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Czech Consumers and Online Regional Food Shopping: After Pandemic Changes in Shopping Habits

[Čeští spotřebitelé a nákup regionálních potravin online: Po pandemické změny nákupních zvyklostí]

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Abstract: The Covid-19 pandemic significantly altered grocery shopping habits worldwide, with online shopping becoming a crucial alternative to physical stores. This quantitative study investigates how the purchasing behaviour of Czech consumers for regional foods has evolved post-pandemic. Utilizing data collected by the research agency IPSOS from 525 respondents aged 18-65, we apply both descriptive and inferential statistical methods to analyse the frequency and determinants of online regional food purchases. Our findings indicate a persistent shift towards online shopping for regional foods, influenced by factor household income. The hypothesis that post-pandemic consumers do not prefer to buy regional food online was tested using the Kruskal-Wallis test, revealing significant demographic influences. The study provides insights into post-pandemic consumer behaviour and highlights the potential for growth in the online regional food market. These insights can guide online retailers and policymakers in enhancing the online shopping experience and supporting regional food producers.

Keywords: consumer, consumer purchasing behaviour e-commerce, regional food.

JEL classification: C12, M31

Introduction

Before the Covid-19 pandemic, there was already a noticeable increase in online shopping. In 2007, 50 % of people in the EU ordered goods or services online, and by 2017, this figure had risen to 68 %. In the surveyed year, more than 8 out of 10 internet users shopped online, with the highest share of e-shoppers among internet users aged 25 to 34 (77 %). Age played a significant role in the types of goods or services purchased online; for example, young shoppers aged 16 to 24 (71 %) predominantly bought clothes and sports goods online, while shoppers aged 45 to 54 (48 %) primarily used the internet for booking holiday accommodation.[1]

The Covid 19 pandemic let to significant restrictions on social interactions, the closure of physical stores, and limited travel, compelling consumers to seek alternatives such as online grocery shopping. Prior to the pandemic, online grocery shopping was less prevalent. This study explores the post-pandemic shift in consumers. By examining changes in product assortment and shopping habits, this research aims to provide a comprehensive understanding of the long-term effects of the pandemic on shopping behaviours. During the pandemic, online grocery shopping and online ordering of ready-to-eat meals emerged as convenient alternatives to visit to brick-and-mortar stores and restaurants. (Conway, da Silva and Mirtich 2020).

Forbes (2020) reports that in 2019, 81 % of American consumers had never shopped for groceries online. However, by 2020, amid the Covid-19 pandemic, 79 % of American

[1] Online shoppers & e-purchases. [online]. [seen 31st May 2024]. Accesse from: https://ec.europa.eu/eurostat/cache/infographs/ict/bloc-2a.html.

consumers were ordering groceries online. Smilarly, McKinsey (2020) notes that 15 % of European consumers had become accustomed to new online grocery shopping services, and 12 % had switched to new stores offering home delivery or order-and-collect services. These trends may have occurred also among Czech customers.

Prior to Covid-19, many studies examined trends in online grocery shopping. It was found out that young, higher-income, and more educated consumers were more likely to shop for food and goods online (Keeble et al. 2020, Dana et al. 2021). Most research from the pre-pandemic era focused on non-food purchasing, as online grocery and food shopping services were not widespread. However, during the pandemic, the expansion of online food shopping and related services significantly increased to meet the growing demand. (Lee et al. 2017).

In the current post-pandemic period, it is crucial to investigate whether the changes in online grocery shopping are persisting or if consumer behaviour is reverting to pre-pandemic patterns. This paper aims to present what factors influence the intention of buying regional food online of Czech consumers. The focus is on the changes in the assortment of products purchased and how consumers´ shopping habits have evolved. These factors are analysed in relation to gender, education, marital status, and monthly household income.

By examining these dynamics, this research provides insight into the long-term impacts of the pandemic on online shopping behaviours and offers a nuanced understanding of the evolving consumer landscape in the Czech Republic.

