

-RESEARCH ARTICLE-

## EVALUATION OF THE FACTORS AFFECTING CONSUMERS' PURCHASES OF FRESH FOOD ONLINE FROM CHINA AND HUNGARY

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### —Abstract—

Considerable focus has been directed towards the study of individuals' online shopping purchase intentions and behaviours. This paper examines the factors that impact the online purchase of fresh food following the COVID-19 pandemic. This study examined the influential factors on consumers' online shopping consumer purchase behaviour. Five factors, namely price, quality, environment, comments, and logistics, were analysed. A survey was conducted online to gather the experiences of 311 consumers from China and Hungary who made online purchases of fresh food. An analytical model was constructed and examined using SmartPLS. Based on the findings, it is evident that these five factors significantly influence consumers purchase intentions in a favourable manner. Furthermore, the price factor can serve as a moderator in the correlation between quality and purchase intention, as well as the correlation between environment and purchase intention. Based on the study's findings, recommendations are provided to online retailers to enhance the promotion of fresh food sales through online platforms.

**Keywords:** purchase intention, fresh food, online shopping

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## 1. INTRODUCTION

The impact of the Internet and information technology on consumption patterns and habits is evident (Shang & Wu, 2017). The rise of online shopping has been swift, with this relatively new platform quickly becoming a popular choice for consumers (Benn et al., 2015). The new shop format caters to consumer needs through adjustments in product range, opening hours, and shopping locations (Nagyová & Tonkovičová, 2008). Modern manufacturers, search engines, and social networks have revolutionised the way consumers access product information and make purchases. This has enabled consumers to conveniently shop and gather information anytime and anywhere (Verhoef et al., 2015). Online shopping has been shown to be a cost-effective method for both retailers and consumers (Miyatake et al., 2016). In a study by Vietoris et al. (2016), it was found that respondents expressed a preference for purchasing organic food directly from producers, with supermarkets, specialty shops, and pharmacies following suit.

Due to the COVID-19 pandemic, consumer purchasing patterns have undergone a substantial shift (Lipták & Musinszki, 2022). The COVID-19 pandemic emerged as a significant global crisis in late 2019, originating in China and rapidly spreading to other nations. It resulted in numerous cases of severe pneumonia and had far-reaching consequences (Long & Khoi, 2020). The ongoing COVID-19 pandemic has had a significant impact on the global food supply. In addition, public health measures have brought about changes in the way individuals purchase food. It is worth noting that traditional in-person shopping methods can further worsen the issue of food insecurity (Kent et al., 2022). Food loss occurred globally during the outbreak as suppliers faced challenges with market closures and reduced operating hours. This led to the unfortunate consequence of fresh food spoilage and waste (Shahzad et al., 2022).

Curfew restrictions and concerns about illness have highlighted the numerous benefits of online shopping (Soós, 2020). According to a recent study by Lu et al. (2022), individuals who have a heightened awareness of the potential for infection beyond their residence are more inclined to make use of online platforms for purchasing fresh food. Online shopping provides the convenience of purchasing necessary items from the comfort of one's home while also mitigating the risk of viral transmission and reducing food waste. During the COVID-19 pandemic, there was a significant surge in the number of people engaging in online shopping (de la Iglesia et al., 2022).

In 2020, online retail sales in China experienced significant growth, reaching RMB 11.76 trillion, which is a 10.9% increase compared to the previous year (Ministry of Commerce of the People's Republic of China, 2021). In 2022, national online retail sales reached RMB 13.79 trillion, showing a 4% increase compared to the previous year (Lyu, 2023). In Hungary, online retail trade revenues have experienced substantial growth over the past few years. In 2019, the revenues were valued at HUF 781 billion, and this

figure increased to HUF 1203 billion in 2021 (GKID Research & Consulting, 2023). By 2022, a significant majority of the Hungarian population is expected to engage in online shopping, with a projected figure of 74.3%. The percentage for this figure in 2019 is 54.5% (Hungarian Central Statistical Office, 2022).

The growth of online shopping has raised concerns among respondents regarding the quality of products and their confidence in making purchases online (Lipták & Musinszki, 2022). Perishability is the primary characteristic of fresh food (Jiang et al., 2021). According to the study by Bartók et al. (2021), customers who purchase food online express concerns about perishable items (meat, baked goods).

Consumer behaviour plays a crucial role in the growth of e-commerce for fresh agricultural products (Cao, 2016). According to Sun (2016), various factors influence customers' purchase intentions, such as product quality, merchant credit level, and logistics distribution quality. In a study conducted by Cao (2016), it was suggested that e-commerce companies specialising in fresh agricultural products can enhance their product quality and storage capacity through the exploration, development, and utilisation of innovative technologies. This, in turn, can lead to improved consumer satisfaction. Nie (2017) found that the content of purchase evaluations has a significant impact on consumers' purchase decisions. Therefore, understanding the process of establishing and upholding a positive reputation is crucial for enhancing consumer satisfaction.

This paper utilises questionnaires to gain insights into consumers' purchasing experiences of fresh products. It also examines consumer behaviours that impact online fresh food shopping and provides development suggestions for online retailers.

## 2. LITERATURE REVIEW

### Consumer Behaviour Affecting Online Food Shopping

Extensive research has been conducted on the impact of consumer behaviour on online food shopping across various countries. In a recent study conducted by Zámková et al. (2022), the researchers examined the various factors that impact consumers' decision to purchase food online. The findings revealed that a significant number of consumers in the Czech Republic expressed that online food shopping offers time-saving benefits, a broader range of product options, and a more convenient and effortless search process.

In a recent study, Alaimo et al. (2020) examined the consumption patterns and habits of online food consumers in Italy. The findings suggested that most participants reported a satisfactory experience with purchasing food online, with only a few minor issues reported.

