

## ORIGINAL ARTICLE

**Citation:** Jakubowska, D., & Radzyńska, M. (2019). Health and environmental attitudes and values in food choices: a comparative study for Poland and Czech Republic. *Oeconomia Copernicana*, 10(3), 433–452. doi: 10.24136/oc.2019.021

Contact to corresponding author: dominika.jakubowska@uwm.edu.pl; University of Warmia and Mazury in Olsztyn, ul. M. Oczapowskiego 4, 10-719 Olsztyn, Poland

Received: 12.12.2018; Revised: 14.07.2019; Accepted: 28.08.2019; Published online: 19.09.2019


### Dominika Jakubowska

University of Warmia and Mazury in Olsztyn, Poland

 [orcid.org/0000-0002-2797-9680](https://orcid.org/0000-0002-2797-9680)

### Monika Radzyńska

University of Warmia and Mazury in Olsztyn, Poland

 [orcid.org/0000-0003-0531-268X](https://orcid.org/0000-0003-0531-268X)

## Health and environmental attitudes and values in food choices: a comparative study for Poland and Czech Republic

**JEL Classification:** A14; D12; D91; L66

**Keywords:** consumers; health and environmental sustainability; sustainability of food systems; sustainable consumption

### Abstract

**Research background:** Health and environmental concerns linked to food production and consumption have become crucial both for policy makers and for consumers for modern society. Some consumers are becoming increasingly careful about what they eat, giving value to the impacts of everyday food choices on their health and on the environment. There have been few studies that have jointly analyzed these consumption patterns and that have looked for their association.

**Purpose of the article:** The objective of the study is to develop a Polish (PL) and Czech (Cz) young-adult consumers' segmentation based on health and environmental attitudes and values in food choices. The research is needed to diagnose consumption trends in this segment of the market to enable creating a market offer tailored to this group of consumers.

**Methods:** A total of 631 students from two Universities — one in Poland (University of Warmia and Mazury in Olsztyn (323)) and on in the Czech Republic (University of South Bohemia (308)) were selected to participate in the research. The sample of students was chosen because of the importance of young-adult consumers as the participants of the market with a specified purchasing potential. The data were collected through a survey questionnaire, in which a Likert type scale

was used to determine the health and environmental attitudes and values in food choices. The results obtained were analyzed statistically using Statistica 13.1 using Principal Component Analysis (PCA) with Varimax rotation, cluster analysis using the k-means method and ANOVA.

**Findings & Value added:** The survey demonstrated that the students presented both health and environmental attitudes, and that their food choices were driven to a lesser extent by the environmental than by the health-related values. Results demonstrated that the two distinguished factors significantly differentiated both the Polish and the Czech students into two clusters, with the first cluster being represented by consumers presenting stronger health and environmental attitudes (PL N=58%, Cz N=48%) compared to the students from the second cluster. It adds value to recent young consumers' behavior knowledge by jointly analyzing their attitudes toward health and environmental values in food choices. These findings may be useful in developing effective educational and marketing campaigns and understanding the demand for certain products.

## Introduction

The problem of imbalance in the production and consumption of food in today's world becomes an alarming issue. In the face of demographic changes, industrialization, and globalization of agriculture and food processing; changes in food consumption patterns; and a growing gap between rich and poor societies the problems related to the sustainability of food systems will aggravate in the future. Hence a need emerges for radical changes aimed at increasing the efficiency and protection of resources that would enable satisfying nutritional needs of our increasingly urbanized planet.

Food consumption is a major issue in the politics of sustainable consumption and production because of its impact on the environment, health, and the economy (Reisch *et al.*, 2013, pp. 7–25). Consumer food choices can have a large environmental impact. An estimated 20–30% of the environmental impact caused by European households is related to food consumption (Siegrist & Hartmann, 2019, pp. 196–202). Consumer choices can play a leading role in orienting production as they are driven by the place of origin, production processes or manufacturer of a food product. Consumers can also exert strong influences through the ways they buy, transport, cook, and consume their food. The interest in issues concerning health and environmental sustainability has grown among consumers of industrialized countries, impacting their food consumption choices. Indeed, some consumers are becoming increasingly careful about what they eat, giving value to the impacts of everyday food choices on their health and on the environment (Banterle & Ricci, 2013, pp. 149–158; Cavaliere *et al.*, 2014, pp. 9494–9509). On the other hand, nutrition is one of the main sources of the use of planet resources and at the same time contributes to the production of materials adverse to the natural environment (Annunziata & Vecchiob, 2016, pp. 193–200).

The complexity of the issues related to the sustainable consumption prompts research on the attitudes and behaviors of consumers which affect their health and the natural environment. Assessment of attitudes of young consumers is particularly interesting in this case. The importance of the role of young consumers in consumption processes is justified by the fact that they have an increasing purchasing power, and that the presence of children and adolescents in a family transforms the level and structure of expenditures and consumption in the household (Gutkowska & Ozimek, 2008, pp. 248).

Based on these considerations, the present study aims to develop a consumer segmentation based on health and environmental concerns in food choices among Polish and Czech students. An attempt has been made to answer the following research questions: whether Polish and Czech students present any health and environmental attitudes and whether their attitudes are reflected in their food choices. The knowledge about the environmental and health values in students' food choices, which represents the outcome of this survey, will allow for adapting the educational and marketing activities in the researched countries.

