Analysis of Factors Affecting Household Food Consumption Away From Home in Türkiye

Cuma AKBAY[1]✍, Abdulbaki BİLGİÇ[2], Mücahit PAKSOY[3],
[1,3]Kahramanmaras Sutcu Imam University, Agricultural Faculty, Department of Agricultural Economics, Kahramanmaras, Türkiye, [2]Bilecik Şeyh Edebali University, Faculty of Economics and Administrative Science, Bilecik, Türkiye
[1]https://orcid.org/0000-0001-7673-7584, [2]https://orcid.org/0000-0001-5946-0915, [3]https://orcid.org/0000-0002-1037-1548
✉: cakbay@ksu.edu.tr

ABSTRACT

One of the most important changes in consumer food consumption habits in recent years is the trend toward food consumption away from home (FAFH). The effects of socioeconomic and demographic factors on FAFH expenditure and consumption decisions were jointly investigated using the inverse hyperbolic sine double-hurdle (IHS-DH) model, and household survey data consisting of 1655 consumers in 14 cities in Türkiye. According to the results, the consumer being a male, having a high school or university diploma, an extra person generating income outside the family head, having children under the age of 18, and having high income increased the likelihood of consuming FAFH. However, the probability of FAFH consumption spending decreases with the variables of the consumer age, seasonal variables, geographical regions, and family size. On the other hand, consumers' unconditional FAFH consumption expenditure increases when the variables of male, high school or university diploma, internet, children under the age of 18, and visiting shopping centers frequently. However, the presence of regular meals in the family decreases FAFH consumption. This research sheds light on the nuanced interplay of various socioeconomic and demographic factors shaping consumer behaviors regarding FAFH consumption, thereby offering valuable insights for policymakers and stakeholders in the food industry.

Türkiye'de Tüketicilerin Ev Dışı Gıda Tüketimi ve Tüketimi Etkileyen Faktörlerin Analizi

ÖZET

Tüketicilerin gıda tüketim alışkanlıklarında son yıllarda yaşanan en önemli değişikliklerden biri de ev dışında gıda tüketimine (FAFH) yönelik eğilimdir. Sosyoekonomik ve demografik faktörlerin FAFH harcama ve tüketim kararları üzerindeki etkileri, ters hiperbolik sinüs çift engel (IHS-DH) modeli ve Türkiye'deki 14 ildeki 1655 tüketiciden oluşan hane halkı anketi verileri kullanılarak araştırılmıştır. Sonuçlara göre tüketicinin erkek olması, lise veya üniversite diplomasına sahip olması, aile reisi dışında gelir elde eden bir kişi olması, 18 yaş altı çocuk sahibi olması ve gelirinin yüksek olması FAFH tüketme olasılığını arttırmaktadır. Ancak FAFH tüketim harcaması olasılığı tüketici yaşı, mevsimsel değişkenler, coğrafi bölgeler ve aile büyüklüğü değişkenleriyle birlikte azalmaktadır. Öte yandan tüketicilerin erkek olması, lise veya üniversite diplomasına sahip olması, internet kullanımı, 18 yaş altı çocuk sahibi olması ve alışveriş merkezlerini sık ziyaret etme değişkenleri göz önüne alındığında tüketicilerin koşulsuz FAFH tüketim harcamaları artmaktadır. Diğer taraftan, ailede öğünlerin düzenli olması FAFH tüketimini azaltmaktadır. Bu araştırma, FAFH tüketimine ilişkin tüketici davranışlarını şekillendiren çeşitli sosyoekonomik ve demografik faktörlerin etkilerine ışık tutmakta ve böylece gıda endüstrisindeki politika yapıcılara ve paydaşlara değerli bilgiler sunmaktadır.

INTRODUCTION

Recent economic progression and lifestyle changes in Türkiye have led to an increase in the number of people who consume food outside of the home. In particular, the intense participation of family members in business and the increasing share of working women have changed the lifestyle of individuals as well as their eating habits (Bugra & Cakar, 2010; Wang et al., 2014; Saksena et al., 2018). One of the most important changes in consumer food consumption behavior in recent years is the increasing tendency to consume more food away from home (FAFH). Consumers spend less time preparing food at home (FAH) than in previous years (Smith et al., 2013; Monsivais et al., 2014), leading to an increase in FAFH consumption expenditure. FAFH consumption is primarily related to food and beverage consumption outside the home. However, in the commercial sense, FAFH means that consumers purchase and consume food and beverages produced and served by a commercial enterprise outside the home (Seguin et al., 2016; Saksena et al., 2018). Although this trend is occurring worldwide, there are some structural differences between developed and developing countries. For example, in the United States, households allocate about half of their total food budgets to FAFH consumption expenditures (27% in 1960 compared to 50% in 2010), compared to around 16% in Italy and 25% in Greece, from 25% in 1996 to 30% in 2006 in Spain, from 24% in 2002 to 31% in 2008 in Brazil and from 22% in 1995 to 31% in 2019 in the United Kingdom (UK) (Mihalpoulos & Demoussis, 2001; Montini, 2001; Mutlu & Gracia, 2006; Bezerra et al., 2013; Saksena et al., 2018; Law et al., 2022).

A similar situation has been observed in Türkiye. FAFH consumption increased significantly compared to total food consumption. According to Turkish Statistical Institute (TURKSTAT) data, the share of food expenditure in total expenditure in 1994 was approximately 35%, which decreased to 26% in 2018. On the other hand, the share of FAFH food consumption expenditures in total food expenditure increased from approximately 3% to 15% in the same period (TURKSTAT, 2018). The changes in socio-demographic and economic structure observed in Türkiye in recent years have had an important effect on this change in FAH and the FAFH consumption structure of consumers. Although the share of FAFH consumption expenditure in total food expenditure is not at the level of the United States and other remaining developed countries, the increasing trend observed in recent years is worth emphasizing.

The agricultural sector, which contributes to social welfare by providing the final food needs of the population, is closely related to such phenomena until the final consumption stage. At this point, consumer decisions guide all sectors. FAH and FAFH consumptions are influenced by both income and price, along with numerous other factors. The change in the demographic structure of the household, the increase in the number of women participating in the business life, more two-earner households (couples), the decreasing household size, the increase in the income level, the increase in the level of education, the use of credit cards, and the rapid increase of different brands of fast-food restaurants and cafeterias and the increased urbanization cause an increase in households' FAFH consumption and expenditure (Byrne et al., 1998; Mihalpoulos & Demoussis, 2001; Montini, 2001; Fanning et al., 2010; Akbay et al., 2007; Angulo et al., 2007; Liu, 2011; Seguin et al., 2016; Saksena et al., 2018).

The rapid increase in the number of domestic franchises and opened fast-food restaurants in recent years, mainly in shopping malls are among the most important inducements for the development of out-of-home food consumption in Türkiye. Especially in metropolitan or big cities, the number of western-origin McDonald's, Pizza Hut, and Burger King restaurants selling pizza and hamburgers has increased significantly. By 2018 among foreign fast-food restaurants in Türkiye, Burger King ranked first with 651 restaurants, followed by Domino's Pizza (381), McDonald's (225), Popeye's (200), Starbucks (161), Sbarro (107), KFC (72), Subway (72), Pizza Hut (45), and Arby's (68 restaurants) (Tavak, 2018). Thus, FAFH consumption not only enriches the food range and development of the Turkish catering industry and other related businesses but also offers great opportunities to attract foreign investors and increase employment in the catering sector in the country.

