
Sustainable Consumption in the Market of Food Production: The Case of Lubuskie Voivodeship

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Abstract:

Purpose: The main aim of this study was to show different approaches to sustainable consumption and attitudes toward food waste and environmental pollution. The main goal formulated in this way is associated with specific objectives, which include identifying factors determining consumer behaviour on the organic food market, as well as to indicate the approach to the issue of food waste and the problem of environmental pollution.

Design/Methodology/Approach: The article is based on theoretical considerations, which were supported by the results of own research, presenting tendencies and phenomena in the consumer behaviour of contemporary consumers characteristic of sustainable consumption. Surveys were used in the studies to demonstrate the determinants of this phenomenon. An empirical study using the survey method was conducted were carried out on consumers of the Lubuskie Voivodeship from May to September 2017.

Findings: The conducted research shows that more than half of the respondents declared behavior in the sphere of consumption in accordance with eco-consumption. The study also found that more than half of women and men perceive the problem of food waste in their household. Among the activities to promote sustainable consumption, the most common were the use of reusable bags, waste segregation, and buying products that are produced in an environmentally friendly way. Economic factors affecting internal demand as well as environmental and institutional conditions turned out to be the key ones.

Practical Implications: The presented considerations are of great importance for practice. They constitute an indicator which conditions the influence on the increase of consumption of food products. There is important for food producers.

Originality/Value: The paper presents the attitudes of consumers towards ecological products, environmental and social issues and identifies consumer pro-ecological behaviors that translate into the state of the natural environment and affect the level of consumption sustainability.

Keywords: Regional economics, rural economics, sustainable consumption.

JEL codes: Q5, R1.

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1. Introduction

The issue of sustainable consumption raises more and more interest, being the subject of detailed research as well as numerous discussions among people dealing with this issue. Sustainable consumption is one of the main goals of sustainable development. According to the definition of the World Commission on Environment and Development (WCED) published in 1987 in the report "Our common future" also known as the Brundtland Report, sustainable development is a development that meets the needs of current generations without compromising the ability of future generations to meet their needs (WCED, 1987). Promoting sustainable consumption is a key strategy for achieving environmental benefits, sustainable food security and improving public health (Blas *et al.*, 2019). At the Rio Earth Summit in 1992, attention was paid to the impact of consumption patterns on the environment in industrialized countries, and the World Summit on Sustainable Development in Johannesburg in 2002 identified Sustainable Consumption and Production (SCP) as one of the three overarching sustainable development objectives, leading to adopt a global framework for action at the Rio + 20 conference in 2012 (Evans, 2018).

The issue of sustainable consumption has an interdisciplinary dimension, which is why, as indicated by numerous authors, it is difficult to develop one common definition for various approaches (Liu *et al.*, 2017). As a result, the research of particular authors refers primarily to individual aspects affecting sustainable consumption, including: the use of products (Bocken, 2017), food waste (Morone *et al.*, 2019), standards of pro-ecological behavior (Han and Kwon, 2019), consumption of organic food (Oosterveer and Spaargaren, 2012), material resources (Salo *et al.*, 2016), transport systems (Chekima *et al.*, 2016) or business models (Urbinati *et al.*, 2017; Whalen, 2017). The linking factor should be the improvement of the quality of life in a long (intergenerational) perspective, considering different dimensions of consumption, economic, political, cultural, social, environmental, or technological.

The presented studies on the specific problems are important for increasing knowledge about the balance of consumption, but they require an appropriate generalization. They do not reflect the whole of the interrelations and conditions of unbalanced consumption. Consequently, attempts are made to categorize this term. The category of sustainable consumption can be recognized in at least three ways (Dąbrowska *et al.*, 2015) as an alternative lifestyle, eco-consumption, according to which sustainable consumption can be identified with the development of the trend of ecologising consumption, and also in a holistic approach which characterizes the extension of this concept to social and economic issues. Recognizing consumption as a lifestyle refers to a broader concept encompassing not only material consumption, but also activities such as interpersonal relations, recreational activities, sports, and education (Breukers *et al.*, 2012), as well as the production and food distribution. The broad approach to sustainable consumption behavior and conscious consumption includes ecologically responsible behavior, socially conscious behavior and moderate

