

A Multicriteria Analysis Approach to Tourists' Satisfaction with Local Food Consumption



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Abstract In this chapter, we study tourists' satisfaction with local food consumption. Greece is selected as a case study because of the importance of its culinary tradition, while for data collection we interviewed tourists departing from the Thessaloniki Airport "Macedonia". The analysis is based on an extension of the MUSA method. The MUSA method is a multicriteria analysis approach that can collectively measure customers' overall and partial satisfaction, providing a series of results that can identify the strengths and weaknesses of customer perceptions. The results show that tourists are highly satisfied by consuming local food. The most critical local food attributes are taste, safety, aroma, authenticity, appearance, and connection to Greek culture. These attributes are the competitive advantages of local food. On the other hand, healthiness, quality, cost, and package could be perceived as potential threats to tourists' satisfaction. Tourists appear indifferent towards the enhancement of the local economy.

Keywords Tourist satisfaction · Local foods · MUSA method · Tourism food consumption · Multicriteria analysis

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1 Introduction

Local food covers multiple roles for tourism experience and tourists' wellbeing (Sánchez-Cañizares & López-Guzmán, 2012; Tikkanen, 2007). It can be a primary reason for choosing a destination (Björk & Kauppinen-Räisänen, 2016), as it serves as a central holiday experience by reflecting national and local traits and connecting tourists with the destination's culture (Björk & Kauppinen-Räisänen, 2016). The importance of local food consumption is also related to a sustainable tourism experience by connecting with the destination's culture and people (Sims, 2009). In general, food plays a big part of overall tourists' expenditure (Kim et al., 2009), while tourists show a strong interest in purchasing local food (Sanchez-Cañizares & Castillo-Canalejo, 2015; Sánchez-Cañizares & López-Guzmán, 2012). Cross-cultural research also reveals that tourists are willing to pay more for local food (Akdag et al., 2018; Sanchez-Cañizares & Castillo-Canalejo, 2015).

Previous research efforts have studied the motives that drive tourists to consume local foods in the host destination. Sensory traits, authenticity quest, health concerns, cultural connection, and visual representation are solid motivators for local food consumption (Chang & Mak, 2018; Cohen & Avieli, 2004; Kim et al., 2009; Mak et al., 2012, 2017). Furthermore, there is some evidence for which food attributes tourists perceive as important. Taste is the most important attribute, followed by quality, local origin, and authenticity (Altintzoglou et al., 2016).

On the other hand, there is little research about the drivers of tourists' satisfaction with local gastronomic experiences. Relevant literature mainly focused on the dimensions of tourists' gastronomic satisfaction, the effect of foods' perceived image and value, and its impact on revisit intentions. Food quality, price, variety, convenience, cultural aspects, and appearance affect tourists' satisfaction by gastronomic experiences and food consumption (Chi & Qu, 2008, 2009; Peštek & Činjurević, 2014).

Therefore, it is not clear yet how food attributes affect tourists' satisfaction. This study applies a multicriteria analysis approach to tourist satisfaction, aiming to evaluate the importance of food attributes. The primary research aim of the study is to investigate tourists' satisfaction with local food consumption.

The importance of customer satisfaction is well explained in the relevant literature. It is a predictor of consumers' post-purchase behavior (Grigoroudis & Siskos, 2010), while in the tourist literature, it affects their loyalty to a destination (Hammami et al., 2018; Kim et al., 2011). Estimating the weights or importance of food attributes may help policymakers to develop actions or strategies that can enhance customers' satisfaction.

There is a rich literature discussing the relationships between food consumption, tourist satisfaction, and behavioral intentions. There might be different linkages between the aforementioned variables and alternative mediators. For example, local food consumption motivations are linked with tourists' satisfaction (Perçin et al., 2021), local food experiences may significantly affect tourists' behavioral intention

(Ghanem, 2019), while tourist's involvement can serve as a mediator in the food consumption-satisfaction relationship (Rehman et al., 2022).

In this context, we apply the MUSA (Multicriteria Satisfaction Analysis) method. It is a preference disaggregation technique based on ordinal regression analysis. The MUSA method measures and analyzes satisfaction (consumers' satisfaction, employees' satisfaction, customers' satisfaction), and its results can estimate the importance (weight) of each satisfaction criterion (Grigoroudis & Siskos, 2002). Moreover, MUSA can estimate performance indices that show the average satisfaction level of customers. Based on these results, the MUSA method can generate an action diagram, a matrix similar to SWOT analysis, identifying the strong and weak parts of tourists' satisfaction. It should be also mentioned that the LP formulation of the MUSA method allows the consideration of additional constraints with special properties of the assessed model variables. Under this context, an extension of the MUSA method is applied to the examined problem. A detailed description of the method is presented in the next section.

2 MUSA Method

2.1 Basic Model

The MUSA method, developed by Grigoroudis and Siskos (2002), is the primary research methodology of the presented study. The method aims at achieving the maximum consistency between a collective value function Y^* and a set of partial value functions X_i^* . Partial value functions X_i^* are referring to consumer satisfaction on a specific attribute, while Y^* refers to the overall consumer satisfaction. Using a double-error variable, the ordinal regression equation has the following form:

$$\hat{Y}^* = \sum_{i=1}^n b_i X_i^* - \sigma^+ + \sigma^- \tag{1}$$

where \hat{Y}^* is the estimation of the global value function Y^* , n is the number of criteria used in the analysis, b_i is the weight of the i -th criterion with $\sum_{i=1}^n b_i = 1$, while σ^+ and σ^- are the overestimation and underestimation errors, respectively.

