A novel model for improving food tourism, environmental aspects and tourist satisfaction

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ABSTRACT

Food tourism is a rapidly growing sector within the travel and hospitality industry, centered on exploring a destination's culture, history, and flavors through its culinary offerings. Supply-side innovations, such as interactive food experiences, authentic local cuisine, and cultural immersion, are key drivers in the evolving landscape of food tourism. Research aims to explore the role of supply-side innovations in designing food tourism experiences and their impact on tourist satisfaction. Tourist data was gathered using a mixed-methods methodology. Quantitative data were gathered through surveys distributed to 152 tourists who participated in food tourism experiences. The independent variables include the type of innovation, level of engagement, service quality, cultural significance, and authenticity, while the dependent variable is tourist satisfaction. Statistical analyses, including descriptive statistics, analysis of variance (ANOVA), multiple regression, and correlation analysis, were conducted to assess the impact of supply-side innovations on tourist satisfaction. The findings indicate that key factors such as the type of innovation, level of engagement, authenticity, service quality, and cultural significance strongly influence overall tourist satisfaction. Tourists who reported greater emotional involvement in the experience were also more likely to recommend it and revisit it in the future. Research provides empirical evidence supporting the integration of food tourism innovations as a means to enhance tourist satisfaction and contribute to the sustainability of the industry.

Keywords: Culinary experiences, Supply-side, Food tourism, Tourist satisfaction, Level of engagement.
Article type: Research Article.

INTRODUCTION

Culinary tourism is one of the fastest-growing sectors of the travel market that is closely associated with people's culinary traditions, culture, and gastronomic experimentations (Recuero-Virto & Arróspide 2024). Food has evolved from a survival resource to one of the key motivators for traveling and a factor that affects the tourists' satisfaction and the destination's economic profit (Sgroi 2022). Culinary tourism activities such as food fairs, farm-to-table, cooking classes, and food tours make a place attractive for visitors. These are not only cultural benefits but also economically beneficial for local and indigenous foods, culinary practices, and specialties (Ibrahim *et al.* 2024). From the supply-side perspective, the concept of food tourism innovation is centered on ways through which supply-side factors, including restaurants and chefs, food producers, and policymakers, can offer tourists unique dishes to make their experiences more memorable (Jia & Chaozhi 2021). Innovation in this sector is shown in the implementation of virtual menus, proper nutrition with recommendations based on customers' choices and preferences, the use of digital applications that advocate for sustainability, and the modification of traditional food recipes into more viable ones that would suit the market trends. Supply-side stakeholders play an important part since their actions contribute to the nature of food tourism experiences offered to consumers (Wondirad *et al.* 2021). However, some challenges affect the advancement and measurement of food tourism innovation. First, the assessment of the tourists' satisfaction regarding culinary experiences is not an exact science, as it depends on tourists' preferences, experiences, and cultural perceptions. The absence of widely accepted benchmarking standards about the satisfaction metrics of gastronomic offers makes cross-destination

comparisons difficult (Aybek & Özdemir 2022). Second, the advancement of sustainability within food tourism is yet inconsistent, which refers to the fact that many actors are struggling to strike a balance between profits and sustainable practices. Some difficulties include high operating costs, difficulties in sourcing sustainable and affordable ingredients, and the customers' willingness to pay for principled dining, among others (Calza *et al.* 2023). Furthermore, supply-side innovations also have the challenge of high capital cost, whereby the necessary infrastructure, developed skills of the people, and the introduction of a digital environment might be soaked up by small firms. Seasonal production and instability of some external conditions, for instance, climatic change and supply chain factors, pose major challenges in the planning for food tourism (Sreenivasan & Suresh 2024).

Research objective: To investigate the role of supply-side innovations in the food tourism experiences and the satisfaction levels of the tourists. It aims to find out how these innovations can be incorporated to improve the satisfaction of the tourists to improve the sustainability of this sector.

The present research is divided into six phases: Phase I presents the introduction, Phase II presents the related articles, the research methodology is explained in Phase III, Phase IV illustrates the results, the research is discussed in Phase V, and finally, the conclusion is described in Phase VI.