In addition, many international restaurants operate in Türkiye and pursue expansion policies. Besides these, many local fast-food chains such as Mado (200), Sultanahmet Koftecisi (130), Usta Dönerci (135), Simit Sarayı, and Pizza Pizza (150) operate in Türkiye (Tavak, 2018), most of which are located in large cities and shopping malls. In addition to the fast-food restaurants mentioned above, the number of small and large doner and kebab restaurants in Türkiye is increasing rapidly. It is estimated that approximately half of the total sales consist of doner and kebab sales. For example, meatballs, shish kebabs, lahmacun, pita bread, and doner kebabs offered by peddlers have been indispensable elements of the Turkish food system for many years. In recent years, local hamburger and pizza restaurants and Çiğ Köfte sales places have been

increasing rapidly and they have continued to exist under different names (such as Tatlıses Lahmacun, Tadım Pizza, Pizza Hot, Tatlıses Çiğ Köfte, Adıyaman Çiğ Köfte[1]).

Although there have been many studies on FAFH in the past (Çabuk and Sengül, 2000; Özçelik and Sürücüoğlu, 1998; Akbay et al., 2007; Tayfun & Tokmak, 2007; Kayisioglu, 2012; Hamsioglu, 2013; Terin, 2019), no national studies have been found that address the socio-demographic, economic, and health perceptions of consumers' FAFH consumption and the food consumption attitudes and behaviors of consumers. In addition, based on the fact that some health problems arise as a result of the increasing tendency of families to consume FAFH, understanding the FAFH consumption and spending behaviors of consumers has become increasingly important for many reasons such as business decisions and health problems (Barrett et al., 2019). Unhealthy eating habits are an important disease problem in individuals of all ages, as they increase with the increase in food consumption outside the home, especially with social and dietary changes (Chen et al., 2021). The current study aims to empirically elicit how consumers' preferences and the factors including dietary behavior and health perceptions that trigger FAFH consumption in Türkiye are determinative on both probability and spending levels, using an inverse hyperbolic sine double-hurdle (IHS-DH) censored model. Unlike previous studies, the current study is the first study to analyze the general structure of household FAFH consumption in Türkiye. Obtaining eclectic empirical results from nationally representative cross-sectional data is crucially important when considering the role of FAFH consumption and providing guidance on healthy FAFH choices in nutritional intervention programs. To create effective marketing channels, it is very important to segregate families into groups according to their role-playing characteristics on FAFH probability and spending levels. The use of household survey data has, therefore, several advantages. First, economic theory can be applied to individual household behaviors by using household survey data. Second, household data are not affected by time-dependent structural changes. Over the past 20 years, Türkiye's demographics have undergone important changes in social and economic structure. Unfortunately, time series analysis is insufficient to elicit changing behavior patterns unique to individuals or families. Therefore, using survey data increases the applicability of demand forecasts with varying household behavioral structures. The results of the current study will also make it easier for businesses to make more informed decisions and will

be a guide for private-sector entrepreneurs. In other words, the investigation of the factors affecting FAFH consumption probabilities and spending levels may have a clear and direct impact on the private sector. However, when the issue is examined extensively, FAFH consumption expenditures can have a direct impact not only on businesses but also on existing health problems, thereby increasing obesity rates. Therefore, understanding the factors that determine consumers' FAFH consumption probability and spending levels is important not only for companies but also for policymakers to make interventionist decisions for effective nutrition programs in the country. Health problems due to increased consumption of FAFH will force the state to have many financial obligations as health expenditures increase.

The structure of the paper is as follows. First, the descriptive analysis of the data and the collection method are presented. This is followed by a brief discussion of the data analysis method. A discussion of the empirical results will be thereafter presented. Finally, we conclude with our main findings and recommendations.

MATERIAL and METOD
Data collection (sampling) method

In this study, supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) with project number 113K733, the data were obtained via face-to-face interviews with households determined by an appropriate sampling method. Within the scope of this study, 14 cities in Türkiye were selected to uncover at least one city from 12 NUTS1 regions (Istanbul, Izmir, Bursa, Ankara, Konya, Antalya, Adana, Kayseri, Samsun, Erzurum, Gaziantep, Diyarbakir, Malatya, and Trabzon). The number of households interviewed to represent the study population was determined using the proportional sampling formula (Yamane, 2001):

$$n = \frac{Np(1-p)}{(N-1)\sigma_{px}^2 + p(1-p)} \qquad \text{(i)}$$

where n is the sample size, N is the total number of households in the surveyed provinces (approximately 7.74 million according to the TURKSTAT, 2018), and p is FAFH consumption share (0.50 will be taken as reaching the maximum sample volume will reduce possible error) and σ_{px}^2 is variance ($\sigma_{px} = 1.96/0.025$).

According to the aforementioned formula, the initial sample size was calculated to be 1537, ensuring a 2.5% error margin and a 95% confidence interval, and subsequently increased by 10% to bolster the

---

[1] Çiğ Köfte (raw meatballs) is a dish belonging to the Southeastern Anatolia (Şanlıurfa and Adıyaman cities) region, prepared by kneading and mixing bulgur, ground hot

pepper, minced meat, tomato paste, onion, parsley, and various spices and consumed without heat treatment (cooking).

statistical power of the study. This enlargement aims to facilitate more dependable and precise estimations of population parameters. After incorporating additional questionnaires, a sample from 1655 households was included in the study.

The descriptive statistics of the factors used in the model according to the information provided by the head of the family are presented in Table 1. The head of the family is 37 years old on average, 56% of them are male, 77% are married, 33 and 37% are high school and university graduates, respectively. Additionally, 15% of respondents reported having health issues, while 24% are currently following a diet program. About 25% pay close attention to their daily food intake, and 15% are classified as obese, with a body

mass index (BMI) exceeding 40 kg/m². Moreover, approximately 21% of respondents drink more than 2.5 liters of water per day. Approximately 15% of individuals visit the shopping center 5 or more times a month. The average family size is 3.5 people, which is in line with the TURKSTAT data. The monthly average family income is around 3500 TL, and we see that about a quarter of this is devoted to food expenditures, which is in line with the TURKSTAT data. The average family spends 139 Turkish Lira (TL) per month with a high standard deviation, and about 87% of families have a dining-out culture in Türkiye. The share of Food-Away-From-Home (FAFH) expenditures accounts for 16.3% of total food expenditures, while its share relative to income is 3.9%.

Table 1. Definition and descriptive statistics of variables
Çizelge 1. Değişkenlerin tanımı ve tanımlayıcı istatistikleri

Variable	Definition of variables and measurement units	Mean	Std. Dev.
Dependent Variable			
FAFH expenditure	Household monthly FAFH expenditure	139.467	149.508
DFAFH	1: Consume FAFH; 0 otherwise	0.870	0.336
İndependent Variables			
HHAGE	Age of household head (year)	38.707	10.427
HHGENDER	1 if the household head is male; 0 otherwise	0.563	0.496
HHMSTATS	1 if the household head is married; 0 otherwise	0.771	0.420
HGSCHOOL	1 if the household head graduated from high school; 0 otherwise	0.333	0.471
CLSCHOOL	1 if the household head graduated from university; 0 otherwise	0.375	0.484
HHLTHPRB	1 if the head of the family has any health problems; 0 otherwise	0.147	0.354
HHDIYET	1 if the head of the family applies for a daily diet program; 0 otherwise	0.237	0.425
WATCHFUL	1 if the head of the family pays much attention to what he eats daily; 0 otherwise	0.255	0.435
FRQWATER	1 if the head of the family consumes 2.5 lt or more of water daily; 0 otherwise	0.206	0.405
INTERNET	1 if there is internet at home; 0 otherwise	0.730	0.444
HOMECOOK	1 if regular home cooking is cooked at home; 0 otherwise	0.831	0.375
SEASON	1 if the survey was done in summer 1; 0 otherwise	0.476	0.500
MFRTQVST	1 if the individual visits the shopping center 5 or more times a month; 0 otherwise	0.154	0.361
MARMARA	1 if Marmara; 0 otherwise	0.292	0.455
HSIZE	Household size (person)	3.473	1.340
OBESE	Body mass index of household head higher than 40 kg/m²	0.153	0.360
INCGRP2	Middle-income household	0.371	0.483
INCGRP3	Higher-income Household	0.310	0.463

