

## CHAPTER 1

### Introduction

An optimal physical health condition, when dealing with food production is necessary in preventing food borne diseases. In compliance with food safety standards set for street food stall vendors, physical health must be maintained at an optimum level at all times during duty, and not just during time of permit renewal.

Illness can impair a vendor's attention to hygiene, food handling, and sanitation protocols, all of which are crucial in preventing foodborne illnesses. For instance, when a vendor is suffering from fever, headaches, or gastrointestinal issues, their capacity to maintain cleanliness, washing of hands properly, or keeping food at safe temperatures may be compromised (Sontakke et al., 2021). Also, working while being sick increases the likelihood of transmitting pathogens to the food, utensils, and surfaces they interact with. As food vendors frequently come into direct contact with raw and cooked food, any microbial contamination from the vendor's body—whether through respiratory droplets, hand contact, or sneezing—can contaminate the food and lead to the spread of diseases to customers (Singla et al., 2022). Vendors suffering from illnesses, especially those affecting the respiratory and gastrointestinal systems, pose a direct risk to the food safety of their customers due to the possibility of transmitting pathogens via contaminated food items or unclean working environments (Ramas et al., 2020). These findings highlight the importance of health evaluations for vendors to ensure they are in good health while performing their duties, helping prevent the transmission of infectious diseases to the public.

Fatigue, in particular, was identified as a contributing factor to poor compliance with food safety protocols as it can impair both mental focus and physical stamina necessary for

sanitation procedures (Wang et al., 2021). Respiratory illnesses like colds and fevers can directly hinder food vendors, as symptoms such as coughing or sneezing may increase the risk of contaminating food (Sparks et al., 2021). Moreover, gastrointestinal illness can directly impair a food vendor's capacity to maintain food safety standards through issues like dehydration or compromised physical function (United Nations Food and Agriculture Organization, 2020).

With the literature above, yearly health requirement compliance may not be enough, and regular monitoring must be done. With the use of the standardized food inspection tool developed by DOST, the vendor's individual health may be assessed. However, Dumaguete City does not utilize this tool. In an interview with the representative from the City Sanitary Office, Visminda S. Delicano, confirmed that the city does not employ any standardized tool for monitoring stall operations or vendors' adherence to food safety practices. The interview revealed inadequacies in the monitoring of individual vendors' health conditions.

Without effective monitoring of vendors' physical health and their level of adherence, there is insufficient data to establish the relationship between these variables. This study is focused on assessing the vendors' physical health condition, their level of food safety adherence and the interrelationship of these two variables.

Philippine regulations exist to monitor only those who passed certain requirements to be allowed for operation of any food supplying businesses, including those of street food stalls. Some of these requirements include Health Certificate, Food handler's permit, and Sanitation permit, which are both overseen by the DOH, and can only be obtained by passing assessments

and sanitation inspection (Roberti, 2023). Modules published by the Department of Science and Technology (DOST) such as the “Code of Standards for the Food Inspection Checklist and Grading System of Food Service Establishments,” and the “Operation Manual for the Risk-Based Inspection and Grading System of Food Service Establishments” are the official modules on Philippine food safety are available along with the standardized food safety inspection checklist.

In Metro Manila, another study by Tabugoc et al. (2020) found that, despite food safety training programs, vendors continued to engage in unsafe practices like improper food storage and contamination risks due to the lack of strict regulatory enforcement and the absence of consistent monitoring. These findings suggest that while training is a necessary component of food safety, without proper resources, oversight, and support, adherence to food safety protocols remains inconsistent.

Without proper assessment of the vendors’ physical health and their level of adherence, data to prove the extent of the variables’ relationship is not made available. This might pose potential health risks, not only for the vendors but also for their customers, without proper proof, a suspicion will remain a suspicion.

This study is focused on assessing the vendors’ physical health condition, their level of food safety adherence and the interrelationship of these two variables.

## **Statement of the Problem**

This study aims to answer the following research questions:

1. What is the profile of the respondents in terms of:
  - a. age;
  - b. of experience; and
  - c. estimated income of the operated stall?
  - d. highest educational attainment
2. What is the respondents' current physical health condition?
3. What is the level of adherence of the respondents?
4. Is there a significant relationship between the respondents' profile and the level of adherence to food safety?
5. Is there a significant relationship between the respondents' physical health condition and the level of adherence to food safety?
6. Is there a significant relationship between the respondents' profile and physical health condition?

## **Hypothesis**

H<sub>01</sub>: There is no significant relationship between the respondents' profile and the level of adherence to food safety.

H<sub>02</sub>: There is no significant relationship between the respondents' current health condition and the level of adherence to food safety.

H<sub>03</sub>: There is no significant relationship between the respondents' profile and physical health condition.

## **Significance of the Study**

This study is focused on exploring the relationship between the vendors' health condition and their adherence to food safety practices of the street food stall vendors in Dumaguete City.

**Nurses.** As poor food safety practice may cause gastrointestinal, and other problems, identifying Dumaguete's vendors' level of adherence to food safety practice is needed. The vendors' health condition should be assessed and relate it with their level of adherence. This correlational study, is an assessment tool for nurses to utilize in application of the nursing process wherein when proven, specific factors that lead to non-adherence to food safety will be intervened with specifically, helping in the prevention of possible food borne disease outbreaks from happening.

**Health care providers.** To have an overview and form interventions based on the health data derived from this study, enhance the food safety practices among street food vendors and reduce the incidence of foodborne illnesses, healthcare providers can implement targeted interventions, and as well as conduct routine inspections to ensure maintenance of optimum physical health, as well as compliance with safety standards based on the findings of this study.

**Student Nurses.** Findings of this study can lead to findings and conclusions that may be useful for the student nurses' community nursing knowledge and practice, as well as a reference for future experimental studies, especially that this study may already serves as an assessment

that will lead them to immediately plan for interventions, and go on with the rest of the nursing process in their years as student nurses.

**Academe.** Assessment of factors, and recommendations for interventions will lead to the wellness and disease prevention of the people in Dumaguete City. With this, the academe may be able to build and solidify their relationship with the city, working together to promote the citizens' health.

**Dumaguete City Government.** As the body that is concerned with the wellness of the general public, the government of Dumaguete City may be able to use this study as a reference for disease prevention and health promotion in the city. With the data of this study, improvements when indicated will be promptly, specifically, and efficiently made. Promoting the citizens' health will promote the city's well being as well.

**Vendors.** With the results of this study, the vendors will be informed of their physical health condition, level of adherence to food safety practice, and how these two variables are associated with each other. With this, appropriate practice adjustment as well as triggers for seeking health care assistance may be solidified, preventing food borne diseases, and promoting the vendors' health.

**Researchers.** Findings may serve as a valuable reference for many researchers by providing new information, guiding future investigations and studies with supporting evidence that are replicable and reliable.

## **Scope and Limitations**

A cluster sampling method is used; it will not cover all barangays within Dumaguete City, as only specific groups were chosen for evaluation, which could introduce bias and affect generalizability. The study, conducted within a two-month period, will focus exclusively on vendors with stationary stalls, at Fronting NORSU, Cheese Stick Country, and Pantawan-Rizal Boulevard. Furthermore, this study is limited to investigating the relationship between the vendors' health and level of adherence only, and formulate actionable recommendations to improve adherence to health regulations and food safety standards. The standardized assessment tool provided by the DOST was also modified to suit an individualistic approach and integrating a self-made questionnaire which focuses on the vendor as an individual and not the stall as a whole. A guided interview will be established. Furthermore, this research only explores the physical aspect of the vendors' health as it has the most common associations when it comes to practice adherence. Future research could expand beyond Dumaguete City, extend the study's timeline, or explore more associated factors to food safety awareness, agreement, and adherence for more in-depth insights.

## Definition of Terms

In this study, the researchers have taken steps to ensure clear understanding and accuracy by defining key terms for the important terms used throughout the research.

The following terms are used:

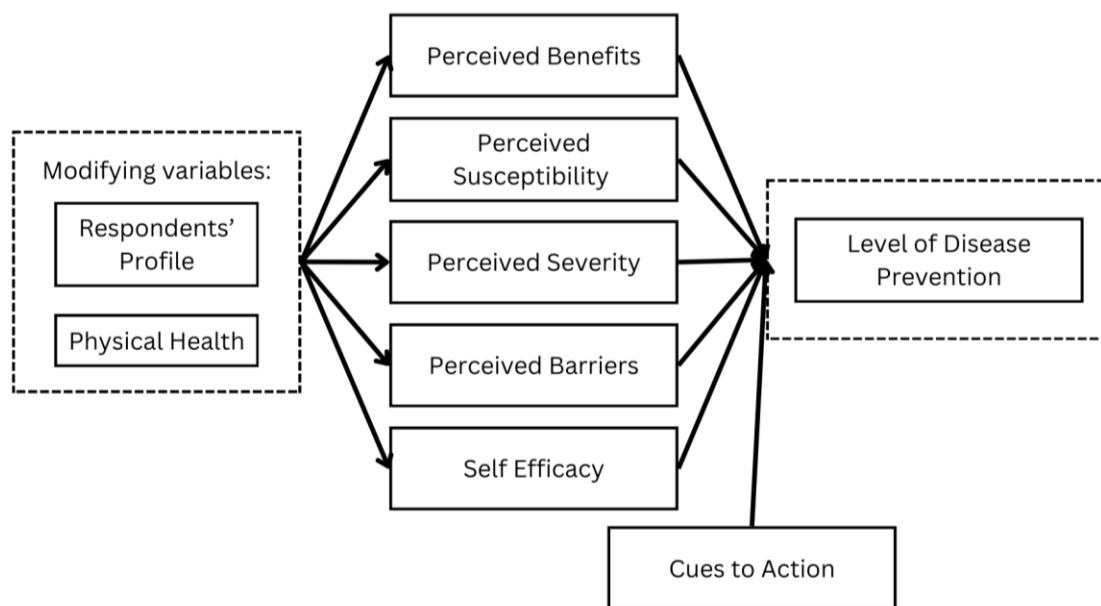
- a. **Physical Health Condition** - refers to the respondents' overall physical well-being and health status.
- b. **Adherence** - refers to the consistent practice of following rules and guidelines to keep food safe to eat.
- c. **Food Safety Practices** - these are measures the respondents take in order to make sure that the food prepared, cooked, and eaten is safe.
- d. **Street Food Stall Vendors**- are the respondents in this study, referring to individuals who sell food from stands or stalls located on the street.
- e. **Optimum Physical Health Condition** - An overall physical state wherein activities are not restricted by any physical condition.
- f. **Level of adherence** - it measures the extent to which the respondents comply with recommended procedures to ensure food safety.



