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CONSUMER APPROACH TO THE FOOD WASTE IN SELECTED EU COUNTRIES

Abstract. *This paper deals with the issue of food waste as a part of consumer behavior. Due to the absence of conceptual definitions and methodology for monitoring the quantity of food waste, the attention is focused on monitoring the factors that affect consumers purchasing the food and post-buying behavior with food. A survey focused on the subjective attitudes of consumers was carried out in two EU countries – the Netherlands and Slovakia. These countries are members of the EU and differ in their natural, cultural, and socio-economic influences. Based on the similarity of consumer behavior resulting from cluster analysis, the segments are defined to address them more effectively to reduce the amount of wasted food with negative consequences for the environment. Dutch consumers make small purchases as often as consumers from Slovakia. However, they differ in the frequency of purchases for more than 20 €. In the Netherlands, up to 46 % of respondents indicated that they do larger purchases one to two times. There is a neutral attitude to the importance of the price in both countries. Although the Slovaks buy less, they waste more food compared to the Dutch. Besides, they also mention inappropriate storage as a reason. The respondents' attitudes to food waste were divided by similarities into 5 segments in Slovakia and 5 – in the Netherlands. In Slovakia, the above segments involved young women-wasters, consumers, partial self-suppliers, uninterested loner women, gentle and responsible people with an active approach in the area of waste. In the Netherlands, there are other segments of people such as food-friendly housewives, younger women-wasters, families with children with a neutral attitude to waste, students from big cities, young working uninterested loners. The findings showed factors affecting consumer wasting are country-specific. Thus, it is initial to understand the differences in consumer behavior to set appropriate policies to reduce food waste.*

Keywords: consumption behavior, causes of waste, consumer behavior factors, segmentation.

Introduction. The advanced societies of the 21st century face many problems, which they are not prepared for. They still look for a solution. One of these problems is food waste. More wealthy sections of the population have abundance. They can afford to waste and are characterized by a loss of respect for food. On the other hand, less wealthy residents suffer from scarcity and malnutrition in many world regions. Food waste is a waste of resources spent throughout the food production chains, i.e., from economical production, handling, storage, processing, distribution (chain stores) to the final consumer. An important

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topic is the effects of food waste on the environment. Reducing food waste is an important factor in ensuring their sufficiency globally, using limited resources for other purposes, reducing financial losses and environmental risks (Dou et al., 2016; Borma, 2017). The factors with sociological character also have a significant impact on food waste. These factors can be described as a change in the family structure (household) and lifestyle. The issue of food waste is not just a major economic, environmental, but also an ethical problem. The paper's authors agree that the causes of food waste should be sought in the theory of consumer behavior (Kardes et al., 2015). The individual, his/her personal qualities and environment, which they are surrounded by, determines its consumption behavior. The question remains whether people from different countries forming an EU society are similar and whether they can jointly take effective measures to reduce food waste. Two countries, which have different natural and climatic conditions, do not belong to the same cultural affinity zones (Usunier, 1998), have different historical developments, were selected for verification. These countries are the Netherlands and Slovakia. Both mentioned countries are members of the EU but with different social and economic development. For a better understanding of the food waste causes and significant cultural ones, it is important to introduce the current economic situation of Slovakia and the Netherlands. Slovakia has 5443120 inhabitants and 49035 km², with a population density of 111 population/km². The Netherlands has 17081507 inhabitants, a total area of 42508 km², and a population density of 507 inhabitants/km². The age structure of the population in both countries does not significantly differ. Both countries have been experiencing an aging population in recent years. The great disadvantage of Slovakia is the low birth rate and low rate of immigration. Compared to the Netherlands and other developed countries, Slovakia cannot replace the population. From the economic perspective, the Netherlands recorded the fourth-highest level of GDP per capita in the EU in 2017, at 28% above the EU average. In 2017 it was 38400€ per capita, while the EU average was 30000 € per capita (Eurostat, 2019a). The dominant numbers of the Netherlands are influenced by the fact that the Netherlands is one of the largest economies in the world. Behind its wealth lies its colonial history. Nowadays, benefits mainly from the openness and liberal approach caused many professionals representing the desired workforce for international corporations to move into the country. In addition, the Netherlands is a country of dynamically developing tech companies, but also innovative start-ups. It boasts the perfect infrastructure and providing high salaries and social security to citizens.

