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Relationship Between Attitude and Online Purchase Intention of Dairy Functional Foods in Hungary: An Extended TAM Approach

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Abstract:

Purpose: *This study aims to investigate the determinants of Hungarian customers' attitudes toward dairy functional foods and their online purchase intentions.*
Design/Methodology/Approach: *The research framework employed in this study combines the Technology Acceptance Model, a widely recognized facilitator of internet shopping, with the model proposed by Urala and Lähteenmäki (2007), which suggests that attitudes towards dairy functional foods have a significant impact on consumer behavior and is consistent with the theory of planned behavior. We conducted a descriptive cross-sectional analysis using primary data collected from a sample survey of the Hungarian population with 313 valid questionnaires. We used The Partial Least Square method to test the hypothesis and the relationships between the different variables.*
Findings: *Obtained results show that attitude toward dairy functional foods and perceived usefulness are crucial factors influencing online food purchase intentions. Among these drivers, perceived ease of use has an indirect impact on purchasing intention. However, perceived ease of use has a significant impact on perceived usefulness.*
Practical Implications: *This study indicates that grocery retail firms can enhance their online presence in Hungary by understanding the importance of attitudes towards dairy functional foods and their perceived usefulness in influencing online food purchase intentions. Targeted marketing strategies can be developed to improve the online food purchasing experience for customers.*
Originality/Value: *The study lies in its use of an extended Technology Acceptance Model approach to examine the factors influencing Hungarian customers' attitudes towards and intention to purchase dairy functional foods online. The study provides practical implications for grocery retail firms seeking to establish an online presence in Hungary and contributes to the literature on consumer behavior and marketing.*

Keywords: *Healthy, functional food, online purchasing, customer intention, agri-food.*

JEL Code: *M31, I12, Q13.*

Paper type: *Empirical research.*

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1. Introduction

The number of studies on food purchases has increased significantly in recent years, and one of the key findings is that customers are looking for high-quality food (Szakos *et al.*, 2020). However, food must also provide the necessary nutrients to avoid nutrition-related disorders and support psychological and physical well-being (Menrad, 2003). However, encouraging customers to eat healthier can be difficult, as consumers are increasingly aware of the impact of their food choices on their health. Thus, it is important for people who value their health to be informed about the relationship between nutrition and a healthy lifestyle (Verbeke, 2006).

The ability to purchase food online is becoming increasingly important in the modern world, with both retail and wholesale food businesses facing new challenges due to the current circumstances (Witek-Hajduk and Zaborek, 2020). Furthermore, consumers often turn to online platforms for their purchasing needs because they can shop at their convenience from the comfort of their own homes (Rezaei *et al.*, 2016).

Moreover, both consumers and companies are greatly impacted by the Internet and mobile technologies, with a large percentage of Internet users accessing the Web through mobile devices (Nielsen, 2015). However, online grocery shopping is growing rapidly and is preferred by many customers due to convenience, usability, and past online experiences (Saarijärvi *et al.*, 2014).

Several factors can influence customer purchasing behaviors and attitudes. For example, during the COVID-19 pandemic, health consciousness may have increased (Fanelli, 2021), which could lead to a higher tendency for online food shopping (Gomes and Lopes, 2022). Furthermore, consumers who are concerned about their health are more likely to participate in health-related activities and may have sought to reduce the number of times they went shopping to lower their chances of contracting the virus (Cranfield, 2020).

Additionally, the time-saving element can increase the value of services by reducing the effort and time customers need to spend to buy a product (Jeng, 2016). However, online food consumption is influenced by both utilitarian and hedonic motivations (Alavi *et al.*, 2016), and many online shoppers enjoy visiting online shops on social networking sites (Cranfield, 2020).

The goal of this study is to investigate the relationship between the factors that influence consumer attitudes toward dairy functional foods and the intention to purchase these foods online in Hungary. The technology acceptance model (TAM) has been widely used in previous research on online buying behavior (Gefen *et al.*, 2000), and this study extends the TAM by combining its key constructs, which are important factors in internet purchasing behavior (Tuteja *et al.*, 2016), and health consciousness towards healthy dairy functional foods. The study adds to existing knowledge on technology adoption and online food purchases in emerging market

countries by focusing on Hungary and provides new insights into how various variables influence online food product purchases in the Hungarian market. This information can be useful to stakeholders such as online food retailers, associations, the dairy industry, and policymakers in developing and managing strategies to increase the purchase of online food products.