*: In 2016, 1 US Dollar = 3.02 TL

The Inverse-Hyperbolic Sine Double-hurdle model

The inverse hyperbolic sine double-hurdle model (IHS-

DH), which is one of the generalized censored models, will be used in this study[2]. In presenting the model we

---

[2] Food away from home consumption is generally based on the utility model introduced by Becker (1965). However,

Becker's utility model failed to attract much attention from many researchers, as it is particularly complex and requires

will uncover its many advantages, but now we will focus on the reasons behind the zero observations in the data. Microdata generally contains zero observations for consumption (quantity) and expenditure variables. These zeros occur for very different reasons. One of the most common reasons for this is either the family's lack of income or the high price of the product at that time. Such reasons are defined as the reason for the emergence of classical censorship. However, although the family may have a sufficient income level and the power to buy the product at a high price, consumers may not be able to consume, for example, out-of-home foods because they find them unhealthy. Or, shift meals of working family members may be uncovered by the company they work for. Or, family members may not consume western origin products by displaying a conservative attitude, or they may not buy them because they are not suitable for their palate. Or they do not need out-of-home meals because the family lives in the heart of the city center. Because of the high cost of time for the family or family members they meet, or with the food they bring from home, they can meet their food needs during work-break hours. As can be seen, there may be too many behavioral restrictions other than income and price in not consuming the product. Methods that ignore such a zero-consumption feature resulting from a consumption action involving a two-stage process jeopardize some basic statistical properties such as unbiasedness, consistency, and efficiency. Censorship and discrete generalized state in the dependent variables usually require the use of limited dependent models such as the DH or the "Sample Selection (SS)" model. The current empirical applications of these models are predominantly based on the bivariate normality distribution for the error terms. However, parameter estimations are inconsistent when models with discrete dependent variables do not fit the assumption of normality and constant variance (29) for cases in which the normal distribution and constant variance assumption do not hold in the well-known censored (Tobit) model of-home meals because the family lives in the heart of the city center. Because of the high cost of time for the family or family members they meet, or with the food they bring from home, they can meet their food needs during work-break hours. As can be seen, there may be too many behavioral restrictions other than income and price in not consuming the product. Methods that ignore such a zero-consumption feature resulting from a consumption action involving a two-stage process jeopardize some basic statistical properties such as unbiasedness, consistency, and efficiency. Censorship and discrete generalized state in the dependent

variables usually require the use of limited dependent models such as the DH or the "Sample Selection (SS)" model. The current empirical applications of these models are predominantly based on the bivariate normality distribution for the error terms. However, parameter estimations are inconsistent when models with discrete dependent variables do not fit the assumption of normality and constant variance (Arabmazar & Schmidt, 1982) for cases in which the normal distribution and constant variance assumption do not hold in the well-known censored (Tobit) model. The IHS transformation of variable y (e.g., the dependent variable) with any parameter (θ) is given by the following equation (Reynolds & Shonkwiler, 1991):

$$T(y) = \theta^{-1} sinh(\theta y) = \theta^{-1} log(\theta y + (\theta^2 y^2 + 1)^{1/2}) \quad \text{(ii)}$$

where y stands for the dependent variable, e.g., spending levels on FAFH. When transformation $\theta=0$ or approaching 0, it will resemble the logarithmic transformation ($log(2\theta y)$) for a substantially linear and large y value (regardless of the y-values of the zeros). In addition, the transformation scale is invariant and is suitable for removing the skewness mode of the data by mitigating the effect of outliers above the mean. Therefore, applying the transformation to the dependent variable (y) will avoid possible non-normality distribution of error terms and drastically varying variance problems (Reynolds & Shonkwiler, 1991; Su and Yen, 1996; Mihalpoulos & Demoussis, 2001). Let us define the dependent variable y_i (e.g., the monthly spending levels of food away from home) with the IHS transformation as shown in the equation as $T(y_i)$. The IHS-DH model can be expressed as follows:

$$T(y_i) = x_i'\beta + u_{2i} \text{ if } z'\alpha + u_{1i} > 0 \text{ and } x_i'\beta + u_{2i} > 0$$
$$= 0, \text{otherwise} \quad \text{(iii)}$$

where z_i and x_i are explanatory variable vectors, α, and β are parameters corresponding to these variables and $[u_{1i}, u_{2i}]'$ are random error terms. The random error terms fit the bivariate normal distribution with an arithmetic mean of zero, variance of $[1, \sigma^2]'$, and a correlation coefficient of ρ:

$$\begin{bmatrix} u_{1i} \\ u_{2i} \end{bmatrix} \sim N\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \rho\sigma \\ \rho\sigma & \sigma^2 \end{bmatrix} \right) \quad \text{(iv)}$$

where the correlation coefficient, ρ, measures the linear relationship between the probability of food away from home spending levels and spending levels. Equation 3 assumes that the discrete outputs (zero or positive) occur entirely by a random sampling mechanism. The value of $x_i'\beta + u_{2i}$ is equivalent to the

---

many additional exogenous factors, but few researchers still base food expenditures on the above-mentioned utility model (Yen, 1993; Mutlu & Gracia, 2006; Bai et al., 2016).

Interested reader(s) may refer to this literature on the subject.

latent variable y_i^*, where if the FAFH spending amount is less than the reservation amount predetermined by their household members or the household, they can consume the meal(s) while dining out. It is worth noting that households will, unfortunately, face income restrictions from the pre-set reservation amount on their out-of-home food consumption, as relatively low-income but large-scale households are expected to be a more disadvantaged group from such income restrictions. In this case, two decision mechanisms must be synchronously processed. In the first decision stage, it should be decided whether to dine out, whereas the second decision stage involves how much they will spend on FAFH, including zero cost. While the dining out decision has a causal relationship with social and behavioral stimuli in the first decision, the spending level decision on FAFH has a causal relationship with economic factors such as budget constraints in the second stage.

The sampling likelihood function for the dependent variable:

$$L = \prod_{y_i=0} \left\{ 1 - \Phi_2\left(z_i'\alpha, \frac{x_i'\beta}{\sigma_i}, \rho\right) \right\} *$$

$$\prod_{y_i=0} \left\{ (1 + \theta^2 y_i^2)^{-1/2} \sigma_i^{-1} \phi\left[\frac{T(y_i) - x_i'\beta}{\sigma_i}\right] \Phi\left[\frac{z_i'\alpha + (\rho/\sigma_i)(T(y_i) - x_i'\beta)}{(1-\rho^2)^{1/2}}\right] \right\} \quad (v)$$

where Φ_2 refers to the bivariate standard normal distribution (cdf) and ϕ and Φ are the univariate probability density function (pdf) and the cumulative distribution function of the standard normal distribution (cdf), respectively. Zero and positive results in the dependent variable (y_i) are managed by a double-hurdle mechanism. The probability of the dependent variable to be $y_i=0$ is determined by both parameter sets (α and [β, σ, θ]) and the parameters are no longer separable with the zero-correlation constraint ($\rho = 0$) in the maximum likelihood function. As with the IHS-DH model, when the variables are $\theta \to 0$, $T(y_i) \to y_i$, and the Jacobian term takes the value 1, the model turns into a conventional error-dependent DH model. When the error terms correlation (ρ) is 0, the IHS-DH and DH models will turn into independent IHS-DH and independent DH models, respectively.

$$\text{Prob}(y_i|x_i, z_i, h_i) = \Phi_2\left(z'\alpha_i, \frac{x_i'\beta}{\sigma_i}, \rho\right)$$

$$E^+ = E[y_i|y_i > 0, x_i, z_i, h_i]$$

$$= \frac{1}{\Phi_2\left(z'\alpha_i, \frac{x_i'\beta}{\sigma_i}, \rho\right)} \int_0^\infty y_i (1 + \gamma^2 y_i^2) \frac{1}{\sigma_i} \varphi\left[\frac{T(y_i, \gamma) - x_i'\beta}{\sigma_i}\right] \Phi\left[\frac{z_i'\alpha + \frac{\rho[T(y_i, \gamma) - x_i'\beta]}{\sigma_i}}{\sqrt{1-\rho^2}}\right] dy_i$$

$$E = E[y_i|x_i, z_i, h_i] = \text{Prob}(y_i|x_i, z_i, h_i) * E[y_i|y_i > 0, x_i, z_i, h_i]$$

The first equation reflects the associative probability level while the remaining last two equations refer to conditional and unconditional FAFH expenditure levels, respectively. If the derivatives of all equations are taken against an independent variable, the unitary (marginal) effect is reached. The

IHS-DH models used by Yen and Jones (1997) are restricted to error-dependent DH (Blundell & Meghir, 1987), independent IHS-DH (Su & Yen, 1996), and independent DH (Bulundell & Meghir, 1987). IHS-DH models can be tested against the internal correlation problem by conventional tests such as the Wald test, LR test, or LM test.