Related works

The perspectives and opinions of supply-side stakeholders about regional food were investigated in the research (Stalmirska 2024). The result indicates that supply-side participants have different meanings and discursive constructs compared to local food. These are often categorized into three categories such as socioeconomic status, cultural, and environmental. The investigation looked at culinary tourism activities from the viewpoint of executives and proprietors of winemakers. It highlighted three ways (Duarte Alonso *et al.* 2022) in which wineries could enhance availability, direction, and foundation setting to improve culinary tourism. Difficulties included fostering enthusiasm, developing a specialization, improving culinary repertoires, and requiring participation. In the framework of the industrial tourism industry (Park & Widyanta 2022), the investigation examined the way that extent collaborative efforts related to culinary tourism impact and shape the foodscape in a developing food region. The investigation clarified the incomplete knowledge of target foodscapes in connection to food-related tourism operations, with effects on the administration of gastronomy destinations. The purpose of the analysis (Batat & Addis 2021) was to discuss the requirement to broaden the objectives of the food sector by taking into account its contribution to the entire food wellness of users. Understanding how culinary experts could create enjoyable and nutritious dietary experiences that improve individual food wellness is the objective of Food Interaction Layout (FED). FED suggested an integrated and comprehensive structure. To determine the factors that influence culinary tourists' Behavioral Intentions (BIs), the investigation (Soltani *et al.* 2021) attempted to create an outline. The result provided managers and professionals in the culinary tourism sector with recommendations on the way to most effectively market their products to improve inbound culinary tourism. The research examined co-creation in wine and food-related tourism activities. It also highlighted the increasing interest in culinary and alcoholic activities as well as addressed administrative and theoretical suggestions to destination executives coupled with the local community. The result (Carvalho *et al.* 2023) offered a thorough comprehension of collaboration among tourists. Food tourism (Stone *et al.* 2022) could improve the tourist experience while promoting cultural long-term viability. In that research, the creation of a multi-stakeholder plan to raise fresh locals' food literacy could support regional customs and benefit travel agencies. The structure and mechanisms underlying the intellectual growth of culinary visitors' perceived tastes and to pinpoint the cognitive elements that impact their dietary taste perception within the framework of a culinary tourism location were investigated. Significant conceptual as well as practical ramifications for participants about visitor experiences with food taste assessment in food tourism sites and activities were clarified by Kim *et al.* (2021). The collaborative development of value in wine and culinary tourist experiences in the wine-growing area was examined by Carvalho *et al.* (2021). The findings demonstrated that aspects of the collaboration process, such as engagement, interactions, active involvement, and customization, were perceived. Administrative and conceptual insights into destination management and marketing were offered in that research.

MATERIALS AND METHODS

To investigate the elements impacting visitor satisfaction in culinary tourism experiences, this research used a mixed-methods strategy that combines quantitative and qualitative data collection techniques. The approach used surveys, statistical analysis, and hypothesis testing to investigate how different factors affect satisfaction levels.

Data collection

The data was collected using both qualitative and quantitative methods as part of the mixed-methods research. Quantitative data was collected through questionnaires from 152 tourists involved in food tourism activities. Table 1 depicts the demographic data that included gender, age, nationality frequency of traveling, and the type of food tourism. Participating in events like food festivals, culinary workshops, guided food tours, and local dining experiences, the respondents' experiences were diverse. This approach offered general information on the various determinants of tourist satisfaction. To obtain more detailed insight into the experiences of the tourists, qualitative data were also collected to supplement the surveys. In general, the method provided maximizes the data collection and the accuracy of the results.

Table 1. Demographic Profile of Survey Respondents and Food Tourism Experience Categories.

Demographic Variable	Category	Frequency (n = 152)	Percentage (%)
Gender	Female	74	48.7
	Male	78	51.3
Age	18–25 years	32	21.1
	26–35 years	45	29.6
	36–45 years	38	25.0
	46–55 years	22	14.5
	56+ years	15	9.8
Nationality	Domestic tourist	88	57.9
	International tourist	64	42.1
Travel frequency	First-time visitor	50	32.9
	Occasional traveler	63	41.4
	Frequent traveler	39	25.7
Type of food tourism experience	Food festival attendee	40	26.3
	Cooking class participant	35	23.0
	Guided food tour participant	48	31.6
	Local dining experience	29	19.1

Hypotheses development and conceptual framework

The hypothesis also focused on the effects of supply-side innovations on the level of tourists' satisfaction, with independent variables as the type of innovation, level of tourist engagement, and authenticity, and the dependent variable is tourist satisfaction. Key factors, such as service quality, cultural significance, and engagement, are expected to moderate and mediate the connection between innovations and satisfaction. Fig. 1 shows the hypothesis conceptual model.

