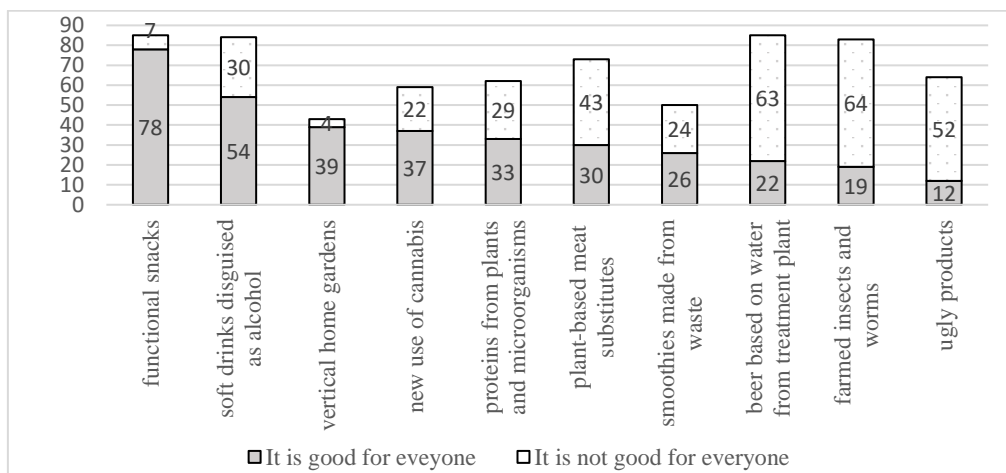
For example, the latter product received 43 positive and 20 negative indications, although respondents' opposition is not as strong as for the three products mentioned earlier.



Source: authors' calculations based on the research data, 2023

Fig. 1. Positive and negative reactions regarding food innovations (n=185)

It is evident that consumers sometimes do not accept innovations (Figure 2) - when they were asked what is good for everyone, more negative than positive indications were given to beer based on water recovered in a sewage treatment plant (22 positive versus 63 negative), farmed insects and worms (19 versus 64), and ugly products (12 versus 52). Again, 3 innovations received the most positive reviews: functional snacks (78 positive indications, 42.1%), alcohol-free drinks (respectively 54, and 29.2%) and vertical home gardens (39, and 21%).



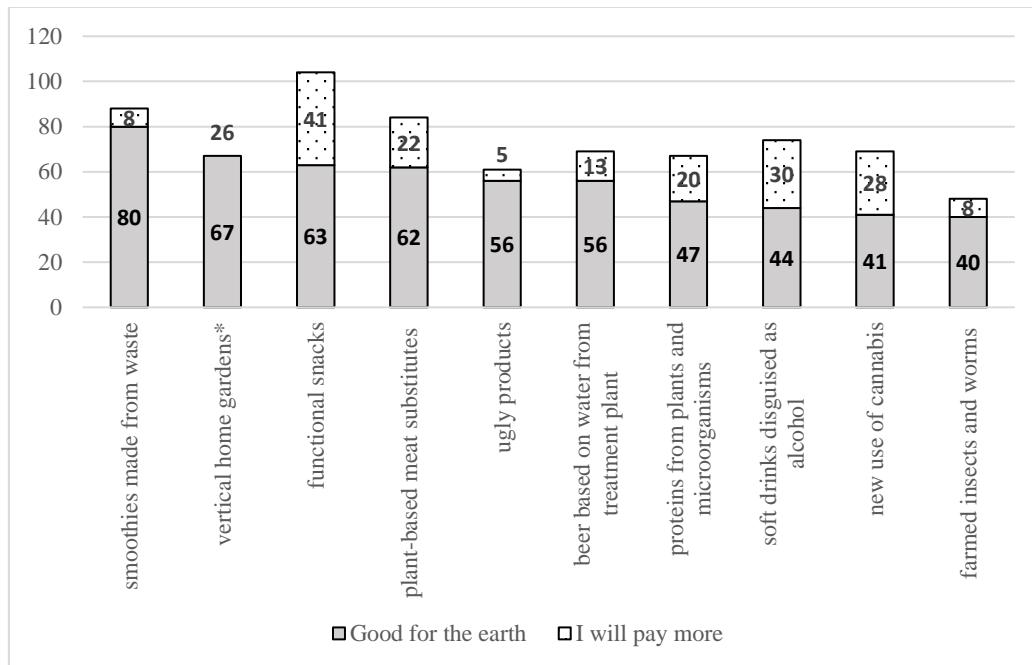
Source: authors' calculations based on the research data, 2023