The standard deviation of the dependent variable and error terms was re-parameterized as variable function to avoid problems of varying variance and non-compliance with normal distribution. Heteroscedasticity problems in error terms will make maximum likelihood estimators inconsistent. To correct heteroscedasticity that goes beyond the IHS transformation, the standard deviation "σ" of the model corresponding to the FAFH spending level can be parameterized with descriptive variables vector w_i and γ parameter set:

$$\sigma_i = \exp\left(w_i'\gamma\right) \quad (vi)$$

where the first column of w_i consists of 1's. Similar heteroscedasticity adaptations were applied in some studies (Su & Yen, 1996; Yen & Jones, 1997; Newman et al., 2003; Aristei & Pieroni, 2008). Except for homoscedasticity assumed error terms, nested hypothesis, and the first element of γ is equal to zero, the amounts of all elements can also be estimated with the Wald, LR, or LM tests. To eliminate the problem of identification in the model, different independent variables were used in the equations for FAFH consumption probability and expenditure levels, drawing on the random utility theory (Pudney, 2013). For example, in addition to the common traits in both equations, dummy body mass index variables (30-40 and >40), total food expenditure variable, and only dummy region variables for Istanbul and Ankara are included in the FAFH consumption probability, while the FAFH expenditure equation, body mass index and income are continuously included in the FAFH consumption probability while including some metropolitan indicators as dummy variables in the model in addition to the covariates.

The probability, conditional, and unconditional FAFH expenditure levels are measured as follows:

(vii)

estimated conditional and unconditional levels of FAFH expenditure were calculated using the numerical method because the function in the integral does not have a closed structure. At the same time, standard deviations of marginal effects were calculated using the delta method. Analyzing the

relationship between consumption probability and expenditures and socioeconomic and demographic factors has an important role in determining and analyzing policies, planning, and developing strategies.

Factors affecting households' spending levels for food away from home (as the explanatory variable in the model) are divided into four main groups. These are demographic factors related to household heads in the household (gender, marital status, education, age, obesity, job status, health insurance), household-related factors (household income, total expenditure, household size, mother's employment status, number of children, and age groups), regional factors (geographical area of residence, distance of shopping centers, availability of fast-food restaurants) and value judgments (prices, health, environment, service, etc.).

RESULTS and DISCUSSION

Before discussing the model results, we include results of specification tests on the fit of the inverse hyperbolic sine double-hurdle censored model to the data. The error-dependent IHS-DH model has some interesting features unique to it. Therefore, some mandatory tests related to the suitability of the model should be applied. First, if the correlation coefficient $\rho = 0$ in the model is assumed, the IHS-DH model turns into an error-independent IHS-DH model. On the other hand, assuming the theta parameter (θ) to be 0 in the model, the IHS-DH model turns into a conventional error-dependent double-hurdle censored model (DH). Note that the error-dependent DH model is at the core of the IHS-DH model. Therefore, before obtaining the parameters of the DH model, it is necessary to test whether the IHS-DH model converts to the DH model. If the test result mandates the DH model, the DH model has to be estimated, otherwise, the IHS-DH model must be decided. In addition to the above tests, if both the correlation coefficient and theta parameters in the model are assumed simultaneously $\rho=\theta=0$, the IHS-DH model is reduced to the error-independent DH model. All these tests were carried out with the help of conventional Wald and Likelihood tests. Similarly, in the correction of the non-normality and unequal variance status of the model residuals, the variance of the IHS-DH model was assumed as a function of the consumer's age, body mass index, and the number of individuals at home, and income variables. The test of the hypothesis, which suggests that these variables do not affect the variance of the IHS-DH model, was performed with the help of the Wald test. As a result of the tests, the correlation coefficient in the IHS-DH model was found to be different from zero (Wald = 155.37, degrees of freedom (df) = 1, and p <0.01). Therefore, the error-dependent IHS-DH model is not reduced to the error-independent IHS-DH model. In this context, both the probability of FAFH spending and the spending levels of FAFH need to be analyzed

simultaneously with each other. The correlation coefficient (ρ) in the IHS-DH model was negative (-0.176) and statistically significant. Therefore, there is an inverse linear relationship between the FAFH expenditure possibility and expenditure levels in the IHS-DH model. This finding indicates that uncontrollable factors in the model increase (or decrease) the probability level of FAFH while they decrease (or increase) the level of FAFH expenditure. Or, as the amount of FAFH expenditure increases (or decreases), the probability of FAFH expenditure decreases (or increases), such that discrete models without correlations compromise some essential properties of the parameters. Also, the zero-hypothesis testing of $\rho= \theta = 0$ in the IHS-DH model was similarly demonstrated using the Wald test. As a result of the test, the null hypothesis was rejected, so the counter-model-error-free DH model was rejected: both the correlation coefficient and the theta parameters used to correct for outliers in the dependent variable were simultaneously nonzero showing that the dependence of residuals on the likelihood of FAFH and their spending level values and the suitability of inverse hyperbolic sinus transformation to ensure normal distribution is appropriate. The zero hypotheses, which suggests that the independent variables used to correct the unequal variance are simultaneously indistinguishable from zero, was rejected (Wald = 1.409, df = 3, p <0.000). The test results show that the independent variables used in correcting the variance were found to be different from zero simultaneously, and the variance in the IHS-DH model changed as the family size and income variables changed, and the variance of the model increased with the increase in these variables. By controlling such a variability, residuals were ensured to have equal variance. Similarly, the standard deviation of the IHS-DH model was estimated as a parameter (0.256) and found statistically significant. AIC and BIC criteria values of the model were found to be 2498.00 and 2734.79, respectively. All independent variables used in the model were found to be different from zero simultaneously, confirming the accuracy of the selection of the variables used in the model.

Most of the maximum likelihood parameters of the IHS-DH model matched our a priori expectations (Tables 2 and 3). However, since the IHS-DH model used is not linear, the maximum likelihood parameters do not reflect marginal effects on both the possibility of FAFH expenditure and FAFH spending levels. Because marginal effects are attributed more than the maximum likelihood parameters estimated in economic science, these effects need to be measured. In the following, we will only present and discuss the marginal effects of the IHS-DH model. The marginal effects of these variables are presented in Table 4, and only the marginal effects of statistically significant

variables will be discussed. FAFH expenditure is inversely related to the age of the household head, and as age increases, the probability of household FAFH expenditure decreases. In general, young people's food tastes and preferences, eating habits, lifestyles, and socialization opportunities greatly differ from those of the elderly, as expected (Heng & Guan, 2007). As the individual ages a year, the probability of household FAFH consumption decreases approximately by 0.1%. Stewart & Yen (2004) also concluded that the aging of the population will reduce fast food consumption approximately by 2%. Such a reduction in FAFH consumption is expected as a result of the decrease in the mobility of the aging population (Mutlu & Garcia, 2006; Angulo et al., 2007; Keelan et al., 2009; Blick et al., 2017).