2. Theoretical Framework and Hypotheses

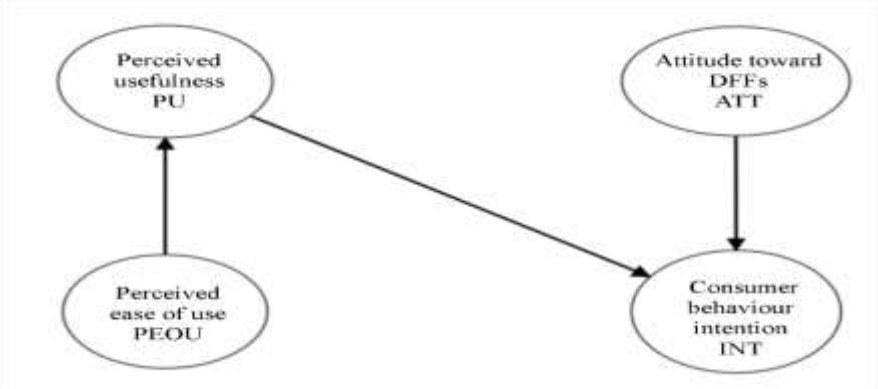
2.1 Theoretical Framework

Davis *et al.* (1989) introduced the technology acceptance model (TAM) 1989 as a theory to explain people's interactions with computers. However, TAM has become a prominent study framework in the field of information systems. The TAM is a useful paradigm for explaining and predicting e-commerce use, both in terms of consumers' intentions and their actual behaviors when making purchases online (Bauerová and Klepek, 2018).

However, TAM is similar to the theory of planned behavior (TPB), which is a fundamental theory of personal behavior used to investigate consumer attitudes and behavior, including health-related activities such as functional foods (Küster-Boluda and Vidal-Capilla, 2017). This theory suggests that behavioral intention has a direct influence on behavior (Ajzen, 1991).

Furthermore, our study includes a partial adoption of the model developed by Urala and Lähteenmäki (2007), which elaborates on the attitude towards functional food and the willingness to consume it. The goal of this work is to identify a conceptual model that takes the relationships into account and is used to evaluate attitudes and intentions toward dairy functional food online purchasing. The conceptual framework for the proposed linkages is shown in the provided information in Figure 1.

Figure 1. *Theoretical research model*



Source: *Own developed model based on Davis (1989) and Urala & Lähteenmäki (2007).*

2.2 Research Hypotheses

Online grocery shopping is the purchasing of consumables and other household items through e-commerce websites or mobile shopping apps (Driediger and Bhatiasevi, 2019). In the 1990s, researchers began looking at the possibility of doing food shopping online as the first members of the high-tech generation came of age (Park *et al.,* 1996). The technology acceptance model (TAM) is a theoretical model that was one of the first to be used to predict customers' acceptance and intention to make purchases from online grocery stores (Davis, 1989).

TAM suggests that the adoption of new technology is influenced by the perceived usefulness (PU) and perceived ease of use (PEOU) of the technology. This model has served as the basis for many researchers studying online buying behavior and is an effective theoretical framework for predicting the acceptance of e-commerce, such as consumer behavioral intention (INT) and actual behaviors toward purchasing online. For instance, (Shang and Wu, 2017) advanced TAM to include the expectation confirmation model, which suggests that consumer perceived value, in addition to perceived ease of use, impacts technology acceptance for online grocery shopping.

Perceived ease of use (PEOU) is online shopping to use and positively affects consumers' desire to use it, but it may be influenced by individual circumstances (Driediger and Bhatiasevi, 2019). This is particularly relevant in the Hungarian market, where consumers may be more focused on traditional food (Siró *et al.,* 2008; Szakály *et al.,* 2016), and may be less likely to shop online due to the inability to physically see, touch, or taste the items they are purchasing (Goethals *et al.,* 2012).