## Theoretical Framework

The study applied the Health Belief Model as its theoretical framework. The health belief model (HBM) is a psychological health behavior change model developed to explain and predict health-related behaviors, particularly in regard to the uptake of health services. The health belief model was developed in the 1950s by social psychologists at the U.S. Public Health Service and remains one of the best known and most widely used theories in health behavior research (Urich, n.d.).

## Health Belief Model



*Figure 1. Health Belief Model*

The Health Belief Model posits that individuals' engagement in health-promoting behaviors is influenced by their beliefs about health issues, the perceived benefits and barriers to taking action, and their level of self-efficacy. Additionally, a stimulus or cue to action is necessary to initiate these health-promoting behaviors (Urich, n.d.).

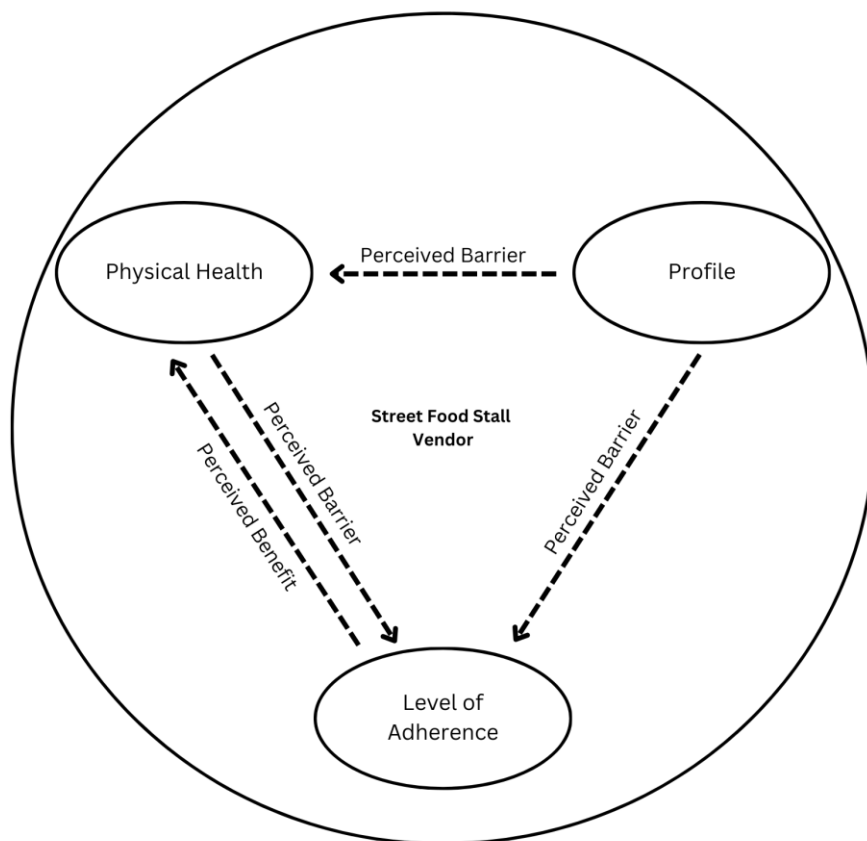
Key elements of the Health Belief Model focus on individual beliefs about health conditions, which predict individual health-related behaviors. The model defines the key factors that influence health behaviors as an individual's perceived threat to sickness or disease (perceived susceptibility), belief of consequence (perceived severity), potential positive benefits of action (perceived benefits), potential barriers to action (perceived barriers), exposure to factors that prompt action (cues to action), and confidence in ability to succeed (self-efficacy) (*The Health Belief Model - Rural Health Promotion and Disease Prevention Toolkit*, n.d.).

As a nursing tool, HBM, could be utilized to assess the adherence of the street food stall vendors in Dumaguete City. In this study, the respondents' profile, respondents' current health condition, stall profile, and source of food safety practices were evaluated. In addition to this, the level of adherence to the food safety practices of the respondents were also assessed. Generally, with this approach, the researchers will be able to assess the variables that influence Dumaguete City's street food stall vendors' adherence to food safety practices.

## Conceptual Framework

The conceptual framework of this study focused on Food Safety Practice Adherence Among Street Food Stall Vendors in Dumaguete City, as well as their health condition and the relationship between both. It was molded and designed after the Health Belief Model concept on the Health Belief Model as its theoretical framework. The study determined the interrelationship between the vendor's individual physical health conditions to their adherence to food safety practices, as well as how their profile is related to both of these variables. After the data are collected, their relationship will be evaluated and conclusions be drawn. The Health Belief model postulated that beliefs about one's own benefits gained as well as the barriers experienced that hinders appropriate action leading to health promotion (*The Health Belief Model - Rural Health Promotion and Disease Prevention Toolkit*, n.d.).

For this study's case, the respondents' physical health condition may be affected by their profile which may add to their perceived barrier to obtaining optimum physical health, and their level of adherence which is rooted from their perceived benefits in following food safety practice standards. On the other hand, their level of adherence may also be affected by their physical health and profile by also building their perceived barrier.



*Figure 2. Conceptual Framework on the Food Safety Knowledge and Adherence Among Street Food Stall Vendors in Dumaguete City.*

## REVIEW OF RELATED LITERATURE

### Profile

This consists of information and details about the respondents' identity which includes age, sex, location of business, weekly income, highest educational attainment, years as street vendor, and business permit.

**Age.** Older adults face significant challenges as they age, particularly in terms of mobility and daily activity levels. According to the World Health Organization (2023), as individuals grow older, they often experience declines in intrinsic capacity, including mobility, strength, and endurance. This can lead to a reduction in their ability to carry out daily activities, limit workloads, and live independently. Tipon et al. (2023) highlight the heightened vulnerability of senior street food vendors to physical health issues, attributing this to the demanding nature of their work. Such changes are often compounded by the presence of multiple health conditions, which are more prevalent in older populations.

Older vendors tend to suffer from more frequent health problems, which may lead to a decline in their ability to adhere to hygiene and food safety standards. For example, a study by Garcia et al. (2018) found that older vendors in the Philippines were more likely to experience chronic illnesses such as hypertension and arthritis, conditions that can reduce their capacity to manage their stalls and maintain proper food hygiene practices (Garcia et al., 2018). Additionally, age-related decline in cognitive and physical functions can make it harder for older vendors to maintain consistent hand washing, manage food storage, or avoid cross-contamination (Sontakke et al., 2021). The physical burden of prolonged hours spent standing and handling food in challenging environments can further exacerbate these health issues, affecting their

overall well-being and ability to provide safe food. In their research, Ramas et al. (2020) observed that elderly vendors, particularly those working in informal markets, are often more vulnerable to foodborne diseases due to physical limitations that prevent them from maintaining high standards of cleanliness and hygiene (Ramas et al., 2020).

**Sex.** Sex and gender interact in complex ways to affect health outcomes. Gender norms, socialization, roles, differentials in power relations and in access to and control over resources contribute to differences in vulnerabilities and susceptibilities to illness, how illness is experienced, health behaviours (including health-seeking), access to and uptake of health services, treatment responses and health outcomes. For example, gender can determine health risks faced and taken. Data show that men's increased risk of acquiring SARS-COV2, is also linked to their lower rates of handwashing, higher rates of smoking and alcohol misuse and, related to that – higher comorbidities for severe COVID-19 symptoms as compared to women (Liebert, 2021)

Sex and gender can significantly influence the physical health of street food vendors through various factors such as occupational hazards, health perceptions, and working conditions. Women experienced higher rates of chronic pain, reproductive health issues, and stress-related disorders due to a combination of occupational and household responsibilities. Men had higher injury rates but lower reporting of chronic health conditions, possibly due to cultural expectations of masculinity Biswas et al. (2021). Wang et al. (2024) revealed that gender significantly influences where, how, and when street vendors operate, which in turn affects their health risks and economic stability. Women prioritize safety and stability but face chronic stress and financial

constraints, while men prioritize mobility and profit but are at higher risk of physical injuries and exhaustion which might be factors that hinders their adherence to food safety practices.

**Highest Educational Attainment.** Educational attainment significantly influences physical health outcomes, and this relationship extends to street vendors' adherence to health-promoting practices. Dong and Zeb (2022) explore the role of higher education in fostering law-abiding behavior among Chinese students and found that higher education institutions contribute significantly to cultivating students' ethical, moral, legal, and psychological well-being, leading to increased compliance with laws and regulations.

