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Analysis of Factors Influencing Consumer Attitudes and Online
Purchasing in the Hungarian Dairy Functional Food Market

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LIST OF ABBREVIATION

adj	adjusted
ATT	attitude toward using
AVE	average variance extracted
BAR	barrier
CB-SEM	covariance-based structural equation modeling
CRE	credibility
DFFs	dairy functional foods
ENT	entertainment
FF	functional food
HBM	health belief model
HTMT	heterotrait-monotrait
INF	informativeness
INT	consumer behavior intention
IRR	irritation
LM	linear model
MAV	media advertising value
MOT	motivation
MV	mean value
NFI	Normed Fit Index
OLS	ordinary least squares
PEOU	perceived ease of use
PLS	partial least squares
PLS-SEM	variance-based structural equation modeling
PU	perceived usefulness
Q ²	Stone-Geisser criterion
RMSE	root mean squared error

RSI relative speed index
SD standard deviation
SEM structural equation models
SRMR standardized root mean square residual
TAM Technology Acceptance Model
TPB Theory of Planned Behavior
TRA Theory of Reasoned Action
VAB value-attitude-behavior
WCF willingness to consume

1 INTRODUCTION

Over the past few decades, the dairy functional food market has experienced significant growth worldwide, driven by consumers' increasing awareness of the health benefits of functional foods and their desire for products that can improve their overall well-being (Topolska et al., 2021). Dairy functional foods, in particular, have gained considerable attention due to their high nutritional value and the presence of bioactive compounds, such as probiotics, prebiotics, and peptides, which can improve gut health, boost immunity, and reduce the risk of chronic diseases (Hadjimbei et al., 2022).

In Hungary, the dairy functional food market has also witnessed steady growth in recent years, as consumers are becoming more health-conscious and seeking out products that can support their immune system and digestive health (Balogh et al., 2020b; Nagy, 2010). However, online purchasing of dairy functional foods has become increasingly popular in Hungary, as it offers consumers the convenience of shopping from home, easy access to a wide range of products, and the ability to compare prices and quality across different vendors (Madarász et al., 2022). At the same time, media marketing has emerged as a powerful tool for promoting dairy functional foods and creating awareness among consumers about their health benefits (Kovalchuk, 2020; Narayana et al., 2020). Media marketing refers to the use of various channels and platforms, such as social media, TV, radio, and print media, to reach out to consumers and persuade them to buy products or services (Qader et al., 2022). In the context of dairy functional foods, media marketing can play a critical role in shaping consumers' attitudes and perceptions of these products and influencing their purchasing behavior (Hoque et al., 2018). However, the impact of media marketing on dairy functional food online purchasing in Hungary has not been fully explored in the literature. Although some studies have examined the role of various marketing techniques, such as brand loyalty,

perceived value, and trust, in influencing consumer behavior in the dairy functional food market (Nagpal et al., 2012; Siró et al., 2008; Temesi et al., 2019), few have specifically focused on the effects of media marketing on online purchasing behavior.

The popularity of online grocery shopping has been driven by several factors, including the convenience it offers, the wider variety of products available, and increasing levels of trust in online retailers (Sreeram et al., 2017). Additionally, consumers appreciate the ability to browse products, place orders, and schedule deliveries with just a few clicks, which saves time and effort. Furthermore, online grocery shopping also provides access to niche and specialty products that may not be available in physical stores, giving consumers greater choice and flexibility. As trust in online retailers continues to grow, more consumers in Hungary are comfortable with the idea of purchasing groceries online. Despite the benefits of online grocery shopping, there are still challenges to be addressed, such as the logistics and infrastructure of delivery and the need for a better user experience. However, the rise of online grocery shopping presents significant opportunities for retailers and marketers to better understand consumer behavior and preferences and introduce new and innovative products to the market.

The COVID-19 pandemic has had a profound impact on people's behavior and daily habits, including their food choices and purchasing behavior. The pandemic has brought a renewed focus on health and well-being, leading many people to reconsider their dietary habits and seek out healthier options. In Hungary, as in many other countries, the pandemic has also led to an increased reliance on home delivery services for groceries and food, as people seek to minimize their risk of exposure to the virus (Juhász et al., 2022).

Research has shown that pandemics can have a significant impact on food choice and behavior. For example, a study by Madarász et al. (2022) found that the COVID-19 pandemic led to a significant increase in the consumption of healthy foods, as people sought to boost their immune systems and improve their overall health. Another study by Gomes & Lopes (2022) found that the pandemic led to an increase in online grocery shopping and home delivery services, as people sought to minimize their risk of exposure to the virus.

In Hungary, the pandemic has also led to changes in food choice and behavior (Huszka et al., 2022). According to a survey by Madarász et al. (2022), the pandemic has led to a significant increase in the use of home delivery services for groceries and food. This shift in behavior has been attributed to a number of factors, including concerns about exposure to the virus, restrictions on movement and social distancing measures, and a desire for convenience and time-saving. The pandemic has also led to an increased focus on health and well-being in Hungary, with many people seeking out healthier food options. A survey by Garbóczy et al. (2021) found that Hungarian consumers were paying more attention to their health and well-being as a result of the pandemic, and consumers were trying to eat healthier foods. This shift in behavior has been linked to a desire to boost immunity and protect against illness, as well as a greater awareness of the importance of healthy eating.

To fill this gap, the present study analysis of factors influencing consumer attitudes and online purchasing in the hungarian dairy functional food market, using a range of theoretical models to identify the key factors that influence consumer behavior and attitudes in this context. The theoretical models that will be used in this study include the Value-Attitude-Behavior (VAB) model, the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), and the Media Advertising Value (MAV) theory.

The VAB model posits that values and attitudes are important determinants of behavior, and that individuals are more likely to engage in behaviors that align with their personal values and beliefs (Homer & Kahle, 1988). The TPB extends the VAB model by including perceived behavioral control as a factor that influences behavior, along with attitudes and subjective norms (Ajzen, 1991). The TAM focuses on the adoption of new technologies and suggests that users' intention to use technology is influenced by perceived usefulness and ease of use (Davis, 1989). Finally, the MAV theory proposes that media advertising has an intrinsic value that can influence consumers' attitudes and behavior towards a product, regardless of its actual characteristics (Cuesta-Valiño et al., 2020).

In order to address these inquiries, the research will employ quantitative data collection and analysis techniques. The quantitative aspect of the study will involve conducting a survey among a sizable group of Hungarian consumers of dairy functional food. This survey seeks to delve into their attitudes, values, and perceptions regarding online purchasing, while also examining their exposure to media advertising. The ultimate goal is to test theoretical models and explore the interconnections among various variables.

The results of this study are expected to contribute to a better understanding of the factors that influence dairy functional food online purchasing in Hungary and to provide insights into the role of media marketing in shaping consumer behavior and attitudes. The findings may have practical implications for dairy functional food manufacturers and marketers, as they can use the insights gained from this study to design more effective marketing strategies and communication campaigns that resonate with consumers' values, attitudes, and beliefs.

In summary, the present study aims to analysis of factors influencing consumer attitudes and online purchasing in the hungarian dairy functional food market, using a range of theoretical models to identify the key factors that influence consumer behavior and attitudes in this context. The study will employ a mixed-methods approach, combining qualitative and quantitative data collection and analysis methods, to provide a comprehensive understanding of the research questions. The findings of this study may have practical implications for dairy functional food manufacturers and marketers, as well as contribute to the theoretical literature on consumer behavior and media marketing.

2 LITERATURE OVERVIEW

2.1 Functional food in Hungary

Functional foods refer to those food items that offer benefits beyond their basic nutritional value (Menrad, 2003). The concept of functional food has been gaining significant attention in Hungary in recent years (Szakály et al., 2014). Historically, Hungary has produced functional foods like paprika, red wine, and honey that have been used for their therapeutic properties for centuries (Veres et al., 2003). Recently, the Hungarian food industry has focused on the development of new functional foods that can provide health benefits beyond traditional foods. This has resulted in the production of probiotic dairy products, functional beverages, and functional bread in Hungary (Havelda et al., 2020; Siró et al., 2008). Food product functionality's was recognized even before the turn of the millennium by the food industry, which accelerated the development of new products (Szakos et al., 2020). However, new products have a high market failure rate, because most of them have not been preceded by a deeper exploration of consumer demands (Menrad, 2003). That's why, many ways to improve traditional food processing have increased over the past decade, and the development of new dairy products is gaining attention due to the increase in the demand for palatable, healthy, well-made more sustainable products. Ultrasonic processing or sonication is a promising alternative technology in the food industry as it can improve the technology and functional properties of dairy and dairy products (Carrillo-Lopez et al., 2021).

The development of functional foods in Hungary is mainly driven by research conducted in universities, research institutes, and the food industry (Siró et al., 2008; Szakály et al., 2011; Szakos et al., 2022; Szilárd, 2003). However, research shows that consumer behaviour in Hungary is slowly changing, and a positive trend has emerged, but it will take time to develop a strong conscious

consumer base about the importance of functional food and its benefits for sustainability and healthy life (Deák, 2014). Furthermore, according to Szakos et al. (2020), the development of functional foods in Hungary is primarily driven by health and wellness concerns, as well as increasing demand for convenience foods.

The consumption of functional food in Hungary is still relatively low compared to other European countries, but there is a growing interest among Hungarian consumers (Deák, 2014). The most popular functional foods in Hungary are probiotic dairy products, followed by functional beverages and functional bread (Szakály et al., 2012; Szakos et al., 2022). The research conducted by Szakály et al. (2019a) found that Hungarian consumers were motivated to purchase functional foods primarily for health benefits, taste, and convenience. Furthermore, the study by Papp-Bata & Szakály (2020) found that the main factors influencing the purchasing decisions of functional foods were health benefits, taste, and price. Another study by Szakály et al. (2019) found that functional foods that are locally produced and have a natural composition were preferred by Hungarian consumers.

2.2 Dairy functional food in Hungary

Dairy functional food is gaining popularity in Hungary due to its various health benefits. In recent years, there has been an increase in the production and consumption of functional dairy products in Hungary (Németh et al., 2020). Functional dairy foods are enriched with bioactive compounds, such as probiotics, prebiotics, fiber, and vitamins, which promote gut health, reduce cholesterol levels, and improve the immune system (Kaur et al., 2022).

According to a study by Szakos et al. (2020), there is a growing demand for functional dairy products in Hungary. The study found that consumers are

willing to pay more for dairy products that contain added health benefits. The study also found that consumers are more likely to buy dairy products that are low in fat and calories and have added vitamins and minerals.

Probiotics are one of the most commonly added functional ingredients in dairy products. In a study by (Várhidi et al., 2022), the authors found that probiotic-enriched dairy products are becoming increasingly popular among Hungarian consumers. Furthermore, the study showed that consumers are willing to pay a higher price for probiotic-enriched dairy products compared to regular dairy products. Additionally, the study also found that consumers prefer yogurt and kefir as the preferred dairy products for probiotic supplementation. Another popular functional dairy product that is gaining popularity among athletes and fitness enthusiasts in Hungary is whey protein (Clal, 2022). In addition, the study found that whey protein is effective in promoting muscle growth and improving exercise performance (Devries & Phillips, 2015). The study also found that consumers prefer whey protein in the form of protein shakes and bars.

One of the key benefits of functional dairy products is their impact on gut health. Probiotics, which are commonly added to dairy products, have been shown to have a positive effect on the gut microbiome, which is essential for maintaining a healthy digestive system (Kaur et al., 2022). In a study by Figler et al. (2006), it was found that functional dairy products, especially those with added probiotics, are effective in improving digestive health and reducing the risk of gastrointestinal disorders.

Prebiotics are another bioactive compound that is commonly added to functional dairy products in Hungary (Várhidi et al., 2022). In a study by Fiorindi et al. (2022), it was found that prebiotic-enriched dairy products can significantly improve gut health and reduce the risk of inflammatory bowel

diseases. Moreover, the study in Hungart found that the consumption of prebiotic-enriched dairy products improved the composition of the gut microbiome, which is critical for maintaining digestive health (Figler et al., 2006). In addition to improving gut health, functional dairy products have been shown to reduce cholesterol levels and improve cardiovascular health. A study by Korpela et al. (2006) found that dairy products enriched with plant sterols, which are known for their cholesterol-lowering properties, can significantly reduce LDL (bad) cholesterol levels. What's more, the study also found that functional dairy products are effective in reducing the risk of cardiovascular disease, which is a major health concern in Hungary (WHO, 2021).

In conclusion, the consumption of functional dairy products has numerous health benefits, including improved gut health, reduced cholesterol levels, and improved cardiovascular health. The availability and accessibility of these products have contributed to their increasing popularity in Hungary, as consumers become more health-conscious and seek out foods that provide added health benefits. As research continues to explore the potential health benefits of functional dairy products, we can expect to see further growth in this market segment in Hungary.

2.3 Dairy functional food Hungarian market

In Hungary, the market for dairy functional foods is vast and offers a diverse range of products (Szakos et al., 2022). One of the most popular types of dairy functional foods is lactose-free dairy products. These products have become increasingly popular, especially among people who have lactose intolerance. Lactose-free dairy products are made by removing lactose, a natural sugar found in milk, making these products easier to digest and gentler on the stomach (Szabó et al., 2021).

Another type of functional dairy product that is popular in Hungary is low-fat dairy products. Low-fat dairy products are a healthier alternative to full-fat dairy products and have been associated with weight loss, reduced risk of type 2 diabetes, and improved cardiovascular health (Neulinger & Simon, 2011).

Probiotic yogurts are another popular type of functional dairy product in the Hungarian market. These products are made by adding live bacteria to yogurt, which helps to promote gut health and boost the immune system. Regular consumption of probiotic yogurts has been associated with a reduction in the incidence of diarrhea, improved lactose digestion, and a lower risk of colon cancer (Németh et al., 2020).

In addition to lactose-free dairy products, low-fat dairy products, and probiotic yogurts, there are other functional dairy products available in the Hungarian market (Németh et al., 2020). Furthermore, milk fortified with calcium is one such example. Calcium is an essential mineral that is required for strong bones and teeth, and it is particularly important for children and older adults (Pravina et al., 2013). Furthermore, milk fortified with calcium is a good source of this mineral and can help people meet their daily calcium requirements (Vyas & Tong, 2004).

Enriched milk with Omega3 EPA & DHA is another functional dairy product available in the Hungarian market. Omega-3 fatty acids are essential for the human body and play a vital role in brain function, heart health, and inflammation. Milk enriched with Omega-3 EPA & DHA has been shown to help improve cognitive function, reduce inflammation, and lower the risk of heart disease (Lopez-Huertas, 2010).

Finally, milk fortified with folic acid is also available in the Hungarian market. Folic acid is a B vitamin that is essential for the formation of red blood cells, and it has been associated with a reduced risk of birth defects in newborns.

Milk fortified with folic acid is an excellent source of this vitamin, making it a healthy choice for pregnant women and women of childbearing age (Boeneke & Aryana, 2008).

In conclusion, the Hungarian market for functional dairy foods is diverse, offering a wide range of products that provide consumers with additional health benefits. As research continues to reveal the health benefits of these products, we can expect to see continued growth and innovation in this market segment.

2.4 Consumer attitude and behavior toward dairy functional food

The attitude towards consuming functional food has become increasingly positive in recent years, with many individuals recognizing the potential benefits of these foods for both physical and mental health. One attitude towards functional food is the belief that these foods can help improve mood (Salmani et al., 2020; Urala & Lähteenmäki, 2007). Functional foods such as fatty fish, nuts, and leafy greens contain nutrients that have been shown to help regulate mood and reduce symptoms of depression and anxiety. By consuming these foods regularly, individuals can support their mental health and improve their overall quality of life. Another attitude towards functional food is the belief that these foods can enhance performance (Salmani et al., 2020; Urala & Lähteenmäki, 2007). Many functional foods contain nutrients that can help boost energy levels and improve cognitive function, which can help individuals perform better at work or school. By consuming these foods regularly, individuals can support their mental and physical performance and achieve their goals more effectively.

Additionally, many individuals believe that consuming functional foods regularly can help prevent disease. Functional foods such as berries,

cruciferous vegetables, and whole grains are rich in antioxidants, fiber, and other nutrients that can help reduce the risk of chronic diseases such as cancer, heart disease, and diabetes. By incorporating these foods into their diet, individuals can support their overall health and reduce their risk of developing these conditions (Milner, 2000). Another attitude towards functional food is the belief that these foods can repair the damage caused by an unhealthy diet. Many individuals may have consumed processed or unhealthy foods for a prolonged period of time, leading to poor health outcomes. However, by incorporating functional foods into their diet, individuals can repair some of the damage caused by an unhealthy diet and support their overall health and well-being (Urala & Lähteenmäki, 2004).

In recent years, a study conducted by Németh et al. (2020) found that consumers in Hungary have positive attitudes towards functional dairy products, with health benefits being the most important factor influencing their purchase decisions. Additionally, sensory appeal, brand name, and price were also significant factors in consumer behavior towards dairy functional food in Hungary. Likewise, other studies found that functional dairy products such as probiotic yogurts and kefir are becoming increasingly popular among Hungarian consumers and that there is a growing demand for these products in the market. The study also found that younger consumers are more likely to purchase functional dairy products, indicating a potential growth area for the industry (Siró et al., 2008; Szakály et al., 2019). Overall, consumer behavior in dairy functional food in Hungary is driven by a combination of health benefits, sensory appeal, brand name, and price. Producers and marketers in the dairy industry can use this information to tailor their products to meet consumer needs and preferences, and to develop effective marketing strategies.

2.5 Motivation and Barriers of consuming functional foods

Motivation: Functional foods are becoming increasingly popular among health-conscious individuals, as they are believed to offer a range of health benefits beyond basic nutrition. These foods contain bioactive compounds that have been shown to promote health and prevent chronic diseases. The motivation for consuming functional foods varies among individuals, but generally, people are drawn to these foods because they want to improve their overall health and well-being (Urala & Lähteenmäki, 2004). One of the main motivators for consuming functional foods is the desire to live longer (Downes, 2008). Research has shown that some functional foods contain compounds that have anti-aging properties, which can help to slow down the aging process and increase lifespan. For example, green tea contains antioxidants that have been shown to reduce the risk of age-related diseases, such as Alzheimer's and Parkinson's disease (Chen et al., 2020). Another motivation for consuming functional foods is the desire to be healthy. Functional foods are often marketed as being able to improve health in various ways, such as reducing the risk of heart disease, cancer, and other chronic illnesses (Downes, 2008; Urala & Lähteenmäki, 2007). This is because many functional foods contain bioactive compounds that have been shown to have anti-inflammatory and antioxidant properties, which can help to protect against these diseases. Furthermore, weight management is also a common motivator for consuming functional foods. Many functional foods are low in calories and high in nutrients, which can help to promote weight loss and maintain a healthy weight.

Barriers: Despite the many benefits associated with consuming functional foods, there are also a number of barriers that can prevent individuals from incorporating these foods into their diets (Küster-Boluda & Vidal-Capilla, 2017). These barriers may include a lack of motivation, a lack of support or

encouragement from others, competing demands on time, and financial constraints. One of the most common barriers to consuming functional foods is a lack of motivation (Downes, 2008). Many individuals may not see the immediate benefits of incorporating these foods into their diets, or they may not fully understand the long-term health benefits. Without a clear understanding of the benefits, it can be difficult to maintain the motivation necessary to make changes to one's diet. However, another common barrier is a lack of support or encouragement from others. For example, family members or friends may not understand the importance of consuming functional foods and may not offer the support needed to make dietary changes. This lack of support can make it difficult to maintain a healthy diet and make it easier to fall back into unhealthy eating habits (Downes, 2008; Küster-Boluda & Vidal-Capilla, 2017). Furthermore, competing demands on time can also be a significant barrier to consuming functional foods. Many individuals may be juggling multiple responsibilities, such as work, family, and other commitments, which can make it challenging to find the time and energy to plan and prepare healthy meals (Downes, 2008). Finally, in Hungary, financial constraints can also prevent individuals from consuming functional foods (Szabó-Szentgróti et al., 2017). These foods can be more expensive than processed or convenience foods, and some individuals may not be able to afford them on a regular basis. This can be particularly challenging for individuals who live in areas with limited access to fresh and healthy foods.

2.6 Key drivers of functional food consumption

2.6.1 Socio-demographic profile

Many studies showed that there is a very strong relationship between socio-demographic profile which is embodied in age, gender, education level, household, geography location, and marital status) and the willingness to

consume functional food products (Ares & Gámbaro, 2007; Kavoosi-Kalashami et al., 2017; Kljusuric et al., 2015; Kraus et al., 2017; Moro et al., 2015; Ozen et al., 2013; Schnettler et al., 2015; Bui, 2015; Verbeke, 2005; Verbeke, 2006).

Educational level: Undoubtedly, there is a significant relationship between education level and consumer acceptance of functional food (Bekoglu et al., 2016; Brečić et al., 2014; Büyükkaragöz et al., 2014; Kraus et al., 2017; Szakály et al., 2019). The level of education and knowledge has a strong impact on consumer acceptance of functional food and the way how they think about the food ingredients (Szakály et al., 2019), and a lot of people know about functional food from the internet because it's the fastest way to gate information in this era (Balogh et al., 2020b). For example, people with a graduation degree had a higher potential to use functional food (Çakiroğlu & Uçar, 2018). In another word, educated people are correlated with a willingness to consume functional food (Jong et al., 2003). And also survey showed that the respondents are aware of the definition of functional food and the influence of functional food on the body (Balogh et al., 2020a). Furthermore, it was shown that a higher level of knowledge of the consumer and income level not only increases The acceptance to buy functional food and the willingness to pay to consume functional food but also increases the purchasing number of functional food (Szakály et al., 2019), and also it was shown that high education level has a positive impact on the constant use of dairy functional food such as lactose-free products (Szabó et al., 2021).

Gender: Gender plays an essential role in the acceptance of functional food by consumers and it was shown in most research (Balogh & Kőszegi, 2020b; Kozup et al., 2018; Szabó et al., 2021). Most of the studies declared that females are more willing to consume functional food than males (Brečić et al., 2014; Büyükkaragöz et al., 2014; Çakiroğlu & Uçar, 2018; Plasek et al., 2021;

Verneau et al., 2019). This is because females are generally responsible to prepare the food for their families, running the household, and they buy the food by themselves (Balogh & Kőszegi, 2020b; Bech-Larsen & Scholderer, 2007; Kozup et al., 2018). while males prefer to do shopping with a companion, which makes females the decision-maker in buying household products (Szabó et al., 2021). Another reason why females prioritize their health is that they have a greater capacity to allocate extra funds to maintain a healthy lifestyle and consume nutritious food (Szabó et al., 2021).

Age: Numerous studies explained the influencing factor of age and consumer willingness to use functional food (Çakiroğlu & Uçar, 2018; Plasek et al., 2021; Verneau et al., 2019). It was shown that aged people have more potential to consume functional foods compared with the young generation (Büyükkaragöz et al., 2014; Siegrist et al., 2008; Verneau et al., 2019). In contradiction, other studies demonstrated that young people 25 years of age were more interested to consume functional food compared with the old generation (Çakiroğlu & Uçar, 2018; G. Rezai et al., 2012). Another study indicated that both the young population, aged 18–25 years, and the older generation, aged 56 years, are interested in consuming functional food (Plasek et al., 2021). This is because the older generation is more concerned about their health compared to the younger generation (Büyükkaragöz et al., 2014; Siegrist et al., 2008). And also the young generation is more open-minded to the innovation of functional food (Carrillo et al., 2013).

Household characteristics: Household characteristics such as size and income are one of the main demographic factors that have a strong relationship with the acceptance of using functional food (Corso et al., 2018; Plasek et al., 2021), and the willingness to pay for the functional food was strongly connected with the consumer with higher income (Corso et al., 2018; Stojanovic et al, 2013; Rezai et al., 2012; Szakály et al., 2019). This is due to

the customer with higher income have more ability to afford to pay extra costs to buy higher quality food products (Carrillo et al., 2013). Another factor that influences the consumer acceptance to buy functional food is the size of the family (Plasek et al., 2021). In general, families with fewer members (2 persons) showed more tendency to buy and consume functional food compared with large-size family members in Europe (Markovina et al., 2011; Plasek et al., 2021). However, this was contradictory to a study conducted in Malaysia that show that a family size with 5-6 members was more willing to buy functional food (Phuah et al., 2015).

Marital status: Marital status is an important factor that can influence the consumer behavior towards functional foods. However, not many studies determined the relationship between the influence of marital status and the acceptance of functional food products (Baker et al., 2022). According to some studies, marital status may impact dietary intake and food choices. Married individuals may have different dietary habits and preferences than single individuals, due to various factors such as shared food preparation and household income (Szabó et al., 2021). One study conducted found that there was a significant association between marital status and the consumption of functional foods, such as fortified products. The study reported that married individuals were more likely to consume fortified dairy products than singles (Choumenkovitch et al., 2002). This could be due to the fact that married individuals may be more health-conscious and have a higher interest in improving their health through nutrition. Furthermore, the study reported that married individuals were more likely to consume functional foods for their children than for themselves. This suggests that the motivation to consume functional foods for the family's health may be stronger among married individuals. However, the study also found that there were no significant

differences in the barriers to consuming functional foods between married and single individuals (Szakály et al., 2011).

Geographic location: Geographic location could be a very important influencing factor in identifying consumer acceptance of functional food (Kljusuric et al., 2015). The study by Balogh et al. (2020a), showed that there is a positive connection between the consumption of functional food and the area of the respondent, which declares that most who show a tendency to consume functional food many times per week lives in urban area. Another study confirmed that most of the respondent who consumes functional food lives in a countryside town (Plasek et al., 2021). Furthermore, answers to satisfaction with consuming functional food products were mostly female respondents with high income who more likely lives in cities (Balogh et al., 2020b). Furthermore, geographic location may also impact the cost of functional foods. In some cases, the cost of shipping functional foods to more remote areas may result in higher prices for consumers in those regions. This could potentially be a barrier for individuals who are motivated to consume functional foods but are unable to afford the higher prices. Additionally, in rural areas, access to a variety of functional foods may be limited compared to urban areas where there are more options available. A study conducted in Hungary found that individuals living in urban areas were more likely to consume functional foods compared to those living in rural areas (Balogh & Kőszegi, 2020b). However, the availability of functional foods in different regions of Hungary may vary due to differences in distribution and marketing strategies. For example, a study conducted in 2016 found that some functional foods, such as probiotic yogurt, were not widely available in certain regions of Hungary (Nagy, 2010).

2.6.2 Product identity

Many studies revealed the relationship between consumer acceptance of functional food and the product identity that is summarized in components and ingredients, price, taste, brand, and health information (Balogh & Kőszegi, 2020b; Brečić et al., 2017; Jahn et al., 2019; Szabó et al., 2021).

Price: Consumers tend to perceive functional foods as being more expensive than conventional foods due to their additional health benefits (Szakály et al., 2012). High prices can lead to a decrease in demand, even for those who are highly motivated to consume functional foods. Many former studies reported that the price influences the willingness to consume functional food (Ares et al., 2010; Büyükkaragöz et al., 2014; Miroso & Mangan-Walker, 2017). In the first place, consumers prefer to buy functional food at a fair price and receive expected health benefits (Büyükkaragöz et al., 2014; Huang et al., 2019; Stojanovic et al., 2013). Price has a contradictory influencing factor in consumer point of view: the first point of view is that low price means low quality and low consumer purchasing intention, and the second point of view is that higher price means higher perceived quality and increasing purchasing intention (Ares et al., 2010; Huang et al., 2019; Jaeger, 2006). In some cases, if consumers are more concerned with a healthy lifestyle, they could be more tolerant of higher prices (Ares et al., 2010). And it was shown that a consumer who cares more about their health didn't mind paying extra cost to get the expected health from using functional food products (Pappalardo & Lusk, 2016).

Undauntedly, people prefer high-quality products, but high quality is associated with higher prices considered the main player, that's why the majority of people are not able to do financial sacrificing to get expensive healthy food due to the inability to buy it (Balogh & Kőszegi, 2020a). And in

another case, the same was found in Sri Lanka, consumers care more about the price of functional food than the health benefits that they obtain from consuming healthy food (Narayana et al., 2020). Mostly who consider functional food expensive because they don't have a high income and they don't have adequate purchasing power (Balogh et al., 2020a).

The combination and ingredients: The combination and ingredients of functional food products can also be a motivating factor for consumers to purchase them. Consumers may prefer functional food products that contain ingredients that they are familiar with, such as fruits, nuts, and grains, and may be hesitant to try products with unfamiliar ingredients. Additionally, consumers may be more inclined to purchase functional food products that combine multiple health-promoting ingredients, as opposed to single-ingredient products.

A significant connection was observed between a component in functional food and the willingness to purchase these products. This association is driven by the belief that the nutritional value of the food has improved, leading to an anticipation of positive health benefits from consumption (Szakály et al., 2019). Furthermore, consumers preferred to use functional foods that include naturally enriched components (Ares & Gámbaro, 2007; Jahn et al., 2019). And also, consumers consider that there are naturally healthy foods such as yogurt which are more healthy than harmful foods such as spreads (Bech-Larsen & Scholderer, 2007). In addition, it was shown that the attitudes toward functional food were indirectly influenced by beliefs about nutrition throughout the information that was given about functional food (Szakály et al., 2019). And also, it was found that consumers perceived suitability toward functional food that includes a component that is already known before and used to consume (Krutulyte et al., 2011). Thus, functional food product

ingredients consider a main influencing factor in consumer acceptance (Brečić et al., 2017; Carrete & Arroyo, 2014).

Research has shown that consumers have a preference for natural and minimally processed ingredients in functional foods (Nolan-Clark et al., 2011). Natural ingredients are often perceived as being healthier and more beneficial than artificial ingredients. Moreover, the presence of specific ingredients, such as antioxidants, fiber, and probiotics, can influence consumers' purchase decisions (Bimbo et al., 2017). Furthermore, the combination of ingredients can also influence consumers' perceptions of taste and texture. Research has shown that the taste and texture of functional food products are important factors that affect consumers' willingness to purchase and consume them (Topolska et al., 2021). Consumers may prefer products that have a pleasant taste and texture, and may be less likely to purchase products that have an unpleasant taste or texture, even if they are perceived as being healthy.

Brand loyalty: Brand loyalty is another significant barrier that affects the consumption of functional foods in Hungary (Nábrádi & Szakály, 2021). Consumers may have a strong preference for a specific brand and may resist switching to another brand, even if it offers similar or better health benefits. Research suggests that brand loyalty is influenced by several factors such as a positive attitude towards the brand, satisfaction with previous purchases, trust in the brand, and emotional attachment to the brand (García-Salirrosas et al., 2022). Furthermore, brand loyalty is particularly high among consumers who have been consuming a specific brand for a long time, and it may be challenging to convince them to switch to a new brand (Kiss et al., 2022). This can be a significant barrier for manufacturers who are trying to introduce new functional food products into the market. For instance, if a consumer has been consuming a specific brand of probiotic yogurt for many years, they may be hesitant to switch to a new brand, even if the new product has better health

benefits. Thus, brand loyalty can limit the market potential for new functional food products. In addition, consumers may perceive a high degree of risk associated with switching brands, particularly in cases where the new brand is relatively unknown or has not established a positive reputation in the market. This can be particularly challenging for small or new manufacturers who lack the resources to invest in extensive advertising and promotional campaigns. Therefore, brand loyalty can be a significant barrier to the adoption of functional foods, particularly in cases where there is a high degree of competition in the market. Overall, brand loyalty can significantly impact consumer behavior and attitudes towards functional foods, particularly in cases where consumers have developed strong emotional ties to a specific brand (Nábrádi & Szakály, 2021).

Taste: Taste and texture are important factors that can influence consumers' decision to consume functional foods (Topolska et al., 2021). The taste and texture of functional foods can be different from traditional foods due to the addition of functional ingredients. This can be a barrier for some consumers who are not used to the taste or texture of functional foods. Furthermore, it was shown that taste has a significant impact on consumer willingness to use functional foods (Jung et al., 2020; Pappalardo & Lusk, 2016). In some cases, the factor of taste could be more favorable for the customer than the health perceived benefits (Moons et al., 2018). And also, consumers are not able to sacrifice the taste of the food to obtain health (Lyly et al., 2007; Moons et al., 2018; Temesi et al., 2019). In addition to the taste and other organoleptic features of the product (Anders & Schroeter, 2017; Vasiljevic et al., 2015). However, taste and texture can also be motivators for consumers to choose functional foods. In a study conducted in Hungary, consumers reported that they would be more likely to consume functional foods if they had a good taste and texture (Szakály et al., 2016). In another study, it was found that consumers

who rated the taste and texture of a functional food product as high were more likely to purchase the product again (Urala & Lähteenmäki, 2004).

2.6.3 Health-related factors

Health-related factors significantly influence consumer behavior and choices. These include seeking health information, considering health benefits, managing weight, addressing food intolerances, and catering to the needs of the aging population. Understanding and addressing these factors are crucial for businesses to meet consumer demands and offer products that align with their health and wellness goals.

Health information: Health information is an important factor that influences consumer behavior towards functional foods. Health information refers to the knowledge and understanding of the potential health benefits and risks associated with consuming functional foods. Furthermore, consumers who are more knowledgeable about the health benefits of functional foods are more likely to consume them regularly (Papp-Bata & Szakály, 2020). However, the health information that can be found on the product label has a very important role in the acceptance of functional food products (Kozup et al., 2018). This information can enhance the consumer expectation that they can receive from consuming functional food (Marette et al., 2010). It was explained that the health information about functional food that could not be understood by consumers was less acceptable to be consumed (Ahn et al., 2016). And also it was found that the more provided information about the advantage of lowering cholesterol the more interested the consumer to buy yogurt with functional characteristics (Baker et al., 2022). Furthermore, several studies have highlighted the importance of health information in shaping consumer behavior towards functional foods.

Health benefits: One of the major motivations for consumers to use functional foods is the potential health benefits associated with these products. Many functional foods are formulated to provide specific health benefits, such as improving heart health, boosting immune function, or aiding in weight loss. Consumers who are concerned about their health may be more likely to seek out and use these products as a way to improve their overall well-being (Urala & Lähteenmäki, 2007). Studies have shown that consumers are particularly interested in functional foods that offer cardiovascular benefits. For example, one study found that participants were more likely to purchase a functional yogurt that claimed to lower cholesterol levels compared to a regular yogurt without any health claims (Baker et al., 2022). Additionally, the health benefits of functional foods can also play a role in influencing consumer behavior towards healthier eating habits. A study by Clifton et al. (2004) found that participants who consumed a functional bread with added plant sterols experienced improvements in their cholesterol levels, which led to increased awareness and interest in heart-healthy foods. This suggests that using functional foods to target specific health concerns can have a positive impact on consumer behavior and promote healthier lifestyles.