Both global and partial functions, Y^* and X_i^* , are monotonic and normalized in the interval $[0, 100]$. To assure monotonicity, the MUSA method uses the following transformation equations:

$$\begin{cases} z_m = y^{*m+1} - y^{*m} & m = 1, 2, \dots, \alpha - 1 \\ w_{ik} = b_i x_i^{*k+1} - b_i x_i^{*k} & k = 1, 2, \dots, \alpha_i - 1, i = 1, 2, \dots, n \end{cases} \tag{2}$$

where α and α_i are the number of levels of the global and partial value functions, y^{*m} is the value of the y^m overall satisfaction level, and x_i^{*k} is the value of the x_i^k partial satisfaction level.

Using linear programming, the optimization problem can be written as follows:

$$\begin{aligned}
 [\min]F &= \sum_{j=1}^M (\sigma_j^+ + \sigma_j^-) \\
 &\text{subject to} \\
 &\sum_{i=1}^n \sum_{k=1}^{x_i^j-1} w_{ik} - \sum_{m=1}^{y^j-1} z_m - \sigma_j^+ + \sigma_j^- = 0 \quad \text{for } j = 1, 2, \dots, M \\
 &\sum_{m=1}^{\alpha-1} z_m = 100 \\
 &\sum_{i=1}^n \sum_{k=1}^{\alpha_i-1} w_{ik} = 100 \\
 &z_m, w_{ik}, \sigma_j^+, \sigma_j^- \geq 0 \quad \forall i, j, k, m
 \end{aligned} \tag{3}$$

where M is the number of customers and y^j, x_i^j are overall and partial satisfaction (on the i -th criterion) of the j -th customer using the ordinal scales Y and X_i .

Assuming strictly increasing value functions, the previous LP may be re-written as follows:

$$\begin{aligned}
 [\min]F &= \sum_{j=1}^M (\sigma_j^+ + \sigma_j^-) \\
 &\text{subject to} \\
 &\sum_{i=1}^n \sum_{k=1}^{x_i^j-1} w'_{ik} - \sum_{m=1}^{y^j-1} z'_m - \sigma_j^+ + \sigma_j^- = \gamma(y^j - 1) - \sum_{i=1}^n \gamma_i(x_i^j - 1) \quad \text{for } j = 1, 2, \dots, M \\
 &\sum_{m=1}^{\alpha-1} z'_m = 100 - \gamma(\alpha - 1) \\
 &\sum_{i=1}^n \sum_{k=1}^{\alpha_i-1} w'_{ik} = 100 - \sum_{i=1}^n \gamma_i(\alpha_i - 1) \\
 &z'_m, w'_{ik}, \sigma_j^+, \sigma_j^- \geq 0 \quad \forall i, j, k, m
 \end{aligned} \tag{4}$$

where γ and γ_i are the preference thresholds for the value functions Y^* and X_i^* , respectively (with $\gamma, \gamma_i \geq 0$) and z'_m, w'_{ik} are the new decision variables with $z'_m = z_m - \gamma$ and $w'_{ik} = w_{ik} - \gamma_i$.

The MUSA method includes a post-optimality analysis step in order to analyze model stability. During post-optimality, the existence of multiple or near-optimal solutions is investigated through the following linear programs:

$$\begin{aligned}
 & [\max] F' = \sum_{k=1}^{\alpha_i-1} w_{ik} \text{ for } i = 1, 2, \dots, n \\
 & \text{subject to} \\
 & F \leq F^* + \varepsilon \\
 & \text{All the constraints of LP(3) or LP(4)} \tag{5}
 \end{aligned}$$

where F^* is the optimal value of the objective function F of LP (3) or LP (4) and ε is a small number. The final solution is estimated as the average of the solutions given by the previous n LPs (5).

2.2 Results

Based on the previous modeling approach, the MUSA method estimates the global and partial value functions Y^* and X_i^* , respectively, as follows:

$$y^{*m} = \sum_{t=1}^{m-1} z_t \text{ for } m = 2, 3, \dots, \alpha \tag{6}$$

$$x_i^{*k} = 100 \frac{\sum_{t=1}^{k-1} w_{it}}{\sum_{t=1}^{\alpha_i-1} w_{it}} \text{ for } i = 1, 2, \dots, n, \quad k = 2, 3, \dots, \alpha_i - 1 \tag{7}$$

The estimated value functions show the real value, in a normalized interval [0,100], that customers give for each level of the global or marginal ordinal satisfaction scale. The form of these functions indicates the customers' degree of demanding, i.e., demanding customers (convex value function), non-demanding customers (concave value function), and neutral customers (linear form of value function). The MUSA method assumes that Y^* and X_i^* are monotonic, nondecreasing, discrete (piecewise linear) functions.

On the other hand, the satisfaction criteria weights represent the relative importance of the assessed satisfaction dimensions. Based on the model variables of the previous sections, the weights are calculated using the following formula:

$$b_i = \frac{\sum_{t=1}^{\alpha_i-1} w_{it}}{100} \text{ for } i = 1, 2, \dots, n \tag{8}$$

The MUSA method assesses also a set of performance indicators in order to estimate the satisfaction level both globally and per satisfaction criterion. The average

global and partial satisfaction indices, S and S_i , respectively, are given by the following formulas:

$$S = \frac{1}{100} \sum_{m=1}^{\alpha} p^m y^{*m} \quad (9)$$

$$S_i = \frac{1}{100} \sum_{k=1}^{\alpha_i} p_i^k x_i^{*k} \quad \text{for } i = 1, 2, \dots, n \quad (10)$$

where p^m and p_i^k are the frequencies of customers belonging to the y^m and x_i^k satisfaction levels, respectively.