Fig. 2. Are the given innovations good for everyone? (n=185)

Then respondents were asked if the innovation was good for the Earth (Figure 3) - again, the same products that previously received the most positive reviews are repeated, however, their order changes: number 1, and therefore the most earth-resource-friendly innovation, is smoothie made from vegetable waste (80 positive indications, 43.2%), then vertical home gardens (67, and 36.2%), and functional snacks (63 and 34%). With this question it can be noticed that generally the respondents evaluate innovations very positively, because the average of positive indications is 55.6 (30%), so they understand that such

innovations are good for the Earth. On the other hand, indications for the statement "they are good for everyone" were worse - the average of positive indications was 35 (18.9%).

Interestingly, according to the respondents, one of the most valuable innovations - smoothies made from waste - is at the same time rated as the one for which they will not pay more than necessary. Only 8 respondents (4.3%) declared that they could pay a little more for this product. The relationship between the overall value of innovation and the willingness to sacrifice one's money is shown in Figure 3 as well.



*vertical home gardens - here the answer was "I will do it"

Source: authors' calculations based on the research data, 2023

Fig. 3. The willingness to sacrifice one's money for products which are good for the Earth (n=185)

One question was open and respondents could enter their thoughts. Answering to what in their opinion an average consumer would think of such innovations, they said (quotations) listed below.

- 1) *Some of the innovations in the survey may be controversial, especially those related to sewage or insects, which are associated with something repulsive and "dirty". I think that it would be easier to encourage people to these ideas if things made of waste were cheaper than traditional ones. These ingredients would otherwise be wasted and so both parties can benefit.*
- 2) *Consumers may be afraid to try something new, they need time to accept.*
- 3) *I think opinions will be divided. It gave me mixed feelings. Some of the products seem quite interesting, while others are repulsive at the very thought.*
- 4) *The response depends on the person. Some people will like it more and others less, but I don't think the reactions will be very positive.*
- 5) *I think that at the beginning of the introduction of such innovations and such substitutes in food products, there will be little interest at first. But after good publicity, social media coverage, and TV coverage, some community will start to introduce these solutions to their households.*

It is evident that the respondents personally either do not have a clear opinion about the presented innovations, or the opinion is negative. In the comments of the respondents, however, it is visible what they lack - information and promotion, above all.

Discussion

It is important to note that there is no monolithic "European", or "Spanish", or "Polish" customer (Gescinska 2018; Bárcenas et al., 1998), and the cultural, social, and political characteristics of people can vary greatly depending on a number of factors, including historical context, economic development, regional differences and religion, as well as personal experiences and preferences. This also applies to the acceptance of new products or - as you might call them - innovations (Yeniyurt, Townsend 2003). In this article we discuss the acceptance of food novelties that have recently been introduced and may be accepted by a given society or rejected.

At first glance, it would seem that the group of respondents we obtained in this study is inappropriate, because mostly it is consisted of people under 30. But aren't young people the ones who are open to new things and absorb all innovations? That's why we decided to continue this study and look at the issue of accepting new things from the perspective of young people. It is generally believed that young people tend to be more open to innovations than older generations (Packalen, Bhattacharya 2019), as they have grown up in a world of rapid changes (i.e. technological advancements) and are often early adopters of new technologies, and new trends. However, it's important to note that this is not a universal rule, and there can be significant variations among different individuals and countries. Additionally, even among young people, there may be some who are more resistant to change and new ideas, as we can see in obtained results.

Factors such as education, socio-economic background, cultural upbringing, and personal beliefs can also influence how open individuals are to innovations (Sparke and Menrad, 2011). For example, someone from a rural area, and with conservative approach to life may be less open to new and innovative products compared to someone from an urban area with more exposure to and experience with new ideas (Yeganeh, 2023; Zhang and Gong 2022; Lekezwa and Zulu 2022; Masry-Herzallah and Da'as 2021).

