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Article

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A SEGMENTATION STUDY ON HOW CZECH CONSUMERS MAKE HOUSEHOLD FOOD PURCHASES

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Abstract

Understanding consumer behaviour is crucial for companies operating in the food products market, which has undergone numerous changes in recent years. Consumer typology plays a vital role in the development of effective marketing strategies and in catering to diverse consumer needs. The article explores the topic of consumer behaviour in the Czech Republic when making household food purchases. It aimed to develop a consumer typology in the Czech food products market and identify differences between segments based on sociodemographic characteristics, purchasing behaviour and attitudes, including responses to current trends such as price increases and new retail technologies. Quantitative research was conducted on a representative sample of 352 respondents. Using principal component analysis and cluster analysis, five clusters were profiled, namely, the disinterested consumers, the thrifty consumers, the prepared consumers, the modern consumers, and the busy consumers. The study demonstrated how segments differ and which components primarily influence consumers in particular segments. Classifying Czech consumers based on preferences and attitudes is more valuable than traditional segmentation based on sociodemographic characteristics. It can be more useful in setting marketing targets.

Keywords: food products market, consumer typology, consumer segments, consumer attitudes, grocery market, principal component analysis, cluster analysis.

JEL Classification: C38, C83, L66, M31.

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Introduction

The food products market is a highly competitive and dynamic industry driven by ever-changing consumer demands and preferences. These changes are influenced not only by technological advances, pressure for sustainable behaviour, or interest in a healthy lifestyle, but also by the significant increase in food prices over the last few years. This may affect the structure of consumer segments and the criteria that play a role in household food purchasing decisions. Understanding consumer segments and their behaviour is vital for companies operating in the food products market.

Consumer typology offers a framework for categorising consumers based on various dimensions. Existing studies dealing with consumer typologies in the food market use sociodemographic criteria, psychographic criteria, consumer attitudes, or shopping habits (Pestek, Agic and Cinjarevic, 2018; Gumber and Rana, 2021; Tokinomo, 2022). However, there is a research gap where the current significant increase in food prices or consumer attitudes toward new technologies when purchasing are not considered among the existing segmentation criteria, specifically in the Czech grocery market. This study aims to bridge this gap by exploring consumer behaviour and creating a typology of consumers according to their household food purchase habits, adding these criteria to other factors a consumer may consider when buying food for their household. The aim is to find out to what extent these factors have an impact on consumer segments.

The paper is structured into several parts. First, a review of the scientific literature on consumer typology in the food product market is done. The research methodology is explained then, and the findings are presented and discussed. In the last part, recommendations and marketing implications are shown, and limitations of research and possibilities for future investigation are mentioned.

The scientific contribution of this paper lies in the extension of existing consumer typologies with new criteria that reflect changes affecting household food purchases. Therefore, the study provides a more comprehensive insight into the decisions of consumers today about buying food. The new consumer typology can be useful in determining marketing strategies to target newly defined consumer segments.

1. Review of the scientific literature

In line with the paper's focus, the theoretical background is devoted to the importance of market segmentation, approaches to consumer typologies in the food market, and methods used for this purpose.

1.1 The importance of market segmentation

Consumer heterogeneity has been observed in the marketplace in recent years, making segmentation a valuable tool for marketers, allowing them to identify distinct groups of consumers with similar characteristics, behaviours, and preferences (Brand, Schwanen and Anable, 2020). Market segmentation divides a large market into more manageable and targeted segments (Kumar and Smith, 2018). Understanding consumer diversity is crucial to customising products and services to match the distinct requirements and preferences of each market segment (Semaan et al., 2024). Market segmentation can be based on a variety of factors, including demographics, geography, psychographics, and behaviour. This involves

considering shopping motivations such as variety and convenience, as well as factors such as personality traits, trust, attitude, perceived risk, and enjoyment of shopping (Semaan et al., 2024). The most common segmentation criteria include consumer attitudes, individual preferences, and purchase motives. The differences in the criteria used depend on the topic of the research and the type of product or part of the target food market.

With society becoming increasingly fragmented, there has been a growing emphasis on typologies that focus on purchasing behaviour and buying patterns in recent years, making traditional demographic segmentation less relevant (Bauerová, Starzyczna and Zapletalová, 2023). It is also necessary to consider current trends in the food market that influence consumers' decisions when purchasing household food. Therefore, the principal component analysis and cluster analysis used in this study will segment consumers according to the newly created components based on the analysis of consumer behaviour.