The probability of FAFH spending is directly related to consumers' gender. The odds of household FAFH expenditure decreases with a household female-headed and increase when the head of the household is male. As far as the transition between the gender variable is concerned, the probability of family FAFH spending increases approximately by 4.5%. The fact that the consumer is male affects the likelihood of household spending FAFH. This is an expected situation because, in Türkiye, close friendships and relatives among men are high, so it will increase in parallel with the odds of family spending FAFH, as it is likely to spend time eating out collectively. Also, given the fact that women are much more concerned about health and environmental issues than men and their superior ability for home cooking, female-headed households are likely to consume less FAFH. Our finding is in line with the literature (Byrne et al., 1998; Bozoglu et al., 2013; Angulo et al., 2007; Keelan et al., 2009; Fanning et al., 2010; Liu, 2011; Blick et al., 2017; Terin, 2019; Kılıç et al., 2020; Rasool and Akbay, 2021).

Table 2. Maximum likelihood estimates for the DH model
Çizelge 2. DH modeli için maksimum olabilirlik tahminleri

Variables	Spending probability		Spending level		Heteroscedasticity	
	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value
Constant	16.069	0.18	0.626	3.02	-	-
HHAGE	0.0349	0.89	-0.001	0.00	0.008***	4.37
HHGENDER	1.144	1.55	0.062	1.14	-	-
HHMSTATS	-3.792	-0.04	0.256***	3.49	-	-
HGSCHOOL	1.094	1.37	0.175***	2.63	-	-
CLSCHOOL	-1.549	-1.64	0.259***	3.23	-	-
HHLTHPRB	0.814	1.05	0.224***	2.75	-	-
SEASON	-0.548	-0.91	-0.005	-0.08	-	-
HSIZE	-1.452***	-3.46	-0.036	-0.57	-0.023**	-2.12
OBESE	-1.760**	-2.14	-0.116*	-1.73	-	-
WATCHFUL	-1.435**	-1.99	0.409***	5.58	-	-
FRQWATER	1.096	1.04	-0.588***	-6.76	-	-
HOMECOOK	2.091*	1.84	0.172***	3.02	-	-
MFRTQVST	-2.369**	-2.46	0.252***	3.37	-	-
MARMARA	-1.154*	-1.70	-0.154**	-2.52	-	-
HHDIYET	0.021	0.03	0.068**	2.42	-	-
INTERNET	-0.673	-1.14	0.198***	2.73	-	-
INCGRP2	-5.421	-1.37	-0.392***	-3.89	-0.755***	-19.66
INCGRP3	-1.803	-0.44	-0.204**	-2.00	-0.526***	-14.35
Sigma	----	----	1.154***	18.50	-----	-----
Rho	----	----	-0.563***	-1,26	-----	-----
Log-Likelihood value			-1860.428			

Note: *, ** and *** Show statistically important variables at %10, %5 and %1 level.

Table 3. Maximum likelihood estimates of the IHS-DH model
Çizelge 3. IHS-DH modelinin maksimum olabilirlik tahminleri

Variable	Spending probability		Spending level		Heteroscedasticity	
	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value
Constant	1.273***	3.89	0.565***	7.23	-	-
HHAGE	-0.007	-1.09	0.0001	0.40	0.006**	2.15
HHGENDER	0.265**	2.45	0.014	0.74	-	-
HHMSTATS	0.231	1.39	0.067***	2.73	-	-
HGSCHOOL	0.427***	3.33	0.028	0.95	-	-
CLSCHOOL	0.825***	4.96	0.049	1.25	-	-
HHLTHPRB	0.238	1.44	0.068**	2.35	-	-
SEASON	0.136	0.96	-0.008	-0.42	-	-
HSIZE	-0.238**	-1.99	-0.006	-0.33	0.009	0.49
OBESE	-0.123	-0.86	-0.041*	-1.94	-	-
WATCHFUL	0.326**	2.54	0.115***	3.83	-	-
FRQWATER	-0.224	-1.06	-0.182***	-5.41	-	-
HOMECOOK	-0.408***	-3.37	0.083***	3.52	-	-
MFRTQVST	0.135	0.73	0.091***	3.56	-	-
MARMARA	-0.130	-1.10	-0.038*	-1.95	-	-
HHDIYET	-0.107**	-2.52	0.028***	3.13	-	-
INTERNET	0.165	1.14	0.047*	1.92	-	-
INCGRP2	-0.003	-0.02	-0.147***	-5.32	-0.363***	-5.84
INCGRP3	0.455***	2.91	-0.084***	-2.87	-0.264***	-4.40
Sigma	-----	-----	0.256 ***	6.10	-----	-----
Rho	-----	-----	-0.176*	-1.93	-----	-----
Gamma	-----	-----	1.409***	5.64	-----	-----
Log-Likelihood value			-1204.004			

Note: *, ** and *** show statistically important variables at %10, %5 and %1 level.

Table 4. Marginal effects of the IHS-DH model
Çizelge 4. IHS-DH modelinin marjinal etkileri

Variables	Spending probability		Unconditional spending level		Conditional spending level	
	Estimate	t-value	Estimate	t-value	Estimate	t-value
HHAGE	-0.0013	-1.36	-0.0042	-1.59	-0.0021	-1.31
HHGENDER	0.0449**	2.53	0.0632*	1.91	0.0157	0.94
HHMSTATS	0.0439*	1.65	0.1447***	3.25	0.0631***	2.88
HGSCHOOL	0.0728***	3.48	0.1121**	2.24	0.0311	1.16
CLSCHOOL	0.1402***	5.15	0.2076***	3.12	0.0549	1.55
HHLTHPRB	0.0451*	1.66	0.1471***	2.88	0.0640**	2.48
HHDIYET	0.0217	0.93	0.0076	0.21	-0.0056	-0.33
WATCHFUL	-0.0397**	-2.03	-0.0471	-1.33	-0.0088	-0.49
FRQWATER	-0.0239	-1.03	-0.0860**	-2.30	-0.0386**	-2.05
INTERNET	0.0637***	3.08	0.2390***	4.89	0.1083***	4.02
HOMECOOK	-0.0528	-1.53	-0.3328***	-5.59	-0.1674***	-5.56
SEASON	-0.0599***	-3.07	0.0741*	1.91	0.0704***	3.33
MFRTQVST	0.0302	0.99	0.1691***	3.48	0.0835***	3.65
MARMARA	-0.0248	-1.28	-0.0829**	-2.39	-0.0363**	-2.06
HSIZE	-0.0156**	-2.30	0.0226	1.13	0.0198*	1.69
OBESE	0.0312	1.32	0.1015**	2.41	0.0441**	2.04
INCGRP2	0.0047	0.22	0.0221	0.33	0.0266	0.68
INCGRP3	0.0808***	3.17	0.1234*	1.80	0.0455	1.17

Note: *, **, and *** show statistically important variables at %10, %5, and %1 level. Since the dependent variable is divided into 100 at the model stage, the unitary effects of unconditional and conditional spending levels must be multiplied by 100.

The fact that the household head is a high school and university graduate, including master's and doctoral degrees, increases the likelihood of household spending FAFH whereas having a lower level of education makes households less likely to spend FAFH. Having a certain educational career positively triggers the probability of household spending FAFH by creating a social class in the community and enabling more social and cultural activities outside the home. Compared to secondary education and lower education levels of the household head, high school and university degrees increase the probability of family spending FAFH by approximately 7.3% and 14.0%, respectively. Note that as human capital (education level) increases, the probability of spending FAFH increases gradually. In particular, fast food and other FAFH companies can increase their sales by conducting research on this educational group and making certain promotions for the group. These positive effects of education are consistent with previous findings (Cupak et al., 2016; Piekut, 2016; Traş & Şengül, 2017; Terin, 2019; Ağır and Akbay, 2021).

