

# Food Safety Knowledge: A Determinant of Sanitation Conditions in Local Restaurants

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## ABSTRACT

This research aimed to explore the influence of food safety knowledge employee hygiene management on food safety practices among local restaurant employees. This study was steered to focus on whether employee hygiene management contributed to increasing food safety practices among the local restaurants. There were 105 employees in five (5) different local restaurants in Santo Tomas who were chosen through convenient sampling. Two (2) research tools were adapted for this research. These were purposefully selected and modified to align with the study's objectives. This research study would utilize a quantitative research design incorporating both descriptive and correlational methods. The study reveals that there was moderate correlation between food safety knowledge and sanitation condition in local restaurants. The result shows that there is a significant relationship between food safety knowledge and sanitation condition. Therefore, this brought attention to the fact that owners, employees, customers, and future researchers are determined to value the importance of food safety knowledge to maintain food safety practices in local restaurants. Thus, future researchers should focus to investigate the effectiveness of maintaining the food properly by the food handlers. However, future researchers can add information to the body of knowledge.

**Keywords:** Sanitation Condition, Food Safety, Employee's Hygiene, Descriptive-Correlational, Philippines

## INTRODUCTION

Sanitation conditions play a vital role in ensuring effective systems that promote proper maintenance, cleaning, availability of handwashing facilities, waste management, and the overall success of cleanliness processes in food establishments (Asmelash & Abay, 2020). The level of sanitation in local food restaurants significantly impacts public health and safety, particularly in preventing infections caused by common foodborne pathogens. Compliance with hygiene standards varies widely globally, highlighting the urgent need for societies to address this issue promptly. While foodborne illnesses are preventable, they remain prevalent due to the health risks associated with non-compliance. Emphasizing sanitation in food establishments is essential for reducing the occurrence and impact of endemic foodborne diseases (Crim et al., 2019; Odeyemi et al., 2019).

The World Health Organization (WHO) highlights that in Ethiopia, inadequate food handling practices, lack of knowledge, and infrastructure deficiencies pose significant risks for foodborne illnesses (FBDs). Neglecting proper food handling protocols in large catering establishments could have severe consequences on public health (Osaili et al., 2019). Consequently, the central problem that the current study aims to solve is this conundrum. Ensuring food safety internationally is more important than ever, given the notable increase in international travel and food imports and exports (WHO, 2020).

In Santo Tomas, Davao del Norte, there are a lot of food restaurants that are selling and preparing food. Since there is no study about the sanitation condition in our locality, the researchers interviewed some of the employees in the food establishment. Employees have sanitary defects in flies as well as in exhaust fans where there are spotted feathers near the counter area (Maglente, 2024). Furthermore, Mariaca (2024) attested that one of the sanitary issues that their store faces everyday is the bird droppings outside especially in the parking area as well as in the glass pane.

In their study, the researchers aimed to address a gap in existing research by focusing on sanitation control and hygiene practices, particularly concerning employees in local restaurants (Jennifer L. Freeman, 2019). Their primary objective was to investigate the reasons behind poor hygiene and sanitation practices, as well as the potential implications for disease transmission and infections. The researchers identified the pressing need for this study due to the risk posed by mishandling and neglect of hygienic measures by food handlers. Such lapses could lead to the contamination of food by pathogenic bacteria, which may survive and proliferate to levels that can cause illness in consumers.

Recognizing the critical importance of this issue, the researchers embarked on a comprehensive study to shed light on these aspects of safety practices and hygienic practices in terms of food handling in restaurant settings.

Conversely, the researcher hopes to effectively present the study's findings firstly at our college institution. The researchers also intend to disseminate the findings of this study through utilizing online and offline platforms. And lastly, the researchers aim to disseminate the results to the primary beneficiary of this study which is the local restaurants in our municipality to engage our research in a wider community.

### **Statement of the Problem**

The main objective of this study was to uncover the correlation between food safety knowledge and actual on-site sanitation conditions within the local restaurants in Santo Tomas, Davao del Norte.