GDP per capita in Slovakia is below the EU average, but as in the Netherlands and Slovakia, the growing trend was recorded in the period under review. In 2017, GDP per capita in Slovakia was 24% below the EU average, reaching 22900 € (Eurostat, 2019b). For expressing the population's living standard in addition to GDP, the average monthly household income is used. In 2017, it was 2196.25€ in the Netherlands and 624.25€ in Slovakia. It is advisable to add also values of food and non-alcoholic beverages price level indexes in 2016 (the Netherlands 100.2; Slovakia 88.3) and 2017 (Netherlands 101.3, Slovakia 92.2) relative to the EU-28 (index = 100). Average food consumer prices in Slovakia are below average in the EU-28 countries, while in the Netherlands, prices were equal to the EU-28 average in 2016 and in2017 rose slightly above the EU average. These differences are not only reasons but also possibilities to monitor their relevance to consumer behavior concerning food. The Netherlands is at the forefront of food waste in European Union. In 2012, it was 3rd place, while Slovakia was 19th.

The paper aims to identify the factors that influence consumer behavior concerning food waste. Based on these findings, consumers in selected countries will be segmented. To verify the existence of a relationship between the economic situation and the quantity of wasted food obtained, secondary data from databases of EU countries were used.

The paper uses primary data from a questionnaire survey conducted by the Department of Marketing and Trade of Mendel University in Brno (the Czech Republic) in cooperation with the University of Agriculture in Nitra (Slovakia) for the first quarter of 2017 in the Netherlands and Slovakia. The questionnaire has focused on consumer shopping behavior and the routines that characterize it

concerning food before, during, or after food purchases. The relationship with food is closely related to food waste, so consumers' attitude towards waste, their awareness or awareness in this area was ascertained.

Literature Review. Wasting food is part of the consumer's behavior, which is mainly manifested in purchase and consumption. The purchase itself is also influenced by the consumer decision-making style, which affects not only food consumption (Bandara, 2014).Consumption and subsequent food waste production at the household level is influenced by several interrelated factors, especially socio-demographic characteristics of households, their income situation, and their eating patterns (Selzer et al., 2009; Persson, 2019). Social-democratic factors like the level of education or age have a great influence on consumer interest in the area of food waste (Qi and Roe, 2016). According to Blichfeldt et al. (2015) and Tucker and Farrelly (2015), the younger people focus on the financial dimension of food waste, while older people are more concerned about the social and environmental consequences of food waste. On the other hand, older age categories have certain life experiences, created a certain relationship to the products of nature, and respect the created values. They do not waste these products. The subject of interest is food waste's social and ethical dimension in research studies because wasting is a problem, especially in economically advanced societies (Parizeau et al., 2015).The authors emphasize that for most consumers the food waste is primarily a social problem. Attention should also be paid to the influence of social norms, ethical rules, and personal responsibility. According to Visscherset et al. (2016), the sense of personal responsibility prevents food waste or minimizes it. Consumer decision in the question of food waste is also related to the society's culture in which the consumer lives (Bonaccorsi, 2015). The issue of food waste and the effort to reduce waste has a fundamental problem. There is no generally valid definition for food waste. The mentioned fact means that there is no uniform methodology for determining the amount of food waste. The question is whether it is possible to find a uniform definition for food waste throughout the whole food chain, from farmers to households. A specialized agency, the Food and Agriculture Organization of the United Nations (FAO), contributes to creating common definition mainly due to global harmonization of issues, improvement of data collection, and the current development of regulatory measures to reduce waste. In the EU, the concept of food waste is not legally anchored and defined. Anchoring the term in the EU should not be underestimated as it affects policymaking and quantification across sectors of the food chain. Food losses and food waste can be defined as «any food originally intended for human consumption (excluding products not intended for nutritional purposes), which are thrown or destroyed at all levels of the food chain, from farm to consumer» (FAO, 2014). In some research and publications, there is a differentiation in terms of food loss and food waste. Parfitt et al. (2010) mentioned that post-harvest food waste is usually perceived as food loss. These are related to a reduction in food quantity or quality that makes them unsuitable for human consumption. In later stages of the food chain, food waste is more commonly used because it is more related to consumer behavior. The differentiation of food losses and waste is mentioned in the FAO document (2014) and Priefer et al. (2013) publication. Food loss means a loss of the food quantity originally intended for human consumption, which, for various reasons, disappears from the supply chain (Kinderis, 2019). They are usually linked to phases of production, harvest, and post-harvest processing processes. The food losses are associated and caused by the inefficiency of food chains such as infrastructure and logistics, technologies, inadequate skills, knowledge, capacity management of the food supply chain, and insufficient access to markets (Akhtar, 2019). Natural disasters also play a role in food losses. Food waste is a subset of food losses. These represent the foods intended for human consumption but were discarded because the expiration date was exceeded or thrown out due to human intervention or inaction. The reason could be an excessive market offer or individual purchasing and consumer behavior of the population. Therefore, based on the above, it is necessary to measure the environmental consequences, identify barriers and thus create a favorable market environment (Khan Ajaz et al., 2019).The scientific community distinguishes the term

