Changes in the intensity and impact of factors influencing consumer behaviour in the food market over time

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Abstract: The paper aims to identify the changes and intensity of the factors influencing consumers' purchasing decision-making process in the food market. The research offers a unique comparison of the situation between the years 2007 and 2022 and reveals the emerging factors affecting consumer decisions. The authors conducted a representative questionnaire survey ($N = 686$) to determine the influence of individual factors. The data were processed using factor analysis, which allowed for the reduction of the number of factors (20) to four determinants covering 61% of the total variability in the dataset. The determinants of consumer purchasing decisions include traditional promotional elements, product parameters, newly formed factors based on sustainability and health awareness trends, and price discounts. Consumer behaviour appears to be influenced by a wide range of short- and long-term factors, and it is necessary to look at it comprehensively over a longer time horizon, taking current trends into account.

Keywords: digitalisation; food consumption; perceived consumption; purchase determinants; sustainable consumption

Traditional marketing tools, as well as emerging determinants of behaviour, enter into consumer behaviour research. Among the newly formed determinants of consumer behaviour, the increasing interest in sustainability, the impact of consumption on the environment, and the increasing attention to health are particularly interesting. The COVID-19 pandemic contributed to increased consumer awareness of health and significantly accelerated the adoption of digital technologies in consumers' daily lives (Thomas-Francois et al. 2023).

Sustainability in the food market is mainly discussed because of food waste. According to the United Na-

tions Environment Programme (2021), 17% of the world's total food production is wasted. Food production and disposal require large amounts of freshwater and land, producing greenhouse gas emissions (Kawasaki et al. 2023), which raises questions about sustainability. A significant proportion of food waste is generated by consumers, which creates a need to address consumer behaviour in the food market.

The effects of factors on consumer behaviour were also the subject of research published in 2008 (Stávková et al. 2008). The factors examined were: necessity, habit, quality, product parameters, price, discount, advertising, recommendations from friends, brand, pack-

aging, design, etc., i.e. factors resulting mainly from the employment of marketing tools.

This paper aims to identify the changes and intensity of the existing factors and identify the emerging factors in satisfying consumer needs in the food market. The objective was to learn about the determinants of food purchasing behaviour involving individual factors. The research was based on comparing the effects of factors influencing food purchasing behaviour over time (the difference between 2007 and 2022). The authors chose the food consumption category with regard to current trends and pressing issues, which primarily include sustainability and environmental burdens associated with food production and consumption.

Literature review. Previous research examined the determinants of consumer behaviour associated with marketing tools such as price, discount, advertising, etc. (Estelami and De Maeyer 2004; Toncar et al. 2010). Important factors influencing consumers not only during the COVID-19 pandemic crisis are mainly availability, convenience and quality (Eger et al. 2021). The consumption behaviour is constrained by the household budget (Achar et al. 2016), which is why income determines the living conditions of the household (Antošová et al. 2021).

Today's consumer behaviour is influenced by digital technologies that offer consumers new shopping options, and there is a debate about consumer adoption of digital technologies. Digital adoption means that consumers are moving to digital platforms to meet their daily needs (Wang et al. 2022), which may include grocery shopping. As the importance of online shopping increases, so does the importance of the form of product presentation on e-commerce platforms (Yoo and Kim 2014; Li et al., 2016). The two main types of product information on an e-commerce platform are textual and visual (Li et al. 2016). Among the most important factors influencing online shoppers are reviews and discounting strategies (Fu et al. 2020; Niu et al. 2023). Cho et al. (2019) identified consumers' motivations for online shopping as convenience and trust. They also identified customers' intention to use food delivery applications continuously. Roh and Park (2019) found that compatibility and ease of use were important factors in deciding on online grocery shopping. Ray and Bala (2021) included the price advantages of online shopping in addition to credibility. Many web browsers and applications allow customers to store payment and previous order details, saving them time on future purchases (Hong et al. 2021). Wang et al. (2022) found that increased use of digital

technologies can be beneficial to protecting the environment.