As already noted, the shape of the estimated value functions may indicate the demanding level of customers. In this context, the MUSA method assesses the global and partial demanding indices, D and D_i , respectively, as follows:

$$D = \frac{\sum_{m=1}^{\alpha-1} \left(\frac{100(m-1)}{\alpha-1} - y^{*m} \right)}{100 \sum_{m=1}^{\alpha-1} \frac{m-1}{\alpha-1}} \quad \text{for } \alpha > 2 \quad (11)$$

$$D_i = \frac{\sum_{k=1}^{\alpha_i-1} \left(\frac{100(k-1)}{\alpha_i-1} - x_i^{*k} \right)}{100 \sum_{k=1}^{\alpha_i-1} \frac{k-1}{\alpha_i-1}} \quad \text{for } \alpha_i > 2, i = 1, 2, \dots, n \quad (12)$$

These demanding indices represent the average deviation of the estimated value curves from a “normal” (linear) function. They are normalized in $[-1, +1]$, so customers appear demanding if $D \approx 1$ or $D_i \approx 1$, non-demanding if $D \approx -1$ or $D_i \approx -1$, and neutral if $D \approx 0$ or $D_i \approx 0$.

Finally, the MUSA method can generate a series of action diagrams that indicate customers’ strong and weak points by combining weights and average satisfaction indices. These diagrams are similar to a SWOT analysis and result in four quadrants as shown in Fig. 1: status quo, leverage opportunity, transfer resources, and action opportunity [see (Grigoroudis & Siskos, 2010)].

- *Status quo (low performance and low importance)*: Generally, no action is required, given that these satisfaction dimensions are not considered as important by the customers.
- *Leverage opportunity (high performance/high importance)*: This area can be used as advantage against competition. In several cases, these satisfaction dimensions are the most important reasons why customers have purchased the product/service under study.
- *Transfer resources (high performance/low importance)*: Regarding the particular satisfaction dimension, company’s resources may be better used elsewhere (i.e. improvement of satisfaction dimensions located in the action opportunity quadrant).

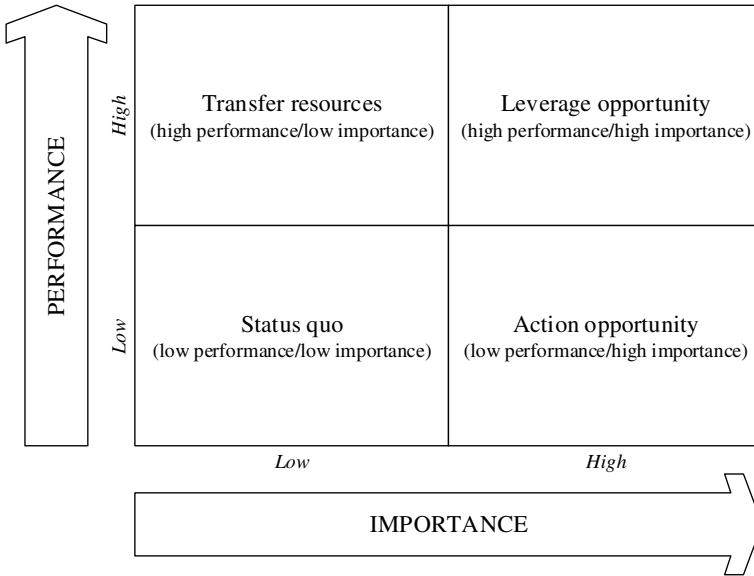


Fig. 1 Action diagram (Grigoroudis & Siskos, 2010)

- *Action opportunity (low performance/high importance)*: These are the criteria that need attention; improvement efforts should be focused on these, in order to increase the global customer satisfaction level.

2.3 Extension of the MUSA Method

The basic LP formulation of the MUSA method gives the ability to introduce additional constraints that are able to enhance the stability of the provided results. Grigoroudis and Siskos (2010) examined the introduction of additional constraints regarding the assessed average indices. More specifically, a linkage between global and partial average satisfaction indices may be assumed (the same applies for the average demanding indices) as these considered the main performance indices of the business organizations. Hence, the global average satisfaction S is assessed as a weighted sum of the partial satisfaction S_i :

$$S = \sum_{i=1}^n b_i S_i \Leftrightarrow \sum_{m=1}^{\alpha} p^m y^{*m} = \sum_{i=1}^n b_i \sum_{k=1}^{\alpha_i - 1} p_i^k x_i^{*k} \tag{13}$$

The previous equation can be re-written using the main variables of LP (3) as follows:

$$\sum_{m=2}^{\alpha} p^m \sum_{t=1}^{m-1} z_t = \sum_{i=1}^n \sum_{k=2}^{\alpha_i} p_i^k \sum_{t=1}^{k-1} w_{it} \tag{14}$$

Similarly, a weighted sum formula may be assumed for the average demanding indices:

$$D = \sum_{i=1}^n b_i D_i \tag{15}$$

or equivalently:

$$\begin{aligned} & \frac{\sum_{m=1}^{\alpha-1} \left[100(m-1) - (\alpha-1) \sum_{t=1}^{m-1} z_t \right]}{\alpha(\alpha-1)} \\ &= \sum_{i=1}^n \frac{\sum_{k=1}^{\alpha_i-1} \left[(k-1) \sum_{t=1}^{\alpha_i-1} w_{it} - (\alpha_i-1) \sum_{t=1}^{k-1} w_{it} \right]}{\alpha_i(\alpha_i-1)} \end{aligned} \tag{16}$$

It should be noted that formulas (14) and (16) may be also used in the case of strictly increasing value functions, substituting $z_m = z'_m + \gamma$ and $w_{ik} = w'_{ik} + \gamma_i$.

The previous additional properties for the average satisfaction and demanding indices may be inserted as new constraints in the basic LP formulation. This extension of the MUSA method, proposed by Grigoroudis and Siskos (2010), may provide more robust results (Grigoroudis & Politis, 2015). The applied approach, in the case of the generalized MUSA method (strictly increasing value functions) consists of the following three steps:

Step 1

Solve LP (4).