avoidable, unavoidable, and potentially avoidable food waste as WRAP defines them (Quested and Johnson, 2009). Food waste is an important issue for global food security and environmental management, directly linked to all aspects of sustainable development. The amount of food produced but not consumed leads to negative effects on the environment (Fusions, 2015). Food waste negatively affects the amount of available water, energy, and overall contribution to climate change on the earth. According to the Food and Agriculture Organization of the United Nations (FAO, 2017), food waste participates in 8% of all emissions of greenhouse gases caused by humans. Food waste also has an important ethical aspect, as about 800 million people worldwide suffer from malnutrition. That's why there is an urgent need to solve excessive food waste and related problems. The above reasons of the problem severity, the lack of conceptual definitions, and the resulting absence and ambiguity of methodologies for knowledge and food waste quantification have shown the need to know the current state of the given issue. The analyses in both countries, Slovakia and the Netherland, showed that current data on food waste in Slovakia are relatively rough estimates with a significant variation range of errors in this estimate of the amount of food waste.

Different consumer behavior in urban and rural areas also leads to varying numbers of produced food waste. In cities, more waste is generated than in rural areas (Government Office of the Slovak Republic, 2016). Residential, institutional, and commercial sectors are considered as the largest producers of food waste. However, there is not enough information to identify the causes of waste. In Slovakia, there is a lack of reliable data on food waste, which is one of the four key conditions for implementing a successful food waste policy (Parry, 2015; Popp et al., 2018). Therefore, the Ministry of Agriculture and Rural Development of the Slovak Republic currently develops a methodology for evaluating food waste at each stage of the food supply chain and expects improvement by 2020. Current data on food waste in Slovakia are relatively rough estimates with a significant variation range of errors in this estimate of the amount of food waste. It needs to note that Slovakia is one of the few EU countries that does not have the legal possibility to use foods with the expired date of minimum durability for social purposes (European Court of Auditors, 2016). The Slovak legal acts oblige the grocers to destroy the food after their expired date of minimum durability. In Slovakia, the Food Research Institute on the Ministry of Agriculture initiative deals with reducing the production of food waste. Results of the first research carried out in 2017 (Polovka and Nouzovska, 2017) showed that fruit and vegetable waste is dominated the total amount of food waste (56%). Other commodities reached a relatively negligible amount. From the research calculated generated average annual waste per household is approximately 112 kg. Based on the results of the consumer opinion survey conducted in 2018. TESCO found that the most wasted food in Slovakia is bread. The research also showed the need to improve consumer awareness of food waste. The most common food reduction activity in Slovakia is donating food through Foodbanks. Since January 2015, it has been possible to deliver the food before the expiry date or the date of minimum durability to the Food Bank in Slovakia (Government Office of the Slovak Republic, 2016). In 2014, the Food and Beverage Operational Program was also approved in Slovakia. The program prevents food waste by promoting the distribution of donated food and their subsequent obtaining by non-profit organizations or non-profit providers of social services of crisis intervention.

