



# Rethinking Mobile Food Safety: A Strategic Framework for Ambulant Vendors in the Philippines

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## ABSTRACT

This research aims to assess the quality, safety, and hygienic practices of street vendors in San Isidro, Nueva Ecija. The study used a descriptive methodology, using a standardized questionnaire, interviews, and observations for data collection. 37 out of 41 companies in Poblacion, San Isidro, took part in the research. The sample size was determined using Sloven's Formula, and participants were chosen by purposive sampling. The data analysis included creating frequency distributions and calculating metrics of central tendency. The survey showed that most participants were female, married, and had finished high school. Most vendors were stationary, had been in business for <5 years, employed tricycles for promotion, and operated without any personnel. Commonly sold food items were siomai, siopao, kikiyam, fishball, kwek-kwek, tokwa, nuggets, and tokneneng. Vendors usually bought items at the Public Market and then processed them on the premises. The commodities were displayed on open stands without shelter from heat, dust, or wind. The sanitary conditions were insufficient, lacking sufficient access to clean water and handwashing facilities. The stalls were situated far away from garbage cans, sewers, and toilets. Vendors routinely washed their hands before food preparation and delivery, but they did not consistently use aprons, hairnets, or gloves. Respondents exhibited diverse personal hygiene behaviors while cooking. Although most street food sellers provided trash bins, the separation of biodegradable and non-biodegradable garbage was not a widespread practice. Moreover, several merchants did not possess permits, knowledge of current rules, or compliance with sanitary regulations. Street retailers had difficulties due to external competition. Interventions are necessary to enhance the quality, safety, and hygienic practices of street vendors in San Isidro, Nueva Ecija based on these results. This information may be used by policymakers and local authorities to create and implement policies that support food safety and cleanliness in street selling.

**Keywords:** Street Food, Sanitation, Roving Vendors, Food Hygiene

**JEL Classifications:** M000, O11, R00, Z300, D00

## 1. INTRODUCTION

Street vending is an important aspect of Philippine culinary culture, offering handy and cost-effective choices for residents and visitors. Ensuring the quality, safety, and hygienic procedures of street food is a developing problem. Several studies have highlighted the need for maintaining stringent standards in street food restaurants to reduce the chances of foodborne infections and enhance public health (Bryan et al., 1988; Santos et al., 2019; Akbar et al., 2020).

In the Philippine context, street food vendors, also known as ambulant vendors, are a common sight in urban and rural areas

alike. They offer a diverse range of culinary delights, including favorites such as siomai, siopao, fishball, and kwek-kwek. Despite their popularity, these vendors often operate in informal and unregulated settings, raising questions about the quality and safety of the food they serve (Santos et al., 2019; Ali et al., 2019).

Several local studies have shed light on the challenges faced by ambulant vendors in upholding food safety standards. In a study conducted by Santos et al. (2019), it was found that many street food vendors lacked access to clean water, handwashing facilities, and proper waste management systems. Similarly, a study by Menes, Japitana, Chua, Dico, Parcon, & Makilan (2019) revealed

that the majority of vendors did not possess the necessary permits and licenses required by local health authorities. These findings underscore the urgent need to address the gaps in food safety and sanitary practices among ambulant vendors in the Philippines (Girma, 2018; Umoh and Odoaba, 1999).

To date, limited research has been conducted specifically focusing on street vendors in the municipality of San Isidro, Nueva Ecija. This study aims to fill this gap by assessing the quality, safety, and sanitary standards of street sellers in this particular area. By examining the current practices and identifying areas for improvement, this research will provide valuable insights for policymakers and local government authorities in formulating effective policies and interventions to enhance food safety and sanitary practices among ambulant vendors (Armas and Moralde, 2022).

Furthermore, the findings of this study will contribute to the existing body of knowledge on street food safety in the Philippine context. It will serve as a basis for local government policy development, enabling the formulation of guidelines and regulations that can improve the overall street food experience, protect public health, and promote the sustainability of the street vending industry (Australian Institute of Food Safety, 2016; Food Standards Australia New Zealand, 2015).

### 1.1. Statement of the Problem

The research aims to investigate the Sanitary Practices of Street Food Vendors in the Philippines, with a focus on many essential elements. The primary goal is to outline the demographic characteristics of the suppliers, including age, gender, marital status, and educational level. The second aim is to clarify the business-related attributes of the vendors, such as their categories, years in operation, kinds of vending carts used, average daily revenue, and the number of peddlers/helpers. The study aims to outline the Quality Management techniques used by street food sellers, including product quality, cleanliness processes, waste management strategies, and adherence to regulatory norms. The study's objective is to identify and assess the typical obstacles faced by street food sellers in their daily activities.

### 1.2. Consumer Knowledge, Attitudes, and Practices

Castillo (1994) conducted a comprehensive study on the knowledge, attitudes, and practices of street food consumers in Manila, revealing a significant gap in consumer awareness regarding food safety. Similarly, Alonsabe (1994) surveyed street food vendors in Manila, finding that many lacked proper knowledge and practices necessary to ensure food safety. These studies highlight the need for public health campaigns to educate both consumers and vendors on safe food consumption and handling practices.