Weight management: Weight management is one of the main factors that lead customers to consume healthy food and dairy functional food. The increasing prevalence of overweight and obesity is a major public health concern in Hungary, and many people are turning to healthier food options to manage their weight (Coats & Martirosyan, 2015; Papp-Bata & Szakály, 2020). Research has shown that consuming a healthy diet, which includes nutrient-dense foods such as fruits, vegetables, whole grains, and low-fat dairy products, can help with weight management (Spence et al., 2011). Moreover, dairy functional food, which is fortified with specific nutrients, has been shown to have potential benefits for weight management. For example, a study

conducted in Hungary found that consuming a dairy functional food enriched with calcium and vitamin D led to significant weight loss compared to a control group (Siró et al., 2008). Another study found that consuming a dairy functional food enriched with conjugated linoleic acid (CLA) led to decreased body fat mass and increased lean body mass (Szakály et al., 2010).

Food intolerances: Lactose intolerance is a common food intolerance that affects many individuals worldwide. In Hungary, it is estimated that around 30-40% of the population is lactose intolerant (Storhaug et al., 2017). This intolerance occurs when the body is unable to produce enough lactase, the enzyme required to break down lactose, the sugar found in milk and dairy products (Matthews et al., 2005). Additionally, individuals with lactose intolerance may experience symptoms such as bloating, gas, diarrhea, and abdominal pain after consuming dairy products (Santos et al., 2019). As a result, many people with lactose intolerance may avoid consuming dairy products, which can lead to inadequate calcium and vitamin D intake (Hodges et al., 2019). Thus, to address this issue, there are many lactose-free dairy products available in Hungary, such as lactose-free milk, cheese, and yogurt. These products have been treated with lactase enzyme to break down lactose and make them more easily digestible for individuals with lactose intolerance (Santos et al., 2019). Therefore, there are also non-dairy alternatives available in Hungary for individuals with lactose intolerance, such as soy milk, almond milk, and oat milk. These plant-based “milks” are naturally lactose-free and can be used as a substitute for dairy milk in many recipes (Collard & McCormick, 2021). Furthermore, it is worth mentioning that people who do not have a problem with lactose can potentially develop lactose intolerance if they regularly consume lactose-free products. This paradoxical occurrence may arise due to reduced exposure to lactose, causing a decrease in the production of lactase, the enzyme responsible for digesting lactose. As a result,

their ability to tolerate lactose may diminish over time, leading to symptoms of lactose intolerance when reintroduced to regular dairy products (Kasza et al., 2023).

Aging population: The aging population in Hungary has been shown to have a significant impact on the demand for healthy and functional food products (Szakos et al., 2022). As people age, their nutritional needs change, and they may require more specialized foods to maintain good health and prevent chronic diseases (Szakos et al., 2020). This has led to an increase in the demand for products that are rich in protein, fiber, vitamins, and minerals, as well as those that can help improve cognitive function and support bone health (Özer & Kirmaci, 2010). Moreover, research has shown that the aging population in Hungary is more concerned with food safety and quality than younger generations, and they tend to prefer locally sourced and organic foods (Szegegyiné Fricz et al., 2020). This trend is driving the growth of the organic food market in Hungary, which is expected to continue in the coming years.

2.6.4 Other factors influencing functional food consumption

Several factors influence the consumption of functional foods, including advertising and marketing efforts, awareness levels, convenience, and product availability. These factors play a significant role in shaping consumer behavior and decision-making when it comes to choosing and incorporating functional foods into their diets. Businesses in Hungary need to consider and address these factors to effectively promote and make functional foods more accessible to consumers.

Advertising and marketing: In Hungary, advertising and marketing play an important role in influencing consumer behavior towards food consumption. A study conducted by Nagy (2010) found that advertising significantly affects the consumption patterns of children and adolescents, and they are more likely

to choose unhealthy food products due to the influence of marketing. Similarly, a study by Malik & Sudhakar (2014) found that marketing techniques such as packaging design, product placement, and celebrity endorsements can significantly influence the food choices of consumers. Moreover, food companies often use misleading health claims to promote their products, which can further misguide consumers. A study by Kušar et al. (2021) found that a majority of the surveyed packaged food products made at least one health claim, but many of them did not meet the requirements of the European Food Safety Authority (EFSA) for substantiating health claims. Furthermore, it was found that social media marketing has a positive impact on consumer purchase behavior, especially for low-involvement products such as food and household items (Salamzadeh et al., 2022). Another study conducted by Balogh & Mizik (2022) examined the impact of advertising appeals on consumer purchase intention in Hungary, and found that advertising appeals that focused on emotional benefits (e.g., happiness, excitement) had a greater impact on purchase intention than appeals that focused on functional benefits (e.g., performance, quality). Furthermore, the study by Papp-Váry & Kerti (2022) demonstrated that, Hungarian consumers are responsive to discounts and promotions in online advertising, with these strategies positively impacting consumer purchase behavior. Additionally, this study also found that personalized advertising, such as personalized offers and recommendations, had a stronger impact on purchase intention than non-personalized advertising. Furthermore, a study by Tari & Mihály (2018) examined the influence of mobile advertising on consumer behavior in Hungary, and found that mobile advertising has a significant effect on consumer purchase behavior, especially for products that are frequently purchased, such as food and beverages.

Lack of awareness: Lack of awareness is another significant barrier to the use of functional foods. Many people in Hungary are not aware of the benefits of

consuming functional foods or do not have enough information about them. This lack of awareness can be due to various reasons, such as inadequate advertising, lack of knowledge about the products, or limited access to information sources. Some studies conducted by Papp-Bata & Szakály (2020), Siró et al. (2008), and Szakály et al. (2011) showed that the majority of Hungarian consumers have limited knowledge about the health benefits of functional foods, and only a small percentage of them consume these products regularly. This lack of awareness can also affect the demand for functional foods, as consumers may choose traditional foods over functional foods due to their lack of knowledge about the latter. To overcome this barrier, it is essential to raise awareness about the benefits of functional foods among consumers. Marketers can employ various strategies to educate consumers, such as advertising campaigns, informative websites, and social media marketing. The use of health claims and labels on product packaging can also help consumers to identify functional foods easily. Furthermore, partnerships between functional food manufacturers and health professionals, such as nutritionists and dietitians, can play a vital role in educating consumers about the health benefits of functional foods.

Convenience: In Hungary, convenience has been identified as one of the major factors driving the consumption of healthy and functional foods. According to studies by Nagy (2010) and Szakály et al. (2011), consumers often choose healthy food options that are quick and easy to prepare, and that can be consumed on-the-go. This trend is particularly strong among younger consumers and those with busy lifestyles. Similarly, a study by Papp-Bata & Szakály (2020) found that convenience was a key driver of the consumption of functional foods in Hungary, with consumers valuing products that were easy to consume and could be incorporated into their daily routine without disruption.

Product availability: In Hungary, consumers may face challenges in finding functional food products in their local stores or supermarkets. According to former studies, consumers reported that functional food products were not readily available in their local supermarkets, and they had to travel to other stores to purchase them. The study also found that the availability of functional food products varied by region, with more significant availability in urban areas compared to rural areas (Siró et al., 2008; Szakos et al., 2020). This lack of product availability is a significant barrier to the motivation to use functional foods, particularly for consumers living in rural areas. The high cost of transportation and time required to travel to larger cities or specialized stores to purchase functional foods can be a significant deterrent for many consumers. That's why, online shopping has emerged as a popular option for consumers to purchase functional foods in Hungary. Online shopping provides consumers with a wider range of product choices and eliminates the need for consumers to travel to specialized stores. With the growth of e-commerce, it has become easier for consumers to purchase functional food products from online retailers that specialize in these products.

2.7 Online grocery shopping in Hungary

In Hungary, the growth of online grocery shopping can be attributed to several factors. One of the main drivers has been the increasing availability and accessibility of online shopping platforms. According to the data, in 2020, the average daily time spent shopping online in Hungary was approximately 48 minutes, an increase from the previous year's average of 41 minutes. Additionally, the research shows that younger generations spend more time shopping online than older generations, with the 25-34 age group spending an average of 64 minutes daily. The increase in online shopping can be attributed to factors such as the COVID-19 pandemic and the growing popularity of e-

commerce platforms in Hungary (Statista, 2021b). Furthermore, the report found that online grocery shopping is one of the fastest-growing segments in the Hungarian e-commerce market (Statista, 2021a).

Another factor contributing to the growth of online grocery shopping in Hungary is the increasing adoption of smartphones and other mobile devices. Based on the data, the number of smartphone users in Hungary was projected to increase steadily in recent years, from approximately 6.2 million users in 2016 to an estimated 7.5 million users in 2021. This growth was due to the increasing affordability and availability of smartphones, as well as the advancements in mobile technology. The use of smartphones is becoming more prevalent among all age groups in Hungary, with the younger generation being the most active users. As the number of smartphone users continues to grow in Hungary, this presents opportunities for businesses to reach more customers through mobile platforms and for the development of new mobile applications and services (Statista, 2022a).

The growth of online grocery shopping has also led to changes in consumer behavior in Hungary. For instance, consumers are now able to shop for groceries from the comfort of their homes, at any time of the day. This has led to a decrease in the number of trips made to physical stores, as consumers are able to purchase groceries in bulk and have them delivered to their doorstep. Furthermore, the availability of online shopping platforms has also led to changes in the types of products that consumers purchase. Consumers are now able to access a wider variety of products, including those that are not available in physical stores. This has led to an increase in the number of niche and specialty products being sold online.

Online grocery shopping in Hungary has experienced significant growth, there are still several challenges that need to be addressed. For instance, the logistics

and infrastructure of online grocery shopping in Hungary are not fully developed, leading to delayed deliveries and stock shortages (Statista, 2022c). Furthermore, there is a need to improve the user experience of online grocery shopping by providing better product information, user-friendly interfaces, and more personalized recommendations. However, the growth of online grocery shopping also presents several opportunities for retailers and marketers. For instance, online shopping data can be used to better understand consumer behavior and preferences, which can be leveraged to improve the relevance and personalization of marketing efforts. Furthermore, online shopping platforms can be used to introduce new and innovative products, providing a competitive advantage in a crowded market.

According to the data (Statista, 2022c), the online grocery delivery market in Hungary was expected to generate a revenue of €36 million in 2021 and grow at a compound annual growth rate of 16.1% between 2021 and 2025. The largest segment in the market is food, which was expected to generate a revenue of €34.7 million in 2021. The user penetration rate for online grocery delivery in Hungary was expected to be 4.4% in 2021, which means that only 4.4% of the country's population was expected to use online grocery delivery services. However, this is expected to reach 7.4% by 2025. The average revenue per user in the online grocery delivery market in Hungary was expected to be €110.76 in 2021 and grow to €145.87 by 2025. This means that each user was expected to spend an average of €110.76 on online grocery delivery in 2021, which is expected to increase to €145.87 by 2025. Tesco was expected to be the largest player in the market, with a market share of 50.1% in 2021. The number of users in the online grocery delivery market in Hungary was expected to be 138,000 in 2021 and grow to 228,000 by 2025. The number of orders was expected to reach 2.3 million in 2021 and grow to 3.8 million by 2025. The average order value was expected to be €15.85 in 2021 and grow to

€16.99 by 2025 (Statista, 2022c). The growth of the online grocery delivery market in Hungary is expected to be driven by increasing demand for convenience, a growing number of internet users, and the availability of online ordering platforms. Compared to other European countries, Hungary has a relatively low user penetration rate for online grocery delivery. However, it is expected to see significant growth over the next few years. The average revenue per user in Hungary is lower than in some other European countries, such as the UK and France, but higher than in others, such as Poland and the Czech Republic (Statista, 2022c). Overall, the online grocery delivery market in Hungary is expected to see strong growth over the next few years. While Tesco is expected to maintain its position as the market's largest player, there may be opportunities for other players to gain market share as the market continues to expand.

2.7.1 Factors motivate individuals to engage in online ordering of grocery products

The increasing popularity of online grocery ordering can be attributed to various factors, including convenience, a wide selection of products, price comparison, contactless delivery, subscription models, personalized recommendations, environmental concerns, and improved accessibility. These factors collectively motivate individuals to engage in online ordering, offering them a convenient and efficient way to meet their grocery needs.

Convenience and time-saving: Convenience and time-saving are important factors that influence consumers to order groceries online. Studies have found that convenience is a major motivator for online grocery shopping, as it allows consumers to avoid the inconvenience of physically visiting a grocery store (Madarász et al., 2022; Papp-Bata & Szakály, 2020). Additionally, online grocery shopping saves time, which is a valuable resource for many consumers

(A. Mohammad et al., 2022). The convenience and time-saving factors associated with online grocery shopping are especially important for busy individuals, such as working parents, who have limited time to shop for groceries (Grunkowski & Martinez, 2022). Furthermore, the COVID-19 pandemic has highlighted the importance of convenience and time-saving in online grocery shopping, as many consumers have turned to online ordering to avoid the risk of exposure to the virus in physical grocery stores (Fehér et al., 2022). Online grocery shopping has been perceived as a safer and more convenient alternative during the pandemic, leading to an increase in its adoption (Madarász et al., 2022).

Wide selection: The availability of a wide selection of products is another important factor that motivates consumers to order groceries online. Online shopping platforms often offer a larger variety of products compared to physical stores, and consumers can easily browse through different categories and brands to find exactly what they are looking for. This is especially appealing to consumers who live in areas where access to certain products may be limited. In a study of online groceries, shoppers reported that the wider selection of products was a reason they chose to shop for groceries online (Grunkowski & Martinez, 2022). Research also suggests that the availability of a wide selection of products can positively influence consumer attitudes towards online grocery shopping. For example, a study by Zámková et al. (2022) found that consumers who shop for groceries online are more likely to have positive attitudes towards online shopping if they believe that online retailers offer a greater variety of products compared to physical stores. Additionally, a study by Huszka et al. (2022) found that consumers who purchase groceries online are more likely to shop at retailers that offer a larger selection of products.

Ability to compare prices: Online grocery shopping allows customers to easily compare prices of similar products from different retailers without the need to physically visit each store. This helps customers to find the best deals and save money on their grocery shopping. Research has shown that customers often compare prices of different products and retailers when shopping for groceries online. A study by Pitts et al. (2020) found that online grocery shoppers compare prices across different retailers before making a purchase. Another study by Bigné-Alcaiz et al. (2013) revealed that online grocery shoppers compare prices online before making a purchase. Furthermore, online retailers often offer discounts and promotions to attract customers and increase sales. Customers can easily compare the prices of similar products from different retailers to take advantage of these offers and save money on their grocery shopping.

Contactless delivery: Contactless delivery has become a popular feature of online grocery ordering, especially during the COVID-19 pandemic. This type of delivery allows customers to receive their groceries without having to interact with delivery drivers or touch the products. One study found that contactless delivery was the preferred delivery method among consumers during the pandemic, with survey respondents indicating that they would choose this option for grocery delivery (Madarász et al., 2022). Another study found that contactless delivery was perceived as a safe and convenient option, leading to higher levels of customer satisfaction (Rowland, 2022).

Subscription models: Subscription models have become a popular option for online grocery shopping, allowing customers to sign up for regular deliveries of their favorite products. This can offer several benefits, such as convenience, time-saving, and the ability to save money on regular purchases. Furthermore, subscription models have been found to increase customer loyalty and retention (Ebrahimi et al., 2021), as customers can enjoy the convenience of

having their regular groceries delivered without having to worry about re-ordering. Subscription models have also been shown to increase purchase frequency and order size (Zaharia et al., 2022).

Personalized recommendations: Many e-commerce platforms use customer data to create personalized recommendations for products, based on their previous purchases and browsing history. These recommendations are tailored to the customer's preferences, making it easier for them to find products that they are likely to purchase. Research has shown that personalized recommendations can significantly increase customer satisfaction and loyalty. A study conducted by Hallikainen et al. (2022) found that personalized recommendations led to an increase in customer satisfaction and an increase in revenue for e-commerce companies. Furthermore, a study conducted by Accenture (2022) found that customers are more likely to purchase from a retailer that provides personalized recommendations. In addition to increasing customer satisfaction and loyalty, personalized recommendations can also help retailers to increase their sales and profits (Behera et al., 2020). By promoting products that are more relevant to the customer, retailers can increase the chances of a successful purchase and reduce the likelihood of a returned product.

Environmental concerns: Another factor that encourages customers to order groceries online is environmental concerns. Online grocery shopping can potentially reduce carbon emissions and waste generated from transportation to and from physical stores, as well as the use of plastic bags and packaging materials. According to a study conducted by Accenture (2019), consumers consider environmental impact when making a purchase, and they are willing to pay more for sustainable products. In addition, it was found that global consumers feel strongly that companies should help improve the environment (Nielsen, 2018). Furthermore, online grocery shopping can also reduce food

waste by offering customers the ability to purchase only what they need and reducing the likelihood of impulse purchases. This is especially important as food waste is a major contributor to greenhouse gas emissions and environmental damage. However, it is important to note that online grocery shopping is not always more environmentally friendly than traditional grocery shopping, as factors such as the energy used in packing and shipping products, and the carbon emissions generated from delivery trucks and planes, must also be taken into account (EPA, 2022).

Accessibility: Accessibility is another factor that influences customers to order groceries online. Online grocery shopping provides convenience to individuals who face challenges in traveling or carrying heavy bags due to physical disabilities or mobility issues. Moreover, it enables people living in rural areas or locations with limited access to grocery stores to access a wider range of products without having to travel long distances. A study by Bartók et al. (2021) found that individuals who face difficulties in visiting grocery stores, such as those with disabilities or those living in rural areas, are more likely to use online grocery shopping services. Another study by Pitts et al. (2018) highlighted that customers who have limited access to physical grocery stores are more likely to use online grocery shopping as it provides greater accessibility to a wider range of products. In addition, online grocery shopping also provides accessibility to a larger demographic, such as elderly people or those with busy schedules who may not have the time or ability to go to physical stores. A survey by Accenture (2022) found that customers would consider using online grocery shopping services in the future. Overall, the accessibility provided by online grocery shopping is a significant factor that motivates customers to opt for this mode of shopping.

2.7.2 Factors barrier individuals to engage in online ordering of grocery products

There are various factors that can hinder Hungarian individuals from engaging in online ordering of grocery products. These factors may include concerns related to shipping, product quality, delivery times, trust, website usability, payment security, privacy, technical issues, preference for in-store shopping, and the need for immediacy. Overcoming these barriers and addressing consumer concerns is crucial to encourage more individuals to embrace online grocery shopping as a convenient and reliable option. By addressing these factors, businesses can enhance the online shopping experience and build trust with customers, ultimately driving the adoption of online grocery ordering.

Shipping cost: Shipping cost is an important factor that can affect customers' decisions to order groceries online. Some online grocery retailers may charge additional shipping fees, which can make the cost of groceries more expensive than shopping in-store. A study by Huang & Oppewal (2006) found that high delivery charges were cited as a top reason for consumers not using online grocery shopping services.

Product quality: According to a study conducted in Hungary, product quality is an important factor that affects the decision of customers to buy groceries online (Garai-Fodor et al., 2022; Szegedyné Fricz et al., 2020). Customers are concerned about the freshness and condition of the products when they are delivered to their homes. The study also found that customers who had negative experiences with the quality of products were less likely to continue using online grocery services. Therefore, it is important for online grocery retailers to ensure that their products are of high quality and meet the expectations of their customers.

Delivery time: A study conducted found that delivery time was one of the main concerns of consumers when ordering groceries online (Chang et al., 2022). Customers expected their orders to be delivered quickly and reliably, and any delays or uncertainty about delivery times could discourage them from using the service. Another study in Hungary found that the time and day of delivery were also important factors for customers, with many preferring to have their groceries delivered on specific days and within certain time frames (Szabó et al., 2019). Overall, these findings suggest that delivery time and reliability are crucial for online grocery services to meet customer expectations and retain their loyalty.

Trust issues: Trust issues can be a significant factor that prevents customers from ordering groceries online. Customers may be concerned about the safety of their personal information, the security of their financial transactions, and the reliability of the online retailer. They may also worry about the quality and freshness of the products they receive, particularly if they have had negative experiences in the past with online grocery shopping. A study conducted by Katalin (2019) found that one of the main reasons why customers did not order groceries online was a lack of trust in the online retailer. This included concerns about the reliability of delivery times, the quality of products, and the security of personal information. Another data by Statista (2022b) found that trust was a critical factor in determining whether customers would order groceries online. The study showed that customers valued transparency and reliability in the online shopping experience, and that retailers who were able to build trust through clear communication and reliable service were more likely to succeed in the online grocery market.

Website usability: Several studies have shown that website usability is an important factor for consumers when considering online grocery shopping. A study by Statista (2022b) found that website design and ease of use were

among the most important factors that influenced consumer satisfaction with online grocery shopping. Similarly, a study by Mohammad & Szigeti (2023) found that website usability was a key factor that influenced consumer decision-making in online grocery shopping in Hungary. Furthermore, a report by Salamzadeh et al. (2022) found that the usability of online grocery shopping websites in Hungary varied widely, with some websites providing a more user-friendly experience than others. This highlights the importance of investing in website design and development to ensure that the online grocery shopping experience is easy and intuitive for consumers.

Payment security: Payment security is a crucial factor in online grocery shopping, as customers need to feel confident that their personal and financial information is protected. In Hungary, online retailers have implemented various measures to ensure payment security, such as encryption technologies and secure payment gateways (Pintér et al., 2021). However, some customers may still have concerns about the safety of online payments, especially if they have had negative experiences in the past. A study conducted in Hungary found that payment security was one of the most significant barriers to online grocery shopping, with 67% of respondents indicating that they were worried about the security of online payments (Statista, 2022b). Retailers can address these concerns by clearly communicating their security measures and partnering with trusted payment providers to offer secure payment options.

Privacy concerns: A study conducted in Hungary found that privacy concerns were a significant factor preventing customers from purchasing groceries online. Customers were concerned about the collection and use of their personal information, as well as the security of their payment and personal data (Balogh & Mészáros, 2020). Additionally, customers were worried about the possibility of their personal information being sold to third-party companies without their consent (Nam et al., 2006). Privacy policies, secure payment

gateways, and data encryption were found to be important in building trust and confidence in online grocery shopping (Hoffman et al., 1999).

Technical issues: In Hungary, technical issues with the online ordering system still considered as a barrier to ordering groceries online. Customers may encounter difficulties with the website or app, such as slow loading times or errors during the checkout process. Technical issues can be frustrating for customers and may discourage them from using the service in the future. According to a survey by Statista (2022b) Hungarian customers reported technical issues as a barrier to online shopping. The most common issues reported were slow loading times and difficulty finding products on the website. To address this issue, online retailers in Hungary may need to invest in improving the usability and functionality of their websites and apps (Balogh & Mészáros, 2020).

Preference for in-store shopping: In Hungary, consumers still prefer to shop for groceries in-store instead of online due to various reasons such as the desire to see and touch products before purchase, concerns about product quality, and the social experience of shopping (Statista, 2022b). A study conducted by Kásler (2020) found that the preference for in-store shopping was influenced by age, income, and educational level. Additionally, some consumers may perceive online grocery shopping as time-consuming, particularly if they are unfamiliar with the platform or encounter technical issues. This may also contribute to a preference for in-store shopping.

Need for immediacy: The need for immediacy is another factor that may deter some customers from ordering groceries online. Some consumers may require groceries immediately, such as for a last-minute dinner or to restock a bare pantry. In such cases, waiting for delivery or even scheduling a pickup time may not be a viable option, and the immediacy of in-store shopping may be

preferred. Research suggests that the need for immediacy is a common reason why consumers prefer to shop for groceries in-store rather than online. A survey of Hungarian consumers found that respondents preferred to buy groceries in-store because they wanted to choose fresh products themselves and did not want to wait for delivery (Fehér et al., 2022). Similarly, a study found that consumers preferred to shop for groceries in-store because they could get the products immediately (Klepek & Bauerová, 2020).

2.8 Models for Understanding Consumer Behavior towards online grocery shopping

The value-attitude-behavior (VAB) model, the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), and the Media Advertising Value (MAV) theory are all models used to explain consumer behavior. While each model has its unique approach, they share some commonalities that make them logically and understandably connected. In this section, we will explore the connection between these models and their role in understanding consumer behavior towards functional and organic food products.

The VAB model posits that values influence attitudes, which in turn affect behavior, this model implies that the more an individual values a product, the more likely they are to have a positive attitude towards it, which will translate into actual purchase behavior (Homer & Kahle, 1988). The TPB model, on the other hand, posits that attitudes, subjective norms, and perceived behavioral control all influence behavioral intention, which in turn influences actual behavior. Thus, an individual's intention to purchase a product is influenced by their attitudes towards the product, subjective norms (the social pressure to conform to others' expectations), and their perceived control over the behavior (Ajzen, 1991). The TAM model, which is specific to technology products, posits that the perceived usefulness and ease of use of a technology product

will influence an individual's intention to use it, which in turn will influence their actual use of the product (Davis et al., 1989). Finally, the MAV theory posits that advertising messages affect consumer behavior by creating a perceived value of the product through the message's relevance, novelty, and credibility (Ducoffe, 1996).

In the context of functional food products, these models are interconnected. For instance, a study by Küster-Boluda & Vidal-Capilla (2017) applied the VAB model to examine the relationship between consumers' values, attitudes, and behavior towards functional food. The study found that consumers who placed a high value on health and the environment had a more positive attitude towards organic food, which led to increased purchase behavior. Similarly, a study by Nguyen et al. (2019c) applied the TPB model to examine the factors influencing consumers' intentions to purchase functional food products. The study found that attitude, subjective norm, and perceived behavioral control all played a role in determining consumers' intentions to purchase functional food products.

The TAM model has also been applied in the context of functional and organic food products. For instance, a study applied TPB and TAM to investigate the factors that influence consumers' intentions to purchase functional food products. The study found that perceived usefulness and ease of use of functional food products were significant predictors of consumers' intentions to purchase these products (Choe et al., 2021; Mack, 2018).

The MAV theory can also be applied to understand consumer behavior towards functional and organic food products. Furthermore, Cuesta-Valiño et al. (2020) applied the MAV theory to examine the effect of advertising messages on consumers' purchase intentions for functional food products. The study found that advertising messages that emphasized health benefits and taste were more

effective in influencing consumers' purchase intentions than messages that emphasized convenience or price.

Overall, these models share a common understanding of consumer behavior in terms of the importance of attitudes, intentions, and perceived value. They also highlight the role of social and psychological factors in shaping consumer behavior. The VAB model emphasizes the role of values, while the TPB model emphasizes the role of subjective norms and perceived behavioral control. The TAM model emphasizes the role of perceived usefulness and ease of use, while the MAV theory emphasizes the role of advertising messages in shaping consumer behavior.

In conclusion, the VAB model, TPB model, TAM model, and MAV theory are all useful in understanding consumer behavior towards functional and organic food products. While each model has its unique approach.

3 OBJECTIVES OF THE DISSERTATION

The research objective of "Analysis of Factors Influencing Consumer Attitudes and Online Purchasing in the Hungarian Dairy Functional Food Market" is to comprehensively investigate the complex interplay of factors shaping consumer behaviors and purchasing decisions within the realm of dairy functional foods (DFFs) through online platforms in Hungary. Specifically:

- **Examine the Impact of Media Marketing:** Investigate the relationship between key components of media marketing value (credibility, informativeness, irritation, and entertainment) and their impact on consumer attitudes toward DFFs.
- **Explore Health Subjective Norms:** Investigate the role of health subjective norms, encompassing motivators and barriers, in shaping consumer attitudes and willingness to consume DFFs.
- **Evaluate Technology Acceptance Model (TAM):** Explore the impact of attitudes toward DFFs on consumer behavioral intentions, drawing insights from the Technology Acceptance Model (TAM).

The potential significance of this research lies in its capacity to offer invaluable insights for businesses operating in the Hungarian market. By comprehensively understanding the multifaceted impact of media marketing on the purchasing intentions of dairy functional foods, businesses, including shops and retailers, can refine their marketing strategies to effectively engage and influence their target audience.

Manufacturers also stand to benefit by gaining a deeper understanding of consumer behavior and preferences regarding dairy functional foods. This insight can inform the development of more effective marketing strategies and innovative product offerings that align with the evolving needs and expectations of their customer base.

Additionally, the examination of health subjective norms and attitudes toward DFFs aims to illuminate the factors influencing consumer decision-making in the Hungarian market. This knowledge can be strategically employed by businesses to craft targeted marketing campaigns that resonate with the specific needs and desires of their customers, contributing to enhanced market success and consumer satisfaction.

4 MATERIALS AND METHODS

4.1 Theoretical framework and hypotheses

Online grocery shopping is a kind of internet purchasing that includes purchasing consumables and other items for the house through e-commerce websites or mobile shopping applications (Driediger & Bhatiasevi, 2019). In the 1990s, the first members of the high-tech generation were coming of age, researchers first started looking at the possibility of doing food shopping online (Park et al., 1996), who made the switch to internet shopping because they wanted to save time and effort.

The Technology Acceptance Model (TAM) was one of the early theoretical models to be used to predict customers' acceptance, and intention to make purchases from online grocery stores (Davis, 1989). This model suggests that the adoption of new technology is influenced by the perceived usefulness (PU) of the technology and perceived ease of use (PEOU), and this approach is relevant for online grocery shopping (Driediger & Bhatiasevi, 2019). In the context of online buying, the TAM has served as the basis for a great number of researchers (Bauerová & Klepek, 2018; Gefen et al., 2003; Hassanein & Head, 2007). Gefen et al. (2003) insinuate that a website is a sort of information technology; hence, the TAM needs to be able to adequately describe customers' intentions to buy things online. This debate is validated with the experimental research showing that TAM is an appropriate theoretical framework that effectively asserts and illustrates the acceptance of e-commerce, such as consumer behavioral intention and actual behaviors toward purchasing online (Changchit et al., 2018; Gefen, 2000; Hassanein & Head, 2007). Recently, Shang & Wu (2017) advanced the TAM to include the expectation confirmation model developed by Oliver (1976), highlighting the fact that consumer perceived value in addition to perceived ease of use impact

technology acceptance for shopping for groceries online. In addition, TAM shows similarity to the Theory of Planned Behavior (TPB) which is constructed by Ajzen (1991), this theory is one of the fundamental theories of personal behavior, and is extensively used to investigate consumer attitudes and behavior, which is concerned with the individual determinants of executing health-related activities such as functional foods (Cuesta-Valiño et al., 2020; Küster-Boluda & Vidal-Capilla, 2017; Salmani et al., 2020). The theory said that behavioral intention has a direct influence on behavior.

According to Driediger & Bhatiasevi (2019), consumers' perceived ease of use (PEOU) of online purchasing suggests that it is beneficial and favorably impacts their desire to use it. However, this choice may be influenced by the customers' circumstances. Moreover, such a concept is especially pertinent to interpreting online food shopping decisions in the Hungarian market. For example, Hungarian consumers pay a lot of attention to conventional food (Siró et al., 2008; Szakály et al., 2016). Besides that, shopping for groceries online also prevents customers from seeing, touching, or tasting the foods they are purchasing, which may be a deal breaker for elderly people who are more likely to scrutinize their food purchases before making a final decision (Goethals et al., 2012). However, when it comes to health problems, people's plans to buy groceries online can't just be based on how they feel about the advantages, threats, and pleasures of shopping online on their values (Gomes & Lopes, 2022). It was mentioned that healthier consumers are more diverse, and a balanced diet is part of risk management strategies (Gasmi et al., 2020). Moreover, consumer consciousness of the value of health, well-being, and making more sustainable food choices and consumer behavior around food and beverages was significantly impacted in a good way (Marty et al., 2021; Sorić et al., 2021). However, better diets led to changes in consumer behavior, which made online grocery shopping more popular because people needed access to

healthier foods but couldn't get to the store as often (Sorić et al., 2021). Thus, health concerns expressed on the websites of online food retailers are included in the framework to better understand customer attitudes and intentions about the purchase of dairy functional foods online in the Hungarian market.

According to Davis (1989), PU refers to the extent to which an individual feels utilizing a certain method will improve his or her work performance, whilst PEOU denotes how much a person thinks utilizing a certain system would be effortless from a physical and mental standpoint. In other words, while PU represents people's opinions on “the outcome of the experience”, PEOU denotes what they think about it “the process leading to the outcome” (Perea et al., 2004, p. 104). Considering this in the light of grocery buying online, PU is referred to as the perception held by consumers who believe that their shopping experience will be improved by buying food online and that it will make them better shoppers. Furthermore, the assumption by customers that the least amount of effort would be involved in online food purchasing is referred to as PEOU. According to the TAM, PU is affected by PEOU. The findings of an empirical study on online purchasing indicate that PEOU has a significant impact on PU in both developed markets and emerging countries (Gefen et al., 2000; Gefen et al., 2003; Kim, 2012). That is to say, the ease with which customers can utilize internet-connected gadgets or websites to purchase things online correlates directly to the degree to which these consumers see online shopping as being beneficial (Bauerová & Klepek, 2018; Perea et al., 2004; Sondakh, 2017). A survey of online grocery shoppers conducted by Bauerová & Klepek (2018) demonstrates that there is a significant and beneficial connection between PEOU and PU. Hence, the following hypothesis was formulated:

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

Behavioral intention corresponds to “how hard people are willing to try” and “how much of an effort they are planning to exert” to engage in a certain course of action (Kim & Woo, 2016). Within the context of the TAM, a user's perception of the utility of technology has a significant impact on their attitude toward adopting a new system or piece of technology (Davis et al., 1989). Numerous research that looked at online shopping has validated the links between these components (Chang et al., 2005; Gefen et al., 2003; Perea et al., 2004). According to Gentry & Calantone, (2002), perceived usefulness (PU) is a measure of how the buyer thinks a certain technology will help them shop faster. In other words, the consumer perceives internet shopping as beneficial since it saves time, minimizes the effort needed, extends store hours, and provides faster checkout processes (Chiu et al., 2014). It has also been shown that customers with greater incomes place a higher value on time because of the opportunity costs involved. That means consumers who have a lot of surplus income but a limited amount of free time feel that buying online is appealing since it helps them save time (Punj, 2012). In addition, according to the findings of a qualitative study conducted by Ramus & Nielsen (2005), the convenience, wide range of products, and time-saving capabilities of online purchasing are important factors that influence consumers' decisions to buy food online. These factors contribute to the usefulness of online purchasing. Likewise, Dang et al. (2018) said that the main reason people in an emerging market buy food online is that it is easy. As shown by Chien et al. (2003) research, PU has a beneficial impact on individuals' intentions to shop food online. Therefore, the following hypotheses were developed:

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

The definition of attitude toward a certain behavior is “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior

in question” (Ajzen, 1991). The term "behavioral attitude" refers to an individual's general assessment, which may be positive or negative, of the repercussions that are associated with engaging in a certain action, such as buying functional food items (Nystrand & Olsen, 2020). Both hedonistic (emotional) and utilitarian (functional) aspects make up attitude (Voss et al., 2003). Authors inferred that customers' perceptions regarding functional foods influence their intentions to buy or use them (Nystrand & Olsen, 2020; Patch et al., 2005; Rezai et al., 2017). Recently, it was found that purchase attitude seemed to have the highest influence on the intention towards buying functional foods (Huang et al., 2019). On the other hand, health consciousness as a factor of attitude toward buying functional foods seems to be a key motivator of healthy food product purchases (Huang et al., 2019; Michaelidou & Hassan, 2010; Nguyen et al., 2019b; Pham et al., 2018). However, Jayanti & Burns (1998) describe health awareness as “the degree to which health concerns are integrated into a person’s daily activities”. It also indicates a person's willingness to engage in healthy choices (Becker et al., 1977). Furthermore, people who care about their health tend to do different things to stay healthy (Newsom et al., 2005). In addition, people think that functional foods improve health in several crucial parts of the human body and lower the risk of getting multiple illnesses (Aguiar et al., 2019; Barauskaite et al., 2018). Moreover, numerous studies show that consumers' health concerns significantly influence their choices of functional foods (Annunziata & Vecchio, 2011; Bech-Larsen & Grunert, 2003; Brečić et al., 2014). According to studies, consumer lifestyle influences their utilization of healthy nutrients. For example, Zandstra et al. (2001) investigate the link between health and total dietary behavior and conclude that health and lifestyle are excellent predictors of eating behavior and the desire to consume healthy foods.