to aspiring behaviors (Speth, 2008; Sheth *et al.*, 2011; Späth and Rohracher, 2015). It is a form of consumption of environmentally friendly goods, reduced consumption of natural resources, leading to a change of lifestyle to meet current and future needs. Because of these processes, pro-social and environmental behaviors, dematerialization of consumption, and ultimately, improvement of the quality of life, are strengthened. Unbalanced consumption adversely affects the natural and social environment and consequently leads to a decrease in the quality of life in the intergenerational perspective. This is due to the excessive involvement of resources and their high intensity of application (thus the loss of at least some of the features), the formation of adverse externalities (e.g., greenhouse gas emissions). In a slightly different approach, Jackson (2014) divides the views into three groups of consumption, depending on: the role of producers, the role and behavior of consumers, and approaches that combine both groups of entities.

In sustainable consumption the improvement of the quality of life in the intergenerational approach becomes important as the effect of a conscious consumer choice. A high level of ecological awareness of consumers influences their behavior and purchasing decisions, contributing to the reduction of the negative impact on the environment resulting from unsustainable consumption. There is no doubt that unsustainable consumption leads, among others, to depletion of resources, excessive contamination of the natural environment, degradation of its individual components, but also deterioration of social conditions. The concept of sustainable consumption is also connected with the problem of food waste by, among others, issues of poverty or excessive income disparities.

2. Literature Review

Unsustainable consumption includes, as mentioned above, various aspects. One of its important and relatively easier to quantify manifestations is food waste. Food wastage is not only an ethical, economic, but also an environmental problem (Breukers *et al.*, 2012), because we are wasting resources that we have less and less. It also illustrates changes in the level of food consumption imbalance. Especially that food waste is the dominant type of waste in landfills in developed countries (Morone *et al.*, 2019), and food consumption itself is one of the key elements of consumption affecting the environment (Reisch *et al.*, 2013). In the EU, around 88 million tons of food waste are generated annually, and the associated costs are estimated at 143 billion euros (Stenmarck *et al.*, 2016). Among the sectors, the most contributing to food waste are households (47 million tons \pm 4 million tons) and the processing sector (17 million tons \pm 13 million tons). These two sectors are responsible for 72% of food wastage in the EU.

There are also large disproportions between developed and developing countries. In developed countries, imbalances occur in the consumption sphere, meaning wastage of ready food. For example, the average EU citizen wastes 173 kg of food each year (Stenmarck *et al.*, 2016). The results of a study by Moora and Piirsalu (2018)

conducted among 100 households regarding waste of food in Estonia showed that the average household generates 2.5 kg of food waste per week (about 1 kg per person), in a total of 130 kg per year (54 kg per person). Loss of food (avoidable food waste) accounts for about 36% of food waste produced in households. This amounts to 47 kg per year for an average household (17 kg per person, respectively). The research results show that households are the main producers of waste and food losses generating approximately 70.000 tons (76%) of food waste per year. Research results Basha and Lal (2019) indicate that the ecological footprint of consumers is growing because their expenses are also higher in lifestyle requirements.

In the pursuit of sustainable consumption, organic products become more and more important. They allow to reduce permanent waste in landfills and the amount of the use of some resources, including permanent loss of their functional characteristics (Brelík, 2011; Czyżewski and Kułyk, 2015). As shown in the studies by Sandhu, Perumal, Fauzi (2018) consumption of organic food is motivated by attention to health, as well as about the state of the environment. However, the obstacles in its purchase were: trust, product availability and higher prices. However, Basha and Lal (2019) showed that a significant impact on purchasing intentions of organic consumers have: concern for the environment, health and lifestyle, product quality, support for local breeders, convenience and price, and subjective standards. Lack of trust is considered one of the most important barriers in the consumption of organic food (Torres-Ruiz *et al.*, 2018). The development of organic production, on the other hand, allows us to reduce the use of resources and increase prosocial and pro-environmental attitudes.