Desye et al. (2023) revealed that vendors with higher educational attainment were more likely to comply with food safety regulations, highlighting the role of education in promoting healthful practices. Educational quality may be more closely related to physical health because it directly assesses the cognitive and skill-based benefits of education, which influence health-related decision-making (Cundiff et al. 2022).

Studies consistently highlight that higher educational attainment correlates with improved awareness of hygiene practices and regulatory compliance, which in turn influences vendors' physical health and the safety of the food they sell. In Cagayan de Oro City, only 22% of vendors acquired knowledge through formal training (Lubos 2024), underscoring the need for structured initiatives to bridge gaps in theoretical and practical skills, particularly given the low adherence to medical certification requirements (30%). Similarly, in Zamboanga del Norte's Twin Cities, despite a majority of vendors holding college degrees, nearly all lacked formal food safety training (Solon 2022), revealing a critical disconnect between general education and sector-specific expertise.

A study in Batangas City demonstrated that vendors with secondary education exhibited better adherence to safe handling practices, such as avoiding cross-contamination and proper waste disposal, compared to those with only primary education. However, despite this, many vendors—even those with higher education—struggle to translate theoretical knowledge into practice due to systemic barriers like limited access to affordable training programs. For example, a study in Poblacion, Batangas, found that vendors' average food safety knowledge did not translate into hygienic practices, partly due to environmental constraints (e.g., lack of running water) and insufficient skills in hazard analysis. This disconnect suggests that educational interventions must integrate practical, context-specific training to bridge knowledge-to-action gaps (Argente 2020). The physical health of vendors is equally influenced by their educational background. Limited education often correlates with poor awareness of occupational health risks, such as prolonged exposure to unsanitary environments or improper use of protective equipment. In Cebu City, vendors showed poor compliance with health card requirements and head coverings, practices linked to reduced contamination risks (Espinosa-Gelisanga, R. & Alturas, S.B. 2022). Similarly, a study in Manila proposed the “awareness-to-agreement-to-adherence” model, emphasizing that higher educational attainment fosters greater awareness of health risks, leading to better agreement with safety guidelines and eventual behavioral adherence (Labana et al., 2024). This model aligns with findings that vendors with secondary education are more likely to adopt practices like handwashing and waste segregation, which mitigate both personal and public health risks (Espinosa-Gelisanga, R. & Alturas, S.B. 2022).

Structural challenges, however, persist. Many vendors in the Philippines operate within informal economies where regulatory enforcement is lax, and educational disparities exacerbate vulnerabilities. For instance, DepEd officials have raised concerns about unregulated street



vendors near schools, whose low compliance with sanitary permits and food handling standards poses significant health risks to students (Macas 2015). Local government units (LGUs) often lack the capacity to enforce food safety laws, leaving vendors reliant on self-taught practices. This systemic neglect is compounded by the fact that only 47% of vendors nationwide have attended high school, and 77% lack formal food safety training 216. Without targeted interventions—such as subsidized training programs or partnerships between LGUs and educational institutions—these gaps will persist, perpetuating cycles of foodborne illness and occupational health hazards (Himang & Del Fierro, 2022).

**Experience as a Street Vendor.** The relationship between years of experience and financial success in street vending is a critical area of study, underscoring the dynamics of this informal economic sector. Mercado (2018) highlights that a significant proportion of street vendors possess less than three years of experience, indicating a high turnover rate that suggests instability within the profession. This instability is further reflected in the income disparities among vendors, with some barely breaking even while others face consistent losses. Such findings imply a correlation between years of experience and the likelihood of achieving economic success, as more experienced vendors are likely to have established customer relationships, refined their business acumen, and achieved higher sales volumes, all contributing to greater economic stability. These findings through their study on street vendors in urban settings, which reveals that while many vendors have extensive experience—some exceeding 27 years—there remains a notable number with less than three years of engagement. If we relate this with previous literature on income and its associations with adherence, it may be drawn out that

the higher the experience, the better their adherence to food safety practice will be. (Bayatan and Palic, 2020).

Ahmad and Abidin (2024) emphasize the importance of food safety education in improving adherence, particularly among future food handlers, as knowledge of hygiene, food storage, and preparation techniques plays a critical role in preventing foodborne illnesses. Similarly, experience can serve as an informal form of education, where long-term vendors accumulate practical knowledge about health risks and best practices. Vendors with extensive experience may also be more aware of food safety regulations and recognize the consequences of non-compliance, leading to better adherence.

A society's occupational structure determines which jobs are available to workers, and thus determines the distribution of positive and negative exposures for the workforce. Some societies are characterized by post-industrial economies and are dominated by professional/managerial and service occupations that put workers at risk for stressors but avoid most physical or environmental dangers. This would ultimately mean that depending on the work environment, a person's experience may impact health either negatively or positively (Burgard & Lin, 2013).

**Estimated weekly income of stall operated.** A study by Huynh-Van et al. (2022) found that vendors with higher business capital were more likely to comply with food safety and hygiene regulations. Limited financial resources may hinder vendors' ability to invest in necessary infrastructure and training, leading to lower compliance rates. Greater total buscapital correlated with higher compliance. For each unit increase in capital, there was a corresponding

0.4% rise in adherence to food safety standards. Vendors with limited financial means may struggle to invest in essential resources such as clean water, quality ingredients, and appropriate storage facilities. These economic limitations may hinder their ability to maintain necessary food safety standards (Salamandane et al., 2023). The study titled "Action Research on the Challenges of Street Vendors in Manila" delves into the multifaceted issues faced by street vendors in the city. It emphasizes that economic necessity drives individuals to engage in street vending as a primary means of livelihood. The financial pressures faced by vendors can lead to challenges in complying with social and legal norms due to limited resources (Romero et al., 2024).

Families and individuals made vulnerable by poverty are most likely to live in unsafe homes and neighborhoods, often with limited access to healthy foods, employment options, and quality schools. While the starkest difference in health is between those with the highest and lowest incomes, this relationship persists throughout all income brackets. Adults in the highest income brackets are healthier than those in the middle class and will live, on average, more than six years longer than those with the lowest incomes. The ongoing stress and challenges associated with poverty can lead to cumulative health damage, both physical and mental. Chronic illness is more likely to affect those with the lowest incomes, and children in low-income households are sicker than their high income counterparts. Another study indicates a correlation between lower maternal income and increased likelihood of pre-term or low birthweight babies, who face a higher risk of chronic diseases and behavioral challenges (Income, n.d.). Risk of experiencing sickness presenteeism was higher in workers with a lower socioeconomic status and those in poor health. Our present results revealed that those with a poor health condition had a greater likelihood of experiencing sickness presenteeism: those whose self-rated health was poor, or with psychological distress, loneliness, and workplace support

were at greater risk of experiencing sickness presenteeism. It is clear from the definition that sickness presenteeism is more likely in poor health. Conversely, workers with sickness presenteeism are known to be more likely to exacerbate their illness. In our present study, we found an association between greater psychological distress and a higher likelihood of sickness presenteeism. A number of studies have noted that the fear of infection when visiting a hospital is a major reason for treatment interruption. Anxiety concerning infection may affect treatment discontinuation, resulting in continued working in poor physical condition. (Masuda et al., 2021).

**Physical Health Conditions.** The operation of food vendors while ill or unwell poses a significant threat to food safety adherence, with cascading implications for public health, economic stability, and regulatory compliance. Foodborne illnesses linked to symptomatic vendors are a critical concern, particularly in settings where hygiene infrastructure and awareness are limited. When vendors work despite exhibiting symptoms of illness, they risk transmitting pathogens such as norovirus and Hepatitis A through direct food handling, contaminated surfaces, or improper hygiene practices (Smith et al., 2020). Norovirus, a leading cause of gastroenteritis, is highly contagious and can spread through microscopic quantities of fecal matter, making handwashing lapses among ill vendors a potent vector for contamination (CDC, 2021). Similarly, Hepatitis A outbreaks, often tied to fecal-oral transmission, have been traced to symptomatic food handlers in environments lacking sanitation protocols (WHO, 2019). Health problems among street vendors, including headaches, fever, and respiratory tract infections, which are exacerbated by limited access to healthcare and poor hygiene practices (Singh & Singh, 2023). Additionally, a study on food vendors in the Philippines by Ramas et al. (2020) highlights the prevalence of fever and headaches, often linked to foodborne illnesses and

unsafe working conditions (Ramas et al., 2020). These risks are compounded by behaviors such as coughing or sneezing near food preparation areas, which facilitate the spread of bacteria like *Salmonella* and *E. coli* (Gould et al., 2018). Such practices not only endanger consumers but also undermine broader food safety frameworks designed to prevent outbreaks.

The public health consequences of these lapses are severe, particularly for vulnerable populations. For example, *Listeria monocytogenes*, a pathogen associated with ready-to-eat foods, can cause life-threatening complications such as meningitis or septicemia in immunocompromised individuals, while posing pregnancy-related risks like miscarriage or neonatal infections (Buchanan et al., 2017). Outbreaks linked to ill vendors often escalate into public health crises, straining healthcare systems and eroding consumer trust. Economically, the repercussions are equally dire. Small-scale vendors in low-resource settings are especially vulnerable to these impacts, as even temporary closures or loss of customer trust can threaten livelihoods (FAO, 2018). These challenges highlight the intersection of public health and economic sustainability in food safety governance.

In Low- and Middle-Income Countries (LMICs), structural barriers exacerbate these risks. Vendors often lack formal training in food safety protocols, including the importance of refraining from work while symptomatic (Kariuki et al., 2017). Compounding this issue is the economic precarity that forces vendors to prioritize income over health, even when exhibiting signs of illness. A study in Nairobi revealed that 68% of street vendors continued working during gastrointestinal illness due to fear of income loss (Karanja, P. N. (2020). Furthermore, regulatory frameworks in LMICs are frequently fragmented or poorly enforced, enabling non-compliance. For example, in Dhaka, only 12% of vendors reported access to formal food safety training, while 90% operated without licenses, illustrating systemic neglect of hygiene standards (Hossain

et al., 2022). These conditions create environments where pathogens thrive, perpetuating cycles of foodborne disease and economic instability.

