

# ENVIRONMENTAL AWARENESS SURVEY IN THE HUNGARIAN ONLINE FOOD TRADE

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## ABSTRACT

By the time of publishing this article, the economic situation created by the pandemic had caused us to face some serious issues. The food sector underwent significant changes in the first year of COVID-19 with online shopping and e-commerce becoming one of the most important channels for market operators. The rapid and significant increase has made everyone face challenges, particularly from the perspective of environmental protection. There are more vehicles on the road and more packaging is being used. When the pandemic started, customers did not consider how this business affected the environment, but conscious customers now give priority to environmental impacts. This study is aimed at exploring how customers' expectations mirror their environmental consciousness. The article is based on the evaluation of a questionnaire, in which the authors investigated whether customers, driven by environmental awareness, were willing to pay more for transport and packaging in a situation when COVID-19 intensified food e-commerce activities. Based on the respondents' level of education and income, the article shows their reaction to the topic. The result indicates that the behaviour of the younger generation differs from that of the older generation, and it is suggested that service providers react to this by focusing on green solutions, such as ecologically friendly packaging, electric vans, or other alternative delivery solutions. Additionally, it is also expected that the increase of order numbers won't have a negative impact on social sustainability, such as traffic jams, air pollution, and noise. Based on the findings, the service provider is seen as responsible with only a limited willingness by customers to bear the financial consequences. It can be concluded that the economical challenge of the increase in e-commerce caused by the pandemic remains with retailers in Hungary.

## KEYWORDS

online food trade, survey, environmental awareness, home delivery

## CLASSIFICATION

JEL: Q56

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## **INTRODUCTION**

The commercial sector is undergoing continuous transformation. A growing number of players are entering the market, consumer habits are changing, and online commerce is gaining ground. All factors of this business were forever changed in the spring of 2020, due to the COVID-19 epidemic. Distrust, restrictions on access, and the impact on society placed an increased burden on operators who introduced rapid developments in online commerce markets to remain competitive. However, this posed a number of challenges for all stakeholders. According to the GKI Digital [1] report, in 2020, the combined turnover of the fifteen largest e-merchants exceeded HUF 380 billion (more than 1 billion EUR), which makes up 41 % of the market, while the total number of orders was close to 11,5 million. In this highly volatile and unpredictable market and social environment, online retail achieved a record high 45 % increase in turnover.

The pollution caused by deliveries cannot be avoided in e-commerce. The transport of goods to warehouses and customers places a significant burden on the environment, and sooner or later, this will become unsustainable. As a result, companies are under increasing pressure from society and Non-Governmental Organisations to adopt more sustainable and environmentally friendly logistics systems.

A study by the Clean Air Action Group (in Hungarian: Levegő Munkacsoport) also criticizes the environmental impact of freight transport. A number of studies show [2-4] that road transportation is the greatest pollutant and responsible for 40 % of nitrogen oxides emitted by transport vehicles. Along with PM10 and nitrogen oxides and tyre and road wear, the main factors are PM2.5 particles discharged into the atmosphere from exhausts. The costs they incur are related to the circulatory and respiratory diseases they cause. Greenhouse gas emissions account for 4 % of the EU's annual emissions, 25 % of which come from lorries. The costs should also account for the growing risk of a range of accidents, noise pollution and congestion [5].

The growth of e-commerce has also affected the field of traditional commerce which has shown accelerated development during the pandemic. As the number of online customers increased and more webstores were opened, smaller orders for individual customers started to replace the old way of preparing bulk orders. This naturally affects the entire supply chain process and requires more flexibility, particularly in terms of delivery [6].

The environmental impact of online commerce is a timely subject, while the effects of the growing fleet and the problem of non-recyclable packaging have to be considered.