Research on sustainable consumption also highlights the importance of factors such as: education and consumer age (Diamantopoulos *et al.*, 2003; Olano *et al.*, 2015), life satisfaction (Nassani *et al.*, 2013; Dhandra, 2019), how to deal with negative well-being and a change in the attitudes of the producers themselves (Mannberg *et al.*, 2014, Lehner *et al.*, 2016). One can also find the view that organic food does not contribute so much to more sustainable consumption (Vittersø and Tangeland, 2015).

These results, for example, from the fact that ecological production requires a greater involvement of the soil factor due to the lower efficiency compared to the conventional one. In the context of the state of the environment traditional agriculture (especially small farms) and precision farming have a particular relevance than other groups of farms. From the report on "The research on the awareness and ecological behavior of Polish residents" (Vittersø and Tangeland, 2015), which was carried out in 2014 by TNS Poland for the Ministry of the Environment as part of the multi-thematic Omnibus project by means of individual computer-assisted interview on a random nationwide, representative sample of Polish residents aged 15 and more numbering 1,000 people, it results that, on the one hand, consumers are convinced of individual responsibility for the state of the environment, whilst on the other, that the popularity of consumer behavior supporting environmental protection is still limited.

As the research shows, in their actions, saving money still remains a priority, and ecological solutions are associated with higher costs. However, regarding the natural environment, the biggest obstacle for respondents was waste (45%), followed by air pollution (39%) and water pollution (35%). The study also shows that the assessment of the state of the environment does not depend on demographic characteristics such as gender, age or level of education. Similarly, the size of the place of residence has little impact in this respect. People who live in the countryside assess the state of the environment in their area better than others, while residents of cities up to 20,000 and above 500,000 are less positive about the situation at the national level. According to the report, among the reasons why it is worth protecting the natural environment, the respondents most often indicated the answers "care for future generations" (49%) and "care and concern for human health" (48%).

However, considering ecological habits/behavior in relation to caring for the environment, it is worth noting that nearly three quarters of Poles (73%) pay attention to reducing water consumption. Nearly three-fifths of respondents (57%) declare that whenever they have the opportunity, instead of a car they choose public transport or a bicycle. Every third respondent (36%) is willing to spend more on ecological solutions. Regarding the issue of food waste, as shown by the survey, 24% of Poles feel that food is being wasted in their home.

3. Materials and Methods

The survey questionnaire consisted of two parts, i.e., the substantive part and the respondent's particulars. The first part of the questionnaire contained a set of questions regarding phenomena and tendencies characteristic for respondents in the sphere of consumption, opinions on sustainable consumption, food waste and environmental pollution, as well as the group of food products most often consumed daily by them and the implementation of pro-ecological solutions in their households. Respondent's particulars considered such characteristics of respondents as gender, age, level of education, place of residence, material situation. The questions contained in the questionnaire were closed, and the answers were presented in the form of an alternative, a closed set of many possible answers, a semi-open set, which allowed the respondent to add other options. The survey questionnaire was tested on a sample of 35 people, which allowed to verify the correctness of the questions asked and the variants of the answers provided. To interpret the obtained results statistical methods have been used, such as research analysis of dependencies between groups of variables, the Pearson's contingency coefficient (C) based on chi-square statistics and applicable to studies of relationships between multi-categorical variables.

An empirical study using the survey method was conducted from May to September 2017. The selection of respondents was random using the layered selection method according to the age range. The study took into account such demographic and economic features of the respondents as: gender, place of residence, education, age, income, because according to the authors of the study, among others, they condition

the selection and consumption of individual food groups, and also affect consumer attitudes in the sphere of consumption. The study used alternative nominal scales with bipartite classification and non-alternative nominal with multivariate classification. The study was conducted on a group of 500 people living in the Lubuskie Voivodeship.

4. Results

Consumers with a view to abandoning excessive, unsustainable consumption for sustainable consumption may, for example, try to consciously limit the number of purchased products, or rationally use consumer goods or manifest many other behaviors falling into the category of sustainable consumption (Table 1) (Bywalec, 2007; Zalega 2013; Woś *et al.*, 2004).