According to Figueroa & Sanchez (2004), when studying consumer behavior concerning functional foods, one of the most important factors to consider is health. On the other hand, customers who are more health-conscious and knowledgeable about the benefits of leading a healthy lifestyle are more likely to utilize functional foods, and vice versa (Chen, 2011a). Additionally, Roininen et al. (1999) also noted in their general food research that all health subscales suggested for choices of healthy foods are excellent predictors of food attitudes. Furthermore, Chen (2011) argued that customers who are health aware and who are concerned about their current health have a more favorable attitude toward foods that provide functional purposes. Moreover, Quevedo et al. (2016) discovered that attitude had a favorable link with buyers' intentions to buy groceries online. This finding is echoed by Loketkrawee & Bhatiasevi (2018) who argued that attitude influences customers' online grocery buying intention. Thus, the following hypothesis was formulated:

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

Figure 1 summarizes the relationships between the first three hypotheses.

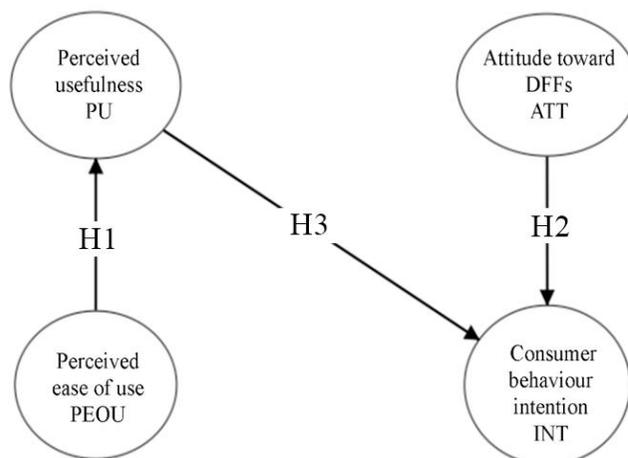


Figure 1 Conceptual model of TAM and attitude towards DFFs.

Source : (Davis, 1989) and (Urala & Lähtenmäki, 2007).

The theory of planned behavior found by Ajzen (1991), which is one of the fundamental concepts of human behavior, is commonly used to analyze the attitudes and behaviors of consumers in a variety of contexts, that are concerned with individual motivational and barriers factors as determinants of the performing health-related behaviors including functional food (Cuesta-Valiño et al., 2020; Küster-Boluda & Vidal-Capilla, 2017; Salmani et al., 2020). According to the TPB, behavioral intention has a direct effect on behavior. Additionally, three elements such as attitude toward the behavior, subjective social norms, and perceived behavioral control have an impact on behavioral intention. Subjective norm takes into account "the perceived social pressure to perform or not to perform the behavior," perceived behavioral control demonstrates "the perceived ease or difficulty of performing the behavior," and attitude towards the behavior applies to "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior." (Ajzen, 1991). In another hand, in line with value–attitude–behavior (VAB) model which is a theoretical basis for understanding consumer responses (Chang et al., 2020; Honkanen et al., 2006; Kang et al., 2015). In general, the VAB model is similar to the TPB model, in which attitude and norms had an effect on the intention to behave. That's why measurements of motivators and barriers as the values that determine the attitude of the healthy behavior variable are used, the goal is to ascertain its relationship with attitudes and the latter's relationships with consumer willingness and intention.

The contributions of Downes (2008) and Urala & Lähteenmäki (2007) have been used in the development of the model that has been suggested. According to the TPB, an attitude toward a behavior is the degree of approval or rejection of that behavior, a good attitude impacts the intention to execute that behavior positively. However, in Verbeke (2005) research, it was confirmed that attitudes, knowledge, and control over health are the main variables in

functional food acceptability. Unlike earlier research, this hypothesis encompasses attitudes and willingness to use a wide variety of dairy functional foods. Similarly, this connection is analyzed in the context of a broader model in which the effect of other factors may affect the strength of the connection. Finally, the relationship is focused on the Hungarian market. Thus, a preliminary hypothesis posits a favorable link between dairy functional foods attitude and willingness to consume them:

Hypothesis 4. Attitudes towards DFFs influence the willingness to consume DFFs.

In the research of Figueroa & Sanchez (2004) conducted on consumer behavior with functional foods, health was shown to be one of the primary factors of interest. Moreover, products that boast of having positive effects on consumers' health are more attractive (Aschemann-Witzel & Hamm, 2010; Papp-Bata & Szakály, 2020). This is why the proposed model of Downes (2008) is defended, a healthy lifestyle can affect the attitude or consumption of functional foods. Factors that serve as motivators and barriers to the practice of health behaviors can be categorized as personal and environmental factors. Personal factors are those factors identified from an individual perspective, motivation, health concerns, and time constraints (Downes, 2008). Environmental factors are those factors identified from a broader sociopolitical perspective that influence lifestyle choices, including safety concerns, financial constraints, social support, and stress (Downes, 2008). Several motivators to practice healthy dietary habits or increase physical activity levels were identified in the context of personal and environmental experiences. Personal motivators include those factors related to the observation of health and healthy behaviors (Keller, 1993). Perceived severity and susceptibility of disability, death, and unrelieved symptoms of an illness were identified as personal motivators (Plowden & Miller, 2000).

According to Jones & Nies (1996), environmental motivators are those that are connected to the availability of resources, social support, and awareness of the increased risk of disease (Fleury, 1996; Keller, 1993). Additionally, the author emphasizes personal drivers that may contribute to an individual's motivation to engage in physical activity including an increase in energy levels, spiritual beliefs, a desire to manage weight, and a desire to achieve a specific outcome. As a result, factors including motivation, health, and illness prevention encourage choosing functional diets (Urala & Lähteenmäki, 2003). Similarly, Verbeke (2005) asserts that the adoption of functional foods is impacted more by the confirmation of their health benefits and the presence of a sick relative can be a very challenging experience that may have a greater impact on an individual's physical activity levels than sociodemographic, cognitive, and attitudinal factors. In conclusion, a favorable correlation between the drivers of a healthy lifestyle and one's perception of functional foods is demonstrated.

Hypothesis 5. Motivators positively influence attitudes toward DFFs.

Barriers to the practice of dietary or physical activity were identified in the context of personal and environmental experiences (Downes, 2008; Papp-Bata & Szakály, 2020). However, different kinds of barriers are identified by Downes (2008): Personal factors that can impact physical activity levels include a lack of motivation and a lack of time. Environmental factors that can influence physical activity include a lack of social support, safety concerns, and a lack of resources. Moreover, personal experiences identified as negative emotional reactions (Fleury, 1996; Keller, 1993), physical symptoms and health concerns (Eyler et al., 1998), a lack of desire (Eyler et al., 1998; Jones & Nies, 1996), and a lack of time were all cited as barriers (Eyler et al., 1998; Jones & Nies, 1996). Access to exercise facilities, racial/cultural concerns, safety, a lack of social support (Eyler et al., 1998; Jones & Nies, 1996), financial restrictions, and bad weather were recognized as environmental

experiences that acted as barriers (Fleury, 1996). However, when it comes to the barriers, Miles et al. (2005) claimed that one of the biggest ones is the lack of knowledge and confidence about transgenic foods. As a result, they argue that good labeling and transparency are essential in order to overcome this obstacle to the consumption of these foods. Similarly, it is hypothesized by Abood et al. (2003) that choosing a proper diet is adversely affected by a lack of nutritional information. Likewise, several perceivable barriers, such as a lack of trust and supply limitations, have a significant influence on consumer attitudes (Nguyen et al., 2017; Pham et al., 2018). That's why it can be concluded that a negative relationship exists between barriers to functional food consumption and attitude toward them.

Hypothesis 6. Barriers negatively influence attitudes toward DFFs.

The influences on eating behaviors have been thoroughly studied in prior work of Deshpande et al. (2009). The health belief model (HBM) is a behavioral model; nevertheless, its implementation has gotten less attention. Additionally, factors affecting eating habits have been researched. House et al., (2006) looked at the advantages a healthy diet would provide to consumers thought. Furthermore, Horacek et al. (1998) discovered that the factors that impacted eating behaviors in that order were flavor, time availability, convenience, and cost. According to what the focus group stated, they tend to serve as greater barriers to healthy eating (House et al., 2006). The argument made in the literature is that consumer lifestyle has an impact on their attitude toward and consumption of healthy foods. As an illustration, Zandstra et al. (2001) examined the association between health and dietary habits and found that both an individual's overall health status and lifestyle were significant predictors of their eating behavior and their motivation to consume healthy foods. In contrast, the study also found that consumer health awareness can influence attitudes towards functional foods, which are foods that are specifically

formulated to provide specific health benefits beyond basic nutrition. As a result, individuals who prioritize their health and are informed about healthy lifestyles are more inclined to consume functional foods (Chen, 2011b; Papp-Bata & Szakály, 2020). From here, the positive and negative relationship between healthy behavior dimensions of motivators and barriers and the willingness to consume dairy functional foods can be formed:

Hypothesis 7. Motivators positively influence the willingness to consume DFFs.

Hypothesis 8. Barriers negatively influence the willingness to consume DFFs.

The core concept of the theory of TPB and VAB is that the behavior of consumers was influenced by their attitude. However, attitude plays a mediator factor between the behavior and the antecedents (Cuesta-Valiño et al., 2020; Küster-Boluda & Vidal-Capilla, 2017; Urala & Lähteenmäki, 2007). In the same vein, Urala & Lähteenmäki (2003) affirmed in their study on functional foods, attitudes modulate how information is processed, adapted, used, or refused. Nevertheless, the attitude has been assessed in this study from this dual viewpoint, where the cognitive and emotional antecedents of attitude to this kind of product are, respectively, the motivators and barriers to using dairy functional foods. Because attitudes affect how people choose their food, they can aid us in comprehending why customers make certain food choices (Sugawara & Nikaido, 2014). That's why the hypothesis can be concluded accordingly:

Hypothesis 7a. Motivators positively influence the willingness to consume DFFs through attitude as a mediator.

Hypothesis 8a. Barriers negatively influence the willingness to consume DFFs through attitude as a mediator.

Figure 2 summarized the hypotheses and relationships between Health Behavior, Motivators, Barriers, Attitude towards DFFs, and Willingness to Consume DFFs.

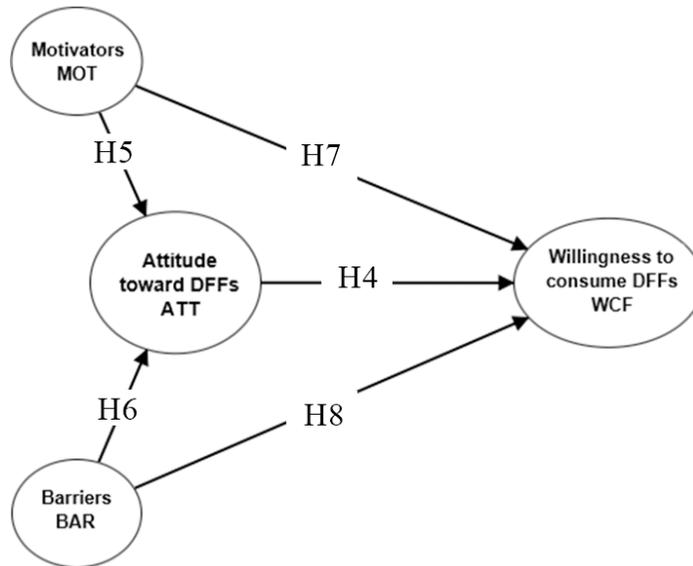


Figure 2 Conceptual model of the impact of health behavior of motivators and barriers on attitude toward DFFs and willingness to consume DFFs.

Source : (Downes, 2008) and (Urala & Lähteenmäki, 2007).

The most commonly used theory to explain user perceptions and attitudes toward internet advertising is Ducoffe (1996). Accordingly, Ducoffe proposed informativeness, entertainment, credibility, and irritation as antecedents of advertising value. The Media Advertising Value (MAV) of healthy food refers to the individual subjective value of the potential consumer that, through online/offline advertising, incorporates users' interactions and any content they share. The advertising content may also include, with the consumer's consent, various aspects of their person, such as photos, videos and names (Dao et al., 2015). Some authors, when defining the MAV, add the nuance of the relative subjective utility, to consumers, of the advertising (Dhar & Wertenbroch, 2018). Hamouda (2018) adds that the MAV of healthy food

affects consumer behavior through attitudes. In previous studies, Gangadharbatla & Daugherty (2013) have considered informativeness, entertainment, and credibility to be the antecedent variables of MAV, and other authors Bennett et al. (2006) and Caus et al. (2009) have also incorporated the irritation variable. The present study considers all of these to be antecedent variables of the MAV (Hamouda, 2018), in order to discover the extent to which each of these influences the MAV of healthy foods. Informativeness in advertising is considered to be the ability to describe the characteristics and benefits of alternative products in a way that attempts to match consumer needs and desires by making the market more efficient (Ducoffe, 1996). Increasingly, consumers are looking for information on social networks supported by image or video messages (Dao et al., 2015). Additionally, information from media advertising may become viral (Saxena & Khanna, 2013), as consumers learn from the experience of other consumers by sharing information among their contacts. Informativeness in advertising thus creates a rational link between the brand and the consumer's response. Authors such as Bennett et al. (2006) and Dao et al. (2015) consider that advertising should be informative, as a causal variable to social media advertising value. The following hypothesis can therefore be proposed:

Hypothesis 9. Informativeness has a positive influence on the MAV of DFFs.

Entertainment is considered to be the ability to make pleasant, create fun and pleasure in the consumers (Zhou & Bao, 2002). On the other hand, Cheng et al. (2009) define entertainment as how interesting social media advertising is to the consumer. Because of the interactive style of social networks, users expect entertainment from their advertising content (Hamouda, 2018). Likewise, entertainment in advertising creates an emotional link between the brand and the consumer's response (Wang & Sun, 2010), so the user naturally plays the role of the first evaluator of the advertising content in the network.

There is a positive relationship between entertainment and media advertising, which makes it a relevant factor to consider when designing an effective advertising campaign (Dao et al., 2015). The more entertaining media advertising is, the more value it will therefore have for the customer, and consequently, the more interactions there will be in the consumer's network with that advertising. The following hypothesis can therefore be established:

Hypothesis 10. Entertainment has a positive influence on the MAV of DFFs.

Credibility refers to how truthful or believable the consumers perceive the product information included in advertising content to be (MacKenzie & Lutz, 1989). These types of reactions to advertising occur at the level of mental perception, and lead to the formation of trust or distrust in the advertising message (Lee & Hsieh, 2009). Likewise, Dix et al. (2012) establish that credibility is the expression of consumer expectations in relation to the reality of the advertising message. It is important to explain that the concept of credibility in advertising differs from "trusting beliefs" since the former focuses on the information contained in advertising and the latter on people and organizations (McKnight & Kacmar, 2006). Therefore, credibility is an important element in having a positive influence on the value of advertising and, indirectly, on attitude (Choi & Rifon, 2013). Additionally, MacKenzie & Lutz (1989) emphasize the importance of creating credible advertising to improve the effectiveness of advertising in creating value. In addition, the credibility of an advertising message is evaluated by feedback from the customers (Okazaki, 2015). Thus, the following hypothesis is proposed:

Hypothesis 11. Credibility has a positive influence on the MAV of DFFs.

While informativeness, entertainment and credibility are positive factors that increase media advertising value, the irritation variable is a negative factor since it decreases MAV (Dix et al., 2012). Irritation can be considered as the

way in which a consumer feels displeased for personal reasons (Saxena & Khanna, 2013) or due to the repetition of the ad, which causes saturation. Cheng et al. (2009) explain how consumers can easily be irritated by advertising. They are, therefore, less likely to be persuaded by advertisements they consider annoying, offensive, manipulative, disappointing or dishonest, which thus generate less perceived value (Voss et al., 2003). Some researchers consider that one of the main reasons why consumers tend to criticize advertising is irritation, which consequently leads to a reduction in advertising effectiveness (Ducoffe, 1996). The following hypothesis is therefore suggested:

Hypothesis 12. Irritation has a negative influence on the MAV of DFFs.

The MAV of healthy food refers to the individual subjective value of the potential consumer through media advertising that, with the consumer's consent, incorporates the other consumer feedback, and also shares different aspects of his or her person as experience within the media advertising (Dao et al., 2015). The MAV generates consumer expectations (Ducoffe, 1996), so it influences attitudes. Attitude, on the other hand, is a feeling, which is a person's learned predisposition to display a specific behavior or has a positive or negative thought (Fishbein & Ajzen, 2011). It is an essential factor in predicting intention in consumer behavior (Fishbein & Ajzen, 2011). In the context of advertising, Lutz (2021) argues that attitude is the tendency to respond to a specific advertising stimulus during a specific occasion on which the advertisement is displayed. Luna-Nevarez & Torres (2015), meanwhile, define attitude to advertising in media as a predisposition to respond favorably or unfavorably to advertising. In fact, attitude is affected by the perceived value of an advertisement (Ducoffe, 1996). A negative attitude generates the thought that advertising is intrusive and irritating (Edwards et al., 2013). The following hypothesis is therefore proposed:

Hypothesis 13. The MAV of DFFs has a positive influence on attitudes toward DFFs.

Figure 3 summarizes the relationships and hypotheses between informativeness, entertainment, credibility, and irritation with media advertising value. And media advertising value with Attitude towards DFFs.

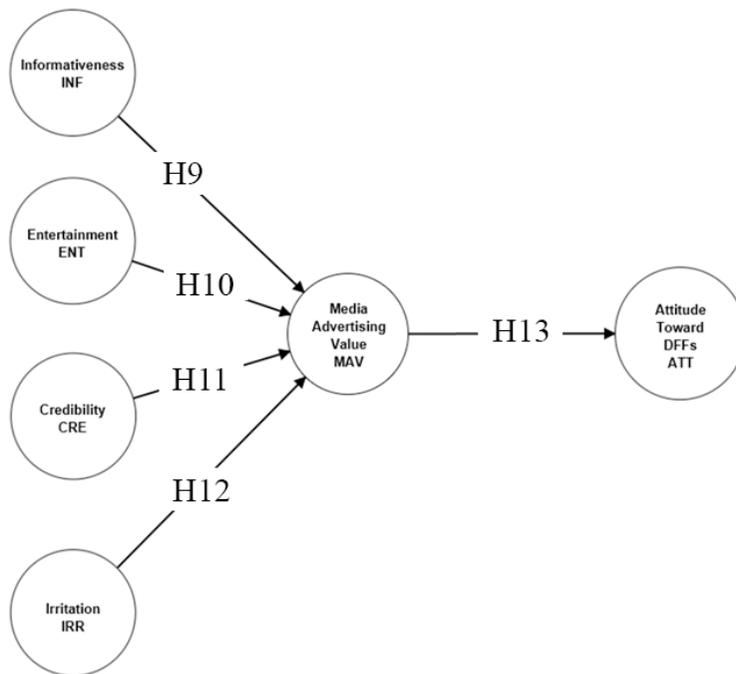


Figure 3 Conceptual model of MAV on attitude toward DFFs.

Source: (Cuesta-Valiño et al., 2020) and (Urala & Lähteenmäki, 2007).

A comprehensive approach is taken by our conceptual model in Figure 4, incorporating various well-established theoretical models, such as the Value-Attitude-Behavior (VAB) model, the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), and the Media Advertising Value (MAV) theory. Additionally, the estimated hypotheses are presented.

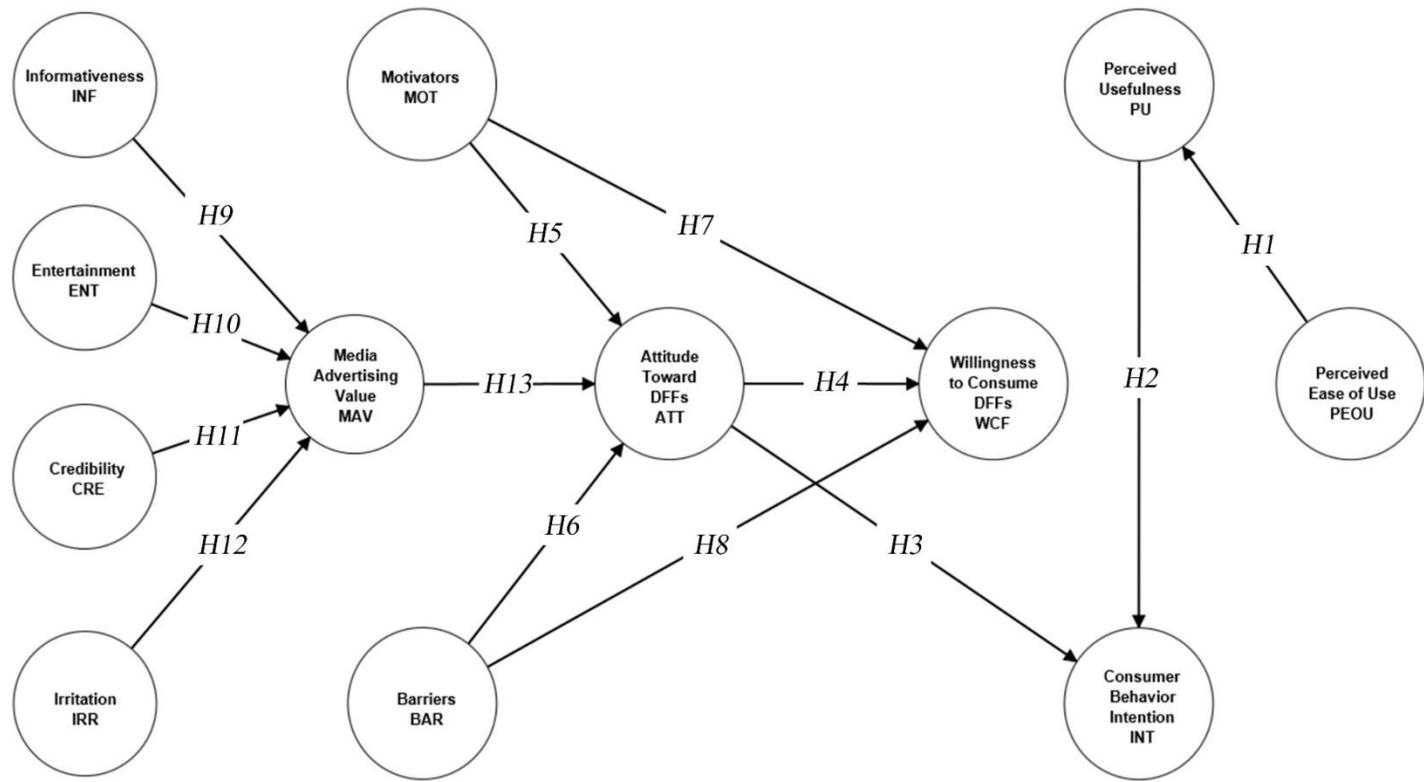


Figure 4 Conceptual model and hypothesis

4.2 Research design

The research topic, which analysis of factors influencing consumer attitudes and online purchasing in the hungarian dairy functional food market, is relatively new and has not been extensively studied. To address this gap, we used a mix-method research process that combined both inductive and deductive approaches. This allowed to develop new insights into this emerging area, while also evaluating the hypotheses.

As part of research process, preliminary studies were reviewed to gain a broader understanding of the research landscape. However, it is important to emphasize that the focus remains on the primary studies, and the preliminary studies have not been analyzed in detail. This is due to the scope of thesis, which is limited to analysis of factors influencing consumer attitudes and online purchasing in the hungarian dairy functional food market.

4.2.1 Systematic literature review

The goals of a systematic literature review are twofold. First, it aims to provide a comprehensive overview of existing research on a specific topic, including both published and unpublished studies. This ensures that the review is both rigorous and comprehensive, and that it captures the full range of research that has been conducted on the topic. Second, a systematic literature review was employed to analyze the factors influencing consumer attitudes and online purchasing behavior in the Hungarian dairy functional food market. By selecting and examining relevant studies, this research aims to uncover how various factors, such as marketing strategies and consumer health awareness, impact buying decisions. The objective is to gain a deeper understanding of these dynamics to provide insights that can support both academic discussions and practical marketing strategies, ultimately promoting the consumption of

dairy functional foods in Hungary. This approach is designed to highlight key drivers and trends, offering a foundation for future research and marketing efforts in this domain.

4.2.2 Main study

4.2.2.1 Quantitative research and data collection

To generate a dataset as a basis for testing the research model, primary data collection was conducted by means of an online survey as a quantitatively oriented method. The platform Google was used. An extensive assessment of the available literature was used to choose the different constructs of the 12 factors of the questionnaire. With this questionnaire of 38 items, the questionnaire was translated into the Hungarian language to ensure that just Hungarian individuals can answer the questionnaire. Furthermore, short definition of what dairy functional foods mean, along with photos of existing products in the Hungarian market, was provided on the first page of the questionnaire to avoid any misunderstanding caused by a lack of knowledge of DFFs products.

After the survey questionnaire was modified, it was released on the internet at the beginning of the third week of April 2022 using Google Forms. The reasons for the online survey were that it enabled a larger range and a lower effort than a personal or telephone survey of several hundred participants, the exclusion of a possible influence on the participant by the interviewer, and the time and location-independent participation possibility (Wright, 2005). In addition, the anonymity of the survey could be credibly guaranteed (Meffert et al., 2019). The questionnaire had 38 constructs and in most of them, a five-point Likert response format was used, which respondents rated from 1 (“completely disagree”) to 5 (“completely agree”) for (irritation, credibility, entertainment, informativeness, media advertising value, attitude toward DFFs, motivators,

barriers, perceived ease of use, perceived usefulness, and consumer behavior intention) factors and 1 (“not willing”) to 5 (“extremely willing”) for (willingness to consume DFFs) factor. Because of this, respondents could complete the survey on their PCs, tablets, or cell phones in an average of 8 minutes. The survey was made available through social networks including social media platforms (Facebook, Instagram, etc.) with many reminders to persuade prospective responders to answer. In the end, 313 valid questionnaires a sample of the Hungarian population were collected in 40 days. The full questionnaire can be found in Appendix.

4.2.2.2 Demographic Data

The total sample size was 313 individuals which don't consider representative of the Hungarian population. According to gender, 58.8% of the respondents were female, and 41.2% were male. And according to age, 51.1% of the respondents were between the ages of 18 and 25, while 21.7% were between 26 and 30, and 14.1% were between 31 and 40. The percentages decrease for older age groups. However, education level was 53.0% of the respondents had completed college or university, while 38.0% had completed vocational high school or secondary grammar school. Only 0.6% had a maximum education level of 8 in general. Furthermore, perceived income was 56.9% of the respondents reported that they have enough income to live on and save, while 22.4% reported that they make a very good living and can save. Only 1.0% reported having regular livelihood problems. However, the location of the respondent was 49.5% of the respondents lived in a city, 29.4% lived in the capital, and 21.1% lived in a village as shown in Table 1.

Table 1 Socio-demographic characteristics of the sample.

Gender	%	Total 313
Female	58.8	184
Male	41.2	129
Age	%	Total 313
18-25	51.1	160
26-30	21.7	68
31-40	14.1	44
41-50	8.3	26
>51	4.8	15
Education level	%	Total 313
Maximum 8 in general	0.6	2
Vocational school/apprenticeship	1.3	4
Vocational High School/Secondary grammar school	38.0	119
College/University	53.0	166
PhD degree	7.0	22
How do you perceive your relative income	%	Total 313
We have regular livelihood problems	1.0	3
Sometimes it's not even enough to make a living	1.6	5
Just enough to live on, but we can no longer save	18.2	57
Enough to live, and we save from it	56.9	178
We make a very good living and we can save it	22.4	70
Where do you live?	%	Total 313
Village	21.1	66
City	49.5	155
Capital	29.4	92

4.2.2.3 Partial least squares PLS-SEM

SmartPLS version 4 was used to investigate the theoretical framework (Ringle et al., 2015). The studies were carried out using partial least squares (PLS) and a structural equation modeling (SEM) method. The SEM method is a statistical technique that enables researchers to analyze both the structural component (path model) and measurement component (factor model) of a given model. Furthermore, the PLS model is determined by two systems of equations. The structural model (inner model) reflects the relationships between the constructs, while the measurement models (outer models) show the relationships between the observable manifest variables (synonymous: indicators, constructs) and the unobservable constructs (latent variables), whereby an indicator is always assigned to exactly one construct (Hair et al.,

2011). In another hand, SEM is often used in social and behavioral sciences to evaluate relationships between variables and to test hypotheses about those relationships, whereas PLS helps this tool to be utilized when researchers need to work with a non-normal distribution and ignore variable changes that could cause problems with the model interpretation (Hair et al., 2021). Moreover, when it comes to the use of measuring scales that have been used in previous surveys but are incorporated in a new model, for example, an extension of an existing structural theory, this instrument is more versatile than other available possibilities. In addition, the objective is to make predictions about important target structures in order to get more information regarding judgments concerning future variables. In this case, it is recommended to use PLS-SEM (Hair et al., 2011). Moreover, this method enables investigations of dependencies between manifest and latent constructs (Boßow-Thies & Panten, 2009). Thus, two models were considered: first, the measurement model for evaluating the manifest indicators to capture the endogenous and exogenous latent constructs and, second, the structural model for evaluation of the constructs (Hair et al., 2021). Thus, the focus of the model is on explaining the variance of the dependent variables. Therefore, reflective structures were established following an examination of the theoretical principles. The key justifications are that the correlation between the constructs and the constructs makes changes in the constructs and influences the underlying measures but the effects of item removal do not impact content validity.

4.2.2.4 Evaluation measurement model

The measurement model is based on reflective indicators. That means the direction of effect in reflective measurement runs from the constructs to the indicators. A correlation of the indicators is to be expected. If a construct changes, there is a change in all the indicators assigned to it (Huber et al., 2011). The PLS algorithm is basically divided into two steps: in the first step,

the construct scores are estimated iteratively. Then, in the second step, the path coefficients of the structural model and the weights and loadings of the measurement models are determined using least squares estimations (Hair et al., 2021). The subsequent quality assessment of the PLS model can also be divided into two steps. Thus, the first step is to assess whether the measurement models are considered unidimensional, reliable, and valid. For reflective constructs in the measurement model, this assessment is done separately. The reflective constructs are evaluated by means of internal consistency reliability, convergence validity, and discriminant validity (Boßow-Thies & Panten, 2009).

4.2.2.5 Evaluation reflective constructs

Cronbach's Alpha and Composite Reliability (CR)

To assess the internal consistency reliability of a scale, Cronbach's alpha and Composite Reliability (CR) were employed. Cronbach's alpha measures the proportion of total variance in a scale that can be attributed to the common construct. It is assumed that the indicators possess identical loadings underpinning Cronbach's alpha. In contrast, Composite Reliability assumes distinct loadings for each indicator, providing a more precise result (Cronbach, 1951; Jöreskog, 1971). Additionally, the quality measures of Cronbach's alpha and composite reliability have comparable thresholds. However, Cronbach's alpha is considered a more conservative measure. A value of 0.7 or above is considered acceptable for both measures (Burt, 1954). If the measures have values exceeding 0.9, particularly 0.95, this indicates the presence of redundant indicators (Hair et al., 2019).

Convergence validity

Convergence validity is a measure used to evaluate the correlation between different measurements of the same construct. To assess convergence validity,

the amount of loading and "average variance extracted" (AVE) are used. A factor loading of at least 0.7, which explains at least 50% of the variance of an indicator, is recommended (Birkinshaw et al., 1995). If other quality criteria are met, loadings of 0.4 or more can be acceptable. Additionally, the p-values of the indicators are assessed using bootstrap analysis (Hair et al., 2021). At the construct level, AVE is calculated based on the mean of the squared loadings of all indicators assigned to the construct. A value of 0.5 suggests that, on average, half of the variance of the indicators can be explained by the construct. This method was first proposed by (Fornell & Larcker, 1981).

Discriminant validity

After testing internal consistency and convergent validity, the next step is to evaluate discriminant validity. This measures how different a construct is from other constructs in the model. To assess this, cross-loadings of the indicators, Fornell-Lacker criterion, and heterotrait-monotrait (HTMT) correlation ratio are used. Cross-loadings are used to check if the indicator charge on the assigned construct is higher than on the other constructs in the model, and if the assigned indicator loadings are higher on the construct than other indicators assigned to other constructs. The Fornell-Larcker criterion compares the square root of the AVE with the correlation of the constructs. This should indicate that a construct shares more variance with its associated indicators than with other constructs in the model. The HTMT correlation ratio compares the indicator correlations of different constructs with the average correlations of the indicators of a construct. A value close to 1 may indicate a lack of discriminant validity. Thresholds of 0.9 or 0.85 can be used for conceptually similar or dissimilar constructs. The bootstrap can also be used to check if the HTMT values are significantly different from 1 or a lower threshold value (Birkinshaw et al., 1995; Fornell & Larcker, 1981; Hair et al., 2021; Henseler et al., 2015).