Having a family head with chronic health problems reduces the odds of household FAFH spending. This is an expected situation: people with chronic illnesses do not have a mobile life and higher health concerns can mitigate the likelihood of household FAFH spending. However the result indicated that households where the head has health problems are 4.51% more likely to spend on FAFH compared to households where the head does not have health problems. The reason for this positive relationship can be explained by the bidirectional relationship. Increased consumption of food-away-from-home (FAFH) could also lead to health problems. FAFH options are often higher in calories, fat, sugar, and sodium than home-cooked meals. Regular consumption of these types of foods can lead to poor nutritional outcomes, including obesity, cardiovascular disease, and other health problems. Moreover, results indicate that households where the head pays close attention to their daily diet are 3.97% less likely to spend on FAFH. This result is statistically significant at the 5% level.

The fact that the family has the odds of spending more on FAFH than those who do not have the internet may be perceived as an opportunity provided by communication in which the internet fulfills the function of information networks such as inviting friends or relatives home or going out to dinner together through social media. It brings the information to be obtained through online research results to a more advantageous position in terms of the likelihood of spending FAFH compared to those who do not have such information. Our result overlaps with the finding of Bozoglu et al. (2013) a positive relationship between having an internet connection at home and FAFH expenditures.

Meanwhile, seasonal changes shape the probability of household FAFH spending. The fact that the consumer is in winter compared to summer has increased the likelihood of spending FAFH. The rate of increase was approximately 6.0%.

As expected, the probability of spending FAFH decreases with an increasing economic burden as family size increases. The presence of an extra person in the family reduced the likelihood of spending FAFH approximately by 1.6%. Our result overlaps with the literature findings (Heng & Guan, 2007; Akbay et al., 2007; Drescher & Roosen, 2013; Blick et al., 2017). Interestingly, the probability of spending FAFH increases in individuals with a body mass index higher than 40 (Obese). Increased body mass index binds people inside rather than outside the home, and it is likely that while indoor food consumption increases, the probability of out-of-home food consumption decreases, which they may forego because they know they will spend more money while dining out. On the other hand, there is a positive relationship between family income and the odds of family FAFH spending. Although the income variable is not directly included in the equation for the probability of spending FAFH, its effect is indirect. This finding is expected: it triggers more outside activities to increase economic welfare as family income increases. Compared to lower income households, higher income households increase the probability of family spending FAFH by approximately 8.1%. Such income inferences were also consistent with literature findings (Cupak et al., 2016; Piekut, 2016; Blick et al., 2017; Traş & Şengül, 2017; Terin, 2019; Ağır and Akbay, 2021; Rasool and Akbay, 2021).

The marginal effects of the independent variables on the conditional and unconditional food away-from-home spending levels are given in the last four columns of Table 4 with their statistics. In line with our comment, only statistically important variables are emphasized. Similarly, to make a population-oriented inference, the level of FAFH expenditure is emphasized. Looking at the effects of the unitary or marginal impact, men spent more (6.3 TL) on FAFH than women. In line with the Turkish social structure, men spend more FAFH due to reasons such as being more out of the home and being more active than women in terms of socialization. Or, women's health concerns about food consumption outside of the home, increased opportunity costs with the intensity of housework, and more frugal behavior may be the driving forces behind the low level of spending. Angulo et al. (2007) reported that men spend more on FAFH than women in Spain.

Compared to an individual with a secondary or a lower education level, the individual's high school diploma or

university degree has been observed to increase monthly FAFH expenditures (11.2 TL and 20.8 TL, respectively). The increase in FAFH spending is inevitable when the human accumulation gained through education requires more presence outside the home, especially if people with higher education levels look for work fatigue outside the home. Or, the high opportunity cost of higher education levels may push households to consume more out-of-home food. This finding overlaps with international literature findings (Jensen & Yen, 1996; Angulo et al., 2007; Zan & Fan, 2010; Keelan et al., 2009; Liu, 2011). In a study conducted by Akbay et al. (2007), university graduates go to fast food places more frequently. Meanwhile, as expected, a household head who drinks 2.5 lt of water per day decreases home FAFH expenditure. Given such consumer health concerns or diet, it is inevitable to encounter such a finding. Having an internet connection at home increases consumers' FAFH expenditure (23.9 TL more). Considering factors such as the ease of booking reservations in places such as restaurants, the ability to book meals with friends by communicating with social media (e.g., Facebook, Youtube, Instagram, Twitter, Snapchat, etc.), and the quick availability of information about FAFH confirms the existence of such a finding.

A consumer who regularly cooked at home has less FAFH consumption expenditure (33.3 TL) than those who do not have such an advantage. This is an expected situation: the habit of individuals who regularly cook at home with their family members and eat home meals on time mitigates the expenditure on FAFH. A consumer spends more FAFH (7.4 TL) in the summer season than in the winter season. The comfort brought about by the summer season allows the consumer to spend more on FAFH and shows that the amount of FAFH expenditure is affected by the seasonal structure. Firms that offer FAFH spending can take advantage of this summer and increase their profits by adopting a different advertisement and promotion attitude. It has been determined that consumers who visit shopping malls more than 5 times a month spend more on FAFH than expected (16.9 TL more). Families residing in Marmara region spend less on FAFH than their peers residing in other parts of Türkiye (8.3 TL). Thus, we determined that the demographic difference between provinces shapes FAFH consumption. While our findings were consistent with the findings of some previous studies (Keelan et al., 2009; Chang & Yen, 2010; Bozoglu et al., 2013, Cupak et al., 2016; Tiraş & Şengul, 2017), they contradicted some other findings (Heng & Guan, 2007; Akbay et al., 2007; Drescher & Roosen, 2013; Blick et al., 2017).

Interestingly, the amount of FAFH expenditure decreased with increasing body mass index. Households with obese-headed spent more on FAFH (10.1 TL) than households with non-obese-headed. Therefore, it can be said that as the body mass level increases, the amount of FAFH expenditure also increases. This finding is consistent with those of previous research (De Vogli et al., 2014; Seguin et al., 2016). De Vogli et al. (2014) stated that, as an economic freedom instrumental variable, the relationship between fast food consumption and body mass index is weakened but found to be meaningful. Seguin et al. (2016) found a positive and significant relationship between fast food consumption and body mass index.

As income increases, households consume more FAFH products. This is an expected situation: increased income brings more socialization outside the home, and this attitude is reflected in FAFH expenditure. The results are to be expected because more affluent households tend to spend more on products and services, including entertainment, diversity, and ambiance, and dining facilities such as alcohol service (Bozoglu et al., 2013). Our result is also consistent with findings in the international literature (Jensen and Yen, 1996; Byrne et al., 1998; Montini, 2001; Akbay and Boz, 2005; Akbay et al., 2007; Zan & Fan, 2010; Liu, 2011; Seguin et al., 2016). Montini (2001) emphasized that income has a significant effect on FAFH consumption, and income elasticity is calculated as 1.22. Moreover, Byrne et al. (1998) and Akbay et al. (2007) indicated that income is the most important factor, especially for fast-food restaurant preferences and expenditures.

When looking at the estimated probability of FAFH expenditure in the IHS-DH model, the probability of FAFH expenditure was 0.870, while the model estimated this probability as 0.823. However, the model predicted the unconditional amount of FAFH expenditure at a higher level (176.8 TL)

RESULTS and RECOMENDATIONS

With economic growth over the last 20 years in Türkiye, there have been important changes in consumer habits. Newly processed foods are placed in the market and have started to take their place in supermarkets, hypermarkets, and other food and beverage offering markets. The wide range of food varieties offered in restaurants and fast-food places and the spread of many new FAFH companies throughout Türkiye offers great opportunities to consumers.