Changes in purchasing behaviour need to be seen in a broader context, including sustainability aspects. Individual consumer behaviour is crucial for sustainable development (Lubowiecki-Vikuk et al. 2021). According to Binder and Blankenberg (2017), sustainable development depends on consumers' environmental awareness. The concept of sustainable consumption was defined in 1994 as 'the use of goods and services that respond to basic needs and bring a better quality of life, while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardise the needs of future generations' (Šajn 2020).

Sustainable consumption is intended to help remedy environmental problems and promote environmentally friendly purchasing behaviour, which requires the intersection of ecology in brands, product design and advertising (Prieto-Sandoval et al. 2022). Springmann et al. (2020) suggested that promoting sustainable and healthy eating behaviours could reduce health and environmental burdens. According to Kawasaki et al. (2023), the predictors of sustainable behaviour were demographics, especially education and age, and psychological factors. Puntiroli et al. (2022) claim that if consumers behave sustainably today, we can expect them to do so in future years. Lifestyle and personal attitudes and values also significantly influence consumer behaviour. Consumption is no longer perceived as just the immediate satisfaction of a need or scarcity (Howel 2013; Binder and Blankenberg 2017).

Demographic factors have traditionally influenced consumers' purchasing decisions, but psychological factors are also coming to the fore. They enable an understanding of consumers' purchase motivations, taking into account perceived values (González and Bello 2002; Su et al. 2019; Akkaya 2021). It is, therefore, crucial to focus on the value perceived by consumers, which is determined by product quality, brand or parameters (Akkaya 2021). Understanding the determinants of consumer buying behaviour also allows subsequent segmentation to be carried out, making it possible to achieve more accurate information about individual consumer segments (González and Bello 2002; Akkaya 2021).

The newly formed factors of buying behaviour include recommendations by others. According to Chen et al. (2019), trustworthy recommendations can lead to impulsive purchases. Trust is a prerequisite for accepting recommendations and spreading word

of mouth (Filieri et al. 2015). In addition to recommendations by common users, the pre-purchase role of influencers is also significant, as they seek to create a solid influencer-consumer relationship and thus create positive attitudes towards the product (Belanche et al. 2021).

MATERIAL AND METHODS

To achieve the paper's objective, the authors collected primary data through a questionnaire survey among Czech respondents ($N = 686$) in 2022. The sample's representativeness was ensured by applying three quota characteristics – gender, educational attainment, and size of the respondent's municipality of residence. The structure by quota characteristics has been compared with microdata from the EU-SILC (European Union – Statistics on Income and Living Conditions) survey (Table 1). The EU-SILC database provides data on individuals and households in all EU countries. For the purposes of this paper, only the part of the database containing data for the Czech Republic was used.

Other demographic and socio-economic characteristics of respondents and their households were provided as well. Table 2 shows the absolute and relative structure of respondents according to their age, economic activity, household type and income. Descriptive statistics were used to review respondents' opinions.

The representativeness of the sample is tested by the goodness-of-fit test (χ^2 test) with the null hypothesis H_0: there is no difference between the structure of the sample and the population. According to the resulting *P*-values, the null hypothesis was accepted in the case of the struc-

ture according to gender, highest education and also the size of the municipality of residence (*P*-value$_{gender}$ = 0.906, *P*-value$_{education}$ = 0.994, *P*-value$_{municipality}$ = 0.996).

Exploratory factor analysis was used to summarise the variability in the dataset and reduce the number of variables. After the application of factor analysis, it was clear which groups of attributes best fit together. The large number of factors was thus reduced and named in order to achieve a specific interpretation. The calculation started by determining the factor loadings based on the eigenvalue of the principal component analysis. The second phase was the factor rotation, i.e. the transformation to the interpreted factors. Finally, factor loadings were calculated (Finch 2019). Assuming that $x^T = (x_1, x_2, ..., x_m)^T$ denotes the general object of observed characteristics in the *X* source data matrix of the n × *m* dimension. The *X* source matrix corresponds to the R correlation matrix. The following factor analysis model describes the general object:

$$x_1 = l_{11}f_1 + l_{12}f_2 + ... l_{1p}f_p + \varepsilon_1 \tag{1}$$

$$x_2 = l_{21}f_1 + l_{22}f_2 + ... l_{2p}f_p + \varepsilon_2 \tag{2}$$

$$x_i = l_{i1}f_1 + l_{i2}f_2 + ... l_{ip}f_p + \varepsilon_n \tag{3}$$

where: $f_1, f_2, ... f_p$ – factors that induce correlations between characteristics; $\varepsilon_1, \varepsilon_2, ... \varepsilon_n$ – error factors that contribute to the variance of individual characteristics; l_{ip} – coefficients, which represent the factor loadings of the *i*-th object on the *p*-th factor, stand for the elements of the factor loadings matrix (Finch 2019).

Table 1. Structure of respondents according to quota characteristics

Quota character	Absolute frequency	Relative frequency (%)	Relative frequency according to EU-SILC (%)
Gender			
Male	395	57.58	49.33
Female	291	42.42	50.76
Highest education			
Primary education	11	1.60	0.20
Secondary education	527	76.82	78.90
University education	148	21.57	20.90
Size of the municipality of residence			
≤ 4 999 inhabitants	194	28.28	33.59
5 000–49 999 inhabitants	238	34.69	33.83
≥ 50 000 inhabitants	254	37.03	32.57

EU-SILC – European Union – Statistics on Income and Living Conditions
Source: Own processing of questionnaire data ($N = 686$)

Table 2. Demographic and socio-economic characteristics of respondents

Categories of respondents' characteristics	Absolute frequency	Relative frequency (%)
Age group		
18–29	305	44.46
30–39	111	16.18
40–49	102	14.87
50–59	97	14.14
60+	71	10.35
Economic activity		
Employee	286	41.69
Entrepreneur (self-employed)	62	9.04
Unemployed	13	1.90
Student	243	35.42
Retired persons	58	8.45
Maternity or parental leave	8	1.17
Other	16	2.33
Household type		
One adult	83	12.10
Two adults without children	188	27.41
One adult with at least one child	37	5.39
Two adults with children	336	48.98
Other	42	6.12
Disposable household income		
< EUR 814	71	10.35
EUR 814–1 628	197	28.72
EUR 1 629–2 442	242	35.28
EUR 2 443–3 257	104	15.16
> EUR 3 257	72	10.50

Source: Own processing of questionnaire data (N = 686)

Varimax factor rotation was applied to describe the factor loadings of the variables. All statistical analyses were performed using the IBM SPSS Statistics 29 software.

RESULTS AND DISCUSSION

The food market is affected by current trends in sustainable food production and disposal, increased interest in healthy lifestyles and more. The 2007 research was repeated in 2022 to get up-to-date data on how consumers perceived the factors influencing their purchase decision-making. The repeated research made it possible to compare consumer perceptions 15 years apart. Respondents rated the influence of the same 14 factors on food purchases on a scale of 1–10, with 1 being the least influential in both the first and the second surveys.

According to the latest research, the most decisive factor for consumers buying food is the severity of need, whose average importance on a scale from 1 to 10 was 8.23 (Figure 1). This factor was also perceived as the most important by consumers in 2007, with even higher importance (9.02 on average). The slight increase in the importance of prices and discounts can be attributed to the society-wide crises (the pandemic in 2020 and 2021, and then the energy crisis in 2022) and high inflation. There have been no significant changes in consumers' perceptions of the factors' importance (in terms of impact on consumer purchasing decisions). Currently, some factors are perceived to be slightly more important than in the past (e.g. an increase in the importance of price, discount, quality or recommendation). Still, on average, these are differences of a tenth of a point on the scale. This finding is in line with Puntiroli et al. (2022) that consumers are consistent over time.

Responses to the 2022 survey questions regarding shopping patterns showed that about 60% of respondents tended to make larger purchases, 40% preferred shopping on the weekends, and 53% admitted to buying food based on the current discount promotions. Food was regularly purchased online by 15% of respondents. 75% of respondents were loyal to a particular store brand, and 80% used credit card payments.