In November 2020, Sabrina Madi interviewed experts from sixteen international e-commerce companies on how they envision the e-commerce logistics innovations for 2040. The answers are not surprising: the experts agreed that electric and hydrogen-powered cars replace the current diesel and gasoline vehicles. Electric and conventional bicycles can solve the problems of urban logistics. As plastic bags and sacks will no longer be used, recyclable boxes can provide a solution for the issue of packaging. Further possibilities include taking advantage of shared fleets and Big Data [7].

Two hypotheses on environmental issues were formulated:

**H<sub>1</sub>**: according to the first hypothesis, environmentally friendly packaging is important for customers who shop online; therefore, they tend to accept higher costs,

**H<sub>2</sub>**: an environmentally friendly fleet is important for online customers; therefore, they tend to pay higher shipping fees.

## **LITERATURE REVIEW**

The present article addresses the topic of environmentally friendly packaging, which has been the subject of a great deal of research supported by a rich body of scientific results [8, 9-15].

Reviewing the relevant demographic characteristics (age, income and education), a literature review [16] of research results in 2006 appeared to be somewhat contradictory. Several researchers consider the effect of these factors to be significant, while others disagree [8, 17-19]. The former concept is seemingly logical, but results may be influenced by other factors. These factors can include market variables, in which price is of the utmost importance, and in line with expectations, studies have shown that price has a negative impact. [18, 20] Recent Hungarian research also pointed out that social groups show differences in terms of environmental awareness [21]. A pre-pandemic survey [22] with 7000 respondents from several countries (France, Germany, Italy, Poland, Spain, Turkey, UK) indicated, that 77 % of all respondents are willing to pay extra for packaging with a reduced impact on the environment. As a critic, the survey respondents could choose between answers “nothing” and also “0-5 %”. The latter is classified as willingness to pay extra, however 0 % is also included. In our opinion the outcome is rather 53 % are not willing to pay extra or just a very small amount and 47 % showed tangible interest to spend money for green packaging. Another European survey in 2020 indicated a similar result [23]. The study involved multiple countries (Germany, Italy, Norway, Sweden, UK, Austria, Denmark, Finland, France) and 5 900 respondents with 44 % agreeing or strongly agreeing to pay more.

Scopus database has been reviewed looking for scientific articles issued in the years of the pandemic (years 2019-2022). The search words “environment” and “packaging” resulted to 193 documents, further to application of multiple filters, such as document type to article, review and book chapter and exclusion of irrelevant subject areas. Based on a final evaluation by reading the abstracts, 10 relevant documents remained in scope. Two documents were listed as literature reviews, which was found to be very useful in order to understand the current state of the research. Wandosell et al. [24] concluded that there is a growing awareness around sustainable development though green packaging alternatives revealing the growing interest of scholars and researchers. The literature review of Brennan et al. [25] highlighted that there is little research on the role of consumer perceptions and more research is needed to explore the same regarding the understanding and acceptance of packaging technologies. As a conclusion of the reviews it can be stated that a research of customer payment readiness for environment friendly packaging is actual. On the other hand, three scientific articles have been identified in the SCOPUS database, dealing with the same topic in two countries, China and Italy. The Italian researchers were looking for consumer perceptions of specific packaging types, such as biodegradable materials [26] or BIO-bottles [27]. The result indicates different consumer attitudes dependent on the food product and packaging, respectively low willingness to pay for milk offered in biodegradable packaging and higher willingness to buy water in BIO bottles. Recycled materials are not preferred in this respect. In multiple countries, China, Malaysia and Italy, researchers highlight that the increase of consumer knowledge about the environment friendly packaging solutions is inevitable. Moorthy et al. concluded, that the knowledge towards green packaging has a direct relationship with intention to purchase green packaging products [28]. Although the findings are similar in China where researchers found in a survey study with 781 respondents [29] that there is a strong willingness to pay for it. Another questionnaire survey of 10 067 participants from 13 countries (Argentina, Brazil, Croatia, Greece, Hungary, Latvia, Lithuania, Poland, Portugal, Serbia, Slovenia, Romania and United States) indicated that consumers prefer foods that have been produced and packed in sustainable way [30]. Guo et al. studied the Chinese catering platforms as the largest three market players possess 20 million daily orders and consume 60 million plastic packaging products. The result found it evident that the main reasons which contribute to the plastic packaging pollution are related to recycling costs, technology and efficiency [31]. Similarly to Guo et al. other researchers addressed the problem and proposed different solutions by streamlining logistics processes [32] and presenting an econometric efficiency model [33].