Step 2

Solve the following LP:

$$[\min]\Phi = \sum_{j=1}^M \left[(s_j^+ + s_j^-) + (d_j^+ + d_j^-) \right]$$

subject to

$$\begin{aligned} & \sum_{i=1}^n \sum_{k=2}^{\alpha_i} p_i^k \sum_{t=1}^{k-1} w'_{it} - \sum_{m=2}^{\alpha} p^m \sum_{t=1}^{m-1} z'_m - s_j^+ + s_j^- \\ &= \gamma \sum_{m=2}^{\alpha} (m-1) p^m - \sum_{i=1}^n \gamma_i \sum_{k=2}^{\alpha_i} (k-1) p_i^k \end{aligned}$$

$$\sum_{i=1}^n \frac{\sum_{k=1}^{\alpha_i-1} \left[[1 - \gamma_i(\alpha_i - 1)(k - 1)] \sum_{t=1}^{\alpha_i-1} w'_{it} - (\alpha_i - 1) \sum_{t=1}^{k-1} w'_{it} \right]}{\alpha_i(\alpha_i - 1)} - \frac{\sum_{m=1}^{\alpha-1} \left[(100 - \gamma(\alpha - 1))(m - 1) - (\alpha - 1) \sum_{t=1}^{m-1} z'_t \right]}{\alpha(\alpha - 1)} - d_j^+ + d_j^- = 0$$

$$F \leq F^* + \varepsilon$$

all the constraints of the LP of step 1 (17)

where F^* is the optimal value of the objective function of the LP (4) (step 1), ε is a small number, s_j^+ and s_j^- are the overestimation and underestimation errors, respectively, regarding the average satisfaction indices constraint, and d_j^+ , d_j^- are the overestimation and underestimation errors, respectively, regarding the average demanding indices constraint.

Step 3

The final step refers to the stability analysis based on the MUSA III method (Grigoroudis & Siskos, 2010) where the following LP is solved:

$$\begin{aligned} & [\max] F' = z_m \text{ or } [\max] F' = w_{ik} \forall i, k, m \\ & \text{subject to} \\ & F \leq F^* + \varepsilon_1 \\ & \Phi \leq \Phi^* + \varepsilon_2 \\ & \text{all the constraints of steps 1-2} \end{aligned} \tag{18}$$

where Φ^* is the optimal value of the objective function of the LP (17) (step 2) and ε_1 , ε_2 are small numbers. The final solution is calculated as the average of the optimal solutions of the previous LPs.

3 Research Design

3.1 Satisfaction Criteria

The assessment of satisfaction criteria in this study is based on previous research efforts that identify which food attributes are considered significant factors for local food consumption and customers' satisfaction.

Like taste and aroma, sensory traits have been identified as essential motivators for food consumption during the holiday (Kim et al., 2009; Mak et al., 2012). Furthermore, the taste is the most vital motivational factor for local food consumption (Altintzoglou et al., 2016).

Quality is one of the essential food attributes during the holiday (Altintzoglou et al., 2016). Quality is also determinant for tourists' gastronomic satisfaction (Akdag et al., 2018; Peštek & Činjurević, 2014). Outside the tourist context, quality concerns are among the strongest drivers for local food consumption (Stephenson & Lev, 2004).

Tourists have been described as authenticity seekers (Cohen & Avieli, 2004). In their quest for authentic experiences, they perceive local cuisine as a conceptual part of place and culture (Henderson, 2009; Sims, 2009). Food authenticity is an essential dimension of the eating experience (Björk & Kauppinen-Räsänen, 2014). Thus, local food consumption is a cultural experience (Wang et al., 2016), allowing tourists to get familiar with the place and cover interpersonal needs (López-Guzmán et al., 2017). Authenticity is a dominant food attribute for tourists (Altintzoglou et al., 2016) and a strong motivator (Kim et al., 2009; Mak et al., 2012).

Health and safety concerns regarding ethnic food consumption were portrayed in various researches (Cohen & Avieli, 2004; Kim & Eves, 2012; Kim et al., 2009; Mak et al., 2012). Healthiness and nutrition are also among the dimensions of the local cuisine image (Peštek & Činjurević, 2014) and among the motivational factors for consuming local foods during the holiday (Kim & Eves, 2012; Kim et al., 2009).

There is a social dimension to local food consumption by tourists as this is beneficial for local societies and economies and tourists (Sims, 2009). When tourists consume local foods through alternative networks, they enhance the local community's sustainability, while these networks are being empowered by consumers who prefer local products (Sims, 2009).

Local cuisine is perceived as a predictor of authenticity by tourists (Cohen & Avieli, 2004), and the eating culture is reflecting national traits through local and national dishes (Björk & Kauppinen-Räsänen, 2016) as food acts as a medium of interaction between humans and places (Ellis et al., 2018). Tourists are seeking to be connected to a host's country culture through local foods (Cohen & Avieli, 2004; Ellis et al., 2018; Tikkanen, 2007) and consider local food culture as an essential dimension of eating experiences (Björk & Kauppinen-Räsänen, 2014; Kim & Eves, 2012). Gastronomic satisfaction is affected by foods' traditional and cultural aspects (Akdag et al., 2018; Peštek & Činjurević, 2014).

Foods' visual image is important both as a motivator for local food consumption (Kim et al., 2009; Mak et al., 2012) and as a satisfaction indicator (Peštek & Činjurević, 2014). The importance of food aesthetics is also recognized as part of the eating experience (Björk & Kauppinen-Räsänen, 2014).

The importance of price is essential for local foods' purchase. Peštek and Činjurević (2014) suggest that price is crucial for local food consumption during holidays. Price is a necessary predictor for purchase intentions (Ahmad et al., 2019), while it can be also a dimension of gastronomic image (Chang & Mak, 2018).