The pandemic had a positive impact on the food and beverage consumption behaviour of Portuguese consumers, leading to changes in their online grocery shopping experience. The

study revealed that a satisfactory online grocery shopping experience during the COVID-19 pandemic had a positive impact on individuals' intentions to continue purchasing groceries online post-pandemic. Shopping online offers the convenience of finding and learning about products quickly and easily. Additionally, offering vouchers for food purchases can increase consumer interest (Gomes & Lopes, 2022).

Research conducted in Germany indicates that product quality plays a crucial role in consumers' purchasing decisions. However, when it comes to online shopping, the significance of quality is heightened, along with logistical considerations such as the delivery process (Seitz et al., 2017). There has been a gradual rise in the number of customers in Poland who are opting to purchase food online. However, these consumers have reservations regarding the extra delivery charges and potential delays. Additionally, they express apprehensions about the quality and price of the products (Barska & Wojciechowska-Solis, 2020). Bryła's (2018) analysis provides a comprehensive examination of the characteristics, attitudes, and opinions of Polish food e-consumers. Research has shown that the factors influencing consumer buying decisions revolve around the visual appeal and quality of the product.

The purchasing patterns of Malaysian consumers in the online food market indicate a clear preference for the convenience, wide range of options, and competitive prices offered by online shopping (Khalifa & Liu, 2007). A recent study conducted by Lee et al. (2020) in South Korea revealed that various factors, including system quality, product quality, brand characteristics, and affordability, have a significant impact on consumer satisfaction when purchasing fresh food online.

In Nissi, India, the COVID-19 epidemic and the digital era have significantly impacted consumer behaviour in terms of online food purchases. Consumers now prioritise shopping convenience, product quality, and price when making their choices (Yolanda et al., 2023).

The online food retail market in South Africa is undergoing rapid evolution and presenting new challenges. Many consumers perceive online shopping as a convenient and cost-effective alternative to traditional brick-and-mortar stores for purchasing groceries and other goods. Simultaneously, consumers express apprehension regarding the potential compromise of personal information when engaging in online shopping (Chokoe & Oyekale, 2022).

## **Environment and Price**

Understanding the context in which food is produced can help consumers make informed choices when buying (Wunderlich et al., 2018). Bruschi et al. (2013) argue that consumers tend to prefer foods that adhere to stricter environmental standards. According to Hughner et al. (2007), consumers consider the quality of the production environment when making decisions about what food to purchase. Online shopping enables modern consumers to easily compare product prices (Gomes & Lopes, 2022).

Price is a key consideration for certain consumers when making purchasing decisions (Paul R et al., 2012). The following hypothesis was formulated:

**H1.** *Environment has a positive impact on purchase intentions to buy fresh food online.*

**H2.** *Price has a positive impact on the purchase intention to buy fresh food online.*

## **Quality, Logistics and Comments**

Numerous studies have shown that a product's or service's quality frequently affects a customer's satisfaction (Chien-Hsiung, 2011; Cronin et al., 2000; Suhartanto et al., 2020). The quality of food has a significant impact on consumer behaviour when it comes to purchasing food online (Chang et al., 2014).

Online-purchased perishable food must be transported efficiently to ensure quality, safety, and well-being (Lin, 2020). A recent study by Ma et al. (2022) evaluated the factors that influence consumers' online fresh food purchases. The Chinese market research found that wellbeing and packaging improve customer satisfaction and repurchase propensity. It's interesting that shipping doesn't affect consumers repurchase intentions. According to Wang and Guo (2022), there has been a growing focus on the quality of online shopping logistics services among consumers. They argue that e-tailers can attract more consumers by enhancing the quality of their logistics services. In a study conducted by Xia (2016), it was found that the quality of logistics plays a crucial role in determining consumers' satisfaction with online shopping and their subsequent intentions to shop online.

Online purchase comments facilitate public communication among consumers, revealing a correlation between higher ratings and increased sales (Dequan & Enyan, 2022). A study discovered that reviews positively influenced the purchase intentions of first-time consumers in the realm of online shopping. Furthermore, sharing food experiences, opinions, and suggestions can effectively encourage consumers to buy more food products (Liu et al., 2018).

The following hypothesis was formulated:

**H3.** *Quality has a positive impact on purchase intention to buy fresh food online.*

**H4.** *Logistics has a positive impact on the purchase intention to buy fresh food online.*

**H5.** *Comments have a positive impact on purchase intention to buy fresh food online.*

## **The Moderating Role of Prices**

Moderation and mediation share similarities in the sense that a third variable (mediator or moderator) can influence the intensity of the connection between two latent variables (Memon et al., 2019).

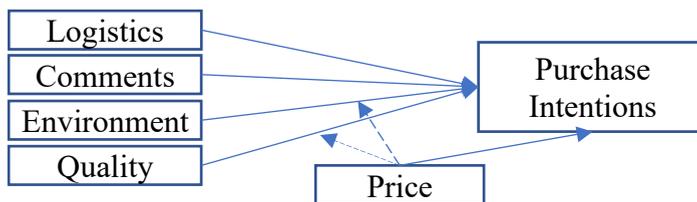
According to research by Barska and Wojciechowska-Solis (2020) and Khalifa and Liu

(2007), price is a significant factor for many consumers. A study conducted by Minbashrazgah et al. (2017) revealed that the price of green chicken can have a significant impact on consumers' purchasing decisions and behaviour. Multiple studies have indicated that price plays a significant role in influencing the connection between quality, environment, and purchase intention (Lee et al., 2015; Xing et al., 2022).

The following hypothesis was formulated:

- H6.** *Price moderates the relationship between environment and purchase intentions.*  
**H7.** *Price moderates the relationship between quality and purchase intentions.*

According to the Hypotheses I built the model (Figure 1).



**Figure 1:** The Study's Model.

### 3. MEASUREMENT METHODS

This paper utilises the questionnaire method of data collection, a widely employed research tool for conducting extensive surveys. Questionnaires offer a standardised approach to collecting data, guaranteeing that all participants are presented with identical questions. Furthermore, questionnaires prove to be a valuable tool for gathering substantial amounts of data, particularly when the intended participants are dispersed across different geographical areas (Dillman et al., 2014). The study included participants from China and Hungary.