Reviewing the literature, it seems worthwhile to capture a snapshot of the relationship between individual demographic factors and price and environmental awareness in the field of online commerce, which has flourished during the epidemic.

## **MARKET ANALYSIS**

The reorganization of consumer behavior that happened due to COVID-19 naturally led to changes on the supply side. Several food chains started to trade online, many webshops were launched and countless operators, such as eMAG, expanded their portfolios with food products.

Tesco is currently the market leader in Hungary. In 2013, the online shopping business was launched with three stores in Budapest. The UK operating model was implemented, but local legislation was also taken into account. Currently, they offer two types of online services: online shopping (referred to as Tesco Home as of March 2021) and webshop (Tesco Box). Half of the Hungarian population has access to the Tesco Home service, which is available in twenty stores.

It is important to clarify the fundamental differences between the two services. Tesco Box is available throughout the entire country. In addition, these services have a slightly different product range. Tesco Home has a selection of nearly fifteen thousand products, including frozen and fresh (chilled) lines. Customers can finalize the order by 11pm the day prior to delivery and book a two-hour time slot in which a Tesco employee or contracted partner delivers the order to the customer's address. Customers can also pick up orders at a chosen store. Another essential difference is the conclusion of the contract. In the case of the Tesco Home service, the order is compiled at one of twenty different stores, so it is not guaranteed that all ordered products are available. In addition, prices are "guide" prices, so the final contract is only concluded upon receipt of the products.

The Tesco Box webshop offers a limited selection of approximately three thousand ambient and non-food products to the entire population of the country. The products are collected at a specific store (Pesterzsébet) and delivered to the customer by a contracted partner within 3 days. In this case, the contract is concluded when the order is completed on the website.

Aldi started cooperating with Roksh in November 2020. They offer 3 000 food products online and provide distribution in Budapest and at Lake Balaton. Their selection includes (typically self-branded) high-quality fresh and grocery products. Aldi has not developed an online platform, therefore customers place their orders on the Roksh website. Respectively, the latter company fulfils the logistics related tasks.

Auchan had planned to expand its online presence even prior to the pandemic and made significant capital investments. Due to COVID-19, this activity has accelerated, the fleet has been improved, services were expanded and thanks to their webshop, has achieved nationwide coverage. Auchan offers a wide range of mainly fresh food and grocery products. Its delivery services are only available in Budapest and the surrounding areas. Customer feedback indicates product availability issues, which has a direct negative impact on the level of customer satisfaction.

CBA is one of the first operators to enter the online market, but the pandemic did not trigger any additional activity. The delivery range is concentrated around Budapest. The strength of its selection lies in its fresh produce lines. It is rumored that the Hungarian government intends to boost CBA's market position, however, its activities show no signs of innovation.

COOP, as a Hungarian operator, has also launched its webshop. They provide basic grocery products on a nationwide level (similar to Tesco Box). The selection includes popular products that require no refrigeration. COOP is typically accessible in rural areas and small settlements, therefore its online activity is expected to be successful in these locations.

GRoby also has a long-standing presence on the market. Owner Róbert Gárdonyi, started home delivery in 1999 and launched his online store in 2000. They are currently working with an assortment of around 9000 items, including many high-quality fresh produce lines. No further innovation or activities have been noticeable in recent years.