However, health concerns can also influence online food shopping behaviors, as healthier consumers may prioritize access to healthier options and may be more conscious of the value of well-being and sustainable food choices (Gasmi *et al.,* 2020). Thus, health concerns are a factor in consumer attitudes and intentions regarding the purchase of dairy functional foods online in the Hungarian market.

Perceived usefulness (PU) refers to the extent to which an individual believes a particular method will improve their work performance and represents the belief that buying food online will improve the shopping experience, while PEOU represents the perception that the process of buying food online will be effortless (Davis, 1989).

However, an empirical study found that PEOU has a significant impact on PU in both developed and emerging markets, meaning that the ease of using internet-connected devices or websites for online shopping is directly related to how beneficial consumers perceive it to be (Gefen *et al.,* 2000). Furthermore, a survey of online grocery shoppers also found a significant positive relationship between PEOU and PU (Bauerová and Klepek, 2018). Therefore, the following hypotheses were developed:

Hypothesis 1. Consumers' PEOU of online DFFs purchasing has a positive influence on PU of online DFFs purchasing.

Consumer behavioral intention (INT) refers to the willingness and effort a person is willing to put into engaging in a specific action (Kim and Woo, 2016). Within the context of the TAM, a user's perception of the utility of technology significantly affects their attitude toward adopting a new system or technology (Davis *et al.*, 1989). However, PU is a measure of how a consumer believes technology will help them shop more efficiently, for example by saving time and providing faster checkout processes (Chiu *et al.*, 2014). Furthermore, Chien *et al.* (2003) pointed out that PU has a positive impact on individuals' intentions to shop for food online. Therefore, the following hypotheses were developed:

Hypothesis 2. Consumers' PU of online DFFs purchasing has a positive influence on their online purchasing intentions INT toward DFFs.

Attitude toward a behavior (ATT) is an individual's overall evaluation of the consequences associated with that behavior (Ajzen, 1991). However, a behavioral attitude refers to a person's general assessment of the consequences of engaging in a specific action, such as buying functional food items (Nystrand and Olsen, 2020). Furthermore, attitude toward buying functional foods is influenced by both hedonistic (emotional) and utilitarian (functional) aspects (Voss *et al.*, 2003).

Moreover, purchase attitude has a strong influence on the intention to buy functional foods, and health consciousness is a key motivator for healthy food purchases (Huang *et al.*, 2019). However, health awareness refers to the integration of health concerns into daily activities and the willingness to make healthy choices *(Huang et al.*, 2019).

Thus, health is an important factor to consider when studying consumer behavior toward functional foods (Barrena and Sánchez, 2004). Therefore, customers who are more health-conscious and knowledgeable about the benefits of a healthy lifestyle are more likely to use functional foods (Chen, 2011). Additionally, the attitude has a positive relationship with the intention to buy groceries online, and it influences customers' online grocery buying intention (Quevedo-Silva *et al.*, 2016). Therefore, the following hypotheses were developed:

Hypothesis 3. Consumers' attitudes towards DFFs ATT will have a positive influence on their online purchasing intentions INT toward DFFs.

3. Research Methods

This research is based on primary data from a questionnaire completed by a sample of the Hungarian population during March and April of 2022. The number of valid questionnaires gathered in total was 313 which don't consider representative of the

Hungarian population. The survey covers the 4 constructs of the model proposed (attitude toward DFFs, perceived usefulness, perceived ease of use, and intention behavior) questionnaire components were based on thorough literature studies. The survey was released online using Google Forms at the beginning of the third week of April 2022. In the majority of the questionnaires of 14 questions, a five-point Likert answer scale was employed, which respondents rated from 1 ("completely disagree") to 5 ("completely agree") for (attitude toward DFFs, perceived usefulness, perceived ease of use, and intention behavior) factors. The questionnaire was sent out through the Internet including social media channels (Facebook, Instagram, etc.).

The Partial Least Squares Structural Equation Modeling (PLS-SEM) technique was used to analyze the conceptual framework in this study using Smart-PLS version 3. PLS-SEM allows researchers to investigate both the structural and measurement components of a model simultaneously, and it is particularly useful when dealing with a non-normal distribution and when using previously tested measuring scales in a new model.