Package is also a vital attribute affecting the purchase of various food products (Endrizzi et al., 2015; Grunert, 1997; Koutsimanis et al., 2012). In the tourism context, package as an extrinsic attribute can be associated with the importance of visual appearance, as indicated in the relevant literature (Kim et al., 2009; Mak et al., 2012).

Based on the aforementioned research and studies, the following satisfaction criteria have been chosen to evaluate local food consumption by tourists:

1. Taste
2. Healthiness
3. Safety
4. Aroma
5. Authenticity
6. Quality
7. Cost/Price
8. Appearance
9. Package
10. Connection to local culture
11. Enhancement to local economy.

3.2 Questionnaire Development

A structured questionnaire has been developed based on the previous satisfaction criteria, and it has been translated into English, German and Russian through verified translators. The questionnaire uses five-point Likert scale questions regarding food consumption evaluations. To investigate tourists' global satisfaction with local food consumption, we asked respondents to state their level of agreement with the following statement: "During the holiday I was satisfied with Greek food consumption". Respondents could state their level of agreement by choosing between the following ordinal scale: Strongly disagree—Disagree—Neither agree nor disagree—Agree—Strongly agree.

Respondents were also asked to evaluate the following attributes of Greek foods: (1) Taste, (2) Healthiness, (3) Safety, (4) Aroma, (5) Authenticity, (6) Quality, (7) Cost/Price, (8) Appearance, (9) Package, (10) Connection to local culture, and (11) Enhancement to the local economy.

Finally, the questionnaire covered some demographic characteristics of tourists, such as gender, age, education, income, and nationality.

3.3 Participants and Sampling

Greece was selected as a case study as its culinary tradition is a vital aspect of choosing Greece as a host destination (Triantafillidou et al., 2019). Positioned at the armpit of the Mediterranean Sea, having suitable soil and climatic conditions for agriculture, being a civilization melting pot for thousands of years, and obtaining a continuous tradition through the centuries are major factors in Greece for the existence of a very competitive and qualified food sector and cuisine. The significance of Greek

Table 1 Socio-demographic characteristics of the sample

Variable	Values	Frequency (% percentage)
Gender	Male	141 (45.3)
	Female	170 (54.7)
Education	Ph.D./Master	151 (48.6)
	Bachelor	103 (33.1)
	Primary/Secondary	57 (18.3)
Household size	1 member	53 (17.0)
	2 members	111 (35.7)
	3 members	55 (17.7)
	4 members	58 (18.7)
	More than 4 members	34 (10.9)
Nationality	Germany	111 (35.7)
	Russia	30 (9.7)
	United Kingdom	41 (13.2)
	Others	129 (41.4)

cuisine is also derived from its connection to the Mediterranean Diet, a part of Human Culture and Intangible Cultural Heritage of UNESCO (Medina, 2009).

The questionnaire was distributed to foreign tourists at the “Macedonia” Airport of Thessaloniki, Central Macedonia, from July 2018 to September 2018. Respondents were tourists who were departing from Greece. For data collection, convenience sampling technique was used. Convenience sampling is used very frequently in tourism research, as it is challenging to apply other techniques. The demographic characteristics of the sample are presented in Table 1.

Most respondents were females (55.2%) and university-level educated (86.3%). The most significant part of the sample had a monthly income greater than 2000 euros, and the biggest nationality category is Germany. In addition, the average age of respondents is 38.83 years (with a standard deviation of 0.81). Overall, the respondents’ profile is a German woman with a monthly payment of over 2000 euros and a tertiary education degree.

4 Results

For the analysis, univariate, bivariate, and multivariate methodologies were utilized. Descriptive statistics were used, through STATA 16.0, in order to analyze the demographic traits of the sample. Chi-square and ANOVA, through STATA 16.0, were used to trace the effect of socio-demographic variables to the level of tourists’ satisfaction. An extension of the MUSA method was used to analyze customer satisfaction.

Table 2 Satisfaction criteria frequencies (in % percentage*)

	SD	D	NAND	A	SA
Greek foods are tasty	0.00	0.32	1.93	48.55	49.20
Greek foods are healthy	0.32	5.79	22.19	45.66	26.05
Greek foods are safe	0.00	0.96	15.43	55.31	28.30
Greek foods have a nice aroma	0.00	0.96	10.61	53.70	34.73
Greek foods are authentic	0.00	0.32	19.94	46.30	33.44
Greek foods have better quality	0.32	2.89	34.41	40.51	21.86
Greek foods are expensive**	2.25	7.72	31.83	44.05	14.15
Greek foods have a nice appearance	0.00	2.25	22.19	59.16	16.40
Greek foods have a nice package	2.89	12.54	50.16	27.65	6.75
Greek foods are connected to Greek culture	0.00	1.29	20.90	52.73	25.08
Greek foods are enhancing Greek economy	0.32	3.22	39.23	40.51	16.72

*SD: Strongly Disagree; D: Disagree; NAND: Neither Agree Nor Disagree; A: Agree; SA: Strongly Agree

** Reversely coded

4.1 Univariate Analysis

The majority of the sample strongly agrees ($n = 149/47.91\%$) that they are satisfied by local food. Another major part of the respondents stated that they agree to the satisfaction statement ($n = 145/46.62\%$). A small amount of the sample stated that they neither agree nor disagree that they are satisfied with local food consumption ($n = 17/5.47\%$). There are no tourists who disagreed with the satisfaction statement. The results of the food evaluations on the detailed satisfaction criteria are presented in Table 2.

4.2 Bivariate Analysis

The effect of the respondents' socio-demographic traits on the level of their overall satisfaction is presented in Table 3. Gender, household size, income, and age are significant for tourists' satisfaction. Females, respondents who belong to a two-member household, earning monthly more than 3000 euros and with an average age of 39 years old, demonstrate the highest level of agreement with the statement that they are satisfied with local food.