Kifli is currently the most innovative market player. The company had already been present in the Czech Republic before entering the Hungarian market, and it now operates in Austria and Germany as well. Its selection is continuously growing. It offers high-quality products sourced directly from producers, as well as special brands such as Marks and Spencer and Alnatura. The company places great emphasis on environmental protection as its entire fleet is CNG-powered, the packaging is recyclable and a packaging-free option is also available. Kifli operates a Bistro service that allows customers to order from established restaurants. The company operates a fulfilment center, thanks to which Kifli maintains a high level of product availability. Kifli's primary targets are premium customers. The innovations serve to successfully boost customer satisfaction.

Foodpanda targets customers with smaller needs looking for a fast delivery service. The narrow product range includes basic lines and they can fulfil orders within half an hour in Budapest. They also cooperate with Tesco.

The Penny Market is also a market player in Hungary and collaborates with Foodpanda. The catchment is mainly around Budapest but as they entered the online market in Czechia, the same approach is expected in Hungary in the near future.

Spar is also present on the online market. As noticeable at Spar stores, the company's strength lies in its selection of fresh produce lines. Spar operates in Budapest and the surrounding areas. There was no intensive expansion during the pandemic (only a handful of pickup points were opened).

The above-mentioned GKI report [1] supports this analysis. In respect of the TOP5 online FMCG retailers, in 2020, the field of FMCG (fast-moving consumer goods) recorded a turnover of HUF 76,6 billion and achieved the greatest growth in the online retail business.

## **RESEARCH METHODOLOGY**

According to an analysis from 2018, 4,2 million Hungarian customers order online, however, only 7 % can be considered regular customers, while the proportion of customers who regularly order food online is 6 % [34].

This means that approx. 300 000 people placed orders online prior to the pandemic. A significant portion of these customers opt for multinational companies (Tesco, Auchan, Kifli and Spar) for online services. Considering the population of Hungary, we may calculate with 500 000 people in the current situation.

According to Rubin and Babbie [35], the advantage of a questionnaire is the ability to define the characteristics of large quantities, providing the possibility of a detailed, standardized analysis. The disadvantage of a questionnaire is the limitations caused by research participants' admissions and their validity [36]. The method of using a survey have been mostly adopted by previous researches related to the current topic referred herein [22, 23, 26, 27, 29, 39]. The usage of the same method increases the comparability of the results. Although questions and focus areas may differ, this aspect was also considered at the definition of the research method.

Potential customers received a Google questionnaire with 16 questions, which was available on various social network sites between 7 Feb and 21 Feb 2021. Apart from basic questions, there were open-ended questions, focusing on age and income and the Likert-scale method was also used in several cases. We evaluated the results in an Excel spreadsheet and a descriptive evaluation was also prepared. Statistical methods of averaging, standard deviation and cross-

tabulation were used to calculate the results. We also conducted descriptive research, the results of which are not considered to be representative.

We received 646 responses to the questionnaire in the given period, which can be considered a high statistical sample size. 43 respondents indicated that they did not order food online, so we excluded these responses from the analysis.

## RESULTS

Reviewing shopping habits, we can see that 19 % of the respondents spend less than 25 GBP, 55 % spend between 25 and 50 GBP, 22 % spend 120 GBP and only 4 % spend more than 120 GBP per purchase.

When it comes to product groups, 299 respondents indicated items other than food products as their primary purchases which represents almost half of the total sample. Only 41 respondents indicated that they mainly buy fresh products when they shop online.

We received the following responses in answer to the question as to whether environmental protection is important in online food trade, which were processed by educational attainment (Table 1):

**Table 1.** Importance of environmental protection based on educational attainment (source: Self-edited primary research. N:603).

Education	Average	Deviation
Elementary school	5,6	1,16
Grammar school	5,3	1,13
Vocational school	5,3	1,14
Higher education	5,22	1,14

Based on the results, all respondents agreed that environmental protection is also important in this business line, regardless of level of education. Their response was not as obvious when it comes to the pollution of delivery vans. The evaluation given by all respondents is an average value of 4 – which means they are polluting – but the standard deviation value is slightly higher (1, 4), which shows that the resolution is not so clear in this regard.