Food waste is a huge problem in the Netherlands. Approximately one-third of the total produced food ends up in the basket (Aramyam and Valeva, 2016; Waarts et al., 2011). One of the causes of high levels of food waste is the EU regulation. Although these regulations are the backbone of the Dutch legal regulations, Waarts et al. (2011) pointed out that their implementation in the Netherlands is stricter.

The main reasons are:

1. Activities of public administration; EU Regulation No. 882/2004, which is related to the official controls. Dutch companies noted that in the Netherlands, they are stricter in comparison to other European countries.

2. Requirements of private individuals at the wholesale, retail, and non-wholesale level and sector outside the households. Example: The hygiene codes based on Regulation No. 852/2004 could be edited to help reduce food waste, or they would prevent its creation, including food information regulations.

3. Improvements in detection methods; some substances on the contamination list have zero-tolerance levels. Thanks to better detection methods and fewer amounts of these substances, they are detected and rejected (Waarts et al., 2011).

The total amount of food waste in the Netherlands in 2012 is reported between 1.7 to 2.6 billion kilograms, with consumer food waste up to 38%. In 2013, food waste per person reached approximately 47 kilograms. In monetary terms, it is more than 150€ (van Dooren et al., 2018). The current data published at the beginning of 2019 indicated food final consumer waste is up to 42% of total food waste in the Netherlands. Compared to 2013, when the food waste per person reached approximately 47 kilograms. Currently, it represents 6 kg less for consumers (Pieters, 2019). Based on the analyses carried out in 2016 concerning the species composition of wasted food in households can be stated that the Dutch throw an average of 11.6 kilograms of solid food and 9.6 kg of liquid food, of which 2.6 litter are dairy products and 7.6 litter of other liquid foods (van Dooren et al., 2018). The research has confirmed that the quantity of food thrown out depends on education, income, and household member number. People with above-average income (van Dooren et al., 2018) waste nearly twice as much as people with below-average income. Furthermore, the research has shown that people who have a shop list or plan their diet waste less.

In 2018, the Netherlands announced and launched a new national program, «United Against Food Waste», aimed to reduce food waste by at least half. The Task Force Circular Economy in Food announced the program, composed of representatives of businesses, research institutes, civil society, and government (Waste360 Staff, 2018). There is currently a large number of initiatives against food waste in the Netherlands. One of them is the application Too Good To Go. With this app, hotels, bakeries, restaurants, and supermarkets can offer their unsold products and food for sale for a lower price. The content of the package is unknown. Therefore, it is labeled as a «magic box» and can be picked up near the residence. According to Pieters (2019), within the first year of application use up to 250000 meals were saved. Another application is a pilot alley in supermarkets, intended for goods assembled or made from foods that would get into waste for other reasons (e.g., esthetical or made from hard pastry, etc.) (Waste360 Staff, 2018).

Methodology and research methods. The main secondary data source is the European Eurostat database, DATA cube, and Central Bureau Voor de Statistik. Secondary data were obtained according to the Guidelines on waste classification by EWC-Stat (European Commission, 2010). The EWC-Stat classification is mandatory for member states when reporting the national data related to waste statistics but does not prescribe a certain data collection method at national levels. States may use any method of primary collection data and any classification of statistical data, as far as the obtained data can be reclassified into EWC-Stat categories. In practice, most countries collect data incategoryLoW (LoW classifies waste by the industry) and transforms it into EWC-Stat categories(animal and mixed food waste, vegetable waste, household waste, and similar waste) is subsequently provided to Eurostat.

Furthermore, primary data will be obtained by a questionnaire survey of Slovakia and the Netherlands respondents. The questionnaire consists of 18 questions about consumer behavior and routines that characterize the relationship to food, their waste, the causes, and attitudes to this issue. The questionnaire also contains identification questions. The survey was carried out in 2017. Respondents were 18-60 years old (age restriction was used due to the different calculation methodology of the economically active population). Control characters for the sample are economic activity and education. The results of the questionnaire are processed by using descriptive statistics. Multidimensional statistical method – PCA – cluster analysis will be used to sort respondents into clusters based on hierarchical clustering. Thus,

clusters are formed according to similarities and differences. The similarity measurement is based on the Euclidean distance metric and means method. IBM SPPS Statistics software is used for the analysis mentioned above and calculations.