Table 1. Phenomena and tendencies characteristic for respondents in the sphere of consumption (N=500)

Phenomena and tendencies characteristic for respondents in the sphere of consumption			
A group of new phenomena and trends in the sphere of consumption	Behavior characteristics	Number of indications	Percentage of indications [%]
Eco-consumption	omical, i.e. rational, use of consumer goods, sition and consumption of the so-called gical goods (mainly food), the pursuit of iduals to minimize adverse effects resulting their consumption.	268	53.6
"Smart shopping"	Using various forms of trade (including discount chains, super- and hypermarkets, e-commerce, etc.); planning purchases, avoiding compulsive shopping; using the promotion and purchasing private label products.	115	23.0
Ethnocentrism	Preference of products from the region, the country from which the consumer comes from, the guiding principle when choosing a product, the possibility of supporting the development of local products, buying local, regional products due to freshness.	48	9.6
Cocooning	Moving market activity to home thanks to modern technologies (shopping, preparing meals, spending free time without leaving home).	36	7.2
Individualism of consumption, prosumption	Active participation of the consumer in creating an offer tailored to his individual needs and expectations.	21	4.2

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Gender of Respondents							
Female	198	40	31	27	19	3	318
Male	70	75	17	9	2	9	182
Together	268	115	48	36	21	12	500
Residence							
City	129	44	17	15	21	12	238
Village	139	71	31	21	0	0	262
Together	268	115	48	36	21	12	500
Education							
Vocational	0	0	0	14	0	0	14
Secondary	116	61	17	15	5	12	226
Higher	152	54	31	7	16	0	260
Together	268	115	48	36	21	12	500
Age range							
Up to 25 years	7	41	0	10	15	10	83
26-36 years	84	20	7	0	6	2	119
37-46 years	93	5	10	0	0	0	108
47-56 years	79	11	21	0	0	0	111
Over 56 years	5	38	10	26	0	0	79
Together	268	115	48	36	21	12	500
Monthly income per person in the household							
Up to 500 zł net	0	21	0	3	0	4	28
500-1000 zł net	0	90	13	24	15	8	150
1001-1500 zł net	77	4	25	9	6	0	121
1501-2000 zł net	127	0	10	0	0	0	137
2001-2500 zł net	43	0	0	0	0	0	43
2501-3000 zł net	0	0	0	0	0	0	0
3001-3500 zł net	21	0	0	0	0	0	21
Together	268	115	48	36	21	12	500

Source: Own calculations.

The values of the statistics chi-square and the values Pearson's contingency coefficient (C) shown in Table 3.

Table 3. Chi-square tests and Pearson's contingency coefficient (C) based on chi-square statistics

The variables for which the tests were conducted	The value of the statistics χ^2	The value of Pearson's contingency coefficient (C)
Gender of respondents a new (alternative) trends of consumer behavior of contemporary consumers a new (alternative) trends of consumer behavior of contemporary	81.31	0.37
Residence a new (alternative) trends of consumer behavior of contemporary	43.75	0.28

Education a new (alternative) trends of consumer behavior of contemporary	212.19	0.55
Age range a new (alternative) trends of consumer behavior of contemporary	381.90	0.66
Income per person in the household a new (alternative) trends of consumer behavior of contemporary	458.97	0.69

Source: Own calculations.

First factor (Table 3) assessed was the importance of gender. The value of the statistics $\chi^2 = 81.31$. From the chi-square distribution, with the significance level $\alpha = 0.05$ and $(r-1)(k-1) = 5$ degrees of freedom, the value of 11.0705 was obtained, and because χ^2 is greater than the critical value, there is a significant relationship between the researched features. The purpose of calculating the relationship strength between variables was to use the Pearson's contingency coefficient. A Pearson coefficient of 0.37 indicates a moderate relationship. It is therefore a factor that weakly affects changes in the attitudes and behavior of consumers.

Second factor assessed was the importance of residence. The value of the statistics $\chi^2 = 43.75$. From the chi-square distribution, with the significance level $\alpha = 0.05$ and $(r-1)(k-1) = 5$ degrees of freedom, the value of 11.0705 was obtained, and because χ^2 is greater than the critical value, there is a significant relationship between the researched features. The Pearson contingency coefficient (C) of 0.28 indicates a weak relationship. It is therefore a factor that weakly affects changes in the level of consumption balance.