We also examined customers' willingness to take financial responsibility to reduce the environmental impact of online food delivery. Figure 1. groups the responses by educational attainment.

Education	Number of responses	I willing to pay higher fee with more then 20%	Definitely yes, the everyone is responsible for environment protection	Definitely not, it is retailer responsibility	I willing to pay higher fee with maximum 10%	I willing to pay higher fee with maximum 20%	I willing to pay higher fee with maximum 5%	I don't care about the environment protection
Higher education	316	1%	19%	30%	15%	2%	33%	0%
Secondary school	190	0%	18%	29%	19%	3%	29%	1%
Vocational school	92	1%	26%	42%	7%	0%	21%	3%
Elementary school	5	0%	40%	60%	0%	0%	0%	0%
Average	603	0%	26%	40%	10%	1%	21%	1%

**Figure 1.** Importance of environmental protection based on educational attainment.

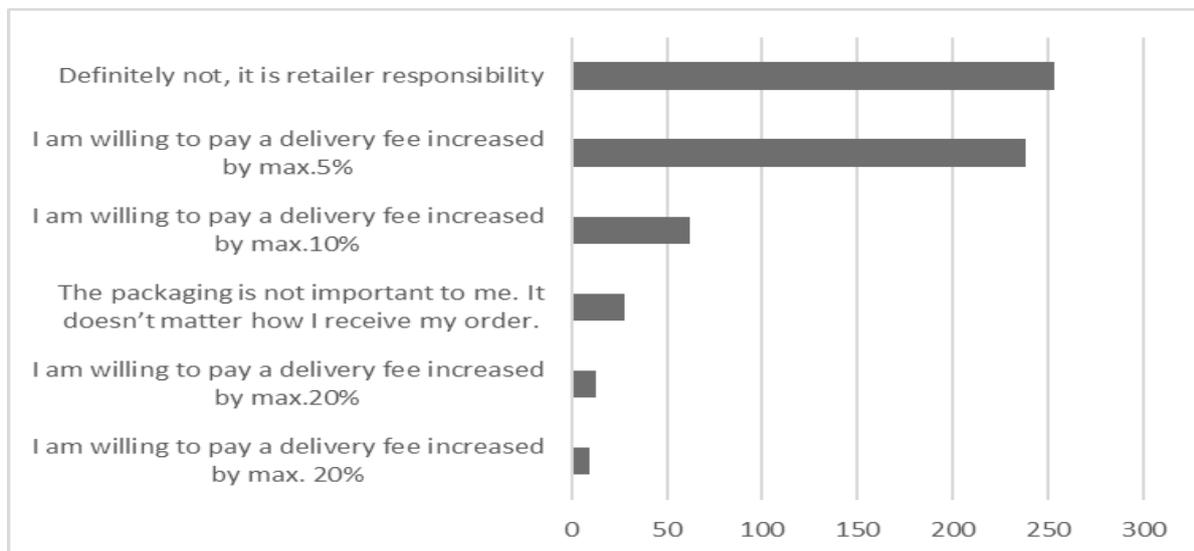
Figure 2 shows how this tendency changes when examined on family income.

Family income	Number of responses	I am ready to pay higher fee with more then 20%	Definitely yes, the everyone is responsible for environment protection	Definitely not, it is retailer's responsibility	I am ready to pay higher fee with maximum 10%	I willing to pay higher fee with maximum 20%	I willing to pay higher fee with maximum 5%	I don't care about the environment protection
Less than 700 GBP	118	0%	27%	35%	15%	2%	21%	0%
Between 701 and 950 GBP	122	1%	15%	37%	16%	2%	30%	0%
Between 951 and 1150 GBP	106	0%	22%	27%	11%	1%	38%	1%
Between 1151 and 1400 GBP	75	1%	15%	35%	15%	1%	33%	0%
Between 1401 and 1650 GBP	68	0%	12%	35%	15%	1%	37%	0%
Above 1651 GBP	114	1%	40%	32%	25%	4%	44%	5%
Average	603	1%	22%	33%	16%	2%	34%	1%