1.2 Approaches to consumer typologies in the food products market

To create typologies, the authors consider different perspectives, such as customer shopping habits (Tokinomo, 2022), consumer attitudes towards local food (Kumar and Smith, 2018), preferences for food quality labels (Velčovská, 2018; Sadílek, 2019), or consumer responsibility for family food purchases (The Food Industry Association, 2015). Other authors have elaborated on specific typologies in the food market, for example, in terms of attitudes toward organic food (Pestek, Agic and Cinjarevic, 2018; Gumber and Rana, 2021), or perceptions of superfoods (Lucas, et al., 2022).

Common segmentation criteria are individual consumer preferences, which each author tailors specifically to their research, as consumer preferences are a huge group of characteristics that can be used. Heide and Olsen (2018) examined segmentation based on how consumers perceive food quality and prestige benefits when purchasing food for special occasions. Figueiredo et al. (2022) focused more on the criteria that consumers value when buying and consuming foods of rural origins. They also used socio-demographic data, but their more specific criteria were products purchased, familiarity with rural areas, and images of food products and their regions of origin. Mesić et al. (2021) divided consumers according to their altruistic motivations and perceived barriers to local food purchases. In another study that focused on local food, the authors chose food-related lifestyle attributes as segmentation criteria (Kumar and Smith, 2018).

In Hempel's study (2024), consumers' reactions to rising food prices in Germany were taken as the criterion for segmentation. Conlin and Labban (2019) analysed consumers according to their attitudes, behaviour, and level of participation when buying groceries. In the study of Brand, Schwanen and Anable (2020), a psychographic segmentation approach was applied concerning consumer attitudes towards online grocery shopping.

Sustainability is one of the most talked about concepts today, and this topic is intertwined with food consumer typology studies. In addition to sustainability, attitudes toward organic food are also examined. The relationship between food sustainability and food consumers is explored by O'Neill et al. (2023). Their study presents a typology using food consumption habits from buying to disposal. The main factors that influence food consumption include quality attributes, food responsibility, dietary choices, and the way food is organised at home. Sustainability benefits are used along with segmentation criteria when exploring consumer perceptions of superfoods (Lucas et al., 2022). Eco-conscious behaviour in the food sector is also a way to live more sustainably. Funk, Sütterlin and Siegrist (2021) present a consumer

segmentation based on eco-friendly behaviour, using the following segmentation criteria: eating habits, percentage of organic food purchased, involvement in food, motives for food choices, mobility and housing behaviour and environmental awareness.

A more comprehensive study, "GfK Shopper Typology 2024", offers comparable shopper-type data in the FMCG (Fast-Moving Consumer Goods) market in different countries. The study focused on shopping behaviour when purchasing food and daily necessities, and shoppers were divided into the following main types according to how they shop and their main expectations: Flexible shopper, heavy loader, convenient shopper, quality shopper, organic shopper, modern shopper, focused discount shopper, discount switcher, and promo hunter. The number and structure of these segments differ between countries. In the Czech Republic, the segment of focused discount shoppers is not represented (Leibmann, Dreyer and Matei, 2022). A picture of the shopping behaviour of Czech consumers when purchasing food products is provided by GfK Shopper Typology 2018. Based on the way they shop and their main expectations, shoppers were divided into five main types, which are "quality for the family" (they want quality), "good value for money" (they want a cheap big purchase), "cheap and close" (they want specific products at a low price), "out of habit" (they want security), "fast" (they want to save time) (GfK, 2018).

According to the study "Purchasing Habits 2021" conducted by KPMG and the State Agricultural Intervention Fund, mediated by the STEM/MARK agency, a typology of Czech consumers was created on the food products market. Within the typology, four consumer groups were profiled based on their preference for quality, price, brand, or origin of food. The profiled segments include the quality-oriented consumer segment, the price-oriented consumer segment, the origin and regional products-oriented consumer segment and the brand-oriented consumer segment (KPMG, 2021).

Velčovská (2018) and Sadílek (2019) proposed a typology of Czech consumers according to their attitudes toward food quality labels. Sadílek (2019) used awareness and perception of quality labels, willingness to pay a higher price for food with certified quality, and sociodemographic factors as segmentation criteria. The final typology consists of these segments: quality seekers, unconscious shoppers, and impulsive shoppers. Taking into account consumer attitudes towards food quality labels, Velčovská (2018) proposed segments of sceptics, undecideds and supporters.

Bauerová, Starzyczná and Zapletalová (2023) segmented Czech consumers according to their behaviour when shopping for food online. They created a typology based on shopping behaviour, personality traits, loyalty, satisfaction with online grocery shopping, and frequency of social media use. The resulting segments were identified as quality-oriented shoppers, influential utilitarians, loyal traditionalists, satisfied conditional loyalists, and mobile eco-sympathisers.

The relationship of Czech consumers with organic food was examined by Koudelka (2013), who primarily focused on the potential of using different types of consumer segmentation approaches in this market, rather than on consumer attitudes towards organic food per se. In particular, he examined variables related to consumer behaviour and lifestyle.