### 1.3. Epidemiology of Food-borne Diseases

Several studies have examined the epidemiology of food-borne diseases in urban environments. Castillo et al. (1993) conducted a case-control study on resistant Salmonella Typhi in Metro Manila, identifying critical factors contributing to the spread of this pathogen. Avelino (1994) documented a cholera outbreak in Cavite, emphasizing the importance of rapid response

and control measures to prevent the spread of such diseases. The National Epidemic Sentinel Surveillance System (1993) provided valuable data on the annual incidence of food-borne diseases, informing public health interventions.

Klontz et al. (1995) explored food consumption and preparation behaviors associated with increased risks of food-borne diseases in the United States, identifying practices that heightened the risk of disease transmission, such as inadequate cooking and improper food handling. Abdussalam and Kaferstein (1993) discussed the global safety concerns of street foods, reinforcing the need for international standards and guidelines to protect public health.

### 1.4. Microbiological Quality of Street Foods

Van Kampen et al. (1998) investigated the microbiological quality of street foods in Jakarta, comparing it with home-prepared foods and foods from tourist hotels. Their study found that street foods had higher levels of contamination, posing significant health risks. Azanza and Gedaria (1997) conducted a hazard analysis and control study of popular street foods in the Philippines, highlighting critical points where contamination could occur and suggesting control measures to enhance food safety.

### 1.5. Environmental Factors and Food Safety

Smith (1986) addressed the role of pests and vectors in urban environments, discussing how these factors contribute to food contamination. Bernabel (1985) examined the hygiene and quality control of food sold in public places in Latin America, providing insights into the challenges faced by street food vendors in maintaining food safety.

### 1.6. Hygiene Practices

Personal hygiene is a fundamental aspect of food safety. The Total Food Network (n.d.) provided guidelines on personal hygiene practices essential for preventing food contamination, emphasizing the need for regular handwashing, proper sanitation of food preparation areas, and the use of protective clothing by food handlers.

### 1.7. Economic and Technological Aspects

Armas (2023) explored the application and commercialization of engineering technology through university-based business incubators, highlighting the potential for technological innovations to improve street food safety and vendor practices. Armas, Lorenzo, and Dela Cruz (2023) assessed the financial viability of business models for engineered vertical hydroponics systems for sustainable onion production in the Philippines, suggesting that such innovations could also be applied to improve street food production. Armas and Moralde (2023) discussed the development of a comprehensive economic enterprise development program in the Philippines, which could support street food vendors in adopting safer and more sustainable practices.

## 2. THEORETICAL FRAMEWORK

The theoretical framework guiding this study is based on the hazard analysis and critical control points (HACCP) approach, a

systematic preventive food safety management system. The Figure 1 shows the applications of provides a structured methodology to identify, assess, and control food safety hazards throughout the food production process (Codex Alimentarius Commission, 2003).

1. *Hazard identification and risk assessment.* HACCP begins with identifying potential hazards associated with food handling, preparation, and distribution. In the context of street vending, hazards may include microbial contamination, improper food handling practices, inadequate sanitation, and environmental factors such as dust and pests (Codex Alimentarius Commission, 2003). Risk assessment evaluates the likelihood and severity of these hazards, considering factors such as vendor practices, equipment, and environmental conditions.
2. *Critical control points (CCPs).* Critical control points are specific steps in the food production process where control can be applied to prevent, eliminate, or reduce food safety hazards to acceptable levels (Codex Alimentarius Commission, 2003). For street vendors, CCPs may include food sourcing, storage, preparation, cooking, serving, and waste management. Effective control measures at these points are crucial for ensuring food safety and hygiene.
3. *Monitoring and verification.* Continuous monitoring and verification are essential components of the HACCP system. Monitoring involves regular checks to ensure CCPs are being effectively controlled, such as temperature monitoring during food preparation and storage, and observation of hygiene practices. Verification involves periodic assessments to confirm that the HACCP system is functioning as intended and that food safety objectives are being met (FAO/WHO, 2008).
4. *Corrective actions.* When deviations from critical limits or unexpected hazards are identified, corrective actions are taken to address the issue and prevent unsafe food from reaching consumers. Corrective actions may include immediate interventions, such as removing contaminated food, retraining staff on proper hygiene practices, or adjusting processes to prevent recurrence of the problem (Codex Alimentarius Commission, 2003).
5. *Documentation and record-keeping.* Documentation is an integral part of the HACCP system, providing evidence of the implementation and effectiveness of food safety measures (FAO/WHO, 2008). Records should include hazard analyses, CCP monitoring logs, verification procedures, corrective action reports, and any relevant documentation related to food safety practices.
6. *Continuous improvement.* The HACCP approach emphasizes the importance of continuous improvement in food safety management. Through regular review, evaluation, and adaptation of procedures, street vendors can identify areas for enhancement and optimize their food safety practices over time. Continuous improvement ensures that street vending operations remain compliant with regulations and responsive to changing consumer preferences and environmental conditions.