Results. The income situation indicator of households is very often used as an indicator of living standards in the given country. Several studies commented on its connection with food consumption and the resulting food waste (Fischer, 2016; Fogarassy et al., 2018). The average monthly income in Dutchhouseholds is several times higher than in Slovak households and exceeds the average household income in the EU. In 2017, it reached 2196.25€ in the Netherlands and 624.25€ – in Slovakia. Household income and consumer food prices determine the total food consumption, respectively spending on food and food wasting. Individual consumption and individual consumption expenditure on consumption (COICOP) are used to monitor expenditures for specific commodities. The classification is functional enough to identify the objectives for which certain transactions are carried out. The first twelve levels of classification referred to individual household consumption expenditure. Food and non-alcoholic beverages expenditure(category CP01) for Slovak households in 2017 was 18.1% of total expenditure, while for Dutch households – only 11.4%. Figure 1 shows graphs (for both countries) with the quantity (in kg) of the above three types of waste per capita. It can be noted that the amount of household waste of the population does not differ very much in the two countries under review. The amount of household waste in Slovakia has a decreasing tendency in the initial phase. Then it rises again, reaching higher values than in the Netherlands. In the Netherlands, household waste has a decreasing character for the whole period. Comparing the amount of animal, mixed food waste, and vegetable waste, these figures are different in both countries (more than 100 kg in the Netherlands, in Slovakia it is only up to 30 kg per capita.

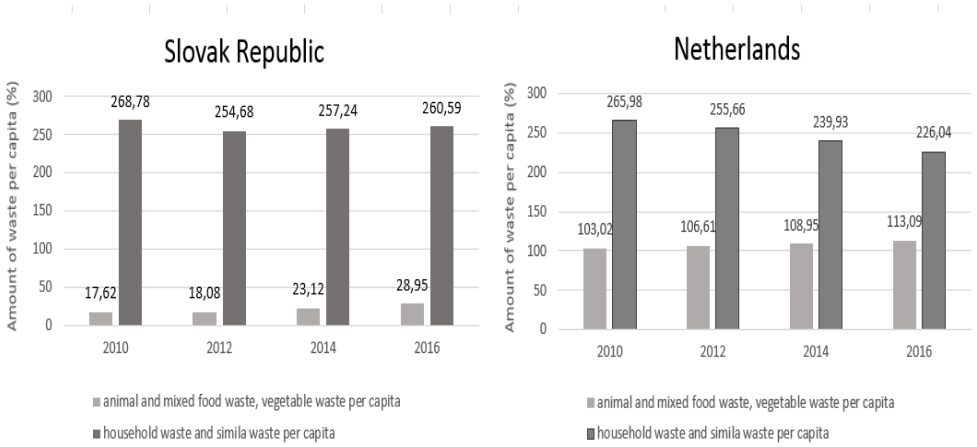

Figure 1. The amounts of animal and mixed household food waste, vegetable waste, and similar waste in kg per capita (2010-2016)

Sources: developed by the authors.

The complexity and inconsistency of the food waste monitoring methodology based on the methodology «Guidance on waste classification by category-Stat» (European Commission, 2010), including their shortcomings and the difference of primary data collection in individual EU countries, disputes the reported results on food waste. At the same time, the results confirmed the opinion of many authors who pay attention to the fact that if the call to reduce food waste is an unconditional assumption, the definitions of food waste categories and the creation of monitoring methodology are necessary.

Due to the doubts concerning the relevance of the results on the amount of wasted food, the authors' attention was paid mainly to the analysis of consumer behavior when purchasing the food and attitudes to food waste. 563 respondents from Slovakia and 538 respondents from the Netherlands participated in the survey. The sample structure relates to gender, age, education, economic activity, size of residence place, the character of household, and how households perceive their monthly income. Based on the questionnaire survey, it can be concluded that the frequency and the size of purchases (expressed with the limit up to 20€ and above 20€) differ between countries. In Slovakia, most respondents (49.4%) indicated that they purchase the food up to 20€ one or two times per week. The second most common answer (29.3%) was shopping two to three times per week. The purchases above 20 € Slovak households do two or three times per month (31.2%), and 30% of respondents purchase 20 € only once a month.