The summary of consumer typologies in the food products market conducted in the last 10 years is presented below (Table no. 1). In the table, only generally focused typologies are mentioned, i.e. not focused on only one food category (e.g. meat).

Table no. 1. Summary of consumer typologies in the food products market

| Authors | Methodology | Segmentation criteria | Segments |
|---|--|---|--|
| Bauerová, Starzyczná and Zapletalová (2023) | online survey N=773 Czech Republic | customer behaviour when shopping for food online | Quality-oriented shoppers; Influential utilitarians; Loyal traditionalists; Satisfied conditional loyalists; Movable eco-sympathizers |
| Brand, Schwanen and Anable (2020) | online survey N=2,032 United Kingdom | psychographic segmentation approach – the Theory of planned behaviour and the Technology Acceptance Model | Intensive urbanites; Online omnivores; Resisting and responsible; Uncaring multitude; Willing but struggling |
| Conlin and Labban (2019) | online survey N=14,807; USA | attitudes and behaviours of grocery shoppers | High and low involvement grocery shoppers |
| Figueiredo et al. (2022) | personal and online survey N=1,553; Portugal | rural food selection criteria, shopping preferences | Influenced; Provenance seekers; All embracers |
| Lucas et al. (2022) | mail survey N=423; Switzerland | consumer perceptions towards superfoods | Super foodies; Adventurous; Involved; Indifferent; Sceptical; Rejecters |
| Funk, Sütterlin and Siegrist (2021) | PAPI N=817 Switzerland | Eco-conscious behaviour in the food sector | Meat and fish eaters; Origin-focused food savers; Ambiguous consumers; Food waste reduction sharers; Renouncement aversives; Pro-environmental consumers |
| Gumber and Rana (2021) | personal survey N=566 India | consumer attitudes towards organic food and their buying patterns | Incognizant; Critical; Conservative; Unconcerned; Congruent consumers |
| Heide and Olsen (2018) | web-based survey N=851 Norway | the quality importance and prestige benefits when buying food for a special occasion | Perfectionists; Premium; Luxury-seeking; Value focussed |
| Hempel (2024) | online survey N=1,000; Germany | Consumer responses to rising food prices | Light adjusters; Savers; Controversialists |
| Kumar and Smith (2018) | survey N=502; USA | consumer attitudes toward local food, food-related lifestyle attributes | Impromptu novelty explorer; Uninvolved connoisseur; Involved information seeker; Apathetic local food consumer |
| Mesić et al. (2021) | online survey N=402; Croatia | altruistic motivations and perceived purchasing barriers | Embedded local food consumers; Disinclined local food consumers |
| O'Neill et al. (2023) | online survey N=324; Ireland | food consumption practices | Food dabblers; Food appreciators; Pro-sus; Pressured |
| Pestek, Agic and Cinjarevic (2018) | online survey N=202; Bosnia and Herzegovina | organic food knowledge, attitudes towards organic food and organic food purchase, consumer innovation | Enthusiastic social-seekers; Enthusiastic moralists; Hostile seldom shoppers; Hostile heavy shoppers |
| Sadílek (2019) | individual interviews N=444 Czech Republic | preferences for food quality labels | Quality seekers; Unconscious shoppers; Impulsive shoppers |
| Velčovská (2018) | online survey N=631, Czech Republic | attitudes towards food quality labels | Sceptics; Undecideds; Supporters |

Based on the summary (Table no. 1), it is clear that individual authors use different segmentation criteria when segmenting consumers in the food market. They usually focus on a specific topic, e.g. attitudes towards food quality, attitudes toward food prices, attitudes towards organic food, rural provenance foods, superfoods, or local foods, attitudes towards food quality labels, environmentally friendly behaviour, online food shopping, level of involvement of grocery shoppers, etc.

Our study aims to fill a research gap in the scientific literature, as the previous researches have primarily focused on traditional segmentation criteria and do not include current trends in the food market, i.e., a significant increase in food prices and consumer attitudes toward new retail technologies, specifically on the Czech market. Therefore, the paper applies a more comprehensive approach by adding these criteria. The intention is to create an up-to-date consumer typology, to find out to what extent the mentioned factors influence the structure of consumer segments on the Czech market, and to gain a better understanding of the purchasing behaviour and decision-making of Czech households. The following research questions (RQ) were formulated:

RQ1: What are the key components that influence Czech consumers when buying food and how influence the structure of consumer segments in the Czech grocery market?

RQ2: In the period of rising food prices on the Czech market, does the price-oriented consumer segment prevail over the quality-oriented consumer segment?