This study is focused on filling the gap in our knowledge about the health and environmental values in food choices made by young consumers, as well as on identifying differences between countries. It adds value to recent young consumers' behavior knowledge by jointly analyzing their attitudes towards health and environmental values in food choices. More specifically, this research is focused on food-related environmental and health beliefs of university students assessed through:

- determining whether young consumers present health and environmental attitudes and whether their food choices are driven by the health and environmental values;
- determining whether the nationality of students determines their health and environmental attitudes and values in their food choices.

The study was conducted at two large universities in north-eastern Poland and the southern Czech Republic based on literature studies and empirical data collected among 631 respondents from Poland and the Czech Republic. A paper-based questionnaire was used in the exploratory empirical study.

The paper is structured as follows: the first part includes an overview of the recent economic literature on health and environmental sustainability issues related to food choices. Following this, the research method and the results of the empirical studies are presented. Conclusions and implications are then forwarded and, finally, study limitations and suggestions for future research are explained.

## Literature review

A large body of research has focused on understanding consumer food choices, including why consumers choose and consume specific food products. So far, numerous attempts have been undertaken to classify the factors which influence consumer behavior and multiple models have been proposed to characterize the factors which influence food choices (Khan & Hackler, 1981, pp. 129–153; Shepherd, 1985, pp. 10–11; Gains, 1994, pp. 51–76; Rybowska & Babicz-Zielińska, 2007, pp. 130–132). Traditional models (Grunert, 1997, pp. 157–174; Grunert, 2005, pp. 369–391) assume that consumer choices are determined by internal factors (color, texture, taste), external factors (price), as well as economic and socio-demographic characteristics of consumers. In addition, it is claimed that in the developed countries food choices are increasingly often driven by additional factors associated with the acceptance of new trends, like e.g.: health-promoting value, as well as environmental, political, and social concerns (Verbeke, 2008, pp. 281–288; Lindeman & Väänänen 2000, pp. 55–59; Honkanen *et al.*, 2006, pp. 420–430; Gagić *et al.*, 2014, pp. 41–51).

Health and environmental aspects are observed to prevail, particularly in recent years, among the factors which affect food choices (de Maya *et al.*, 2011, pp. 1767–1775; Rana & Paul, 2017, pp. 157–165) they are perceived as an outcome of the care of the population over the quality of their life, including their health and natural environment. The growing interest in sustainable production and consumption of food increases the potential impact of health and sustainability considerations on food purchase decisions, and the potential role of health and sustainability as attributes of food products in their consumer evaluation (de Boer *et al.*, 2009, pp. 850–860). Consumers with specific health goals in mind pay increasing attention to nutrition labels on provided food product packages and make healthier choices (van Herpen & van Trijp, 2011, pp. 148–160). Some experts have indicated that people have no sufficient knowledge and therefore need decision aids — such as eco-labels and smartphone apps — to assist them in making more healthy and sustainable purchase decisions (Head *et al.*, 2014, pp. 165–174).

Understanding why people select certain food items in their everyday life is crucial for developing interventions to promote healthy and sustainable diets. In the past, most research has focused on eating pathologies, such as eating disorders and obesity (Renner *et al.*, 2012, pp. 117–128). Since consumption patterns related to food are significant sources of greenhouse gas emissions and other environmental problems (Nissinen *et al.*, 2015, pp. 455–466), the debates on the role of consumption in advancing sustainabil-

ity are now prominent both in everyday life, the media, and various political strategies (Nivaa & Jallinoja, 2018, pp. 349–360).

The majority of investigations addressing health and environmental attitudes in food choices have been carried out among adult consumers, while young consumers have been rarely surveyed in this respect. Young-adult consumers are an interesting consumer segment to explore consumer attitudes to health and environment due to their high consumer autonomy and spending power (Grønhøj, 2007, pp. 243–264), large household influence (Grant & Waite, 2003, pp. 48–57), insight into adult consumer behavior (Rašković *et al.*, 2016, pp. 3682–3686). Considering the importance of young-adult consumers as the participants of the market with a specified purchasing potential, the sample of students was chosen. The research is needed to diagnose consumption trends in this segment of the market to enable creating a market offer tailored to this group of consumers. This justifies the advisability of the undertaken study presented in this manuscript.

## **Research methodology**

Two universities, i.e. University of Warmia and Mazury in Olsztyn (Poland) and University of South Bohemia (the Czech Republic), were chosen for this study. Both Universities are major public research and development centers in the regions they are located in, namely: the south of Bohemia (the Czech Republic) and the north-eastern part of Poland. Most of the adolescents studying at both universities live in the aforementioned regions. The survey included students aged from 20 to 24 years, studying at majors of agricultural sciences, social sciences, the science, and life sciences.

Data were collected a convenience samples in the years 2015–2016 (Czech sample) and in the years 2017–2018 (Polish sample). The students were surveyed in lecture and experimental rooms, with an intermediate technique using a paper-based survey questionnaire. They were invited to participate in the study and advised that the participation was voluntary, and that they could terminate the survey at their own discretion. Should they decide to proceed, a completed questionnaire was requested to be handed back to the researcher who was present during the survey.

Out of 800 survey questionnaires (400 at each university) that were distributed, 631 valid responses were obtained for further analysis (N = 323 from the Polish students, N = 308 from the Czech students).

The original survey questionnaire in Polish was translated into Czech. The survey instrument contained statements related to health (13 items) and

environmental (7 items) attitudes and values in food choices. All the items were measured on a seven-point Likert scale with anchors from 1 = strongly disagree to 7 = strongly agree. The health and environmental items were adapted based on our previous research (Radzymińska, 2016, pp. 190).