1 Literature review

Huang (2006) investigated how delivery charges and three other situational factors affect consumers´ grocery shopping channel choices. The study surveyed 152 supermarket shoppers in South England, presenting respondents with two scenarios to determine their preferences for shopping online or in-store. The findings revealed that while all factors influenced shopping channel preferences, delivery charges were not the most critical factor. Instead, the difference in travel time to the grocery store had a more significant impact on whether consumers preferred to shop online or in-store. The author suggests that emphasizing the time savings of online shopping could be more effective in influencing consumer behaviour.

Influence of Situational Factors

Building on this, Hand et al. (2009) aimed to understand the triggers that influence the adoption of online grocery shopping, emphasizing the role of situational factors. Their research combined qualitative and quantitative methods to reveal that factors such as having a baby or developing health problems were significant triggers for starting to shop for groceries online. However, it was also found out that shoppers often discontinued online grocery shopping once the initial trigger disappeared or if they encountered service issues. Despite situational factors being beyond marketers´ control, these triggers can inform marketing communications and targeted advertising strategies.

The Evolution of Online Grocery Shopping

Bauerová (2018) examined the growing interest in online grocery shopping, identifying it as the most rapidly evolving e-commerce category. Focusing on Czech online grocery buyers, the study involved 536 respondents and highlighted that delivery time and charges significantly impact consumer decision, whereas the minimum required order did not. This underscores the importance of optimizing delivery conditions to attract and retain online grocery shoppers.

Consumer Behaviour Trends
Yan (2020) further explored consumer behaviour through linear relationship analysis and data distribution examination, revealing that online shopping is predominantly favoured. Notably, while most consumers preferred online shopping for clothing, cosmetics, skincare products, and snacks, offline shopping was still preferred for fresh products, beverages, and some clothing items. This indicates that while online shopping will continue to grow, offline retailers need to enhance the shopping experience by focusing on tangible aspects and improving additional services unique to physical stores.

Impact of the Pandemic
Tyrväinen and Harjaluoto (2022) investigated online food shopping before and during the Covid-19 pandemic, finding that factors such as perceived usefulness, ease of use, positive emotions, trust, price, subjective norms, social influence, and attitude positively influenced the intention to purchase food online. Importantly, they found out that many consumers were compelled to shop online due to the pandemic, providing insights into the surge in online grocery shopping during this period and helping to predict post-pandemic trends.

Post-Pandemic Consumer Preferences
Hossain, Fatmi, and Thirkell (2022) examined food shopping and restaurant visit preferences post-pandemic, using data from an online questionnaire conducted in British Columbia, Canada. They reported evolving behaviours and noted that long-term patterns are still uncertain, necessitating further data collection on consumer behaviour during and after the pandemic.

The Role of Technology
Fuentes et al. (2022) concluded that digital technology significantly shapes food purchases, playing a crucial role for both consumers and retailers. They emphasized the need to consider different consumer groups' approaches to online grocery shopping, highlighting the importance of tailoring strategies to various demographics to support the continued growth of online grocery shopping.

Consumer Perceptions
Rout et al. (2022) found out that consumers perceived online grocery shopping as less stressful during the pandemic, with positive attitudes toward the technology enabling online shopping. These positive perceptions contributed to the adaptation of online grocery shopping habits.

Generational Differences
Hansson et al. (2022) focused on older consumers, finding that many began shopping for groceries online during the pandemic and were satisfied with the service. However, it remains uncertain how these behaviours will evolve post-pandemic, with indications that some consumers might alternate between online and in-store shopping.

Regional Food Purchases
Zámková et al. (2022) studied 757 respondents from the Czech Republic, revealing that 80.58% purchase organic food online. The frequency of online purchases increased with higher education levels and income, while it decreased with larger household sizes. This highlights the importance of considering demographic factors in understanding online shopping behaviours.

The reviewed literature provides various perspectives on online grocery shopping, particularly highlighting the significant shift during the pandemic. However, uncertainties remain in the post-pandemic period, and there is a need for further exploration, especially in the category of

regional foods. This article aims to address this gap by providing insights into the online purchase of regional foods, an area that has not been extensively studied.

2 Research methodology

This quantitative study, conducted in late 2023 in collaboration with IPSOS, aimed to analyse changes in online regional food shopping behaviour among Czech consumers.