RQ3: Will the structure of consumer segments be affected by the trend of new retail technologies (scan-and-go, NFC payments, self-service checkouts)?

1.3 Methods used to create a consumer typology

Factor and cluster analysis are the most common methods used to analyse consumer behaviour and attitudes. Authors studying consumer attitudes in the food market apply a combination of these methods and cluster analysis alone, sometimes supplemented by other methods. Heide and Olsen (2018), Sadílek (2019), Frank and Peschel (2020), Funk, Sütterlin and Siegrist (2021), Figueiredo, et al. (2022), Lucas, et al. (2022) only use cluster analysis. The most common is a combination of cluster and factor analysis (Kumar and Smith, 2018; Mesić, et al., 2021; Baueroová, Starzyczna and Zapletalová, 2023; O'Neill et al., 2023). Factor analysis is most often chosen as a method to identify the factors that influence the most consumer buying behaviour. These factors are then usually used as segmentation criteria when creating a typology based on cluster analysis. Some authors have also used other methods in their research, such as multinomial logistic regression, principal component analysis, discriminant analysis or latent profile analysis (Conlin and Labban, 2019; Brand, Schwanen and Anable, 2020; Dana et al., 2021). The authors of this paper use a combination of principal component analysis and cluster analysis.

2. Research methodology

The research study aimed to categorise Czech consumers within the grocery market and suggest a consumer typology considering household food purchase habits. Primary data was collected through a questionnaire survey, using the CAWI (Computer Assisted Web Interviewing) technique. The basic sample consists of residents of the Czech Republic who make all or part of their household food purchasing decisions and fall into the age category of 18-75 years. Quota sampling was used and quotas were defined based on data from the Czech Statistical Office on the age composition of the Czech population. These residents were divided into six age groups. The gender ratio was established at 70 % female and 30 % male, as household food purchasing is carried out predominantly by women (KPMG, 2021), and they are considered nutritional guardians of the household (Crane et al., 2019). Data collection was carried out in February 2023. A total of 377 respondents participated in the survey. Those respondents who did not meet the requirements of the base population were

excluded from the survey by answering "no" to the first question: "Do you make decisions about food purchases for your household?". The total number of respondents eliminated was 25. The relevant respondents totalled 352 (Table no. 2).

Table no. 2. Structure of the Czech population and sample

| N=352 | | Czech population | Sample | |
|-----------------|---------------|------------------|------------|-----------|
| Characteristics | | Percentage | Percentage | Frequency |
| Gender* | Men | 49.00 % | 30.97 % | 109 |
| | Women | 51.00 % | 69.03 % | 243 |
| Age | 18 – 25 years | 10.66 % | 12.50 % | 44 |
| | 26 – 35 years | 16.35 % | 17.05 % | 60 |
| | 36 – 45 years | 19.92 % | 18.75 % | 66 |
| | 46 – 55 years | 21.27 % | 20.45 % | 72 |
| | 56 – 65 years | 16.14 % | 16.48 % | 58 |
| | 66 – 75 years | 15.66 % | 14.77 % | 52 |
| Total | | 100.00 % | 100.00 % | 352 |

**Note: The gender ratio in the sample was determined using the judgment technique to be 70 % female and 30 % male, as women are primarily responsible for purchasing food for the household.*

Source: Czech Statistical Office, 2023 and own research

The thematic areas of the questionnaire were consumer habits in the food market, the choice of the place of purchase, the importance of food quality, the role of price, the usual course of food purchase, sources of information about food, attitudes toward new in-store technologies and the sociodemographic data (gender, age, highest educational attainment, social status, household income, number of household members and size of residence). The structured questionnaire included a series of 16 statements related to grocery shopping. Statements were evaluated using a five-point scale of agreement. This enabled the subsequent use of principal component analysis and cluster analysis to create a typology of consumers. The questionnaire was distributed through social networks, mainly to specified online forums and groups on beverage and grocery shopping.

Data analysis was performed using IBM SPSS and MS Excel software. Additionally, to standard analytical procedures, principal component analysis and cluster analyses were applied to perform segmentation and create consumer typology. Principal component analysis allows reducing the number of variables in a dataset while preserving as much information as possible (Karamizadeh et al., 2013). This method was applied in the research specifically for the battery of statements, with a reduction from 16 original statements to five new components. In the subsequent cluster analysis, the clustering was performed on five new components. In the first step, Ward's method was applied, based on which the number of clusters was set to five. The correctness of the number of clusters was checked by the K-means method, the calculation was made for four, five, and six clusters. Based on the results of the K-means method for different numbers of clusters, the resulting number of clusters was confirmed to be five as the most appropriate distribution of the number of respondents in individual clusters. When comparing the results of the K-means and Ward's method, the output of the K-means method was used because the cluster structure was more consistent and logical. Additionally, analysis of variance (ANOVA) was used to test whether the differences between the observed groups were statistically significant. The chi-squared test of independence was used for categorical variables.