This paper includes a questionnaire that is divided into two parts. The initial section examined the demographic characteristics of the participants, including gender, age, education, country of origin, and other relevant factors. The second part of the study examines various aspects related to fresh food, including logistics, pricing, evaluation, quality, environmental impact, and consumers' purchase intentions. This section highlights the inclusion of various types of fresh food, such as vegetables, fruits, meat, eggs, milk, and aquatic products, etc. All constructs in Part 2 were measured using a five-point Likert scale, with "5" representing "strongly agree" and "1" representing "strongly disagree".

The survey was carried out in China and Hungary between April and June 2023. Residents from both countries exhibit distinct regional cultures and consumption patterns. The target audience consists of individuals who are 18 years of age or older.

Prior to the official survey, a preliminary test was conducted on a sample of 100 participants to assess the scale. Questionnaires were distributed through Wenjuanxing and the Google platform as part of the formal investigation stage. An online questionnaire survey was conducted among consumers in two regions using these two platforms. Participants required an average of 2–5 minutes to successfully fill out the questionnaire. The authors assessed the standardisation and quality of these questionnaires. Ultimately, I obtained a total of 311 valid questionnaires.

I conducted an analysis of the data using Structural Equation Modelling (SEM) and Partial Least Squares (PLS). The statistical modelling method known as SEM was first proposed by Sorbom and Joreskog in the 1970s, as mentioned by [Bollen and Long \(1993\)](#). SEM-PLS is a powerful iterative estimation method that integrates multiple regressions and principal component analysis. It is widely recognised as a suitable approach for simultaneously estimating the relationship between independent variables and dependent variables ([Henseler, 2017](#); [Zhang et al., 2019](#)). In addition, PLS-SEM does not necessitate a normal distribution of the data and is appropriate for models that include moderator variables ([Astrachan et al., 2014](#); [Fornell & Bookstein, 1982](#); [Hair et al., 2017](#)). Collectively, this is applicable to our research.

## Sociodemographic Data of the Sample

**Table 1: Sample Demographic Characteristics.**

X	Demographic	Frequency	Percent
Gender	Male	120	38.6
	Female	191	61.4
Age	18-25	198	63.7
	26-35	88	28.3
	36-45	15	4.8
	over 45	10	3.2
Education	High school	113	36.3
	Bachelor's degree	113	36.3
	Master's degree	53	17.0
	Doctorate	32	10.3
Number of people living together	1	62	19.9
	2	92	29.6
	3	85	27.3
	4	64	20.6
	5	7	2.3
	9	1	0.3
Country	Hungary	158	50.8
	China	153	49.2
Place of residence	City	213	68.5
	Countryside	98	31.5
	Total	311	

Table 1 displays a sample configuration file. Out of the 311 respondents, approximately 61.4% were women and 38.6% were men. A significant majority of the respondents, specifically 63.7%, fall within the age range of 18-25 years old. Over 60% of the participants hold a bachelor's degree or higher. Most of the participants reported having more than two individuals residing in their households. China and Hungary have a roughly equal number of respondents, with each country accounting for approximately 50% of the total. A majority of the participants resided in urban areas.

#### 4. DATA ANALYSIS AND RESULTS

##### Reliability Analysis

**Table 2: Reliability and Validity Tests of the Constructs.**

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Comment	0.878	0.892	0.915	0.731
Environment	0.825	0.826	0.895	0.741
Intention	0.743	0.76	0.854	0.663
Logistics	0.871	0.876	0.912	0.721
Price	0.834	0.843	0.9	0.75
Quality	0.865	0.866	0.908	0.712
Model fit	R2	R2 Adjusted		
Intention	0.459	0.447		

The reliability of the structure is assessed using Cronbach's alpha and composite reliability, as indicated in Table 2. For a scale to demonstrate strong internal consistency, it is important that both CR and Cronbach's alpha values exceed the threshold of 0.7 (Nunnally & Bernstein, 1994). I assessed convergent validity by utilising standardised factor loading and Average Variance Extraction (AVE). As noted by Hair et al. (2017) and Fornell and Larcker (1981), values above 0.5 for AVE indicate satisfactory convergent validity. The findings indicate that the aforementioned criteria have been satisfied.

The overall predictive strength of the model is measured by R2 (Hair et al., 2011). R2 = 0.459 for intention is between 0.3 and 0.6, indicating a moderate effect size.

**Table 3: Correlations and Square Roots of AVEs. (Fornell-Larcker Criterion).**

	Comment	Environment	Intention	Logistics	Price	Quality
Comment	0.855					
Environment	0.356	0.861				
Intention	0.406	0.484	0.814			
Logistics	0.256	0.458	0.463	0.849		
Price	0.142	0.34	0.344	0.312	0.866	
Quality	0.256	0.414	0.409	0.4	0.219	0.844

Note: Diagonal elements in the correlation of constructs matrix are the square root of the average variance extracted

The correlation between various structures in Table 3 is found to be lower than the square root of its own AVE value. This finding provides evidence that the model has achieved adequate discriminant validity (Ab Hamid et al., 2017).