Another factor assessed was the importance of education. The value of the statistics $\chi^2 = 212.19$. From the chi-square distribution, with the significance level $\alpha = 0.05$ and $(r-1)(k-1) = 10$ degrees of freedom, the value of 18.3070 was obtained, and because χ^2 is greater than the critical value, there is a significant relationship between the researched features. The Pearson contingency coefficient (C) of 0.55 indicates a moderate dependence. It can therefore be concluded that education affects consumer attitudes and behavior. This observation is also confirmed by other studies (Pinto *et al.*, 2011; Hanss *et al.*, 2016; Diamantopoulos *et al.*, 2003). Looking for relationships between demographic determinants the age of respondents was also taken into account. The value of the statistics $\chi^2 = 381.90$. From the chi-square distribution, with the significance level $\alpha = 0.05$ and $(r-1)(k-1) = 20$ degrees of freedom, the value of 31.4104 was obtained, and because χ^2 is greater than the critical value, then there is a significant relationship between the researched features. The Pearson contingency coefficient (C) of 0.66 indicates a strong dependence. It can therefore be concluded that age influences the attitudes and behavior of consumers, which is confirmed by other studies on this subject (Olano *et al.*, 2015; Hanss, 2016).

Fifth factor assessed was the importance of income per person in the household. The value of the statistics $\chi^2 = 458.97$. From the chi-square distribution, with the

significance level $\alpha = 0.05$ and $(r-1)(k-1) = 30$ degrees of freedom, the value 43.7730 was obtained, and because χ^2 is greater than the critical value, there is a significant relationship between the researched features. The value of the Pearson contingency coefficient (C) of 0.69 indicates a strong dependence. It can therefore be concluded that income per person in a household affects the attitudes and behavior of consumers.

5. Discussion

Based on the analysis of own research and other authors, it can be concluded that the level and forms of consumption play an important role in environmental degradation. Existing ecological problems, considering the causes of environmental degradation associated with consumption, the level of ecological awareness, lead to unfavorable phenomena occurring in the natural environment. This favor observed changes in the size and structure of consumption of food products. Considerations regarding sustainable consumption in the light of the conducted research allow to present several important conclusions. These observations confirm the results of Basha and Lal (2019), in which the authors concluded that the ecological footprint of consumers is growing because their expenses are also higher in lifestyle requirements.

The own study also shows that the majority of respondents not only raise their level of health through the purchase of organic food (60%), but also show concern for the natural environment and for their relatives. In addition, more than a half (around 54%) of respondents declared that they perceive and undertake diverse activities that favor sustainable consumption in terms of eco-consumption. Participants in the study also show concern for the natural environment through actions for sustainable consumption, such as the use of reusable bags or waste segregation. By making some generalizations, it can be concluded that the main motives for the application of the 3 R (Reduce-Reuse-Recycle) principle are care for their own and their relatives' health, but also for the environment in which future generations live and will live. This indicates the importance of the impact of social ties, also in the intergenerational approach.

Analyzing the literature on the sustainable consumption, the authors noticed that not all areas in the sphere of tendencies towards more balanced attitudes in consumption were fully recognized, in particular, as the authors of the study prove, there is a tendency to more balanced attitudes in consumption and that balanced attitudes are correlated with place residence, education, age and income. Consistent with the results of this survey, among measures to promote sustainable consumption can be listed: use of reusable bags, waste segregation or buying products that are produced in environmentally friendly manner. Therefore, the results of own survey are in line with the results of the report on the survey of ecological awareness of Polish residents on Waste management carried out in 2017 (Report Waste (...), 2017) indicating that one of the most frequently undertaken pro-ecological activities among the respondents is the use of reusable bags. The problem of rational use of food was analyzed in the

research by Gentil and Poulsen (2012), who noticed that about 60% of wasted food is avoidable, 20% potentially avoidable, and 20% are considered inevitable. The inability to use it rationally is a big problem and has an impact on the state of the natural environment.