3. Results and discussion

The results are categorised into five sections: Consumer attitudes towards household food shopping, identification of the segmentation criteria, creation of a consumer typology using cluster analysis, sociodemographic profile of the consumer segments, and discussion.

3.1 Consumer attitudes toward household food shopping

Respondents evaluated 16 statements regarding their attitudes toward household food purchases. For the evaluation, a Likert five-point agreement scale was used (1 means strong agreement, 5 is strong disagreement). The mean scores indicating the level of agreement with the statements are shown in Table no. 3. The respondents were more likely to agree with the statement about saving money by buying food on sale or special offers. They also expressed a relatively strong agreement with the purchase of good quality food. The lowest (but average) level of agreement was found for the statements that they choose a store based on discounts from leaflets and that they like to use new retail technologies.

**Table no. 3. Mean scores of agreement with statements related
to household food shopping (1 – I completely disagree, 5 – I completely agree)**

| Statement | Mean score | Standard deviation |
|---|------------|--------------------|
| I try to save money by buying food on sale or special offer. | 4.16 | 1.11 |
| When I shop for food, I try to buy mainly good quality food. | 3.95 | 0.98 |
| I try to save money when I shop for food. | 3.88 | 1.14 |
| I mainly buy food based on what other family members like. | 3.64 | 1.27 |
| I try to save money by buying less semi-finished food. | 3.62 | 1.30 |
| I usually choose the nearest store to where I live or travel. | 3.52 | 1.32 |
| Quality is more important to me than price when I buy food. | 3.46 | 1.05 |
| I often buy food on impulse and buy things I didn't have on my list or plan. | 3.45 | 1.28 |
| I prefer food produced in the Czech Republic. | 3.40 | 1.28 |
| I enjoy shopping for food, I like to choose what I buy. | 3.39 | 1.35 |
| I always have a shopping list when I go shopping. | 3.32 | 1.41 |
| I like to try new foods. | 3.27 | 1.16 |
| I like to save time when shopping for food. | 3.20 | 1.23 |
| I regularly look at food retailers' leaflets. | 3.05 | 1.50 |
| I like to use new technologies when shopping (scan and go, NFC payments, self-service checkouts). | 3.00 | 1.50 |
| When shopping for food, I choose a store based on discounts from leaflets. | 2.84 | 1.50 |

3.2 Identification of the segmentation criteria

Principal component analysis was performed on the set of 16 statements to reduce them to fewer components that influence family food purchases, thus allowing for more convenient use and interpretation of the ongoing cluster analysis. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity were performed to confirm the adequacy of the principal component analysis. Both conditions were met. The KMO measure of sampling adequacy is 0.708. In Bartlett's Test of Sphericity, the approximate Chi-square is 1446.264, p-value <0.001. Therefore, the use of principal component analysis is appropriate. Once all the conditions had been verified, the principal component analysis was carried out with Varimax rotation. The 16 original statements were reduced to five new components. These

new components explain more than 60 % of the variance of the entire battery, which can be considered an ideal result (Table no. 4).

Table no. 4. Total Variance Explained

| Component | Extraction total | Sums of squared % of variance | Loadings cumulative % | Rotation total | Sums of squared % of variance | Loadings cumulative % |
|--|------------------|-------------------------------|-----------------------|----------------|-------------------------------|-----------------------|
| 1 | 3.14 | 19.59 | 19.59 | 2.88 | 17.99 | 17.99 |
| 2 | 2.64 | 16.50 | 36.09 | 2.30 | 14.39 | 32.39 |
| 3 | 1.48 | 9.27 | 45.36 | 1.80 | 11.22 | 43.61 |
| 4 | 1.31 | 8.20 | 53.56 | 1.44 | 9.00 | 52.61 |
| 5 | 1.06 | 6.59 | 60.15 | 1.21 | 7.55 | 60.15 |
| Extraction Method: Principal Component Analysis. | | | | | | |

The rotated component matrix (Table no. 5) shows the distribution of variables into groups based on component loadings. However, the rotated matrix contains several significant cross-loadings (higher than 0.30 in absolute value) where the original statements load on two or more components. These statements have been assigned to components on the basis of their logical relationship with them and because of the highest loading on those components. Loadings near -1 or 1 indicate a strong influence of the component on the variable, and values near 0 mean a weak effect on the variable.