Legal and operational repercussions further complicate the issue. Regulatory bodies such as the U.S. Food and Drug Administration (FDA) mandate that food handlers avoid direct contact with food while experiencing symptoms like vomiting or diarrhea (FDA, 2022). Non-compliance can result in fines, license suspensions, or criminal charges in cases of gross negligence. However, enforcement remains inconsistent, particularly in informal sectors. For instance, in Maricopa County, fewer than 30% of street vendors reported undergoing health inspections, despite legal requirements (MSN. n.d.). This regulatory laxity not endangers consumers but also places conscientious vendors at a competitive disadvantage, as those ignoring guidelines may operate with lower overhead costs.

**Physical Health as Related to Adherence.** Studies show that the vendors said they had had a chest illness during the past three years that kept them from their usual activities for a week or longer. The studies on environmental and occupational health hazards and outcomes in SA provide some evidence on the health impact faced in street vending activity. The identified risk factors from this review revealed a lack of compliance with SA health legislation. Workers with common diseases also reported more often sick leave, in particular long-term sick leave (>25 days). Common diseases, and foremost mental disorders, were related to both low work ability and sick leave. (Burdorf et al. 2017). The odds for adverse work outcomes increased strongly with an increasing number of diseases. Multimorbidity has a stronger impact on all work outcomes compared to single chronic diseases. (Boonen et al. 2017). The economic burden of poor health includes health-related productivity loss (HRPL) due to sick leave (absenteeism) and reduced performance while at work as a result of uncontrolled diseases or health risks (presenteeism).

(Lee, D. & Lee, J. 2021). Health conditions, especially fatigue and insufficient sleep, musculoskeletal pain, the common cold or flu and mental health problems are associated with substantial labour productivity loss. Chronic disease(s) can significantly reduce work productivity by increasing absenteeism, presenteeism, and net negative critical incidents. (Fouad, 2017). A variety of health conditions contributed to daily productivity loss. The conditions with the highest estimated daily productivity loss and annual cost per person were chronic back pain, mental illness, general anxiety, migraines or severe headaches, neck pain, and depression. (Allen et al. 2018). These findings can help in prioritising workers' health problems and developing measures for the prevention and management of these health conditions, which will allow them to minimize the Health-Related Productivity Loss from absenteeism and presenteeism.

**Health Requirements for Food Handlers.** All food handlers shall secure a valid health certificate. Health certificate shall be issued only after the food handler has: (1) Undergone the required medical and physical examinations as recommended by the World Health Organization (WHO) but not limited to Vaccination (Typhoid, Hepatitis A, COVID-19 and other emerging diseases) Note: Hepatitis A is required by the Department of Labor and Employment (DOLE), stool examination with culture and sensitivity, respiratory examination (Chest X-ray and Sputum) Note: Chest X-ray is required by DOLE, medical and physical examination, completed the recommended food safety training; (2) Food handlers must be healthy and therefore, shall not show any signs or symptoms of communicable disease. A food handler shall not be allowed to handle food if: a. they have one or more of the symptoms associated with an acute gastrointestinal illness, such as diarrhea, fever, vomiting, jaundice and/or sore throat with fever;

b. they are suspected of causing or being exposed to a confirmed communicable disease outbreak; and c. they have infected cuts, wounds, or lesions containing pus on the hand, wrist, an exposed body part, or other body parts that are not properly covered (e.g. boils and infected wounds, however small). (3) Food Service Establishment shall have a protocol on allowing the food handler to work. Moreover, the cause and date of absence of the food handler due to communicable disease must be documented. A food handler can return to work: a. after 24 hours of not having any symptoms; and b. if he/she has received clearance from the physician to return to work (if necessary). (DOST - Food and Nutrition Research Institute, 2021).

**Hygiene Requirements for Food Handlers.** Personnel shall maintain a high degree of personal cleanliness such as wear the appropriate working attire (e.g. clean footwear, clothing - preferably white, apron, face mask or spit guard, hair restraint, and disposable gloves); and cover cuts and wounds, with suitable waterproof dressings (if permitted to continue working). Personnel shall avoid the following behaviors that may result in contamination of food such as eating over food or food contact surfaces; sneezing, blowing or coughing over food or food contact surface; spitting and smoking and/or vaping in areas in which food is handled. Personnel shall perform proper hand washing when engaging in a food handling operation that involves unprotected food or surfaces likely to come into contact with food. Wash hands and disinfect such as before starting or returning to handle food; after touching or handling raw or contaminated food; between different tasks and handling of different food and surface; and immediately after smoking or vaping, coughing, sneezing, using a handkerchief or disposable tissue, eating, drinking or using tobacco or similar substances. When engaging in any food handling operation after a pandemic while the disease is not totally eradicated, food handlers



should wash hands and portions of arms exposed before any food preparation and packaging; use Personal Protective Equipment (PPE – non-slip work shoes, clean protective suit, disposable surgical face masks, hair cover, and disposable gloves) to avoid contamination; minimize bare-hand contact by using utensils, gloves, or tongs especially when preparing or packing ready-to-eat (RTE) foods; ensure that clean and sanitized cloths, towels, linens, aprons, and mop heads are used at appropriate intervals during the work period; and wash, rinse and sanitize all food contact surfaces, equipment and utensils to avoid contamination. Improper food handling practices can contaminate food being prepared and spread communicable disease through the food. Guidelines on proper food handling including good personal hygiene should be taught and practiced. (DOST - Food and Nutrition Research Institute, 2021).

**Factors that influence Adherence.** This study systematically analyzed the knowledge, attitudes, and practices (KAP) of street food vendors toward food safety in low- and middle-income countries (LMICs). It aimed to identify the factors that influence their adherence to safe food handling practices. A random-effects model was employed to estimate the pooled proportions of KAP among street food vendors concerning food safety and its associated factors. The meta-analysis incorporated 14 eligible studies, encompassing a total of 2,989 participants. The pooled results indicated that 62% of street food vendors possessed good knowledge of food safety (95% CI: 51–73), 66% exhibited a positive attitude towards food safety (95% CI: 47–86), and 51% demonstrated good food safety practices (95% CI: 36–65). These findings suggest that while a majority of vendors have adequate knowledge and attitudes towards food safety, there is a notable gap in the implementation of good practices. The study underscores the need for targeted interventions to enhance food safety practices among street food vendors in LMICs.

Implementing training programs and strengthening health education about food safety are recommended strategies to improve vendors' practices, thereby reducing the risk of foodborne illnesses.

This study revealed a significant gap in the knowledge, attitudes, and practices of street food vendors regarding food safety in low- and middle-income countries. Factors such as lack of formal education, inadequate training in food safety, low monthly income, and poor knowledge of food handling were identified as key contributors to poor hygienic practices. To address these issues, continuous training programs, enhanced health education on food safety, and the provision of hygienic materials for vendors are essential strategies to improve and maintain food safety.

**Food safety practice.** This study was conducted to examine the state of street food vending in Catbalogan City, Philippines and assessed whether they practice proper hygiene in preparation and food handling. It also determines if necessary permits and control measures are observed by authorities. The study utilized the descriptive research design using naturalistic observation (Pierce, ND) methodology flowed-up through an interview. A checklist, record book, and a camera were used to document the practices of street vendors. The video recording was deleted after needed information had been generated. An interview guide was prepared prior to the interview of the vendors as well as of the students. The respondents of the study are 25 food vendors of Catbalogan City in the vicinity of Samar State University, Samar College and Saint Mary's College of Catbalogan and 60 consumers (personnel, students and other customers) were interviewed with consent. Twelve food vendors were observed and documented using cameras; evidence of the observation was destroyed to protect the identity of the participants

observed. Information indicates that most of the necessary GMP standards have not been obeyed. Cleaning water utensils were previously reused multiple times. Running water is used for cleaning food stalls. Utensils used in preparing as well as handling of food must also be kept from various contaminants. Street situation/environment is full of various forms of food contaminants. There is the dust, insects, other air-borne bacteria, insects such as flies and other forms of street environment-contaminants. Flies and other insects are potential carriers of contaminants from fecal matters and the likes. The surface where food is served and more importantly where it is prepared must be clean and made of material which does not encourage massive bacterial growth. Disinfection of nonfood-contact areas were also not observed. Covering of food, storing of utensils as well as the uncooked food must at all-time is observed as street environment is very open to all sort of potential contaminants. A little more than half of stalls offer water on a container believed to be somewhat clean (60%) and clean (33%). Good Manufacturing Practices (GMP) is not consistently practiced by street food vendors in Catbalogan City. This is despite the claim that their stalls are visited by inspectors five to eight times a year. There are street food vendors which may endanger consumers such as holding food with bare hands, not wearing hairnets, utensils are not sanitized/sterilized of the utensils and storing food in appropriate containers. There is a need to regulate street food vending in the city and monitoring must be regular and compliance to acceptable manufacturing standards must be seriously implemented. Street food vendors must attend training on GMP and make it a requirement for business permits (Elli, 2016).