H1: The type of innovation in culinary tourism experiences significantly improves tourist satisfaction.

H2: The level of engagement in food tourism experiences positively influences tourist satisfaction.

H3: The authenticity of food tourism experiences has no significant effect on tourist satisfaction.

H4: The service quality in food tourism experiences positively impacts tourist satisfaction.

H5: The cultural significance of culinary tourism experiences significantly enhances tourist satisfaction.

H6: The relationship between the type of innovation and the level of engagement is moderated by tourist satisfaction.

H7: The level of service quality has no significant moderating effect on the relationship between innovation and tourist satisfaction.

H8: The relationship between authenticity and the level of engagement is not significantly mediated by tourist satisfaction.

Statistical analysis

The data analysis of this research was carried out using IBM SPSS version 26. Descriptive statistics, multiple regression techniques, ANOVA (Analysis of Variance), and correlation analysis, the independent variables' influence on tourist satisfaction were analyzed. Demographic data of the sample were described using descriptive statistics and multiple regression analysis tested the significance of independent variables on tourist satisfaction. By comparing the mean satisfaction levels of the various groups using ANOVA, it was confirmed that there were notable variations in visitor satisfaction depending on the degree of authenticity and participation. The correlation analysis quantified the degree of the relationship between the different variables and overall satisfaction, indicating that all the independent variables were positively correlated. The results indicated that higher emotional

involvement in the experience was linked to increased satisfaction, with tourists more likely to recommend and revisit experiences that offered greater engagement and authenticity.
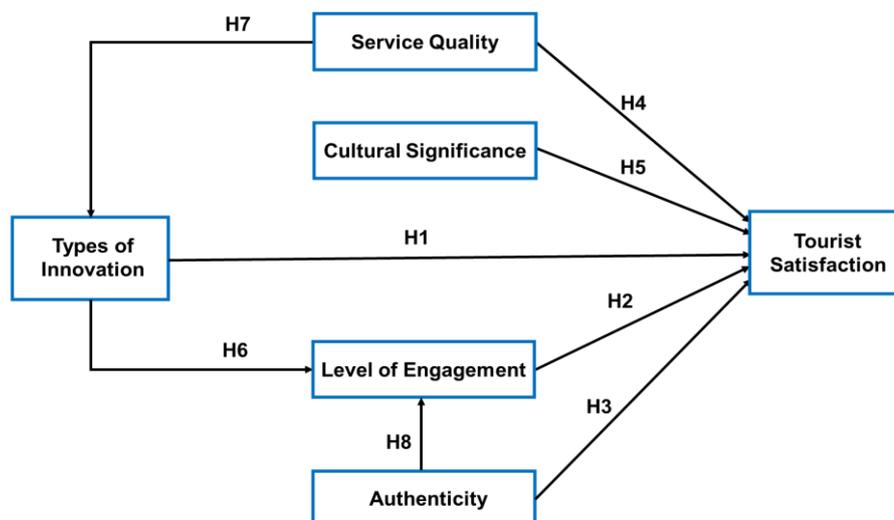

Fig. 1. The conceptual framework of the hypothesis.

RESULTS

This section discusses the significant impact of various factors on tourist satisfaction, with service quality emerging as the most influential variable. The important factors that determine the overall tourist experience are identified through a comprehensive analysis of the data. Descriptive analysis entails the quantitative description of distribution, central tendency, and variability of the variables affecting tourist satisfaction. These statistics provide insights into the nature of the results and patterns within the dynamics, both in absolute and relative terms. Table 2 and Fig. 2 depict the descriptive statistics of factors affecting user satisfaction. From these variables, service quality stands out as the most consistently perceived variable with the least variability, implying a strong and stable relationship with tourist satisfaction. However, authenticity and cultural relevance emerge as average-important as the respondents agreed that these two factors are pertinent to tourist satisfaction. Though there is a wider range of responses on the sort of innovation, suggesting differing views on how important it is in determining pleasure. Another important component is the level of involvement, which has a slightly greater degree of fluctuation than the other categories but yet makes a beneficial contribution. The results demonstrate that although several factors influence visitor happiness, service quality (M = 4.56) is the most significant and consistently assessed component, highlighting its crucial role in improving the entire experience.