Table no. 5. Rotated component matrix with loadings

| Rotated component matrix | PC 1 | PC 2 | PC 3 | PC 4 | PC 5 |
|---|-------|-------|--------|-------|-------|
| Quality is more important to me than price when I buy food. | 0.804 | | -0.353 | | |
| When I shop for food, I try to buy mainly good quality food. | 0.769 | | | | |
| I try to save money by buying less semi-finished food. | 0.471 | | | | |
| I prefer food produced in the Czech Republic. | 0.281 | | | | |
| I regularly look at food retailers' leaflets. | | 0.907 | | | |
| When shopping for food, I choose a store based on discounts from leaflets. | | 0.721 | 0.343 | | |
| I always have a shopping list when I go shopping. | | 0.355 | | | |
| I mainly buy food based on what other family members like. | | 0.311 | | | |
| I try to save money by buying food on sale or special offer. | | | 0.716 | | |
| I try to save money when I shop for food. | | | 0.707 | | |
| I often buy food on impulse and buy things that I did not have on my list or plan. | | | | 0.684 | |
| I like to try new foods. | 0.388 | | | 0.521 | |
| I enjoy shopping for food, I like to choose what I buy. | | | | 0.515 | |
| I like to use new technologies when shopping (scan and go, NFC payments, self-service checkouts). | | | | 0.208 | |
| I like to save time when shopping for food. | | | | | 0.499 |
| I usually choose the nearest store to where I live or travel. | | | | | 0.365 |

Note: PC...Principal component

Principle component 1, which includes the four original statements, is called **Preference for quality food**. The original statements focused on the fact that quality is more important to consumers than price, that consumers buy primarily good quality food, and that consumers prefer to buy less semi-finished food, which is of lower quality than fresh food. They also prefer food from the Czech Republic.

The main component 2, which also combines the four original statements, is called **Food shopping by preparation**. The importance of the second variable lies in the preparation before going to the store. Consumers know in advance what food they are going to buy and thus can avoid unnecessary expenditures. The statements are, 'I regularly look at the leaflets of the supermarkets', 'When I buy food, I choose the store according to the promotions and discounts in the leaflets', 'I always prepare a shopping list when I go shopping' and 'I mainly buy food based on what other family members like'.

Principle component 3 is called **Saving money when shopping** because the common feature of two original statements under this component is that consumers want to spend as little money as possible on food. Consumers focus on buying food on sale or at a discount and they want to save money when they shop.

The principle component 4 is named **Interest in shopping and trying new things** and includes the four original statements. The title defines consumers who enjoy shopping, welcome modern technology in stores, and like to try new products. They are often impulsive shoppers, buying things they had not planned to buy.

Principle component 5 is defined as **Saving time when buying food**. It covers two original statements and indicates consumers who do not want to spend unnecessary time shopping. For this reason, they also visit the nearest possible store, which takes them the least time.

3.3 Creating a consumer typology using cluster analysis

The five newly developed components were used as a basis for the following cluster analysis, which was carried out using Ward's hierarchical clustering method and the Euclidean square distance of similarity measure. Using this approach, the number of clusters was set at five. Subsequently, the non-hierarchical K-means method was used to verify the correctness of the set number of clusters (it is explained in part 2 Research methodology). According to the K-means analysis results, the chosen number of five clusters is ideal and the number of respondents in each cluster is the most appropriately distributed. Differences between clusters and principal components were confirmed using the ANOVA test. The findings indicate significant differences in the mean of the variables. Therefore, the number of clusters can be considered definite and confirmed (Table no. 6, last two rows).

Table no. 6. Principal component scores in individual clusters

| | PC 1 Preference for quality food | PC 2 Food shopping by preparation | PC 3 Saving money when shopping | PC 4 Interest in shopping and trying new things | PC 5 Saving time when buying food |
|--------------------------------|---|--|--|--|--|
| Modern consumers | 0.391 | -0.791 | 0.087 | 0.511 | 0.181 |
| Busy consumers | -0.447 | -0.694 | 0.052 | -0.520 | 0.406 |
| Disinterested consumers | -0.101 | -0.783 | -1.718 | -0.547 | -0.421 |
| Thrifty consumers | 0.057 | 0.737 | 0.247 | -0.209 | -0.025 |
| Prepared consumers | -0.142 | 0.677 | 0.203 | 0.245 | -0.265 |
| ANOVA test: F value | 8.716 | 139.532 | 54.138 | 27.612 | 12.905 |
| p-value | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

Note: PC-Principal component

The new clusters have been named according to the mean values of the component scores (Table no. 6), which express the attitudes of the individual clusters toward the newly created components. Positive values of the component scores indicate that the segments evaluate these components positively. In contrast, negative values indicate that the clusters assess these components negatively.

The three segments (modern, thrifty, and prepared consumers) are approximately the same size and together occupy about three-quarters of the market. The smallest segment is the segment of disinterested consumers.