4.2.2.6 Evaluation structural model

In structural equation modeling, model fit is a critical aspect of assessing the adequacy of a proposed theoretical model. Several fit indices have been developed to evaluate the extent to which the model under investigation corresponds to the observed data. In this context, the Standardized Root Mean Square Residual (SRMR) is a commonly used model fit method. The SRMR is a goodness-of-fit measure that assesses the average discrepancy between the observed correlations among the variables and the predicted correlations based on the proposed model. It is a standardized index, with values closer to zero indicating better model fit. A value below 0.08 is typically considered a good fit, although different cutoff points have been suggested in the literature (Hu & Bentler, 1998).

The ensuing analysis involves the assessment of the model's path coefficients and the subsequent testing of hypotheses derived from theoretical considerations. These coefficients represent standardized regression coefficients, which enable the evaluation of the direction, significance, and strength of the influence exerted by the coefficients in the model. Significance is determined by means of a nonparametric bootstrap procedure. Furthermore, a complimentary appraisal of the mediation effects can be conducted by computing the indirect and total effects of the exogenous constructs on the endogenous constructs (Matthews et al., 2018). The R^2 of the endogenous constructs is a critical parameter in the evaluation of the structural model, as it reflects the proportion of variance of the endogenous constructs that can be explained by the exogenous constructs associated with them, and thus serves as a measure of the model's explanatory power. It is worth noting that R^2 values of 0.67, 0.33, and 0.19 are deemed substantial, moderate, and weak, respectively (Chin, 1998). However, R^2 values should always be interpreted in the context of other studies in the same domain. Moreover, since R^2 is

influenced by the number of exogenous constructs, it is recommended to examine the corrected coefficient of determination, R^2_{adj} , when comparing models (Hair et al., 2021). Furthermore, the effect sizes (f^2) of the exogenous constructs are computed, reflecting the change in the R^2 value of the endogenous constructs when the impact of individual exogenous constructs is considered by either including or excluding them. These values are typically divided into small, medium, and large categories of influence (Chin, 1998). For reflective endogenous constructs, predictive relevance can be assessed using the Stone-Geisser criterion (Q^2), which provides an estimate of the predictability of the endogenous constructs by the exogenous constructs based on a blindfolding technique (Geisser, 1974). A Q^2 value greater than 0, 0.25, or 0.5 is indicative of small, medium, or high predictive relevance, respectively.

In the realm of Partial Least Squares (PLS) analyses, the PLSpredict method is increasingly being used as an additional technique for predicting out-of-sample data. The PLSpredict approach involves using k-fold cross-validation, with k representing the number of subgroups, to assess the predictive performance of PLS pathway models (Shmueli et al., 2016). Cross-validation is a widely used technique to estimate the accuracy of models, especially when the sample size is relatively small (Kohavi, 1995). To evaluate the performance of the PLS pathway models, it is essential to compare the predicted values from the model to a benchmark. In this regard, $Q^2_{predict}$ values greater than zero indicate that the model outperforms the naive benchmark, which is calculated as the mean of the indicators (Hair et al., 2021). The $Q^2_{predict}$ measure indicates the proportion of variance in the endogenous construct that can be predicted by the exogenous variables in the model. Thus, higher values of $Q^2_{predict}$ reflect better predictive accuracy and generalizability of the model. Furthermore, the Root Mean Squared Error (RMSE) values from the PLS

analysis should be compared to a benchmark to assess the quality of the model's predictions. To do so, linear regressions can be performed for all items on a single item of the final endogenous construct. The RMSE values from the PLS model should be as small as possible in comparison to the errors from the LM analysis for each item (Danks & Ray, 2018). This approach allows for assessing the accuracy of the model predictions at the item level, which is essential for understanding the quality of the model's performance (Hair et al., 2021).

5 RESULTS AND EVALUATION

5.1 General information on DFFs consumption

Among the 313 respondents included in the study shown in Figure 5, a majority of 82.4% (258 individuals) reported frequent consumption of DFFs (functional dairy products). Conversely, 17.6% (55 individuals) indicated that they do not consume DFFs on a regular basis.

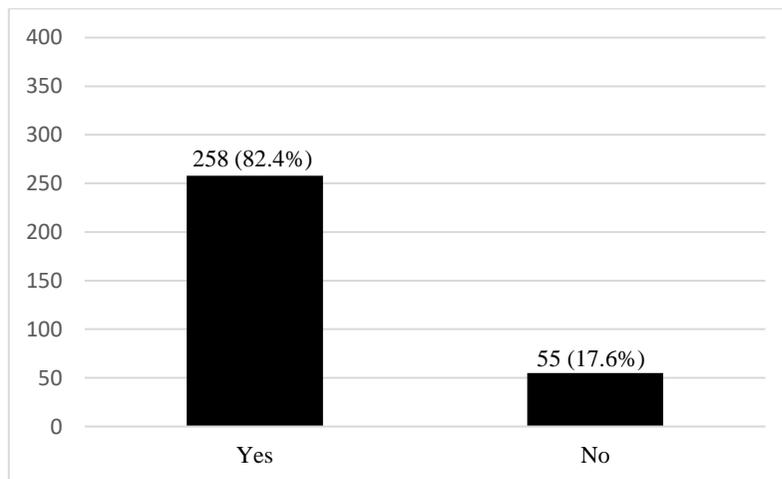


Figure 5 DFFs frequency consumption (N=313)

Among the respondents in Figure 6, the most common purchase intention was categorized as "Maybe," with 130 individuals (41.5%) expressing uncertainty or mixed feelings about utilizing these delivery services. A high number of

participants (24.9%) indicated that they have no purchase intention and responded with a "No." On the other hand, 69 respondents (22%) expressed a positive purchase intention by choosing the option "Yes." It is worth noting that 32 individuals (10.2%) expressed interest in using these services; however, they were unable to do so due to the unavailability of these services in their cities. A small proportion of respondents (1.3%) reported not having knowledge of these services.

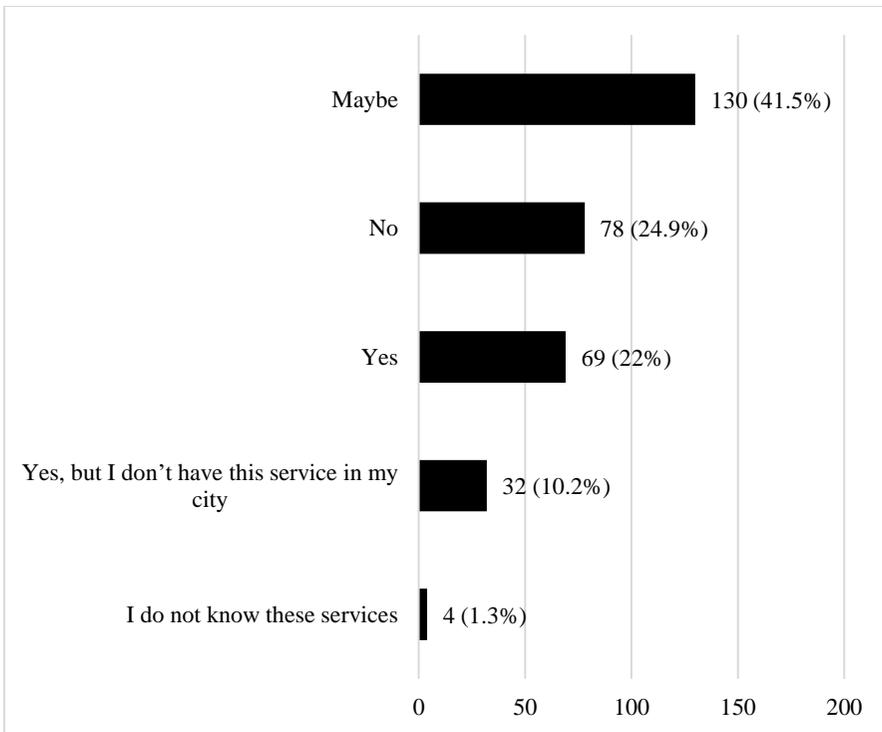


Figure 6 DFFs Purchase intention for available delivery services (N=313)

Respondents indicated, through multiple-choice answers regarding awareness of DFFs, that store shelves emerged as the most influential channel, with 245 respondents (78.3%) indicating that they become aware of functional dairy products through physical presence in stores (Figure 7). Commercial leaflets from supermarkets like SPAR, TESCO, and LIDL were mentioned by 143 participants (45.7%) as a common source of information. TV commercials

were identified as an influential awareness channel by 139 respondents (44.4%). Online advertisements were reported as a source of awareness by 90 individuals (28.8%), while social media advertisements on platforms such as Facebook, Instagram, YouTube, Twitter, and TikTok were noted by 81 participants (25.9%). Websites played a significant role in raising awareness, as mentioned by 77 respondents (24.6%). Posters and billboards were identified by 54 (17.3%) and 38 (12.1%) participants, respectively. A smaller proportion of individuals (11.2%) mentioned gaining knowledge about functional dairy products through influencer content, such as blogs. A few participants (9.3%) reported other unidentified channels, while magazines were cited as an awareness source by 27 respondents (8.6%).

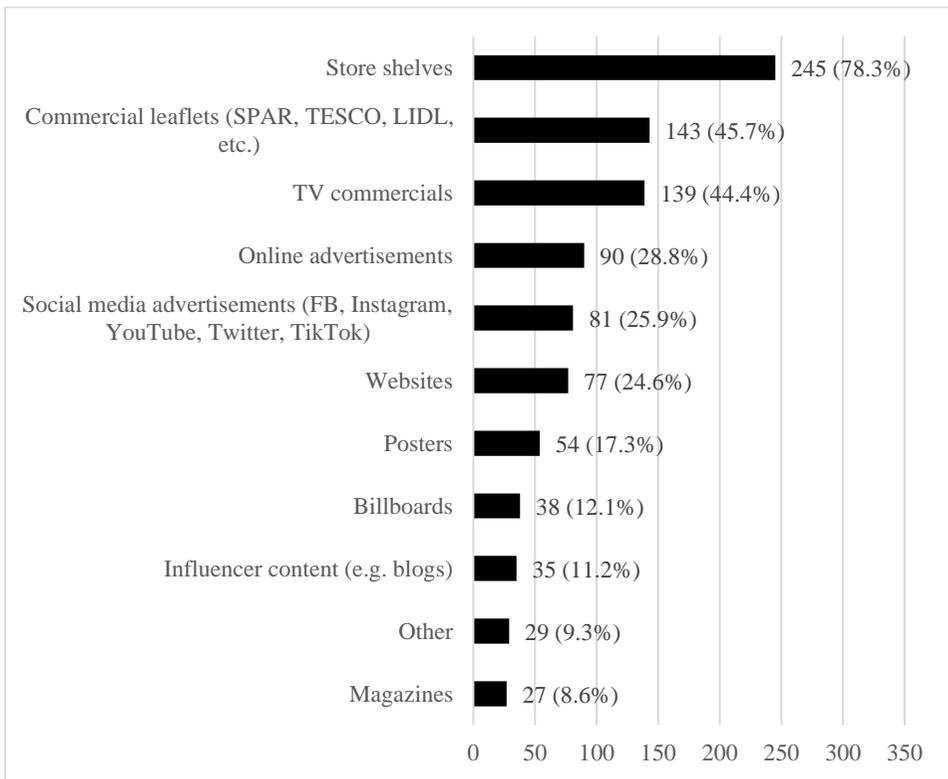


Figure 7 Awareness channels for functional dairy products (N=313)

Among the respondents, the most common frequency of DFFs purchases was found to be on a weekly basis, with 153 participants (48.9%) indicating this

buying pattern. A less portion of DFFs (28.8%) reported making monthly purchases, while 33 participants (10.5%) mentioned buying DFFs less than once a month. It is interesting to note that a noticeable proportion of respondents (9.9%) reported never purchasing DFFs. A small minority of individuals (6%) indicated making daily purchases of DFFs, representing the least frequent buying pattern among the options presented (Figure 8).

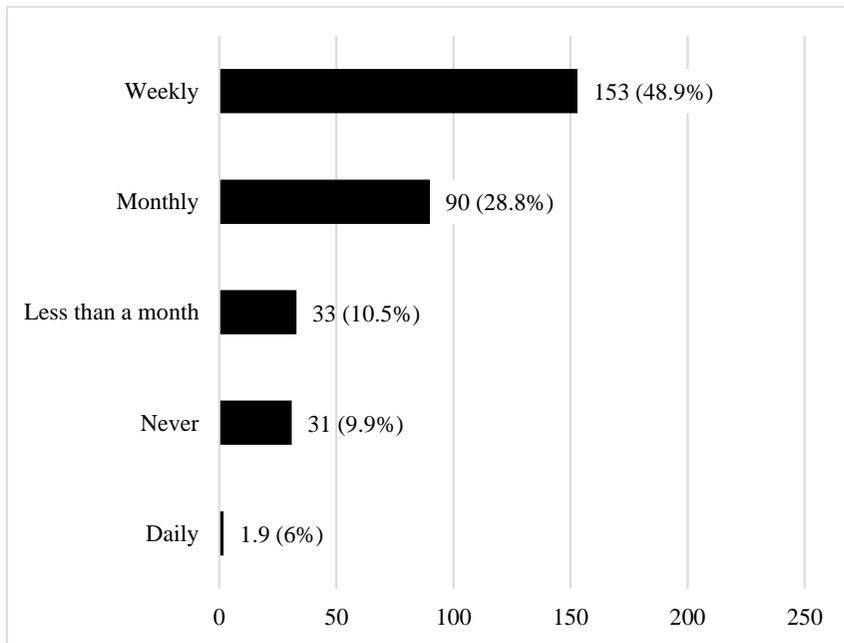


Figure 8 Frequency of DFFs purchases (N=313)

Respondents indicated, through multiple-choice answers regarding shopping placement (Figure 9), the most commonly preferred purchase location for DFFs was discount stores, such as Penny, Lidl, and Aldi, with 191 participants (61%) indicating these stores as their preferred choice. Hypermarkets, including Interspar, Auchan, and Tesco, closely followed, with 181 respondents (57.8%) selecting this option. Supermarkets, such as SPAR and CBA Prima, were also favored by a significant number of participants, with 168 individuals (53.7%) reporting these stores as their preferred purchase location for DFFs. Smaller grocery stores, such as CBA, Coop, and Real, were

chosen by 87 respondents (27.8%), while the market was mentioned as the preferred location by 27 individuals (8.6%). A small proportion of participants indicated their preference for alternative options. Eleven respondents (3.5%) reported purchasing DFFs online, while 22 individuals (7%) mentioned buying directly from the producer. It is noteworthy that 28 participants (8.9%) mentioned that they do not buy DFFs.

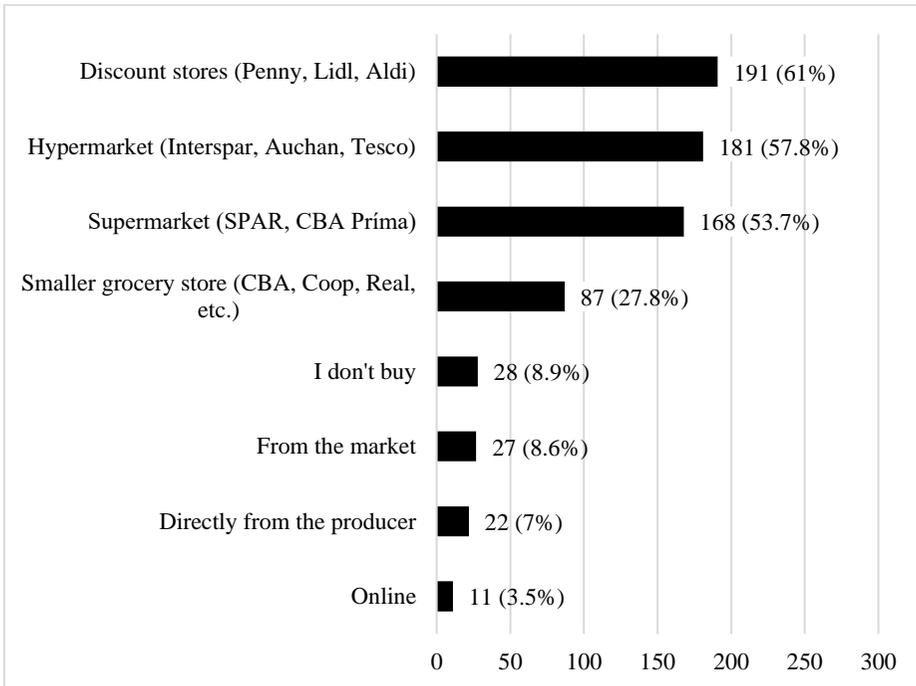


Figure 9 Preferred purchase locations for DFFs (N=313)

5.2 Evaluation of the measurement model

In this study, the measurement model was employed to assess the extent to which the items reflected the hypothetical constructs. The model was built on 12 reflective constructs, and the evaluation of these constructs was based on their internal consistency reliability, convergence validity, and discriminant validity. To ensure the stability of the results and account for static significances, bootstrapping was applied as a nonparametric procedure in

SmartPLS. A total of 5,000 subsamples were drawn from the dataset, and the bias-corrected and accelerated (BCa) bootstrap method was chosen to correct for bias and skewness in the bootstrap distribution, resulting in narrow intervals (Efron, 1987). A two-sided significance test was conducted at a significance level of 0.05 to determine the statistical significance of the results.

The first step in assessing the quality of reflective constructs is to examine content validity. This is done to guarantee that significant support is provided for the reliability of the reflective measurements. This was based on the level of the loadings of the individual items. The loading needed to be greater than 0.7. Thus, items that showed very low loading values, namely (Probiotic yogurts and I am unable to afford healthy foods), had to be deleted. In addition, 3 items that showed values slightly under 0.7 which are (Lactose-free dairy products, Low-fat dairy products, and I have too many other things to do) with the value of (0.64, 0.68, and 0.67) respectively. However, in order to assess whether the removal of each item resulted in an increase in the reliability of internal consistency and convergent validity, individual testing of the items was performed (Hair et al., 2021). However, no significant improvement was observed in either of the aforementioned criteria. Consequently, all items were retained in the final model.

In accordance with the guidelines provided by Hair et al. (2021), internal consistency reliability was assessed using both Cronbach's α coefficient (>0.7) and the composite reliability (CR) value (>0.6). All values surpassed the minimum thresholds, thereby ensuring the internal consistency of the constructs. The values of Cronbach's α ranged from 0.81 to 0.91, while the values of the composite reliability ranged from 0.80 to 0.95. Furthermore, convergent validity was examined using the average variance extracted (AVE) (>0.5). The AVE values, as presented in Table 2, were also satisfactory, ranging from 0.67 to 0.87.

Table 2 Constructs, items, factor loading, reliability, and validity.

Factor Loadings		Sources of Adoption
Attitude toward DFFs: α : 0.88, AVE: 0.68, CR: 0.88		
ATT1: DFFs help to improve my mood	0.78	(Urala & Lahteenmaki, 2007)
ATT2: My performance improves when I eat DFFs	0.86	
ATT3: I can prevent disease by eating DFFs regularly	0.85	
ATT4: DFFs can repair the damage caused by an unhealthy diet	0.80	
ATT5: DFFs promote my well-being	0.83	
Willingness to consume DFFs: α : 0.86, AVE: 0.65, CR: 0.86		
WCF1: Lactose free dairy products	0.64	(Urala & Lahteenmaki, 2007)
WCF2: Low-fat dairy products	0.68	
WCF3: Probiotic yogurts	*	
WCF4: Milk fortified with calcium	0.90	
WCF5: Enriched Milk with Omega3 EPA & DHA	0.90	
WCF6: Milk fortified with folic acid	0.88	
Motivators: α : 0.83, AVE: 0.67, CR: 0.82		
MOT1: I may live longer	0.80	(Downes, 2008)
MOT2: I want to be healthy	0.87	
MOT3: I want to manage my weight	0.83	
Barriers: α : 0.81, AVE: 0.68, CR: 0.80		
BAR1: I am not motivated	0.97	(Downes, 2008)
BAR2: I do not have someone to encourage or help me	0.80	
BAR3: I have too many other things to do	0.67	
Consumer Purchase Behavior Intention: α : 0.88, AVE: 0.81, CR: 0.93		
INT1: I intend to use DFFs online shop when the service becomes widely available.	0.87	(Davis, 1989)
INT2: I intend to use DFFs online shop when there is free home delivery.	0.91	
INT3: 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		
PU1: Using DFFs online shop can save me a lot of time.	0.80	(Davis, 1989)
PU2: Using food online shopping can make my DFFs shopping easier.	0.87	
PU3: 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		
PEOU1: Online DFFs Shopping is/might be easy to use.	0.84	(Davis, 1989)
PEOU2: It is/might be easy for me to follow the procedures when ordering DFFs online.	0.93	
PEOU3: My interaction with the processes of online DFFs is/might be clear and understandable.	0.87	
Continued on the next page		

Table 2 Continued from the previous page		
MAV1: Advertisements of dairy functional foods are useful	0.937	(Dao et al., 2015; Ducoffe, 1996)
MAV2: Advertisements of dairy functional foods are important	0.933	
Informativeness: α : 0.83, AVE: 0.75, CR: 0.90		
INF1: Advertising makes product of dairy functional foods information immediately accessible	0.915	(Dao et al., 2015; Ducoffe, 1996)
INF2: Advertising is a convenient source of dairy functional foods product information	0.928	
INF3: Ad informs me of the latest products and information of dairy functional foods available on the market.	0.744	
Entertainment: α : 0.70, AVE: 0.77, CR: 0.87		
ENT1: Advertising usually makes people laugh and has great amusement value	0.882	(Dao et al., 2015)
ENT2: Advertising tells me what people who share my lifestyle will buy and use	0.869	
Credibility: α : 0.81, AVE: 0.84, CR: 0.91		
CRE1: Advertisements of dairy functional foods are credible	0.922	(Dao et al., 2015)
CRE2: Advertising of dairy functional foods is convincing	0.913	
Irritation: α : 0.87, AVE: 0.79, CR: 0.92		
IRR1: Advertising of dairy functional foods is irritating	0.894	(Ducoffe, 1996)
IRR2: Advertising of dairy functional foods is deceptive	0.854	
IRR3: Advertising of dairy functional foods is annoying	0.923	
α : Cronbach's alpha, AVE: Average variance extracted, CR: Composite reliability		

The attitude construct demonstrates good reliability, as indicated by the high alpha coefficient of 0.88. The average variance extracted (AVE) is 0.68, indicating that the attitude construct explains 68% of the variance in the observed variables. Each item within the attitude construct shows a strong loading on the underlying factor. ATT2: "My performance improves when I eat DFFs" has the highest factor loading of 0.86, followed closely by ATT3: "I can prevent disease by eating DFFs regularly" with a factor loading of 0.85. ATT1: "DFFs help to improve my mood" and ATT5: "DFFs promote my well-being" also exhibit strong factor loadings of 0.78 and 0.83, respectively. ATT4: "DFFs can repair the damage caused by an unhealthy diet" demonstrates a slightly lower, yet still significant, factor loading of 0.80. The reliability coefficient (CR) of 0.88 indicates high internal consistency within the attitude

construct. This suggests that the items within the construct are measuring a common underlying factor consistently.

The willingness to consume construct demonstrates good reliability, with an alpha coefficient of 0.86, indicating high internal consistency. The average variance extracted (AVE) is 0.65, indicating that the construct explains 65% of the variance in the observed variables. Among the items within the willingness to consume construct, WCF4: "Milk fortified with calcium" and WCF5: "Enriched milk with Omega3 EPA & DHA" demonstrate the highest factor loadings of 0.9, indicating a strong relationship with the underlying construct. WCF6: "Milk fortified with folic acid" also exhibits a high factor loading of 0.88. WCF1: "Lactose-free dairy products" and WCF2: "Low-fat dairy products" have moderate factor loadings of 0.64 and 0.68, respectively. It is worth noting that WCF3: "Probiotic yogurts" has been deleted, suggesting that it may not have contributed significantly to the overall willingness to consume construct based on the analysis performed. The reliability coefficient (CR) of 0.86 further supports the internal consistency of the willingness to consume construct, indicating that the items within the construct are measuring a common underlying factor consistently.

The motivators construct demonstrates good reliability, as reflected by the alpha coefficient of 0.83, indicating high internal consistency. The average variance extracted (AVE) is 0.67, indicating that the construct explains 67% of the variance in the observed variables. Among the items within the motivators construct, MOT2: "I want to be healthy" demonstrates the highest factor loading of 0.87, indicating a strong association with the underlying construct. MOT1: "I may live longer" and MOT3: "I want to manage my weight" also exhibit substantial factor loadings of 0.8 and 0.83, respectively, indicating significant relationships with the motivators construct. The

reliability coefficient (CR) of 0.82 further supports the internal consistency of the motivators construct, suggesting that the items within the construct consistently measure a common underlying factor.

The barriers construct demonstrates good reliability, with an alpha coefficient of 0.81, indicating high internal consistency. The average variance extracted (AVE) is 0.68, suggesting that the construct explains 68% of the variance in the observed variables. Among the items within the barriers construct, BAR1: "I am not motivated" exhibits the highest factor loading of 0.97, indicating a strong association with the underlying construct. BAR2: "I do not have someone to encourage or help me" also demonstrates a substantial factor loading of 0.8, suggesting a significant relationship with the barrier construct. BAR3: "I have too many other things to do" shows a moderate factor loading of 0.67. The reliability coefficient (CR) of 0.80 further supports the internal consistency of the barriers construct, indicating that the items within the construct consistently measure a common underlying factor.

The consumer purchase behavior intention construct demonstrates excellent reliability, as reflected by the alpha coefficient of 0.88, indicating high internal consistency. The average variance extracted (AVE) is 0.81, suggesting that the construct explains 81% of the variance in the observed variables. Among the items within the consumer purchase behavior intention construct, INT2: "I intend to use DFFs online shop when there is free home delivery" exhibits the highest factor loading of 0.91, indicating a strong association with the underlying construct. INT3: "I intend to use DFFs online shop when the price is competitive" also demonstrates a substantial factor loading of 0.92, suggesting a significant relationship with the consumer purchase behavior intention construct. INT1: "I intend to use DFFs online shop when the service becomes widely available" shows a strong factor loading of 0.87. The

reliability coefficient (CR) of 0.93 further supports the internal consistency of the consumer purchase behavior intention construct, suggesting that the items within the construct consistently measure a common underlying factor.

The perceived usefulness construct demonstrates excellent reliability, with an alpha coefficient of 0.91, indicating high internal consistency. The average variance extracted (AVE) is 0.77, suggesting that the construct explains 77% of the variance in the observed variables. Among the items within the perceived usefulness construct, PU2: "Using food online shopping can make my DFFs shopping easier" exhibits the highest factor loading of 0.87, indicating a strong association with the underlying construct. PU3: "Using online food shopping is convenient for my DFFs shopping" also demonstrates a substantial factor loading of 0.83, suggesting a significant relationship with the Perceived Usefulness construct. PU1: "Using DFFs online shop can save me a lot of time" shows a strong factor loading of 0.8. The reliability coefficient (CR) of 0.95 further supports the internal consistency of the Perceived Usefulness construct, indicating that the items within the construct consistently measure a common underlying factor.

The perceived ease of use construct demonstrates good reliability, with an alpha coefficient of 0.85, indicating satisfactory internal consistency. The average variance extracted (AVE) is 0.85, suggesting that the construct explains 85% of the variance in the observed variables. Among the items within the perceived ease of use construct, PEOU2: "It is/might be easy for me to follow the procedures when ordering DFFs online" exhibits the highest factor loading of 0.93, indicating a strong association with the underlying construct. PEOU3: "My interaction with the processes of online DFFs is/might be clear and understandable" also demonstrates a substantial factor loading of 0.87, suggesting a significant relationship with the perceived Ease of Use

construct. PEOU1: "Online DFFs shopping is/might be easy to use" shows a good factor loading of 0.84. The reliability coefficient (CR) of 0.91 further supports the internal consistency of the perceived ease of use construct, indicating that the items within the construct consistently measure a common underlying factor.

The MAV construct demonstrates good reliability, with an alpha coefficient of 0.86, indicating satisfactory internal consistency. The average variance extracted (AVE) is 0.87, suggesting that the construct explains 87% of the variance in the observed variables. Among the items within the MAV construct, MAV1: "Advertisements of dairy functional foods are useful" exhibits the highest factor loading of 0.937, indicating a strong association with the underlying construct. MAV2: "Advertisements of dairy functional foods are important (information)" also demonstrates a substantial factor loading of 0.933, suggesting a significant relationship with the MAV construct. The reliability coefficient (CR) of 0.93 further supports the internal consistency of the MAV construct, indicating that the items within the construct consistently measure a common underlying factor.

The informativeness construct demonstrates good reliability, with an alpha coefficient of 0.83, indicating satisfactory internal consistency. The average variance extracted (AVE) is 0.75, suggesting that the construct explains 75% of the variance in the observed variables. Among the items within the informativeness construct, INF2: "Advertising is a convenient source of dairy functional foods product information" exhibits the highest factor loading of 0.928, indicating a strong association with the underlying construct. INF1: "Advertising makes product of dairy functional foods information immediately accessible" also demonstrates a substantial factor loading of 0.915, suggesting a significant relationship with the informativeness construct. INF3: "Ad

informs me of the latest products and information of dairy functional foods available on the market" shows a factor loading of 0.744. The reliability coefficient (CR) of 0.90 further supports the internal consistency of the informativeness construct, indicating that the items within the construct consistently measure a common underlying factor.

The entertainment construct demonstrates satisfactory reliability, with an alpha coefficient of 0.70, indicating acceptable internal consistency. The average variance extracted (AVE) is 0.77, suggesting that the construct explains 77% of the variance in the observed variables. Among the items within the entertainment construct, ENT1: "Advertising usually makes people laugh and has great amusement value" exhibits the highest factor loading of 0.882, indicating a strong association with the underlying construct. ENT2: "Advertising tells me what people who share my lifestyle will buy and use" also demonstrates a substantial factor loading of 0.869, suggesting a significant relationship with the entertainment construct.

The reliability coefficient (CR) of 0.87 further supports the internal consistency of the Entertainment construct, indicating that the items within the construct consistently measure a common underlying factor.

The credibility construct demonstrates good reliability, with an alpha coefficient of 0.81, indicating satisfactory internal consistency. The average variance extracted (AVE) is 0.84, suggesting that the construct explains 84% of the variance in the observed variables. Among the items within the Credibility construct, CRE1: "Advertisements of dairy functional foods are credible" exhibits the highest factor loading of 0.922, indicating a strong association with the underlying construct. CRE2: "Advertising of dairy functional foods is convincing" also demonstrates a substantial factor loading of 0.913, suggesting a significant relationship with the credibility construct.

The reliability coefficient (CR) of 0.91 further supports the internal consistency of the credibility construct, indicating that the items within the construct consistently measure a common underlying factor.

The Irritation construct demonstrates good reliability, with an alpha coefficient of 0.87, indicating satisfactory internal consistency. The average variance extracted (AVE) is 0.79, suggesting that the construct explains 79% of the variance in the observed variables. Among the items within the Irritation construct, IRR3: "Advertising of dairy functional foods is annoying" exhibits the highest factor loading of 0.923, indicating a strong association with the underlying construct. IRR1: "Advertising of dairy functional foods is irritating" also demonstrates a substantial factor loading of 0.894, suggesting a significant relationship with the Irritation construct. Similarly, IRR2: "Advertising of dairy functional foods is deceptive" shows a considerable factor loading of 0.854, indicating its association with the Irritation construct. The reliability coefficient (CR) of 0.92 further supports the internal consistency of the Irritation construct, indicating that the items within the construct consistently measure a common underlying factor.

Discriminant validity

To assess discriminant validity, the cross-loadings, Fornell-Lacker criterion, and HTMT correlation ratio were employed. The cross-loadings indicated that the items were more correlated with their assigned constructs than with other latent constructs. Table 3 shows that the correlations between the latent variables were smaller than the root of the AVE.

Table 3 Fornell-Larcker criterion

	ATT	BAR	CRE	ENT	INF	INT	IRR	MAV	MOT	PEOU	PU	WCF
ATT	0.824											
BAR	-0.172	0.825										
CRE	0.505	0.022	0.918									
ENT	0.238	0.154	0.434	0.875								
INF	0.455	0.031	0.625	0.391	0.866							
INT	0.519	-0.064	0.420	0.266	0.415	0.899						
IRR	-0.375	0.187	-0.518	-0.208	-0.313	-0.212	0.891					
MAV	0.628	-0.070	0.658	0.263	0.535	0.514	-0.513	0.935				
MOT	0.500	-0.107	0.351	0.125	0.300	0.385	-0.182	0.464	0.849			
PEOU	0.322	-0.212	0.279	0.077	0.255	0.302	-0.227	0.297	0.300	0.878		
PU	0.460	-0.083	0.252	0.118	0.315	0.608	-0.131	0.388	0.307	0.524	0.925	
WCF	0.531	-0.111	0.302	0.147	0.293	0.391	-0.208	0.340	0.260	0.255	0.372	0.807

As can be seen in Table 4, the HTMT thresholds did not exceed 0.85 due to the conceptually different constructs. Thus, all the constructs met the requirements of discriminant validity (Hair et al., 2021).

Table 4 Heterotrait-monotrait ratio

	ATT	BAR	CRE	ENT	INF	INT	IRR	MAV	MOT	PEOU	PU	WCF
ATT												
BAR	0.159											
CRE	0.597	0.060										
ENT	0.309	0.228	0.578									
INF	0.519	0.049	0.754	0.499								
INT	0.588	0.068	0.498	0.341	0.476							
IRR	0.429	0.211	0.615	0.265	0.356	0.243						
MAV	0.721	0.083	0.788	0.340	0.614	0.593	0.594					
MOT	0.585	0.169	0.434	0.177	0.366	0.455	0.211	0.553				
PEOU	0.366	0.231	0.337	0.110	0.309	0.345	0.262	0.344	0.357			
PU	0.509	0.115	0.292	0.146	0.368	0.674	0.150	0.437	0.354	0.586		
WCF	0.610	0.093	0.362	0.189	0.332	0.448	0.246	0.394	0.303	0.294	0.421	

Thus, all the reflective constructs met the quality criteria and were sufficiently valid and reliable.

