

AMERICAN UNIVERSITY OF BEIRUT

CONSUMERS PERCEPTIONS ON STREET FOOD AND ITS
SAFETY IN THE CONTEXT OF MASS TOURISM: A CASE
STUDY IN LEBANON

by
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ABSTRACT OF THE THESIS OF

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Title: Consumers Perceptions on Street Food and its Safety in the context of Mass Tourism: A Case Study in Lebanon

Background: Street food has become increasingly popular due to its convenience, offering various food options ranging from traditional dishes to international cuisines. Nevertheless, food safety concerns persist, including contamination from inadequate cooking and hygiene practices.

Objectives: The objective of this study is to analyze consumers' behavior and perceptions of street food in Batroun, which has become a popular destination in Lebanon, and to assess compliance with food safety standards during the city's annual Christmas Market held in December.

Methods: This cross-sectional study involved consumers and non-consumers of street food. Participants completed a questionnaire covering demographic information, purchasing behavior, factors influencing choices, perception of sanitary conditions, and post-consumption experiences. Additionally, a food safety assessment of the street food outlets was conducted, which involved the collection of swabs and food samples, followed by microbiological analysis. Data analysis was performed using IBM SPSS statistical software (version 27).

Results: The study included 226 street food consumers aged 18 to 64, who indicated that taste is the primary factor influencing street food purchasing. Males and younger adults were more likely to be consumers than females and older individuals. Other factors affecting consumption included financial status, nutritional value, and price among others. Most participants considered street food safe; however, many non-consumers highlighted concerns about its consumption. In addition, 60 swabs from 20 street food kiosks were collected during the Christmas Market in Batroun revealing the presence of *Escherichia coli* and *Staphylococcus aureus* on some food-contact surfaces. Also, the microbial quality of street foods was assessed, with all 24 samples falling within the good range for *E. coli* and *Salmonella* spp.

Conclusion: There is a high street food consumption during the Christmas market especially among males and younger individuals. Microbial analysis of swabs and samples revealed generally satisfactory hygiene standards, although there are concerns regarding potential contamination. Future studies could examine whether there are variations in consumer perceptions or food safety among festive events across the year.

Keywords: Street food, consumers, perceptions, Christmas market, food safety.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	1
ABSTRACT	2
TABLES	5
ABBREVIATIONS	6
INTRODUCTION AND LITERATURE REVIEW.....	1
1.1. Consumers' Perception and Attitudes toward Street Food.....	2
1.2. Food Safety Knowledge and Behavior of Street Food Vendors.....	4
1.3. Microbiological Contamination in Street Foods.....	5
1.4. Food Safety Practices in Lebanese Street Food Settings.....	6
1.5. Significance and Objectives.....	8
METHODOLOGY	10
2.1. Consumer Study.....	10
2.1.1. Study design.....	10
2.1.2. Ethical Approval	10
2.1.3. Participants.....	11
2.2. Food Safety Assessment	11
2.2.1. Microbiological Analysis of Swabs.....	11
2.2.2. Microbiological Analysis of Food Samples.....	12

2.3. Data analysis	12
RESULTS	14
3.1. Consumer Study	14
3.1.1. Characteristics of Respondents	14
3.1.2. Street Food Consumption	16
3.1.3. Factors Correlated with Street Food Consumption.....	19
3.2. Food Safety Assessment	24
3.2.1. Microbiological Analysis of Swabs	24
3.2.2. Microbiological Analysis of Food Samples.....	25
DISCUSSION.....	27
4.1. Consumer Study.....	27
4.2. Food Safety Assessment	30
4.3. Consumers and Non-consumers Perceptions on Food Safety	32
4.4. Strengths	33
4.5. Limitations	33
CONCLUSION	35
APPENDIX	36
REFERENCES	41

TABLES

Table

1. Characteristics of Respondents.....	15
2. Characteristics of Consumers and Non-consumers	16
3. Street Food Consumption Frequency	17
4. Street Food Consumption Patterns	18
5. Factors associated with the consumption of Street Food.....	19
6. Factors considered when choosing a SF outlet.	20
7. Consumers' Perceptions on the Sanitary Conditions of Street Food Settings	21
8. Factors predicting the Frequency of consuming Street Food	22
9. Non-consumers Perceptions on Street Food.....	24
10. Results of the Microbial Analysis of the collected Swabs.....	25
11. Results of the Microbial Analysis of the collected Street Food Samples	25

ABBREVIATIONS

SF: Street Food
WHO: World Health Organization
REC: Rapid E Coli
SS: Salmonella Shigella
XLD: Xylose Lysine Deoxycholate
RVS: Rappaport Vassiliadis Soyabean
AUB: American University of Beirut
RTE: Ready to Eat
CFU: Colony Forming Unit
CDC: Centers for Disease Control and Prevention

CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

Over the years, developments in the food service sector have been influenced by a number of factors, mainly related to changes in consumers' lifestyles and habits. These perceived changes are primarily driven by the growing demand for affordable and convenient food that fits into consumers' busy schedules. In light of this fact, street food has become a popular way of receiving quick meals, with a variety of food choices ranging from traditional local dishes to popular international cuisines.

According to the Food and Agriculture Organization of the United Nations (FAO), street foods are defined as "ready-to-eat foods and beverages prepared and/or sold by vendors or hawkers, especially in the streets and other similar places." This includes pre-prepared products such as salads and sandwiches and pre-cooked items such as traditional dishes that are sold for direct consumption (WHO, 2019). In fact, specific criteria are used to classify vending sites as street food stalls. As stated by the WHO, eligible settings include any mobile vendors or sellers with semi-static or stationary vending units that sell ready-to-eat snacks and beverages on streets, while excluding permanent establishments with four permanent walls that do not sell directly on the street or sites that exclusively sell fruits and vegetables, as well as raw and processed meat, fish, or dairy products. These eligible sellers may be found in different locations within a city, either in crowded places such as popular gathering sites or scattered across broader areas of the city.

Millions of consumers in cities rely on street food as a major part of their daily food intake. Additionally, preparing and selling street food is a common source of income for many individuals, especially men and women with limited education, knowledge, and

skills. Nevertheless, street food has long been associated with food safety concerns, such as contamination with pathogenic microorganisms due to inadequate cooking and hygiene practices and improper storage and handling of ingredients. Consequently, consumers need to be aware of the risks associated with eating street food and take the necessary precautionary measures to avoid any potential health hazards.