### 3. METHODOLOGY

#### 3.1. Research Method

This study employed the descriptive method of research to investigate and outline the quality management practices of street

vendors, deemed the most suitable approach for this purpose. The study was conducted in Poblacion San Isidro Nueva Ecija. The Poblacion of the town proper is a quasi-urban area. It is here where the municipal hall, the parish church, the Catholic cemetery, the post-elementary and high schools educational institutions are located.

The national highway traverses the length of the town. It passes in the front of the municipal building and the plaza where the monument of the national hero, Jose Rizal stands. This portion of the national highway named Rizal Street of the town.

#### 3.2. Respondents

The sellers of street food in Poblacion San Isidro, Nueva Ecija, were selected as respondents and the source of data to make the research realistic and comprehensive. The researchers visited the Poblacion San Isidro Barangay Hall to get a list of street vendors; after choosing all street vendors, they compiled a total of 41 merchants selling in Poblacion, San Isidro as of January 2024. 37 out of 41 vendors in Poblacion, San Isidro, participated in the survey. Using Slovin’s Formula, the sample was obtained.

#### 3.3. Construction and Validation of Instruments

The tools were developed and confirmed by the researchers’ examination of relevant papers and literature. Specialists were consulted over the first version of the device. Two individuals from the Hotel and Restaurant Management field, one food scientist, and two from the business administration area. Integrating feedback and suggestions into the study.

**Table 1: Age of the respondents**

Age (years old)	Frequency, n (%)
15–25	8 (21.62)
25–35	8 (21.62)
35–45	11 (29.73)
45 and above	10 (27.03)
Total	37 (100)

**Table 2: Gender of the respondents**

Gender	Frequency, n (%)
Male	13 (35.14)
Female	24 (64.86)
Total	37 (100)

**Table 3: Civil status of the respondents**

Status	Frequency, n (%)
Single	14 (37.84)
Married	23 (62.16)
Total	37 (100)

**Table 4: Educational attainment of the respondents**

Educational attainment	Frequency, n (%)
No formal education	0
Elementary	7 (18.92)
High school	25 (67.57)
College	5 (13.51)
Total	37 (100)

Before completing the questionnaire, an interview and preliminary survey were carried out with street food vendors to gather information on the products they offer and the hygiene practices they use while handling food. The researchers validate the finalized questionnaire by testing it with additional street sellers before releasing it to all respondents.

## 4. RESULTS AND DISCUSSION

### 4.1. Profile of the Respondents

There are four (4) variables used in describing the profile of the respondents interviewed such as: Age, gender, status and educational attainment.

This research analyzed the age distribution of street food sellers in San Isidro, Nueva Ecija to understand the vendors' characteristics and how it may affect their participation in street selling. Table 1 shows that the largest group of participants is between 35 and 45 years old, making up 29.73% of the sample. 27.03% of vendors aged 45 and older follow this, with 21.62% falling between the ages of 15 and 25, and 25 to 35.

The results align with other research in comparable settings, emphasizing the common occurrence of middle-aged sellers in the street food industry (Girma, 2018; Santos et al., 2019; Freese et al., 1998). The researchers' findings, based on surveys and unstructured interviews, confirm that the typical age of street food sellers in the region ranges from 35 to 45 years old.

Individuals in this age bracket generally have family and financial responsibilities, which might motivate them to participate in street selling to earn money (Girma, 2018; Akbar et al., 2020). This discovery is consistent with the extensive research on street vending, which highlights the socioeconomic aspects that impact people's choice to engage in this informal sector (Begum, 2017; Froberg et al., 2018). Moreover, analyzing the age distribution of street vendors highlights the need of addressing the unique requirements and obstacles encountered by vendors within this age group when developing strategies and measures to enhance food safety and hygiene standards.

The study's results on the age distribution of street food sellers add to the current literature by offering insights into the demographic characteristics of vendors in San Isidro, Nueva Ecija. The high number of sellers aged 35-45 suggests that familial and financial factors may play a significant role in their participation in street selling (Bryan et al., 1988). It is essential to comprehend these demographic traits to create focused tactics that cater to the distinct requirements and obstacles encountered by vendors in various age categories, thereby enhancing food safety and hygiene procedures in the street food industry (Australian Institute of Food Safety, 2016; Food Standards Australia New Zealand, 2015).

Table 2 displays the gender distribution of the responses. Female sellers have the largest proportion at 64.86%, while male merchants have the lowest at 35.14%. The data shows that the majority of individuals are female due to their greater expertise in food preparation compared to males.

The Table 3 displays the distribution of street food sellers in San Isidro, Nueva Ecija according on their marital status. Among the 37 responses, 14 merchants (37.84%) are single, while 23 vendors (62.16%) are married. The results indicate that most of the street food sellers in the research region are married. Street selling may serve as a means of livelihood for persons who are responsible for sustaining their families or want to earn extra revenue to maintain their houses. Married persons may be motivated to participate in street selling activities due to the obligation of supporting their family (Santos et al., 2019).