Respondents in Netherland make small purchases as often as respondents from Slovakia, but they differ in the frequency of purchases for more than 20 €. In the Netherlands, up to 46% of respondents indicated that they do larger purchases one to two times per week, not monthly. It can be stated they buy so much more.

The consumption of home-prepared meals occurs among Slovak respondents in 47%. Interestingly, home-cooked food is consumed by households in 26 to 35 years, followed by households aged 18 to 25 (31.1%). In the Netherlands, up to 57% of respondents indicated that they eat prepared food at home every day. Other 32% of Dutch respondents consume homemade food four to five times per week. It means that the Dutch are much more interested in food and prefer food preparation before other activities. Besides, the Dutch control which foods they have at home and buy food according to the shop list. They buy less food at stock prices than the Slovaks but prefer to purchase larger packages. The Slovaks prefer to buy free food. The price, which is considered as one of the decisive factors when purchasing the food, did not reflect in the opinions of the price significance. In both countries, there was a neutral attitude to the importance of the price. The respondents of both countries treat the food after the purchase in the same way. They store food or consume it under the prescribed temperature, place, and period of storage. Despite all these findings, they waste food. The most common causes of food waste are evident in Figure 2.

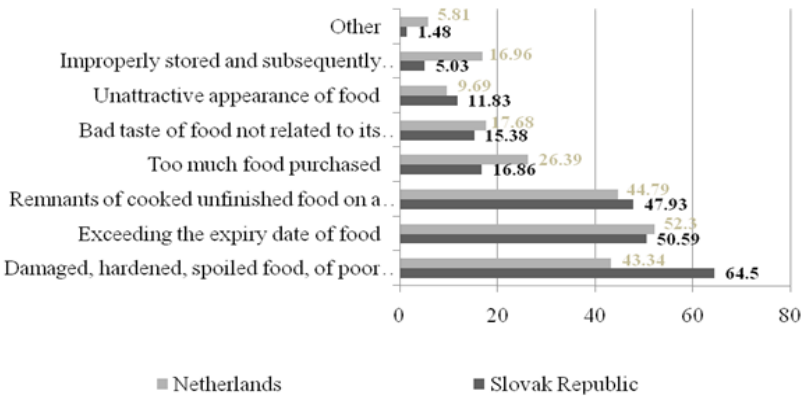

Figure 2. The most common causes of food waste (2010 – 2016)

Sources: developed by the authors.

When comparing the causes of waste in selected countries, it is worth mentioning that the Slovaks, although they buy less, indicate as a reason for food-wasting a purchase of a big amount of food more often than the Dutch. The Slovaks also often mention inappropriate storage as a reason. Figure 3 shows the most

wasted kinds of food. Thus, it is obvious that the order of the most wasted food types is similar in both countries.

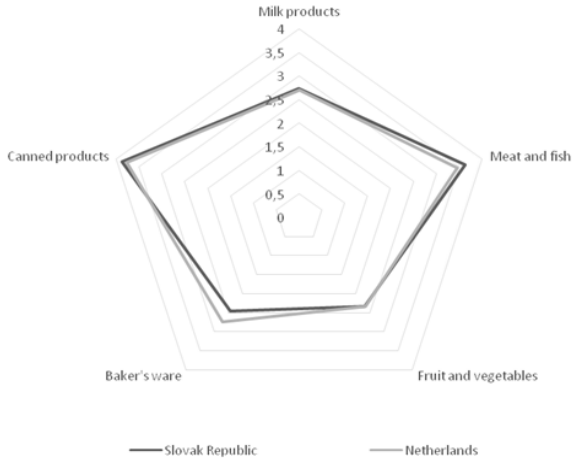

Figure 3. Type of the most wasted food

Sources: developed by the authors.