5.3 Evaluation of the structure model

In scientific research, path coefficients are used to quantify the relationship between two variables in a statistical model. The bootstrapping procedure is a method used to estimate the accuracy of a statistical measure by resampling data from the original sample. A significance test is performed to determine whether the relationship between two variables is statistically significant or not. A significance level of 5% is commonly used, indicating that the probability of the results occurring by chance is less than 5% (Sellin & Keeves, 1994). The researchers found that certain path coefficients were not significant, while others were significant but had a low influence. The path coefficients of BAR -> WCF, ENT -> MAV, and MOT -> WCF were not significant, with values of -0.020, -0.055, and -0.008, respectively. However, the path coefficient of BAR -> ATT, with a value of -0.110, was significant, although its influence was very low, less than 0.1. The results can be found in Table 5.

Table 5 Path coefficients and significances

	Path coefficients	Standard deviation	T statistics	P values
ATT -> INT	0.303	0.048	6.271	0.000
ATT -> WCF	0.532	0.055	9.700	0.000
BAR -> ATT	-0.110	0.048	2.293	0.022
BAR -> WCF	-0.020	0.056	0.356	0.722
CRE -> MAV	0.422	0.060	7.025	0.000
ENT -> MAV	-0.055	0.040	1.367	0.172
INF -> MAV	0.219	0.056	3.894	0.000
IRR -> MAV	-0.237	0.051	4.694	0.000
MAV -> ATT	0.501	0.049	10.290	0.000
MOT -> ATT	0.256	0.053	4.859	0.000
MOT -> WCF	-0.008	0.060	0.141	0.888
PEOU -> PU	0.524	0.047	11.206	0.000
PU -> INT	0.468	0.054	8.613	0.000

In social science research, it is not uncommon for exogenous constructs to affect endogenous constructs via more than one mediator variable. As such, a

multiple mediation analysis of the structural model was carried out to account for these indirect paths. This approach was recommended by Hair et al. (2021) and aimed to evaluate both the indirect and total effects of the exogenous constructs on the endogenous constructs. By identifying and quantifying these effects, the study gained a more comprehensive understanding of the relationships between the variables in the model. This information can inform theoretical frameworks and contribute to the development of practical interventions that target the specific mediator variables through which exogenous constructs influence endogenous constructs. Table 6 shows the results of the path analysis conducted in this study. Among the various paths examined, the paths from ENT → MAV → ATT → INT, ENT → MAV → ATT, and ENT → MAV → ATT → WCF were found to be non-significant. However, the other paths demonstrated significant path coefficients with varying degrees of influence. Specifically, the path coefficients of CRE → MAV → ATT, MAV → ATT → WCF, and PEOU → PU → INT were above 0.2, indicating that MAV, ATT, and INT act as mediators in their respective relationships. These findings suggest that these variables play an important role in influencing users' intentions to adopt the technology in question. The table presenting path coefficients reveals that the relationship between BAR and WCF, as well as between MOT and WCF, did not exhibit statistical significance. However, the analysis of the indirect effects, specifically the paths BAR → ATT → WCF and MOT → ATT → WCF, displayed significant path coefficients with minimal influences of -0.058 and 0.136, respectively. Therefore, the findings suggest that there is evidence of purely indirect mediation, aligning with previous research (Matthews et al., 2018). The results of the path coefficients table reveal significant path coefficients for all the other factors of direct relationships, while the table of indirect effects displays significant path coefficients of the indirect relationships. Therefore, partial

mediation by indirect relations was observed for all the factors. Therefore, path coefficients for each factor were less than 0.1, indicating a low level of mediation.

Table 6 Specific indirect effects

	Path coefficient	Sample mean	Standard deviation	T statistics	P values
ENT -> MAV -> ATT -> INT	-0.008	-0.008	0.006	1.299	0.194
IRR -> MAV -> ATT -> INT	-0.036	-0.036	0.011	3.322	0.001
CRE -> MAV -> ATT	0.212	0.210	0.037	5.672	0.000
BAR -> ATT -> INT	-0.033	-0.034	0.015	2.191	0.029
INF -> MAV -> ATT	0.110	0.110	0.029	3.749	0.000
INF -> MAV -> ATT -> WCF	0.058	0.059	0.017	3.421	0.001
MAV -> ATT -> WCF	0.267	0.265	0.040	6.670	0.000
MAV -> ATT -> INT	0.152	0.153	0.030	5.003	0.000
PEOU -> PU -> INT	0.245	0.245	0.035	6.962	0.000
INF -> MAV -> ATT -> INT	0.033	0.033	0.010	3.297	0.001
BAR -> ATT -> WCF	-0.058	-0.059	0.026	2.270	0.023
CRE -> MAV -> ATT -> INT	0.064	0.064	0.017	3.777	0.000
CRE -> MAV -> ATT -> WCF	0.113	0.111	0.023	4.816	0.000
ENT -> MAV -> ATT	-0.027	-0.027	0.020	1.368	0.171
MOT -> ATT -> WCF	0.136	0.136	0.031	4.340	0.000
ENT -> MAV -> ATT -> WCF	-0.015	-0.014	0.011	1.324	0.185
IRR -> MAV -> ATT -> WCF	-0.063	-0.063	0.018	3.600	0.000
IRR -> MAV -> ATT	-0.119	-0.119	0.029	4.138	0.000
MOT -> ATT -> INT	0.078	0.078	0.021	3.733	0.000

Once the relationships within the structural model were assessed, the explanatory power of the model was examined through the assessment of the coefficient of determination R^2 of the endogenous constructs. This was done by referring to Table 7. The results indicated that WCF and PU had weak R^2 values of 0.282 and 0.274, respectively. On the other hand, ATT, INT, and MAV had moderate R^2 values of 0.462, 0.442, and 0.502, respectively. The R^2_{adj} value further supported these findings. These results demonstrate that the model provides an adequate explanation of the variance in the endogenous constructs, albeit with varying degrees of accuracy.

Table 7 Coefficient of determination (R^2)

	R-square	R-square adjusted
ATT	0.462	0.456
INT	0.442	0.439
MAV	0.502	0.495
PU	0.274	0.272
WCF	0.282	0.275

Furthermore, the impact of exogenous constructs on endogenous constructs was evaluated by computing the effect sizes (f^2) and the results are presented in Table 8. BAR->WCF, ENT->MAV, and MOT->WCF, were found to have no relevant effect. However, BAR->ATT, INF->MAV, IRR->MAV, ATT->INT, and MOT->ATT had a small effect. Moreover, CRE->MAV, ATT->WCF, and PU->INT showed a moderate effect. Conversely, MAV->ATT and PEOU->PU had a large effect.

Table 8 Effect size (f^2)

	ATT	INT	MAV	PU	WCF
ATT		0.130			0.289
BAR	0.022				0.001
CRE			0.166		
ENT			0.005		
INF			0.057		
INT					
IRR			0.083		
MAV	0.366				
MOT	0.095				0.000
PEOU				0.378	
PU		0.310			

To further evaluate the predictive performance of their model, the researchers calculated the predictive relevance Q^2 for each endogenous construct. Q^2 values provide information about the predictive power of each variable in the model, with higher values indicating better predictive performance. As shown in Table 9, the results indicated that all of the endogenous constructs had a

predictive relevance. The size of the predictive relevance was evaluated as small to medium, indicating that the constructs had some level of predictive power but may benefit from further refinement. The Q^2 values are a crucial measure in structural equation modeling and indicate the proportion of the variation in the endogenous variable that is accounted for by the model. Therefore, the results of this analysis suggest that the model had some degree of predictive power for each endogenous construct.

Table 9 Prediction relevance (Q^2)

	SSO	SSE	$Q^2 (=1-SSE/SSO)$
ATT	1565.000	1084.144	0.307
INT	939.000	606.390	0.354
MAV	626.000	355.194	0.433
PU	939.000	726.134	0.227
WCF	1565.000	1284.615	0.179

The researchers aimed to assess the predictive performance of their model using the PLSpredict procedure. To achieve this, they used a k-fold cross-validation approach with three subgroups and repeated this process 10 times. However, the Q^2 predict values were then analyzed, and it was found that all values were greater than zero, indicating a better predictive performance than a naive benchmark. This means that the model was able to accurately predict outcomes for new data points that were not used during the training process. The results of this analysis can be found in Table 10, which provides a detailed breakdown of the Q^2 predict values for each variable in the model. Additionally, the researchers compared the RMSE values obtained from the PLS-SEM with those obtained from the LM. The RMSE is a measure of the difference between the predicted and actual values, and lower values indicate a better fit. The majority of the RMSE values from the PLS-SEM were lower than those obtained from the LM, suggesting an intermediate level of predictive power for the model (Hair et al., 2021). Overall, these findings suggest that the PLS-SEM model had a good predictive performance and was

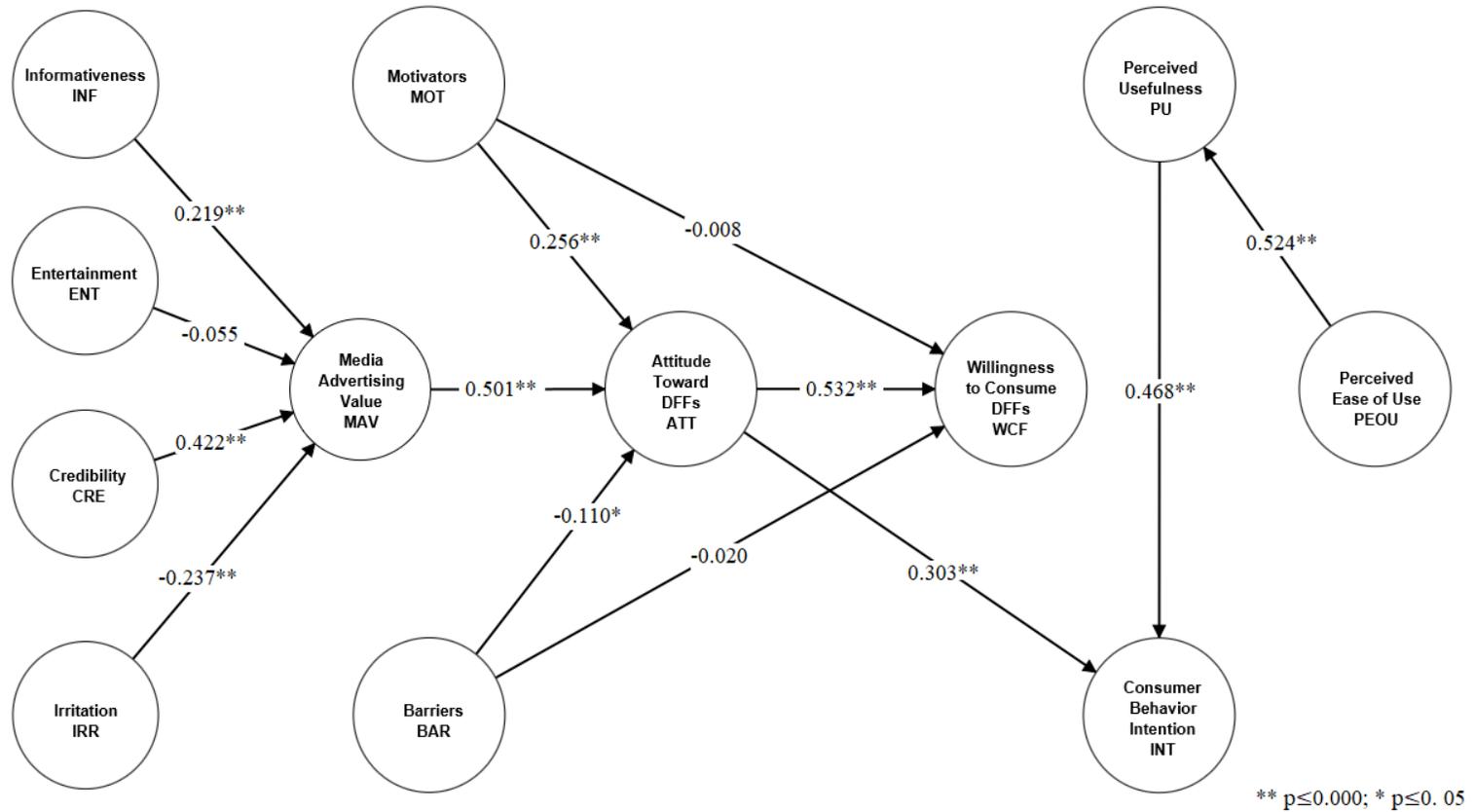
able to accurately predict outcomes for new data points. The intermediate level of predictive power indicates that the model could benefit from further refinement, but it represents a strong foundation for future research in this area.

Table 10 Out-of-sample predictive power

	Q ² predict	PLS-SEM_RMSE	LM_RMSE
ATT	0.391		
ATT1	0.195	1.129	1.183
ATT2	0.231	1.107	1.165
ATT3	0.318	1.090	1.119
ATT4	0.298	1.079	1.110
ATT5	0.286	1.084	1.094
INT	0.181		
INT1	0.172	1.334	1.325
INT2	0.134	1.401	1.407
INT3	0.132	1.360	1.361
MAV	0.488		
MAV1	0.460	0.800	0.814
MAV2	0.390	0.906	0.885
PU	0.266		
PU1	0.271	1.105	1.059
PU3	0.220	1.106	1.105
PUS2	0.189	1.121	1.113
WCF	0.111		
WCF1	0.037	1.508	1.564
WCF2	0.070	1.284	1.310
WCF4	0.093	1.351	1.385
WCF5	0.075	1.388	1.421
WCF6	0.078	1.372	1.401

A test of the theoretical framework's goodness of fit revealed the following findings, which are within acceptable bounds. The discrepancy between the measured and the expected correlation is known as the standardized root mean square residual (SRMR). In PLS-SEM analysis, the SRMR has been employed to evaluate the model fit (Henseler, 2018). It is thought that a score less than 0.10 (or 0.08 in a more conservative form) indicates a satisfactory match for the data (Hu & Bentler, 1998). The SRMR for this model is 0.053, which indicates that a well-fit model.

Figure 10 Results of the structural model, path coefficients, and significances of the model



According to the results of Figure 10, it was found that informativeness has a direct influence on media advertising value of $\beta = 0.219$, $p \leq 0.000$, $f^2 = 0.057$. These results support the H9 hypothesis. However, informativeness showed an indirect influence on attitude toward DFFs of $\beta = 0.110$ and $p \leq 0.000$, and on willingness to consume DFFs of $\beta = 0.058$ and $p \leq 0.001$, and on consumer behavior intention with $\beta = 0.033$ and $p \leq 0.001$. However, entertainment didn't show any influence on media advertising value of ($\beta = -0.055$, $p \leq 0.172$, $f^2 = 0.005$). That's why the H10 hypothesis had to be rejected. Furthermore, entertainment didn't show any indirect influence on any other constructs. In addition, the result of credibility showed different results. It showed that credibility has an influence on media advertising value of $\beta = 0.422$, $p \leq 0.000$, $f^2 = 0.166$. That's why the H11 hypothesis is accepted. Furthermore, the credibility showed an indirect influence on the attitude toward DFFs of $\beta = 0.212$ and $p \leq 0.000$ due to the interference of media advertising value as a mediator. And also, credibility showed an indirect influence on the willingness to consume DFFs and consumer behavior intention due to the interference of media advertising value and attitude toward DFFs as mediators of $\beta = 0.113$, $p \leq 0.000$ and $\beta = 0.064$, $p \leq 0.000$ respectively. Besides that, irritation had a different influence than other constructs. Irritation had a negative influence on media advertising value of $\beta = -0.237$ and $p \leq 0.000$, $f^2 = 0.083$. that's why the H12 hypothesis is accepted. Furthermore, Irritation showed a negative indirect effect also on attitude toward DFFs of $\beta = -0.119$ and $p \leq 0.000$ due to the mediator effect of media advertising value. Additionally, irritation also showed an indirect negative effect on willingness to consume DFFs and consumer behavior intention of $\beta = -0.063$ and $p \leq 0.000$ and $\beta = -0.036$ and $p \leq 0.001$ respectively. However, the construct of media advertising value showed a higher influence on attitude toward DFFs of $\beta = 0.501$, $p \leq 0.000$, $f^2 = 0.366$. Therefore, the H13 hypothesis is accepted. In the same vein, media

advertising value showed an indirect influence on the willingness to consume DFFs and consumer behavior intuition or $\beta = 0.267$ and $p \leq 0.000$ and $\beta = 0.152$ and $p \leq 0.000$ respectively.

The construct of motivators showed influence on attitude toward DFFs of $\beta = 0.256$, $p \leq 0.000$, $f^2 = 0.095$. That's why the H5 hypothesis was accepted. However, motivators didn't show a direct influence on the willingness to consume DFFs of $\beta = -0.008$, $p \leq 0.888$, and $f^2 = 0.000$. Therefore, the H7 hypothesis had to be rejected. In another hand, motivators showed an indirect influence on willingness to consume DFFs throughout the interference of the attitude towards DFFs of $\beta = 0.136$ and $p \leq 0.000$. Furthermore, motivators also showed influence on consumer behavior intention due to the mediator factor of attitude towards DFFs of $\beta = 0.078$ and $p \leq 0.000$. However, barriers showed a negative influence on attitude towards DFFs of $\beta = -0.237$ and $p \leq 0.000$, $f^2 = 0.083$. That's why the H6 hypothesis was accepted. In another hand, Barriers didn't show direct influence on the willingness to consume DFFs. Thus, the H8 hypothesis is rejected. In contradictory, barriers showed a negative indirect influence on the willingness to consume DFFs and on the consumer behavior intention of $\beta = -0.058$ and $p \leq 0.023$ and $\beta = -0.033$ and $p \leq 0.029$ respectively, due to the role of attitude towards DFFs as mediator. However, attitude towards DFFs had the main player in the model and showed the highest path coefficient influence on the willingness to consume DFFs of $\beta = 0.532$, $p \leq 0.000$, $f^2 = 0.289$. That's why the H4 hypothesis had to be accepted. Furthermore, attitude towards DFFs also showed influence on the consumer behavior intention of $\beta = 0.303$, $p \leq 0.000$, $f^2 = 0.130$. In the same manner, the H3 hypothesis had to be accepted.

Perceived ease of use showed the second highest path coefficient influence in the mode on the perceived usefulness of $\beta = 0.524$ and $p \leq 0.000$, $f^2 = 0.378$. Thus, The H1 hypothesis had to be accepted. Furthermore, perceived ease of

use showed an indirect influence on consumer behavior intuition of $\beta = 0.248$ and $p \leq 0.000$ due to the mediation role of perceived usefulness. Lastly, the results showed that perceived usefulness had an influence on consumer behavior intention of $\beta = 0.468$ and $p \leq 0.000$, $f^2 = 0.310$. Therefore, the H2 hypothesis had to be accepted. The summary of hypotheses verification is shown in Table 11.

Table 11 Summary of hypothesis verification.

<i>H1. Consumers' PEOU of online DFFs purchasing has a positive influence on PU of online DFFs purchasing.</i>	Accepted
<i>H2. Consumers' PU of online DFFs purchasing has a positive influence on their intentions toward online DFFs purchasing INT.</i>	Accepted
<i>H3. Consumers' attitudes towards DFFs ATT will have a positive influence on their intentions towards online food purchasing INT of DFFs.</i>	Accepted
<i>H4. Attitudes towards DFFs influence the willingness to consume DFFs.</i>	Accepted
<i>H5. Motivators positively influence attitudes toward DFFs.</i>	Accepted
<i>H6. Barriers negatively influence attitudes toward DFFs.</i>	Accepted
<i>H7. Motivators positively influence the willingness to consume DFFs.</i>	Rejected
<i>H8. Barriers negatively influence the willingness to consume DFFs.</i>	Rejected
<i>H7a. Motivators positively influence the willingness to consume DFFs through attitude as a mediator.</i>	Accepted
<i>H8a. Barriers negatively influence the willingness to consume DFFs through attitude as a mediator.</i>	Accepted
<i>H9. Informativeness has a positive influence on the MAV of DFFs.</i>	Accepted
<i>H10. Entertainment has a positive influence on the MAV of DFFs.</i>	Rejected
<i>H11. Credibility has a positive influence on the MAV of DFFs.</i>	Accepted
<i>H12. Irritation has a negative influence on the SMAV of DFFs.</i>	Accepted
<i>H13. The MAV of DFFs has a positive influence on attitudes toward DFFs.</i>	Accepted

To further evaluate the predictive performance of their model, the researchers calculated the Q^2 values for each endogenous construct. These values indicate the proportion of the variation in the endogenous variable that can be explained by the model, with higher values indicating better predictive power. The results of this analysis, as presented in the text, showed that all of the endogenous constructs had Q^2 values greater than zero. This indicates that the model had some level of predictive power for each construct. The Q^2 values for the

constructs of attitude towards DFFs, consumer behavior intention, media advertising value, perceived usefulness, and willingness to consume DFFs were 0.307, 0.354, 0.433, 0.227, and 0.179 respectively. These values indicate a small to medium level of predictive power for each construct. Overall, these findings suggest that the model was able to capture some of the variations in the endogenous constructs and had some degree of predictive power. However, it is worth noting that the predictive power of the model may still benefit from further refinement or additional data. Nonetheless, these results provide a valuable starting point for future research and highlight the potential of the model to make accurate predictions about consumer behavior towards DFFs.

6 CONCLUSIONS AND RECOMMENDATIONS

The primary objective of the research is to investigate the potential factors influencing consumer attitudes and online purchasing in the Hungarian dairy functional food market. The path estimates for credibility and informativeness variables are consistent with the results from the studies of media advertising (Bennett et al., 2006; Cuesta-Valiño et al., 2020). This suggests that, although media advertising satisfies a consumer need for information exchange, this advertising is found to be more valuable when it is credible. The results from the sample indicate that credibility has the strongest effect on advertising value for media advertising. Informativeness had the second strongest effect on media advertising value, with statistically significant effects. However, credibility had the highest ($f^2 = 0.166$) value on media advertising value compared with informativeness. Furthermore, both antecedents have a moderate indirect effect on attitude toward DFFs, willingness to consume DFFs, and on TAM constructs.

In the case of entertainment, there was no influence on MAV. However, irritation showed a negative effect on MAV and the whole model with a significance level. The most probable explanation is that this is due to the nature of the products selected for this study, which are healthy products. The consumers in question must decide to consume products that are important for their health and it is inevitable that the MAV of healthy products is determined by aspects such as credibility and informativeness and not by entertainment or irritation. Thus, in the case of healthy food, the purchase is rational rather than emotional. As a result, the impact of advertisements promoting healthy products is directly related to two factors: the amount of information they provide and their credibility. In other words, the more information and credibility an advertisement has, the stronger its influence on the perceived value of the advertised product (Saxena & Khanna, 2013). This is especially

true when the benefits of those foods are emphasized, and when they are compared with other foods.

The results of the study show that media advertising value has the strongest rank compared with other constructs in the model (R^2 value = 0.502), which is considered moderate (Chin, 1998). Furthermore, MAV has a strong relationship with attitude toward DFFs, with a high coefficient. This suggests that the perceived value of advertising ultimately plays a greater role in the formation of attitudes to advertising in media. Furthermore, the study found that perceived levels of informativeness and credibility, which are antecedents to MAV, can predict, to some extent, the consumer's attitude toward DFFs. Consumers who perceive DFF advertising to be informative and credible are more likely to have a positive attitude toward such advertising. These findings highlight the importance of creating advertising that is perceived as informative and credible by consumers. Advertisers who can effectively communicate the benefits and features of their products in a transparent and honest way are more likely to gain consumers' trust and influence their attitudes toward DFF advertising. Moreover, the results of the study suggest that MAV can be an effective tool for measuring the effectiveness of DFF advertising. By assessing the perceived value of advertising, advertisers can gauge the effectiveness of their campaigns and identify areas for improvement.

Furthermore, the attitude toward DFFs was influenced by 2 direct constructs of healthy behavior which are considered subjective norms and perceived control namely motivators and barriers to consuming dairy functional foods. Former studies included in their findings the role of motivators and barriers to the use of functional food on attitude and health purchasing behavior (Downes, 2008; Küster-Boluda & Vidal-Capilla, 2017; Papp-Bata & Szakály, 2020). But they couldn't identify the direct and indirect effects of motivators and barriers on attitude and willingness to consume functional food. The findings revealed

that, motivators showed a higher positive impact on attitude toward DFFs with a coefficient of 0.256 compared to barriers which showed a negative impact on attitude toward DFFs with a coefficient of -0.110. The explanation for that, the personal factors as motivators which are identified from an individual perspective such as seeking to live longer, controlling body weight, maintaining a healthy lifestyle, and the fear of sickness because of unhealthy behavior showed a higher impact on attitude rather than the barriers such as not being motivated, not finding the engaging to use healthy food and also because of not having enough time to care about their healthy food which showed a significant negative impact on attitude. This might be because the primary motivating factor for the consumption of functional foods is their potential to promote health, and consumers increasingly preferred natural products and prefer to have a healthy style. This is in line with the finding of Rozin et al. (2004) pointing out that, preference for natural products is often strongly correlated with the perceived health benefits of these products. This suggests that consumers may be more likely to choose natural products when they believe that they will have positive effects on their health and well-being (Chen, 2011b; Papp-Bata & Szakály, 2020).

Willingness to consume DFFs was influenced directly by the attitude with the highest coefficient of 0.532, and this corresponds with the theory of value-attitude-behavior (VAB) and the theory of planned behavior (TPB). However, the R^2 of willingness to consume DFFs showed a weak value ($R^2 = 0.289$). This result indicates that the constructs associated with the independent variables in the models only account for a small fraction of the variation in the dependent variables. This suggests that there may be other factors that play a role in determining the willingness of consumers to purchase DFFs, beyond those included in the current models. Future research efforts could focus on identifying these additional factors, which may include individual differences,

socio-cultural influences, and external factors such as marketing strategies and availability of alternative options.

Multiple authors in various countries have previously examined the relationship between willingness to consume functional food and attitude in their studies (Küster-Boluda & Vidal-Capilla, 2017; Urala & Lähteenmäki, 2004; Urala & Lähteenmäki, 2007). Furthermore, the results found that motivators and barriers didn't impact the willingness to consume dairy functional foods directly, but with an interventional of attitude. That might be due to the fact that the majority of Hungarians are not interested in making changes to their diet or living a healthier lifestyle (Szakály et al., 2014). In addition, 86% of Hungarian customers said they never or rarely sacrifice the enjoyable flavor of food in exchange for it being healthier (Papp-Bata & Szakály, 2020). Furthermore, it is possible that European consumers place a higher value on the product's potential for enjoyment (taste orientation) than they do on their potential for health (healthiness orientation), in comparison to Asian consumers, who place a higher value on the products' potential nutritional benefits (Szakály, 2008).

The model of TAM was investigated in many previous studies, and it confirmed the implication of online food purchasing also (Davis, 1989; Nguyen et al., 2019a; Yeo et al., 2017). Attitude toward DFFs showed high impact on consumer behavioral intention besides perceived usefulness and perceived ease of use with a coefficient of 0.303. According to the findings, having a health-conscious attitude has a significant and beneficial effect on a consumer's intention to buy dairy products that have functional benefits. This finding is consistent with previous research that found that health consciousness or concerns play a key role in influencing consumer perception and attitude toward the purchase and consumption of healthy and functional foods in developed countries such as Germany and Sweden. For example, this

research found that consumers in those countries were more likely to purchase and consume healthy and functional foods if they were concerned about their health (Goetzke et al., 2014; Landström et al., 2007). This demonstrates that consumers who are concerned about their health are more likely to participate in a variety of health-related activities (Newsom et al., 2005).

According to the finding of the former survey, when it comes to food purchases, customers in Hungary place the most importance on the following considerations: cost, quality, healthfulness, and Hungarian provenance (Garai-Fodor et al., 2022). In addition, in recent years, there has been a shift in Hungarian food customers' preferences away from larger supermarkets and hypermarkets toward more local stores and markets in their immediate communities, personal touch became more vital, and people even began to have greater faith in local goods and food as a result of this, local small-scale stores often brought foodstuffs to customers' houses (Soós, 2020). Nevertheless, the Hungarian respondents believe that the identification of the place of origin, health, and support of local producers are the most significant considerations in the purchase decision, and when it comes to where customers may discover information on local food, local producers are legitimate sources that consumers can consult (Kiss et al., 2020). From this vantage point, online shopping is often helped by the fact that buyers can readily access information about a product at a cheap cost and with little effort, which is essential in this day and age of digitization. And this may be used to target younger age groups who like to purchase online since there is a broader variety of options available to local producers, making the overall shopping experience more enjoyable (Chen et al., 2019).

However, it was shown that the purchasing usefulness was influenced directly by purchasing ease of use with the highest coefficient of 0.524 and ($f^2 = 0.378$). This connection is supported by research conducted by different writers (Davis

et al., 1989; Nguyen et al., 2019a). However, the R-square value of perceived usefulness was ($R^2 = 0.289$). Therefore, it is considered weak (Chen et al., 2019). In particular, the results suggest that the construct of perceived ease of use accounts for only a small portion of the variation in perceived usefulness. Therefore, future researchers should investigate additional factors that could potentially influence perceived usefulness beyond perceived ease of use. One potential factor to consider is the role of social influence, as the opinions and recommendations of friends and family members can have a significant impact on individuals' perceptions and attitudes towards a particular technology or product.

Perceived usefulness showed an influence on customer behavior intention with a coefficient of 0.468. 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. (2019c). This finding provides empirical support for the TAM (Davis et al., 1989; Marangunić & Granić, 2014) and also echoes the earlier finding of Chien et al. (2003). It is recommended that if it 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.

Perceived ease of use showed an indirect impact on consumer behavior intention throughout the mediator perceived usefulness with a coefficient of 0.245. These results showed similarity to the results obtained by former studies (Ming et al., 2020; Nguyen et al., 2019c). These results suggest that customers' perceptions about the difficulty of using online food purchasing platforms, such as ease of use, may act as a barrier to the widespread adoption of such platforms (Hansen, 2005; Sreeram et al., 2017; Yeo et al., 2017). These types of online shoppers are often convenience-oriented customers who want their

buy to be made as uncomplicated, straightforward, and rapid as possible (Handa & Gupta, 2014). As a result, businesses that sell food goods online should make an effort to develop websites that are simple to use and don't require a lot of work from customers to operate. This will help customers expend less effort and energy when making purchases of food products online. Per their findings of Hungarian customers, the need for long-lasting food has expanded enormously, and consumers have favored discounts and local convenience shops. This is particularly true for the active population, middle-aged individuals, and young people (Garai-Fodor et al., 2022). Because of this, Hungarian food e-retailers should utilize communication programs to underline that ordering food online is effective, easy, and saves time and that it would enhance the shopping experience and performance of customers. These initiatives have to be designed and put into action in collaboration with online grocery merchants and relevant organizations such as the Association of Hungarian Retailers.

Given the challenges that consumers face in evaluating the quality of food products when shopping online, such as their inability to touch or smell the products. Therefore, the results obtained from the MAV model have significant implications for DFFs retailers' websites. By incorporating detailed and transparent information about the products, including their ingredients, nutritional content, country of origin, and manufacturer, retailers can enhance the credibility and informativeness of their products, thereby empowering consumers to make informed decisions about their food purchases. Furthermore, the inclusion of consumer feedback, particularly comments that emphasize the quality of both the product and the website, can further strengthen the trust and connection between the retailer and the consumer. This, in turn, can lead to increased consumer loyalty and positive brand reputation. By leveraging the insights gained from the MAV model, food

retailers can improve the user experience of their websites and enhance their ability to effectively communicate product information to consumers. Ultimately, this can contribute to the promotion of healthier and more sustainable food choices, as well as greater customer satisfaction and trust in the food retail industry.

7 NEW SCIENTIFIC RESULTS

In the analysis of the Hungarian dairy functional food market, my study unveils key insights by integrating the Technology Acceptance Model (TAM), Value-Attitude-Behavior (VAB) framework, Theory of Planned Behavior (TPB), and Media Advertising Value (MAV) theory:

- By applying the Technology Acceptance Model (TAM), I observed that perceived usefulness and ease of use significantly predict consumer behavior intentions and technology acceptance.
- Utilizing the Value-Attitude-Behavior (VAB) model, my research underscored the critical role of consumer attitudes toward DFFs in their willingness to incorporate these foods into their diets, highlighting the pivotal influence of attitudes on consumption behavior.
- Through the Theory of Planned Behavior (TPB), my study found that attitudes and healthy subjective norms, acting as motivators and barriers, can predict behavioral intentions. Motivators positively affect consumers' willingness to consume DFFs, while barriers have a negative impact, with attitudes serving as a mediator.
- Media advertising can influence the perceived value of a product, which in turn can impact the consumer's attitude and willingness to purchase. In terms of media advertising, my study highlighted the positive influence of informativeness and credibility on the media advertising value of DFFs. However, advertising irritants negatively impact these perceptions.

8 LIMITATIONS AND FUTURE STUDIES

8.1 Limitation

One of the main limitations of this study is that it did not take into account the impact of socio-demographic factors, such as age, gender, and income, on consumers' attitudes towards ordering groceries and food online. Future research should explore how these factors may influence the adoption of online grocery shopping and whether there are any differences in attitudes towards online shopping between different socio-demographic groups.

Another limitation of this study is that it was conducted only among Hungarian consumers. Future research could expand the scope of the study to include consumers from other countries to determine whether cultural and societal factors impact attitudes towards online grocery shopping.

The sample size was relatively small ($n=313$), and the participants do not be representative of the larger population of Hungarian consumers.

8.2 Future Research

Future research should examine the role of trust in online grocery shopping, as it is an essential factor in determining whether consumers will adopt this method of shopping. Additionally, the study could explore how the perceived risks associated with online shopping may impact consumers' willingness to use online platforms for grocery shopping.

Another area for future research could be to investigate the effectiveness of different marketing strategies in promoting online grocery shopping. Specifically, how different forms of media marketing, such as social media advertising and influencer marketing, impact consumers' attitudes and behaviors towards online grocery shopping.

Future studies could use a larger sample size and representative sample to increase the external validity of the findings.

9 SUMMARY

The primary objective of the thesis titled "Analysis of Factors Influencing Consumer Attitudes and Online Purchasing in the Hungarian Dairy Functional Food Market" is to systematically examine and understand the various factors that impact consumer attitudes and online purchasing behavior in the context of the Hungarian dairy functional food market. The thesis aims to analyze and identify key influences, such as media marketing value, health subjective norms of motivators and barriers, and other relevant factors, to provide insights into the dynamics shaping consumer decisions in this specific market. To achieve this objective, a multifaceted approach was adopted, incorporating prominent theoretical models such as the Value-Attitude-Behavior (VAB) model, the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM), and the Media Advertising Value (MAV) theory. These models provided a comprehensive framework for understanding the complex dynamics between media marketing, consumer attitudes, intentions, and the willingness to consume dairy functional foods.