1.1. Consumers' Perception and Attitudes toward Street Food

Several studies have examined consumers' attitudes toward the consumption of street food. For instance, Wiatrowski, Czarniecka-Skubina, and Trafialek (2021) explored the main reasons that drive consumers to purchase and consume street foods, which included convenience, time efficiency, socializing with people, experiencing new flavors, as well as reluctance to prepare food. In addition to these drivers, Banna et al. (2022) pointed out that affordability is often the main reported reason for purchasing street food, followed by personal preferences and ease of accessibility. Furthermore, Chang, Chu, and Shahril (2020) highlighted an additional factor: "perceived value." The authors described perceived value as the evaluation of what is received in comparison to what is given in terms of both monetary factors, such as price, and non-monetary factors, such as time and effort. When it comes to choosing between street food settings, the majority of consumers tend to compare prices of the available food settings before ordering while also considering the quality of the food received relative to the amount of money spent (Chang, Chu, & Shahril, 2020). The selection could also be influenced by recommendations given by family members or friends, social media, online reviews, blogs, magazines, newspapers, and TV channels (Wiatrowski, Czarniecka-Skubina, & Trafialek, 2021). On top of that, the frequency and type of street food chosen are significantly dependent on

the gender, age, educational level, financial situation, and residence area of consumers. In most cases, street food consumers are individuals, primarily men, who are under 18 or between 19 and 30 years of age, with a low educational level and socioeconomic status (Wiatrowski, Czarniecka-Skubina, & Trafialek, 2021). This could be explained by the fact that street foods are very convenient and may be cheaper than other food services.

Street food outlets are perceived positively by consumers. However, there are many concerns about street foods' safety and the hygienic conditions under which these services are offered. For instance, Seo and Lee (2021) stated that many people consider food safety a critical factor when selecting food outlets. The authors mentioned that people's negative attitudes toward the consumption of street food are associated with the perceived risk of eating this type of food. In other words, the consumers' perception of the adverse outcomes of consuming these foods affects their decisions. However, many individuals disregard the food safety issue and consider this type of food as "safe" compared to other food services. However, Wiatrowski, Czarniecka-Skubina, and Trafialek (2021) revealed the presence of "irregularities" in street food preparation, specifically street food hygiene practices in terms of personal hygiene of food workers and cleanliness of the food production area. Based on the consumers' observations, food workers often did not use disposable gloves, had no cover for their hair, had unsuitable working clothes, and the payment process was not properly separated from food production. These observations can be related to consumers' knowledge of food safety, which may depend on several factors. According to Banna et al. (2022), females tend to have more food safety knowledge than males, as females are mostly responsible for household food preparation. In addition, when comparing consumers' knowledge relative to their age, older adults were found to be more familiar with food safety practices than younger adults. This is

because older people may have faced more issues related to food contamination throughout their life experience, leading to a greater knowledge of the proper food safety procedures. Consequently, these findings highlight the need to investigate the ability of street food vendors to adhere to food safety standards during food preparation.

1.2. Food Safety Knowledge and Behavior of Street Food Vendors

Indeed, many existing studies have examined Street food handlers' food safety knowledge, attitudes, and practices. According to Huynh-Van et al. (2022), the prevalence of inadequate food safety conditions and practices in street food settings can be attributed to several factors, namely the limited understanding of food safety principles among vendors, their poor attitude towards food safety, their low socio-economic status, as well as the lack of effective regulatory mechanisms to ensure food safety. Some of the concerning practices observed in street food settings include the improper storage of raw and cooked food in sealed and separated containers, the inadequate cleaning of utensils with detergents, the absence of hand washing prior to handling, preparing, or serving foods, as well as the use of bare hands during cooking (Ma et al., 2019).

This lack of compliance with food safety procedures could be attributed to the fact that, in many cases, food workers did not receive any training regarding proper food safety and hygiene practices (Nkosi & Tabit, 2021). Additionally, as these vendors tend to have limited professional skills to acquire more “formal” employment, they end up working in the Street food business, hence, their limited understanding of food safety procedures. Within this context, Huynh-Van et al. (2022) acknowledged that the level of education and training of street food handlers play a crucial role in raising their awareness about basic food safety principles. This was also indicated by Meher et al. (2022), stating

that food vendors with a bachelor's degree had greater food safety knowledge than those who were less educated. This further highlights the strong correlation between the educational status of street food vendors and their attitude towards food safety. In addition, the authors emphasized the critical role of food safety training in enhancing food vendors' attitudes.

1.3. Microbiological Contamination in Street Foods

Considering the observed non-compliance with food safety procedures, microbiological contamination in street foods became a significant concern, as shown in the literature. For instance, the findings of Bereda et al. (2016) highlighted a high incidence of pathogenic bacterial contamination with *Escherichia coli*, *Staphylococcus aureus*, and *Salmonella* spp. being commonly isolated pathogens. Ferrari et al. (2021) further emphasized the presence of *S. aureus* and *E. coli* in various street food varieties, with some samples also showing contamination with *Salmonella* spp. The study underlined the potential for cross-contamination during food handling and preparation processes, especially in overhandled foods like hot dogs and savory snacks. Salamandane et al. (2021) also revealed unsatisfactory levels of pathogenic microorganisms in traditional hot and cold street foods, indicating post-preparation contamination likely associated with specific culinary practices and poor hygiene conditions. High levels of *E. coli* and total coliforms found in sandwiches suggest potential cross-contamination during transportation and vending, exacerbated by inadequate hygiene practices and improper storage. Furthermore, Moloji et al. (2021) revealed elevated microbial levels in meat samples collected from street vendors, exceeding regulatory standards and indicating potential lapses in food handling and preparation practices. The study highlighted

deficiencies in basic infrastructure at vending sites, such as inadequate access to potable water and waste disposal facilities, which can affect the implementation of proper hygiene practices. Furthermore, microbial analysis identified the presence of pathogens like *Staphylococcus aureus* and *Escherichia coli*, suggesting possible contamination sources such as inadequate handwashing facilities and the reuse of contaminated water. Collectively, these findings stress the need for improved food safety measures, including enhanced hygiene practices, proper storage, and better regulation of street food vending practices to decrease the risk of microbiological contamination in street food settings.

1.4. Food Safety Practices in Lebanese Street Food Settings

As food safety practices continue to gain significant attention, especially in street food settings, a few local studies have been conducted in Lebanon to assess the safety level of foods offered in this type of establishment. An example of this is Loukieh et al. (2018), who examined the food safety performance of street food establishments in Beirut. Subsequently, this study showed that some of these settings did not have access to sufficient amounts of potable water, with most of the vending sites lacking adequate handwashing stations. The absence of hand washing stations leads to the inability of food handlers to wash their hands, thus increasing the risk of contamination of food prepared by direct contact. In addition, most of the food handlers prepared and served the street food using their bare hands while also handling the food and money without washing their hands after touching the money. Furthermore, many street food settings used wood and other non-food grade materials, which did not correspond with the correct food safety practices. Moreover, cross-contamination was frequently observed in these establishments. For example, many food handlers were using the same chopping boards

for different types of food and the same utensils to handle different types of food, including raw, cooked, clean, and unclean. Also, regardless of type, foods were placed in the same refrigerator without appropriate segregation. These unhygienic practices resulted in bacterial contamination across the sampled food categories. Notably, fruits and vegetables exhibited the highest number of contaminated samples, followed by dairy and meat products. Correlation tests revealed significant associations between specific microorganisms at unsatisfactory levels and general hygiene practices, facilities, and surrounding environmental parameters. For instance, inadequate hygiene practices, such as handling money during food preparation without subsequent handwashing, were correlated with *S. aureus* contamination. Similarly, inappropriate refrigeration methods were associated with *Listeria* spp., while limited access to proper waste disposal facilities correlated with *Salmonella* spp. *E. coli* contamination levels were linked to unhygienic conditions and the unavailability of potable water.