Table 3 Socio-demographic effects on tourists' satisfaction

	During holiday I am satisfied with local food consumption*			Chi-square	p-value
	NAND	A	SA		
<i>Gender</i>				6.5653	0.038
Male	70.59	42.07	38.26		
Female	29.41	57.93	61.74		
<i>Education</i>				6.4947	0.165
Ph.D./Master	29.41	55.17	44.30		
Bachelor	47.06	27.59	36.91		
Primary/Secondary	23.53	17.24	18.79		
<i>Household size</i>				16.1440	0.040
1 member	5.88	21.38	14.09		
2 members	11.76	35.17	38.93		
3 members	17.65	16.55	18.79		
4 members	35.29	15.86	19.46		
More than 4 members	29.41	11.03	8.72		
<i>Monthly income</i>				10.8705	0.092
Less than 1,000 euro	35.29	13.79	13.42		
1000–2000 euro	17.65	26.90	20.81		
2000–3000 euro	35.29	28.28	26.85		
More than 3000 euro	11.76	31.03	38.93		
<i>Nationality</i>				2.6717	0.849
Germany	35.29	34.48	36.91		
Russia	23.53	15.86	14.77		
United Kingdom	11.76	13.10	8.72		
Others	29.41	36.55	39.60		

*NAND: Neither Agree Nor Disagree; A: Agree; SA: Strongly Agree

4.3 Multivariate Analysis

The main results of the MUSA method are presented in Table 4. The Average Fitting and Stability Indices of the MUSA method is 89.16% and 74.93%, respectively. These results show that the analyzed customer data are sufficient, and the results of the applied method are highly representative.

Taste is the criterion that has the highest importance (18.9%), which is more than double compared to the weights of the other attributes. Taste is followed by aroma (9.2%), safety (8.3%), authenticity (8.2%), appearance (8.1%) and connection to the Greek culture (8%). The criteria with the lowest weights but with small difference

Table 4 Results of the MUSA method

Criteria	Weight (%)	Average satisfaction index [0,1]	Average demanding index [-1,+1]
Taste	18.9	0.945	-0.560
Healthiness	7.9	0.741	-0.036
Safety	8.3	0.799	-0.061
Aroma	9.2	0.841	-0.147
Authenticity	8.2	0.801	-0.055
Quality	7.8	0.715	-0.031
Cost/Price	7.8	0.664	-0.033
Appearance	8.1	0.747	-0.056
Package	7.6	0.568	-0.023
Connection to Greek culture	8.0	0.771	-0.044
Enhancement to Greek economy	7.7	0.689	-0.030
Overall satisfaction	-	0.842	0.040

compared to the others are package (7%), and enhancement to the Greek economy (7.72%).

Overall, tourists appear quite satisfied since the global average satisfaction index is almost 0.85. The criterion with the highest average satisfaction index is taste (0.945), followed by aroma (0.841), authenticity (0.801), safety (0.799), connection to Greek Culture (0.771) and appearance (0.747). The criteria with the smallest average satisfaction indices are package (0.568), cost/price (0.664), and enhancement to Greek economy (0.689). It can be noticed that criteria with the highest (lowest) performance indices have at the same time the highest (lowest) weights.

The estimated value functions are presented in Fig. 2. They appear to have a rather linear form, revealing that tourists have a neutral demanding level. The average demanding indices further confirm this finding. Both the global and the partial demanding indices are close to zero, showing that the higher satisfaction tourists in Greece express towards local food, the higher the percentage of their fulfilled expectations.

The action diagram is presented in Fig. 3 and can be used to identify the strengths and weaknesses of local food consumption by tourists. The Leverage Opportunity quadrant contains two criteria, i.e., taste and aroma, which have both high-performance indices and high weights, and thus, they are considered as the competitive advantage of local foods. On the other hand, safety, authenticity, and connection the Greek culture belong to the Transfer Resources quadrant. Despite the high performance of these criteria, their impact to tourist's satisfaction is low.

Furthermore, six criteria are located in the Status Quo quadrant: healthiness, appearance, quality, enhancement to the Greek economy, cost/price, and package. These criteria appear to have low performance and low importance and, although