The research methodology involved primary data collection through an online Google survey. The survey questionnaire comprised 38 constructs, most of which utilized a five-point Likert response format. A total of 313 valid questionnaires were collected from a sample of the Hungarian population within a 40-day period, forming the basis for the dataset and subsequent analysis. SmartPLS version 4, a statistical software tool specifically designed for structural equation modeling (SEM), was utilized to investigate the theoretical framework. The research employed a partial least squares (PLS) approach within the SEM framework to analyze the relationships and interactions among the variables.

The findings of the study shed light on several key relationships between variables. It was determined that consumers' perceived ease of use (PEOU) of online dairy functional foods (DFFs) purchasing positively influenced their perceived usefulness (PU) of online DFFs purchasing. Additionally, consumers' PU of online DFFs purchasing positively impacted their intentions toward online DFFs purchasing (INT). Furthermore, attitudes toward DFFs were found to have a positive influence on intentions toward online food purchasing (INT) of DFFs, and attitudes themselves positively influenced the willingness to consume DFFs.

Motivators were identified as positive influencers of attitudes toward DFFs, while barriers were found to have a negative impact. However, it was discovered that motivators did not directly influence the willingness to consume DFFs, and the same applied to barriers. Instead, motivators and barriers influenced the willingness to consume DFFs through attitude as a mediator.

The study also examined the impact of media advertising value (MAV) on consumer attitudes toward DFFs. Informativeness and credibility were found to positively influence the MAV of DFFs, while irritation had a negative influence. However, entertainment didn't show any influence on the MAV of DFFs. Additionally, the MAV of DFFs was found to positively influence attitudes toward DFFs, indicating the significance of effective media marketing strategies in shaping consumer perceptions and attitudes.

The study finds that consumers in Hungary place the most importance on cost, quality, healthfulness, and Hungarian provenance when making food purchases. In recent years, there has been a shift in Hungarian food customers' preferences away from larger supermarkets and hypermarkets toward more local stores and markets in their immediate communities. This shift has been

driven by a desire for a personal touch and greater faith in local goods and food.

The study recommends that food retailers should make an effort to develop websites that are simple to use and don't require a lot of work from customers to operate. This will help customers expend less effort and energy when making purchases of food products online. Additionally, food retailers should utilize communication programs to underline that ordering food online is effective, easy, and saves time, and that it would enhance the shopping experience and performance of customers. These initiatives have to be designed and put into action in collaboration with online grocery merchants and relevant organizations such as the Association of Hungarian Retailers.

The study also highlights the importance of creating advertising that is perceived as informative and credible by consumers. Advertisers who can effectively communicate the benefits and features of their products in a transparent and honest way are more likely to gain consumers' trust and influence their attitudes toward dairy functional food advertising. By incorporating detailed and transparent information about the products, including their ingredients, nutritional content, country of origin, and manufacturer, retailers can enhance the credibility and informativeness of their products, thereby empowering consumers to make informed decisions about their food purchases. Furthermore, the study finds that MAV can be an effective tool for measuring the perceived value of advertising and its impact on consumer behavior. The study recommends that food retailers leverage the insights gained from the MAV model to improve the user experience of their websites and enhance their ability to effectively communicate product information to consumers. Ultimately, this can contribute to the promotion of

healthier and more sustainable food choices, as well as greater customer satisfaction and trust in the food retail industry.

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11 REFERENCES

- A. Spence, L., J. Cifelli, C., & D. Miller, G. (2011). The Role of Dairy Products in Healthy Weight and Body Composition in Children and Adolescents. *Current Nutrition & Food Science*, 7(1), 40–49. <https://doi.org/10.2174/157340111794941111>
- Abood, D. A., Black, D. R., & Feral, D. (2003). Nutrition Education Worksite Intervention for University Staff: Application of the Health Belief Model. *Journal of Nutrition Education and Behavior*, 35(5), 260–267. [https://doi.org/10.1016/S1499-4046\(06\)60057-2](https://doi.org/10.1016/S1499-4046(06)60057-2)
- Accenture. (2019). *More than Half of the consumers would pay more for sustainable products* (Vol. 2022, Issue 02/03). <https://newsroom.accenture.com/news/more-than-half-of-consumers-would-pay-more-for-sustainable-products-designed-to-be-reused-or-recycled-accenture-survey-finds.htm>
- Accenture. (2022). *Final Call for German E-Grocery*. https://www.accenture.com/_acnmedia/PDF-179/Accenture-Grocery-Insights-2022-Final-Call-German-E-Grocery.pdf
- Aguiar, L. M., Geraldi, M. V., Betim Cazarin, C. B., & Maróstica Junior, M. R. (2019). Functional Food Consumption and Its Physiological Effects. *Bioactive Compounds: Health Benefits and Potential Applications*, 205–225. <https://doi.org/10.1016/B978-0-12-814774-0.00011-6>
- Ahn, B. Il, Bae, M. S., & Nayga, R. M. (2016). Information Effects on Consumers' Preferences and Willingness to Pay for a Functional Food Product: The Case of Red Ginseng Concentrate*. *Asian Economic Journal*, 30(2), 197–219. <https://doi.org/10.1111/ASEJ.12090>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Anders, S., & Schroeter, C. (2017). Estimating the effects of nutrition label use on Canadian consumer diet-health concerns using propensity score matching. *International Journal of Consumer Studies*, 41(5), 534–544.

<https://doi.org/10.1111/IJCS.12363>

- Annunziata, A., & Vecchio, R. (2011). Functional foods development in the European market: A consumer perspective. *Journal of Functional Foods*, 3(3), 223–228. <https://doi.org/10.1016/j.jff.2011.03.011>
- Ares, G., & Gámbaro, A. (2007). Influence of gender, age and motives underlying food choice on perceived healthiness and willingness to try functional foods. *Appetite*, 49(1), 148–158. <https://doi.org/10.1016/J.APPET.2007.01.006>
- Ares, G., Giménez, A., & Deliza, R. (2010). Influence of three non-sensory factors on consumer choice of functional yogurts over regular ones. *Food Quality and Preference*, 21(4), 361–367. <https://doi.org/10.1016/J.FOODQUAL.2009.09.002>
- Aschemann-Witzel, J., & Hamm, U. (2010). Do consumers prefer foods with nutrition and health claims? Results of a purchase simulation. *Https://Doi.Org/10.1080/13527260903342746*, 16(1–2), 47–58. <https://doi.org/10.1080/13527260903342746>
- Baker, M. T., Lu, P., Parrella, J. A., & Leggette, H. R. (2022). Consumer Acceptance toward Functional Foods: A Scoping Review. *International Journal of Environmental Research and Public Health*, 19(3), 1217. <https://doi.org/10.3390/IJERPH19031217>
- Balogh, J. M., & Mizik, T. (2022). Impacts of Marketing Strategy and Social Media Activity on the Profitability of Online Wine Shops: The Case of Hungary. *Economies* 2022, Vol. 10, Page 301, 10(12), 301. <https://doi.org/10.3390/ECONOMIES10120301>
- Balogh, T., & Kőszegi, I. (2020a). KNOWLEDGE OF FUNCTIONAL FOODS BY CONSUMERS. *Gradus*, 7(2), 155–160. <https://doi.org/10.47833/2020.2.AGR.030>
- Balogh, T., & Kőszegi, I. (2020b). THE MARKET OF FUNCTIONAL FOODS. *Gradus*, 7(2020), 161–166. <https://doi.org/10.47833/2020.2.AGR.031>
- Balogh, T., Kőszegi, I., & Hoyk, E. (2020a). Knowledge of functional foods by consumers. *Gradus*, 7(2), 155–160. <https://doi.org/10.47833/2020.2.agr.030>
- Balogh, T., Kőszegi, I., & Hoyk, E. (2020b). The market of functional foods.

Gradus, 7(2), 161–166. <https://doi.org/10.47833/2020.2.agr.031>

- Balogh, Z., & Mészáros, K. (2020). Consumer Perceived Risk by Online Purchasing: The Experiences in Hungary. *Naše Gospodarstvo/Our Economy*, 66(3), 14–21. <https://doi.org/10.2478/ngoe-2020-0014>
- Barauskaite, D., Gineikiene, J., Fennis, B. M., Auruskeviciene, V., Yamaguchi, M., & Kondo, N. (2018). Eating healthy to impress: How conspicuous consumption, perceived self-control motivation, and descriptive normative influence determine functional food choices. *Appetite*, 131, 59–67. <https://doi.org/10.1016/j.appet.2018.08.015>
- Barrena Figueroa, M. R., & Sánchez, M. (2004). El consumidor ante los alimentos de nueva generación: alimentos funcionales y alimentos transgénicos. *Revista Española de Estudios Agrosociales y Pesqueros*, 2004(204), 95–128. <https://doi.org/10.22004/AG.ECON.166044>
- 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. <https://doi.org/10.24136/eq.2021.025>
- Bauerová, R., & Klepek, M. (2018). Technology acceptance as a determinant of online grocery shopping adoption. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 66(3), 737–746. <https://doi.org/10.11118/actaun201866030737>
- Bech-Larsen, T., & Grunert, K. G. (2003). The perceived healthiness of functional foods: A conjoint study of Danish, Finnish and American consumers' perception of functional foods. *Appetite*, 40(1), 9–14. [https://doi.org/10.1016/S0195-6663\(02\)00171-X](https://doi.org/10.1016/S0195-6663(02)00171-X)
- Bech-Larsen, T., & Scholderer, J. (2007). Functional foods in Europe: consumer research, market experiences and regulatory aspects. *Trends in Food Science and Technology*, 18(4), 231–234. <https://doi.org/10.1016/j.tifs.2006.12.006>
- Becker, M. H., Maiman, L. A., Kirscht, J. P., Haefner, D. P., & Drachman, R. H. (1977). The health belief model and prediction of dietary compliance: A field experiment. *Journal of Health and Social Behavior*, 18(4), 348–366. <https://doi.org/10.2307/2955344>
- Behera, R. K., Gunasekaran, A., Gupta, S., Kamboj, S., & Bala, P. K. (2020). Personalized digital marketing recommender engine. *Journal of*

Retailing and Consumer Services, 53, 101799.
<https://doi.org/10.1016/J.JRETCONSER.2019.03.026>

- Bekoglu, F. B., Ergen, A., & Inci, B. (2016). The Impact of Attitude, Consumer Innovativeness and Interpersonal Influence on Functional Food Consumption. *International Business Research*, 9(4), p79.
<https://doi.org/10.5539/IBR.V9N4P79>
- Bennett, G., Ferreira, M., Tsuji, Y., Siders, R., & Cianfrone, B. (2006). Analysing the effects of advertising type and antecedents on attitude towards advertising in sport. *International Journal of Sports Marketing and Sponsorship*, 8(1), 56–75. <https://doi.org/10.1108/IJSMS-08-01-2006-B008>
- Bigné-Alcaiz, E., Ruiz-Mafé, C., Aldás-Manzano, J., & Sanz-Blas, S. (2013). Online Shopper Behavior: Influences of Online Shopping Decision. *Online Information Review*, 32(5), 648–667.
<https://doi.org/10.1108/14684520810914025>
- Bimbo, F., Bonanno, A., Nocella, G., Viscecchia, R., Nardone, G., De Devitiis, B., & Carlucci, D. (2017). Consumers' acceptance and preferences for nutrition-modified and functional dairy products: A systematic review. *Appetite*, 113, 141–154.
<https://doi.org/10.1016/j.appet.2017.02.031>
- Birkinshaw, J., Morrison, A., & Hulland, J. (1995). Structural and competitive determinants of a global integration strategy. *Strategic Management Journal*, 16(8), 637–655.
<https://doi.org/10.1002/SMJ.4250160805>
- Boeneke, C. A., & Aryana, K. J. (2008). Effect of folic acid fortification on the characteristics of lemon yogurt. *LWT - Food Science and Technology*, 41(7), 1335–1343.
<https://doi.org/10.1016/J.LWT.2007.08.010>
- Boßow-Thies, S., & Panten, G. (2009). Analyse kausaler Wirkungszusammenhänge mit Hilfe von Partial Least Squares (PLS). *Methodik Der Empirischen Forschung*, 365–380.
https://doi.org/10.1007/978-3-322-96406-9_24
- Brečić, Ružica, Gorton, M., & Barjolle, D. (2014). Understanding variations in the consumption of functional foods - evidence from Croatia. *British Food Journal*, 116(4), 662–675. [124](https://doi.org/10.1108/BFJ-05-2012-</p></div><div data-bbox=)

- Brečić, Ruzica, Mesić, Ž., & Cerjak, M. (2017). Importance of intrinsic and extrinsic quality food characteristics by different consumer segments. *British Food Journal*, *119*(4), 845–862. <https://doi.org/10.1108/BFJ-06-2016-0284/FULL/XML>
- BURT, C. (1954). The assessment of personality. *The Journal of Mental Science*, *100*(418), 1–28. <https://doi.org/10.1192/bjp.100.418.1>
- Büyükkaragöz, A., Bas, M., Sağlam, D., & Cengiz, Ş. E. (2014). Consumers' awareness, acceptance and attitudes towards functional foods in Turkey. *International Journal of Consumer Studies*, *38*(6), 628–635. <https://doi.org/10.1111/IJCS.12134>
- Çakiroğlu, F. P., & Uçar, A. (2018). Consumer attitudes towards purchasing functional products. *Progress in Nutrition*, *20*(2), 257–262. <https://doi.org/10.23751/PN.V20I2.5859>
- Carrete, L., & Arroyo, P. (2014). Social marketing to improve healthy dietary decisions: Insights from a qualitative study in Mexico. *Qualitative Market Research*, *17*(3), 239–263. <https://doi.org/10.1108/QMR-11-2011-0023/FULL/XML>
- Carrillo-Lopez, L. M., Garcia-Galicia, I. A., Tirado-Gallegos, J. M., Sanchez-Vega, R., Huerta-Jimenez, M., Ashokkumar, M., & Alarcon-Rojo, A. D. (2021). Recent advances in the application of ultrasound in dairy products: Effect on functional, physical, chemical, microbiological and sensory properties. *Ultrasonics Sonochemistry*, *73*, 105467. <https://doi.org/10.1016/j.ultsonch.2021.105467>
- Carrillo, E., Prado-Gascó, V., Fiszman, S., & Varela, P. (2013). Why buying functional foods? Understanding spending behaviour through structural equation modelling. *Food Research International*, *50*(1), 361–368. <https://doi.org/10.1016/j.foodres.2012.10.045>
- Caus, T., Christmann, S., & Hagenhoff, S. (2009). Development of context-aware mobile services: An approach to simplification. *International Journal of Mobile Communications*, *7*(2), 133–153. <https://doi.org/10.1504/IJMC.2009.022439>
- Chang, B. P. I., Massri, C., Reipurth, M., Petropoulou, E., Hüttl-Maack, V., Gawlik, D., Kujáni, K., Szente, V., Hegyi, A., Fricz, Á. S., Cruz, E. S., Benos, T., Aouinaït, C., Campos, D., Alfaro, B., Jansseni, F.,

- Theodorakopoulou, I., Iliopoulos, C., & Hieke, S. (2022). Barriers and Facilitators of Purchasing from Short Food Supply Chains: Evidence from Consumer Focus Groups in Germany, Spain, Greece and Hungary. *International Journal of Food Studies*, *11*(0), 208–218. <https://doi.org/10.7455/ijfs/11.SI.2022.a7>
- Chang, H. P., Ma, C. C., & Chen, H. S. (2020). The Impacts of Young Consumers' Health Values on Functional Beverages Purchase Intentions. *International Journal of Environmental Research and Public Health* 2020, Vol. 17, Page 3479, *17*(10), 3479. <https://doi.org/10.3390/IJERPH17103479>
- Chang, M. K., Cheung, W., & Lai, V. S. (2005). Literature derived reference models for the adoption of online shopping. *Information & Management*, *42*(4), 543–559. <https://doi.org/10.1016/j.im.2004.02.006>
- Changchit, C., Cutshall, R., Lonkani, R., Pholwan, K., & Pongwiritthon, R. (2018). Determinants of Online Shopping Influencing Thai Consumer's Buying Choices. <https://doi.org/10.1080/15332861.2018.1496391>, *18*(1), 1–23. <https://doi.org/10.1080/15332861.2018.1496391>
- Chen, Jie, Wang, H., & Gao, W. (2019). How do goal and product knowledge specificity influence online channel choice? A polynomial regression analysis. *Electronic Commerce Research and Applications*, *35*, 100846. <https://doi.org/10.1016/j.elerap.2019.100846>
- Chen, Juan, Zhang, Z., Yu, P., Gan, W. T., Ren, K. H., Zhang, F., Chen, F., Wang, M. W., Bao, J. Z., & Wang, T. (2020). Beneficial effects of green tea on age related diseases. *Frontiers in Bioscience - Scholar*, *12*(1), 70–91. <https://doi.org/10.2741/S541/PDF>
- Chen, M. F. (2011a). The mediating role of subjective health complaints on willingness to use selected functional foods. *Food Quality and Preference*, *22*(1), 110–118. <https://doi.org/10.1016/J.FOODQUAL.2010.08.006>
- Chen, M. F. (2011b). The joint moderating effect of health consciousness and healthy lifestyle on consumers' willingness to use functional foods in Taiwan. *Appetite*, *57*(1), 253–262. <https://doi.org/10.1016/J.APPET.2011.05.305>
- Cheng, J. M. S., Blankson, C., Wang, E. S. T., & Chen, L. S. L. (2009). Consumer attitudes and interactive digital advertising. *International*

Journal of Advertising, 28(3), 501–525.
<https://doi.org/10.2501/S0265048709200710>

- Chien, A.-W., Kurnia, S., von Westarp, F., & Westarp, V. (2003). Association for Information Systems AIS Electronic Library (AISeL) BLED 2003 Proceedings BLED Proceedings The Acceptance of Online Grocery Shopping Recommended Citation. *AIS Electronic Library, December*. <http://aisel.aisnet.org/bled2003/52>
- Chin W, M. G. (1998). The Partial Least Squares Approach to Structural Formula Modeling. *Advances in Hospitality and Leisure*, 8 (2) (January 1998), 5.
[https://books.google.hu/books?hl=en&lr=&id=EDZ5AgAAQBAJ&oi=fnd&pg=PA295&dq=Chin,+W.+W.+\(1998\).+The+partial+least+squares+approach+to+structural+equation+modeling.+In+G.+A.+Marcoulides+\(Ed.\),+Modern+methods+for+business+research+\(pp.+295-336\).+Lawrence+Erl](https://books.google.hu/books?hl=en&lr=&id=EDZ5AgAAQBAJ&oi=fnd&pg=PA295&dq=Chin,+W.+W.+(1998).+The+partial+least+squares+approach+to+structural+equation+modeling.+In+G.+A.+Marcoulides+(Ed.),+Modern+methods+for+business+research+(pp.+295-336).+Lawrence+Erl)
- Chiu, C. M., Wang, E. T. G., Fang, Y. H., & Huang, H. Y. (2014). Understanding customers' repeat purchase intentions in B2C e-commerce: the roles of utilitarian value, hedonic value and perceived risk. *Information Systems Journal*, 24(1), 85–114.
<https://doi.org/10.1111/J.1365-2575.2012.00407.X>
- Choe, J. Y., Kim, J. J., & Hwang, J. (2021). Innovative marketing strategies for the successful construction of drone food delivery services: Merging TAM with TPB. *Https://Doi.Org/10.1080/10548408.2020.1862023*, 38(1), 16–30. <https://doi.org/10.1080/10548408.2020.1862023>
- Choi, S. M., & Rifon, N. J. (2013). Antecedents and Consequences of Web Advertising Credibility. *Https://Doi.Org/10.1080/15252019.2002.10722064*, 3(1), 12–24.
<https://doi.org/10.1080/15252019.2002.10722064>
- Choumenkovitch, S. F., Selhub, J., Wilson, P. W. F., Rader, J. I., Rosenberg, I. H., & Jacques, P. F. (2002). Folic Acid Intake from Fortification in United States Exceeds Predictions. *The Journal of Nutrition*, 132(9), 2792–2798. <https://doi.org/10.1093/JN/132.9.2792>
- Clal. (2022). *Hungary: Dairy sector*. CLAL.
https://www.clal.it/en/index.php?section=quadro_europa&country=HU
- Clifton, P. M., Noakes, M., Sullivan, D., Erichsen, N., Ross, D., Annison, G.,

- Fassoulakis, A., Cehun, M., & Nestel, P. (2004). Cholesterol-lowering effects of plant sterol esters differ in milk, yoghurt, bread and cereal. *European Journal of Clinical Nutrition*, 58(3), 503–509. <https://doi.org/10.1038/SJ.EJCN.1601837>
- Coats, R., & Martirosyan, D. (2015). The effects of bioactive compounds on biomarkers of obesity. *Functional Foods in Health and Disease*, 5(11), 365–380. <https://doi.org/10.31989/FFHD.V5I11.219>
- Collard, K. M., & McCormick, D. P. (2021). A Nutritional Comparison of Cow's Milk and Alternative Milk Products. *Academic Pediatrics*, 21(6), 1067–1069. <https://doi.org/10.1016/J.ACAP.2020.12.007>
- Corso, M. P., Kalschne, D. L., & Benassi, M. de T. (2018). Consumer's Attitude Regarding Soluble Coffee Enriched with Antioxidants. *Beverages 2018*, Vol. 4, Page 72, 4(4), 72. <https://doi.org/10.3390/BEVERAGES4040072>
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334. <https://doi.org/10.1007/BF02310555/METRICS>
- Cuesta-Valiño, P., Rodríguez, P. G., & Núñez-Barriopedro, E. (2020). Perception of Advertisements for Healthy Food on Social Media: Effect of Attitude on Consumers' Response. *International Journal of Environmental Research and Public Health 2020*, Vol. 17, Page 6463, 17(18), 6463. <https://doi.org/10.3390/IJERPH17186463>
- Dang, A. K., Tran, B. X., Nguyen, C. T., Le, H. T., Do, H. T., Nguyen, H. D., Nguyen, L. H., Nguyen, T. H., Mai, H. T., Tran, T. D., Ngo, C., Vu, T. T. M., Latkin, C. A., Zhang, M. W. B., & Ho, R. C. M. (2018). Consumer Preference and Attitude Regarding Online Food Products in Hanoi, Vietnam. *International Journal of Environmental Research and Public Health 2018*, Vol. 15, Page 981, 15(5), 981. <https://doi.org/10.3390/IJERPH15050981>
- Danks, N. P., & Ray, S. (2018). Predictions from partial least squares models. *Applying Partial Least Squares in Tourism and Hospitality Research*, 35–52. <https://doi.org/10.1108/978-1-78756-699-620181003/FULL/XML>
- Dao, W. V.-T., Le, A. N. H., Cheng, J. M.-S., & Chen, D. C. (2015). Social media advertising value. <Http://Dx.Doi.Org/10.2501/IJA-33-2-271-294>,

33(2), 271–294. <https://doi.org/10.2501/IJA-33-2-271-294>

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, 13(3), 319–339. <https://doi.org/10.2307/249008>

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35(8), 982–1003. <https://doi.org/10.1287/mnsc.35.8.982>

Deák, Z. (2014). Fenntarthatóság és a fogyasztói társadalom Magyarországon Sustainability and consumerism in Hungary. *Gradus*, 1(2), 126–132.

Deshpande, S., Basil, M. D., & Basil, D. Z. (2009). Factors Influencing Healthy Eating Habits Among College Students: An Application of the Health Belief Model. <Http://Dx.Doi.Org/10.1080/07359680802619834>, 26(2), 145–164. <https://doi.org/10.1080/07359680802619834>

Devries, M. C., & Phillips, S. M. (2015). Supplemental Protein in Support of Muscle Mass and Health: Advantage Whey. *Journal of Food Science*, 80(S1), A8–A15. <https://doi.org/10.1111/1750-3841.12802>

Dhar, R., & Wertenbroch, K. (2018). Consumer Choice between Hedonic and Utilitarian Goods. <Https://Doi.Org/10.1509/Jmkr.37.1.60.18718>, 37(1), 60–71. <https://doi.org/10.1509/JMKR.37.1.60.18718>

Dix, S., Ferguson, G., Logan, K., Bright, L. F., & Gangadharbatla, H. (2012). Facebook versus television: Advertising value perceptions among females. *Journal of Research in Interactive Marketing*, 6(3), 164–179. <https://doi.org/10.1108/17505931211274651/FULL/XML>

Downes, L. (2008). Motivators and Barriers of a Healthy Lifestyle Scale: Development and Psychometric Characteristics. *Journal of Nursing Measurement*, 16(1), 3–15. <https://doi.org/10.1891/1061-3749.16.1.3>

Driediger, F., & Bhatiasevi, V. (2019). Online grocery shopping in Thailand: Consumer acceptance and usage behavior. *Journal of Retailing and Consumer Services*, 48, 224–237. <https://doi.org/10.1016/j.jretconser.2019.02.005>

Ducoffe, R. H. (1996). Advertising value and advertising on the web. *Journal of Advertising Research*, 36(5), 21–35. <https://slidelegend.com/advertising-value-and-advertising-on-the-web->

- Ebrahimi, P., Hamza, K. A., Gorgenyi-Hegyes, E., Zarea, H., & Fekete-Farkas, M. (2021). Consumer Knowledge Sharing Behavior and Consumer Purchase Behavior: Evidence from E-Commerce and Online Retail in Hungary. *Sustainability 2021, Vol. 13, Page 10375, 13*(18), 10375. <https://doi.org/10.3390/SU131810375>
- Edwards, S. M., Li, H., & Lee, J. H. (2013). Forced Exposure and Psychological Reactance: Antecedents and Consequences of the Perceived Intrusiveness of Pop-Up Ads. *Https://Doi.Org/10.1080/00913367.2002.10673678, 31*(3), 83–95. <https://doi.org/10.1080/00913367.2002.10673678>
- Efron, B. (1987). Better bootstrap confidence intervals. *Journal of the American Statistical Association, 82*(397), 171–185. <https://doi.org/10.1080/01621459.1987.10478410>
- EPA. (2022, May 19). *Carbon Pollution from Transportation*. United States Environmental Protection Agency. <https://www.epa.gov/transportation-air-pollution-and-climate-change/carbon-pollution-transportation>
- Eyler, A. A., Baker, E., Cromer, L. C., King, A. C., Brownson, R. C., & Donatelle, R. J. (1998). Physical Activity and Minority Women: A Qualitative Study. *Health Education and Behavior, 25*(5), 640–652. <https://doi.org/10.1177/109019819802500510>
- Fehér, O., Gere, A., Csiby, Á., Szakál, D., & Dunay, A. (2022). Profiling Hungarian hypermarket shoppers. *British Food Journal, 124*(4), 1204–1220. <https://doi.org/10.1108/BFJ-03-2021-0210/FULL/XML>
- Figler, M., Mózsik, G., Schaffer, B., Gasztonyi, B., Ács, P., Szili, B., Rab, R., & Szakály, S. (2006). Effect of special Hungarian probiotic kefir on faecal microflora. *World Journal of Gastroenterology : WJG, 12*(7), 1129. <https://doi.org/10.3748/WJG.V12.I7.1129>
- Fiorindi, C., Russo, E., Balocchini, L., Amedei, A., & Giudici, F. (2022). Inflammatory Bowel Disease and Customized Nutritional Intervention Focusing on Gut Microbiome Balance. *Nutrients 2022, Vol. 14, Page 4117, 14*(19), 4117. <https://doi.org/10.3390/NU14194117>
- Fishbein, M., & Ajzen, I. (2011). Predicting and changing behavior: The reasoned action approach. *Predicting and Changing Behavior: The Reasoned Action Approach, 1–518*.

<https://doi.org/10.4324/9780203838020/PREDICTING-CHANGING-BEHAVIOR-MARTIN-FISHBEIN-ICEK-AJZEN>

- Fleury, J. (1996). Wellness motivation theory: an exploration of theoretical relevance. *Nursing Research*, 45(5), 277–283.
<https://doi.org/10.1097/00006199-199609000-00005>
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39–50.
<https://doi.org/10.1177/002224378101800104>
- Gangadharbatla, H., & Daugherty, T. (2013). Advertising Versus Product Placements: How Consumers Assess the Value of Each. *Http://Dx.Doi.Org/10.1080/10641734.2013.754706*, 34(1), 21–38.
<https://doi.org/10.1080/10641734.2013.754706>
- Garai-Fodor, M., Popovics, A., & Csiszarik-Kocsir, A. (2022). The perception of Hungarian food by consumer segments according to food purchasing preferences based on primary research results. *PLoS ONE*, 17(8 August), e0273023. <https://doi.org/10.1371/journal.pone.0273023>
- Garbóczy, S., Szemán-Nagy, A., Ahmad, M. S., Harsányi, S., Ocsenás, D., Rekenyi, V., Al-Tammemi, A. B., & Kolozsvári, L. R. (2021). Health anxiety, perceived stress, and coping styles in the shadow of the COVID-19. *BMC Psychology*, 9(1), 1–13.
<https://doi.org/10.1186/S40359-021-00560-3/TABLES/6>
- García-Salirrosas, E. E., Millones-Liza, D. Y., Esponda-Pérez, J. A., Acevedo-Duque, Á., Müller-Pérez, J., & Sánchez Díaz, L. C. (2022). Factors Influencing Loyalty to Health Food Brands: An Analysis from the Value Perceived by the Peruvian Consumer. *Sustainability* 2022, Vol. 14, Page 10529, 14(17), 10529.
<https://doi.org/10.3390/SU141710529>
- Gasmi, A., Noor, S., Tippairote, T., Dadar, M., Menzel, A., & Bjørklund, G. (2020). Individual risk management strategy and potential therapeutic options for the COVID-19 pandemic. *Clinical Immunology*, 215, 108409. <https://doi.org/10.1016/J.CLIM.2020.108409>
- Gefen, D. (2000). E-commerce: the role of familiarity and trust. *Omega*, 28(6), 725–737. [https://doi.org/10.1016/S0305-0483\(00\)00021-9](https://doi.org/10.1016/S0305-0483(00)00021-9)
- Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and tam in online

- shopping: AN integrated model. *MIS Quarterly: Management Information Systems*, 27(1), 51–90. <https://doi.org/10.2307/30036519>
- Gefen, D., Straub, D. W., & Straub Mack Robinson, D. J. (2000). The Relative Importance of Perceived Ease of Use in IS Adoption: A Study of E-Commerce Adoption. *Journal of the Association for Information Systems*, 1(1), 8. <https://doi.org/10.17705/1jais.00008>
- Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika*, 61(1), 101–107. <https://doi.org/10.1093/BIOMET/61.1.101>
- Gentry, L., & Calantone, R. (2002). A comparison of three models to explain shop-bot use on the web. *Psychology & Marketing*, 19(11), 945–956. <https://doi.org/10.1002/MAR.10045>
- Goethals, F., Leclercq-Vandelannoitte, A., & Tütüncü, Y. (2012). French consumers' perceptions of the unattended delivery model for e-grocery retailing. *Journal of Retailing and Consumer Services*, 19(1), 133–139. <https://doi.org/10.1016/J.JRETCONSER.2011.11.002>
- Goetzke, B., Nitzko, S., & Spiller, A. (2014). Consumption of organic and functional food. A matter of well-being and health? *Appetite*, 77, 96–105. <https://doi.org/10.1016/j.appet.2014.02.012>
- 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. <https://doi.org/10.3390/jtaer17030047>
- Grunkowski, L. M., & Martinez, L. F. (2022). Online Grocery Shopping in Germany: Assessing the Impact of COVID-19. *Journal of Theoretical and Applied Electronic Commerce Research*, 17(3), 984–1002. <https://doi.org/10.3390/jtaer17030050>
- Hadjimbei, E., Botsaris, G., & Chrysostomou, S. (2022). Beneficial Effects of Yoghurts and Probiotic Fermented Milks and Their Functional Food Potential. *Foods 2022, Vol. 11, Page 2691, 11(17)*, 2691. <https://doi.org/10.3390/FOODS11172691>
- Hair, Joe F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139–152. <https://doi.org/10.2753/MTP1069-6679190202>
- Hair, Joseph F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to

- use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203/FULL/XML>
- Hair, Joseph F, Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2021). *Advanced issues in partial least squares structural equation modeling (PLS-SEM)* (Vol. 4, Issue 1). https://books.google.com/books/about/Advanced_Issues_in_Partial_Least_Squares.html?id=5wmXDgAAQBAJ
- Hallikainen, H., Luongo, M., Dhir, A., & Laukkanen, T. (2022). Consequences of personalized product recommendations and price promotions in online grocery shopping. *Journal of Retailing and Consumer Services*, 69, 103088. <https://doi.org/10.1016/J.JRETCONSER.2022.103088>
- Hamouda, M. (2018). Understanding social media advertising effect on consumers' responses: An empirical investigation of tourism advertising on Facebook. *Journal of Enterprise Information Management*, 31(3), 426–445. <https://doi.org/10.1108/JEIM-07-2017-0101/FULL/XML>
- Handa, M., & Gupta, N. (2014). A Study of the Relationship between Shopping Orientation and Online Shopping Behavior among Indian Youth. *Journal of Internet Commerce*, 13(1), 22–44. <https://doi.org/10.1080/15332861.2014.918437>
- Hansen, T. (2005). Consumer adoption of online grocery buying: A discriminant analysis. *International Journal of Retail & Distribution Management*, 33(2), 101–121. <https://doi.org/10.1108/09590550510581449/FULL/XML>
- Hassanein, K., & Head, M. (2007). Manipulating perceived social presence through the web interface and its impact on attitude towards online shopping. *International Journal of Human-Computer Studies*, 65(8), 689–708. <https://doi.org/10.1016/J.IJHCS.2006.11.018>
- Havelda, L., Bencz, Z., Veresn, M., & Alint, E. B. (2020). Knowledge, awareness, and usage of probiotics among Hungarian adults: An explorative survey. *Developments in Health Sciences*, 3(3), 53–57. <https://doi.org/10.1556/2066.2020.00010>
- Henseler, J. (2018). Partial least squares path modeling: Quo vadis? *Quality and Quantity*, 52(1), 1–8. <https://doi.org/10.1007/S11135-018-0689->

6/FIGURES/1

- 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. <https://doi.org/10.1007/S11747-014-0403-8/FIGURES/8>
- Hodges, J. K., Cao, S., Cladis, D. P., & Weaver, C. M. (2019). Lactose Intolerance and Bone Health: The Challenge of Ensuring Adequate Calcium Intake. *Nutrients*, 11(4). <https://doi.org/10.3390/NU11040718>
- Hoffman, D. L., Novak, T. P., & Peralta, M. (1999). Building consumer trust online. *Communications of the ACM*, 42(4), 80–85. <https://doi.org/10.1145/299157.299175>
- Homer, P. M., & Kahle, L. R. (1988). A Structural Equation Test of the Value-Attitude-Behavior Hierarchy. *Journal of Personality and Social Psychology*, 54(4), 638–646. <https://doi.org/10.1037/0022-3514.54.4.638>
- Honkanen, P., Verplanken, B., & Olsen, S. O. (2006). Ethical values and motives driving organic food choice. *Journal of Consumer Behaviour*, 5(5), 420–430. <https://doi.org/10.1002/CB.190>
- Hoque, M. Z., Nurul Alam, M., & Nahid, K. A. (2018). Health Consciousness and Its Effect on Perceived Knowledge, and Belief in the Purchase Intent of Liquid Milk: Consumer Insights from an Emerging Market. *Foods 2018*, Vol. 7, Page 150, 7(9), 150. <https://doi.org/10.3390/FOODS7090150>
- Horacek, Tanya M., & Nancy M. Betts. (1998). Students cluster into 4 groups according to the factors influencing their dietary intake. *Journal of the Academy of Nutrition and Dietetics* 98, 12, 1464. <https://www.proquest.com/openview/dd9dc13fc3f9b8e9ca8e55195399aa4e/1?pq-origsite=gscholar&cbl=49142>
- House, J., Su, J., & Levy-Milne, R. (2006). Definitions of healthy eating among university students. *Canadian Journal of Dietetic Practice and Research*, 67(1), 14–18. <https://doi.org/10.3148/67.1.2006.14>
- Hu, L. T., & Bentler, P. M. (1998). Fit Indices in Covariance Structure Modeling: Sensitivity to Underparameterized Model Misspecification. *Psychological Methods*, 3(4), 424–453. <https://doi.org/10.1037/1082-989X.3.4.424>

- Huang, L., Bai, L., Zhang, X., & Gong, S. (2019). Re-understanding the antecedents of functional foods purchase: Mediating effect of purchase attitude and moderating effect of food neophobia. *Food Quality and Preference*, *73*, 266–275.
<https://doi.org/10.1016/J.FOODQUAL.2018.11.001>
- Huang, Y., & Oppewal, H. (2006). Why consumers hesitate to shop online: An experimental choice analysis of grocery shopping and the role of delivery fees. *International Journal of Retail and Distribution Management*, *34*(4–5), 334–353.
<https://doi.org/10.1108/09590550610660260>
- Huszka, P., Karácsony, P., & Juhász, T. (2022). The coronavirus's effect on the decisions and habits of food purchases in Hungary. *Journal of International Studies*, *15*(1), 2022. <https://doi.org/10.14254/2071-8330.2022/15-1/10>
- Jaeger, S. R. (2006). Non-sensory factors in sensory science research. *Food Quality and Preference*, *17*(1–2), 132–144.
<https://doi.org/10.1016/J.FOODQUAL.2005.03.004>
- Jahn, S., Tsalis, G., & Lähteenmäki, L. (2019). How attitude towards food fortification can lead to purchase intention. *Appetite*, *133*, 370–377.
<https://doi.org/10.1016/J.APPET.2018.11.022>
- Jayanti, R. K., & Burns, A. C. (1998). The antecedents of preventive health care behavior: An empirical study. *Journal of the Academy of Marketing Science* *1998* *26:1*, *26*(1), 6–15.
<https://doi.org/10.1177/0092070398261002>
- Jelena Filipovic, and B. M. S. Z. (2013). Consumer acceptance of functional foods in Montenegro. *Montenegrin Journal of Economics*, *9*(3), 65.
- Jilcott Pitts, S. B., Ng, S. W., Blitstein, J. L., Gustafson, A., Kelley, C. J., Pandya, S., & Weismiller, H. (2020). Perceived Advantages and Disadvantages of Online Grocery Shopping among Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Participants in Eastern North Carolina. *Current Developments in Nutrition*, *4*(5). <https://doi.org/10.1093/CDN/NZAA076>
- Jilcott Pitts, S. B., Ng, S. W., Blitstein, J. L., Gustafson, A., & Niculescu, M. (2018). Online grocery shopping: promise and pitfalls for healthier food and beverage purchases. *Public Health Nutrition*, *21*(18), 3360–3376.