Following the analysis conducted by Loukieh et al. (2018) in Beirut, Hassan et al. (2022) further examined the food safety performance of street food establishments in Tripoli, the capital city of North Lebanon. Their study revealed inadequate food safety practices among the different carts in Tripoli, which could be attributed to the fact that most food handlers have only completed primary school education. In line with the findings of Loukieh et al. (2018), the authors discovered that the raw materials in most carts were not stored properly and separately from RTE food, which may increase the risk of food contamination and deterioration. Additionally, many street food vendors opted for raw materials with the lowest available grade, primarily due to their lower costs, which could further increase the risk of potential food hazards. Besides, the results of this study indicated that personal hygiene practices were inadequate among a significant number of

street food vendors. Many food handlers were not wearing an appropriate working uniform, including gloves and hair nets. Also, they did not wash their hands as frequently as required, especially after money transactions. One of the main contributors to the inadequate food safety practices observed is the lack of training of food vendors on the appropriate food safety procedures, as well as their lack of knowledge of food safety laws and regulations. In addition to that, microbial analysis of street food samples revealed that every sample tested positive for at least one of the examined foodborne pathogens. Notably, ten orange juice samples exhibited unsatisfactory yeast levels, while nine samples showed elevated mold levels. Additionally, two RTE food samples exceeded the standard limit for β -glucuronidase-producing *Escherichia coli*, and one shawarma sample failed to meet the standard for *Clostridium perfringens*. These findings highlight the potential risks associated with the consumption of street food and the importance of education and food safety training for street food handlers.

1.5. Significance and Objectives

It is well known that the city of Batroun has become a renowned tourist destination in Lebanon, attracting both residents and international tourists. Consequently, the city of Batroun has experienced a significant increase in street food outlets over the past year, owing to the popularity and convenience of this type of food. That being the case, this city will be the focus of the current study.

This study aims to analyze consumers' behavior and perceptions towards street food by examining the factors that influence consumers' choices, attitudes, and expectations regarding the consumption of street food and to highlight their perceptions regarding food safety in these establishments. In addition, this study assesses the

compliance of street food settings in Batroun with food safety standards and regulations during their annual Christmas Market, which is held during the month of December.

Based on the above-mentioned studies, establishments' compliance with food safety and hygiene practices is important to ensure public safety and improve food quality. It is also crucial to examine consumers' perceptions and behaviors toward the consumption of street food to evaluate the success and sustainability of these establishments. Consequently, the findings of this study will contribute to the existing literature on consumer behavior and the food safety of street food outlets, knowing that previous research in Lebanon has been mostly limited to the evaluation of food safety on its own.

CHAPTER 2

METHODOLOGY

2.1. Consumer Study

2.1.1. Study design

A cross-sectional study was conducted in Batroun among visitors during the month of December 2023, when the annual Christmas Market was launched. Hence, a questionnaire was created based on previous research related to street food. The questionnaire is divided into several sections depending on whether the participant is a consumer or non-consumer. In the case where the participant is a consumer, the sections include Demographic Information, Consumers' Purchasing Behavior, Factors Considered when Choosing Street Food, Consumers' Perception of Sanitary Conditions, and Post-Consumption Experience. On the other hand, if the participant is a non-consumer, the survey is divided into two main sections: Demographic Information and Non-consumer section. In all cases, the data collection was performed using the pen-and-paper interview (PAPI) method.

2.1.2. Ethical Approval

An oral informed consent was obtained from all participants prior to data collection, ensuring they were aware of the objectives of this research and their rights as participants. The study was conducted in compliance with the ethical guidelines set by the International Review Board (IRB) of the American University of Beirut, which granted approval for the study on December 14th, 2023. Furthermore, the purpose of each survey was made clear to the participants through a brief description of the research topic and its objectives at the beginning of the questionnaire.

2.1.3. Participants

The sample consisted of 226 participants from different age groups and backgrounds who were approached in person and invited to participate in the study. All respondents who agreed to complete the survey were included in the analysis.

2.2. Food Safety Assessment

The food safety of 20 street food outlets present during the Christmas market was comprehensively evaluated through the implementation of surface swabs and the collection of food samples.

2.2.1. Microbiological Analysis of Swabs

Swabbing was conducted on food-contact surfaces using sterile swabs moistened in a 5 ml Buffered Peptone Water (BPW) solution (Himedia, India), with each swab rubbed across a defined surface area. Three swabs per kiosk (totaling 60 swabs) were categorized into surface areas (A), handles/buttons of heating equipment (B), fridge handles (C), utensils (D), condiment bottles (E), and other equipment (F). All swab samples were labeled using a 2-digit code to ensure anonymity and were stored under controlled temperature conditions and then transported to the AUB Microbiological Lab the following day. Upon arrival at the lab, samples were inoculated onto Rapid *E. coli* II (REC) (Bio-Rad, France) plates for *Escherichia coli* and Baird Parker (BP) (Scharlab, Spain) plates for *Staphylococcus aureus*, then incubated at 37°C for 24 hours. Pure cultures were characterized based on morphological differences, after purification of the suspected colonies on their selective media (BP/REC).

For *Salmonella* spp., 0.5 ml of the sample was transferred into a 5 ml tube containing 4.5 ml Rappaport Vassiliadis Soyabean Meal Broth (RVS) (HI Media, India) and incubated at 41.5°C for 24 hours. This allows for the selective enrichment of any *Salmonella* present in the sample. The following day, the enriched sample was inoculated onto Salmonella-Shigella (SS) (Bio-Rad) and Xylose Lysine Deoxycholate (XLD) (Neogen, UK) plates and incubated at 37°C for 24 hours.

2.2.2. Microbiological Analysis of Food Samples

Similarly, 24 food samples from the 20 kiosks were collected and stored under controlled conditions until transported to the AUB Microbiological Lab. The samples included burgers, wraps, ka'ak, pasta, hot dogs, and pancakes. Each sample (25 grams) was suspended in 225 ml of sterile BPW and homogenized using a Stomacher for 2 minutes, resulting in a 10^{-1} dilution. A secondary dilution of 10^{-2} was prepared. A hundred microliters of both dilutions were inoculated onto REC (Bio-Rad, France) plates for *E. coli* and Baird Parker (Scharlab, Spain) plates for *S. aureus*. Incubation was done at 37°C for 24 hours. Pure cultures were characterized based on morphological differences, after purification of the suspected colonies on their selective media (BP/REC). *Salmonella* spp. testing followed the same procedure as surface swabs.