To investigate the relationship between consumers' health and environmental attitudes and values in food choices, two hypotheses were advanced in our study:

*H1. Students present health and environmental attitudes, and their food choices are driven by the health and environmental values.*

*H2. Nationality of the students differentiates their environmental and health attitudes and values in their food choices.*

The data obtained from the survey were analyzed with Statistica 13.1 package separately for the Polish and Czech respondents. Basic statistics were determined, including: mean values ( $\bar{x}$ ), standard deviation (SD), and median (M). The variables which significantly differentiated the health and environmental attitudes were selected based on the Varimax-rotated Principal Component Analysis (PCA). The number of the principal components was established according to the Kaiser's criterion, assuming the minimal Eigenvalue equal to 1. In turn, cluster analysis with the  $k$ -mean method was used to determine the differences between students in the established principal components. The decision on the number of clusters was taken arbitrarily. The analysis of variance (ANOVA) was used to test differences between clusters and to compare means of the variables representing the health and environmental attitudes and values between the clusters.

## **Results**

Table 1 presents the results of descriptive statistics of the health and environmental attitudes and values in food choices of the Polish (Pl) and Czech (Cz) students. The results provided therein point to significant ( $p < 0.05$ ) differences in health and environmental attitudes between the surveyed groups of respondents. Generally, the Polish students presented stronger health and environmental attitudes compared to the Czech students. When analyzing the health attitudes, it was concluded that both the Polish and the Czech students, participating in the study, were convinced that the eating habits affected their health status (mean scores given by Pl and Cz students were: 6.65,  $M=7$  and 6.25,  $M=6$ ). The students declared that: they take care

over their health (Pl M=5, Cz M=6), wholesomeness of consumed foods is important to them (Pl and Cz M=5), their diet includes vegetables and fruits (Pl and Cz M=6), they read labels of purchased food products (Pl M=6, Cz M=5), they pay attention to the quality (Pl M=6 and Cz M=5) and composition of food they buy (Pl M=6 and Cz M=5), and they try to eat regularly (Pl and Cz M=5). In turn, it was found that in their food choices the Polish students prefer as little as possible processed food products (M=5) and that they buy food products with possibly the lowest number of preserving agents (M=5), while the Czech students presented ambivalent attitudes in this respect (M=4). Nevertheless, it was demonstrated that both groups usually pay no attention to the number of ingested calories (Pl M=3 and Cz M=2). In addition, the survey showed that significantly ( $p < 0.05$ ) more Polish than Czech students extend their knowledge concerning healthy nutrition by watching educational programs (M=5). Generally, students of both nationalities declared that they did not read and did not buy books about healthy nutrition (Pl M=3 and Cz M=2). The analysis of the environmental attitudes of students revealed they were aware of the environmental concerns related to food production. In their opinion, environmental pollution was due to the today's lifestyle (Pl and Cz M=6) and to the activities of the industry (Pl and Cz M=6). The students evaluated the industrialization of agriculture and food processing as unfriendly to both the natural environment and the consumer (Pl and Cz M=6). According to the respondents, consumers should choose products packed in environmentally-friendly packages (Pl M=6 and Cz M=5). In turn, it was demonstrated that the environmental aspect was often neglected in food choices made by students of both nationalities (Pl and Cz M=4). Finally, the surveyed students were not representatives of the so-called green consumers (Pl M=4 and Cz M=2).

To establish the differences in health and environmental attitudes and the values between students of the same nationality, the obtained data were subjected to the Varimax-rotated principal component analysis (PCA) and to the cluster analysis with the method of *k*-mean grouping. The results of the principal component analysis of data gathered for the Polish and the Czech students were presented in Table 2. In the case of both the Polish and Czech data, the PCA extracted two non-correlated factors which classified variables referring to the health and environmental attitudes of young consumers. The two factors extracted from the data of the Polish students explained 88% of the variance of variables, with Factor 1 explaining 54% and Factor 2 explaining 34% of the total variance. In turn, the factors extracted from data of the Czech students explained 85% of the total variance, with Factor 1 explaining 52% and Factor 2 explaining 33% of the total variance.

In both groups of students, Factor 1 was represented by items referring to the health attitudes, whereas Factor 2 by items representing the environmental attitudes. In the case of data of the Polish students, Factor 1 was the most strongly correlated (factor loading > 0.700) with the following items: *I prefer as least as possible processed food products* (0.712), *I pay attention to the quality of food products I buy* (0.753), *I read labels provided on food packages* (0.753), *I buy natural food products with the lowest possible number of preserving agents* (0.752), and *I pay attention to the composition of purchased foods* (0.774). In turn, Factor 2 showed high loading with the item: *I believe the condition of the natural environment affects the quality of produced food* (0.706). In the case of data gathered for the Czech students, Factor 1 contained two highly correlated (factor loading > 0.700) items: *I read labels provided on food packages* (0.723) and *I pay attention to the composition of purchased foods* (0.725). In turn, Factor 2 was the most strongly correlated with the following items: *The condition of the natural environment is strictly related to the activities of the industry* (0.727) and *Industrialization of agriculture and food processing is unfriendly to both the natural environment and the consumer* (0.726). The reliability of the results was measured through the Cronbach's alpha, which was from 0.76 to 0.87.