Table 4 shows how respondents' educational levels are distributed. 67.57% of respondents have finished high school, 18.92% have done primary school, and 13.51% have completed college. No one claimed to lack formal schooling. Most street food vendors have a high school education due to budgetary constraints preventing them from pursuing further education (Freese et al., 1998; Girma, 2018; Santos et al., 2019).

**Table 5: Type of vendor**

Practice	Frequency, n (%)
Stationary	27 (72.97)
Nonstationary	10 (27.03)
Total	37 (100)

**Table 6: Years in the operation**

Years of existence	Frequency, n (%)
0-5	9 (24.32)
6-10	22 (59.46)
11-15	2 (5.41)
16-20	4 (10.81)
Total	37 (100)

**Table 7: Types of vending cart**

Particulars	Frequency, n (%)
Wooden	8 (21.62)
Push cart	6 (16.22)
Concrete	6 (16.22)
Tricycle	9 (24.32)
Food stall	8 (21.62)
Total	37 (100)

**Table 8: Average daily income**

Daily income	Frequency, n (%)
100-500 pesos	11 (29.73)
500-1000 pesos	15 (40.54)
1000-2000 pesos	8 (21.62)
2000 above	3 (8.11)
Total	37 (100)

**Table 9: Number of peddlers**

Peddlers	Frequency, n (%)
One	21 (56.76)
Two	10 (27.03)
Three	5 (13.51)
Four	1 (2.70)
Total	37 (100)



#### 4.2. Profile of the Business

Five criteria were used to describe the profile of the company interviewed: categories of vendor, years of operation, types of vending cart, average daily revenue, and number of peddlers.

Table 5 displays the distribution of the categories of vendors among the respondents. The stationary vendor has the largest proportion at 72.97%, while the non-stationary vendor has the lowest percentage at 27.03%.

According to the findings, the majority of street food vendors in Poblacion, San Isidro are immobile and do not move from the location where they sell their products. Some vendors are considered non-stationary because they sell sporadically or relocate to areas with potential clients.

Table 6 displays the distribution of respondents based on the number of years they have been in existence in Poblacion, San Isidro. The majority of entities, 59.46%, have been in existence for 6-10 years, followed by those operating for <5 years at 24.32%, entities running for 16-20 years at 10.81%, and those in operation for 11-15 years at 5%.

The high percentage of vendors who have been operating for 6-10 years can be attributed to the strategic locations they occupy, such as near schools, the Town Plaza, and companies with a high number of workers. These locations provide a steady flow of customers, contributing to the longevity and stability of their businesses (Bryan et al., 1988; Santos et al., 2019). Vendors who have been in business for <5 years often represent newer entrants trying to establish themselves in these lucrative areas (Frohberg et al., 2018; Girma, 2018).

The smaller percentages of vendors operating for 11-15 years (5%) and 16-20 years (10.81%) may reflect the challenges and competition within the street food industry. Sustaining a street food business over a long period requires adapting to changing market conditions, maintaining food safety standards, and securing customer loyalty (Akbar et al., 2020; Australian Institute of Food Safety, 2016).

Table 7 displays the distribution of the respondents' vending cart types. The tricycle has the largest proportion at 24.32%, followed by the wooden and food stall at 21.62%. The push cart and concrete have the lowest percentage at 16.22%.

Table 8 indicated that many street food merchants used tricycles as their selling carts. They used a bicycle to facilitate the distribution of their items to various locations.

Table 8 shows the distribution of respondents' mean daily earnings. The greatest share of daily income is 500-1000 pesos at 40.54%, followed by 100-500 pesos at 29.73%, 1000-2000 pesos at 21.62%, and 2000 pesos or more at 8.11%.

Poblacion, San Isidro is a semi-urban district with schools, colleges, the Catholic Church, and the town square, attracting many people, particularly students, who consume street food.

Therefore, the typical daily earnings of many street food sellers range from 500 to 1,000 pesos, which is satisfactory.

Table 9 shows the distribution of the number of peddlers reported by respondents. The highest proportion of peddlers is one, accounting for 56.76%, followed by two at 27.03%, three at 13.51%, and four at 2.70%.

Based on the statistics, most participants said that one vendor is enough to manage or sell street food due to their ease of handling.

**Table 10: Kinds of food offerings**

Types of foods	Frequency, n (%)
Fried banana and sweet potato with added sugar	3 (8.11)
Barbecued and grilled chicken offal	3 (8.11)
Street food (fishball)	6 (16.22)
Calamares fritos	5 (13.51)
Peanut, roasted corn, legumes	3 (8.11)
Mami, lomi, goto, lugaw	3 (8.11)
Siomai, Siopao	6 (16.22)
Buko juice	5 (13.51)
Steamed corn	1 (2.70)
Hotdog	2 (5.40)
Total	37 (100)

**Table 11: Supplies of the product**

Answer choices	Frequency, n (%)
Public market	28 (75.68)
Other wholesaler/retailer	9 (24.32)
Total	37 (100)

**Table 12: Food preparation**

Practice	Frequency, n (%)
On site	32 (86.49)
At home	5 (13.51)
Total	37 (100)