Specifically, below are the following questions that this study seeks answers:

1. What is the extent of food safety knowledge among employees in Santo Tomas, Davao del Norte local restaurants in terms of:

1.1 Food and Food-borne Diseases

1.2 Personnel Hygiene

1.3 Kitchen and Equipment

1.4 Contamination

1.5 Temperature Control and Food Preservation?

2. What is the extent of sanitation conditions in the local food establishments in Santo Tomas, Davao del Norte local restaurant in terms of:

1.1 Restroom

1.2 Dining Room Experience

1.3 Exterior

1.4 Food Handling

1.5 Employee?

3. Is there a significant correlation between food safety knowledge and sanitation conditions in local establishments employees?

### **Hypothesis**

The hypothesis was tested at 0.05 level of significance stating that there is no significant relationship between food safety knowledge and sanitation conditions in local restaurants.

## Theoretical Framework

This research is anchored on the Monitoring Food Contamination Theory by Hussain and Budak (2017), emphasized the paramount importance and difficulty of upholding food safety and hygiene standards for farmers, food industries, governments, and food technologists involved in the food supply chain. The presence of pesticides, toxins, veterinary drug residues, food-borne pathogens, and other harmful substances in a wide range of food items, stemming from different production phases like packaging and transportation, poses a global health challenge. Addressing this issue necessitates advanced and effective technologies for continuous and precise monitoring of food products throughout the entire production to consumption process.

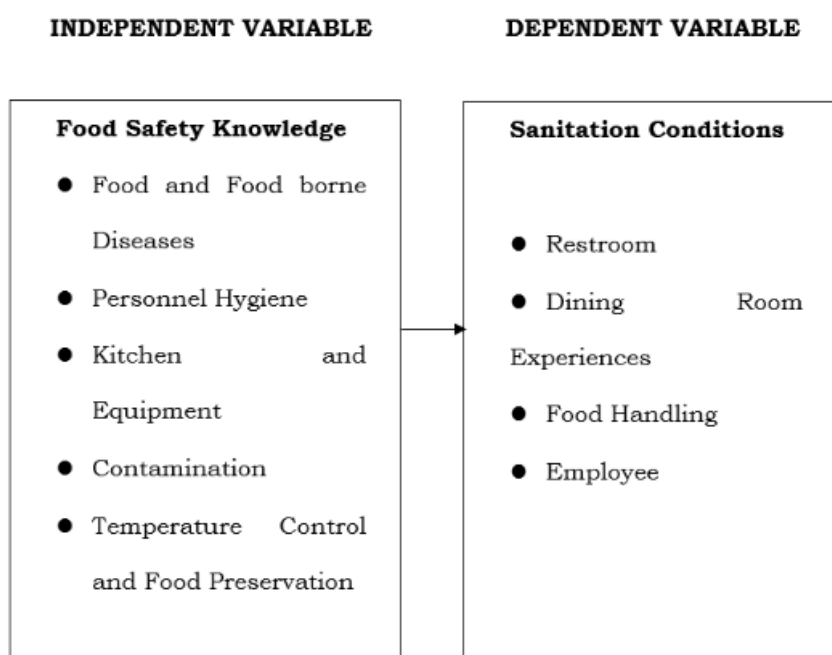
Additionally, the theory of Food Safety Culture: Establishing a Behavior-based Food Safety Management System highlights the current heightened awareness of food safety, the identification of new and emerging threats to the food supply, and the increasing trend of consumers consuming meals prepared outside their homes. To ensure success in Food Safety within this evolving landscape, it is essential to move beyond conventional methods like training, testing, and inspections to effectively manage risks (Springer, 2018).

Furthermore, the Food Sanitation Theory, now in its 6th edition, offers essential sanitation guidance required to maintain hygienic practices and ensure food safety for both food industry professionals and students. It covers key principles concerning contamination, cleaning agents, sanitizers, and cleaning tools. Additionally, the textbook provides detailed instructions on implementing these principles to achieve hygienic standards in food processing and preparation activities (Marriott, Schilling, and Springer, 2018).

## Conceptual Framework

Figure 1 presents the conceptual paradigm of the study. In this study, the independent variable examined was Food Safety Knowledge, utilizing indicators derived from Cumhur's (2021) research on "The Effect of Food Safety and Hygiene Education on the Knowledge Levels of Tourism Students."

The dependent variable under investigation was the state of Sanitation Conditions, with indicators sourced from the study conducted by Haeik Park, Barbara A. Almanza, Li Miao, Sandra Sydnor, and Soo Cheong (Shawn) Jang in 2016 on "Consumer Perceptions and Emotions regarding Sanitation Conditions in Full-Service Restaurants."