The basis for grouping students were factor values obtained by cluster analysis. The results of cluster analysis demonstrated that the two distinguished factors significantly differentiated both the Polish and the Czech students into two clusters. In both cases, the F statistic value was significant at  $p = 0.00$ . Figures 1 and 2 present the factor values for respective clusters. The characteristics of the clusters including the health and environmental values was presented in Tables 3 and 4. In the case of the Polish data (Table 3), cluster 1 was represented by 58% and cluster 2 by 42% of the surveyed students. The students from cluster 1 presented stronger ( $p < 0.05$ ) health and environmental attitudes, compared to these from cluster 2. In contrast to students from cluster 2, those from cluster 1 declared to: be interested in extending their knowledge on healthy nutrition by watching educational programs ( $M=5$ ) and reading books which address this subject ( $M=5$ ), prefer as least as possible processed food products ( $M=6$ ), watch the number of ingested calories ( $M=5$ ), and try to eat regularly ( $M=5$ ). In addition, compared to the students from cluster 2, when purchasing food products, the students from cluster 1 take account of the environmental aspect ( $M=5$ ). Students from both clusters declared not to be green consumers ( $M=4$  and  $M=2$ ). In the case of data collected for the Czech students (Table 4), cluster 1 was represented by 48% and cluster 2 by 52% of the respondents. Generally, students from cluster 1 presented stronger ( $p < 0.05$ )



health and environmental attitudes, compared to these from cluster 2. In contrast to students from cluster 2, these from cluster 1 declared to: extend their knowledge on healthy nutrition mainly by watching educational programs (M=5), try to eat regularly (M=5), prefer as least as possible processed food products (M=5), and buy food products with the lowest number of preserving agents (M=5). Again, compared to students from cluster 2, when purchasing food products, the students from cluster 1 take account of the environmental aspect (M=5). In addition, respondents from both clusters do not care about the number of ingested calories (M=3 and M=2) and are not the so-called green consumers (M=3 and M=2).

Taking into account H1, the survey demonstrated that the students presented both the health and environmental attitudes, and that their food choices were driven to a lesser extent by the environmental than by the health-related values. The clusters distinguished in the statistical analysis revealed differences among the consumers in the presented health and environmental attitudes and values. Two clusters were distinguished in the case of both the Polish and the Czech students, with the first cluster being represented by consumers presenting stronger health and environmental attitudes compared to the students from the second cluster.

Taking into account H2, it was demonstrated that the health and environmental attitudes might differ depending on the nationality of the students. The Polish students presented statistically significant differences in health and environmental attitudes and values ( $p < 0.05$ ) compared to their Czech counterparts (Table 1).

## **Discussion**

The results provide evidence concerning the statistical significance of the impact of selected variables connected with health and environmental values on food choices of young-adult consumers. These results confirm the findings of previous studies conducted previously by other researchers. Results of surveys concerning wholesome attitudes and behaviors conducted in research centers worldwide demonstrate that while choosing food products consumers pay increasing attention to the benefits resulting from their consumption, with the potential health benefits perceived as the key ones (Kita *et al.*, 2017, pp. 293–298; Bosona & Gebresenbet, 2018, pp. 54–63; Bernard *et al.*, 2019, pp. 149–157; Profeta & Hamm, 2019, pp. 217–227). Many surveys have also revealed that the food choices made by consumers are to a lesser extent driven by price, and to a greater extent by the composition, origin or nutritional value of food products (Smith & Paladi-

no, 2010, pp. 93–104; Wansik, 2010, pp. 461–462; Brecic *et al.*, 2012, pp. 662–675; Aschemann-Witzel & Niebuhr Aagaard, 2014, pp. 550–559; Goetzke & Spiller, 2014, pp. 510–526; Maddock & Hill, 2016, pp. 327–342; Oroian *et al.*, 2017, pp. 1559–1669; Szakály *et al.*, 2017, pp. 1763–1775; Kumar *et al.*, 2017, pp. 1–9). Consumers are convinced that the intake of possibly the most natural food products will allow them to preserve good physical condition, which contributes to a lower risk of development of multiple diseases (Thompson & Moughan, 2008, pp. 61–73; Miškolci, 2011, pp. 167–176). It has also been demonstrated that the health-related values prompt consumers to purchase bio-foods (Hansen *et al.*, 2018, pp. 39–52), functional foods (Küster-Boluda & Vidal-Capilla, 2017, pp. 65–79; Huang *et al.*, 2018), and locally-manufactured foods (Onozaka *et al.*, 2010, pp. 1–6; Memery *et al.*, 2015, pp. 1207–1233). In turn, an overview of surveys concerning the pro-ecological attitudes and behaviors reveals that according to some of them the care over environment may also be one of the main reasons behind purchase decisions made by consumers (Onozaka *et al.*, 2010, pp. 1–6; Lazzarini *et al.* 2017, pp. 663–673), whereas according to the others — the positive attitudes of consumers to the issues of environment protection and the growing interest in this subject are not reflected in consumer behaviors (Jakubowska & Radzymińska, 2015, pp. 100–105). Although the pro-ecological attitudes have been shown to affect the pro-ecological behaviors, the strength of their impact was low (Radzymińska *et al.*, 2015, pp. 346–356).

The analysis of literature data indicates that the healthy and sustainable lifestyle widely promoted in many countries fosters hopes for beneficial changes in the nutritional and pro-ecological attitudes. The positive change in nutritional behaviors has been confirmed by many researchers, while the extent of changes in pro-ecological behaviors is still unsatisfactory. On the basis of the studies presented in the paper and their results, it could also be said that young-adult consumers' food choices were driven to a lesser extent by the environmental than by the health-related values. However, observations of the increasing importance of the health and environmental values allow for a more optimistic look into the future and at the same time substantiate the need for undertaking more intense actions to improve both the health status and natural environment condition.