Vanhonacker et al. (2010) says that traditional food consumption patterns are stronger in the south than in the north of Europe. But, analysing food innovations from different perspectives, you can definitely notice that everywhere food can be a multi-sensory experience, engaging our senses of taste, smell, and sight (Batat, 2019). Preparing and enjoying food can provide a rich sensory experience that can be deeply pleasurable and rewarding. So, it may be understandable that worms and other insects, although sometimes considered as a delicacy, in many other cultures are not accepted. Such a situation can be observed in the results presented in this article. The majority of the respondents had ambiguous opinions, and sometimes even negative ones, about non-traditional foods. The respondents even used the words 'repulsive' and 'disgusting'. According to our results, this is especially true for worms and insects, sewage and dirty water, and generally unsightly products. In the given cases, twice as many respondents rejected such a product than accepted it. It seems that consumers better evaluate innovations that are predetermined to provide positive, additional ingredients (such as vitamins) or do not involve eating a meal at all. Therefore, functional snacks and vertical home gardens received the most positive reactions (52.4% and 47%, respectively).

Hémar-Nicolas, Pantin-Sohier, and Gallen (2022) say, that in Western culture insects are considered as non-edible, therefore people predominantly reject insects as food. Thus, our results confirm the previously conducted research (Clarkson, Miroso, and Birch 2018; Cunha, Silva, and Cheung, 2023). What is puzzling, however, is the opposition to the recycling of dirty water and consumption of ugly products. This may be related to the trend being named "Instagram-able food" – this vogue is observed among young people for whom the quality of food is as important as the appearance. So, "Instagram-able food" refers to dishes or

drinks that are visually appealing, colourful, and spotless, and this would explain the reluctance of respondents to imperfect products. Our results show that ugly products are largely unacceptable (27.6% strongly rejected it), they are not perceived as good for everyone, and they are not among the innovations that consumers are willing to pay more for. These issues may be the subject of further research.

Governments and organizations often implement regulations and policies to reduce food waste, such as setting food waste reduction targets, providing incentives, and promoting composting and recycling programs (Koester, 2017; Fraj-Andrés et al., 2023). Consumers may take a similar approach. And it seems that some of the respondents were willing to accept the novelty because it was connected to waste reduction. According to Bekin, Carrigan, and Szmigin (2006), people undertake such challenges as utilization of innovative food, because they want to make a positive contribution to the world. Here one can see an opportunity for responsible consumption (Ozcaglar-Toulouse, 2007). In obtained results, however, we can notice little willingness to engage personally in innovative consumption. Respondents believe that innovative products are indeed good for the Earth and future generations, but they personally do not want to be involved (i.e. buy and consume). Only products that are indisputably positive, such as functional snacks, alcohol-free drinks or vertical gardens, gain the status of "good for everyone", and therefore also for the person answering the questionnaire. Innovations such as plant-based meat substitutes, proteins from microorganisms, smoothies from waste, or protein from insects and worms, are not widely accepted by young respondents. The reason may lie in the culture and tradition of eating, and the perception of what is beneficial. The question of willingness to pay more for an innovative product also refers to the benefits - in our survey, respondents believe that if something is made from waste or from ingredients that are commonly available (like worms), then producers should not charge more money for it. There were even statements to the contrary, that such products should be much cheaper.

It seems that for innovations that improve health and safety, people tend to be more willing to pay more because it makes sense to invest in their health and safety. At the same time, if the innovation provides convenience or makes everyday life easier, people are also more likely to pay more. If consumers do not see a compelling reason to accept the novelty then they become reluctant and wait for broader market information (Alphonse, Waized, and Larsen, 2020). Either way, people need motivation for acceptance of novelty and positive behaviour (Chengqin et al., 2022).

On the other hand, a certain amount of hesitation in the respondents' answers can be observed - many of them indicated that initially people will reject mentioned food innovations, but over time they will get used to. Therefore, the role of marketing and promotion on the part of enterprises producing innovative food is important - companies should promote innovative mindset and consumer empowerment (Kumar and Dholakia 2022; Ozcaglar-Toulouse, 2007). Varese, Cesarani, and Wojnarowska (2023), suggest four different interventions creating new consumer attitudes: availability of products in the supply chain, enabling personal experience, launching awareness campaigns, and finally promoting circular economy, and innovative food products. Nevertheless, it is worth noting that the level of involvement in such activities may vary depending on individual beliefs, values and life situations. Sometimes people may be more willing to make sacrifices for loved ones or communities with which they identify more strongly than for the general public.