In this study, the factors affecting FAFH expenditure were determined by constructing the IHS-DH model. The model contains two interdependent equations; the first includes FAFH spending probability, and the second includes the level of FAFH spending. The different factors determine each equation. The model structure was tested using various statistical tests. Based on all tests performed, the IHS-DH model was found to be compatible with the data. A negative linear

relationship was found between the probability of spending FAFH and the level of spending. As long as zero spending is observed for factors that are not controlled, the amount of FAFH expenditure decreases when the probability of FAFH expenditure increases. Simultaneously, increasing uncontrolled factors affecting the amount of FAFH will reduce the likelihood of FAFH. The model parameters were obtained using the maximum likelihood function. Most parameters were found to be compatible with economic theory. Because the model is not linear, the marginal effects of regressors on dependent variables are derived and explained in detail in the previous section. When considering the probability of spending FAFH consumption in general, the fact that the household head is male and has a high school or university degree, there are children under the age of 18, and household income increases the likelihood of household FAFH spending. However, the probability of household FAFH spending decreases with the age of the household head and household size.

On the other hand, the overall FAFH consumption of the households will increase if the household head is male, has a high school or university degree, has internet at home, the presence of children under the age of 18, the frequency of shopping mall visits, the season, and an increase in household income. On the other hand, FAFH consumption decreases with a daily water consumption level of 2.5 lt and above and regular cooking in the family. Based on these findings, it will be beneficial for companies in FAFH services to try to deliver their promotions to consumers, especially on the internet. It has been determined that the water consumption level will decrease with the presence of variables such as 2.5 lt and above and the presence of regular meals in the family. Based on these findings, it will be beneficial for companies serving FAFH to try to deliver their promotions to consumers, especially on the Internet. They can also offer meals that are rich in nutrients and a healthy diet, by developing home delivery services to the elderly population and families with female heads. Or, marketing channels can be developed by sharing the steps from the preparation of the dishes to the final presentation with the public through the Metaverse, which will become widespread in the coming years.

Similarly, as the level of education increases, the rate of fast-food consumption also increases. Although this result gives the same result as in the literature, this result should be taken into consideration in terms of human health, especially considering the obesity-fast food relationship. In this study, the most important reason for the positive relationship between education and fast-food consumption is the high level of income among households with high education-headed levels and the fact that the work of family members positively affects their eating out. For these reasons, it will be of

interest to businesses in FAFH services to identify consumers with high school or university degrees and increase their quality of service. Companies serving in the Aegean region are in a more advantageous position, and an increase in the quality of food and services in these areas will lead to an improvement in the company's profits. It will be of interest to companies that provide FAFH services to build playgrounds where they are present and offer their consumers such a service.

The data analysis methods applied in this research are relatively new compared to the method used in the research conducted in the FAFH areas in Türkiye. The econometric method used to explain the social, cultural, and economic dimensions of FAFH consumption adds scientific richness and strength to the existing literature and provides new expansions. The results of the current study are of great importance in terms of raising consumers' awareness of FAFH consumption and evaluating what measures should be taken in terms of food reliability and healthy living during the European Union (EU) negotiation period and membership. According to the results, all organizations in the national and international fast-food chains will satisfy Turkish consumers and enable the development of products that can benefit them. At the same time, the findings obtained from this research increase the added value with the critical importance it carries for policies to protect and satisfy consumers in terms of future health and food safety problems.

The research outputs will serve as a guide for food industry managers and related companies who are wondering what the driving forces behind FAFH spending in Türkiye are. The development of effective marketing programs and policies has always been a major concern in the food distribution and retail industries. The findings provide useful information for managers of food businesses in determining new business opportunities, planning and marketing strategies for better service to consumers, and accurately predicting future consumption patterns.

With rapid urbanization and an increase in women's labor force participation, long working hours, and less physical activity, a diet toward more processed and ready-made foods has started worldwide. Therefore, the increasing effects of supermarkets, hypermarkets, and food and beverage supply chains including catering across the country will ultimately lead to changes in all areas of the food chain. In this context, easily accessible and inexpensive communication systems such as mobile phones, the internet, and even Metaverse can assist consumers in information and market-related services regarding the quality and selectivity of products. Studies should be conducted to raise healthy generations and ensure adequate and balanced nutrition. Understanding the factors

affecting consumers' or households' consumption of FAFH and revealing the profiles of their consuming and not consuming FAFH are not only important for businesses but also for policymakers. Health problems resulting from the increase in FAFH consumption will also increase health expenditures. One of the important contributions of the current study is that it allows us to gain generations with a healthy and balanced diet. In addition, the costs of struggling with fatness and obesity by the Ministry of Health and other public institutions and organizations can be minimized. Moreover, considering the elasticity of fast-food consumption, a tax increase applicable to fast-food consumption will decrease the frequency of visiting a fast-food restaurant and fast-food consumption, or by developing healthier menus, catering services can reduce their tax burden.

Acknowledgment

Researchers' Contribution Rate Statement

The authors declare that they have contributed equally to the article.

Conflict of Interest Statement

The authors of the article declare that there is no conflict of interest between them.

REFERENCES

Ağır, HB. & Akbay, C. (2021). The Analysis of Factors Affecting Frequency of Fast Food Consumption, *Journal of Tekirdag Agricultural Faculty.* 18(3), 436-445.

Akbay, C. & Boz, I. (2005). Kahramanmaraş'ta ailelerin ev ve ev dışı gıda tüketim talebi ve tüketici davranışlarının ekonomik analizi. *KSÜ Fen ve Mühendislik Dergisi,* 8(1), 122-131.

Akbay, C., Tiryaki, GY. & Gul, A. (2007). Consumer characteristics influencing fast food consumption in Türkiye, *Food Control*, 18, 904-913.

Angulo, AM., Gill, JM. & Mur, J. (2007). Spanish demand for food away from home: Analysis of panel data, *Journal of Agricultural Economics*, 58(2), 289-307.

Arabmazar, A. & Schmidt, P. (1982). An investigation of the robustness of the Tobit estimator to non-normality, *Econometrica*, 50(4), 1055-1063.

Aristei, D. & Pieroni, L. (2008). A double-hurdle approach to modeling tobacco consumption in Italy, *Applied Economics*, 40(19), 2463-2476.

Bai, J., Zhang, C., Wahl, T. & Seale, J. (2016). Dining out, the missing food consumption in China, *Applied Economics Letters*, 23(15), 1084-1087.

Barrett, CB., Reardon, T., Swinnen, J. & Zilberman, D. (2019). Structural transformation and economic development: Insights from the agri-food value chain revolution, Working paper, Dyson Cornell SC Johnson College of Business, availableat: http://barrett.dyson.cornell.edu/files/papers/BRSZ%2013%20Aug%202019.pdf

Becker, GS. (1965). A theory of allocation of time, *Economic Journal*, 75(299), 493-517.

Bezerra, IN., Souza, AM., Pereira, RA. & Sichieri, R. (2013). Consumption of Foods Away from Home in Brazil, *Rev. Saude Publica*, 41(1), 200-211.

Blick, M., Abidoye, BO. & Kirsten, JF. (2017). An investigation into food–away–from home consumption in South Africa, *Development Southern Africa*, 35(1), 39-52.

Blundell, RW. & Meghir, C. (1987). Bivariate alternative to the Univariate Tobit Model, *Journal of Econometrics*, 33, 79-200.

Bozoglu, M., Bilgic, A., Yen, SY. & Huang, CL. (2013). Household food expenditures at home and away from home in Türkiye, Paper presented at the annual meeting for Agricultural & Applied Economics Association, Washington, DC, August 4-6, 2013.

Bugra, A. & Cakar, BY. (2010). Structural change, the social policy environment and female employment in Türkiye, *Development and Change*, 41(3), 517-538.

Byrne, JP., Capps, JO. & Saha, A. (1998). Analysis of quick-serve, mid-scale, and up-scale food away from home expenditures, *International Food and Agribusiness Management Review*, 3(1), 51-72.

Çabuk, S. & Şengül, S. (2000). Determination of food consumption of families at home and away from home by switching regression method, Statistics Research Symposium 2000. T.R. State Institute of Statistics, Ankara.