## **Conclusions**

Rising concerns about health and environmental degradation have resulted in a considerable shift in young consumers' personal values. Students as the

young-adult generation will create attitudes for future decades. Thus, the diagnosis of consumption trends in this segment of the market is important to enable creating a market offer tailored to this group of consumers. This study contributes to the understanding of how students from two different countries perceive the connections between their food choices, health, and environmental sustainability. It demonstrates significant differences in health and environmental attitudes between the surveyed groups. Generally, the Polish students presented stronger health-related and environmental attitudes compared to the Czech respondents. Study results show that the surveyed consumers were segmented into two clusters with various health and environmental values. The first cluster was represented by consumers expressing strong health-related values and environmental attitudes, whereas cluster 2 by consumers who were less concerned about health-related values and took no account of the environmental aspects in their food choices.

Practical implications of the research include a better understanding of the attitudes of young-adult consumers towards health and environmental values in food choices. Establishing how university students perceive the health and environmental implications in their food choices is a key step in developing effective educational and marketing campaigns and in designing targeted behavioral interventions in support of these values. Our results suggest that better communication with consumers about the environmental impact of food products is needed to motivate them to make sustainable food choices. To promote healthy and environmentally-friendly food choices, motivators related to environmental friendliness and healthiness could be used in synergy. Awareness of the environmental impact of food products should be increased and better information is needed for consumers to allow them for the accurate assessment of the environmental impact and healthiness of foods they buy.

There are some limitations related to the presented study. as the survey data were gathered from a convenience sample, these results should be generalized with caution. To ensure generalizability of the findings to other cultural contexts, replication of this research in other markets is recommended. It should provide a neat summary and possible directions for future research. It would be interesting to test the hypothesis that health and environmental attitudes will play a larger role in food choices, as educational campaigns are deployed to help students become more aware of the connections between food and environmental issues.

## References

- Annunziata, A., & Vecchiob, R. (2016). Organic farming and sustainability in food choices: an analysis of consumer preference in Southern Italy. *Agriculture and Agricultural Science Procedia*, 8. doi: 10.1016/j.aaspro.2016.02.093.
- Aschemann-Witzel, J., & Niebuhr Aagaard, E. M. (2014). Elaborating on the attitude behaviour gap regarding organic products: young Danish consumers and in-store food choice. *International Journal of Consumer Studies*, 38(5). doi: 10.1111/ijcs.12115.
- Banterle, A., & Ricci, E. C. (2013). Does the sustainability of food products influence consumer choices? The case of Italy. *International Journal on Food System Dynamics*, 4(2). doi: 10.18461/pfsd.2013.1305.
- Bernard, J. C., Duke, J. M., & Albrecht S. E. (2019). Do labels that convey minimal, redundant, or no information affect consumer perceptions and willingness to pay? *Food Quality and Preference*, 71. doi: 10.1016/j.foodqual.2018.06.012.
- Bosona, T., & Gebresenbet, G. (2018). Swedish consumers' perception of food quality and sustainability in relation to organic food production. *Foods*, 7(4). doi: 10.3390/foods7040054.
- Brecic, R., Gorton, M., & Barjolle, D. (2012). Understanding variations in the consumption of functional foods evidence from Croatia. *British Food Journal*, 116(4). doi: 10.1108/BFJ-05-2012-0133.
- Cavaliere, A., Claire Ricci, E. C., Solesin, M., & Banterle, A. (2014). Can health and environmental concerns meet in food choices? *Sustainability*, 6. doi: 10.3390/su6129494.
- De Boer, J. Boersema, J. J., & Aiking, H. (2009). Consumers' motivational associations favoring free-range meat or less meat. *Ecological Economics*, 68. doi: 10.1016/j.ecolecon.2008.07.001.
- De Maya, S. R., López-López, I., & Munuera, J. L. (2011). Organic food consumption in Europe: international segmentation based on value system differences. *Ecological Economics*, 70(10). doi:10.1016/j.ecolecon.2011.04.019.
- Gagić, S., Jovičić, A., Tešanović, D., & Kalenjuk, B. (2014). Motives for food choice among Serbian consumers. *Economics of Agriculture*, 61(1). doi: 10.5937/ekoPolj1401041G.
- Gains, N. (1994). The repertory grid approach. In H. L. Meiselman & H. J. H. Mac Fie (Eds.). *Measurement of food preferences*. London: Chapman and Hall.
- Goetzke, B. I., & Spiller, A. (2014). Health-improving lifestyles of organic and functional food consumers. *British Food Journal*, 116(3). doi: 10.1016/j.appet.2014.02.012.
- Grant, I. C., & Waite, K. (2003). Following the yellow brick road-young adults: Experiences of the information super-highway. *Qualitative Market Research: An International Journal*, 6(1). doi: 10.1108/13522750310457375.
- Grønhøj, A. (2007). The consumer competence of young adults: a study of newly formed households. *Qualitative Market Research: An International Journal*, 10(3). doi: 10.1108/13522750710754290.