**Table 13: Food storage and display**

Answer choices	Frequency, n (%)
Openly in the stalls	15 (40.54)
In a pushcart	10 (27.03)
In sealed containers	12 (32.43)
Total	37 (100)

**Table 14: Separation of partially cooked and cooked food products**

Answer choices	Frequency, n (%)
Yes	26 (70.27)
No	11 (29.73)
Total	37 (100)

**Table 15: Handling of leftovers**

Answer choices	Frequency, n (%)
Give it as a free to the customers	8 (21.62)
Kept it to a cooler or refrigerator	8 (21.62)
Reheat and sell it again	12 (35.14)
No left overs	8 (21.62)
Total	37 (100)

### 4.3. Street Food Vendors' Adherence to Quality, Safety, and Sanitary Practices

Five characteristics were used to describe the quality management of street food vendors questioned, including goods, cleanliness, and waste management.

Table 10 displays the distribution of the sort of food they sold. Siomai, siopao, and street foods like fishball have the highest percentage at 16.22%. Buko juice, chicken skin, fried chicken, and kalamares follow with 13.51%. Banana cue, kamote cue, turon, barbeque, isaw, adidas, palong, betamax, atay, mani, binusa, beans, mami, lomi, goto, and lugaw share the same percentage of 8.11%. Hotdog has a percentage of 5.40%, and mais has the lowest percentage at 2.70%.

The study revealed that siomai, siopao, kikyam, fishball, kwek-kwek, tokwa, nuggets, and toknengneng are the predominant food items sold by street vendors. These dishes are primarily sought after by students and young people because to their affordability compared to other options in the region.

Table 11 displays the dispersion of the vendor's product sources. The public market accounts for 75.68% while other wholesalers/retailers account for 24.32%.

Street vendors dominate the market share due to selling perishable items, making it riskier for wholesalers and retailers to invest in bulk supplies that may go unsold.

Table 12 displays the distribution of where the food is prepared. 86.49% of the vendors prepare on site, while 13.51% prepare from home meal preparation on site is preferable over the two mentioned options since it assures clients that the product is produced correctly and retains the freshness of the meal.

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Table 14 displays the distribution of where food is stored or displayed. The largest proportion, 40.54%, is for food freely shown in the stalls, followed by 32.43% for food in sealed containers, and the lowest percentage of 27.03% is for food displayed in a pushcart. Vendors like displaying things openly at booths since it quickly attracts buyers' attention, as seen in the table.

Table 14 displays if the food items are partly cooked and whether the cooked goods are stored separately. The majority of respondents answered affirmatively, accounting for 70.27%, while the remaining respondents answered negatively, representing 30.73%.

This table demonstrates the segregation of raw, partly cooked, and cooked food items to avoid deterioration and contamination.

It assists buyers and merchants in organizing and classifying items efficiently.

Table 15 displays how suppliers manage their surplus groceries or unsold items. 35.14% of respondents reported reheating and reselling their items, while 21.62% said that they provide their products to consumers for free, store them in a cooler, and have no leftover food.

Most merchants choose to reheat and sell leftover food since certain items are not readily perishable and may still be safely eaten.

Table 16 displays the count of suppliers that have pledged to maintain cleanliness in their premises. The selling stalls located distant from debris, waste, bathroom facilities, and open drains had the greatest weighted mean of 4.15, indicating that most vendors agreed. On the other hand, vending stalls exposed to animals and insects had the lowest weighted mean of 2.97, falling into the category of neither agree.

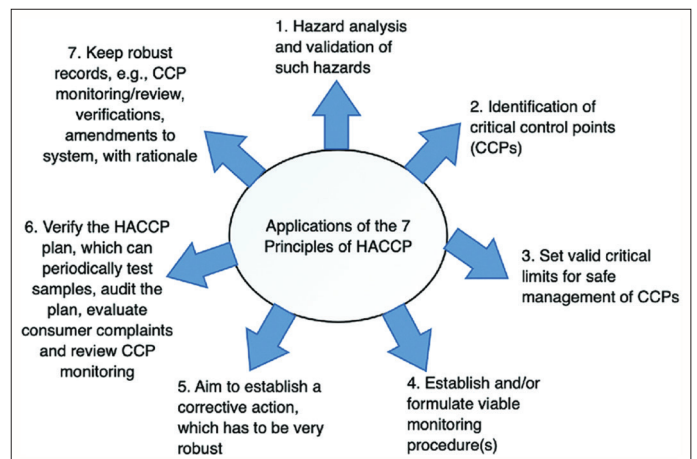
The researchers found that almost all the questions in the survey and observation had the same language description of "neither agree." Most vendors do not consistently maintain the cleanliness of their premises since it is difficult to avoid animals and insects.

The data showed Table 17 in this part offers insights into the hygienic procedures of street food sellers in San Isidro, Nueva Ecija. The replies reflect the degree of agreement or disagreement on certain sanitary elements seen when handling and preparing food.