2.3. Data analysis

Following data collection, all results were translated and organized into tables using the IBM SPSS statistical program (version 27). Descriptive analysis was conducted to present the demographic information of the participants, to describe the frequency of street food consumption among consumers, and to show the different street food

consumption patterns among participants. In addition, binary logistic regression was conducted to examine the demographic factors that may predict whether an individual is a consumer or a non-consumer of street food. Similarly, ordinal logistic regression was performed to assess the factors that can influence the frequency of street food consumption. Finally, descriptive statistics was done for the non-consumers section in the survey to highlight the reasons why they do not consume street food. As for the food assessment part, colony forming units per ml and per grams were calculated for swabs and food samples, respectively, using Microsoft Office Excel.

CHAPTER 3

RESULTS

3.1. Consumer Study

3.1.1. Characteristics of Respondents

The study involved 226 participants, with a gender distribution of 50.4% males and 49.6% females. The study included individuals aged between 18 and 64, distributed as follows: 37.2% in the 18-25 age range, 29.6% in the 26-35 range, and 33.2% in the 36-64 range. A significant majority of participants had attained higher education, accounting for 93.8%. Examining marital status, 55.8% of respondents identified as single, 40.7% were married, while only 3.6% were widowed or divorced. In terms of the self-reported financial status, 49.1% of participants reported a 'good' status, 30.1% indicated an 'average' status, with smaller percentages having 'very good' (18.1%) and 'bad' (2.7%) financial conditions. The participants' professions varied as well, with 31.9% being students, 6.6% in the government sector, 34.5% in the private sector, 21.2% self-employed, and 5.8% unemployed. Furthermore, 81.9% of respondents affirmed that they had visited Batroun during this time of the year, whereas 18.1% indicated that they had never visited Batroun during this period before (Table 1).

Table 1 Characteristics of Respondents.

Variables	Categories	Frequency	Percentage (%)
Gender	Male	114	50.4
	Female	112	49.6
Age Group	18 – 25 years old	84	37.2
	26 – 35 years old	67	29.6
	36 – 64 years old	75	33.2
Marital Status	Single	126	55.8
	Married	92	40.7
	Divorced	6	2.7
	Widowed	2	0.9
Education Level	Elementary school	0	0
	Secondary school	12	5.3
	Higher education	212	93.8
	No formal education	2	0.9
Profession	Student	72	31.9
	Government sector	15	6.6
	Private sector	78	34.5
	Self-employed	48	21.2
	Unemployed	13	5.8
Self-reported Financial Status	Very good	41	18.1
	Good	111	49.1
	Average	68	30.1
	Bad	6	2.7
Previous visits to Batroun during Christmas	No	41	18.1
	Yes	185	81.9

Table 2 presents the demographic variables concerning consumers and non-consumers. In terms of gender, females constitute a lower proportion among consumers (43.1%) compared to non-consumers (63%). Regarding age groups, the highest percentage within consumers falls in the 18-25 years old category (49%), while non-consumers predominantly belong to the 36-64 years old range (69.9%). Marital status exhibits a similar pattern, with a larger proportion of consumers being single (73.2%) compared to non-consumers (19.2%), suggesting potential differences in lifestyle and habits. Furthermore, consumers are more likely to be students (41.2%) or working in the private sector (30.1%), whereas non-consumers are more frequently found in the private sector

(43.8%) and self-employed (28.8%). The distribution of financial status, education level, and visits to Batroun appears to be similar among both groups.

Table 2 Characteristics of Consumers and Non-consumers

Variables	Categories	Consumers	Non-consumers
		Frequency (%)	Frequency (%)
Gender	Male	87 (56.9)	27 (37)
	Female	66 (43.1)	46 (63)
Age Group	18 – 25 years old	75 (49)	9 (12.3)
	26 – 35 years old	54 (35.3)	13 (17.8)
	36 – 64 years old	24 (15.7)	51 (69.9)
Marital Status	Single	112 (73.2)	14 (19.2)
	Married	35 (22.9)	57 (78.1)
	Divorced	4 (2.6)	2 (2.7)
	Widowed	2 (1.3)	0
Education Level	Elementary school	0	0
	Secondary school	10 (6.5)	2 (2.7)
	Higher education	141 (92.2)	71 (97.3)
	No formal education	2 (1.3)	0
Profession	Student	63 (41.2)	9 (12.3)
	Government sector	10 (6.5)	5 (6.8)
	Private sector	46 (30.1)	32 (43.8)
	Self-employed	27 (17.6)	21 (28.8)
	Unemployed	7 (4.6)	6 (8.2)
Self-reported Financial Status	Very good	28 (18.3)	13 (17.8)
	Good	66 (43.1)	45 (61.6)
	Average	53 (34.6)	15 (20.5)
	Bad	6 (3.9)	0
Previous visits to Batroun during Christmas	No	21 (13.7)	20 (27.4)
	Yes	132 (86.3)	53 (72.6)

3.1.2. Street Food Consumption

According to the collected data, the majority of the participants fall into the category of street food consumers, encompassing 67.7% of the sample. Specifically, 4.4% reported consuming street food daily, while 15% do so 2-3 times per week, and 18.6% make such purchases once a week. Additionally, 16.8% buy street food 2-3 times per

month, and 12.8% do so once a month. On the other hand, 32.3% of respondents reported rarely or never purchasing street food (Table 2).

Table 3 Street Food Consumption Frequency

Street Food Consumption Frequency	Frequency	Percent of Total	Consumer/non-consumer	Percent within Category
Daily	10	4.4%	Consumer	6.5%
2-3 times per week	34	15.0%	Consumer	22.2%
Once per week	42	18.6%	Consumer	27.5%
2-3 times per month	38	16.8%	Consumer	24.8%
Once per month	29	12.8%	Consumer	19.0%
Rarely or never	73	32.3%	Non-consumer	N/A
Total	226	100.0%	-	100.0%

Within the consumers category, as shown in Table 3, almost half of street food consumers (43.8%) prefer having street food for dinner. About one-third (33.3%) consume street food at various times throughout the day, whereas a smaller portion of consumers opt for street food as snacks (11.8%), breakfast (5.9%), or lunch (5.2%).

Regarding the type of street food consumed, 54.2% of participants reported consuming more than one type of food. A significant proportion, 32.7%, indicated a preference for fast food, while a smaller percentage favored dessert (8.5%), beverages (3.3%), or other types of food (1.3%).

As for the sources used by participants when choosing a street food outlet, a significant portion of respondents (43.1%) reported utilizing more than one method to find street food settings. 3.9% rely on online searches for nearby settings, while 13.7% discover street food through advertisements on social media platforms. Additionally, 23.5%

encounter street food settings by chance while walking by, while 15.7% rely on recommendations from others to discover new street food outlets.

Potential reasons for purchasing street food were analyzed, revealing various factors influencing consumer choices. As shown in Table 3, a significant majority (47.1%) reported multiple reasons for their purchases. Among individual factors, taste was the primary motivator, chosen by 36.6% of respondents. Additionally, affordability (0.7%), convenience (7.2%), and time efficiency (6.5%) were reported as drivers of street food purchases, although to a lesser extent in comparison to taste.