Reflective constructs were developed in this study due to the fact that changes to constructs can impact fundamental measurements, while the elimination of items does not affect the validity of the content (Hair *et al.,* 2011). PLS-SEM is used to make accurate estimations of target constructs and to gain further knowledge about the relationships between variables.

4. Results

4.1 Measurement Model: Reliability and Validity

To determine the reliability of the measure, we evaluated the degree to which each item is related to the latent variables. These reflective measurements were used in the construction of the latent variable. Falk *et al.* (1992) suggested, as a general rule, the practice of keeping explicit variables with loadings that exceed 0.55 - i.e., 30% of the variance of the manifest variable is related to the component.

However, to offer substantial support for the reliability of formative measurements, all of these loadings must be above 0.70 and load more highly on their construct than on others.

Three different measurements were used in the analysis of the internal consistency: Cronbach's alpha, composite reliability (CR), and the average variance extracted (AVE). Nunnally and Bernstein (1994) recommended that, when Cronbach's alpha is higher than 0.7, it shows that there is a high level of internal consistency. This number is also acceptable for CR, and the value for AVE is accepted when it is equal to or higher than 0.5. As shown in Table 1, all the coefficients of each set of reflective measures in the study exceed 0.80.

The mean scores of the constructs ranged from 3.01 to 3.653. It is important to note that all variables were above the midpoint of 3.0. However, the standard deviation ranged between 1.025 to 1.33.

Table 1. *Constructs, items, factor loading, reliability, and validity.*

Factor Loadings		**Sources**
Attitude toward DFFs: α: 0.88, AVE: 0.68, CR: 0.88, Mean: 3.01, SD: 1.052		
DFFs help to improve my mood	0.78	(Urala & Lähteenmäki, 2007)
My performance improves when I eat DFFs	0.86	
I can prevent disease by eating DFFs regularly	0.85	
DFFs can repair the damage caused by an unhealthy diet	0.80	
DFFs promote my well-being	0.83	
Consumer Purchase Behavior Intention: α: 0.88, AVE: 0.81, CR: 0.93, Mean: 3.189, SD: 1.33		
I intend to use DFFs online shop when the service becomes widely available.	0.87	(Davis, 1989)
I intend to use DFFs online shop when there is free home delivery.	0.91	
I intend to use DFFs online shop when the price is competitive.	0.92	
Perceived usefulness: α: 0.91, AVE: 0.77, CR: 0.95, Mean: 3.653, SD: 1.176		
Using DFFs online shop can save me a lot of time.	0.80	(Davis, 1989)
Using food online shopping can make my DFFs shopping easier.	0.87	
Using Online food Shopping is convenient for my DFFs shopping.	0.83	
Perceived ease of use: α: 0.85, AVE: 0.85, CR: 0.91, Mean: 3.383, SD: 1.028		
Online DFFs Shopping is/might be easy to use.	0.84	(Davis, 1989)
It is/might be easy for me to follow the procedures when ordering DFFs online.	0.93	
My interaction with the processes of online DFFs is/might be clear and understandable.	0.87	
Note: CR: Composite reliability, α: Cronbach's alpha, SD: Standard deviation, AVE: Average variance extracted		

Source: *Authors' own research.*

4.2 Discriminant Validity

Discriminant validity of the model was determined by comparing the square root of the Average Variance Extracted AVE to the correlations among the different constructs (Fornell and Larcker, 1981). The square roots of the AVE for all formative constructs were greater than 0.7 and higher than the correlations between constructs, indicating a stronger relationship with their measurements than with measures of other constructs Table 2.

Table 2. *Discriminant validity*

	ATT	**INT**	**PE**	**PU**
ATT	0.824			
INT	0.523	0.899		

PEOU	0.460	0.605	0.925	
PU	0.322	0.304	0.526	0.878

Source: *Authors' own research.*

4.3 Goodness of Fit Statistics

Indicators of absolute models fit how well a model matches the data sample (McDonald and Ho, 2002). In PLS-SEM analyses, the SRMR has been used to measure how well a model fits (Henseler, 2018). Standardized Root Mean Square Residual (SRMR) is the difference between the correlation that was seen and the correlation that was expected. The theoretical framework was put through a "goodness of fit" test, and the following results, which are within acceptable limits, came out. A value that is lower than 0.10 (or 0.08 in a more conservative version) is thought to mean that the data fit well (Hu and Bentler, 1998).