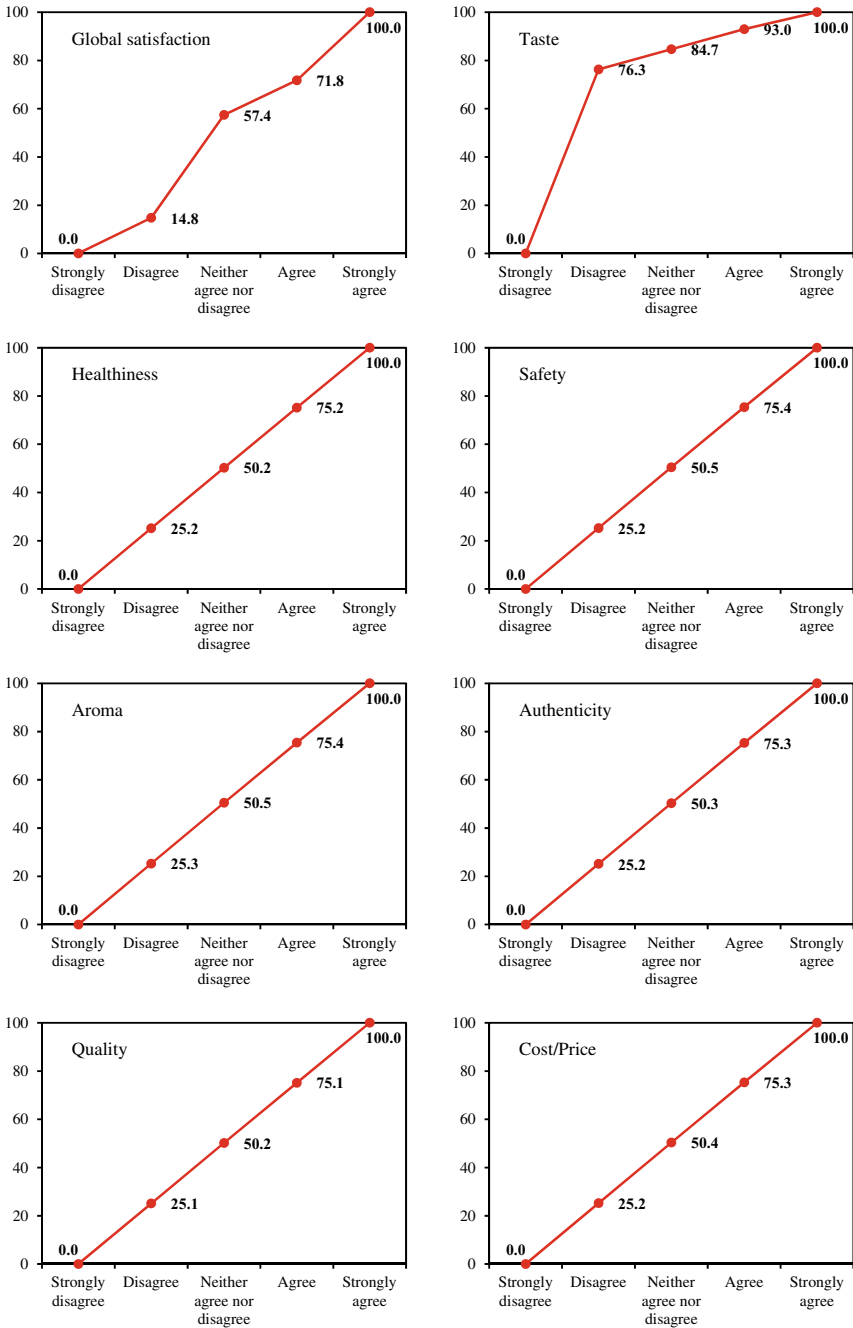


Fig. 2 Estimated value functions

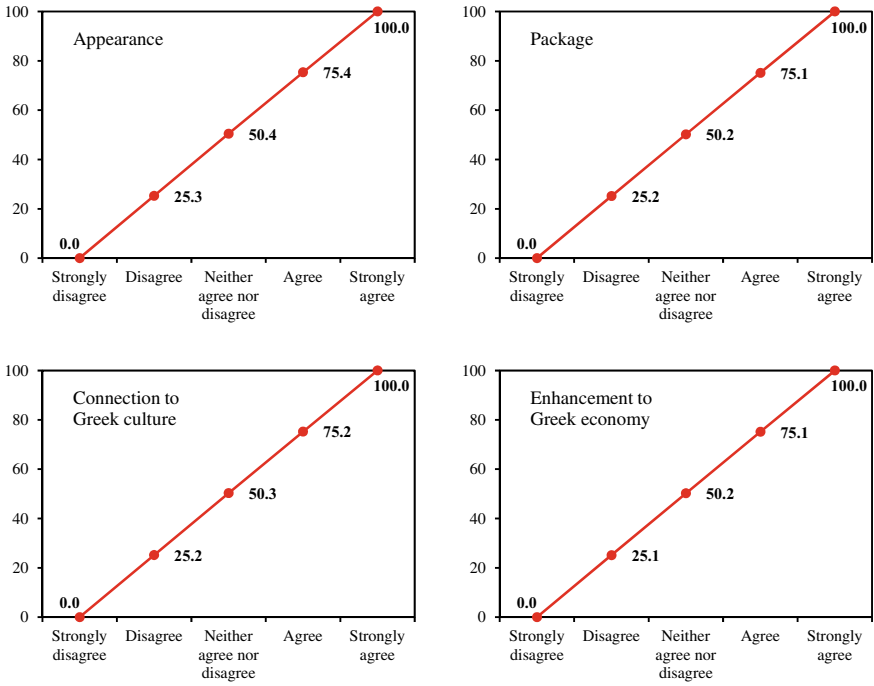


Fig. 2 (continued)

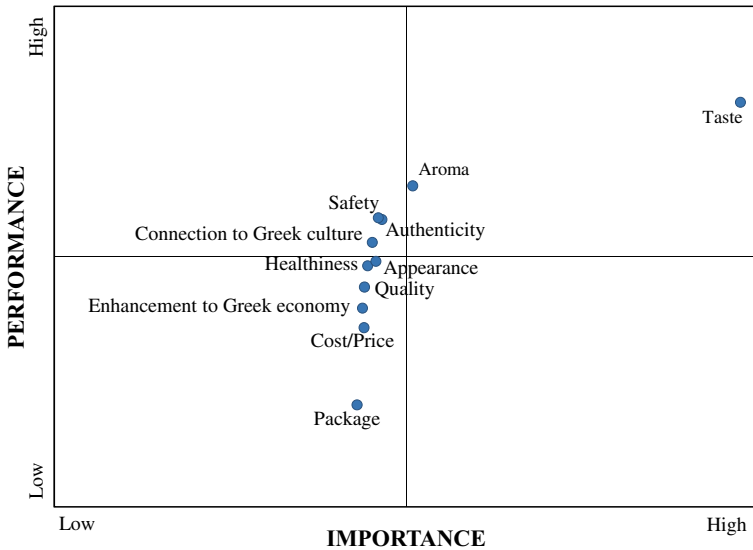


Fig. 3 Estimated action diagram

they require no immediate improvement action, they can be considered as a potential threat to tourists' satisfaction. Finally, no criteria are located in the Action Opportunity quadrant (low performance and high importance), and therefore no specific weaknesses appear in this analysis.