So, certainly it all depends on the individual situation and individual approach, but we can see a certain regularity in the obtained results: the majority of respondents understood the need to reduce consumption and protect the Earth resources (Fig. 3), and mostly accept the presence of innovative food products on the market (Fig. 1), however, personally they are not so willing to consume them, and they are not willing to pay more than for typical products (Fig. 3). This is an important guideline for producers of innovative

food products: the product must be accompanied by clear information about the benefits for the respondent, and such a product must not be more expensive than classic food, because consumers will not want to pay more (Senker 1990; Vlosky, Ozanne, and Fontenot, 1999; Samaraweera, Sims, and Homsey, 2021).

It's understandable that consumers are wary because the widespread use of processed foods and artificial additives has been linked to a range of health issues, including obesity, diabetes, and heart disease. In addition, certain types of food innovations, such as genetically modified organisms can be controversial and raise concerns about the potential long-term impacts on human health and the environment (Jasrotia, Darda, and Pandey, 2022). Therefore, consumers choose products they know and about which they have enough positive information (Bárceñas, 1998), therefore, in our study, only some innovations were positively assessed by the respondents. It should be noted that no product was positively accepted in 100% by all respondents, which means that respondents are generally reluctant to accept a novelty on the food market.

Consequently, it can be said that food can be changed to a certain extent, depending on the specific context and circumstances. So, it cannot be completely new ingredients or recipes that have never been used in a given society before. For example, individuals can choose to modify their own diets by making changes to the types of foods they eat or the way they prepare and consume their food. However, attitudes towards farmed insects and worms as a food source are changing in many parts of the world, as people become more interested in sustainable and alternative food sources. As more research is conducted and new culinary techniques are developed, it is possible that insects and worms may become more widely accepted as a food source in the future (Frewer, Scholderer, and Lambert, 2003). As one of the respondents said about food novelties: "consumers may be afraid to try something new, they need time to accept". Thus, an appropriate promotion, information, and product availability will change consumer attitudes.

Conclusions and recommendations

- 1) While it's generally true that young people are more open to innovations than older generations, it's important to keep in mind that this is not a blanket statement, and there are many individual and contextual factors that can influence how open someone is to new ideas.
- 2) The acceptance of new food products depends on several key factors. First of all, food can be a powerful marker of cultural identity, as it reflects the traditions, customs, and beliefs of a particular community. Sharing and enjoying traditional foods with others can help to reinforce a sense of identity and belonging, therefore people - also young people - are attached to the food they know from their family home and are not willing to change it. Thus, innovative food products will not be accepted if there is no information about what problems they solve - problems can be with individual consumers, they can be with society, and they can be with the whole Earth - consumers just need motivation.
- 3) The approach of Polish consumers to innovative products is ambiguous - on the one hand, they see the need for rational consumption of Earth resources and they assess, that the given innovations are beneficial. However, on the other hand, they personally don't think these are the products for them and are not willing to pay more than for average food products. In their statements, the respondents were quite reserved and most of them indicated that innovative products would not be accepted immediately and consumers would need time to get used to them.
- 4) It must be said that if something is traditionally perceived as unclean or associated with waste (sewage), associated with products not intended for human consumption (food waste), or with products that have never been consumed (worms), then young consumers express strong opposition to

consumption. In such a situation, the desire to protect the earth's resources and responsible consumption recede into the background, therefore the thesis put forward at the beginning of the article has been confirmed.

5) The research results suggest that the authorities shaping social policies regarding sustainable development and food security should plan educational campaigns explaining the benefits of alternative food sources and innovative products. This is important both from the perspective of rational consumption and ensuring food availability. In addition, innovative food producers should understand consumers behaviour: consumers have the right to information and therefore need to know what is in the food; consumers must be motivated to buy and eat atypical foods; consumers must know that by buying a given product they gain benefits for themselves (better health, lower price) or benefits related to the functioning of a given society.

6) Summing up, it can be said that while individuals have the ability to make decisions, there are a variety of factors that can influence and limit their ability to make choices that align with their best interests. Addressing these factors may require a combination of individual efforts, policy interventions, and even systemic change.

7) This article shows only a part of the problem of accepting food innovations in Poland, and of course the topic is not exhausted. There are several topics that may be the subject of further research: price flexibility of innovative food products, availability of products in the distribution channel, producer's pricing policy, as well as scope of information about benefits for consumers in potential promotional campaigns.

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