**Table 4: Heterotrait Monotrait Ratio (HTMT).**

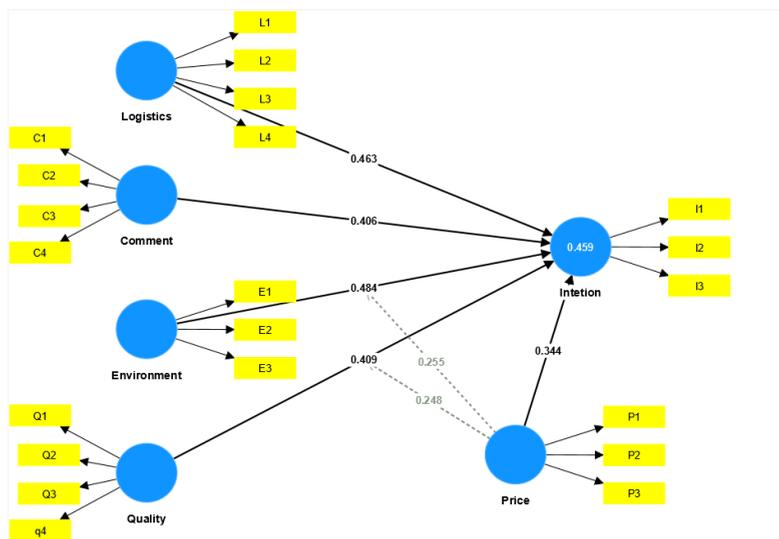
	Comment	Environment	Intention	Logistics	Price
Environment	0.412				
Intention	0.493	0.62			
Logistics	0.285	0.54	0.573		
Price	0.162	0.409	0.429	0.367	
Quality	0.292	0.491	0.504	0.46	0.257

The Heterotrait-monotrait (HTMT) ratio is commonly employed to assess the discriminant validity, as discussed by Henseler et al. (2015). Table 4 indicates that the HTMT ratio values are all below 0.85. The results indicate the discriminant validity for each construct.

**Table 5: Results of Hypothesis H1-H5.**

	Relationship	P	$\beta$	Mean	SD	T statistics	L.L.	U.L.	Support
H1	Logistics→Intention	0.000	0.463***	0.199	0.05	3.938	0.297	0.102	yes
H2	Comment→Intention	0.000	0.406***	0.219	0.043	5.029	0.300	0.136	yes
H3	Environment→Intention	0.001	0.484**	0.179	0.055	3.248	0.290	0.071	yes
H4	Quality→Intention	0.004	0.409**	0.158	0.05	3.141	0.257	0.051	yes
H5	Price→Intention	0.002	0.344**	0.154	0.053	2.912	0.255	0.062	yes

Based on the findings presented in Table 5, Figure 2 illustrates the positive influence of five factors on purchase intention as indicated by the model.



**Figure 2: Results of the Structural Model.**

## Path Relationship Evaluation

The test results are shown in Table 5 and Figure 2. As expected, logistics ( $\beta = 0.463, p < 0.001$ ), reviews ( $\beta = 0.406, p < 0.001$ ), production environment ( $\beta = 0.484, p = 0.001$ ), quality ( $\beta = 0.409, p = 0.004$ ), and price ( $\beta = 0.344, p = 0.002$ ) have a positive effect on consumers buying fresh food online, supporting H1, H2, H3, H4 and H5.

The moderating effect of price

**Table 6: The Results of the Moderating Effect.**

Moderator variable	Interacting	Dependent variable	$\beta$	P	Support
Price	Price*Environment	Intention	0.255**	0.002	Yes
Price	Price*Quality	Intention	0.248**	0.001	Yes

Figure 3 illustrates the variations in the influence of the environment on purchase intention at different levels of the moderator variable's price. There are variations in the slopes, indicating that the impact of the environment on purchasing behaviour varies significantly at different price levels. There is a clear relationship between the environment and purchase intention. The correlation is stronger at higher levels and weaker at lower levels. Additionally, it indicates that as consumers become more price-conscious, the influence of the environment on their purchasing decisions becomes more significant.



**Figure 3: Simple Slope Analysis of the Moderating Effect of Price on the Relationship between Environment and Purchase Intention.**

Figure 4 displays the simple slope of the moderating effect of price on the relationship between quality and purchase intention. There is a clear relationship between quality and purchase intention, with a stronger effect observed at higher levels and a weaker

effect at lower levels. Additionally, the study indicates that as consumers place more emphasis on price, the impact of quality on their intention to purchase also grows.



**Figure 4:** Simple Slope Analysis of the Moderating Effect of Price on the Relationship between Quality and Purchase Intention.

The relationship between environment, quality, and intention was found to be strengthened by price. Specifically, the moderating effect was observed to be greater for the relationship between environment and intention ( $\beta = 0.255$ ,  $p = 0.002$ ). Similarly, price had a similar moderating effect on the relationship between quality and intention ( $\beta = 0.248$ ,  $p = 0.001$ ). Agreed. Therefore, there is support for transitioning from H5 to H6.

## 5. DISCUSSION

Based on the analysis conducted, it is evident that Hypothesis 1 supports the notion that the environment has a favourable impact on the purchasing behaviour of Chinese and Hungarian consumers when it comes to fresh food online. Based on the findings, it can be concluded that the environment has a significant impact on purchase behaviour ( $\beta = 0.484$ ,  $p = 0.001$ ). The factor that has the most significant positive impact is willingness. A well-regulated and conducive production environment has been found to positively influence the purchasing behaviour of Chinese and Hungarian consumers. These findings align with previous research indicating that consumers place a high value on the conditions in which their food is produced. They are also willing to incur additional costs for items such as fruits, vegetables, potatoes, and meat (Wandel & Bugge, 1997).

Our research indicates that the Price factor ( $\beta = 0.344$ ,  $p < 0.005$ ) significantly influences customers' online fresh food purchase decisions. Online fresh food shoppers in China and Hungary prioritise pricing, showing a willingness to pay less. Studies suggest that online food purchases' cost reductions can considerably affect customers' purchasing decisions (Allah Pitchay et al., 2022; Karaoglan & Hamşioğlu, 2022).

Karaođlan and Hamřiođlu (2022) suggest that online food marketers can get a competitive edge by strategically improving consumers' price perception.

According to our analysis, Hypothesis 3 supports the notion that consumers are more inclined to purchase fresh food online due to its quality ( $\beta = 0.409$ ,  $p < 0.005$ ). Food safety is a major concern for consumers in the fresh food industry, with a strong emphasis on product quality. Research has confirmed that the quality of products plays a crucial role in determining consumer satisfaction in the realm of fresh food e-commerce, which subsequently influences their inclination to make purchases (Bosona & Gebresenbet, 2018; Moon et al., 2021).