Concentrate on evaluating and enhancing the food safety and hygiene practices of sidewalk vendors in Balayan Public Market, Batangas, Philippines. The study aims to examine how sidewalk vendors implement food safety measures during food handling and preparation

and determine the extent of adherence to food safety practices enforced by market administration among sidewalk vendors. The study used a mixed-methods approach by gathering data from 55 consumers, 5 sidewalk vendors, and 5 market administrators through purposive and random sampling techniques. Microbial analyses were conducted on popular street foods, including chicken nuggets, isaw (grilled chicken intestines), proben (deep-fried chicken proventriculus), calamari (fried squid rings), and kwek-kwek (battered quail eggs), along with their respective sauces. The findings revealed alarmingly high bacterial counts, particularly in isaw and sweet chicken nugget sauce, revealing significant food safety hazards. This study became increasingly apparent when examining the noticeable lack of experience and knowledge among street food vendors. This study also highlighted widespread non-compliance with basic hygiene standards, including proper attire and hand hygiene. The unsanitary conditions commonly observed among street food vendors posed a significant risk to food safety, emphasizing the urgent necessity for targeted training programs and awareness campaigns. The study proposed that compliance with basic hygiene standards such as proper attire is vital in practicing food hygiene and minimizing food hazards. While the study rules out professing data, it appears to be cross-sectional, capturing data at a single point in time. Longitudinal studies observing changes in food safety practices over time would be beneficial to assess the effectiveness of interventions and training programs. While the study proposes a sanitary action plan, it does not evaluate the effectiveness of such interventions. Thus, it recommended that future researchers should implement and assess the effect of proposed interventions on improving food safety practices among vendors (Tolentino, et al, 2023).

The objectives of this study are to determine the level of food safety knowledge among street food vendors in the Zululand District and assess the compliance of street food vending

facilities with established sanitary standards. The study uses a cross-sectional survey conducted through face-to-face interviews. They collected data from 399 randomly selected street food vendors and 200 randomly selected street food vending facilities. Questionnaires are also used to assess vendors' food safety knowledge, while checklists evaluate the sanitary conditions of vending sites. The study reveals that only 77% had not attended any food safety training courses, 76% of vendors exhibited low food safety knowledge, and only 14% of vending sites were highly compliant with sanitary conditions. The majority of vendors lacked sufficient food safety knowledge, posing risks to consumers recommended implementing comprehensive food safety training programs for street food vendors to enhance their knowledge and practices. The study also recommends strengthening monitoring and enforcement mechanisms, including the use of licensing and permits, to ensure adherence to food safety regulations. Addressing these issues through targeted interventions can significantly improve food safety practices among street food vendors, thereby protecting public health (Nkosi, et al, 2021).

**Street food vendors' perception of their food safety practice.** This study aims to examine street food vendors' perceptions of food safety practices, including their adherence to hygiene protocols, ingredient processing, and risk awareness. Additionally, it explores how economic factors and knowledge gaps influence their compliance with food safety standards.. The researchers utilized a survey questionnaire to gather data on the vendors' viewpoints regarding food safety. In addition to the questionnaire, individual interviews were conducted to gain a more comprehensive understanding of the subject. To assess vendors' adherence to food safety practices, each respondent completed a structured checklist and survey form. In addition to gathering quantitative data, the study incorporated individual interviews to provide deeper

insights into vendors' perceptions and behaviors regarding food safety. After data collection, statistical analysis was performed to systematically interpret trends and compliance levels. The findings reveal that vendors do not prioritize extensive processing of ingredients, as evidenced by their low rating for this indicator. They do not adhere to specific processes for cleaning raw materials, likely due to a lack of awareness regarding the potential consequences of deviating from standard practices. The highest indicator is handwashing, which is crucial for maintaining proper personal hygiene. It is widely recognized that hands serve as the primary tool for handling and preparing ingredients, from storage to the point of sale. On the other hand, the lowest indicator is the potential exposure of food to handlers, suggesting that vendors may not adequately shield the food they handle from potential contamination. It reveals that vendors may be unaware of the potential risks associated with mixing raw and cooked food. Vendors tend to use minimal amounts of chemicals. They rely on simple cleaning products to maintain the cleanliness of their tools and equipment. They prioritize affordability rather than relying on strong chemicals, as their income may not allow for expensive cleaning products. This emphasizes the importance of timely raw material delivery, hygiene, and proper food handling among vendors. Timeliness of delivery is highly valued, while awareness of risks from improper ingredient handling is low. Handwashing is recognized as critical, but there's a lack of awareness about preventing contamination from food handlers. Utensil cleanliness is prioritized, but poor understanding of cross-contamination risks from mixing cooked and raw foods persists. Clean water reservoirs are deemed essential, though the use of chemicals is overlooked, likely due to cost concerns. It is essential to cultivate cooperation amongst different stakeholders, including government and local authorities departments, non-governmental organizations, consumer groups, and standard-setting bodies organizations. Together, these entities have the potential to

enhance street food security. These initiatives should concentrate on supplying resources, instruction, and infrastructure assistance to suppliers, allowing them to embrace and uphold appropriate hygienic habits, avoid cross-contamination and guarantee a sanitary environment. Addressing these areas of concern and implementing appropriate measures will contribute to enhancing the overall safety and quality of street food. Consequently, it will help mitigate the risk of food-borne illnesses and instill greater consumer confidence in street food vendors (Madario, et al, 2023).

**Programs supporting food safety practices.** The Department of Science and Technology (DOST) in the Philippines is actively working to improve food safety. This highlights the DOST's crucial role in developing and implementing comprehensive roadmaps and strategies to address the nation's food safety challenges, particularly in the context of the COVID-19 pandemic. The overarching objective of these initiatives is to provide guidance and support to all sectors involved in the food chain—from producers and processors to consumers—ultimately ensuring safer food for the Filipino population. This is achieved through a multi-pronged approach encompassing research and development, capacity building, policy advocacy, and public awareness campaigns. The DOST employs a multifaceted methodology to achieve its food safety goals. This involves extensive research and development to identify and address emerging food safety issues, leading to the creation of new technologies, protocols, and best practices. Simultaneously, the DOST invests in capacity building through training and technical assistance programs for food industry stakeholders, enhancing their knowledge and skills in implementing effective food safety measures. Furthermore, the DOST actively advocates for the development and implementation of supportive policies and regulations at the government level,

working in collaboration with various agencies and stakeholders to prioritize food safety. This emphasizes several key aspects of the DOST's strategy or initiatives. Sector-specific roadmaps for food processing, retail, and service sectors address unique challenges within each area. Furthermore, the DOST has implemented training programs and technical assistance for food industry stakeholders, enhancing their knowledge and skills in implementing effective food safety measures. This capacity building effort is crucial for ensuring widespread adoption of best practices throughout the food industry. The DOST also actively advocates for the development and implementation of supportive policies and regulations at the government level. This includes working in collaboration with various agencies and stakeholders to prioritize food safety and ensure that regulations are effective in protecting public health. Finally, the DOST undertakes substantial public awareness campaigns to educate consumers about food safety risks and empower them to make informed choices regarding their food consumption. These campaigns play a vital role in fostering a culture of food safety among the Filipino population (Casinas, 2021).

**Local food safety standard.** The main objective of the study was to determine the perceived risk and consumer buying behavior on the streetfood around Negros Oriental State University, Dumaguete City. This study employs a descriptive research method to gather information from students at NORSU Main Campus I in Dumaguete City. The survey instrument included socio-demographic questions such as age, sex, course, and year level. Respondents were asked to indicate their level of agreement using a 5-point Likert scale. Stratified random sampling was used to determine the sample size, and a population frame of all potential respondents was prepared prior to sampling. The study revealed a significant relationship between the perceived risk of street food and consumer buying behavior, suggesting that the



perceived risk affects how consumers make food purchases. Additionally, the findings highlight a link between consumers' demographic profiles and their perceived risk of street food in relation to their buying behavior. Regression analysis showed that food handling practices, including personal hygiene, food preparation, and storage, significantly impact the perceived risk and influence consumers' buying behavior. As the street food area is located near the Provincial Government of Negros Oriental, the researchers recommend regular monitoring by the province's health department. Street food vendors should consistently adhere to proper procedures, and covered waste bins with lids should be accessible to customers. Additionally, the researchers suggest providing hygienic practice checklists at each station within the street food area. These checklists can help evaluate the vendors' food safety practices and promote the implementation of high hygiene standards. They may also assist the health department in developing a comprehensive food safety program (Tayco, et al, 2022).

**Effectiveness of a training program.** This study assessed the effectiveness of a training program designed to improve food safety practices among food handlers in Negros Oriental, Philippines. Employing a Training of Trainers (ToT) methodology, the program aimed to equip local trainers to cascade food safety training within their communities. The curriculum encompassed food processing, preservation, hygiene, and handwashing. Strong institutional support from local government units (LGUs) proved crucial to the program's success. The evaluation comprised three phases: pre-implementation (program design and manual development), implementation (ToT training of 20 participants from two municipalities in Negros Oriental, delivered across four modules), and post-implementation (evaluation of seminar-workshops conducted by the newly trained trainers). Evaluation criteria included

content delivery methods, trainer capabilities, and the overall training environment. The ToT program directly addressed foodborne disease (FBD) prevention by enhancing food safety knowledge and practices. The study concluded that the program successfully equipped trainers with the necessary skills, although it recommended further evaluation to ensure effective implementation of learned practices at the community level. The research underscores the vital link between the ToT program and improved food safety practices among food handlers, also emphasizing the critical role of LGU support in ensuring the success of the ToT program (Manay, 2020).