Table 4 Street Food Consumption Patterns

Street Food Consumption Patterns	Percentage (%)	
What meal of the day do you typically buy street food for?	Breakfast	5.9
	Lunch	5.2
	Dinner	43.8
	Snacks	11.8
	More than one meal	33.3
What type of street food do you usually consume?	Fast Food	32.7
	Desserts	8.5
	Beverages	3.3
	Other	1.3
	More than one type	54.2
How do you typically find out about street food settings?	By receiving recommendations from others	15.7
	Discovering food places by walking by	23.5
	Seeing advertisements on social media	13.7
	Online search of nearby food settings	3.9
	More than one way	43.1
What are the main reasons for buying street food?	Affordability	0.7
	Convenience	7.2
	Time efficiency	6.5
	Tasty food	36.6

Other	2.0
More than one reason	47.1

3.1.3. Factors Correlated with Street Food Consumption

According to the findings presented in Table 4, males exhibit a notably higher likelihood of being street food consumers compared to females, with males being nearly three times more likely to consume street food ($p = 0.005$), after controlling for other variables. Besides, individuals within the 26 – 35 age group are 9.5 times more likely to be consumers than their older counterparts aged between 36 and 64 ($p < 0.001$) while adjusting for the other variables. Additionally, participants without a partner – whether single, divorced, or widowed – showed a significant tendency to consume street food, being approximately nine times more likely to be consumers compared to married individuals ($p < 0.001$) when other factors are held constant.

Table 5 Factors associated with the consumption of Street Food.

	B coefficient (Odds Ratio)	Sig. (p value)
Gender (Male)	3.178	.005*
Age Group		
18 – 25 years old	3.966	.143
26 – 35 years old	9.449	< .001*
Having No Partner	8.838	< .001*
Non-employed	.949	.950
Average or Bad Financial Status	2.183	.088
No previous visits to Batroun during Christmas	.517	.192

*: Indicates statistical significance ($p\text{-value} < 0.05$).

Table 5 outlines the ratings allocated to various factors influencing consumer perceptions of street food establishments. Notably, taste (mean = 4.88) and hygiene and safety (mean

= 4.75) received the highest ratings, suggesting their significance in consumer decision-making. Factors like price (mean = 3.73), variety in food choices (mean = 3.69), and portion size (3.94) received moderate ratings. In contrast, nutritional value (mean = 2.89) and the proximity of food settings (mean = 3.20) received comparatively lower ratings.

Table 6 Factors considered when choosing a SF outlet.

Factors	Mean	Mode
Price	3.73	4
Variety in Food Choices	3.69	3
Taste	4.88	5
Portion Size	3.94	4
Reputation	3.87	4
Hygiene and Safety	4.75	5
Good and Fast Customer Service	4.03	4
Food Presentation and Packaging	3.42	3
Nutritional Value of the product	2.89	3
Location and Closeness of the food setting	3.20	3

Respondents' perceptions regarding the sanitary conditions of street food establishments are presented in Table 6. A considerable proportion (41.8%) generally consider street food as a safe consumption choice, while a smaller percentage (13.7%) disagree, and a notable portion (44.4%) remain uncertain. The majority (71.9%) find the food preparation and handling area in good condition. Additionally, most respondents observe food handlers wearing appropriate working clothes (83.7%) and using disposable gloves (86.3%). Interestingly, most participants (71.9%) disagree that food handlers touch their face, hair, nose, or ears during food preparation, and perceive the payment process to be properly segregated from production (74.5%). However, there are potential concerns regarding the

hygiene practices of food handlers, as only half of the respondents perceived proper handwashing and noted that food handlers were using hairnets to cover their hair.

Table 7 Consumers' Perceptions on the Sanitary Conditions of Street Food Settings

Perceptions on Sanitary Conditions	Yes (%)	No (%)	Do not recall (%)
Do you generally consider street food a safe consumption choice?	41.8	13.7	44.4
Do you find the food preparation and handling area in good condition?	71.9	6.5	21.6
Do food handlers have appropriate working clothes?	83.7	8.5	7.8
Do food handlers cover their hair?	55.6	32.7	11.7
Do food handlers wash their hands properly?	45.8	14.4	39.9
Do food handlers wear disposable gloves?	86.3	8.5	5.2
During food preparation, do food handlers touch their face, hair, nose, or ears?	5.9	71.9	22.2
Is the payment process properly separated from production?	74.5	14.4	11.1

According to the data provided in Table 7, individuals exhibiting a negative perception towards food safety demonstrated a reduced frequency of street food consumption

compared to their counterparts with a positive perception. Gender plays a significant role, with men showing a higher frequency of street food consumption compared to women ($p < 0.001$). Additionally, younger people tend to eat street food more frequently. Regarding influencing factors, those who don't prioritize aspects like location, packaging, service quality, reputation, food safety, portion size, and variety are more likely to consume street food frequently. In contrast, individuals who consider factors such as nutritional value and price as average or unimportant tend to eat street food less often. Financial status also influences street food consumption, with those in a bad financial situation eating street food less frequently, and this difference is statistically significant ($p < 0.05$). Moreover, not having a partner is associated with lower street food consumption frequency. However, results also showed that individuals who usually eat street food alone and those who are unemployed tend to eat street food more frequently.

Table 8 Factors predicting the Frequency of consuming Street Food

Factors	Categories	Estimate	Sig. (p value)
Food Safety Perception	Negative	-.671	.105
	Positive	0 ^a	.
Location	Average or Unimportant	.381	.281
	Important	0 ^a	.
Nutritional Value	Average or Unimportant	-.701	.077
	Important	0 ^a	.
Packaging	Average or Unimportant	.685	.05
	Important	0 ^a	.
Good Service	Average or Unimportant	.161	.703
	Important	0 ^a	.

Reputation	Average or Unimportant	.337	.385
	Important	0 ^a	.
Food Safety	Average or Unimportant	.840	.258
	Important	0 ^a	.
Portion Size	Average or Unimportant	.262	.471
	Important	0 ^a	.
Taste	Important	0 ^a	.
Variety	Average or Unimportant	.401	.263
	Important	0 ^a	.
Price	Average or Unimportant	-.610	.082
	Important	0 ^a	.
Self-reported Financial Status	Average or Bad	-.759	.037*
	Good	0 ^a	.
Employment Status	Non-employed	1.202	.058
	Employed	0 ^a	.
Company	Alone	0.234	.661
	With others	0 ^a	.
Relationship Status	No partner	-.571	.224
	With partner	0 ^a	.
Gender	Male	2.353	< .001*
	Female	0 ^a	.
Age	18 – 25 y	.992	.193
	26 – 35 y	.347	.497
	36 – 64 y	0 ^a	.

*: Indicates statistical significance (p-value<0.05).

a. This parameter is set to zero because it is redundant.