If any action that could reduce food waste should be effective, it must be well-targeted to a certain group of people, respectively, their behavior. Therefore, the data obtained from the questionnaire survey was processed by the cluster analysis method and to create the inhabitant's groups (segments) with approximately the same behavior. The resulting dendrogram for the size of the graphic expression is not published in the text. According to the cluster analysis results, clustering according to Euclidean distance and k-means method is below created segments of respondents in the Netherlands and Slovakia. The customer segments are specified as follows:

1. Characteristics of Slovak consumer segments.

Segment 1: *Young women – wasters*. The segment is represented by younger women, university educated, who live mostly with partners in the household. These women are employed. Their monthly income ranges slightly above average. These women very often buy more food than they can consume in two or one-person households. The reasons for wasting are large food purchases, expired products, and unused leftovers of prepared (cooked) food.

Segment 2: *Consumers, partial self-suppliers*. The second segment is characterized by men and women in different age categories living in smaller municipalities, up to 2999 inhabitants. These people are predominantly high school educated. Most of them live with their spouse, children in a household. They are employed. Their monthly income is rather average. Their residence allows them to grow fruit and vegetables. The price is important when buying food. What they buy, they consume.

Segment 3: *Uninterested loner women.* This segment consists of women under 35 years old. Most of them have a university degree and live alone. Their income is average, satisfactory. Most of them live in municipalities with over 40000 residents. The price is an important factor to them when buying food. They admit that they are not interested in reducing food waste.

Segment 4: *Gentle and responsible.* The segment characteristic: the main persons in the household are mainly men, different age categories. They live with their partner, alone or with friends in the home. The elderly live with their wives and children. Their monthly income due to economic activity is usually

satisfactory. Besides, they live in municipalities with over 100000 inhabitants. The price of food is not so important to them. In turn, they prefer responsible food handling at home and reducing food waste. The reason for wasting is unused products until they expire.

Segment 5: *People with an active approach in the area of waste.* This segment is characterized by both women and men living with their partners and children in households. They are employed, with an average income. They live in municipalities with over 100000 inhabitants. They are responsible before, during, and after buying food. Very low food waste and active interest in food waste are typical for them. The price is an important factor when buying food.

2. Characteristics of Dutch consumer segments

Segment 1: *Food–friendly housewives.* This segment is characterized mainly by women aged 26 to 45 years, living mostly with their husbands and children. There are employed or entrepreneurs, some on maternity leave. They consider their income as satisfactory. They live in municipalities with over 100000 inhabitants. The price of food is not so important to them. They show responsible behavior in food handling, have a good estimate of cooked food portions. They are informed about the issue of food waste and institutions dealing with food waste.

Segment 2: *Younger women – wasters.* This segment is characterized rather by women with university and secondary school education. All of them are employed or running their own business. Most of them live with a partner in a household. Their income is related to economic activity, and they describe it as satisfactory. They do not plan the purchase of food and buy packed products in a certain amount. The food price is not important to them, they do not check the expiration date on the products, and they immediately throw away the food after the expiration. They cannot distinguish the expiration date and date of minimum durability. There is no interest in waste.

Segment 3: *Families with children with a neutral attitude to waste.* This segment is characterized mainly by women of all age categories. Most of them are employed. Their income is usually described as satisfactory. They live with a partner or husband and children in a household. The size of the residence is not crucial. The price of food is important to them. They cook large amounts of food for children, consume everything cooked, throw away products after their expiration, and are not interested in food waste.

Segment 4: *Students from big cities.* This segment is characterized by age (18-25), including male and female students living in big cities. They label their income as satisfactory, buy larger packages of food, and take advantage of discounts. The price of food is important to them. They cook large portions of food and produce appropriate leftovers. They do not distinguish between the expiry date and the date of minimum durability.

Segment 5: *Young working uninterested loner.*The segment is characterized mainly by men aged 25 to 30 years. Most of them are employed. They describe their monthly income as average and satisfactory. Mostly they live alone and buy food for themselves, buy bigger food packages, and take advantage of discounts. The price of food is important to them, show relatively responsible behavior towards food, but do not show interest in the area of food wasting.