**The Republic Act No. 10611.** The Republic Act No. 10611 also known as the "Food Safety Act of 2013," is a landmark legislation in the Philippines that seeks to provide food safety throughout the food supply chain. The law aims to protect consumer health and foster market access for local food products by establishing a framework that incorporates food safety regulations across different government agencies, including the Department of Agriculture (DA) and the Department of Health (DOH) (Republic of the Philippines, 2013). In Section 15, Article II of the 1987 Philippine Constitution declares that the State shall protect and promote the right to health of the people and instill health consciousness among them. Section 6, Section IV of the 1987 Philippine Constitution states that Food law shall aim for a high level of food safety, protection of human life and health in the production and consumption of food. It is also stated in Section III the objectives of the Act to Protect the public from food-borne and water-borne illnesses and unsanitary, unwholesome, misbranded or adulterated foods.

According to Rivera and Gonzales (2019), foodborne diseases pose significant risks in the Philippines, particularly in urban centers where informal food vending is prevalent. Their

study emphasizes the critical role of RA 10611 in setting food safety standards that help minimize contamination and foodborne illnesses. Another study by Villanueva et al. (2022) investigated the impact of RA 10611 on the hygiene practices of street vendors in Metro Manila. Their research revealed that while some vendors follow food handling guidelines, others struggle with compliance due to financial constraints and inadequate government monitoring.

**Physical Problem of Street Vendors.** The study titled "Health Problems Faced by Street Vendors" (2019) investigates the various health challenges encountered by individuals engaged in street vending. The research highlights that street vendors often operate under harsh conditions, including prolonged exposure to the sun and the necessity to carry heavy loads across different locations. These demanding work environments contribute to a range of health complications, such as skin cancer, gastrointestinal issues, musculoskeletal deformities, and respiratory tract infections. The study identified common health issues, including musculoskeletal disorders and respiratory problems, emphasizing the need for policies to improve the health and safety of street vendors. The common health problems among street vendors observed under this study were respiratory tract infections (32%), musculoskeletal problems (54.4%), gastrointestinal problems (18%), generalized weakness (12.7%), non-communicable diseases including hypertension, diabetes (26.6%). Among those who had suffered from these health problems, the majority (68%) utilized private healthcare facilities and 21% utilized public healthcare facilities.

## **RESEARCH METHODOLOGY**

### **Research Design**

This study utilized a descriptive-correlational and quantitative-research design to examine the physical health condition of street food stall vendors in Dumaguete City. Specifically, the research aimed to determine the relationship between the vendors' demographic profile, physical health condition, and their level of adherence to existing food safety regulations.

### **Research Respondents**

The respondents of this study were street food stall vendors operating in Dumaguete City. The study focused on vendors formally recognized by the city government, thereby indicating their compliance with the requisite legal and operational standards. As the number of vendors are inconsistent and some are only taking it as a part-time job, an estimated total of 104 street food stall vendors were included in this evaluation - Fronting NORSU: 22 vendors; Cheese stick country: 52 vendors; Pantawan-Rizal Boulevard: 30 vendors. This ensures a representative sample of vendors who meet the city's regulatory requirements.

### **Sampling Procedure**

With the constant changes of numbers of street food stalls in Dumaguete City, only 3 major clusters of street food stalls where the majority of consumers go to, were identified. Namely, Fronting NORSU, Cheese Stick Country, and Pantawan-Rizal Boulevard. Within these 3 major clusters, 2 will be utilized to identify the respondent sample size. These will be Cheese stick country, and Fronting NORSU, totalling to 74 street food stall vendors.

## **Research Environment**

The data were collected from food stalls located at NORSU, Escaño, and Pantawan Boulevard in Dumaguete City, located in Negros Oriental, Philippines.. These locations were selected due to their well-known appeal and ability to attract large numbers of people who frequently consume street food, making them ideal sites for evaluating food safety practices.

## **Research Instrument**

The instrument used in the study was self-made, together with a modified questionnaire from DOST's standardized tool. It consists of three (3) parts. The first part of the questionnaire determined the profile of the respondents, in terms of age, sex, highest educational attainment, years as street vendor, and estimated weekly income of stall operated. The second part is the current physical health condition of the respondents. The third part measures the vendors' level of adherence to food safety.

The research instrument was subjected to content validation by matter experts with expertise in the field prior to the commencement of data collection.

## **Data Gathering Procedure**

With the approval of the research panel and the NORSU Ethics Review Committee, the study's data collection process was initiated. A self-designed and a modified questionnaire served as the primary instrument and is what will be used for a guided interview, sourced from the Department of Science and Technology to ensure reliability and content validity. Expert feedback prompted revisions to enhance clarity and relevance. Prior to the data collection, approval letters were distributed to local government units and barangay health workers to

support the study. Data collection commenced following the securing of necessary permissions and the preparation of materials.

The Researchers, with the validated questionnaires, went to street food stall vendors at the three identified clusters: NORSU, Escaño, and Pantawan Boulevard, to commence with the guided interview.. These locations were chosen for their popularity and high consumer traffic. Convenience sampling was employed to identify 62 participants, all of whom were city-recognized street food vendors. Researchers conducted guided interviews with vendors using pre-prepared questionnaires, ensuring that all participants fully understood the questions.

Once completed, the researchers collected the questionnaires and carefully organized the data for analysis. For the ‘profile’ and ‘physical health condition’ section of the questionnaire, a survey procedure was implemented to collect the data. For the ‘level of adherence’ section, a mix of observation and survey procedures were followed to gather pertinent data.

Likert scale was used for the ‘physical health condition’ section, while percentage is used for the ‘level of adherence’ section. The data were then organized into a manageable format for further qualitative analysis, identifying key patterns and insights regarding food safety practices. The gathered data were subsequently analyzed using descriptive and inferential statistical techniques to achieve the study’s objectives effectively.

### **Statistical Treatment of Data**

In order to come up with the general data for the respondents’ profile, frequency, percentage, and mean are used. On the other hand, to derive generalized data for their physical

health condition, which uses likert scale in the questionnaire, Spearman Rho was utilized.

Additionally to assess the level of adherence to food safety practice, percentage was also used.

## References:

- Abdel-Hady, F., et al. (2021). Impact of fatigue on food safety compliance among vendors. *Heliyon*, 7(8), e01743. <https://doi.org/10.1016/j.heliyon.2021.01743>
- Addo-Tham, R., Appiah-Brempong, E., Vampere, H., Acquah-Gyan, E., & Akwasi, A. G. (2020). Knowledge on Food Safety and Food-Handling Practices of Street food vendors in Ejisu-Juaben Municipality of Ghana. *Advances in Public Health*, 2020, 1–7. <https://doi.org/10.1155/2020/4579573>
- Ahmad, H., Abidin, S. A., & Quah, W. B. (2024). Keeping it clean: The role of education in food safety among future hospitality professionals. *International Journal of Academic Research in Business and Social Sciences*, 14(9), 1484–1493. <https://doi.org/10.6007/IJARBSS/v14-i9/22824>
- Alabanza Akers, M.A. (2021). *Urban Environments and Health in the Philippines: A Retrospective on Women Street Vendors and their Spaces* (1st ed.). Routledge. <https://doi.org/10.4324/9781003008040>
- Allen, D., Hines, E., Breitenbach, E. (2018). Four-year review of presenteeism data among employees of a large United States health care system: a retrospective prevalence study. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/30413168/>



- Alinsunurin, M., Palicte, J. M., & Dizon, R. S. (2017). Knowledge and practice of food safety among street food vendors in Metro Manila. *Philippine Journal of Food Science and Technology*, 23(1), 45-53.
- Amegah A.K., Dakuu G., Mudu P., Jaakkola J.J.K. Particulate matter pollution at traffic hotspots of Accra, Ghana: Levels, exposure experiences of street traders, and associated respiratory and cardiovascular symptoms. *J. Expo. Sci. Environ. Epidemiol.* 2021:1–10. doi: 10.1038/s41370-021-00357
- Azanaw, J., Gebrehiwot, M., & Dagne, H. (2019). Factors associated with food safety practices among food handlers: facility-based cross-sectional study. *BMC Research Notes*, 12(1). <https://doi.org/10.1186/s13104-019-4702-5>
- Benitez, V. O., & Olmogues, A. J. (2021). Food Safety Practices among Street Food Vendors in Dipolog City. *INTERNATIONAL JOURNAL OF ADVANCED MULTIDISCIPLINARY STUDIES*, 1, 2799–0664. <https://www.ijams-bbp.net/wp-content/uploads/2021/11/IJAMS-OCTOBER-12-23.pdf>
- Biswas, A., Harbin, S., Irvin, E., Johnston, H., Begum, M., Tiong, M., Apedaile, D., Koehoorn, M., & Smith, P. (2021). Sex and Gender Differences in Occupational Hazard Exposures: a Scoping Review of the Recent Literature. *Current Environmental Health Reports*, 8(4), 267–280. <https://doi.org/10.1007/s40572-021-00330-8>

- Boonen, A., Polina, P. (2017). Work outcome in persons with musculoskeletal diseases: comparison with other chronic diseases & the role of musculoskeletal diseases in multimorbidity. Retrieved from <https://pmc.ncbi.nlm.nih.gov/articles/PMC5223391/>
- Buchanan, R. L., Gorris, L. G. M., Hayman, M. M., Jackson, T. C., & Whiting, R. C. (2017). A review of *Listeria monocytogenes*: An update on outbreaks, virulence, dose-response, ecology, and risk assessments. *Food Control*, 75, 1-13. Retrieved from <https://doi.org/10.1016/j.foodcont.2018.02.031>
- Burdorf, A., Robroek, S., & van den Berg, S. (2017) Associations between common diseases and work ability and sick leave among health care workers. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/28550420/>
- Burgard, S. A., & Lin, K. Y. (2013). Bad jobs, Bad health? How work and working conditions contribute to health disparities. *American Behavioral Scientist*, 57(8), 1105–1127. <https://doi.org/10.1177/0002764213487347>
- Centers for Disease Control and Prevention (CDC). (2021). Norovirus: Transmission. Retrieved from <https://www.cdc.gov/norovirus/about/transmission.html>
- Choudhury, M., Mahanta, L., Goswami, J., Mazumder, M., & Pegoo, B. (2011). Socio-economic

profile and food safety knowledge and practice of street food vendors in the city of Guwahati, Assam, India. *Food Control*, 22(2), 196-203.  
<https://doi.org/10.1016/j.foodcont.2010.06.020>