The first cluster, the **Modern consumers**, with 84 respondents (24.4 %), expressed the highest level of agreement with the fourth component, “Interest in shopping and trying new things”. They also have the highest preference for quality food from all segments, and they do not buy food based on preparation.

The second cluster is called the **Busy consumers** and includes 54 respondents (15.3 %). For this segment, there is remarkable agreement with the newly defined component “Saving time when buying food”. In contrast, they do not show much interest in shopping or trying new things, they do not buy according to the previous preparation. They have the lowest preference for quality food of all segments.

The smallest consumer segment, with 30 respondents (8.5 %), was named **Disinterested consumers**. This is a segment with rather negative attitudes towards all components. This is most pronounced for the third component, i.e., they do not try to save money when they shop. They also do not shop according to prior preparation, nor are they significantly interested in shopping and trying new things.

Thrifty consumers create the largest segment with 97 respondents (27.6 %). They show the highest level of agreement with the component “Food shopping by preparation” and also try to save money when shopping. They are not very interested in shopping and trying new things. For the other components, their attitudes are close to the average.

The last cluster, with a total of 85 respondents (24.2 %), is made up of the **Prepared consumers**. This segment also shows the highest level of agreement with the component “Food shopping by preparation”. However, unlike the previous segment, they also show partial interest in shopping and trying new things.

3.4 Socio-demographic profile of consumer segments

The profiles of the segments in the food products market are described according to their socio-demographic characteristics. For each consumer segment, the dependence on the socio-demographic data of the respondents was tested, specifically gender, age, education, social status, net monthly income of the household and size of residence. Dependence was found only for gender (Chi-square = 22.837, p-value <0.001), age (Chi-square = 62.173, p-value <0.001), and number of household members (Chi-square = 31.048, p-value = 0.013). The tests were carried out using chi-squared tests of independence. The overall demographic profile of the defined segments is as follows.

The modern consumer segment consists of 72.09 % women and 27.91 % men. Compared to the general sample, the modern consumer segment has a higher representation of respondents aged 18-25 (18.60 %) and 46-55 (25.58 %). However, consumers 65 years and

older are the least represented (2.33 %). Two-person (48.84 %) and four-person (17.44 %) households predominate in this segment.

Among **busy consumers**, the proportion of men and women is fairly even, with 53.70 % of women and 46.30 % of men. Given that 30.97% of the total sample was male, it can be concluded that men are typical representatives of busy consumers. Compared to the general sample, there are more respondents in this segment in the 56-65 age category (22.22 %), followed by the 36-45 age category (20.37 %), while consumers 66+ are less represented (9.26 %). Single-person (31.48 %) or two-person (38.89 %) households predominate in this segment.

The segment of the **uninterested consumers** includes 56.67 % of men and 43.33 % of women. This is the segment with the highest representation of men in all segments. These consumers are predominantly in the 26-35 (26.67 %) and 36-45 (26.67 %) age categories. On the contrary, the lowest proportions are consumers aged 18-25 (3.33 %) and 56-65 (10 %). The respondents are more likely to come from households of one person (30.00%) or two people (43.33%).

Women (71.13 %) are more likely than men (28.87 %) to be **thrifty consumers**. The segment of thrifty consumers shows the biggest difference in the age distribution of the respondents. The highest proportion is among pensioners 65 years and older (34.02 %). The percentage representation of each age group tends to decrease with the age of consumers. The youngest age group, 18 to 25 years old, is the least represented (5.15 %). In this segment, two-person households (48.44%) and three-person households (27.84%) predominate, while there is a minimum of one-person households (5.19 %).

Prepared consumers are the segment with the largest difference in the gender ratio. Female respondents account for 82.35 % of the segment, while male respondents account for only 17.65 %. The most represented age category is 26-35 years, followed by consumers aged 46-55 years (21.18%). Compared to the age structure of the total sample, the youngest age category, 18-25 years old (16.47 %), is also more represented in this segment. There are fewer respondents aged 56 to 65 and 65 and older among prepared consumers. Compared to the sample, there are more households of four people.

3.5 Discussion

If we compare the results presented in this paper with the results of previous studies, the closest match can be found with studies implemented on the Czech market. The most similar segments emerged from the GfK Shopper Typology 2018 study, which focused on the shopping behaviour of Czech consumers when buying food. In this study, consumers were divided into five segments, three of which are similar to our findings: “quality for the family” (some characteristics are similar to our modern consumer segment), “good value for money!” (they want a cheap big purchase, just like our thrifty consumer segment), “fast” (they want to save time, similar to our busy consumer segment) (GfK, 2018).