The perceptions of non-consumers regarding street food are outlined in Table 7. Based on the survey's data, most non-consumers (75.3%) expressed specific concerns about consuming street food, while a minority (24.7%) reported no such concerns. In addition, many (60.3%) indicated that dietary restrictions or preferences limit their street food

consumption, whereas 39.7% stated otherwise. Only a small fraction (13.7%) reported negative experiences with street food that have influenced their perception, while a significant majority (86.3%) have not encountered such experiences. However, when it comes to considering street food consumption, opinions among non-consumers were split, with 52.1% indicating occasions or situations when they might consider it, while 47.9% do not.

Table 9 Non-consumers Perceptions on Street Food

Non-consumers Perceptions	Yes (%)	No (%)
Do you have any specific concerns about consuming street food?	75.3	24.7
Are there any dietary restrictions or preferences limiting your street food consumption?	60.3	39.7
Have you had any negative experiences with street food that have influenced your perception?	13.7	86.3
Are there specific occasions or situations when you might consider consuming street food?	52.1	47.9

3.2. Food Safety Assessment

3.2.1. Microbiological Analysis of Swabs

A total of 60 swabs were collected from 20 street food kiosks during the Christmas market in Batroun. The results of the microbiological analysis of the collected swabs are shown in Table 10. In the case of *E. coli*, positive growth was observed in 3 samples out of 60 (5%), belonging to categories A, B, and E. Notably, categories C, D, and F showed no growth of *E. coli* across all tested samples. On the other hand, for *S. aureus*, positive growth was recorded in 5 samples out of 60 (8.33%), belonging to categories A, D, E,

and F. The remaining categories demonstrated no growth of *S. aureus* in any of the tested plates. In addition, *Salmonella* spp. was not detected in any of the collected swabs.

Table 10 Results of the Microbial Analysis of the collected Swabs

Category	<i>E. coli</i> (Positive)	<i>S. aureus</i> (Positive)	<i>Salmonella</i> spp. (Positive)
Total (n = 60)	3	5	0
Percentage	5%	8.33%	0%

3.2.2. Microbiological Analysis of Food Samples

In accordance with established guidelines levels for RTE foods, the microbiological quality of savory foods and sweets, collected from the street food market, was assessed based on the presence of *E. coli*, *S. aureus*, and *Salmonella* spp. According to Table 10, among all collected street food products, 24 out of 24 samples fell within the good range for *E. coli* and *Salmonella* spp., indicating a high standard of hygiene. As for *S. aureus*, 19 out of 20 savory food samples demonstrated “good” levels of *S. aureus*, with only one sample falling into the “acceptable” category. In contrast, 2 out of 4 sweets samples showed “good” levels, with one sample classified as “acceptable” and another as “unsatisfactory”.

Table 11 Results of the Microbial Analysis of the collected Street Food Samples

	Guideline Levels		Microbial results of the collected SF samples	
	Classification	Limit (CFU / g)	Savory Foods (n = 20)	Sweets (n = 4)
<i>Escherichia coli</i>	Good	< 3	20	4
	Acceptable	3 – 100	0	0
	Unsatisfactory	≥ 100	0	0
<i>Staphylococcus aureus</i>	Good	100	19	2
	Acceptable	100 – 1000	1	1
	Unsatisfactory	1000 – 10000	0	1

<i>Salmonella</i> spp.	Good	0 in 25 g	20	4
	Acceptable	-	0	0
	Unsatisfactory	> 0 in 25 g	0	0

Source: (Food Standards Australia New Zealand, 2001) CFU: colony forming unit.

CHAPTER 4

DISCUSSION

Street food has gained considerable popularity in Lebanon, especially during events such as Batroun's Christmas market, as it offers both convenience and a festive atmosphere to consumers. However, alongside its appeal, street food also poses potential risks of foodborne illnesses. To our knowledge, this study is the first in Lebanon to assess consumer perceptions regarding street food consumption and the safety of this type of food within festive events, contributing to a deeper understanding of street food dynamics in such contexts.

4.1. Consumer Study

Based on the study's findings, street food consumption is high among participants, with many reporting frequent purchases during the Christmas market period. This could be attributed to the fact that street food is becoming very popular across the world and is being used in a variety of events (Wiatrowski, Czarniecka-Skubina, & Trafialek, 2021). This also aligns with Chang, Chu, and Shahril (2020), who reported that the number of respondents who previously purchased street food is much higher compared to those who never did. However, consumption patterns can vary among individuals, with a higher preference for dinner followed by consumption throughout the day, which aligns with previous research (Chang, Chu, & Shahril, 2020). This is due to street food's convenience, particularly for those visiting the Christmas festival, which is held at night, making it a suitable option for evening meals.

Various sources contribute to consumers' decisions when choosing a street food outlet, with many relying on multiple sources (43.1%). Notably, the predominant source identified is discovering food places while walking by. This was also highlighted in the study conducted by Chang, Chu, and Shabril (2020). Surprisingly, the least utilized source is the online search for nearby food settings. This suggests that despite the growing importance of online presence, particularly in the food industry, the social presence of street food outlets may not exert significant influence as a primary factor in consumer decision-making.

Additionally, results showed that gender and age play significant roles in street food consumption, with males and younger individuals showing a higher likelihood of being consumers with a high frequency of consumption compared to other groups. This finding aligns with Wiatrowski, Czarniecka-Skubina, and Trafialek (2021), who observed that street food consumers are typically males between 19 and 30. This could be explained by males' preferences for convenience and food variety and younger individuals' attraction to new and diverse flavors and public dining experiences, specifically during late-night hours. Another reason could be the differences in knowledge about food safety between males and females and the different age groups (Banna et al., 2022), which can also affect street food consumption patterns. Younger males may have lower food safety awareness than older adults, making them more likely to consume street food. In contrast, individuals between 36 and 45 may prioritize food safety and opt for alternative dining choices.

Other factors influencing street food consumption include taste, which was shown to be the primary factor influencing street food purchases. While affordability has been highlighted in prior studies (Banna et al., 2022), our findings diverge, with consumers

expressing a desire for lower prices at the Christmas market, according to their responses to follow-up questions. This shows that street food is not always considered a cheap and affordable food option, as it is usually portrayed in the literature. Similarly, Wiatrowski, Czarniecka-Skubina, and Trafialek (2021) also noted that consumers do not necessarily view street food as a cheap meal. It is important to note that, in the context of the Christmas market, the observation that street food prices are not as low as expected can be attributed to various factors. Street food vendors operating within the market may have significant operational costs, including rent for space, equipment, utilities, and labor. These expenses can influence pricing decisions, requiring prices that align with these costs. Additionally, due to the large influx of visitors during this period, street food vendors might want to adjust their pricing strategies to maximize profits. This also explains why those in a bad financial situation eat street food less frequently, noting that this result is statistically significant ($p < 0.05$). However, people considering factors such as price and nutritional value as average or unimportant tend to consume street food less frequently. This could be attributed to their indifference towards these factors; thus, these individuals may opt for other alternatives to street food.

Other factors such as location, packaging, service quality, reputation, portion size, and variety influence street food consumption frequency. Individuals who do not prioritize these factors may consume street food more frequently, although the results are not significant. This suggests that convenience and accessibility may outweigh other considerations for certain individuals. People who opt for these factors may consider alternative dining options, such as regular restaurants, often prioritizing food presentation, quality, reputation, and special services.