<https://doi.org/10.1017/S1368980018002409>

- Jones, M., & Nies, M. A. (1996). The Relationship of Perceived Benefits of and Barriers to Reported Exercise in Older African American Women. *Public Health Nursing, 13*(2), 151–158. <https://doi.org/10.1111/J.1525-1446.1996.TB00233.X>
- Jong, N. de, Ocké, M. C., Branderhorst, H. A. C., & Friele, R. (2003). Demographic and lifestyle characteristics of functional food consumers and dietary supplement users. *British Journal of Nutrition, 89*(2), 273–281. <https://doi.org/10.1079/BJN2002772>
- Jöreskog, K. G. (1971). Simultaneous factor analysis in several populations. *Psychometrika, 36*(4), 409–426. <https://doi.org/10.1007/BF02291366/METRICS>
- Juhász, T., Huszka, P., & Karácsony, P. (2022). Impact of the crisis caused by the coronavirus on Hungarian consumer behavior related to food purchases. *Ukrainian Food Journal, 11*(2), 315–330. <https://doi.org/10.24263/2304-974X-2022-11-2-11>
- Jung, S. E., Shin, Y. H., Severt, K., & Crowe-White, K. M. (2020). Determinants of a Consumer's Intention to Consume Antioxidant-infused Sugar-free Chewing Gum: Measuring Taste, Attitude, and Health Consciousness. <https://doi.org/10.1080/10454446.2020.1717712>, 26(1), 38–54. <https://doi.org/10.1080/10454446.2020.1717712>
- Kang, J., Jun, J., & Arendt, S. W. (2015). Understanding customers' healthy food choices at casual dining restaurants: Using the Value–Attitude–Behavior model. *International Journal of Hospitality Management, 48*, 12–21. <https://doi.org/10.1016/J.IJHM.2015.04.005>
- Kásler, T. T. (2020). Investigating the ways parents perceive their preschool aged children's influence on their food purchase behaviour and brand preference. *Marketing & Menedzsment, 54*(2), 65–73. <https://doi.org/10.15170/MM.2020.54.02.06>
- Kasza, G., Szabó, E., Izsó, T., & Ózsvári, L. (2023). How Many Hungarian Consumers Choose Lactose- and Gluten-Free Food Products Even When They Do Not Necessarily Need to? *Foods, 12*(21). <https://doi.org/10.3390/foods12213984>

Katalin, T. (2019). ANALYSIS OF ONLINE SHOPPING TRENDS OF

HUNGARIAN AND AMERICAN ONLINE CONSUMERS. *VADYBA*.
<https://www.cceol.com/search/article-detail?id=807762>

Kaur, H., Kaur, G., & Ali, S. A. (2022). Dairy-Based Probiotic-Fermented Functional Foods: An Update on Their Health-Promoting Properties. *Fermentation* 2022, Vol. 8, Page 425, 8(9), 425.

<https://doi.org/10.3390/FERMENTATION8090425>

Kavoosi-Kalashami, M., Pourfarzad, A., Ghaibi, S., Allahyari, M. S., Surujlal, J., Borsellino, V., Kavoosi-Kalashami, M., Pourfarzad, A., Ghaibi, S., Allahyari, M. S., Surujlal, J., & Borsellino, V. (2017). Urban consumers' attitudes and willingness to pay for functional foods in Iran: A case of dietary sugar. *AIMS Agriculture and Food* 2017 3:310, 2(3), 310–323. <https://doi.org/10.3934/AGRFOOD.2017.3.310>

Keller, C. (1993). Developing and sustaining valued health behaviors in young African-American women. *Health Values*, 17(3), 49–49. https://scholar.google.com/scholar_lookup?hl=en&volume=17&publication_year=1993&pages=49-56&issue=3&author=+Keller%2C+C.&title=Developing+and+sustaining+valued+health+behaviors+in+young+African-American+women

Kim, J. B. (2012). An empirical study on consumer first purchase intention in online shopping: integrating initial trust and TAM. *Electronic Commerce Research* 2012 12:2, 12(2), 125–150.

<https://doi.org/10.1007/S10660-012-9089-5>

Kim, Y. G., & Woo, E. (2016). Consumer acceptance of a quick response (QR) code for the food traceability system: Application of an extended technology acceptance model (TAM). *Food Research International*, 85, 266–272. <https://doi.org/10.1016/j.foodres.2016.05.002>

Kiss, K., Ruzskai, C., Szucs, A., & Koncz, G. (2020). Examining the Role of Local Products in Rural Development in the Light of Consumer Preferences—Results of a Consumer Survey from Hungary. *Sustainability* 2020, Vol. 12, Page 5473, 12(13), 5473.

<https://doi.org/10.3390/SU12135473>

Kiss, M., Czine, P., Balogh, P., & Szakály, Z. (2022). The connection between manufacturer and private label brands and brand loyalty in chocolate bar buying decisions – A hybrid choice approach. *Appetite*, 177, 106145. <https://doi.org/10.1016/J.APPET.2022.106145>

- Klepek, M., & Bauerová, R. (2020). Why do retail customers hesitate for shopping grocery online? *Technological and Economic Development of Economy*, 26(6), 1444–1462. <https://doi.org/10.3846/TEDE.2020.13970>
- Kljusuric, J. G., Čačić, J., Misir, A., & Čačić, D. (2015). Geographical region as a factor influencing consumers' perception of functional food – case of Croatia. *British Food Journal*, 117(3), 1017–1031. <https://doi.org/10.1108/BFJ-12-2013-0282/FULL/XML>
- Kohavi, R. (1995). *A Study of Cross-Validation and Bootstrap for Accuracy Estimation and Model Selection*. <http://robotics.stanford.edu/~ronnyk>
- Korpela, R., Tuomilehto, J., Höglström, P., Seppo, L., Piironen, V., Salo-Väänänen, P., Toivo, J., Lamberg-Allardt, C., Kärkkäinen, M., Outila, T., Sundvall, J., Vilkkilä, S., & Tikkanen, M. J. (2006). Safety aspects and cholesterol-lowering efficacy of low fat dairy products containing plant sterols. *European Journal of Clinical Nutrition* 2006 60:5, 60(5), 633–642. <https://doi.org/10.1038/sj.ejcn.1602362>
- Kovalchuk, O. (2020). BRANDING AS AN EFFECTIVE MARKETING STRATEGY FOR THE COMPETITIVENESS OF THE DAIRY INDUSTRY. *Green, Blue and Digital Economy Journal*, 1(2), 14–19. <https://doi.org/10.30525/2661-5169/2020-2-3>
- Kozup, J. C., Creyer, E. H., & Burton, S. (2018). Making Healthful Food Choices: The Influence of Health Claims and Nutrition Information on Consumers' Evaluations of Packaged Food Products and Restaurant Menu Items: <https://doi.org/10.1509/Jmkg.67.2.19.18608>, 67(2), 19–34. <https://doi.org/10.1509/JMKG.67.2.19.18608>
- Kraus, Artur, Azzurra, A., & Riccardo, V. (2017). Sociodemographic Factors Differentiating the Consumer and the Motivations for Functional Food Consumption. *Journal of the American College of Nutrition*, 36(2), 116–126. <https://doi.org/10.1080/07315724.2016.1228489>
- Krutulyte, R., Grunert, K. G., Scholderer, J., Lähteenmäki, L., Hagemann, K. S., Elgaard, P., Nielsen, B., & Graverholt, J. P. (2011). Perceived fit of different combinations of carriers and functional ingredients and its effect on purchase intention. *Food Quality and Preference*, 22(1), 11–16. <https://doi.org/10.1016/J.FOODQUAL.2010.06.001>
- Kušar, A., Žmitek, K., Lähteenmäki, L., Raats, M. M., & Pravst, I. (2021). Comparison of requirements for using health claims on foods in the

- European Union, the USA, Canada, and Australia/New Zealand. *Comprehensive Reviews in Food Science and Food Safety*, 20(2), 1307–1332. <https://doi.org/10.1111/1541-4337.12716>
- Küster-Boluda, I., & Vidal-Capilla, I. (2017). Consumer attitudes in the election of functional foods. *Spanish Journal of Marketing - ESIC*, 21, 65–79. <https://doi.org/10.1016/j.sjme.2017.05.002>
- Landström, E., Koivisto Hursti, U. K., Becker, W., & Magnusson, M. (2007). Use of functional foods among Swedish consumers is related to health-consciousness and perceived effect. *British Journal of Nutrition*, 98(5), 1058–1069. <https://doi.org/10.1017/S0007114507761780>
- Lee, C. C., & Hsieh, M. C. (2009). The influence of mobile self-efficacy on attitude towards mobile advertising. *Proceedings - 2009 International Conference on New Trends in Information and Service Science, NISS 2009*, 1231–1236. <https://doi.org/10.1109/NISS.2009.91>
- Loketkrawee, P., & Bhatiasevi, V. (2018). Elucidating the Behavior of Consumers toward Online Grocery Shopping: The Role of Shopping Orientation. <https://doi.org/10.1080/15332861.2018.1496390>, 17(4), 418–445. <https://doi.org/10.1080/15332861.2018.1496390>
- Lopez-Huertas, E. (2010). Health effects of oleic acid and long chain omega-3 fatty acids (EPA and DHA) enriched milks. A review of intervention studies. *Pharmacological Research*, 61(3), 200–207. <https://doi.org/10.1016/J.PHRS.2009.10.007>
- Luna-Nevarez, C., & Torres, I. M. (2015). Consumer Attitudes Toward Social Network Advertising. <http://dx.doi.org/10.1080/10641734.2014.912595>, 36(1), 1–19. <https://doi.org/10.1080/10641734.2014.912595>
- Lutz, R. J. (2021). Affective and Cognitive Antecedents of Attitude Toward the Ad: A Conceptual Framework. In *Psychological Processes and Advertising Effects: Theory, Research, and Applications* (pp. 45–63). Lawrence Erlbaum Associates. <https://cir.nii.ac.jp/crid/1571417126312228352>
- Lyly, M., Roininen, K., Honkapää, K., Poutanen, K., & Lähteenmäki, L. (2007). Factors influencing consumers' willingness to use beverages and ready-to-eat frozen soups containing oat β -glucan in Finland, France and Sweden. *Food Quality and Preference*, 18(2), 242–255.

<https://doi.org/10.1016/J.FOODQUAL.2005.12.001>

- Mack, F. (2018). *Factors influencing consumers' adoption of and resistance to functional food product innovations : an impirical investigation into adoption and resistance to functional food product innovations among German customers, to provide new opportunities in health claims regulated markets.*
- MacKenzie, S. B., & Lutz, R. J. (1989). An Empirical Examination of the Structural Antecedents of Attitude toward the Ad in an Advertising Pretesting Context. *Https://Doi.Org/10.1177/002224298905300204*, 53(2), 48–65. <https://doi.org/10.1177/002224298905300204>
- Madarász, T., Kontor, E., Antal, E., Kasza, G., Szakos, D., & Szakály, Z. (2022). Food Purchase Behavior during The First Wave of COVID-19: The Case of Hungary. *International Journal of Environmental Research and Public Health* 2022, Vol. 19, Page 872, 19(2), 872. <https://doi.org/10.3390/IJERPH19020872>
- Malik, A., & Sudhakar, B. D. (2014). Brand Positioning Through Celebrity Endorsement - A Review Contribution to Brand Literature. *International Review of Management and Marketing*, 4(4), 259–275. <https://dergipark.org.tr/en/pub/irmm/issue/32082/355066>
- Marangunić, N., & Granić, A. (2014). Technology acceptance model: a literature review from 1986 to 2013. *Universal Access in the Information Society* 2014 14:1, 14(1), 81–95. <https://doi.org/10.1007/S10209-014-0348-1>
- Marette, S., Roosen, J., Blanchemanche, S., & Feinblatt-Mélèze, E. (2010). Functional food, uncertainty and consumers' choices: A lab experiment with enriched yoghurts for lowering cholesterol. *Food Policy*, 35(5), 419–428. <https://doi.org/10.1016/J.FOODPOL.2010.04.009>
- Markovina, J., Čačić, J., Gajdoš Kljusurić, J., & Kovačić, D. (2011). Young consumers' perception of functional foods in Croatia. *British Food Journal*, 113(1), 7–16. <https://doi.org/10.1108/00070701111097303/FULL/XML>
- Marty, L., de Lauzon-Guillain, B., Labesse, M., & Nicklaus, S. (2021). Food choice motives and the nutritional quality of diet during the COVID-19 lockdown in France. *Appetite*, 157, 105005. <https://doi.org/10.1016/J.APPET.2020.105005>

- Matthews, L., Hair, J., & Matthews, R. (2018). PLS-SEM: The holy grail for advanced analysis. *The Marketing Management Journal*, 28(1), 1–13.
<https://web.s.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=1534973X&AN=129696340&h=EyB15sMNR8tM%2FOLItzmkdWQRzknaCqMeGlsM%2BL7UR%2F5FUFdLiPi3q0D1qTfy5w60GNX21H3QA2Nd6f1dLTZTPQ%3D%3D&crl=c&resultNs=AdminWebAuth&resultLo>
- Matthews, S. B., Waud, J. P., Roberts, A. G., & Campbell, A. K. (2005). Systemic lactose intolerance: A new perspective on an old problem. *Postgraduate Medical Journal*, 81(953), 167–173.
<https://doi.org/10.1136/pgmj.2004.025551>
- McKnight, H., & Kacmar, C. (2006). Factors of information credibility for an Internet advice site. *Proceedings of the Annual Hawaii International Conference on System Sciences*, 6.
<https://doi.org/10.1109/HICSS.2006.181>
- Meffert, H., Burmann, C., Kirchgeorg, M., & Eisenbeiß, M. (2019). Marketing. *Marketing*. <https://doi.org/10.1007/978-3-658-21196-7>
- Menrad, K. (2003). Market and marketing of functional food in Europe. *Journal of Food Engineering*, 56(Nr.2-3), 181–188.
- Michaelidou, N., & Hassan, L. M. (2010). Modeling the factors affecting rural consumers' purchase of organic and free-range produce: A case study of consumers' from the Island of Arran in Scotland, UK. *Food Policy*, 35(2), 130–139.
<https://doi.org/10.1016/J.FOODPOL.2009.10.001>
- Miles, S., Ueland, Ø., & Frewer, L. J. (2005). Public attitudes towards genetically-modified food. *British Food Journal*, 107(4), 246–262.
<https://doi.org/10.1108/00070700510589521/FULL/XML>
- Milner, J. A. (2000). Functional foods: the US perspective. *The American Journal of Clinical Nutrition*, 71(6), 1654S-1659S.
<https://doi.org/10.1093/AJCN/71.6.1654S>
- Ming, F. C., Hasan, N. H. M., Rahmat, S. M., & Abenoh, N. 'Aini. (2020). Consumer Purchase Behaviour Towards Online Grocery in Melaka. *International Journal of Business, Economics and Law*, 23(1), 25–33.
- Miroso, M., & Mangan-Walker, E. (2017). Young Chinese and Functional Foods for Mobility Health: Perceptions of Importance, Trust, and

- Willingness to Purchase and Pay a Premium.
<https://doi.org/10.1080/10454446.2017.1266555>, 24(2), 216–234.
<https://doi.org/10.1080/10454446.2017.1266555>
- Mohammad, A., Aldmour, R., & Al-Hawary, S. (2022). Drivers of online food delivery orientation. *International Journal of Data and Network Science*, 6(4), 1619–1624. <https://doi.org/10.5267/J.IJDNS.2022.4.016>
- Mohammad, M., & Szigeti, O. (2023). Relationship between attitude and online purchase intention of dairy functional foods in Hungary : an extended TAM approach. *European Research Studies Journal*, XXVI(1), 545–559. <https://doi.org/https://ersj.eu/journal/3128>
- Moons, I., Barbarossa, C., & De Pelsmacker, P. (2018). The Determinants of the Adoption Intention of Eco-friendly Functional Food in Different Market Segments. *Ecological Economics*, 151, 151–161. <https://doi.org/10.1016/J.ECOLECON.2018.05.012>
- Moro, D., Veneziani, M., Sckokai, P., & Castellari, E. (2015). Consumer Willingness to Pay for Catechin-enriched Yogurt: Evidence from a Stated Choice Experiment. *Agribusiness*, 31(2), 243–258. <https://doi.org/10.1002/AGR.21401>
- Nábrádi, Z., & Szakály, Z. (2021). Attitudes towards health foods in terms of diet and physical activity. *Élelmiszervizsgalati Közlemények*, 67(3), 3525–3541. <https://doi.org/10.52091/EVIK-2021/3-1-ENG>
- Nagpal, R., Behare, P. V., Kumar, M., Mohania, D., Yadav, M., Jain, S., Menon, S., Parkash, O., Marotta, F., Minelli, E., Henry, C. J. K., & Yadav, H. (2012). Milk, milk products, and disease free health: an updated overview. *Critical Reviews in Food Science and Nutrition*, 52(4), 321–333. <https://doi.org/10.1080/10408398.2010.500231>
- Nagy, S. (2010). Functional Food Marketing: The Hungarian Market Case. *Trusts & Trustees*, 21(5), i5–i5. <https://doi.org/10.1093/TANDT/TTV031>
- Nagy, S., & Ph, D. (2010). Functional Food Marketing - The Hungarian Market Case. *Theory Methodology Practice (TMP)*, 5(01), 43–49.
- Nam, C., Song, C., & Park, E. L. I. (2006). Consumers' Privacy Concerns and Willingness to Provide Marketing-Related Personal Information Online. *ACR North American Advances*, NA-33. <https://www.acrwebsite.org/volumes/12442/volumes/v33/NA-33>

- Narayana, N. M. N. K., Fernando, S., & Samaraweera, G. C. (2020). Awareness and Attitude towards Functional Dairy Products among Consumers in Western Province of Sri Lanka. *Turkish Journal of Agriculture - Food Science and Technology*, 8(6), 1308–1314. <https://doi.org/10.24925/turjaf.v8i6.1308-1314.3326>
- Németh-T., A., Vincze-Tóth, J., Hegyi, J., & Troján, S. (2013). A funkcionális élelmiszerek potenciális fogyasztói és vásárlói csoportjainak felmérése. *GAZDÁLKODÁS: Scientific Journal on Agricultural Economics*, 57(80-2016–950), 579–587.
- Németh, A., Szabó, E., Kasza, G., & Ózsvári, L. (2020). Development of lactose free, functional dairy foods based on consumer survey. *Gradus*, 7(1), 26–29. <https://doi.org/10.47833/2020.1.agr.006>
- Neulinger, A., & Simon, J. (2011). Food consumption patterns and healthy eating across the household life cycle in Hungary. *International Journal of Consumer Studies*, 35(5), 538–544. <https://doi.org/10.1111/J.1470-6431.2011.01015.X>
- Newsom, J. T., McFarland, B. H., Kaplan, M. S., Huguet, N., & Zani, B. (2005). The health consciousness myth: implications of the near independence of major health behaviors in the North American population. *Social Science & Medicine*, 60(2), 433–437. <https://doi.org/10.1016/J.SOCSCIMED.2004.05.015>
- Nguyen, H. V., Nguyen, N., Nguyen, B. K., Lobo, A., & Vu, P. A. (2019). Organic Food Purchases in an Emerging Market: The Influence of Consumers' Personal Factors and Green Marketing Practices of Food Stores. *International Journal of Environmental Research and Public Health* 2019, Vol. 16, Page 1037, 16(6), 1037. <https://doi.org/10.3390/IJERPH16061037>
- Nguyen, N., Nguyen, H. V., Nguyen, P. T., Tran, V. T., Nguyen, H. N., Nguyen, T. M. N., Cao, T. K., & Nguyen, T. H. (2019). Some Key Factors Affecting Consumers' Intentions to Purchase Functional Foods: A Case Study of Functional Yogurts in Vietnam. *Foods* 2020, Vol. 9, Page 24, 9(1), 24. <https://doi.org/10.3390/FOODS9010024>
- Nguyen, T. N., Lobo, A., & Nguyen, B. K. (2017). Young consumers' green purchase behaviour in an emerging market. <https://doi.org/10.1080/0965254X.2017.1318946>, 26(7), 583–600. <https://doi.org/10.1080/0965254X.2017.1318946>

- Nguyen, T. T. H., Nguyen, N., Nguyen, T. B. L., Phan, T. T. H., Bui, L. P., & Moon, H. C. (2019). Investigating consumer attitude and intention towards online food purchasing in an emerging economy: An extended TAM approach. *Foods*, 8(11), 576.
<https://doi.org/10.3390/foods8110576>
- Nielsen. (2018). *Global Consumers Seek Companies That Care About Environmental Issues CPG, FMCG & Retail 1130932018*.
<https://nielseniq.com/global/en/insights/analysis/2018/global-consumers-seek-companies-that-care-about-environmental-issues/>
- Nolan-Clark, D. J., Neale, E. P., Probst, Y. C., Charlton, K. E., & Tapsell, L. C. (2011). Consumers' salient beliefs regarding dairy products in the functional food era: A qualitative study using concepts from the theory of planned behaviour. *BMC Public Health*, 11(1), 1–8.
<https://doi.org/10.1186/1471-2458-11-843/TABLES/1>
- Nystrand, B. T., & Olsen, S. O. (2020). Consumers' attitudes and intentions toward consuming functional foods in Norway. *Food Quality and Preference*, 80, 103827.
<https://doi.org/10.1016/J.FOODQUAL.2019.103827>
- Okazaki, S. (2015). How do Japanese consumers perceive wireless ads? A multivariate analysis.
[Http://Dx.Doi.Org/10.1080/02650487.2004.11072894](http://Dx.Doi.Org/10.1080/02650487.2004.11072894), 23(4), 429–454.
<https://doi.org/10.1080/02650487.2004.11072894>
- Oliver, R. L. (1976). Effect of expectation and disconfirmation on postexposure product evaluations: An alternative interpretation. *Journal of Applied Psychology*, 62(4), 480–486. <https://doi.org/10.1037/0021-9010.62.4.480>
- Ozen, A. E., Del Mar Bibiloni, M., Pons, A., & Tur, J. A. (2013). Sociodemographic and Lifestyle Determinants of Functional Food Consumption in an Adult Population of the Balearic Islands. *Annals of Nutrition and Metabolism*, 63(3), 200–207.
<https://doi.org/10.1159/000354559>
- Özer, B. H., & Kirmaci, H. A. (2010). Functional milks and dairy beverages. *International Journal of Dairy Technology*, 63(1), 1–15.
<https://doi.org/10.1111/J.1471-0307.2009.00547.X>
- Papp-Bata, & Szakály, Z. (2020). The relationship between the motivators

and barriers of health behaviour and consumer attitudes towards functional food. *Acta Alimentaria*, 49(3), 287–294.
<https://doi.org/10.1556/066.2020.49.3.7>

Papp-Váry, Á. F., & Kerti, R. (2022). The Hungarian advertising market and an award-winning effie case study as good practice. In *Handbook of Research on Global Perspectives on International Advertising* (pp. 233–252). IGI Global. <https://doi.org/10.4018/978-1-7998-9672-2.ch012>

Pappalardo, G., & Lusk, J. L. (2016). The role of beliefs in purchasing process of functional foods. *Food Quality and Preference*, 53, 151–158.
<https://doi.org/10.1016/J.FOODQUAL.2016.06.009>

Park, K., Perosio, D., German, G. A., & McLaughlin, E. W. (1996). *What's In Store for Home Shopping?* 87.
<https://ecommons.cornell.edu/handle/1813/68902>

Patch, C. S., Tapsell, L. C., & Williams, P. G. (2005). Attitudes and intentions toward purchasing novel foods enriched with omega-3 fatty acids. *Journal of Nutrition Education and Behavior*, 37(5), 235–241.
[https://doi.org/10.1016/S1499-4046\(06\)60277-7](https://doi.org/10.1016/S1499-4046(06)60277-7)

Perea Y Monsuwé, T., Dellaert, B. G. C., & De Ruyter, K. (2004). What drives consumers to shop online? A literature review. *International Journal of Service Industry Management*, 15(1), 102–121.
<https://doi.org/10.1108/09564230410523358/FULL/XML>

Pham, T. H., Nguyen, T. N., Phan, T. T. H., & Nguyen, N. T. (2019). Evaluating the purchase behaviour of organic food by young consumers in an emerging market economy. *Journal of Strategic Marketing*, 27(6), 540–556. <https://doi.org/10.1080/0965254X.2018.1447984>

Phuah, K. T., Rezai, G., Mohamed, Z., & Shamsudin, M. N. (2015). Socio-Demographic Profile in Purchasing Natural and Synthetic Functional Foods in Malaysia. *International Journal of Social Science and Humanity*, 5(7), 604–607. <https://doi.org/10.7763/IJSSH.2015.V5.525>

Pintér, Z., Tóth, K., Bareith, T., & Varga, J. (2021). The Relationship between Decision and Payment Habits and Its Relation with Wasting—Evidence from Hungary. *Sustainability 2021, Vol. 13, Page 7337*, 13(13), 7337. <https://doi.org/10.3390/SU13137337>

Plasek, B., Lakner, Z., & Temesi, Á. (2021). I Believe It Is Healthy—Impact of Extrinsic Product Attributes in Demonstrating Healthiness of

Functional Food Products. *Nutrients* 2021, Vol. 13, Page 3518, 13(10), 3518. <https://doi.org/10.3390/NU13103518>

Plowden, K. O., & Miller, J. L. (2000). Motivators of health seeking behavior in urban African-American men: an exploration of triggers and barriers. *Journal of National Black Nurses' Association : JNBNA*, 11(1), 15–20. <https://europepmc.org/article/med/11854947>

Pravina, P., Sayaji, D., ... M. A. R. in P. and, & 2013, U. (2013). Calcium and its role in human body. *Academia.Edu*, 4(2). www.ijrbsonline.com

Punj, G. (2012). Income effects on relative importance of two online purchase goals: Saving time versus saving money? *Journal of Business Research*, 65(5), 634–640. <https://doi.org/10.1016/J.JBUSRES.2011.03.003>

Qader, K. S., Hamza, P. A., Othman, R. N., Anwer, S. A., Hamad, H. A., Gardi, B., & Ibrahim, H. K. (2022). Analyzing different types of advertising and its influence on customer choice. *International Journal of Humanities and Education Development (IJHED)*, 4(6), 8–21. <https://doi.org/10.22161/IJHED.4.6.2>

Quevedo-Silva, F., Freire, O., Lima-Filho, D. de O., Brandão, M. M., Isabella, G., & Moreira, L. B. (2016). Intentions to purchase food through the internet: developing and testing a model. *British Food Journal*, 118(3), 572–587. <https://doi.org/10.1108/BFJ-09-2015-0305>

Ramus, K., & Nielsen, N. A. (2005). Online grocery retailing: What do consumers think? *Internet Research*, 15(3), 335–352. <https://doi.org/10.1108/10662240510602726/FULL/XML>

Rezai, G., P.K.Teng, Mohamed, Z., & Shamsudin, M. . (2012). *Functional Food Knowledge and Perceptions among Young Consumers in Malaysia*. <https://doi.org/10.5281/ZENODO.1077517>

Rezai, Golnaz, Teng, P. K., Shamsudin, M. N., Mohamed, Z., & Stanton, J. L. (2017). Effect of perceptual differences on consumer purchase intention of natural functional food. *Journal of Agribusiness in Developing and Emerging Economies*, 7(2), 153–173. <https://doi.org/10.1108/JADEE-02-2015-0014/FULL/XML>

Ringle, C. M., Sven Wende, & Jan-Michael Becker. (2015). SmartPLS 3. SmartPLS GmbH, Boenningstedt. *Journal of Service Science and Management*, 10(3), 32–49.

https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Ringle%2C+C.M.%3B+Wende%2C+S.%3B+Becker%2C+J.M.&btnG=#d=gs_cit&t=1662766055564&u=%2Fscholar%3Fq%3Dinfo%3AfRlanSDTLF UJ%3Ascholar.google.com%2F%26output%3Dcite%26scirp%3D4%26hl%3Den

- Roininen, K., Lähteenmäki, L., & Tuorila, H. (1999). Quantification of Consumer Attitudes to Health and Hedonic Characteristics of Foods. *Appetite*, 33(1), 71–88. <https://doi.org/10.1006/APPE.1999.0232>
- Rowland, M. (2022). Consumer Sentiment, Cognitive Attitudes, and Behavior Patterns toward Delivery Apps. *Economics, Management, and Financial Markets*, 17(1), 44. <https://doi.org/10.22381/emfm17120223>
- Rozin, P., Spranca, M., Krieger, Z., Neuhaus, R., Surillo, D., Swerdlin, A., & Wood, K. (2004). Preference for natural: instrumental and ideational/moral motivations, and the contrast between foods and medicines. *Appetite*, 43(2), 147–154. <https://doi.org/10.1016/J.APPET.2004.03.005>
- Salamzadeh, A., Ebrahimi, P., Soleimani, M., & Fekete-Farkas, M. (2022). Grocery Apps and Consumer Purchase Behavior: Application of Gaussian Mixture Model and Multi-Layer Perceptron Algorithm. *Journal of Risk and Financial Management 2022, Vol. 15, Page 424*, 15(10), 424. <https://doi.org/10.3390/JRFM15100424>
- Salmani, F., Norozi, E., Moodi, M., & Zeinali, T. (2020). Assessment of attitudes toward functional foods based on theory of planned behavior: Validation of a questionnaire. *Nutrition Journal*, 19(1), 1–9. <https://doi.org/10.1186/s12937-020-00574-4>
- Santos, G. J., Rocha, R., & Santana, G. O. (2019). Lactose intolerance: what is a correct management? *Revista Da Associação Médica Brasileira*, 65(2), 270–275. <https://doi.org/10.1590/1806-9282.65.2.270>
- Saxena, A., & Khanna, U. (2013). Advertising on Social Network Sites: A Structural Equation Modelling Approach. *Htp://Dx.Doi.Org/10.1177/0972262912469560*, 17(1), 17–25. <https://doi.org/10.1177/0972262912469560>
- Schnettler, B., Miranda, H., Lobos, G., Sepulveda, J., Orellana, L., Mora, M., & Grunert, K. (2015). Willingness to purchase functional foods according to their benefits: Consumer profiles in Southern Chile. *British*

Food Journal, 117(5), 1453–1473. <https://doi.org/10.1108/BFJ-07-2014-0273/FULL/XML>

Sellin, N., & Keeves, J. P. (1994). Path Analysis with Latent Variables. In *The International Encyclopedia of Education* (pp. 4352–4359). https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Path+analysis+with+latent+variables&btnG=

Shang, D., & Wu, W. (2017). Understanding mobile shopping consumers' continuance intention. *Industrial Management and Data Systems*, 117(1), 213–227. <https://doi.org/10.1108/IMDS-02-2016-0052/FULL/XML>

Shmueli, G., Ray, S., Velasquez Estrada, J. M., & Chatla, S. B. (2016). The elephant in the room: Predictive performance of PLS models. *Journal of Business Research*, 69(10), 4552–4564. <https://doi.org/10.1016/J.JBUSRES.2016.03.049>

Siegrist, M., Stampfli, N., & Kastenholtz, H. (2008). Consumers' willingness to buy functional foods. The influence of carrier, benefit and trust. *Appetite*, 51(3), 526–529. <https://doi.org/10.1016/J.APPET.2008.04.003>

Siró, I., Kápolna, E., Kápolna, B., & Lugasi, A. (2008). Functional food. Product development, marketing and consumer acceptance-A review. *Appetite*, 51(3), 456–467. <https://doi.org/10.1016/j.appet.2008.05.060>

Sondakh, J. J. (2017). Behavioral intention to use e-tax service system: An application of technology acceptance model. *European Research Studies Journal*, 20(2), 48–64. <https://www.um.edu.mt/library/oar/handle/123456789/28975>

Soós, G. (2020). Az élelmiszer-fogyasztói szokások változása a COVID-19 vírus megjelenéséhez kapcsolódóan Magyarországon. *Marketing & Menedzsment*, 54(3), 15–27. <https://doi.org/10.15170/mm.2020.54.03.02>

Sorić, T., Brodić, I., Mertens, E., Sagastume, D., Dolanc, I., Jonjić, A., Delale, E. A., Mavar, M., Missoni, S., Peñalvo, J. L., & Čoklo, M. (2021). Evaluation of the Food Choice Motives before and during the COVID-19 Pandemic: A Cross-Sectional Study of 1232 Adults from Croatia. *Nutrients 2021, Vol. 13, Page 3165*, 13(9), 3165. <https://doi.org/10.3390/NU13093165>

Sreeram, A., Kesharwani, A., & Desai, S. (2017). Factors affecting satisfaction and loyalty in online grocery shopping: an integrated model.