In terms of the origin of food, its composition and healthy nutrition, 55% of respondents preferred Czech food, 58% were interested in the composition of food, 36% were interested in the companies whose products they were buying, only 20% of respondents bought organic food, and 15% of respondents bought healthy food. 73% of respondents said they reduced food waste, and 53% were concerned about the environmental impact of food waste. 27% opted for alternative types of food.

Given the ongoing changes in society and trends such as digital adoption, increased importance and awareness of health, value hierarchies and changing certain mobility patterns, respondents were asked questions about these changes in 2022. These are emerging factors of purchase decisions, such as the method of purchase (in person, online, by phone), the extended return period for unsatisfactory goods, influencer recommendations, special discount codes, country of origin and environmental aspects, all of which were accounted for in the factor analysis.

The variability of the 20 factors influencing consumer buying behaviour can be summarised by four new
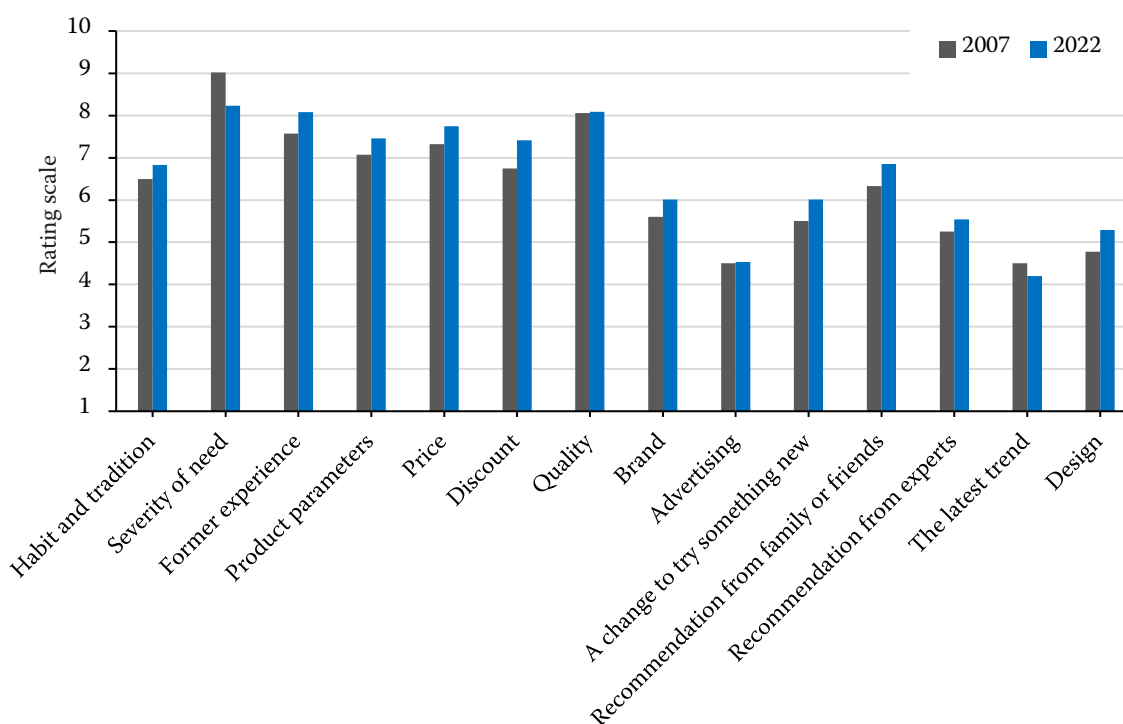
Figure 1. Importance of factors influencing consumer behaviour when buying food

Source: Own questionnaire data ($N = 686$) and Stávková et al. (2008)

Table 3 Determinants influencing food purchasing (Principal Component Analysis results)