The criteria for the research were set at the beginning. They had to be consumers buying regional food and the age of the respondent had to be 18 years or older. Once the criteria were established a sample size of respondents was determined using the formula for unknown respondent composition, which states Kozel (2006),

$$n \geq (z^2 * p * q) / \Delta^2 (1)$$

where *n* is the minimum number of respondents, *p*, *q* is the number of respondents (in percent) knowledgeable (*p*) and ignorant (*q*). If we do not know these numbers exactly, they must be the product of p * q is the maximum, i.e. 50 % * 50 %. Δ is the chosen margin of error and *z* is the critical value of the normalized normal distribution at the chosen significance level (Novotný, Duspiva 2014).

A confidence level of 95% was set to calculate the minimum sample of respondents. For this confidence value, Hindls (2007) gives a critical value of 1.96 and the margin of error was 5 %. Based on these data, the following result was calculated:

$$n \geq (1{,}96^2 * 0{,}5 * 0{,}5) / 0{,}05^2$$
$$n \geq 384 (2)$$

The results show that for the research to be representative according to the chosen criteria. A minimum of 384 respondents are required to participate in the research. Total number of respondents was 525.

Data collection involved structured online questionnaires, and the analysis was performed using IBM SPSS.

Hypothesis

To systematically explore the changes, the following hypothesis was formulated:

H1: Post-pandemic consumers do not prefer to buy regional food online.

This hypothesis was tested to determine if the preference for purchasing regional food online has diminished after the pandemic, considering various demographic factors such as sex, education, marital status, and household income.

Characteristics of the Quantitative Research Sample

The composition of the research sample was as follows (see table 1):

Table 1: Characteristics of the quantitative research sample

Identification marks	Possibility of answers	Count	Total
Sex	Man	266	525
	Woman	259	
Education	Primary school	40	525
	Trained	156	
	High school	199	
	University	130	
Marital status	Single	123	525
	Married	333	
	Divorced	61	
	Widower, widow	8	
Monthly household income	Up to 10 000 Kč	5	525
	10 001 – 15 000 Kč	10	
	15 001 – 20 000 Kč	28	
	20 001 – 30 000 Kč	49	
	30 001 – 40 000 Kč	98	
	40 001 – 50 000 Kč	95	
	50 001 – 60 000 Kč	97	
	60 001 – 70 000 Kč	59	
	70 001 – 80 000 Kč	41	
	80 001 Kč and more	43	

Source: own processing based on IPSOS data

The diverse composition of the sample provided a comprehensive view of the Czech consumer landscape, enabling a thorough analysis of various demographic factors influencing online regional food shopping behaviour post-pandemic.

The methods of arithmetic mean, modus, median and others fall under descriptive analysis. Descriptive analysis is aimed at describing present and historical data and is used to quickly report and for data visualization (Moussaoui and Varela 2010).

The Kolmogorov-Smirnov test will be used to test normality (Lopes, Reid and Hobson 2007). If the data is normally distributed, analyses including Student's t-test, analysis of variance (ANOVA), regression analysis and correlation analysis will be possible. Within a normal distribution of data, it would also be possible to perform parametric tests to compare conditional probabilities, such as the McNemar test or the Bowker symmetry test. Non-parametric tests could be performed if the data are not normally distributed. For example, the Kruskal-Wallis test can be used to test the H1 hypothesis, in which multiple independent variables can also be used to test hypotheses (Vargha et al. 1998).

Kruskal-Wallis test is particularly useful for comparing more than two groups, allowing to evaluate the impact of demographic variables on the frequency of online regional food purchases. The demographic variables considered included gender, education level, marital status, and household income. This non-parametric method allowed to assess whether demographic factors such as sex, education level, marital status, and household income significantly impact the frequency of online regional food purchases.

3 Customer behaviour analysis

Initial normality testing via the Kolmogorov-Smirnov test indicated non-normal data distribution (see Figure 1), leading to the application of non-parametric tests such as the Kruskal-Wallis test to examine the influence of demographic factors on shopping behaviour.