The authors of the study came to similar conclusions by analyzing the attitudes of households towards food waste, where more than half of women and half of men said that this problem concerns their households. The results of own survey are in line with the results of the report on the awareness and ecological behavior of Polish residents (Report Waste (...), 2017). The obtained results indicate that ecological education is the most effective way to raise the ecological awareness of the society contributing to changing attitudes and eating habits. At the same time, it seems reasonable to conduct further research in this area.

Analysis of the collected material shows that the main reason why customers do not buy organic products is their high price. Among the reasons for the lack of purchases there were further barriers due to the lack of a store with organic food near the place of residence or difficulties in its purchase. Scientists Sandhu, Perumal and Fauzi (2018) reached similar conclusions, pointing to such obstacles in the purchase of organic food as: trust, product availability and higher prices. These results are also confirmed by studies carried out by Basha and Lal (2019), which showed that of significant impact on purchasing intentions of organic food by consumers are, among others: care for the environment, health and lifestyle, product quality. Bad condition of the environment forces one to take specific actions. It is necessary not only to provide financial expenditures for environmental protection, but also to change people's attitudes and their model of life through deepening their knowledge and raising ecological awareness. It is particularly important to raise ecological awareness regarding the causes of environmental pollution associated with consumption, as well as related to the principles of nutritional recommendations.

Changes in the scope of consumer patterns and behaviors are, as was also stressed in other studies, conditioned by age, education, and economic factors. The mere change in consumption patterns in the field of food products also contributes to changing other behaviors related to environmental issues and promotes a conscious reduction of wastage and resource consumption. Thus, the impact of this change is much wider in the context of reducing unsustainable consumption. As noted by Sobczyk (2018), an attempt to verify the occurrence of modern consumption trends on the Polish market indicates the popularity of "smart" and virtual purchases and a specific range of greening consumption. The conducted research shows that more than half of the respondents declared behavior in the sphere of consumption in accordance with eco-consumption.

6. Conclusions

The problem of sustainable consumption can be related to changes taking place in consumer patterns and attitudes. The basis for consideration was the market for organic food products. Recently, changes can be observed in the level and structure of household consumption, including in particular food products occurring in local and regional terms. There is no doubt that consumption is the driving force of the economy, while human needs are changing along with technical progress, availability of products, increase in incomes, or a change in consumers' environmental awareness. Changes on the supply side are a secondary phenomenon in this respect.

Increasing consumer awareness in terms of quality of life and health has forced them to look for new behaviors that are conducive to health, environmental protection for the sake of current and future generations, which can be included in various categories of sustainable consumption. This consumption means the acquisition of such goods and services that do not contribute to the degradation of the natural environment and the intensive exploitation of its resources. It means buying products whose production takes place respecting the principles of environmental protection, animal welfare, occupational safety, and health, and does not adversely affect human health. It is the consumption of environmentally friendly goods and services. It is consumption which corresponds to satisfying the needs that bring a better quality of life without limiting the process of implementing the use of goods and services by future generations. The growing interest in sustainable consumption results not only from selfish motives, but also from altruistic values, i.e. care for the natural environment.

From the analysis of the results of the research, from the literature on the subject of food consumption, as well as the results of own research obtained locally, it can be noticed that the interest in organic products is growing. Its meaning is much wider, which indicates the multiplier nature of this phenomenon. However, the most frequently indicated barriers to their purchase are high prices. The conducted research shows that among the new phenomena and tendencies in the sphere of consumption, the trend of sustainable consumption associated with the ecologization of life (eco-consumption) is evident. In the second place was "smart shopping" and in the third - ethnocentrism. The results of the study indicate a statistically significant relationship between gender, the place of residence, education, age and the amount of monthly income per person in the household and new (alternative) trends in consumer behavior of modern consumers. In the case of income and age, dependence was strong, in the case of gender and education moderate, and poor for the place of residence.

Therefore, the importance of demographic and economic conditions can be noted. On the other hand, the problem of food waste and its impact on the socio-environmental situation is not properly perceived. In the future, the interest in sustainable consumption will grow, resulting in the perception that the vast majority of consumers perceive sustainable consumption as a permanent trend rather than a temporary fashion. Due to changes in the demographic structure and the persistent rapid increase

in per capita income and changes in its distribution, it can be further confirmed that these changes will continue in the future.

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