Table 2. Descriptive statistics of variables influencing tourist satisfaction.

Variable	Mean	Standard deviation	Minimum	Maximum
Type of innovation	3.45	0.89	1	5
Level of engagement	4.12	0.72	2	5
Authenticity	4.28	0.64	2	5
Service quality	4.56	0.53	3	5
Cultural significance	4.18	0.77	2	5
Tourist satisfaction	4.35	0.62	2	5

ANOVA is a statistical method that enables a statistical and qualitative comparison of several variables aimed at determining whether the means of two or more groups differ significantly. Measuring the influence of independent factors helps to explain the dependent variable's degree of variance. In this analysis, ANOVA was applied to investigate the effect of type of innovation, level of engagement, authenticity, service quality, and cultural importance on tourist satisfaction. Table 3 and Fig. 3 depict the ANOVA results. Therefore, the findings of this analysis are that all the factors have a significant effect since their p-values are below 0.05. This research shows that increasing the quality of services is probably going to have the most effect on raising visitor satisfaction. Among these variables, only service quality has a high level of F-value (9.62) and the lowest p-value (0.0001), which indicates that changes in service quality make the most substantial contribution to change in tourist satisfaction. This points out that an increase in the service quality can be of significant benefit in increasing the level of satisfaction among the tourists. However, other factors, such as the type of innovation, level of

engagement, authenticity, and cultural value, influence satisfaction but to a limited extent. These findings reveal that in the context of the current research, while all antecedent variables have a considerable effect on the tourist experience, service quality is the most influential attribute, which underlines the significance of tourism services' constant focus on enhancing quality to enhance visitors' satisfaction.
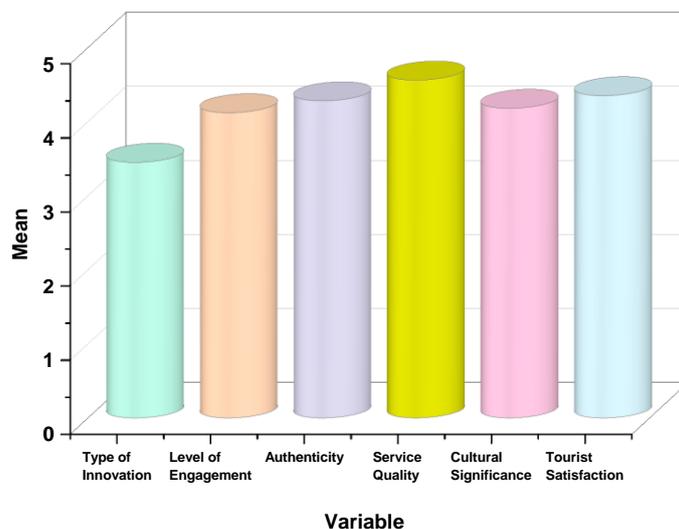

Fig. 2. Mean values of determinants in tourist satisfaction.

Table 3. ANOVA for determinants of tourist satisfaction.

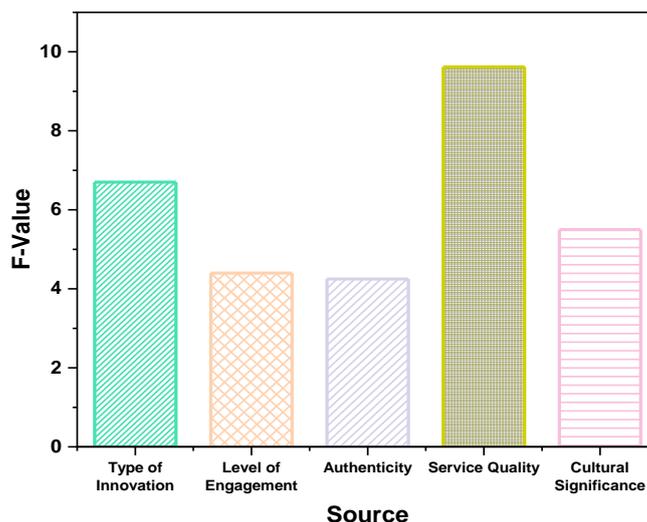| Source	Sum of squares (SS)	df	Mean square (MS)	F-value	*p*-value
Type of innovation	12.45	4	3.11	6.70	0.0002
Level of engagement	8.34	4	2.09	4.40	0.0025
Authenticity	7.89	4	1.97	4.25	0.0033
Service quality	16.22	4	4.06	9.62	0.0001
Cultural significance	10.56	4	2.64	5.50	0.0009
Residual variance	45.67	147	0.32	-	-
Total	84.13	151	-	-	-

Fig. 3. F-value comparison of variables influencing tourist satisfaction.