The SRMR for this model is 0.056, which suggests that it fits well. In addition, the model's outcomes indicate that the dimensions are accountable for a significant amount of variance in both consumer behavior intention and perceived usefulness, with R^2 values of 0.443 and 0.274 correspondingly. The Stone-Geisser (Q^2) results for consumer behavior intention and perceived usefulness are 0.256 and 0.267 respectively, indicating that the model is relevant in predicting the dimensions when the values are greater than zero. Furthermore, a comparison of the RMSE values between PLS-SEM and LM demonstrated that PLS-SEM had superior fit and intermediate predictive power, as indicated by lower RMSE values (Hair *et al.*, 2021).

4.4 Results of SEM

Our conceptual model results in Figure 2 show how each of the factors is related to the other. There is a significant relationship between perceived ease of use (PEOU) and perceived usefulness (PU) with a p-value < 0.05 (0.000) and a positive coefficient of 0.524 that is why the first hypothesis H1 is accepted. And following, the relationship between perceived usefulness (PU) and consumer behavior intention (INT), there is also a significant impact from perceived usefulness (PU) on consumer behavior intention (INT) with a p-value < 0.05 (0.000) and a coefficient of 0.468 leading us to confirm and accept the second hypothesis H2.

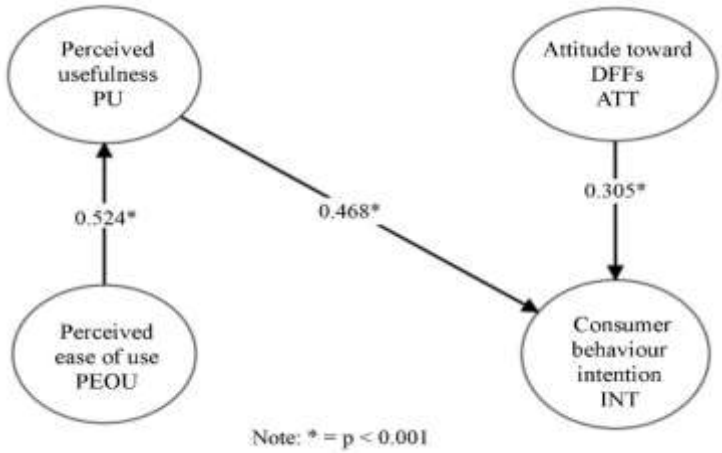
In the same manner, we can confirm the relationship between attitude toward DFFs (ATT) and consumer behavior intention (INT) with a p-value < 0.05 (0.000) and a coefficient of 0.305 that is why the third hypothesis H3 is accepted. However, the factor of perceived ease of use (PEOU) showed an indirect relationship with consumer behavior intention (INT) throughout the mediator factor perceive usefulness (PU) with p-value < 0.05 (0.000) and a coefficient of 0.245 as in Table 5.

Table 5. *Latent variables and total effects.*

	Path coefficients	**T statistics**	**P values**	**P < 0.05**
ATT -> INT	0.305	6.334	0.000	yes
PEOU -> PU	0.524	11.406	0.000	yes
PU -> INT	0.468	8.614	0.000	yes
PEOU -> PU -> INT	0.245	6.968	0.000	yes

Source: *Authors' own research.*

Figure 2*. Path coefficient of PLS-SEM*



Source: *Authors' own research.*

5. Discussion and Recommendations

The model of TAM was investigated in many previous studies, and it confirmed the implication of online food purchasing also (Shang and Wu, 2017; Bauerová and Klepek, 2018; Driediger and Bhatiasevi, 2019). The TAM model in previous studies takes the consideration of attitude for using the online platform to purchase food online.

However, the models did not highlight the main healthy attitude of customers that led them to take action and use the online platform to do their purchasing. From here we formed our conceptual model taking the consideration of the healthy attitude of customers toward dairy functional foods that influence their behavior and intention to purchase this kind of product online.

It was shown that the PU was influenced directly by PEOU with the highest coefficient of 0.526. This connection is supported by research conducted previously (Davis *et al.*, 1989). However, PU showed the lowest influence on INT with a coefficient of 0.152. This result is similar to the findings of *Chien et al.* (2003) who indicated that the PU of online grocery buyers had a direct effect on their intentions.