Figure 1: Kolmogorov-Smirnov test

One-Sample Kolmogorov-Smirnov Test

			Sex	Education	Marital status	Monthly household income	Will you buy regional groceries more online?	Will you buy more regional food? Whether online or in brick-and-mortar stores and the like.	Will you look more for vending machines with regional food?	Will you shop more at farmers' markets?	Frequency of regional food purchases
N			525	525	525	525	525	525	525	525	488
Normal Parameters[a,b]	Mean		,51	2,80	1,91	6,31	2,86	2,36	2,88	2,45	2,92
	Std. Deviation		,500	,900	,636	2,035	,840	,802	,909	,887	1,409
Most Extreme Differences	Absolute		,345	,215	,320	,104	,279	,282	,229	,265	,148
	Positive		,338	,186	,314	,104	,214	,282	,166	,265	,148
	Negative		-,345	-,215	-,320	-,089	-,279	-,208	-,229	-,182	-,138
Test Statistic			,345	,215	,320	,104	,279	,282	,229	,265	,148
Asymp. Sig. (2-tailed)[c]			<,001	<,001	<,001	<,001	<,001	<,001	<,001	<,001	<,001
Monte Carlo Sig. (2-tailed)[d]	Sig.		,000	,000	,000	,000	,000	,000	,000	,000	,000
	99% Confidence Interval	Lower Bound	,000	,000	,000	,000	,000	,000	,000	,000	,000
		Upper Bound	,000	,000	,000	,000	,000	,000	,000	,000	,000

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 2000000.

Source: SPSS

After the Kolmogorov-Smirnov test was performed, a basic statistical investigation was conducted on how often consumers currently purchase regional food. The results of this investigation are shown in Figure 2.

Figure 2: Frequency of regional food purchases at present

Statistics

Frequency of regional food purcl

N	Valid	488
	Missing	37
Mean		2,92
Median		3,00
Mode		3

Source: SPSS

The results show that the arithmetic mean, mode, and median are all 3, which corresponds to consumers buying regional food mostly once a month (see table 2).

Table 2: Frequency of purchasing regional food online at present

Frequency	Code number
Once a week	1
Several times a week	2
Once a month	3
Several times a month	4
Once a quarter	5
Once every six months	6
Once a year	7

Source: own processing based on IPSOS data

Descriptive statistics revealed that the most common frequency of online regional food purchases among consumers is once a month. This finding highlights a stable, recurring pattern in consumer behaviour, indicating that while online regional food shopping is not a daily or weekly activity for most, it maintains a consistent presence in their purchasing habits.

To further explore the factors influencing this behaviour, the Kruskal-Wallis test was applied. With the use of Kruskal-Wallis test was tested hypothesis H1: Post-pandemic consumers do not prefer to buy regional food online. Figure 3 shows the results of the Kruskal-Wallis test for the gender variable.

Figure 3: Kruskal-Wallis test results for the gender variable

Test Statistics[a,b]

	Will you buy regional groceries more online?	Will you buy more regional food? Whether online or in brick-and-mortar stores and the like.	Will you look more for vending machines with regional food?	Will you shop more at farmers' markets?
Kruskal-Wallis H	2,495	1,761	3,254	,153
df	1	1	1	1
Asymp. Sig.	,114	,185	,071	,696

a. Kruskal Wallis Test

b. Grouping Variable: Sex

Source: SPSS

The significance level is greater than 0.05 in these cases and therefore it is not possible to reject the hypothesis at this level of significance. It does not mean that there is no difference between the groups, but this difference cannot be proven at this level of significance.

In the next step, hypothesis H1 was tested on the basis of the variable education. The results are shown in Figure 4.

Figure 4: Results of the Kruskal-Wallis test for educational change

Test Statistics[a,b]

	Will you buy regional groceries more online?	Will you buy more regional food? Whether online or in brick-and-mortar stores and the like.	Will you look more for vending machines with regional food?	Will you shop more at farmers' markets?
Kruskal-Wallis H	2,692	2,469	4,926	6,421
df	3	3	3	3
Asymp. Sig.	,442	,481	,177	,093

a. Kruskal Wallis Test

b. Grouping Variable: Education

Source: SPSS

From the overall results of the Kruskal-Wallis test, it is again evident that the H1 hypothesis cannot be rejected this time either, as the significance level is again greater than the established significance level.

Hypothesis H1 was also tested in relation to the variable marital status. The results of the Kruskal-Wallis test for this variable are shown in Figure 5.