The research indicates that most respondents (mean score of 3.51) believe that sellers consistently wash their hands in clean water before handling and selling food. Proper hand hygiene is crucial for limiting the spread of diseases and maintaining food safety, making this a favorable discovery (Bryan et al., 1988; Santos et al., 2019).

Respondents (mean score of 3.51) also agree that the vendor's attire is clean and well-maintained, a crucial aspect for keeping a sanitary food preparation setting. Wearing clean clothes reduces

**Figure 1:** Applications of hazard analysis and critical control points principles



**Table 16: Sanitation of the facilities**

Questions	Average weighted means	Verbal description
Is vending stall protected from sun, dust and wind?	3.05	Neither agree
Are animals or insects evident around the vending stall?	2.97	Neither agree
Is the vending stall maintained in a clean condition?	3.22	Neither agree
Is there access to potable water at the site?	3.03	Neither agree
Is adequate hand washing facilities available?	3.11	Neither agree
Is environment around the stall clean far from rubbish, waste, toilet facilities and open drains?	4.15	Agree

**Table 17: Vendor’s personal hygiene**

Questions	Average weighted means	Verbal description
1. Does the vendor wash their hands in clean water each time before the handling preparation and serving of food?	3.51	Agree
2. Are the vendor clothes clean and presentable?	3.51	Agree
3. Does the vendor use an apron?	2.92	Neither agree
4. Does the vendor handle food using		
Bare hands	3.46	Agree
Gloves		
Thongs		
Fork/spoon		
Ladle/funnel		
5. Does the operator have clean short nails?	3.22	Neither agree
6. Does the operator coughing, sneezing while serving of foods?	2.68	Neither agree
7. Is dirt or dust removed by means of an apron, dirty cloths, or bare hands?	3.51	Agree
8. Is dirt or dust removed by blowing?	2.92	Neither agree
9. Does vendor smoke during the handling/preparation of foods?	3.22	Neither agree

**Table 18: Cleanliness of utensils**

Questions	Weighted mean	Verbal description
Are utensils properly cleaned/washed?	4.27	Strongly agree
Are utensils are covered?	3.51	Agree
Are utensils cleaned adequately every time after use?	3.86	Agree

**Table 19: Waste management**

Permits	Frequency (%)	
	Yes	No
Barangay permit	14 (38)	23 (62)
Mayor’s permit	14 (38)	23 (62)
Sanitary permit	14 (38)	23 (62)
Barangay ticket	23 (62)	14 (38)

the chances of infection and enhances a professional appearance. The research indicates that the majority of respondents (mean score of 2.92) are neutral toward the usage of aprons. There is a lack of agreement or uniformity in the usage of aprons across merchants. Aprons provide an extra level of defense against cross-contamination and should be used more consistently (Girma, 2018; Freese et al., 1998).

The majority of respondents (mean score of 3.46) believe that sellers use proper tools such as gloves, tongs, forks/spoons, or ladles/funnels, rather than bare hands while handling food. This is a beneficial discovery since it decreases the likelihood of hands coming into close contact with food, thereby reducing the danger of infection (Akbar et al., 2020; Ali et al., 2019). The respondents’ perspectives on the cleanliness of short nails are varied, with a mean score of 3.22 indicating neutrality. Keeping nails clean and manicured is crucial to avoid the buildup and spread of dirt and germs when handling food (Umoh and Odoaba, 1999).

The research indicates that there is no definitive agreement (mean score of 2.68, neither agree nor disagree) on whether vendors cough or sneeze when selling food. Vendors must follow good respiratory hygiene by covering their mouth and nose with a tissue or elbow to minimize the transmission of respiratory droplets and possible infection (Australian Institute of Food Safety, 2016).

Respondents (mean score of 3.51) agree that merchants employ suitable precautions such as aprons, soiled rags, or bare hands to remove dirt or dust. There is uncertainty (mean score of 2.92, neither agree nor disagree) about whether blowing can effectively remove dirt or dust, which might impact food safety and hygiene (Food Standards Australia New Zealand, 2015).

Finally, respondents rated vendors as neutral (mean score of 3.22, neither agree nor disagree) on smoking while handling and preparing food. Avoiding smoking while preparing food is crucial to prevent the introduction of harmful pollutants and ensure food safety (Solomons and Gross, 1995).

The results emphasize both effective methods and areas for improvement in the hygienic standards of street food sellers in San Isidro, Nueva Ecija. The study highlights the significance of ongoing surveillance, education, and actions to encourage and guarantee regular compliance with correct hygiene protocols by

**Table 20: Internal problems in the operation**

Problems encountered	Average weighted means	Verbal description
Injury or any unexpected accident while vending street foods	2.16	Rarely
Sickness	2.24	Rarely
Lack of supplies for their products	2.76	Often
Harassment or any demand for bribes	4.14	Sometimes
Evictions from selling places, arrest and confiscation of goods by authorities	2.38	Rarely

**Table 21: Internal problems in the operation**

Problems encountered	Average weighted means	Verbal description
Decrease in sales during rainy season	2.68	Often
Difficulty in finding secure places to sell	2.62	Often
Lack of services and infrastructure such as water, electricity and waste removal	2.68	Often
High competition	4.14	Sometimes
Nonpayment of customers	2.38	Rarely

street food sellers, thereby improving food safety and decreasing health hazards for customers (Begum, 2017; Frohberg et al., 2018).