It has been observed that the logistics factor discussed in Hypothesis 4 has a positive influence on the online purchase of fresh food. Chinese and Hungarian consumers have found that logistics significantly influences their purchase intention when considering buying fresh food online ( $\beta = 0.463$ ,  $p = 0.000$ ). Research has indicated that the logistical considerations of consumers can have a direct impact on their intentions to make online purchases (Wang & Guo, 2022). The proximity between the e-commerce provider and customers can impact purchasing decisions. The time it takes for products to be delivered can impact consumer satisfaction, and improving delivery speed can help attract customers from various countries (Kim et al., 2017).

Our findings support Hypothesis 5, indicating that comments have a significant positive impact ( $\beta = 0.406$ ,  $p = 0.000$ ) on consumers' online purchases of fresh food. The consumers we interviewed prioritise reviews and comments when making purchasing decisions for fresh food. In today's digital era, reviews play a crucial role in shaping consumers' online shopping habits. Online consumer reviews have emerged as popular communication channels, allowing individuals to share their opinions and influence the beliefs and purchasing decisions of others. This has led to increased consumer participation in online shopping (Shi & Liao, 2017).

Our findings indicate that Price plays a significant role as a moderator between Environment and Purchase Intention ( $\beta = 0.255$ ,  $p < 0.005$ ). Additionally, Price also acts as a moderator between Quality and Purchase Intention ( $\beta = 0.248$ ,  $p < 0.005$ ), demonstrating a positive moderating effect. It is evident that heightened consumer price consciousness in online fresh food purchases corresponds to increased consideration for quality and environmental factors, ultimately leading to a higher intention to make a purchase. In a study conducted by Rao and Monroe (1989), they introduced the concept of "price-quality inference." The findings revealed that participants acknowledged the ability to infer quality based on price, indicating that consumers consider both quality and price when making decisions. Consumers frequently view price as a sign of product quality, which in turn influences their intention to make a purchase (Han et al., 2001). Consumers consider both the production environment and price when purchasing food.

They are willing to pay more for a production environment that aligns with their values (Wandel & Bugge, 1997).

## 6. CONCLUSION

This paper aims to investigate the factors that impact consumers in China and Hungary when purchasing fresh food online in the post-COVID-19 era. The findings indicate that there are five key factors that can have a positive impact on consumers' intentions to purchase fresh food online. These factors include price, quality, logistics, comments, and the environment. It is worth noting that price plays a significant role in moderating the effects of environment and quality. The findings align closely with prior studies in the field.

Historically, the price has held significant importance for consumers. When formulating a pricing strategy, it is important for online retailers to remain adaptable and continuously refine their approach. This involves thoroughly analysing the target market and competitors before settling on a strategy and then adjusting based on market demand and product value. Discount promotions and other methods can be employed to entice consumers with competitive pricing. When adjusting prices, it is crucial to prioritise quality. This means maintaining the quality of the products and ensuring they meet customer expectations and are long-lasting. It is also important to conduct thorough product quality control and assurance. By doing so, consumers will feel that they are receiving value for their money when purchasing food.

Online businesses need logistics to reach customers. Shopping satisfaction affects client buy intent. Internet retailers must address the speed and efficiency of fresh food delivery. To guarantee fresh food quality throughout the epidemic, merchants must tailor food packaging and delivery. With the rise of non-contact delivery, this reduces delivery harm. To satisfy customers, retailers must meet their needs. Specialised courier businesses can improve logistics services for online merchants and meet their clients' different needs.

Comments on online shopping are open to all consumers, and customer reviews of fresh food products can have a significant impact on the purchasing decisions of other potential customers. Online retailers can actively manage customer reviews by encouraging them to rate products, respond to customer feedback and complaints in a timely manner, and respond to positive reviews to strengthen brand image. It is important for them to acknowledge and respond to negative feedback, actively work towards resolving issues, and strive to enhance the quality of their service. Retailers should enhance their efforts to promote the production environment for fresh food products. Sharing images of the processing environment will help allay consumer concerns and increase consumer confidence in the products.

## 7. LIMITATIONS OF THE STUDY

Like any scientific study, this one has its limitations. The model fails to account for all potential factors that could impact consumer behaviour when it comes to purchasing fresh food online. The data was gathered during a two-month timeframe and given the influence of seasonal and regional factors on fresh food, it may not accurately reflect the broader patterns of consumer purchasing behaviour. Given the sample's size and limitations, it was drawn from a subset of Chinese and Hungarian consumers, making it inappropriate to generalise the results to other populations. Given the global impact of COVID-19 and the rapid growth of online shopping, it would be valuable to explore the implications in different countries or regions within an international framework for future research.