**Figure 2.** Importance of environmental protection based on family income.

Some conclusions can be clearly be drawn from the two figures. In terms of education, even if everyone agrees on the importance of protecting the environment when delivering food ordered online, the costs involved should be borne by the trader (40 %). 25 % of the respondents would be willing to pay no more than an additional 5 % to make the delivery of their ordered products more environmentally friendly. The income-based survey shows slightly different results. The proportion of those willing to pay no more than an additional 5 % is similar to the number of those who put the responsibility on the retailer (31 % and 32 %, respectively). This is possibly due to the fact that people with higher incomes have higher willingness to pay more. However, customers cannot be segmented by income, therefore we can say that customers — even if they consider the environment to be important — do not want to pay more for the service.

The answers below were given in relation to packaging. The importance of receiving an order in eco-friendly packaging obtained a mean score of 4,8 on the Likert-scale of six alternatives, which is a high result. The 1,2 standard deviation is higher than the previous results, which indicates that the opinions on this topic are more divergent. 409 respondents gave preference to recycled paper boxes. Figure 3 which shows their willingness to pay extra fees for environmentally friendly packaging. Many respondents think that retailers are responsible for providing environmentally friendly packaging but the number of respondents who are willing to pay 5 % more is nearly equal to them.



**Figure 3.** Importance of environmentally friendly packaging.

The question on the importance of reusable packaging obtained a mean score of 4,6 on the Likert-scale, which is a high result. The 1,6 standard deviation is higher than the previous results, therefore the opinions on this topic are more divergent. 409 respondents gave preference to recycled paper boxes.

## CONCLUSIONS

The primary analyses performed on this subject are suitable for analyzing the defined hypotheses. It is evident that consumers are increasingly conscious about the environment, however the desire to do something about the environment does not seem to be widely supported in practice in their daily activities. Consumers are generally unwilling to make financial sacrifices for the environment. The vast majority think that the duty of protecting the environment falls on someone else, therefore the costs incurred should be covered by others. Table 2. shows the results.

**Table 2.** Summary of results.

	<b>Hypothesis</b>	<b>Database and methods</b>	<b>Results</b>
<b>H<sub>1</sub></b>	Environmentally friendly packaging is important for customers who shop online; therefore, they tend to accept higher costs.	Field research evaluated by statistics methodology.	Rejected.
<b>H<sub>2</sub></b>	An environmentally friendly fleet is important for customers; therefore, they tend to pay higher delivery fees.	Field research evaluated by statistics methodology.	Rejected.

**H<sub>1</sub>:** environmentally friendly packaging is important for customers who shop online; therefore, they tend to accept higher costs.

Considering the performed analyses this hypothesis is rejected: even though environmental protection is important for customers, the responsibility is attributed to the service providers. Thesis: even if environmentally friendly packaging is important for online shoppers, they are not willing to incur higher costs.

**H<sub>2</sub>:** an environmentally friendly fleet is important for customers; therefore, they tend to pay higher delivery fees.

This hypothesis has been rejected: although an environmentally friendly fleet is important to customers, the responsibility is primarily attributed to the trader. Thesis: an environmentally friendly fleet is important for customers, however, they are not willing to pay higher delivery fees.

To summarize the result, we are able to recognize that as online shopping is continuously increasing, in parallel customer expectations are also higher. As the younger generation has started to order online, they are very sensitive to green solutions. The basic requirements of delivery on time, driver helpfulness, product quality and good prices are no longer enough to provide excellent service to online customers. To avoid losing market position, the e-retailer should provide an ecologically friendly solution without requesting an extra fee from customers which is a challenge for all players.

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