5 Discussion

The results of this analysis allow several conclusions about tourists' satisfaction from local food consumption. Most importantly, this study confirms the importance of sensory traits, like taste and aroma. Taste is the most critical food attribute, as it obtains the most significant weight, and a nice aroma is following in importance. Sensory traits have been identified as essential motivators for local food consumption (Kim et al., 2009; Mak et al., 2012), and taste is the most essential food attribute for tourists (Altintzoglou et al., 2016).

Authenticity and connection to Greek culture are also important for customer satisfaction. The importance of authenticity is highlighted in the relevant literature as a strong tourist motivator (Cohen & Avieli, 2004), while it is also an important food attribute (Altintzoglou et al., 2016). The local food connection to the destination's culture is identified in the literature as a vital tourist motivator (Björk & Kauppinen-Räsänen, 2014; Kim & Eves, 2012).

The importance of safety reflects the tourists' concerns that have been identified in the relevant literature (Cohen & Avieli, 2004). This finding seems contradictory to the lower importance of healthiness for customer satisfaction. This difference can be attributed to the fact that tourists may prioritize safety over healthiness in a temporary situation as a holiday. Moreover, in a similar study, healthiness, and nutrition did not affect tourist satisfaction with local food (Peštek & Činjurević, 2014). Thus, our results confirm this finding.

The appearance of local food is also a vital attribute for tourists' satisfaction. This result confirms the attention given to foods' visual image as a motive for local food consumption (Kim et al., 2009; Mak et al., 2012), as a food dimension that affects tourists' satisfaction (Peštek & Činjurević, 2014), and even as a gastronomic experience (Björk & Kauppinen-Räsänen, 2014). On the other hand, the importance of package is very low despite its association with food image and its significance for food marketing (Endrizzi et al., 2015). These results reveal the prioritization of food appearance over its packaging.

The low relative importance of quality contradicts the relevant literature. Quality affects tourists' gastronomic satisfaction (Akdag et al., 2018; Peštek & Činjurević, 2014), and it is a crucial food attribute for tourists' purchases (Altintzoglou et al., 2016). Beyond tourism literature, products quality is among the most critical factors for consumers who purchase local food (Stephenson & Lev, 2004). A possible explanation could be that quality is important for tourists, but it may be taken as granted, and this may result to a relatively low weight compared to other attributes.

The low weight of the enhancement of the local economy signals that sustainability concerns are not that important for tourists' satisfaction. Other studies have found that local communities' economic and social sustainability is important for tourists (Sims, 2009). Our study shows that the satisfactory effect of enhancing local communities is low, but this may be affected by the characteristics of the respondents included in the sample.

Cost gets the lowest relative importance which is an interesting result but contradictory to the findings of the relevant literature. Price is a dimension of the gastronomic image of a destination; it can affect purchase intentions (Ahmad et al., 2019) and tourists' satisfaction (Peštek & Činjarević, 2014). One potential explanation could be that local food consumption is an experiential part of the holiday (Quan & Wang, 2004). Therefore, they are willing to pay a price premium to get new and fulfilling experiences (Morgan, 2006).

Concluding from the performance indices, tourists are delighted with local food consumption. At the same time, they mainly evaluate them as tasty, with a nice aroma, authentic, safe, with a nice appearance, and connected to Greek culture. They less consider them as inexpensive, having a nice package and enhancing the Greek economy. Concluding from the demanding indices, tourists are not demanding towards the selected criteria.

There are demographic differences in tourists' agreement with satisfaction with local food. Female respondents with a household size of two members, a monthly income of 3000 euro, and an average age of 39 years old stated that they are satisfied by consuming local food. Demographic traits affect tourists' decision to consume local food (Kim et al., 2009).

6 Conclusions

The presented study aims to measure the importance of the effect of local food attributes on tourists' satisfaction. One of the main advantages of the study is the application of an extension of the MUSA method in order to respect the qualitative nature of customer judgments, assuring robust results (Grigoroudis & Siskos, 2010). Our study contributes to the literature on tourists' satisfaction with local food (Chi & Qu, 2008, 2009; Peštek & Činjarević, 2014). Besides, it further adds to the relevant MUSA applications in tourism industry (see for example (Tsitilioni et al., 2013; Delias et al., 2018)).

The results of the study may be used by agribusiness managers and food retailers in the tourism sector in order to sustain and improve tourists' satisfaction. Tourism stakeholders should emphasize taste, connection to Greek culture, safety, nice appearance, authenticity, and nice aroma, which are considered as major competitive advantages. On the other hand, healthiness, quality, enhancement to Greek economy, cost and nice package are classified as potential threats. Therefore, tourism stakeholders should try to increase the performance of these attributes, by communicating

for example the health advantages of Greek food and their contribution to local development.

The main limitation of the study concerns the relatively small sample size. The population of tourists visiting Greece is rather heterogenous, and therefore future research may focus on specific tourist groups having distinctive geographic, demographic, socioeconomic, psychographic, or behavioral characteristics and preferences. Specifically, the MUSA method as a collective model provides aggregate measures that might mask latent heterogeneity. Future studies should aim at understanding differences in tourists' satisfaction and deriving market segments.

Another limitation of the study is related to the assessment of the satisfaction criteria. More specifically, tourists may have difficulties to understand the distinction between some criteria (e.g., differences between culture and authenticity or between aroma and taste), particularly regarding non-expert respondents. Therefore, potential interrelations among satisfaction criteria may appear. For this reason, future research may examine alternative extensions of the MUSA method that can consider possible criteria interactions (Angilella et al., 2014).

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