- Grunert, K. G. (1997). What's in a steak? A cross-cultural study on the quality perception of beef. *Food Quality and Preference*, 8(3). doi: 10.1016/S0950-3293(96)00038-9.
- Grunert, K. G. (2005). Food quality and safety: consumer perception and demand. *European Review of Agricultural Economics*, 32(3). doi: 10.1093/eurrag/jbi011.
- Gutkowska, K., & Ozimek, I. (2008). *Zachowania młodych konsumentów na rynku żywności*. Warszawa: Wydawnictwo SGGW.
- Hansen, T., Sørensen, M. I., & Riewerts Erikse, M. L. (2018). How the interplay between consumer motivations and values influences organic food identity and behavior. *Food Policy*, 74. doi: 10.1016/j.foodpol.2017.11.003.
- Head, M., Sevenster, M., Odegard, I., Krutwagen, B., Croezen, H., & Bergsma G. (2014). Life cycle impacts of protein-rich foods: creating robust yet extensive life cycle models for use in a consumer app. *Journal of Cleaner Production*, 73. doi: 10.1016/j.jclepro.2013.11.026.
- Honkanen, P., Verplanker, B., & Olsen, S. O. (2006). Ethical values and motives driving organic food choice. *Journal of Consumer Behaviour*, 5(5). doi:10.1002/cb.190.
- Huang, L., Bai, L., Zhang, X., & Gong, S. (2018). Re-understanding the antecedents of functional foods purchase: mediating effect of purchase attitude and moderating effect of food neophobia. *Food Quality and Preference*. Advance online publication. doi: 10.1016/j.foodqual.2018.11.001.
- Jakubowska, D., & Radzymińska, M. (2015). Attitudes and behaviour of Warmia and Mazury residents towards issues related to environmental protection. *Zeszyty Naukowe Akademii Morskiej w Gdyni*, 88.
- Khan, M. A., & Hackler, L. R. (1981). Evaluation of food selection patterns and preferences. *Critical Review of Food Science and Nutrition*, 15. doi: 10.1080/10408398109527314.
- Kita, P., Furková, A., Reiff, M., Konštiak, P., & Sitášová, J. (2017). Impact of consumer preferences on food chain choice: an empirical Study of consumers in Bratislava. *Acta Universitatis Agriculturae Et Silviculturae Mendelianae Brunensis*, 65(1). doi: 10.11118/actaun201765010293.
- Kumar B., Manrai A. K., & Manrai L. A. (2017). Purchasing behavior for environmentally sustainable products: a conceptual framework and empirical study. *Journal of Retailing and Consumer Services*, 34. doi: 10.1016/j.jretconser.2016.09.004.
- Küster-Boluda, I., & Vidal-Capilla, I. (2017). Consumer attitudes in the election of functional foods. *Spanish Journal of Marketing - ESIC*, 21(1). doi: 10.1016/j.sjme.2017.05.002.
- Lazzarini, G. A., Zimmermann, J., Visschers, V. H. M., & Siegrist, M. (2016). Does environmental friendliness equal healthiness? Swiss consumers' perception of protein products. *Appetite*, 105. doi: 10.1016/j.appet.2016.06.038.
- Lindeman, M., & Väänänen, M. (2000). Measurement of ethical food choice motives. *Appetite*, 34(1). doi: 10.1006/appe.1999.0293.

- Maddock, S., & Hill, B. (2016). Bagels and doughnuts... round food for every mood food advertising discourses. *British Food Journal*, 118(2). doi: 10.1108/BFJ-04-2015-0136.
- Memery, J., Angell, R. J., Megicks, P., & Lindgreen A. (2015). Unpicking motives to purchase locally-produced food: analysis of direct and moderation effects. *European Journal of Marketing*, 49(7/8). doi: 10.1108/EJM-02-2014-0075.
- Miškolci, S. (2011). Consumer preferences and willingness to pay for the health aspects of food. *Acta Universitatis Agriculturae Et Silviculturae Mendelianae Brunensis*, 59(4). doi:10.11118/actaun201159040167.
- Nissinen, A., Heiskanen, E., Perrels, A., Berghall, E., Liesimaa, V., & Mattinen, M. (2015). Combinations of policy instruments to decrease the climate impacts of housing, passenger transport and food in Finland. *Journal of Cleaner Production*, 107(16). doi: 10.1016/j.jclepro.2014.08.095.
- Nivaa, M., & Jallinoja, P. (2018). Taking a stand through food choices? Characteristics of political food consumption and consumers in Finland. *Ecological Economics*, 154. doi: 10.1016/j.ecolecon.2018.08.013.
- Nozaka, Y., Nurse, G., & McFadden, D. T. (2010). Local food consumers: how motivations and perceptions translate to buying behavior. *Choice, The Magazine of Food Farm and Resource*, 25(1).
- Oroian, C. F., Safirescu, C. O., Harun, R., Chiciudean, G. O., Arion, F. H., Muresan, I. C., & Bordeanu, B. M. (2017). Consumers' attitudes towards organic products and sustainable development: a case study of Romania. *Sustainability*, 9. doi: 10.3390/su9091559.
- Profeta, A., & Hamm, U. (2019). Do consumers prefer local animal products produced with local feed? Results from a discrete-choice experiment. *Food Quality and Preference*, 71. doi: 10.1016/j.foodqual.2018.07.007.
- Radzymińska, M. (2016). *A consumer at the local food market – an empirical study*. Olsztyn: Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego w Olsztynie.
- Radzymińska, M., Jakubowska, D., & Mozolewski, W. (2015). Proecological attitudes and behaviours towards the environmental issues. *Handel Wewnętrzny* 2(355).
- Rana, J., & Paul, J. (2017). Consumer behavior and purchase intention for organic food: a review and research agenda. *Journal of Retailing and Consumer Services*, 38. doi: 10.1016/j.jretconser.2017.06.004.
- Rašković, M., Ding, Z., Škare, V., Ozretić Došen, D., & Žabkar, V. (2016). Comparing consumer innovativeness and ethnocentrism of young-adult consumers. *Journal of Business Research*, 69. doi: 10.1016/j.jbusres.2016.03.029.
- Reisch, L., Eberle, U., & Lorek, S. (2013). Sustainable food consumption: an overview of contemporary issues and policies. *Sustainability: Science, Practice and Policy*, 9(2). doi: 10.1080/15487733.2013.11908111.
- Renner, B., Sproesser, G., Strohbach, S., & Schupp, H. T. (2012). Why we eat what we eat. The eating motivation survey (TEMS). *Appetite*, 59(1), doi: 10.1016/j.appet.2012.04.004.