Conclusion. Food waste is part of the consumer's behavior, which is mainly purchasing and consumption, which is closely linked to waste. The consumer's behavior is under certain socio-economic conditions. The assumption was that with a better economic situation and higher living standards, food wastage would grow. Based on the analysis in both selected countries, it can be stated that GDP per capita in the Netherlands is above the EU average, in Slovakia – below the EU average. Still, in both countries, it has a growing tendency. The average monthly income in Netherlands households is several times higher than in Slovak households and exceeds the average household income in the EU. In 2017, it was 2196.25€ per household in the Netherlands and 624.25€ in Slovakia. The income situation of households and consumer prices of food are determining for the overall food consumption, respectively expenditures for food and strongly affect wasting. Due to the absence of conceptual definitions in the area

of waste and losses and the ambiguity of the methodology for monitoring the quantity of wasted food, the waste data cannot be considered as relevant (as indicated by the amounts of wasted food in both countries). The paper's goal was to identify the factors that affect the consumers, the causes of waste, the structure of wasted food, and identify the consumers' groups with similar behavior to address them more effectively.

The questionnaire survey showed that the Dutch make smaller purchases as often as the Slovaks (two to three times per week), but they often make large purchases. They are less affected by discount prices; the price of food is not so important to them. They eat much more often food prepared at home. The Dutch prepare for shopping and check the stock level. Besides, they buy large packages of food.

On the other hand, the Slovaks prefer free foods. Purchasing behavior is in both countries the same. They store food as recommended. Based on the amount and frequency of purchase, it can be stated that the Dutch waste more food. In both countries, fruit and vegetables are the most wasted food. The second is bread, followed by dairy products. The least wasted food is meat and fish and durable food. The most common reasons for waste are degraded food of inadequate quality, expiration date, not consumed home-cooked food, large amounts of purchased food, the bad taste of purchased food, the unattractive appearance of food, and improperly stored and degraded food.

Based on the cluster analysis, the consumer groups with similar behavior were created. The segments showed that conclusions could not be made for the population as a whole. The groups of individuals close to each other by their behavior in each country must be sought. The cause of these differences can be ascribed to different cultural determinants, but this assumption needs further research. The knowledge of consumer segments contributes to the possible formulation of more effective measures leading to food waste reduction.

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Поводження споживачів із харчовими відходами: на прикладі окремих країн ЄС

У рамках даної статті висвітлено особливості впливу споживчої поведінки на утворення харчових відходів. Зважаючи на відсутність загального підходу та методології до контролю кількості харчових відходів, у статті розглянуто фактори-впливу на поведінку споживачів при купівлі харчових продуктів та поводження з ними після придбання. Емпіричний аналіз базується на даних опитування респондентів, які проживають у Нідерландах та Словаччині. У статті наголошено, що природні, культурні та соціально-економічні відмінності досліджуваних країн, попри їх належність до ЄС, впливають на споживачів та їх поведінку із харчовими відходами. Емпіричне дослідження проведено з використанням інструментарію кластерного аналізу. Отримані результати засвідчили, що частота здійснення невеликих покупок не відрізняється між споживачами досліджуваних країн. До того, ціновий фактор не впливає на їх рішення щодо купівлі харчових продуктів. Встановлено, що у Нідерландах 46% респондентів роблять покупки на суму понад 20 євро один-два рази на тиждень. При цьому у Словаччині цей показник є нижчим, тоді як утворення харчових відходів – вищим. Обгрунтовано, що однією з головних причин утворення харчових відходів є їх неправильне зберігання. За результатами аналізу, споживачів було розділено на п'ять кластерів залежно від їх поводження із харчовими відходами. Таким чином, у Нідерландах це є домогосподарки зі свідомим ставленням; молоді жінки, які марнують харчові продукти; сім'ї з дітьми, які нейтрально відносяться до харчових відходів; студенти з великих міст та молоді неодружені працівники, які незацікавлені у питаннях поводження з харчовими відходами. У Словаччині це є молоді жінки, що марнують харчові продукти; споживачі, частково самозабезпечені; незацікавлені неодружені споживачі; свідомі та відповідальні у питаннях поводження з харчовими відходами. Результати дослідження дають підстави стверджувати, що розуміння відмінностей у споживчій поведінці дозволяють сформувати ефективну політику для скорочення харчових відходів та боротьби з негативними наслідками для навколишнього середовища.

Ключові слова: поведінка споживачів, причини утворення відходів, фактори споживчої поведінки, сегментація.