Cundiff, J. M., Lin, S. S., Faulk, R. D., & McDonough, I. M. (2022). Educational quality may be a closer correlate of cardiometabolic health than educational attainment. *Scientific Reports*, 12(1). <https://doi.org/10.1038/s41598-022-22666-3>

Desye, B., Tesfaye, A. H., Daba, C., & Berihun, G. (2023). Food safety knowledge, attitude, and practice of street food vendors and associated factors in low-and middle-income countries: A Systematic review and Meta-analysis. *PLoS ONE*, 18(7), e0287996.  
<https://doi.org/10.1371/journal.pone.0287996>

Dewey-Mattia D, Manikonda K, Hall AJ, Wise ME, Crowe SJ. Surveillance for Foodborne Disease Outbreaks — United States, 2009–2015. *MMWR Surveill Summ* 2018;67(No. SS-10):1–11. DOI: <http://dx.doi.org/10.15585/mmwr.ss6710a1>.

Dong, Y., & Zeb, S. (2022). Role of higher education system in promoting law abiding behavior among students. *Frontiers in Psychology*, 13.  
<https://doi.org/10.3389/fpsyg.2022.1036991>

Elli, J. (2016). Assessment of street food in catbalogan city, philippines *journal of academic research* 01:1(2016), pp. 11-20 Retrieved from

<https://www.researchgate.net/profile/Janice->

[Elli/publication/331438261\\_streetAssessment\\_of\\_Street\\_Food\\_in\\_Catbalogan\\_City\\_Philippines/links/5c792ca0a6fdcc4715a5a9b9/streeAssessment-of-Street-Food-in-Catbalogan-City-Philippines.pdf](https://www.researchgate.net/publication/331438261_streetAssessment_of_Street_Food_in_Catbalogan_City_Philippines/links/5c792ca0a6fdcc4715a5a9b9/streeAssessment-of-Street-Food-in-Catbalogan-City-Philippines.pdf)

Food safety and quality: Street foods. (n.d.). <https://www.fao.org/food/food-safety-quality/a-z-index/street-foods0/en/>

Fouad, A. M. et al. (2017). Effect of Chronic Diseases on Work Productivity: A Propensity Score Analysis. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/28486344/>

Ghana | MAFAP | Food and Agriculture Organization of the United Nations. (n.d.). MAFAP. <https://www.fao.org/in-action/mafap/where-we-work/ghana/en>

*Gender and health*. (2025, February 7). <https://www.who.int/news-room/questions-and-answers/item/gender-and-health>

Himang, C. M., & Del Fierro, E. (2022). Analytical evaluation of food safety knowledge and practices of street food vending in the Philippines. Schoology. [https://www.academia.edu/89065823/Analytical\\_Evaluation\\_of\\_Food\\_Safety\\_Knowledge\\_and\\_Practices\\_of\\_Street\\_Food\\_Vending\\_in\\_the\\_Philippines](https://www.academia.edu/89065823/Analytical_Evaluation_of_Food_Safety_Knowledge_and_Practices_of_Street_Food_Vending_in_the_Philippines)

Hlongwane, F., Mthembu, Q. M., & Mothapo, W. T. (2020). *Food safety knowledge and sanitary*

*compliance among street food vendors in Zululand District, South Africa. BMC Public Health, 20(344).*

Huynh-Van, B., Vuong-Thao, V., Huynh-Thi-Thanh, T., Dang-Xuan, S., Huynh-Van, T., Tran-To, L., Nguyen-Thi-Thao, N., Huynh-Bach, C., & Nguyen-Viet, H. (2022). Factors associated with food safety compliance among street food vendors in Can Tho city, Vietnam: implications for intervention activity design and implementation. *BMC Public Health, 22(1)*. <https://doi.org/10.1186/s12889-022-12497-2>

*Income.* (n.d.). County Health Rankings & Roadmaps. <https://www.countyhealthrankings.org/health-data/health-factors/social-economic-factors/income>

Inadequate food safety knowledge and hygiene practices among street food vendors in Dhaka, Bangladesh (2024) | Nutrition Connect. (n.d.). <https://nutritionconnect.org/resource-center/inadequate-food-safety-knowledge-and-hygiene-practices-among-street-food-vendors>

Kariuki, E.N., Ng'ang'a, Z.W., & Wanzala, P. (2017). Food-Handling Practices and Environmental Factors Associated With Food Contamination Among Street Food Vendors in Nairobi County, Kenya: A Cross-Sectional Study. *The East African Health Research Journal, 1*, 62 - 71.

Karanja, P. N. (2020). Food safety knowledge and practices of street food vendors in selected locations within Kiambu County, Kenya. *African Journal of Food Science*.

Khan, N., Javed, Z., Acquah, I., Hagan, K., Khan, M., Valero-Elizondo, J., Chang, R., Javed, U., Taha, M. B., Blaha, M. J., Virani, S. S., Sharma, G., Blankstein, R., Gulati, M., Mossialos, E., Hyder, A. A., Achirica, M. C., & Nasir, K. (2023). Low educational attainment is associated with higher all-cause and cardiovascular mortality in the United States adult population. *BMC Public Health*, 23(1). <https://doi.org/10.1186/s12889-023-15621-y>

Lee, D. & Lee, J. (2021). Health-Related Productivity Loss According to Health Conditions among Workers in South Korea. Retrieved from <https://pmc.ncbi.nlm.nih.gov/articles/PMC8307799/>

Letuka, P., Nkhebenyane, J., & Thekiso, O. (2021). Street food handlers' food safety knowledge, attitudes and self-reported practices and consumers' perceptions about street food vending in Maseru, Lesotho. *British Food Journal*, 123(13), 302–316. <https://doi.org/10.1108/bfj-07-2020-0595>

Mary Ann Liebert, Inc. (2021). Sex-based differences in COVID-19 outcomes. *Journal of Women's Health*, 30(4), 561–567. <https://doi.org/10.1089/jwh.2020.8974>

Madario, M., Pulga, H., Lim, K., Dagalea, F. (2023). Awareness and practice of good manufacturing practices (GMP) among street food vendors in catarman, northern samar. *Archives of Current Research International* Volume 23, Issue 7, Page 1-6, 2023; Article

no.ACRI.101681

ISSN:

2454-7077

<http://article.researchpromo.com/id/eprint/1307/1/Dagalea2372023ACRI101681.pdf>

Mana-ay, A. K. A. (2020). Evaluation of a Training of Trainers Program on Food Safety and Nutrition Security. *Philippine Social Science Journal*, 3(1), 82-92.  
<https://doi.org/10.52006/main.v3i1.111>

Masuda, M., Ishimaru, T. et al. (2021). A Cross-Sectional Study of Psychosocial Factors and Sickness Presenteeism in Japanese Workers During the COVID-19 Pandemic Retrieved from <https://pmc.ncbi.nlm.nih.gov/articles/PMC8715929/#R14>

Mekonnen, T H., Tefera, A., Melsew, A., (2018). Sick at work: prevalence and determinants among healthcare workers, western Ethiopia: an institution based cross-sectional study. Retrieved from <https://pmc.ncbi.nlm.nih.gov/articles/PMC5793443/>

*Millennials face frequent illness and mounting medical bills.* (n.d.). Manila Bulletin.  
[https://mb.com.ph/2024/11/9/health-costs-hitting-young-pinoys-hard?utm\\_source=chatgpt.com](https://mb.com.ph/2024/11/9/health-costs-hitting-young-pinoys-hard?utm_source=chatgpt.com)

MSN. (n.d.). <https://www.msn.com/en-us/health/other/multiple-illnesses-tied-to-unpermitted-street-vendors-maricopa-county-officials-say/ar-AA1ptb7I>

Mwanga, T., et al. (2019). Factors influencing food safety practices among food handlers. BMC Research Notes, 12, 33. <https://doi.org/10.1186/s13104-019-4702-5>

Nguyen, T., & Doan, Q. (2022). Evaluating the link between knowledge and compliance with food hygiene regulations in street food markets in Vietnam. *Asian Pacific Journal of Public Health*, 34(2), 188-197. <https://doi.org/10.1177/1010539522110569>

Sathe, S., Baxi, M., Chaudhary, N., Pawar, V., & Bhirange, S. (2021). Ergonomic evaluation of street vendors as determined by rapid entire body assessment method. *International Journal of Current Research and Review*, 13(08), 62–66. <https://doi.org/10.31782/ijcrr.2021.13819>

Sepadi, M. & Nkosi, V. (2022) Environmental and Occupational Health Exposures and Outcomes of Informal Street Food Vendors in South Africa: A Quasi-Systematic Review Retrieved from <https://pmc.ncbi.nlm.nih.gov/articles/PMC8835235/>

Occupational Safety and Health Administration. (n.d.). Personal protective equipment - Overview. U.S. Department of Labor. Retrieved from <https://www.osha.gov/personal-protective-equipment>

Orozco, N. A., Ramos, A. C., & Rivera, L. M. (2019). Assessment of food safety practices of street food vendors in selected areas of the Philippines. *Philippine Journal of Health Research and Development*, 23(2), 13-21.