- Rybowska, A., & Babicz-Zielińska, E. (2007). Cluster analysis in dietary behaviour assessment of students. *Food Quality and Preference*, 18. doi: 10.1016/j.foodqual.2005.09.009.
- Shepherd, R. (1985). Dietary salt intake. *Nutrition and Food Science*, 96. doi: 10.1108/eb059082.
- Siegrist, M., & Hartmann, Ch. (2019). Impact of sustainability perception on consumption of organic meat and meat substitutes. *Appetite*, 132(1). doi: 10.1016/j.appet.2018.09.016.
- Smith, S., & Paladino, A. (2010). Eating clean and green? Investigating consumer motivations towards the purchase of organic food. *Australasian Marketing Journal*, 18. doi: 10.1016/j.ausmj.2010.01.001.
- Szakály, Z., Popp, J., Kontor, E., Kovács, S., Pető, K., & Jasák, H. (2017). Attitudes of the lifestyle of health and sustainability segment in Hungary. *Sustainability*, 9. doi: 10.3390/su9101763.
- Thompson, A., & Moughan, P. (2008). Innovation in the food industry: functional foods, innovation: management. *Policy & Practice*, 10. doi: 10.5172/impp.453.10.1.61.
- van Herpen, E., & Van Trijp, H. C. (2011). Front-of-pack nutrition labels. Their effect on attention and choices when consumers have varying goals and time constraints. *Appetite*, 57(1). doi: 10.1016/j.appet.2011.04.011.
- Verbeke, W. (2008). Impact of communication on consumers' food choices. *Proceedings of the Nutrition Society*, 67(3). doi: 10.1017/S0029665108007179.
- Wansik, B. (2010). From mindless eating to mindlessly eating better. *Physiology & Behavior*, 100. doi: 10.1016/j.physbeh.2010.05.003.

## Annex

**Table 1.** Descriptive statistics

Items	Polish students			Czech students			ANOVA	
	x	SD	M	x	SD	M	F	p
<b>Health attitudes and values (HV)</b>								
1. I take care over my health	5.45	0.90	5	5.44	1.17	6	0.03	0.87
2. Eating habits affect health	6.65	0.63	7	6.25	0.99	6	38.20	0.00
3. I watch educational programs about healthy nutrition	4.29	1.68	5	3.34	1.72	2	49.90	0.00
4. I read or buy books about healthy nutrition	3.42	1.86	3	2.70	1.61	2	26.71	0.00
5. I watch the number of ingested calories	3.50	1.80	3	2.59	1.72	2	42.36	0.00
6. I try to eat regularly	4.50	1.60	5	4.32	1.73	5	1.85	0.17
7. My diet includes vegetables and fruits	5.47	1.36	6	5.63	1.31	6	2.15	0.14
8. I prefer as little processed food products as possible	4.71	1.50	5	3.73	1.48	4	66.98	0.00
9. Wholesomeness of consumed foods is of great importance to me	5.15	1.33	5	4.52	1.52	5	30.43	0.00
10. I pay attention to the quality of food products I buy	5.58	1.15	6	5.19	1.40	5	14.73	0.00
11. I read labels provided on food packages	5.63	1.35	6	4.82	1.67	5	44.56	0.00
12. I buy natural food products with the lowest possible number of preserving agents	4.83	1.44	5	4.19	1.49	4	29.98	0.00
13. I pay attention to the composition of purchased foods	5.57	1.40	6	4.62	1.63	5	61.20	0.00
<b>Environmental attitudes and values (EV)</b>								
1. Environment pollution is a consequence of today's people's lifestyle	5.36	1.33	6	5.77	1.21	6	16.18	0.00
2. The condition of the natural environment is strictly related to the activities of the industry	5.93	0.92	6	5.97	1.00	6	0.30	0.58
3. Consumers should choose food products packed in environmentally-friendly packages	5.84	1.01	6	5.21	1.30	5	46.05	0.00
4. I believe the condition of the natural environment affects the quality of produced food	5.86	1.03	6	5.22	1.39	5	43.10	0.00
5. Industrialization of agriculture and food processing is unfriendly to both the natural environment and the consumer	4.98	1.31	5	4.89	1.32	5	0.71	0.40
6. I take account of the environmental aspect when I buy foods	3.93	1.42	4	4.12	1.51	4	2.43	0.12
7. I am a so-called "green consumer"	3.27	1.47	4	2.86	1.62	2	11.21	0.00



**Table 2.** Results of principal component analysis for health and environmental attitudes and values — data for Polish and Czech students

Items	Loading			
	Polish students		Czech students	
	I	II	I	II
HV1	0.608	0.008	0.583	0.210
HV2	0.368	0.473	0.418	0.332
HV3	0.524	0.127	0.641	-0.078
HV4	0.613	0.100	0.670	-0.116
HV5	0.600	0.039	0.566	-0.157
HV6	0.483	0.115	0.539	-0.021
HV7	0.498	0.200	0.441	0.088
HV8	0.712	0.207	0.464	0.213
HV9	0.638	0.288	0.672	0.247
HV10	0.753	0.194	0.663	0.301
HV11	0.753	0.072	0.723	0.185
HV12	0.752	0.265	0.697	0.297
HV13	0.774	0.089	0.725	0.286
Cronbach alpha value	0.87		0.87	
EV1	0.151	0.659	-0.031	0.611
EV2	0.112	0.638	-0.083	0.727
EV3	0.050	0.684	0.253	0.681
EV4	0.067	0.706	0.224	0.680
EV5	0.045	0.646	0.050	0.726
EV6	0.160	0.599	0.330	0.560
EV7	0.278	0.524	0.433	0.243
Cronbach alpha value	0.77		0.76	
% variance	53	34	52	33