Table 18 displays the hygiene level of kitchen tools. The majority of respondents strongly agree that their utensils are well cleaned and washed, with a weighted mean of 4.27. The majority of respondents said that their utensils are covered and sufficiently cleaned after each use, with a weighted mean of 3.51 and 3.86, respectively, both described as “agree.”

Many vendors were worried about the cleanliness of their utensils when selling food, since it is crucial for the utensils and equipment to be well cleaned.

Table 19 displays the distribution of respondents’ compliance with legal requirements for their businesses. The percentages for business permission, mayor’s permit, and sanitary permit are 38% for yes and 62% for no. The barangay’s ticket received 62% for yes and 38% for no.

**4.4. Problems Encountered in the Operation**

The Table 20 presents statistics on the difficulties encountered by street food sellers, including accidents, illnesses, supply shortages, harassment, and evictions by authorities.

The participants reported few instances of injuries or unforeseen incidents when selling street cuisine (mean score of 2.16). This discovery indicates that, in general, the merchants are rather secure in their regular activities. However, occasional incidents might still endanger their well-being and the safety of the food they sell (Bryan et al., 1988; Santos et al., 2019).

Sickness among street food sellers was infrequent (mean score of 2.24). Vendors often exhibit excellent health while running their business. It is important to understand that inappropriate food handling, insufficient sanitation measures, and exposure to filthy circumstances may raise the likelihood of vendors becoming sick. Implementing appropriate food safety and hygiene procedures is crucial to reduce these dangers (Freese et al., 1998; Umoh and Odoaba, 1999).

Vendors have expressed considerable worry about the regular shortage of supply for their goods (mean score of 2.76). This

finding is consistent with other research that emphasizes the difficulties encountered by street food sellers in obtaining and maintaining a reliable source of goods and resources for their business (Santos et al., 2019; Akbar et al., 2020). Restricted access to resources may influence the quality and accessibility of street food, which may have an effect on the vendors’ earnings and the general viability of their operation (Ali et al., 2019).

Vendors also reported occasional harassment or requests for bribes (mean score of 4.14). This discovery supports earlier research that emphasizes the existence of corruption and extortion in the street food selling industry (Girma, 2018). Street food sellers often have challenges in understanding and complying with regulatory requirements and interacting with authorities, which may have an influence on their commercial activities and financial security (Australian Institute of Food Safety, 2016).

The data shows that evictions from selling areas, as well as arrests and seizure of items by authorities, are infrequent, with a frequency of 2.38. Street food sellers in the study region seem to have consistent selling spots and encounter little disruption from authorities. However, it is crucial to acknowledge that these disruptions might interrupt business activities, result in financial losses, and harm their livelihoods. Street food sellers face challenges in a multifaceted regulatory landscape, necessitating specific strategies and assistance from local authorities to tackle eviction and confiscation difficulties (Food Standards Australia New Zealand, 2015; Frohberg et al., 2018).

This research adds to the current body of knowledge on street food selling by highlighting the difficulties and hazards that sellers encounter in their day-to-day activities. These findings emphasize the significance of tackling problems like inadequate supplies, harassment, and uneven regulatory standards to improve the entire business climate for street food sellers, eventually benefitting both vendors and customers. Supportive policies, training, and resources may enhance the working conditions and livelihoods of street food sellers (Santos et al., 2019; Girma, 2018; Solomons and Gross, 1995).

The data provided in Table 21 shows that street food vendors face several challenges such as reduced sales in the rainy season, difficulties in finding safe selling spots, inadequate amenities and infrastructure, strong competition, and sporadic nonpayment by customers.



Respondents saw a decrease in sales (2.68) during the wet season. This result aligns with previous study that has recognized weather as a crucial factor affecting the sales of street food (Akbar et al., 2020). During rainy seasons, people may be less inclined to buy street food due to worries about hygiene and food safety. Vendors must develop strategies to adjust to seasonal fluctuations to sustain their businesses.

Sellers often mention the challenge of finding safe areas to sell their products. This analysis aligns with previous research that highlights the issue of limited vending locations and the continuous struggle of vendors to get suitable venues (Ali et al., 2019). The lack of approved vending areas and competition for prime selling spots might impede vendors' ability to attract customers and generate steady income.

The merchants highlighted the regular lack of essential services and infrastructure such as water, electricity, and waste management (2.68). This finding aligns with previous studies emphasizing the need of fundamental infrastructure for street food vending activities (Frohberg et al., 2018). Insufficient water supply and inadequate waste management facilities may impact food safety and hygiene, causing worries for vendors and customers alike. Enhancing the accessibility of services and infrastructure at vending places is crucial for ensuring the safety and sustainability of street food businesses.