Journal of Indian Business Research, 9(2), 107–132.
<https://doi.org/10.1108/JIBR-01-2016-0001/FULL/XML>

- Statista. (2021a). *Hungary: frequency of online grocery shopping 2021* / Statista. 2021. <https://www.statista.com/statistics/1170155/hungary-frequency-of-online-grocery-shopping/>
- Statista. (2021b, April 28). *Hungary: average daily time spent shopping online 2020* / Statista. 2021. <https://www.statista.com/statistics/1232148/hungary-average-daily-time-spent-shopping-online/>
- Statista. (2022a). *Hungary: number of smartphone users 2015-2025* / Statista. 2022. <https://www.statista.com/statistics/566122/predicted-number-of-smartphone-users-in-hungary/>
- Statista. (2022b, March 11). *Hungary: perceived barriers to ordering online 2019* / Statista. <https://www.statista.com/statistics/1102601/hungary-percieved-barriers-to-ordering-over-the-internet/>
- Statista. (2022c). Online Food Delivery - Hungary. In Statista. <https://www.statista.com/outlook/dmo/online-food-delivery/hungary>
- Storhaug, C. L., Fosse, S. K., & Fadnes, L. T. (2017). Country, regional, and global estimates for lactose malabsorption in adults: a systematic review and meta-analysis. *The Lancet. Gastroenterology & Hepatology*, 2(10), 738–746. [https://doi.org/10.1016/S2468-1253\(17\)30154-1](https://doi.org/10.1016/S2468-1253(17)30154-1)
- Sugawara, E., & Nikaido, H. (2014). Properties of AdeABC and AdeIJK efflux systems of *Acinetobacter baumannii* compared with those of the AcrAB-TolC system of *Escherichia coli*. *Antimicrobial Agents and Chemotherapy*, 58(12), 7250–7257. <https://doi.org/10.1128/AAC.03728-14>
- Szabó-Szentgróti, E., Szabó-Szentgróti, G., & Szakály, Z. (2017). Empirical research on corporate strategies in Hungarian dairy industry. *Applied Studies in Agribusiness and Commerce*, 11(3–4), 169–179. <https://doi.org/10.19041/apstract/2017/3-4/23>
- Szabó, E., Szakos, D., Kasza, G., & Ózsvari, L. (2021). Analysis of the target group of lactose-free functional foods for product development. *Acta Alimentaria*, 50(3), 153–161. <https://doi.org/10.1556/066.2020.00168>
- Szabó, I., Lehota, J., & Magda, R. (2019). Purchase of Fresh Fruits and

Vegetables Through Box Schemes in Hungary – Opportunities and Hindering Factors on the Way to Sustainability. *Visegrad Journal on Bioeconomy and Sustainable Development*, 8(1), 37–41.
<https://doi.org/10.2478/VJBSD-2019-0007>

Szakály, Z., K., M., & Jasák, H. (2014). Functional foods, consumer attitudes and personalized nutrition. *The Hungarian Journal of Nutrition Marketing*, 1(1–2), 3–17.

Szakály, Z., Kovács, B. H., Szente, V., & Szakály, S. (2010). Conjugated linoleic acid intake of the population of the EU-25 - The role of dairy products. *Milchwissenschaft*, 65(3), 258–262.
<https://www.cabdirect.org/cabdirect/abstract/20103246220>

Szakály, Z., Polereczki, Z., & Kovács, S. (2016). Consumer attitudes toward genetic testing and personalised nutrition in Hungary. *Acta Alimentaria*, 45(4), 500–508. <https://doi.org/10.1556/066.2016.45.4.6>

Szakály, Z., Szente, V., Polereczki, Z., & Szigeti, O. (2011). Health conscious consumer and functional foods — Exploration of factors affecting consumer behaviour in Hungary via focus group discussions. *Acta Alimentaria*, 40(3), 335–344.
<https://doi.org/10.1556/AALIM.40.2011.3.4>

Szakály, Zoltán. (2008). Trendek és tendenciák a funkcionális élelmiszerek piacán: Mit vár el a hazai fogyasztó? *Élelmiszer, Táplálkozás És Marketing*, 5(2–3), 3–11.
<http://journal.ke.hu/index.php/etm/article/view/71>

Szakály, Zoltán, Kovács, S., Pető, K., Huszka, P., & Kiss, M. (2019). A modified model of the willingness to pay for functional foods. *Appetite*, 138, 94–101. <https://doi.org/10.1016/j.appet.2019.03.020>

Szakály, Zoltán, Szente, V., Kövér, G., Polereczki, Z., & Szigeti, O. (2012). The influence of lifestyle on health behavior and preference for functional foods. *Appetite*, 58(1), 406–413.
<https://doi.org/10.1016/j.appet.2011.11.003>

Szagos, D., Ózsvári, L., & Kasza, G. (2020). Consumer demand analysis in the Hungarian functional food market focused on the main health problems. *Gradus*, 7(1), 62–66. <https://doi.org/10.47833/2020.1.agr.015>

Szagos, D., Ózsvári, L., & Kasza, G. (2022). Health-related nutritional preferences of older adults: A segmentation study for functional food

- development. *Journal of Functional Foods*, 92, 105065.
<https://doi.org/10.1016/J.JFF.2022.105065>
- Szegedyné Fricz, Á., Ittész, A., Ózsvári, L., Szakos, D., & Kasza, G. (2020). Consumer perception of local food products in Hungary. *British Food Journal*, 122(9), 2965–2979. <https://doi.org/10.1108/BFJ-07-2019-0528/FULL/XML>
- Szilárd, B. (2003). *The Consumer View on the Components of Functional Quality of Basic Foods of Animal Origin* [UNIVERSITY OF KAPOSVÁR FACULTY OF ANIMAL SCIENCES].
http://phd.ke.hu/fajlok/1240902384-tz_en660.pdf
- Tari, Katalin, Mihály, & Nikolett. (2018). Analysis of Competitiveness with Online Marketing Tools in Hungary. *SSRN Electronic Journal*.
<https://doi.org/10.2139/ssrn.3282264>
- Temesi, Á., Bacsó, Á., Grunert, K. G., & Lakner, Z. (2019). Perceived Correspondence of Health Effects as a New Determinant Influencing Purchase Intention for Functional Food. *Nutrients* 2019, Vol. 11, Page 740, 11(4), 740. <https://doi.org/10.3390/NU11040740>
- Topolska, K., Florkiewicz, A., & Filipiak-Florkiewicz, A. (2021). Functional food—consumer motivations and expectations. *International Journal of Environmental Research and Public Health*, 18(10), 5327.
<https://doi.org/10.3390/ijerph18105327>
- Tung BUI, D., & Duy TUNG, B. (2015). Consumer Acceptance of Functional Foods in Ho Chi Minh City. *Eurasian Journal of Business and Economics*, 8(16), 19–34. <https://doi.org/10.17015/ejbe.2015.016.02>
- Urala, N., & Lähteenmäki, L. (2003). Reasons behind consumers' functional food choices. *Nutrition & Food Science*, 33(4), 148–158.
<https://doi.org/10.1108/00346650310488499>
- Urala, N., & Lähteenmäki, L. (2004). Attitudes behind consumers' willingness to use functional foods. *Food Quality and Preference*, 15(7–8), 793–803. <https://doi.org/10.1016/J.FOODQUAL.2004.02.008>
- Urala, N., & Lähteenmäki, L. (2007). Consumers' changing attitudes towards functional foods. *Food Quality and Preference*, 18(1), 1–12.
<https://doi.org/10.1016/J.FOODQUAL.2005.06.007>
- Várhidi, Z., Máté, M., & Ózsvári, L. (2022). The use of probiotics in

- nutrition and herd health management in large Hungarian dairy cattle farms. *Frontiers in Veterinary Science*, 9, 1346.
<https://doi.org/10.3389/FVETS.2022.957935/BIBTEX>
- Vasiljevic, M., Pechey, R., & Marteau, T. M. (2015). Making food labels social: The impact of colour of nutritional labels and injunctive norms on perceptions and choice of snack foods. *Appetite*, 91, 56–63.
<https://doi.org/10.1016/J.APPET.2015.03.034>
- Verbeke, W. (2005). Consumer acceptance of functional foods: Socio-demographic, cognitive and attitudinal determinants. *Food Quality and Preference*, 16(1), 45–57.
<https://doi.org/10.1016/j.foodqual.2004.01.001>
- Verbeke, W. (2006). Functional foods: Consumer willingness to compromise on taste for health? *Food Quality and Preference*, 17(1–2), 126–131.
<https://doi.org/10.1016/J.FOODQUAL.2005.03.003>
- Veres, Z., Domokos-Szabolcsy, É., Koroknai, J., Dudás, L., Holb, I. J., Nyéki, J., & Fári, M. G. (2003). Hungarian fruits and vegetables of high anti-oxidant activity as functional foods (Review article). *International Journal of Horticultural Science*, 9(3–4), 13–21.
<https://doi.org/10.31421/IJHS/9/3-4/401>
- Verneau, F., La Barbera, F., & Furno, M. (2019). The role of health information in consumers' willingness to pay for canned crushed tomatoes enriched with lycopene. *Nutrients*, 11(9), 2173.
<https://doi.org/10.3390/nu11092188>
- Voss, K. E., Spangenberg, E. R., & Grohmann, B. (2003). Measuring the hedonic and utilitarian dimensions of consumer attitude. In *Journal of Marketing Research* (Vol. 40, Issue 3, pp. 310–320). SAGE Publications/Sage CA: Los Angeles, CA.
<https://doi.org/10.1509/jmkr.40.3.310.19238>
- Vyas, H. K., & Tong, P. S. (2004). Impact of Source and Level of Calcium Fortification on the Heat Stability of Reconstituted Skim Milk Powder. *Journal of Dairy Science*, 87(5), 1177–1180.
[https://doi.org/10.3168/JDS.S0022-0302\(04\)73266-X](https://doi.org/10.3168/JDS.S0022-0302(04)73266-X)
- Wang, Y., & Sun, S. (2010). Assessing beliefs, attitudes, and behavioral responses toward online advertising in three countries. *International Business Review*, 19(4), 333–344.

<https://doi.org/10.1016/J.IBUSREV.2010.01.004>

- WHO. (2021). *Noncommunicable diseases*. <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases#:~:text=Key facts,-and middle-income countries.>
- Wright, K. B. (2005). Researching internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication*, 10(3).
<https://doi.org/10.1111/J.1083-6101.2005.TB00259.X/4614509>
- Yeo, V. C. S., Goh, S. K., & Rezaei, S. (2017). Consumer experiences, attitude and behavioral intention toward online food delivery (OFD) services. *Journal of Retailing and Consumer Services*, 35, 150–162.
<https://doi.org/10.1016/J.JRETCONSER.2016.12.013>
- Zaharia, T. E., Zaharia, R., & Burlacioiu, C. (2022). Online Commerce Pattern in European Union Countries between 2019 and 2020. *Societies* 2023, Vol. 13, Page 4, 13(1), 4. <https://doi.org/10.3390/SOC13010004>
- 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* 2022, Vol. 19, Page 13316, 19(20), 13316. <https://doi.org/10.3390/IJERPH192013316>
- Zandstra, E. H., De Graaf, C., & Van Staveren, W. A. (2001). Influence of health and taste attitudes on consumption of low- and high-fat foods. *Food Quality and Preference*, 12(1), 75–82.
[https://doi.org/10.1016/S0950-3293\(00\)00032-X](https://doi.org/10.1016/S0950-3293(00)00032-X)
- Zhou, Zheng, B. Y. (2002). Users ’ Attitudes toward Web Advertising : Effects of Internet Motivation and Internet Ability. *Advances in Consumer Research*, 29(1), 71–78.
<https://www.acrwebsite.org/volumes/8560/volumes/v29/NA-29/full>

12 LIST OF AUTHORS' PUBLICATIONS IN THE FIELD OF THE DISSERTATION

Scientific papers

Mohammad, M., & Szigeti, O. (2023). RELATIONSHIP BETWEEN ATTITUDE AND ONLINE PURCHASE INTENTION OF DAIRY FUNCTIONAL FOODS IN HUNGARY: AN EXTENDED TAM APPROACH. *European Research Studies Journal*, 26(1), 545-559.

Mohammad, M. (2022). THE IMPACT OF SOCIO-DEMOGRAPHIC PROFILE AND PRODUCT IDENTITY ON FUNCTIONAL FOOD ACCEPTANCE: A REVIEW. *International Journal of Applied Research in Business and Management*, 3(2), 48–65. <https://doi.org/10.51137/ijarbm.2022.3.2.4>

Mohammad, M. (2021). HEALTH AWARENESS TOWARD DAIRY FUNCTIONAL FOODS IN HUNGARY. *Regional and Business Studies*, 13(2), 1–10. <https://doi.org/10.33568/rbs.2912>

Papers in proceedings

Mohammad, M.: CUSTOMER BEHAVIOUR AND MOTIVATION TOWARDS DAIRY FUNCTIONAL FOOD IN HUNGARY. In: Muhammad, Safdar Bhatti; P, Sivasakthivelan; Babayeva-Shukurova, Farahila Fazil; Tuba, Firat (eds.) *4th International "Başkent" Congress On Physical, Social And Health Sciences Full-Text Book*, Istanbul, Turkey: BZT Academy Publishing House (2022) 882 p. pp. 654-661., 8 p.

Mohammad, M.: DAIRY FUNCTIONAL FOOD PROCESSING AND SUSTAINABILITY IN THE HUNGARIAN MARKET. In: Muhammad, Safdar Bhatti; P, Sivasakthivelan; Babayeva-Shukurova, Farahila Fazil; Tuba, Firat (eds.) *4th International "Başkent" Congress On Physical, Social And Health Sciences Full-Text Book*, Istanbul, Turkey: BZT Academy Publishing House (2022) 882 p. pp. 662-669., 8 p.

Mohammad, M., & Szigeti, O.: MARKET ORIENTATION AND DAIRY FUNCTIONAL FOOD IN SMALL AND MEDIUM ENTERPRISES PERFORMANCE IN HUNGARY. In: Teuta, Iljazi; Tuba, Firat (eds) *7th Istanbul Scientific Research Congress Proceedings Book*, Istanbul, Turkey: BZT Academy Publishing House (2021) 609 p. pp. 500-508., 9 p.

Mohammad, M., & Szigeti, O.: THE IMPORTANCE OF SUSTAINABLE DAIRY FUNCTIONAL FOOD PROCESSING. In: Bayoumi, Hamuda Hosam (ed.) *12th ICEEE–2021 International Conference “Global Environmental Development & Sustainability: Research, Engineering & Management” Full Text Book*, Budapest, Magyarország : Óbudai Egyetem (2021) pp. 312-322., 11 p.

Abstract in proceedings

Mohammad, M.: THE IMPACT OF MEDIA MARKETING VALUE ON DAIRY FUNCTIONAL FOOD WILLINGNESS TO CONSUME IN HUNGARY. In: Neslihan, Doğan-Sağlamtimur; Elnur, Albizad; Tuba, Firat (eds.) *9th International Istanbul Scientific Research Congress Abstract Book*, Istanbul, Turkey: BZT Academy Publishing House (2022) 397 p. pp. 323-323., 1 p.

13 CURRICULUM VITAE

Mohammad Mohammad, born on April 12, 1988, in Damascus, Syria, is a remarkable individual with a passion for agriculture and engineering. In 2014, he completed his studies at the Faculty of Agricultural Engineering and embarked on a fulfilling journey of vocational training as an industrial clerk.

In 2016, Mohammad's dedication and talent were recognized when he was awarded the prestigious Stipendium Hungaricum scholarship. This honor allowed him to pursue a master's degree in Animal Nutrition and Feed Safety Engineering at Kaposvár University, which is now known as MATE – Hungarian University of Agriculture and Life Sciences. In 2018, he proudly obtained his master's degree, a testament to his hard work and commitment to academic excellence. Following this achievement, Mohammad's exceptional potential was acknowledged once again as he received the Stipendium Hungaricum scholarship for his Ph.D. studies at the same esteemed institution.

Throughout his career, Mohammad has accumulated valuable experience in various fields. From 2008 to 2015, he honed his skills as a freelance engineer, specializing in landscaping design and implementation. Additionally, from 2012 to 2013, he engaged in practical training as a feed supervisor engineer, working with cows and sheep on a large-scale farm in Tartous City/Syria. During the same period, he also dedicated his efforts to the survey of medical plants in Syria and the Middle East, further broadening his expertise. Furthermore, from 2013 to 2014, he assumed the role of Supervisor and Monitor at a poultry farm in Tartous City, overseeing the operations of broiler and layer poultry.

Embracing the dynamic world of social media, Mohammad embarked on a new endeavor in 2018. He ventured into the realm of social media marketing, offering his services as a freelancer for companies based in Dubai, United Arab

Emirates. Alongside his professional pursuits, Mohammad cherishes his special hobbies as a social media creator and video maker. Through his engaging content, he strives to spread knowledge and promote awareness about healthy food lifestyles, leaving a positive impact on his audience.

Mohammad Mohammad's journey serves as an inspiration, showcasing the harmonious blend of his educational achievements, professional experience, and creative pursuits.

14 APPENDIX

English version of the questionnaire:

The effect of media and health behavior on the consumer attitude and purchasing behavior of functional dairy products.

Functional dairy products: Dairy products that contain ingredients that positively affect the human body by enriching the food with additional nutrients through innovative methods and technologies, or by eliminating harmful components.

For example:

Milk: Mizo UHT low-fat lactose-free milk, Puleva Omega 3 lactose-free milk, TOLLE vital milk.

Cheese: Tolle Light low-fat Trappist cheese, Medve lactose-free cheese, Szarvasi lactose-free mascarpone cream cheese.

Yogurt: Danone Actimel yogurt drink, Zott Jogobella live-culture, fat-free, lactose-free yogurt drink, Danone Activia creamy, live-culture, plain yogurt, Zott Jogobella sugar-free or reduced-sugar Light yogurt.

Other products: lactose-free sour cream, lactose-free half-fat cow's curd, Pöttyös Túró Rudi lactose-free natural dessert, Mizo lactose-free tea butter.

Milk



Cheese



Yogurt



Other DFF's product



General information

What is your gender?

- Male
- Female

How old are you?

- 18-25 years old
- 26-30 years old
- 31-40 years old
- 41-50 years old
- >51 years old

What is your highest level of education?

- Maximum 8 in general
- Vocational school/apprenticeship
- Vocational High School/Secondary grammar school
- College/University
- PhD degree

How do you perceive your relative income?

- We have regular livelihood problems
- Sometimes it's not even enough to make a living
- Just enough to live on, but we can no longer save
- Enough to live, and we save from it
- We make a very good living and we can save it

Where do you live?

- Village
- City
- Capital

Do you frequently consume DFFs?

- Yes
- No

How do you become aware of dairy functional products? Multiple answers are possible.

- From store shelves
- TV commercials
- Radio commercials
- Commercial leaflets (SPAR, TESCO, LIDL, etc.)
- Magazines
- Billboards
- Websites

- Online advertisements
- Social media advertisements (FB, Instagram, YouTube, Twitter, TikTok)
- Influencer content (e.g., blogs)
- Other

How often do you purchase functional dairy products?

- Never
- Less than once a month
- Monthly
- Weekly
- Daily

Where do you usually purchase functional dairy products? Multiple answers are possible!

- Directly from the producer
- Farmers' market
- Small grocery stores (CBA, Coop, Reál, etc.)
- Supermarkets (SPAR, CBA Prima)
- Hypermarkets (Interspar, Auchan, Tesco)
- Discount stores (Penny, Lidl, Aldi)
- Online
- I don't purchase them

If functional dairy products were available on various platforms such as Wolt, Foodpanda, Bolt food, would you order them?

- Yes
- No
- Maybe
- Yes, but such services are not available in my city.
- I am not familiar with these services.

Consumer attitude towards dairy functional products

- DFFs help to improve my mood.
- My performance improves when I eat DFFs.
- I can prevent disease by eating DFFs regularly.
- DFFs can repair the damage caused by an unhealthy diet.
- DFFs promote my well-being.

Consumer Willingness to consume dairy functional products:

To what extent are you willing to consume the following functional dairy products on a scale of 1-5, where 1 means not willing at all, and 5 means completely willing?

- Lactose-free dairy products.
- Low-fat dairy products.
- Probiotic yogurts.
- Milk fortified with calcium.
- Enriched Milk with Omega3 EPA & DHA.
- Milk fortified with folic acid.

The motivators and barriers of consuming dairy functional products

Please indicate to what extent the following statements apply to you on a scale of 1-5, where 1 means not applicable at all and 5 means highly applicable:

I consume functional dairy products because...

- I might live longer.
- I want to be healthy.
- I want to manage my weight.

Please indicate to what extent the following statements apply to you on a scale of 1-5, where 1 means not applicable at all and 5 means highly applicable:

I do not consume functional dairy products because...

- I am not motivated.
- I do not have someone to encourage or help me.
- I have too many other things to do.

The Advertisements of Functional Dairy Products in the Media

To what extent do you agree with the following statements regarding the information about functional dairy products on a scale of 1-5, where 1 means strongly disagree and 5 means strongly agree?

- Advertising makes product of dairy functional foods information immediately accessible.
- Advertising is a convenient source of dairy functional foods product information.
- Advertising informs me of the latest products and information of dairy functional foods available on the market.

To what extent do you agree with the following statements regarding the entertainment value of advertisements on a scale of 1-5, where 1 means strongly disagree and 5 means strongly agree?

- Advertising usually makes people laugh and has great amusement value.
- Advertising tells me what people who share my lifestyle will buy and use.

To what extent do you agree with the following statements regarding the credibility of advertisements about functional dairy products on a scale of 1-5, where 1 means strongly disagree and 5 means strongly agree?

- Advertisements of dairy functional foods are credible.
- Advertising of dairy functional foods is convincing.

To what extent do you agree with the following statements regarding the annoying impact of advertisements about functional dairy products on a scale of 1-5, where 1 means strongly disagree and 5 means strongly agree?

- Advertising of dairy functional foods is irritating.
- Advertising of dairy functional foods is deceptive.
- Advertising of dairy functional foods is annoying.

To what extent do you agree with the following statements regarding the advertising value of advertisements about functional dairy products in the media on a scale of 1-5, where 1 means strongly disagree and 5 means strongly agree?

- Advertisements for dairy functional products are useful.
- Advertisements of dairy functional foods are important.

Purchasing functional dairy products online

To what extent do you agree with the following statements regarding the online purchase of functional dairy products on a scale of 1 to 5, where 1 means strongly disagree and 5 means strongly agree?

- I intend to use DFFs online shop when the service becomes widely available.
- I intend to use DFFs online shop when there is free home delivery.
- I intend to use DFFs online shop when the price is competitive.

To what extent do you agree with the following statements regarding the usefulness of online purchasing of functional dairy products on a scale of 1 to 5, where 1 means strongly disagree and 5 means strongly agree?

- Using DFFs online shop can save me a lot of time.
- Using food online shopping can make my DFFs shopping easier.
- Using online food Shopping is convenient for my DFFs shopping.

To what extent do you agree with the following statements regarding the simplicity of online purchasing of functional dairy products on a scale of 1 to 5, where 1 means strongly disagree and 5 means strongly agree?

- Online DFFs Shopping is/might be easy to use.
- It is/might be easy for me to follow the procedures when ordering DFFs online.
- My interaction with the processes of online DFFs is/might be clear and understandable.

Hungarian version of the questionnaire:

A média és az egészségmagatartás hatása a funkcionális tejtermékek fogyasztói attitűdjére és vásárlói magatartására.

Funkcionális tejtermékek: Olyan összetevőket tartalmazó tejtermékek, amelyek pozitívan befolyásolják az emberi szervezetet azáltal, hogy innovatív módszerek és technológiák segítségével extra tápanyaggal dúsítják az élelmiszert, vagy megszüntetik a káros összetevőket.

Például:

Tej: Mizo UHT alacsony zsírtartalmú laktózmentes tej, Tej Puleva Omega 3 laktózmentes, TOLLE vitál tej.

Sajt: Tolle Light zsírszegény trappista sajt, Medve laktózmentes sajt, Szarvasi laktózmentes mascarpone krémsajt.

Joghurt: Danone Actimel joghurtital , Zott Jogobella élőflórás, zsírmentes, laktózmentes joghurtital, Danone Activia krémes, élőflórás, natúr joghurt, Zott Jogobella hozzáadott cukor nélküli, vagy csökkentett cukortartalmú Light joghurt.

Egyéb termékek: laktózmentes tejföl, laktózmentes félzsíros tehéntúró, Pöttyös Túró Rudi laktózmentes természetes desszertkészítmény, Mizo laktózmentes teavaj.

Tej



Sajt



Joghurt



Egyéb termékek



Általános információk

Mi az ön neme?

- Férfi
- Nő

Hány éves Ön?

- 18-25 éves
- 26-30 éves
- 31-40 éves
- 41-50 éves
- >51 éves

Mi az Ön legmagasabb iskolai végzettsége?

- Maximum 8 általános
- Szakiskola/Szakmunkásképző
- Szakközépiskola/Gimnázium
- Főiskola/Egyetem
- PhD fokozat

Hogyan ítéli meg anyagi helyzetét?

- Rendszeresen megélhetési gondjaink vannak
- Néha arra sem elég, hogy megéljünk belőle
- Éppen elegendő, hogy megéljünk belőle, de félretenni már nem tudunk
- Megélünk belőle, de keveset tudunk félretenni
- Nagyon jól megélünk belőle és félre is tudunk tenni

Az Ön lakhelye

- Az Ön lakhelye
- Város
- Falu

Fogyaszt Ön funkcionális tejtermékeket?

- Igen
- Nem

Honnan ismeri a funkcionális tejtermékeket? Több válasz is lehetséges

- üzletek polcairól

- TV reklámokból
- TV reklámokból
- kereskedelmi szórólapokból (SPAR, TESCO, LIDL, stb.)
- magazinokból
- óriásplakátokról
- weboldalokról
- online reklámokból
- közösségi média reklámokból (FB, Instagram, YouTube, Twitter, TikTok)
- infulencer tartalmakból (pl. blogok)
- Egyéb

Milyen gyakran vásárol funkcionális tejtermékeket?

- Soha
- Ritkábban, mint havonta
- Havonta
- Havonta
- Naponta

Általában hol vásárol funkcionális tejtermékeket? Több válasz is lehetséges!

- Közvetlenül a termelőtől
- Piacról
- Kisebb élelmiszerboltból (CBA, Coop, Reál, stb.)
- Szupermarketből (SPAR, CBA Príma)
- Hipermarketből (Interspar, Auchan, Tesco)
- Diszkontokból (Penny, Lidl, Aldi)
- Online
- Nem vásárolok

Amennyiben a funkcionális tejtermékek elérhetők lennének különböző platformokon, (mint Wolt, Foodpanda, Bolt food) megrendelné őket?

- Igen
- Nem
- Talán
- Igen, de a városomban nincs ilyen szolgáltatás
- Nem ismerem ezeket a szolgáltatásokat

Fogyasztói hozzáállás a funkcionális tejtermékekhez

Mennyire ért egyet – a funkcionális tejtermékek hasznosságára vonatkozó – alábbi állításokkal 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem ért egyet, 5 – teljes mértékben egyet ért?

- A funkcionális tejtermékek javítják a hangulatomat.
- Javul a teljesítményem, ha funkcionális tejterméket fogyasztok.
- Megelőzhetem a betegségeket, ha rendszeresen fogyasztok funkcionális tejtermékeket.
- A funkcionális élelmiszerek helyrehozhatják az egészségtelen táplálkozás okozta károkat.
- A funkcionális tejtermékek elősegítik a jólléteimet.

Fogyasztói hajlandóság a funkcionális tejtermékek fogyasztására

Milyen mértékben hajlandó az alábbi funkcionális tejtermékeket fogyasztani 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem hajlandó, 5 – teljes mértékben hajlandó?

- Laktózmentes tejtermékek
- Alacsony zsírtartalmú tejtermékek
- Probiotikus joghurtok
- Kalciummal dúsított tej
- Omega-3-mal (EPA és DHA) dúsított tej
- Folsavval dúsított tej

A funkcionális tejtermékek fogyasztásának motivációi és akadályai

Milyen mértékben jellemzők Önre az alábbi állítások 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem jellemző, 5 – teljes mértékben jellemző? Azért fogyasztok funkcionális tejtermékek, mert ...

- talán tovább élek.
- egészséges akarok lenni.
- szeretném kezelni a súlyomat.

Milyen mértékben jellemzők Önre az alábbi állítások 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem jellemző, 5 – teljes mértékben jellemző? Azért nem fogyasztok funkcionális tejtermékek, mert ...

- nem vagyok motivált.
- nincs senki, aki bátorítana vagy segítene nekem.
- túlságosan elfoglalt vagyok.

A funkcionális tejtermékekkel kapcsolatos reklámok a médiában

Mennyire ért egyet – a funkcionális tejtermékekről szóló információkra vonatkozó – alábbi állításokkal 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem ért egyet, 5 – teljes mértékben ért egyet?

- A reklámok azonnali információkat nyújtanak a funkcionális tejtermékekről.
- A reklámon keresztül kényelmesen juthatok információkhoz a funkcionális tejtermékekről.
- A reklám tájékoztat a piacon elérhető legújabb funkcionális tejtermékekről.

Mennyire ért egyet – a reklámok szórakoztató hatására vonatkozó – alábbi állításokkal 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem ért egyet, 5 – teljes mértékben ért egyet?

- A reklámok általában megnevettetik az embereket és szórakoztatóak.
- A reklámok sugallják, hogy az én életstílusomhoz hasonló emberek mit fognak vásárolni és használni.

Mennyire ért egyet – a funkcionális tejtermékekről szóló reklámok hitelességére vonatkozó – alábbi állításokkal 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem ért egyet, 5 – teljes mértékben ért egyet?

- A funkcionális tejtermékek reklámjai hitelesek.
- A funkcionális tejtermékek reklámjai meggyőzők.

Mennyire ért egyet – a funkcionális tejtermékekről szóló reklámok zavaró hatására vonatkozó – alábbi állításokkal 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem ért egyet, 5 – teljes mértékben ért egyet?

- A funkcionális tejtermékek reklámjai idegesítők.
- A funkcionális tejtermékek reklámjai megtévesztők.
- A funkcionális tejtermékek reklámjai bosszantók.

Mennyire ért egyet – a funkcionális tejtermékekről szóló reklámok média reklámértékére vonatkozó – alábbi állításokkal 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem ért egyet, 5 – teljes mértékben egyet ért?

- A funkcionális tejtermékek reklámjai hasznosak.
- A funkcionális tejtermékek reklámjai fontosak

A funkcionális tejtermékek online vásárlása

Mennyire ért egyet – a funkcionális tejtermékek online vásárlására vonatkozó – alábbi állításokkal 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem ért egyet, 5 – teljes mértékben egyet ért?

- A funkcionális tejtermékeket akkor fogom online vásárolni, ha ez a szolgáltatás széles körben elérhetővé válik.
- A funkcionális tejtermékeket akkor fogom online vásárolni, ha ingyenes lesz a házhoz szállítás.
- A funkcionális tejtermékeket akkor fogom online vásárolni, ha az ár versenyképes lesz.

Mennyire ért egyet – a funkcionális tejtermékek online vásárlás hasznosságára vonatkozó – alábbi állításokkal 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem ért egyet, 5 – teljes mértékben egyet ért?

- A funkcionális tejtermékek online beszerzésével sok időt takaríthatok meg.
- Az online vásárlás megkönnyítheti a funkcionális tejtermékek beszerzését.
- Az online vásárlás kényelmessé teszi a funkcionális tejtermékek beszerzését.

Mennyire ért egyet – a funkcionális tejtermékek online vásárlás egyszerűségére vonatkozó – alábbi állításokkal 1-5-ig terjedő skálán, ahol 1 – egyáltalán nem ért egyet, 5 – teljes mértékben egyet ért?

- Könnyen lehet funkcionális tejtermékeket online beszerezni.
- Könnyen követhetők az egyes lépések a funkcionális tejtermékek online rendelése során.
- Érttem a funkcionális tejtermékek online vásárlás folyamatának lépéseit.