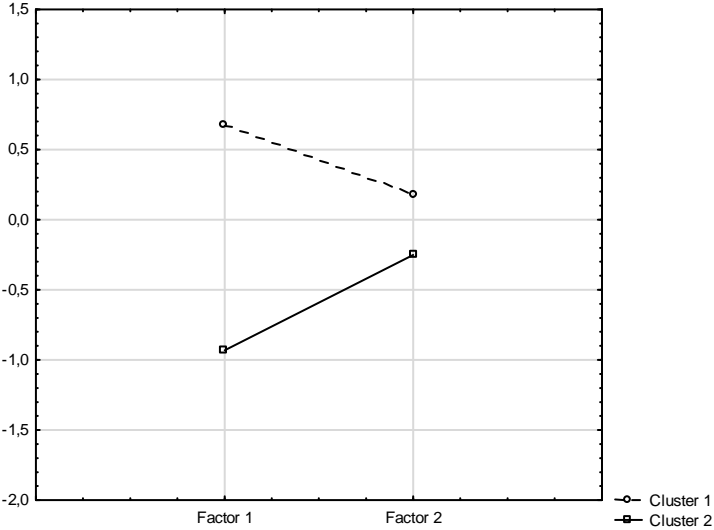
**Table. 3.** Profile of clusters of Polish students according to health and environmental attitudes and values

Items	Polish students						ANOVA	
	1 (n=58%)			2 (n=42%)			F	p
	x	SD	M	x	SD	M		
HV1	5.81	0.74	6	4.97	0.87	5	86.44	0.00
HV2	6.89	0.35	7	6.33	0.77	6	75.67	0.00
HV3	4.94	1.47	5	3.40	1.54	3	82.48	0.00
HV4	4.21	1.78	5	2.31	1.32	2	110.10	0.00
HV5	4.24	1.68	5	2.47	1.44	2	97.53	0.00
HV6	5.05	1.41	5	3.75	1.53	4	61.93	0.00
HV7	5.97	1.02	6	4.78	1.47	5	74.47	0.00
HV8	5.53	1.05	6	3.56	1.28	4	229.33	0.00
HV9	5.73	1.05	6	4.33	1.25	5	117.73	0.00
HV10	6.16	0.77	6	4.77	1.11	5	179.17	0.00
HV11	6.30	0.77	6	4.69	1.41	5	173.59	0.00
HV12	5.64	0.95	6	3.70	1.24	4	255.96	0.00
HV13	6.34	0.73	6	4.50	1.40	5	234.53	0.00
EV1	5.64	1.23	6	4.97	1.37	5	21.10	0.00
EV2	6.12	0.77	6	5.67	1.04	6	20.28	0.00
EV3	5.98	0.91	6	5.65	1.12	6	8.36	0.00
EV4	5.98	0.96	6	5.70	1.10	6	6.22	0.01
EV5	5.16	5.16	5	4.72	1.43	5	9.25	0.00
EV6	4.30	1.31	5	3.43	1.43	3	31.99	0.00
EV7	3.73	1.38	4	2.63	1.35	2	50.73	0.00

**Table. 4.** Profile of clusters of Czech students according to health and environmental attitudes and values

Items	Czech students						ANOVA	
	1 (n=48%)			2 (n=52%)			F	p
	x	SD	M	x	SD	M		
HV1	6.01	0.86	6	4.91	1.18	5	86.87	0.00
HV2	6.58	0.61	7	5.94	1.17	6	36.53	0.00
HV3	4.24	1.59	5	2.49	1.38	2	106.91	0.00
HV4	3.51	1.58	3	1.94	1.23	2	95.37	0.00
HV5	3.28	1.88	3	1.94	1.24	2	54.34	0.00
HV6	5.07	1.48	5	3.62	1.65	3	65.78	0.00
HV7	6.04	1.04	6	5.25	1.43	6	30.91	0.00
HV8	4.35	1.43	5	3.16	1.29	3	59.39	0.00
HV9	5.42	0.99	5	3.68	1.45	4	149.53	0.00
HV10	5.97	0.81	6	4.46	1.44	5	127.44	0.00
HV11	5.90	0.94	6	3.82	1.57	4	195.70	0.00
HV12	5.18	0.99	5	3.26	1.28	3	215.24	0.00
HV13	5.67	1.00	6	3.64	1.48	4	195.70	0.00
EV1	5.85	1.27	6	5.69	1.14	6	1.47	0.23
EV2	6.03	0.98	6	5.92	1.04	6	1.01	0.32
EV3	5.68	1.09	6	4.78	1.33	5	41.64	0.00
EV4	5.63	1.19	6	4.85	1.45	5	26.49	0.00
EV5	5.11	1.32	5	4.69	1.30	5	7.98	0.01
EV6	4.74	1.35	5	3.53	1.41	4	59.67	0.00
EV7	3.60	1.70	3	2.16	1.19	2	74.49	0.00

**Figure 1.** Factor values of respective clusters for Polish students



**Figure 2.** Factor values of respective clusters for Czech students