## REFERENCE

- Ab Hamid, M. R., Sami, W., & Sidek, M. M. (2017). Discriminant validity assessment: Use of Fornell & Larcker criterion versus HTMT criterion. *Journal of Physics: Conference Series*, 890(1), 012163. doi: <https://doi.org/10.1088/1742-6596/890/1/012163>
- Alaimo, L. S., Fiore, M., & Galati, A. (2020). How the Covid-19 Pandemic Is Changing Online Food Shopping Human Behaviour in Italy. *Sustainability*, 12(22), 9594. doi: <https://doi.org/10.3390/su12229594>
- Allah Pitchay, A., Ganesan, Y., Zulkifli, N. S., & Khaliq, A. (2022). Determinants of customers' intention to use online food delivery application through smartphone in Malaysia. *British Food Journal*, 124(3), 732-753. doi: <https://doi.org/10.1108/BFJ-01-2021-0075>
- Astrachan, C. B., Patel, V. K., & Wanzenried, G. (2014). A comparative study of CB-SEM and PLS-SEM for theory development in family firm research. *Journal of Family Business Strategy*, 5(1), 116-128. doi: <https://doi.org/10.1016/j.jfbs.2013.12.002>
- Barska, A., & Wojciechowska-Solis, J. (2020). E-Consumers and Local Food Products: A Perspective for Developing Online Shopping for Local Goods in Poland. *Sustainability*, 12(12), 4958. doi: <https://doi.org/10.3390/su12124958>
- Bartók, O., Kozák, V., & Bauerová, R. (2021). Online grocery shopping: the customers' perspective in the Czech Republic. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 16(3), 679-695. doi: <https://doi.org/10.24136/eq.2021.025>
- Benn, Y., Webb, T. L., Chang, B. P. I., & Reidy, J. (2015). What information do consumers consider, and how do they look for it, when shopping for groceries online? *Appetite*, 89, 265-273. doi: <https://doi.org/10.1016/j.appet.2015.01.025>
- Bollen, K. A., & Long, J. S. (1993). *Testing structural equation models*. Sage Publications, Inc. Retrieved from <https://us.sagepub.com/en-us/nam/testing-structural-equation-models/book3893>
- Bosona, T., & Gebresenbet, G. (2018). Swedish Consumers' Perception of Food Quality

- and Sustainability in Relation to Organic Food Production. *Foods*, 7(4), 54. doi: <https://doi.org/10.3390/foods7040054>
- Bruschi, V., Napolitano, F., Naspetti, S., Piasentier, E., Scarpa, R., & Zanoli, R. (2013). Organic label as an identifier of environmentally related quality: A consumer choice experiment on beef in Italy. *Renewable Agriculture and Food Systems*, 28(1), 70-79. doi: <https://doi.org/10.1017/S1742170512000026>
- Bryła, P. (2018). Organic food online shopping in Poland. *British Food Journal*, 120(5), 1015-1027. doi: <https://doi.org/10.1108/BFJ-09-2017-0517>
- Cao, H. J. (2016). DEMATEL-based analysis of factors influencing the development of fresh produce e-commerce. *Journal of Mudanjiang University*, 25(10), 24-27. Retrieved from <https://www.cqvip.com/qk/70321x/201610/670248389.html>
- Chang, S.-C., Chou, P.-Y., & Lo, W.-C. (2014). Evaluation of satisfaction and repurchase intention in online food group-buying, using Taiwan as an example. *British Food Journal*, 116(1), 44-61. doi: <https://doi.org/10.1108/BFJ-03-2012-0058>
- Chien-Hsiung, L. (2011). A study on the relations between the brand image and customer satisfaction in catering businesses. *African Journal of Business Management*, 5(18), 7732-7739. Retrieved from [https://academicjournals.org/article/article1380705690\\_Lin.pdf](https://academicjournals.org/article/article1380705690_Lin.pdf)
- Chokoe, S. C., & Oyekale, A. S. (2022). Perceptions of online shopping and determinants of consumers' online purchase of food groceries in Polokwane local municipality, South Africa. *African Journal of Food, Agriculture, Nutrition and Development*, 22(7), 20905-20923. doi: <https://doi.org/10.18697/ajfand.112.21040>
- Cronin, J. J., Brady, M. K., & Hult, G. T. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76(2), 193-218. doi: [https://doi.org/10.1016/S0022-4359\(00\)00028-2](https://doi.org/10.1016/S0022-4359(00)00028-2)
- de la Iglesia, R., García-González, Á., Achón, M., Varela-Moreiras, G., & Alonso Aperte, E. (2022). Fish, Seafood, and Fish Products Purchasing Habits in the Spanish Population during COVID-19 Lockdown. *International Journal of Environmental Research and Public Health*, 19(18), 11624. doi: <https://doi.org/10.3390/ijerph191811624>
- Dequan, Z., & Enyan, W. (2022). Study on Information Quality of Online Shopping Reviews. *International Journal of Social Science and Humanity*, 12(4), 297-302. doi: <https://doi.org/10.18178/ijssh.2022.12.4.1106>
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). John Wiley & Sons.
- Fornell, C., & Bookstein, F. L. (1982). Two Structural Equation Models: LISREL and PLS Applied to Consumer Exit-Voice Theory. *Journal of Marketing Research*, 19(4), 440-452. doi: <https://doi.org/10.1177/002224378201900406>
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39-50. doi: <https://doi.org/10.1177/002224378101800104>

- GKID Research & Consulting. (2023). *Gross revenue of the online retail trade in Hungary from 2015 to 2022 (in billion forints)*. Statista. Retrieved from <https://www.statista.com/statistics/668710/eretail-revenue-hungary>
- Gomes, S., & Lopes, J. M. (2022). Evolution of the Online Grocery Shopping Experience during the COVID-19 Pandemic: Empiric Study from Portugal. *Journal of Theoretical and Applied Electronic Commerce Research*, 17(3), 909-923. doi: <https://doi.org/10.3390/jtaer17030047>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Sage Publications.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice*, 19(2), 139-152. doi: <https://doi.org/10.2753/MTP1069-6679190202>
- Han, S., Gupta, S., & Lehmann, D. R. (2001). Consumer price sensitivity and price thresholds. *Journal of Retailing*, 77(4), 435-456. doi: [https://doi.org/10.1016/S0022-4359\(01\)00057-4](https://doi.org/10.1016/S0022-4359(01)00057-4)
- Henseler, J. (2017). Bridging Design and Behavioral Research With Variance-Based Structural Equation Modeling. *Journal of Advertising*, 46(1), 178-192. doi: <https://doi.org/10.1080/00913367.2017.1281780>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135. doi: <https://doi.org/10.1007/s11747-014-0403-8>
- Hughner, R. S., McDonagh, P., Prothero, A., Shultz, C. J., & Stanton, J. (2007). Who are organic food consumers? A compilation and review of why people purchase organic food. *Journal of Consumer Behaviour: An International Research Review*, 6(2-3), 94-110. doi: <https://doi.org/10.1002/cb.210>
- Hungarian Central Statistical Office. (2022). *Share of population shopping online in Hungary from 2010 to 2022*. Statista. Retrieved from <https://www.statista.com/statistics/1095820/online-shopping-rate-in-hungary>
- Jiang, Y., Lai, P., Chang, C.-H., Yuen, K. F., Li, S., & Wang, X. (2021). Sustainable management for fresh food e-commerce logistics services. *Sustainability*, 13(6), 3456. doi: <https://doi.org/10.3390/su13063456>
- Karaođlan, S., & Hamşiođlu, A. B. (2022). Online Retail Food Shopping During the Covid-19 Pandemic Period. *Mehmet Akif Ersoy Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 9(2), 1400-1419. doi: <https://doi.org/10.30798/makuiibf.1097375>
- Kent, K., Alston, L., Murray, S., Honeychurch, B., & Visentin, D. (2022). The Impact of the COVID-19 Pandemic on Rural Food Security in High Income Countries: A Systematic Literature Review. *International Journal of Environmental Research and Public Health*, 19(6), 3235. doi: <https://doi.org/10.3390/ijerph19063235>
- Khalifa, M., & Liu, V. (2007). Online consumer retention: contingent effects of online shopping habit and online shopping experience.