Multiple regression analysis is another form of analyzing data that helps in establishing the relationship between several independent and one dependent variables. Table 4 and Fig. 4 show the outcome of multiple regressions on tourist satisfaction. It assists in explaining the influence that each independent variable has on the outcome while considering the impact of other variables. From the results of this analysis, service quality comes out as the most important predictor of tourist satisfaction with the highest coefficient value of 0.35 and a highly significant

p-value of 0.000, pointing to a strong relationship. The findings revealed that there is a potential to enhance tourist satisfaction significantly by enhancing service quality. Also, the other factors that have a positive impact on satisfaction include the type of innovation, level of engagement, authenticity, and cultural importance of the innovation, all showing significant connections between the variables. This suggests that quality of service delivery has a stronger impact on influencing satisfaction levels as compared to other factors.

Table 4. Impact of Variables on tourist satisfaction: Multiple Regression outcomes.

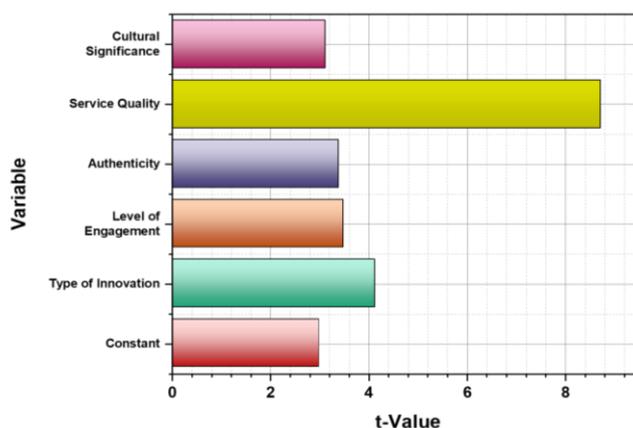| Variable	Standard error (SE)	Coefficient (β)	t-value	*p*-value	95% Confidence interval
Constant	0.41	1.23	3.00	0.003	[0.42-2.04]
Type of innovation	0.07	0.29	4.14	0.000	[0.15-0.43]
Level of engagement	0.06	0.21	3.50	0.001	[0.09-0.33]
Authenticity	0.05	0.17	3.40	0.001	[0.07- 0.27]
Service quality	0.04	0.35	8.75	0.000	[0.27-0.43]
Cultural significance	0.08	0.25	3.13	0.002	[0.09-0.41]

Fig. 4. t-values for variables in predicting tourist satisfaction.

Correlation analysis is used to measure the connection between two or more variables. It indicates how closely each factor is related to others, allowing for the identification of the most significant variables. Table 5 and Fig. 5 depict the outcomes of correlation analysis. Among all factors, satisfaction with service quality turned out to be the most strongly associated with tourist satisfaction and its value is 0.80. This shows that service quality is strongly and positively correlated with tourist satisfaction, thus being the most relevant antecedent to satisfaction. Moreover, the analysis revealed a high correlation between the level of engagement and tourist satisfaction (0.65), and there is also a moderate relationship between engagement and other variables, making the level of engagement a factor that should not be neglected when evaluating the experience of tourists. Similarly, the cultural significance and authenticity of the destination also have high and significant correlation coefficients with tourist satisfaction (0.76 and 0.70, respectively), which supports the notion that those elements are important in the tourist satisfaction process. Although all the factors enhance the model, the close link between service quality and tourist satisfaction reveals its significance in affecting satisfaction levels.

Table 5. Factors influencing tourist satisfaction: A correlation analysis.

Variable	Type of innovation	Level of engagement	Authenticity	Service quality	Cultural significance	Tourist satisfaction
Type of innovation	1.00	0.45*	0.32	0.56**	0.48**	0.60**
Level of engagement	0.45*	1.00	0.56**	0.72**	0.55*	0.65**
Authenticity	0.32	0.56**	1.00	0.63**	0.59**	0.70**
Service quality	0.56**	0.72**	0.63**	1.00	0.74**	0.80**
Cultural significance	0.48**	0.55*	0.59**	0.74**	1.00	0.76**
Tourist satisfaction	0.60**	0.65**	0.70**	0.80**	0.76**	1.00

Note: * denotes the significant correlation at a certain level (often *p* < 0.05), & ** indicates a stronger significant correlation, often at a lower *p*-value (such as *p* < 0.01).