Extracted factors	Original variables	Factor loadings	Eigenvalue	% of total variance
1. Promotional elements	brand	0.617	4.486	22.43
	advertising	0.779		
	a chance to try something new	0.661		
	recommendation from family and friends	0.557		
	recommendation from expert	0.633		
	recommendation from influencer	0.798		
	the latest trend	0.813		
	design	0.706		
2. Product parameters	habit and tradition	0.509	3.160	38.23
	severity of need	0.736		
	previous experience	0.816		
	product parameters	0.757		
	price	0.372		
	quality	0.744		
3. The new factors	method of purchase	0.468	2.272	49.59
	extended return period	0.469		
	country of origin	0.828		
	ecological aspect	0.840		
4. Discounts	discount	0.823	2.118	60.18
	special discount codes	0.636		

Source: Own processing of questionnaire data ($N = 686$)

aggregate determinants, including the original ones. According to the principal component analysis results based on the rotated component matrix, the newly formed summary determinants explained 60.18% of the variability of the original factors (Table 3).

The first component formed, i.e. the first group of factors, includes traditional promotional elements (brand, advertising, chance to try something new, recommendations from family and friends, experts and influencers, the latest trends and design). These are mainly traditional determinants of consumption, as presented by Estelami and De Maeyer (2004), and emerging marketing tools such as influencer marketing, whose important role before purchase has also been identified by Belanche et al. (2021). Recommendations are crucial in word-of-mouth marketing, which is integral to business marketing. The second component can be described as product parameters closely related to previous experience, habit, and quality interrelated with price and need in the purchase decision process. The third component includes factors stemming directly from current trends and issues being addressed. For this reason, this component has been labelled as the new factors. It consists of the method of purchase, extended return period, country of origin, and the ecological aspect, which, according to Prieto-Sandoval et al. (2022), is critical to achieving sustainable consumption. Digital adoption, which belongs among the new factors, has enabled online shopping and brought many benefits to consumers, as observed by Hong et al. (2021). The last (fourth) component includes discounts and special discount codes, mainly applied to online purchases. However, as Zheng (2022) pointed out, discounts affect the consumer quality perception.

CONCLUSION

By comparing the results of the 2007 and 2022 surveys, which aimed to monitor the importance of factors associated with marketing tools (such as product parameters, price, discounts, product quality, brand, advertising, a chance to try something new, recommendations from friends and family, recommendations from experts, the latest trends, design, habit and tradition, necessity and previous experience), the authors obtained the important finding that for all the factors monitored, there have been only slight changes in consumers' perception of their importance over the 15-year period but nothing significant. However, new factors influencing consumers have emerged under the influence of current trends and changes in society. These

include, for example, digitalisation, increased perceived importance of health and sustainability of consumption. Digital adoption has enabled online shopping and the introduction of discount codes, extended return periods, and influencer recommendations.

The paper's main contribution is the reduction of a large number of factors influencing consumers into four determinants of consumer decision-making in food purchasing. The reduction was achieved through the use of factor analysis. Retailers and manufacturers can use these findings to target consumer segments.

The first component of determinants points to a group of factors related to the forms of promotional elements, such as brand, advertising and recommendations. The second component indicates the power of habit, tradition and experience to determine the preferred product parameters. The third determinant includes emerging factors related to digitalisation and sustainable consumption. The fourth component reflects the role of discounts in pricing.

The study is based on original data from consumers on how they perceive different factors when purchasing food. The subjectivity of their perceptions in assessing the influence of each factor may be a limitation of the study. Similarly, the influence of advertising may be hidden or much greater than the consumers themselves are aware of. The area for future research can be seen in the application of the objective measurement of the influence of factors in real commercial situations.

The findings presented in the article confirmed that the satisfaction of an individual's needs must be approached comprehensively, not only as a simple satisfaction of a given need but as a sustainable satisfaction integrated with lifestyle, personal attitudes and values. Consumers are influenced not only by marketing tools (i.e. short-term sales promotion) but also by other determinants associated with sustainability and other subjective personal values, which are shaped over the long term and can be expected to continue to have a lasting effect.

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