Competition was seen as a significant barrier (4.14). This finding adds to prior studies on the competitive nature of the street food sector (Akbar et al., 2020). Close proximity to several enterprises results in intense rivalry for customers and market dominance. In order to succeed in this competitive industry, suppliers need to differentiate their products, provide unique flavors or specialties, and deliver exceptional customer service.

Customers' non-payment was reported to be seldom (2.38). The research shows that most customers fulfill their financial obligations. Intermittent failure to make payments might nonetheless adversely affect the seller's profitability and financial stability. Creating transparent payment methods and ensuring transaction clarity may help decrease cases of nonpayment and protect suppliers' interests.

This study contributes to the existing knowledge on the challenges faced by street food vendors and emphasizes the need of implementing supportive policies and initiatives. Enhancing infrastructure, providing secure vending locations, creating weather-resistant selling strategies, and promoting fair competition are crucial for enhancing the street food vending sector (Akbar et al., 2020; Ali et al., 2019; Frohberg et al., 2018). Addressing these challenges may enhance the sustainability of street food businesses, enhance food safety, and improve the overall urban food system.

## 4.5. Proposed Policy for the Local Government Unit (LGU)

### 4.5.1. Enhancing street food vending practices for a safe and sustainable food environment (Policy Brief)

#### 4.5.1.1. Rationale

Street food vending plays a significant role in the culinary culture and economy of our country. However, it is crucial to ensure

the safety and sustainability of street food operations to protect the health of consumers and support the livelihoods of vendors. This policy brief proposes key recommendations based on the findings of a study conducted on the food safety and sanitary practices of ambulant vendors in the Philippines. The aim is to inform policymakers and local government authorities about the necessary measures to improve street food vending practices and create a favorable policy environment.

#### 4.5.1.2. Key recommendations

##### 1. Establish and enforce food safety guidelines

- Develop comprehensive food safety guidelines specifically tailored for street food vending, addressing aspects such as personal hygiene, food handling, storage, and waste management.
- Conduct regular inspections and enforce strict compliance with the established food safety guidelines to ensure that vendors adhere to proper hygiene practices and maintain the quality and safety of their food products.
- Provide training and capacity-building programs for vendors to enhance their understanding of food safety principles and practices.

##### 2. Improve infrastructure and facilities

- Enhance the infrastructure in street food vending areas by providing adequate water supply, sanitation facilities, and waste management systems.
- Establish designated vending zones equipped with clean and accessible facilities, such as handwashing stations, covered stalls, and proper waste disposal units.
- Collaborate with relevant government agencies and local communities to ensure the availability of essential services like electricity and clean water in street food vending areas.

##### 3. Facilitate licensing and formalization

- Streamline the licensing process for street food vendors, making it more accessible and affordable.
- Develop a simplified registration system that encourages vendors to formalize their businesses, enabling them to benefit from government support programs and access financial services.
- Provide assistance and guidance to vendors in meeting the legal requirements and standards necessary for operating a street food business.

##### 4. Promote hygiene and best practices

- Conduct regular hygiene and best practice awareness campaigns targeting both vendors and consumers.
- Encourage vendors to wear clean and appropriate attire, including aprons, hairnets, and gloves, to maintain personal hygiene while handling and serving food.
- Educate vendors on the importance of proper food handling techniques, including the use of utensils and tongs, to minimize direct contact with food and reduce the risk of contamination.

##### 5. Foster collaboration and dialogue

- Establish platforms for regular communication and collaboration between street food vendors, local government

- authorities, health departments, and relevant stakeholders.
- Encourage vendors' associations and cooperatives to actively participate in decision-making processes and contribute to the formulation of policies related to street food vending.
- Promote knowledge sharing and exchange of best practices among vendors to foster a culture of continuous improvement and innovation.

## 5. CONCLUSION

The study's findings reveal important conclusions about the characteristics of street food sellers and the difficulties they encounter in San Isidro, Nueva Ecija. The majority of sellers are female, aged 35-45, married, and have a high school education. Most vendors have a stationary company profile, have been operating for 6-10 years, use tricycles to sell their wares, and make an average daily revenue ranging from 500 to 1,000 pesos. Moreover, they provide a variety of popular street food dishes like siomai, siopao, kikiam, fishball, kwek-kwek, tokwa, nuggets, and tokeneng. Nevertheless, the suppliers have many obstacles concerning infrastructure and cleanliness notwithstanding their economic operations. Their stalls are inadequately shielded from the heat, dust, and wind, vulnerable to animals and insects, and often unsanitary. Furthermore, there is restricted availability of drinkable water and insufficient hand-washing facilities. The cubicles are located at a distance from garbage bins, drains, and bathrooms. Vendors exercise hand hygiene by washing with clean water but do not utilize protective clothing such as aprons, hairnets, or gloves. Most vendors do not segregate their garbage into biodegradable and non-biodegradable products. Most vendors lack compliance with licenses, laws, and sanitary requirements. Vendors face internal obstacles including harassment and requests for bribes, along with exterior competition.

The results emphasize the urgent need for interventions and policies to tackle the infrastructural and hygiene challenges encountered by street food vendors, boost their adherence to rules, and provide assistance to improve their business operations and safety standards.

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