Pontino, B. (2024). Food hygiene and sanitary condition awareness among street food vendors.

International Journal of Current Science Research and Review, 7(12).

<https://doi.org/10.47191/ijcsrr/V7-i12-13>

Putri, M. S., & Susanna, D. (2021). Food safety knowledge, attitudes, and practices of food

handlers at kitchen premises in the Port 'X' area, North Jakarta, Indonesia 2018. Italian

Journal of Food Safety, 10(4). <https://doi.org/10.4081/ijfs.2021.9215>

Raghupathi, V., & Raghupathi, W. (2020). The influence of education on health: an empirical assessment of OECD countries for the period 1995–2015. *Archives of Public Health*, 78(1). <https://doi.org/10.1186/s13690-020-00402-5>

Rakha, A., Fatima, M., Bano, Y., Khan, M. A., Chaudhary, N., & Aadil, R. M. (2022). Safety and quality perspective of street vended foods in developing countries. *Food Control*, 138, 109001. <https://doi.org/10.1016/j.foodcont.2022.109001>

Roberti, R. (2023, January 22). How to start a small food business in Philippines.

<https://www.linkedin.com/pulse/how-start-small-food-business-philippines-damian-roberti>

Romero, R., Paulino, E., Tan, R., & Cortez, D. M. (2024). Urban entrepreneurship on the fringe: action research on the challenges of street vendors in Manila. *Journal of Business and Management Studies*, 6(5), 169–184. <https://doi.org/10.32996/jbms.2024.6.5.20>

- Sepadi, M. (2022). Environmental and Occupational Health Exposures and Outcomes of Informal Street Food Vendors in South Africa: A Quasi-Systematic Review Retrieved from <https://www.mdpi.com/1660-4601/19/3/1348?>
- Siddiky, A., Mollick, K., Aktarujjaman, M., Islam, F., Mamun, M. A., & Roy, N. (2024). Determinants of food safety knowledge and practices among food handlers in Bangladesh: An institution-based cross-sectional study. *Heliyon*, 10(4), e25970. <https://doi.org/10.1016/j.heliyon.2024.e25970>
- Sverdlik, A. (2021). Street vendors and garbage pickers need protection from climate extremes. Retrieved from <https://www.iied.org/street-vendors-garbage-pickers-need-protection-climate-extremes>
- Tayco, R., Zamora, G., Tubog, Millard. (2022). Perceived risks and consumer buying behavior on street food around negros oriental state university, Dumaguete City. *Techymindorg*.. Vol 12. 2. <https://doi.org/10.17722/ijrbt.v12i2.1247>
- Tabugoc, J. R., Panganiban, A. M., & Soria, E. J. (2020). Evaluation of food safety knowledge, attitude, and practices among street food vendors in Metro Manila, Philippines. *Asian Pacific Journal of Health Sciences*, 7(1), 46-52.

*The Health Belief Model - Rural Health Promotion and Disease Prevention Toolkit.* (n.d.).

<https://www.ruralhealthinfo.org/toolkits/health-promotion/2/theories-and-models/health-belief>

Tolentino, R. T., Padua, D. M., Aglugub, J. S., Villena, J. R., & Calderon, J. C. (2023). Be aware mga suki: Practices of food safety and appropriate hygiene among sidewalk vendors in Balayan, Batangas. PhilArchive. <https://philpapers.org/archive/TOLBAM.pdf>

Tipon, F. K. R., Baldado, K. S., Delos Santos, A. M., Montaos, J. L., & Tus, J. (2023). The quality of life, lived experiences, and challenges faced by senior citizen street vendors. *Psychology and Education: A Multidisciplinary Journal*, 7(1). <https://doi.org/10.5281/zenodo.7576874>

Tiu, AM., Tanaid, RA., Durano, J. et al. (2021). Analytical Evaluation of Food Safety Knowledge and Practices of Street Food Vending in the Philippines. *Journal of Public Health and Emergency*. Retrieved from: <https://www.igi-global.com/article/analytical-evaluation-of-food-safety-knowledge-and-practices-of-street-food-vending-in-the-philippines/284870>

United Nations. (2015). Occupational safety and health (OSH) framework. Chief Executives Board for Coordination. [https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100\\_ILO\\_CODE:C155](https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C155)

U.S. Food and Drug Administration (FDA). (2022). Food Code 2022: Recommendations for food safety regulations. Retrieved from <https://www.fda.gov/food/fda-food-code/food-code-2022>

Wang, X., Sun, J., Scott, I., & Sun, Z. (2024). Exploring gender-based spatio-temporal patterns of informal street vending: A case study in Fangshan District, Beijing, China. *Transactions in Planning and Urban Research*, 3(1–2), 47–63. <https://doi.org/10.1177/27541223241242007>

World Health Organization (WHO). (2015). Estimates of the global burden of foodborne diseases. Retrieved from <https://www.who.int>

World Health Organization (WHO). (2019). Hepatitis A: Fact sheet. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/hepatitis-a>

World Health Organization (WHO). (n.d.) "Golden Rules" for Safe Food Preparation. <https://www.paho.org/en/health-emergencies/who-golden-rules-safe-food-preparation>

World Health Organization. (2024, October 1). Ageing and health. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>

Yan, Z., Xin, Y., Zhong, X., Yi, Y., Li, P., & others. (2023). Dissolved organic nitrogen cycling revealed at the molecular level in the Bohai and Yellow Sea. *Water Research*, 244, 120446. <https://doi.org/10.1016/j.watres.2023.120446>

## Appendix : Survey Questionnaire

### QUESTIONNAIRE

#### I. Profile.

**Direction:** Choose the information or choice that best applies to you and put a check (/) mark in the space provided.

a. Name ( Optional): \_\_\_\_\_

b. Age:

c. Sex:

☐ Male      ☐ Female

d. Highest Educational Attainment:

☐ Elementary Level

☐ Elementary Graduate

☐ High School Level

☐ High School Graduate

☐ College Level

☐ College Graduate

e. Time/Years of experience as Street Vendor

☐ Less than ½ year

☐ ½ to 1 year

☐ 1 to 3 years

☐ 3 to 5 years

☐ 5 to 7 years

☐ 7 to 9 years

☐ 9 to 11 years

☐ More than 11 years

f. Estimated Weekly Income of Stall Operated in Philippine Peso

☐ Less than 1000.00

☐ 3,000.00 - 5,000.00

☐ 1,000.00 - 3,000.00

☐ More than 5,000.00

## II. Current Physical Health Condition

**Direction:** Choose the information or choice that best applies to you while you are on duty and put a check (/) mark in the space provided.

Statements	Always 4	Often 3	Rarely 2	Never 1
1. I follow recommended vaccination schedule (Hepatitis A, COVID-19, Typhoid, and other emerging diseases)				
2. I do not catch coughs and colds easily.				
3. I experience stomach pain and diarrhea.				
4. I experience vomiting.				
5. I feel energetic and don't get fatigued.				
6. I do not experience headaches.				
7. I do not struggle with my vision.				
8. I do not struggle with smell.				
9. I do not struggle with hearing.				
10. I do not struggle with taste.				
11. I do not work when I'm sick.				
12. I do not experience having skin injuries.				
13. I do not get skin infections.				
14. I do not experience dizziness or lightheadedness while in duty.				
15. I do not experience musculoskeletal pain.				

## II. Vendors' Level of Adherence (Derived from DOST-FNRI Standardized Food Inspection Checklist)

**Instructions for inspector:** On the Compliance column, mark ✓ if the answer to the question is YES; mark X if the answer to the question is NO; write N/A if the question is Not Applicable.

Statements	Compliance	Points
1. Trained in food safety with valid certification.		8
2. Have valid health certificates and I show no signs of illness.		8
3. Regularly monitors the holding of cooked food.		8
4. Uses equipment and utensils for the holding of cooked food (e.g. sneeze guards, food covers, and serving utensils).		8
5. Follows proper cooking procedures.		8
6. Follows proper cooling procedures.		8
7. Follows proper reheating procedures.		8
8. Follows proper serving and packaging procedures.		8
9. Properly prepares food ingredients to prevent cross-contamination.		8
10. Follows proper personal hygiene.		8
11 Proper cleaning and sanitization procedures of food and non-food contact surfaces are followed.		8
12. Follows proper disposal procedures for food waste.		8
13. The garbage containers are constructed and maintained properly.		8
14. Follows proper control procedures for pests and animals.		8
15. Guides the consumers on potential allergens / halal/kosher in the food served.		4
16. Separates raw, ready-to-eat (RTE), and non-food items (e.g. packaging materials, cleaning chemicals) to prevent cross-		4

contamination.		
17. Obtains all ingredients from sources approved by the local authority.		<b>4</b>
18. Follows proper receiving requirements and procedures.		<b>4</b>
19. Cleans, sanitize, properly store, and replace the cleaning materials as necessary.		<b>4</b>
20. Disposes of the garbage in a timely manner.		<b>4</b>

<b>Inspection Summary</b>	<b>Percentage (%)</b>	<b>Interpretation</b>
Inspection summary  Total Major Criteria = _____ x 8 = _____ = a  Total Minor Criteria = _____ x 4 = _____ = b  Total Points earned = (a) + (b) = _____ = c  Total points of criteria checked  136 - _____ N/A Criteria points = _____ = d	<b>90 - 100</b>	<b>Excellent</b>
Percentage  {(c) / (d)} x 100 = _____ %	<b>80 - 89</b>	<b>Very Satisfactory</b>
	<b>75 - 79</b>	<b>Satisfactory</b>