Figure 5: Kruskal-Wallis test results for the marital status variable

Test Statistics[a,b]

	Will you buy regional groceries more online?	Will you buy more regional food? Whether online or in brick-and-mortar stores and the like.	Will you look more for vending machines with regional food?	Will you shop more at farmers' markets?
Kruskal-Wallis H	7,661	2,103	,850	6,049
df	3	3	3	3
Asymp. Sig.	,054	,551	,837	,109

a. Kruskal Wallis Test

b. Grouping Variable: Marital status

Source: SPSS

Again, at this level of significance, it is not possible to reject hypothesis H1. However, for the dependent variable, "Will you buy regional food more online?", the significance level is close to 0.05.

Finally, the dependent variables were tested on the independent variable of monthly household income. The results are shown in Figure 6.

Figure 6: Kruskal-Wallis test results for the variable monthly household income

Test Statistics[a,b]

	Will you buy regional groceries more online?	Will you buy more regional food? Whether online or in brick-and-mortar stores and the like.	Will you look more for vending machines with regional food?	Will you shop more at farmers' markets?
Kruskal-Wallis H	20,721	3,631	11,118	9,094
df	9	9	9	9
Asymp. Sig.	,014	,934	,268	,429

a. Kruskal Wallis Test

b. Grouping Variable: Monthly household income

Source: SPSS

Here it can already be seen that for the dependent variable, "Will you buy more regional food online?", the significance level is less than 0.05 and therefore the hypothesis H1 can be rejected for this variable. Consumers with higher incomes may tend to buy regional food more online in

the future. However, for the other variables, the H1 hypothesis cannot be rejected at the specified significance level.

4 Results

The hypothesis H1 was defined at the beginning.
H1: Post-pandemic consumers do not prefer to buy regional food online.

According to the data, which was processed using the mathematical and statistical program SPSS, it was found out that the average consumer buys regional food once a month. Further, the above-mentioned hypothesis H1 was tested using Kruskal-Wallis test. The dependent variables were tested on the following independent variables - gender, education, marital status, and monthly household income. For the independent variables of gender, education and marital status, statistical significance could not be demonstrated at the chosen level of significance. However, it was shown that monthly household income is a statistically significant variable that can influence the number of online purchases of regional food, where households with higher incomes may tend to purchase regional food online more often. These results reflect the specificity of regional food being purchased by a narrower range of consumers.

The research also faced some limitations. The data was obtained with the help of the research agency IPSOS, which has its own panel of respondents, which is positive in the sense that a sufficient number of respondents was secured, but on the other hand the questionnaire did not reach a wider range of consumers. The research also looked at a specific group of respondents as it was only consumers who buy regional food. It would be useful to repeat the research in the future and compare the results.

5 Discussion

Monthly household income emerged as a statistically significant influence of the independent variable on the dependent variable. It was found out that households with higher incomes tended to purchase regional food online more frequently. Similar results are also reported by Hossain et al. (2022), who argue that those with lower incomes tend to shop for food in grocery stores.

The higher frequency of online purchases as a function of higher income is also confirmed by Zámková et al. (2022). The authors report that the percentage of respondents with a monthly family income of up to CZK 20,000 increased from approximately 72% to 86% for respondents with a monthly household income of more than CZK 50,000. Interestingly, Zámková et al. (2022) also report that consumers with higher education prefer to shop online, but this was not confirmed in the authors' research.Significant influence of monthly household income also confirms Keeble et al. (2020) and Dana et al. (2021).

Conclusion

Since late 2019, the world has been dealing with the Covid-19 pandemic, which has affected us in several waves. There have been government restrictions that have also affected consumer buying behaviour. The aim of this article was to analyse how the buying behaviour of Czech consumers who buy regional food online has changed.

This study demonstrates that the Covid-19 pandemic has led to enduring changes in the online shopping behaviours of Czech consumers, particularly for regional foods. Higher income is significant factor driving this trend. The results suggest that online shopping for regional foods is likely to remain popular, necessitating strategies to enhance to online shopping experience and support regional producers. These insights are crucial for online retailers and policymakers

to adapt to the evolving consumer landscape and promote sustainable growth in the regional food market. Future research should explore the long-term sustainability of these trends and their implications for the retail industry.

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