Moreover, participants without partners demonstrated a greater tendency to consume street food, potentially influenced by eating habits and lifestyle preferences associated with marital status variations. For instance, street food provides a quick and accessible option for unpartnered individuals balancing work, social activities, and personal responsibilities. Furthermore, being in a committed relationship promotes health-promoting behaviors, such as consuming healthier food and limiting fast food. This is because partners often influence each other's behavior and provide social support for healthier choices (Schoeppe, 2018). Consequently, individuals without partners may lack this influence, leading them to opt for street food, which is convenient but often less nutritious. However, the study also revealed that not having a partner is associated with lower street food consumption frequency. This suggests that while individuals without a partner may be more likely to opt for street food, they may not consume it as frequently as those in relationships. This highlights the complex interplay between relationship status and dietary choices.

4.2. Food Safety Assessment

The microbial analysis of the swabs collected from the street food kiosks provided valuable insights into the hygienic conditions and potential microbial contamination present in the food preparation environment. Any detection of *E. coli* and *S. aureus* in the swab samples raises concerns regarding sanitation practices and overall hygiene standards within the street food kiosks. Although the occurrence of *E. coli* was limited, its presence in categories A, corresponding to surface areas, B, corresponding to handles/buttons of heating equipment, and E, corresponding to condiment bottles, suggests possible fecal contamination, which can originate from various sources such as improper handwashing

or inadequate cleaning of food preparation surfaces, among other sources (Loukieh et al., 2018). Similarly, detecting *S. aureus*, particularly in categories A (surface), D (utensils), E (condiment bottles) and F (other equipment), highlights potential lapses in hygiene practices during food handling and preparation. *Staphylococcus aureus* is commonly associated with human skin and can be introduced to food through contact with contaminated surfaces or improper food handling techniques (Bencardino, Amagliani, & Brandi, 2021).

As for the collected street food samples, the microbial content of the samples was compared to Australian and New Zealand guidelines for Microbiological Examination of Ready-to-Eat Food (Food Standards Australia New Zealand, 2001) due to the lack of local guidelines. Across both savory foods and sweets, all samples met the criteria for good microbiological quality regarding *E. coli* and *Salmonella* spp. presence, with levels below the specified limits. However, differences were observed in the prevalence of *S. aureus*. In savory foods, most samples fell within the ‘good’ range, whereas a smaller proportion of sweet samples exceeded the acceptable limit. These findings suggest that street foods generally adhere to microbial quality standards. Nevertheless, the observed differences in the prevalence of *S. aureus* between savory foods and sweets suggest potential factors contributing to bacterial contamination and food safety risks. *S. aureus* can be effectively killed by heat during cooking processes (CDC, 2023). Therefore, in savory foods that undergo proper cooking or heat treatment, such as meats, the presence of *S. aureus* may be eliminated in the absence of post-process contamination. However, in sweets, such as pancakes, which do not typically undergo thorough cooking, the risk of *S. aureus* contamination may be higher. Additionally, handling practices during the preparation of sweets could introduce cross-contamination post-production. Another concern arises

from the fact that while heat may kill *S. aureus* bacteria, the toxins they produce, such as staphylococcal enterotoxins, can withstand high temperatures and remain stable even after cooking (CDC, 2023). Although these toxins were not analyzed in the study, their potential accumulation in improperly handled or contaminated products could pose a risk of foodborne intoxication to consumers.

Nevertheless, results indicated that street foods were generally safe at the Christmas market. This can be explained by the fact that most of the street food outlets at the market are affiliated with well-known restaurant chains. These establishments will likely maintain higher standards of food safety and hygiene practices due to their reputation and brand image. They may have dedicated special personnel or resources to ensure their operations meet or exceed regulatory standards, thus contributing to positive food safety assessments. Any lapses in food safety practices at their street food outlets could harm their overall brand image. Furthermore, Batroun's municipality plays a pivotal role in ensuring public health by conducting checks on the status of street food vendors present at the market, given that Batroun is a tourist destination. Accordingly, through active monitoring and enforcement of food safety standards, the municipality ensures that street food outlets adhere to hygiene practices and regulatory requirements.

4.3. Consumers and Non-consumers Perceptions on Food Safety

While a significant percentage of participants perceive street food as a safe consumption choice, concerns persist among non-consumers regarding food safety and dietary restrictions. Addressing these concerns through adherence to food safety regulations can encourage wider acceptance of street foods. The negative perception of food safety is a significant factor influencing street food consumption. Individuals who

perceive street food as unsafe tend to consume it less frequently. This aligns with the idea that perceived risks impact consumer behavior (Seo & Lee, 2021). On the other hand, those with a positive perception of food safety are more likely to consume street food. This implies that addressing concerns related to food safety could potentially encourage more people to consume street food. Nevertheless, many consumers positively perceived that food handlers were following the proper food safety and hygiene practices (table 6). This was also noted by Wiatrowski, Czarniecka-Skubina, and Trafialek (2021), where respondents do not agree with the statement that these premises have a low level of hygiene. They believe that meals offered in such settings are as safe as those provided in stationary premises.

4.4. Strengths

This study represents the first attempt to examine consumer perceptions of street food and its safety during festive events, contributing to a deeper understanding of street food dynamics within these contexts. Additionally, analyzing both swab samples and food items provided a comprehensive assessment of hygiene practices and microbial contamination. Incorporating consumer surveys also enriched the study by providing valuable data on consumer attitudes toward street food consumption.

4.5. Limitations

Although this study makes several contributions to street food literature, it has some limitations related to the methodology and its applicability. First, the study had a relatively small sample size in terms of participants and the number of collected samples and swabs. This limitation was primarily a result of time constraint, as the study was

confined to a one-month timeline. In addition, the number of street food outlets was limited to around 25 kiosks, subsequently limiting the number of samples that could be collected for the analysis. As for the consumer study, it is important to note that the festive context of the Christmas market might have influenced participation rates, as visitors were primarily focused on enjoying the festival rather than completing long surveys. Also, the sample mainly consisted of educated individuals with degrees, which can affect the generalizability of the results. Moreover, respondents self-reported their financial status, potentially introducing bias into the results. Despite these limitations, the study's contributions to understanding consumer perceptions and microbial safety in Lebanon remain significant.

CHAPTER 5

CONCLUSION

In conclusion, this study provides valuable insights into street food consumption dynamics during Lebanon's festive events. Our findings indicated high street food consumption during the Christmas market, mostly influenced by taste, especially among males and younger individuals. Some recommendations for future festive events include lowering the food prices to accommodate individuals from all social classes. As for the food safety assessment of these establishments, microbial analysis of street food kiosks and food samples revealed generally satisfactory hygiene standards, although areas of concern regarding potential contamination were identified. Addressing non-consumers' concerns, particularly regarding food safety and dietary restrictions, could foster a wider acceptance of street food consumption.