And contrary to online food shopping conducted by Nguyen *et al.* (2019). This finding provides empirical support for the TAM (Gefen *et al.*, 2000) and also echoes the earlier finding of Chien *et al.* (2003). It is recommended that if PEOU is improved in a way that minimizes the amount of mental and physical effort required by customers, then those consumers' perceptions of the utility and efficiency of online food shopping would be improved.

The results of the study suggest that customers' PEOU of online food purchasing platforms may act as a barrier to the widespread adoption of these platforms. These results showed similarity to the results obtained by the former study of Ching *et al.* (2020). These types of customers are often convenience-oriented and want the process to be simple and efficient (Handa and Gupta, 2014).

However, to increase the adoption of online grocery platforms, businesses should strive to create websites that are easy to use and do not require a lot of effort from customers. In Hungary, there is a growing demand for long-lasting food and consumers prefer discounts and local convenience shops, especially among the active population, middle-aged individuals, and young people (Fodor *et al.*, 2022).

Thus, Hungarian food retailers should communicate the benefits of ordering food online, such as the convenience and time-saving aspects, to enhance the shopping experience and performance of customers. Furthermore, these initiatives should be developed in collaboration with online grocery merchants and relevant organizations.

The study found that attitude towards dairy functional foods ATT has the highest impact on INT compared to PU and PEOU, with a coefficient of 0.474. This finding is consistent with previous research showing that health consciousness plays a key role in influencing consumer perception and attitude toward the purchase and consumption of healthy and functional foods in developed countries (Goetzke *et al.*, 2014).

In Hungary, cost, quality, healthfulness, and Hungarian provenance are the most important considerations for food purchases (Fodor *et al.*, 2022). In recent years, there has been a shift in Hungarian customers' preferences toward more local stores and markets, and people have greater faith in local goods and food (Soós, 2020). However, Hungarian consumers believe that identification of the place of origin, health, and support of local producers are the most significant considerations in the purchase decision, and local producers are legitimate sources of information about local food (Kiss *et al.*, 2020).

Furthermore, online shopping is often attractive because buyers can easily access information about a product at a low cost and with little effort, which may be particularly appealing to younger age groups who like to purchase online because of the wider range of options available to local producers (Chen *et al.*, 2019).

Generally, customers prefer to physically experience a product and enjoy the atmosphere of personal shopping, so it is unlikely that online shopping will completely replace shopping in physical stores (Bauerová *et al.*, 2021).

In the coming years, health is expected to be a crucial factor in consumer behavior patterns, and Hungarian consumers rarely sacrifice the enjoyable flavor of food for it to be healthier (Szente *et al.*, 2006). In addition, European consumers place a higher value on the potential enjoyment of a product (taste orientation) compared to its potential health benefits (healthiness orientation) compared to Asian consumers (Szakály, 2008).

To help consumers evaluate the quality of food products when shopping online, food retailers' websites need to provide detailed and honest information about the products and the conditions of purchasing or ordering. Consumer comments about the quality of the product and the website can also help build trust and connection with customers.

6. Conclusion

This study is the first to examine the attitude toward dairy functional foods concerning online food shopping in Hungary using the technology acceptance model. The conceptual model includes attitude towards dairy functional foods, purchasing usefulness, and purchasing ease of use as predictors of consumer intention to purchase online. The results show a positive and significant influence of attitudes towards dairy functional foods on the intention to purchase online.

There is also a positive and significant impact of purchasing ease of use on purchasing usefulness, and a significant impact of purchasing usefulness on consumer intention to purchase online. However, the impact of purchasing usefulness on intention was the lowest. The study found that Hungarian respondents are more open to trying innovations and are willing to use online grocery services if they are widely available and offer competitive prices and free home delivery.

However, they found the ordering process to be difficult and recommend improving the ordering channel to reduce the physical and mental effort for consumers and increase engagement in online food purchasing. The study's conclusions have practical implications for companies producing healthy foods like dairy functional foods, suggesting that success depends on educating and communicating with customers about the health benefits of these products.

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