Chang, HH. & Yen, ST. (2010). Off-farm employment and food expenditures at home and away from home, *European Review of Agricultural Economics*, 37(4), 523-551.

Chen, JJ., Tsai, LY., Tsai, JM. & Hsu, CY. (2021). Food away from home and self-perceived gastrointestinal health, *Frontiers in Nutrition*, 8, 741647.

Cupak, A., Pokrivcak, J. & Rizov, M. (2016). Demand for food away from home in Slovakia, *Finance a úvěr – Czech J. of Economics and Finance*, 66(4), 354-369.

De Vogli, R., Kouvonenb, A. & Bukki, DG. (2014). The influence of market deregulation on fast food consumption and body mass index: a cross-national time series analysis, *Bull World Health Organ*, 92(2), 99-10.

Drescher, LS. & Roosen, J. (2013). A cohort analysis of food at home and food away from home expenditures in Germany, *German Journal of Agricultural Economics*, 62(1), 39-51.

Fanning, J., Marsh, T. & Stiegert, K. (2010). Determinants of US fast food consumption 1994-1998, *British Food Journal*, 112(1), 5-20.

Hamsioglu, BA. (2013). An application to determine the lifestyles of consumers buying fast food products, *International Journal of Economic and Administrative Reviews*, 6(11), 17-34.

Heng, HLS. & Guan, ATK. (2007). Examining Malaysian household expenditure patterns on food–away–from–home, *Asian Journal of Agriculture and Development*, 4(1), 1-14.

Jensen, HH. & Yen, ST. (1996). Food expenditure away from home by type of meal, *Canadian Journal of Agricultural Economics*, 44, 67-80.

Kayisioglu, S. & Icoz, A. (2012). The effect of education level on fast food consumption habits. *Tekirdag J. of Agriculture Faculty*, 9(2), 16-19.

Keelan, CD., Henchion, MM. & Newman, CF. (2009). A double–hurdle model of Irish households' food service expenditure patterns. *J. of International Food & Agribusiness Marketing*, 21(4), 269-285.

Kılıç, O., Boz, İ. & Eryılmaz, GA. (2020). Determination of Consumers' Behaviors in Food Purchasing, Conservation, Consumption and Food Safety. *Journal of Management and Economics Research*, 18(2), 29-40.

Law, C., Smith, R. and Crnelsen, L. (2022). Place matters: Out-of-home demand for food and beverages in Great Britain. *Food Policy*, 107(1), 1-12.

Liu, M. (2011). Food expenditures away from home by type of meal and by facilities among different household types. MS thesis, The University of Tennessee.

Mihalpoulos, VG. & Demoussis, M. (2001). Greek household consumption of food away from home (FAFH): A micro econometric approach. *European Review of Agricultural Economics,* 28(4), 421-432.

Monsivais, P., Aggarwal, A. & Drewnowski, A. (2014). Time spent on home food preparation and indicators of healthy eating. *American Journal of Preventive Medicine,* 47(6), 796-802.

Montini, A. (2001). Food away from home and households' expenditures in Italy. The Food Consumer in the Early 21st Century, 19-20 April 2001, Zaragoza, Spain.

Mutlu, S. & Gracia, A. (2006). Spanish Food Expenditure Away from Home (HAFH): By Type of Meal. *Applied Economics,* 38 (9), 1037-1047.

Newman, C., Henchion, M. & Matthews, A. (2003). A double-hurdle model of Irish household expenditure on prepared meals. *Applied Economics,* 35(9), 1053-1061.

Özçelik, Ö.A., Sürücüoğlu, M.S. (1998). Tüketicilerin Fast Food Türü Yiyecek Tercihleri, Gıda 1998 23(6), 437-447.

Papastefanou, G. (2018). An empirical investigation of the impact of smoking on body weight using an

endogenous treatment effects model approach: The role of food consumption patterns. *Nutrition Journal,* 17(1), 1-12.

Piekut, M. (2016). Restaurants and hotels expenditure in Polish households of the elderly. *Economics and Management,* 8(1), 80-90.

Pudney, S. (2013). Modelling individual choice. Basil Blackwell, 1989. Oxford. https://www.ssc.wisc.edu/~walker/wp/wp-content/uploads/2013/09/pudney89_chapter2.pdf

Rasool, Z.S., & Akbay, C. (2021). Fast Food Consumption Behavior of Consumers in the Northern Region of Iraq. *Eurasian Journal Of Agricultural Economics (EJAE)*, 1(1), 1-13.

Reynolds, A. & Shonkwiler, J. (1991). Testing and correcting for distributional misspecifications in the Tobit model: An application of the information matrix test. *Empirical Economics, 16*, 313-323.

Saksena, MJ., Okrent, AM., Anekwe, TD., Cho, C., Dicken, C., Effland, A., Elitzak, H, Guthrie, J., Hamrick, KS., Hyman, J., Jo, Y., Lin, BH., Mancino, L., McLaughlin, PW., Rahkovsky, I., Ralston, K., Smith, TA., Stewart, H., Todd, J. & Tuttle, C. (2018). America's eating habits: food away from home. EIB-196, Michelle Saksena, Abigail M. Okrent, and Karen S. Hamrick, eds., U.S. Department of Agriculture, Economic Research Service.

Seguin, RA., Aggarwal, A., Vermeylen, F. & Drewnowski, A. (2016). Consumption frequency of foods away from home linked with higher body mass index and lower fruit and vegetable intake among adults: A cross-sectional study. *Journal of Environmental and Public Health, 2016*, 3074241.

Smith, LP., Ng, SW. & Popkin, BM. (2013). Trends in US home food preparation and consumption: analysis of national nutrition surveys and time use studies from 1965-1966 to 2007-2008. *Nutrition Journal,* 12, 45.

Stewarth, H. & Yen, ST. (2004). Changing household and the away-from-home food market: A censored equation system approach. *Food Policy,* 29, 643-658.

Su, S. & Yen, S. (1996). Micro econometric models of infrequently purchased goods: An application to household pork consumption. *Empirical Economics,* 21, 513-533.

Tavak. (2018). Türkiye'de yeme-içme sektörünün boyutları. Gastronomi ekonomisi. https://tavakvakfi.org/wp-content/uploads/2019/01/2018-Gastronomi-Ekonomisi-2018-converted.pdf

Tayfun, A. & Tokmak, C. (2007). A study on the reasons of consumers to prefer Turkish style fast food businesses. *Electronic Journal of Social Sciences,* 26(22), 169-183.

Terin, M. (2019). Determining factors in food away from home expenditure of Turkish households. *Applied Ecology and Environmental Research,*

17(2), 3441-3455.

Traş, MF. & Şengul, S. (2017). Cohort effect on food away from home in Türkiye: A double hurdle approach. *Akdeniz University Journal of Economics and Administrative Sciences,* 17(35), 59-80.

TURKSTAT (2018). Household budget survey. Türkiye Statistical Institution 2018, Ankara.

Wang, MC., Naidoo, N., Ferzacca, S., Reddy, G. & Van Dam, RM. (2014). The role of women in food provision and food choice decision-making in Singapore: a case study. *Ecology of Food and Nutrition,* 53(6), 658–677.

Yamane, T. (2001). Basic sampling methods (Translations: A. Esin, C. Aydın, M. A. Bakır ve E. Gurbuzsel). Literatur Publishing, Istanbul.

Yen, ST. (1993). Working wives and food away from home: The Box-Cox Double Hurdle Model. *American Journal of Agricultural Economics,* 75, 884-895.

Yen, S. & Jones, A. (1997). Household consumption of cheese: An inverse hyperbolic sine double-hurdle model with dependent errors. *American Journal of Agricultural Economics,* 79, 246-251.

Zan, H. & Fan, J. (2010). Cohort effects of household expenditures on food away from home. *Journal of Consumer Affairs*, 44(1), 213-233.