- European Journal of Information Systems*, 16(6), 780-792. doi: <https://doi.org/10.1057/palgrave.ejis.3000711>
- Kim, T. Y., Dekker, R., & Heij, C. (2017). Cross-Border Electronic Commerce: Distance Effects and Express Delivery in European Union Markets. *International Journal of Electronic Commerce*, 21(2), 184-218. doi: <https://doi.org/10.1080/10864415.2016.1234283>
- Lee, K. H., Bonn, M. A., & Cho, M. (2015). Consumer motives for purchasing organic coffee. *International Journal of Contemporary Hospitality Management*, 27(6), 1157-1180. doi: <https://doi.org/10.1108/IJCHM-02-2014-0060>
- Lee, S., Kwak, M., & Cha, S. (2020). Consumers' choice for fresh food at online shopping in the time of covid19. *Journal of Distribution Science*, 18(9), 45-53. doi: <https://doi.org/10.15722/jds.18.9.202009.45>
- Lin, Q. X. (2020). Research on cold chain logistics of fresh agricultural products under the mode of online shopping. *Logistics Engineering and Management*, 42(05), 109-111. doi: <https://doi.org/10.3969/j.issn.1674-4993.2020.05.036>
- Lipták, K., & Musinszki, Z. (2022). Impact of teleworking on shopping habits during the COVID-19 pandemic in Hungary. *Journal of International Studies*, 15(3), 186-200. doi: <https://doi.org/10.14254/2071-8330.2022/15-3/13>
- Liu, Z., Shen, Q., Ma, J., & Dong, Z. (2018). Research on comment target extracting in Chinese online shopping platform. *International Journal of Crowd Science*, 2(3), 247-258. doi: <https://doi.org/10.1108/IJCS-09-2018-0019>
- Long, N. N., & Khoi, B. H. (2020). An empirical study about the intention to hoard food during COVID-19 pandemic. *Eurasia Journal of Mathematics, Science and Technology Education*, 16(7), em1857. doi: <https://doi.org/10.29333/ejmste/8207>
- Lu, M., Wang, R., & Li, P. (2022). Comparative analysis of online fresh food shopping behavior during normal and COVID-19 crisis periods. *British Food Journal*, 124(3), 968-986. doi: <https://doi.org/10.1108/BFJ-09-2020-0849>
- Lyu, L. Y. (2023). *National online retail sales of 13.79 trillion yuan in 2022, New business models and modes of e-commerce show vitality*. Guangming Daily. Retrieved from [https://www.gov.cn/xinwen/2023-01/31/content\\_5739339.htm](https://www.gov.cn/xinwen/2023-01/31/content_5739339.htm)
- Ma, K. X., Mather, D. W., Ott, D. L., Fang, E., Bremer, P., & Miroso, M. (2022). Fresh food online shopping repurchase intention: the role of post-purchase customer experience and corporate image. *International Journal of Retail & Distribution Management*, 50(2), 206-228. doi: <https://doi.org/10.1108/IJRDM-04-2021-0184>
- Memon, M. A., Cheah, J.-H., Ramayah, T., Ting, H., Chuah, F., & Cham, T. H. (2019). Moderation Analysis: Issues and Guidelines. *Journal of Applied Structural Equation Modeling*, 3(1), 1-11. doi: [http://dx.doi.org/10.47263/JASEM.3\(1\)01](http://dx.doi.org/10.47263/JASEM.3(1)01)
- Minbashrazgah, M. M., Maleki, F., & Torabi, M. (2017). Green chicken purchase behavior: the moderating role of price transparency. *Management of Environmental Quality: An International Journal*, 28(6), 902-916. doi: <https://doi.org/10.1108/MEQ-12-2016-0093>