Moving forward, future research could explore and compare different festive events across the year to examine whether there are variations in consumer perceptions or the food safety practices of these establishments over time. This comparative analysis could offer valuable insights into the seasonal dynamics of street food consumption and provide suitable interventions to enhance food safety and consumer satisfaction. For instance, microorganisms grow faster during summer months due to hot and humid conditions (USDA). Given these factors, understanding seasonal variations is essential in assessing food safety risks and implementing effective interventions across various festivals throughout the year.

APPENDIX

CONSUMER SURVEY

General Questions	
1. Gender	<input type="radio"/> Male <input type="radio"/> Female
2. Age	<input type="radio"/> 18 – 25 years old <input type="radio"/> 26 – 35 years old <input type="radio"/> 36 – 64 years old
3. Marital Status	<input type="radio"/> Single <input type="radio"/> Married <input type="radio"/> Divorced <input type="radio"/> Widowed
4. Education	<input type="radio"/> Elementary school <input type="radio"/> Secondary school <input type="radio"/> Higher education (university) <input type="radio"/> No formal education
5. Profession	<input type="radio"/> Student <input type="radio"/> Government sector <input type="radio"/> Private sector <input type="radio"/> Self-employed <input type="radio"/> Unemployed
6. Self-reported Financial Status	<input type="radio"/> Very good <input type="radio"/> Good <input type="radio"/> Average <input type="radio"/> Bad <input type="radio"/> Prefer not to answer
7. Have you ever visited Batroun during this time of the year?	<input type="radio"/> Yes <input type="radio"/> No
Consumers' Purchasing Behavior	
8. How often do you buy street food?	<input type="radio"/> Daily <input type="radio"/> 2-3 times per week <input type="radio"/> Once per week <input type="radio"/> 2-3 times per month <input type="radio"/> Once per month <input type="radio"/> Rarely or never* (Check the end of the survey)
9. What meal of the day do you typically buy street food for?	<input type="radio"/> Breakfast <input type="radio"/> Lunch <input type="radio"/> Dinner <input type="radio"/> Snacks

(Respondents can choose more than one answer)	
10. What type of street food do you usually consume? (Respondents can choose more than one answer)	<input type="radio"/> Fast Food (Burgers, sandwiches, ...) <input type="radio"/> Seafood <input type="radio"/> Desserts (Ice cream, cake, cookies, ...) <input type="radio"/> Beverages <input type="radio"/> Other: -----
11. Do you usually buy street food	<input type="radio"/> Alone <input type="radio"/> With Others (friends, colleagues, ...)
12. Do you feel more compelled to buy street food when you're with company?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe
13. How do you typically find out about street food settings? (Respondents can choose more than one answer)	<input type="radio"/> By receiving recommendations from others <input type="radio"/> Discovering food places while walking by <input type="radio"/> Seeing advertisements on social media <input type="radio"/> Online search of nearby food settings
14. What are the main reasons for buying street food? (Respondents can choose more than one answer)	<input type="radio"/> Affordability <input type="radio"/> Convenience <input type="radio"/> Time efficiency <input type="radio"/> Tasty food <input type="radio"/> Other: -----
15. Do you find the ambiance in Batroun more appealing and encouraging to buy street food?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe
16. How would you rate the street food in Batroun compared to other places you've visited?	<input type="radio"/> Excellent <input type="radio"/> Good <input type="radio"/> Average <input type="radio"/> Poor
17. Follow-up Question	<input type="radio"/> Explain why:
Factors considered when choosing Street Food (Likert scale)	
18. Price	<input type="radio"/> Unimportant <input type="radio"/> Moderately unimportant <input type="radio"/> Neutral <input type="radio"/> Moderately important <input type="radio"/> Very important
19. Variety in Food Choices	<input type="radio"/> Unimportant

	<ul style="list-style-type: none"> ○ Moderately unimportant ○ Neutral ○ Moderately important ○ Very important
20. Taste	<ul style="list-style-type: none"> ○ Unimportant ○ Moderately unimportant ○ Neutral ○ Moderately important ○ Very important
21. Portion size	<ul style="list-style-type: none"> ○ Unimportant ○ Moderately unimportant ○ Neutral ○ Moderately important ○ Very important
22. Reputation	<ul style="list-style-type: none"> ○ Unimportant ○ Moderately unimportant ○ Neutral ○ Moderately important ○ Very important
23. Hygiene and Safety	<ul style="list-style-type: none"> ○ Unimportant ○ Moderately unimportant ○ Neutral ○ Moderately important ○ Very important
24. Good and Fast Customer Service	<ul style="list-style-type: none"> ○ Unimportant ○ Moderately unimportant ○ Neutral ○ Moderately important ○ Very important
25. Food Presentation and Packaging	<ul style="list-style-type: none"> ○ Unimportant ○ Moderately unimportant ○ Neutral ○ Moderately important ○ Very important
26. Nutritional Value of the product	<ul style="list-style-type: none"> ○ Unimportant ○ Moderately unimportant ○ Neutral ○ Moderately important ○ Very important
27. Location and Closeness of the food setting	<ul style="list-style-type: none"> ○ Unimportant ○ Moderately unimportant ○ Neutral ○ Moderately important ○ Very important
28. Follow-up Question: Which factor from the	<ul style="list-style-type: none"> ○ Elaborate:

above ones is the most important when choosing street food?	
Consumers' Perception on the Sanitary Conditions of Street Food	
29. Do you generally consider street food a safe consumption choice?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not know
30. Do you find the food preparation and handling area in good condition? (Clean, undamaged)	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not recall
31. Do food handlers have appropriate working clothes?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not recall
32. Do food handlers cover their hair?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not recall
33. Do food handlers wash their hands properly (by observation)?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not recall
34. Do food handlers wear disposable gloves?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not recall
35. During food preparation, do food handlers touch their face, hair, nose, or ears?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not recall
36. Is the payment process properly separated from production?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not recall
Post-consumption Experience	
37. Have you ever had any illness or experienced any GI symptoms after consuming street food?	<input type="radio"/> Yes <input type="radio"/> No If yes, specify:
38. Do you have any recommendations to	<input type="radio"/> Yes <input type="radio"/> No

improve the street food sector?	If yes, specify:
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• **For participants who responded by “Rarely or never”:**

8. Do you have any specific concerns about consuming street food?	<input type="radio"/> Yes <input type="radio"/> No If yes, specify:
9. Are there any dietary restrictions or preferences limiting your street food consumption?	<input type="radio"/> Yes <input type="radio"/> No If yes, specify:
10. Have you had any negative experiences with street food that have influenced your perception?	<input type="radio"/> Yes <input type="radio"/> No If yes, specify:
11. Are there specific occasions or situations when you might consider consuming street food?	<input type="radio"/> Yes <input type="radio"/> No If yes, specify:
12. Do you find the ambiance in Batroun more appealing and encouraging to buy street food?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Maybe
13. Do you have any recommendations to improve the street food sector?	<input type="radio"/> Yes <input type="radio"/> No If yes, specify:

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