Correlation Matrix of Variables Influencing Tourist Satisfaction
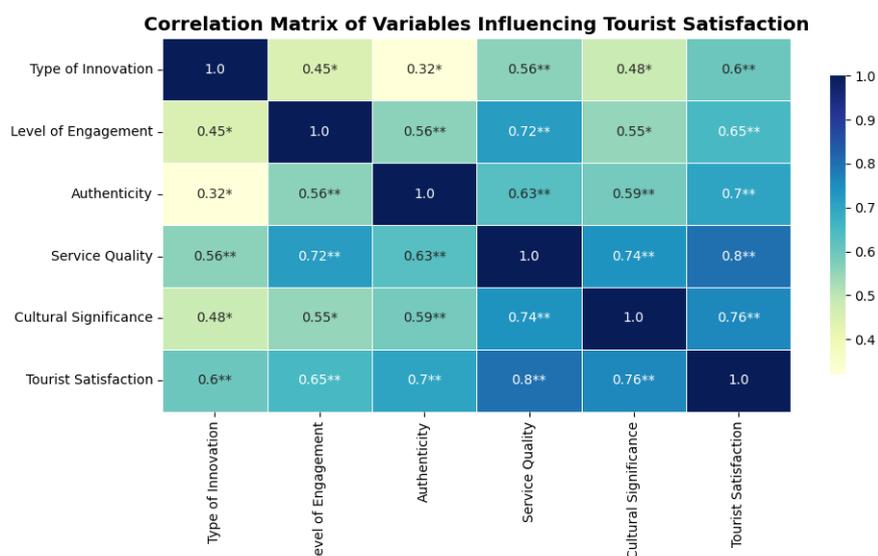

Fig. 5. Correlation analysis of factors affecting tourist satisfaction.

DISCUSSION

The analysis reveals that service quality is the strongest factor affecting the degree of satisfaction of tourists, as described by strong and consistent relationships evident in descriptive statistics, ANOVA, multiple regression, and correlation analysis. Service quality, carrying a mean of 4.56 and displaying the highest F-value under ANOVA at 9.62, exhibits minimal variability and an extremely stable perception among tourists, reflecting its importance in contributing to satisfaction. This is further confirmed by regression analysis, which reveals that service quality plays a dominant role, with a β of 0.35 and *p*-value of 0.000, indicating a direct impact on satisfaction. Other factors, such as type of innovation, level of engagement, authenticity, and cultural significance, also have positive effects on satisfaction, but their impact is comparatively lower. While involvement and cultural elements exhibit moderate to significant connections with happiness, the large range of responses regarding innovation indicates varying opinions of its significance. The correlation analysis also demonstrates the strongest relationship between service quality and satisfaction (0.80), followed by involvement (0.65), cultural importance (0.76), and authenticity (0.70). Collectively, these results imply that, although service quality continues to be the most important aspect, improving the entire visitor experience requires a balanced emphasis on other elements like engagement, authenticity, and cultural relevance.

CONCLUSION

The significant impact of supply-side innovations on food tourism experiences and tourist satisfaction was highlighted. Analyzed the variables such as type of innovation, level of engagement, service quality, cultural significance, and authenticity, the research pointed out how each of these attributes impacted the level of satisfaction. The results indicated that food experience and cultural authenticity were significant variables that influenced the attitudes of tourists toward food tourism activities. Tourists who experienced a higher amount of positive emotional experiences were more likely to recommend and revisit such experiences. It was recommended that stakeholders involved in food tourism, especially the chefs, restaurants, and policymakers, should consider developing innovations that are responsive to the preferences of the consumers as a way of promoting the expansion and sustainability of food tourism in the travel and hospitality industry.

Limitation and Future Scope: Research mainly examines supply-side changes and does not explore possible changes in tourist demands and cultural factors that could alter satisfaction levels greatly. Further research can proceed by considering demand-side factors relying on the ability of the destination to effectively incorporate any supply-side innovations in an effort to increase total satisfaction among tourists.

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