- Ministry of Commerce of the People's Republic of China. (2021). Annual e-tailing market development in 2020. Retrieved from <http://www.mofcom.gov.cn/article/i/jyjl/j/202101/20210103033716.shtml>
- Miyatake, K., Nemoto, T., Nakaharai, S., & Hayashi, K. (2016). Reduction in Consumers' Purchasing Cost by Online Shopping. *Transportation Research Procedia*, 12, 656-666. doi: <https://doi.org/10.1016/j.trpro.2016.02.019>
- Moon, N. N., Talha, I. M., & Salehin, I. (2021). An advanced intelligence system in customer online shopping behavior and satisfaction analysis. *Current Research in Behavioral Sciences*, 2, 100051. doi: <https://doi.org/10.1016/j.crbeha.2021.100051>
- Nagyová, L., & Tonkovičová, Z. (2008). Image of the multinational trade chains functioning in the Slovak food market. *Agricultural Economics*, 54(8), 384-391. doi: <https://doi.org/10.17221/298-AGRICECON>
- Nie, C. T. (2017). A study of factors influencing consumers' online purchase of fresh produce based on online review texts. *E-commerce*, 02, 48-50. Retrieved from <http://www.cqvip.com/qk/97526b/201702/7000108536.html>
- Nunnally, J. C., & Bernstein, I. H. (1994). The Assessment of Reliability. *Psychometric Theory*, 3, 248-292.
- Paul R, W., Loreen, M., Julie, H., Anne W, T., Samantha B, M., & John, C. (2012). The social determinants of food purchasing practices: who chooses price-before-health, taste-before-price or organic foods in Australia? *Food and Nutrition Sciences*, 3(4), 18488. doi: <http://dx.doi.org/10.4236/fns.2012.34066>
- Rao, A. R., & Monroe, K. B. (1989). The Effect of Price, Brand Name, and Store Name on Buyers' Perceptions of Product Quality: An Integrative Review. *Journal of Marketing Research*, 26(3), 351-357. doi: <https://doi.org/10.1177/002224378902600309>
- Seitz, C., Pokrivčák, J., Tóth, M., & Plevný, M. (2017). Online grocery retailing in Germany: an explorative analysis. *Journal of Business Economics and Management*, 18(6), 1243-1263. doi: <https://doi.org/10.3846/16111699.2017.1410218>
- Shahzad, M. A., Razzaq, A., Qing, P., Rizwan, M., & Faisal, M. (2022). Food availability and shopping channels during the disasters: Has the COVID-19 pandemic changed peoples' online food purchasing behavior? *International Journal of Disaster Risk Reduction*, 83, 103443. doi: <https://doi.org/10.1016/j.ijdrr.2022.103443>
- Shang, D., & Wu, W. (2017). Understanding mobile shopping consumers' continuance intention. *Industrial Management & Data Systems*, 117(1), 213-227. doi: <https://doi.org/10.1108/IMDS-02-2016-0052>
- Shi, X., & Liao, Z. (2017). Online consumer review and group-buying participation: The mediating effects of consumer beliefs. *Telematics and Informatics*, 34(5), 605-617. doi: <https://doi.org/10.1016/j.tele.2016.12.001>
- Soós, G. (2020). Az élelmiszer-fogyasztói szokások változása a COVID-19 vírus megjelenéséhez kapcsolódóan Magyarországon. *Marketing & Menedzsment*, 54(3), 15-27. doi: <https://doi.org/10.15170/MM.2020.54.03.02>

- Suhartanto, D., Ismail, T. A. T., Leo, G., Triyuni, N. N., & Suhaeni, T. (2020). Behavioral intention toward online food purchasing: An analysis at different purchase levels. *International Journal of E-Business Research (IJEER)*, 16(4), 34-50. doi: <https://doi.org/10.4018/IJEER.2020100103>
- Sun, Y. (2016). A study on consumers' willingness to buy fresh produce based on e-commerce platforms. *Industry Economic*, 15(1), 151. doi: <https://doi.org/10.3969/j.issn.1009-2994.2017.01.111>
- Verhoef, P. C., Kannan, P. K., & Inman, J. J. (2015). From Multi-Channel Retailing to Omni-Channel Retailing: Introduction to the Special Issue on Multi-Channel Retailing. *Journal of Retailing*, 91(2), 174-181. doi: <https://doi.org/10.1016/j.jretai.2015.02.005>
- Vietoris, V., Kozelova, D., Mellen, M., Chrenekova, M., Potclan, J. E., Fikselova, M., et al. (2016). Analysis of Consumer's Preferences at Organic Food Purchase in Romania. *Polish Journal of Food and Nutrition Sciences*, 66(2), 139-146. doi: <https://doi.org/10.1515/pjfn-2015-0028>
- Wandel, M., & Bugge, A. (1997). Environmental concern in consumer evaluation of food quality. *Food Quality and Preference*, 8(1), 19-26. doi: [https://doi.org/10.1016/S0950-3293\(96\)00004-3](https://doi.org/10.1016/S0950-3293(96)00004-3)
- Wang, W., & Guo, Q. (2022). Empirical research on online shopping consumption decision model based on logistics service quality. *National Circulation Economy*, (18).
- Wunderlich, S., Gatto, K., & Smoller, M. (2018). Consumer knowledge about food production systems and their purchasing behavior. *Environment, Development and Sustainability*, 20(6), 2871-2881. doi: <https://doi.org/10.1007/s10668-017-0021-y>
- Xia, G. L. (2016). Research on the relationship between logistics service quality and consumers' online shopping intention. *Value Engineering*, 35(1), 42-45. Retrieved from <http://www.cqvip.com/qk/93273x/20161/666900923.html>
- Xing, Y., Li, M., & Liao, Y. (2022). Trust, price sensitivity and consumers' organic food purchasing behaviour in China. *Food Science and Technology*, 42, e42422. doi: <https://doi.org/10.1590/fst.42422>
- Yolanda, A. M., Septya, F., & Andriani, Y. (2023). Effect customer behaviour in online food purchasing on customer perceptions of the existence of online food marketing for sustainable food security in Pekanbaru municipality. *E3S Web of Conferences*, 373, 04009. doi: <https://doi.org/10.1051/e3sconf/202337304009>
- Zámková, M., Rojík, S., Prokop, M., Činčalová, S., & Stolín, R. (2022). Czech Consumers' Preference for Organic Products in Online Grocery Stores during the COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, 19(20), 13316. doi: <https://doi.org/10.3390/ijerph192013316>
- Zhang, K., Jiang, W., Zhang, S., Xu, Y., & Liu, W. (2019). The impact of differentiated technological innovation efficiencies of industrial enterprises on the local emissions of environmental pollutants in Anhui province, China, from 2012 to 2016. *Environmental Science and Pollution Research*, 26(27), 27953-27970. doi: <https://doi.org/10.1007/s11356-019-06032-x>