Other similarities can be found in the "Purchasing Habits 2021" study whose output includes, among other segments, the quality-oriented consumer segment (similar to our modern consumer segment which emphasizes mainly on food product quality) and the price-oriented consumer segment (comparable with our thrifty consumer segment, which tries to save money when shopping for food) among Czech consumers (KPMG, 2021). Segments of modern shoppers and discount switchers were also identified by the GfK Shopper Typology

2024 (Leibmann, Dreyer and Matei, 2022). The quality-oriented shoppers segment was also identified by Bauerová, Starzyczná and Zapletalová (2023). Sadílek (2019) named these consumers quality seekers.

However, our study also focused on consumers' attitudes towards new technologies in stores (e.g., scan and go, NFC payments, self-service checkouts), which, unlike the previous studies mentioned above, was reflected in our modern consumer segment. Therefore, this segment is interested in both high-quality food and the use of new technologies when shopping.

In comparison with foreign studies, only a similarity of sub-segments was found. Conlin and Labban (2019) revealed a segment of low-involvement consumers, which is similar to our segment of disinterested consumers. The segment of thrifty consumers in our study was identified as savers in the study by Hempel (2024).

It can be said that the Czech food market shows certain specificities compared to foreign markets, which is demonstrated by a greater match of current segments with earlier studies on the Czech market.

Based on the results of the study, it is also possible to answer the research questions.

RQ1: The key components that currently influence Czech consumers when purchasing food are a preference for quality food, food shopping by preparation, saving money when shopping, interest in shopping and trying new things, and saving time when buying food. These components are reflected in a consumer typology and five consumer segments have been profiled based on them in the Czech grocery market.

RQ2: In the period of rising food prices on the Czech market, the price-oriented consumer segment (27.6 % of thrifty consumers) slightly prevails over the quality-oriented segment (24.4 % of modern consumers with the highest preference for quality food).

RQ3: The trend of new retail technologies that consumers can use when shopping for food affects the structure of consumer segments. A segment of modern consumers has been identified. Its members not only prefer quality food, but also are also interested in new things and use modern retail technologies when shopping.

It should be emphasised that each of the studies used partly different methodologies and was usually carried out in one single country or focused on a specific part of the market; these limitations should be taken into account when comparing the results.

Conclusions

This research explored consumer behaviour in the context of household food purchases, providing an understanding of how different factors influence purchase decisions. Its primary objective was to create a consumer typology based on criteria that reflect different consumer priorities and preferences when buying food for their households. By examining these criteria, the authors were able to categorise consumers into distinct segments, each characterised by unique behaviours and motivations. The segments were also described by consumers' sociodemographic characteristics.

Data were analysed using principal component analysis and cluster analysis. Five segmentation criteria emerged from the results of the principal component analysis: preference for quality food, shopping for food according to preparation, saving money when

shopping for food, interest in shopping and trying new things, and saving time when shopping for food. Through cluster analysis, a total of five consumer segments were profiled, namely, the disinterested consumers, the thrifty consumers, the prepared consumers, the modern consumers and the busy consumers.

By segmenting consumers according to segmentation criteria, this research provides a comprehensive typology of Czech consumers that captures the diverse motivations and behaviours behind household food purchases and reflects current trends. Each segment represents a distinct consumer mindset influenced by varying degrees of quality consciousness, economic considerations, purchasing habits, and time management needs. The developed typology not only enhances our understanding of consumer behaviour but also provides valuable insights for marketers and retailers targeting different consumer groups. The findings underscore the importance of personalised marketing strategies and targeted product offerings that meet the nuanced priorities of each segment of consumers.

One of the benefits of this research paper is that there are not many studies that deal with the segmentation of consumers in the food market in terms of general household shopping rather than a selected product or under specific conditions. There is no typology of distinctly Czech consumers in the food market that takes the key influencing components together and that incorporates current trends such as rising food prices or the use of new retail technologies in the store.

The presented research also has limitations. The authors did not focus on sustainability, local food, or online shopping as segmentation criteria. The reason was an effort to include the main criteria that influence the purchase of common (not specific) household food in brick-and-mortar stores. An idea for the next research would be to focus on online shopping for household items. It would be interesting to have a closer look at it, also in terms of comparison with grocery shopping in brick-and-mortar stores from the consumers' point of view. Online shopping itself adds other influences that affect consumer behaviour. In general, it is argued that online grocery shopping saves time that would otherwise be spent in a store, so an interesting study could be whether time is the deciding variable in choosing online or face-to-face forms of shopping. It would also be interesting to focus on attitudes towards sustainability, organic and local food in a further study.

The research showed the structure of consumer segments in the current Czech food market in terms of their attitudes toward household food purchases, considering factors related to current influences on this market, such as price increases, new technologies, and the emphasis on food quality. These changes pose challenges for food chain actors, and knowledge of current consumer segments should be the starting point for marketing strategies.

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