**Figure 1. The Conceptual Paradigm of the Study**

**Table 1**

Distribution of Respondents:

RESPONDENTS	Total No. of local restaurant Employee	Percentage
Restaurant A	14	13%
Restaurant B	50	48%
Restaurant C	30	28%
Restaurant D	5	5%
Restaurant E	6	6%
<b>Total:</b>	<b>105</b>	<b>100%</b>

## METHODOLOGY

This chapter covers numerous approaches employed in this study, including the research design, research subject, instruments used, data gathering procedures, and statistical technique of the data.

### Research Design

The research employed a quantitative research design that incorporated descriptive and correlational methodologies. Quantitative research involves the systematic investigation of phenomena and their characteristics using measurable data (Kandel, 2020).

The relationships between variables within the same population or across different populations were analyzed in various ways (Leedy & Ormrod, 2020). The study uses a quantitative descriptive correlational research design and employs a range of research methods to explore one or more variables, specifically focusing on service quality and customer satisfaction through the collection of numerical data (McCombes, 2020). Moreover, the study employed the correlational method to collect quantitative data concerning food safety knowledge and sanitation conditions in local restaurants. The descriptive approach was utilized to evaluate and depict the levels of safety knowledge and sanitation conditions among employees, utilizing mean tests for measurement. Additionally, a correlational approach was adopted to investigate the association between food safety knowledge and sanitation conditions among employees in local restaurants.

Furthermore, the chosen research design was address the primary objectives and interests of the study effectively. This broad classification ensured that all findings from the research will fell within a single category, aligning with the specific goals and focus of the study.

### Research Subject

The participants of this study were the employees in Barangay Tibal- og, Santo Tomas, Davao del Norte who worked at local restaurants. Collectively, respondent's population size for the study comprised 105 employees in total. Furthermore, this research employed a simple random sampling method to establish the sample size and identify the total number of respondents. According to the Qualtrics sample size calculator, considering a confidence level of 95% and a margin of error of 5%, the optimal number of participants targeted for this study was 83 employees out of the total 105.

### Research Instrument

This study used (2) adapted survey questionnaires. These were purposefully selected and modified to align with the study's objectives.

*Food Safety Knowledge Questionnaire (FSKQ)*. The FSKQ was considered a reliable instrument for measuring employee food safety knowledge by Bilgeri, (2021). It consisted of fifteen (15) questions with five (5) indicators which were food and food-borne diseases with three (3) items, personnel hygiene with three (3)

items, kitchen and equipment with three (3) items, contamination with three (3) items, and temperature control and food reservation with three (3) items. This study used a five Likert scales of food safety knowledge in local restaurants, the following range of means, descriptive equivalent, and interpretation applied.

Range of Means	Descriptive Equivalent	Interpretation
4.20-5.00	Very High	This meant that Food safety knowledge was always manifested in local restaurants.
3.40-4.19	High	This meant that Food safety knowledge was manifested in local restaurants.
2.60-3.39	Moderate	This meant that Food safety knowledge was sometimes manifested in local restaurants.
1.80-2.59	Low	This meant that Food safety knowledge was less manifested in local restaurants.
1.0-1.79	Very Low	This meant that Food safety knowledge was least manifested in local restaurants.

*Sanitation Condition Questionnaire (SCQ)*. The SCQ was considered a reliable instrument for measuring employee sanitation conditions by Haeik Park et, al. (2016) It consisted of fifteen (15) questions with five (5) indicators which were restroom with three (3) items, dining rooms experiences with three (3) items, exterior with three (3) items, food handling with three (3) items, and employee with three (3) items. This study used five Likert scales of sanitation conditions in local restaurants, the following range of means, descriptive equivalent, and interpretation applied.

Range of Means	Descriptive Equivalent	Interpretation
4.20-5.00	Very High	This meant that Sanitation conditions were always evident.
3.40-4.19	High	Sanitation conditions are evident.
2.60-3.39	Moderate	This meant that Sanitation conditions were sometimes evident.
1.80-2.59	Low	This meant that Sanitation conditions were less evident.
1.0-1.79	Very Low	This meant that Sanitation conditions were least evident.

## Statistical Treatment of Data

The statistical methods listed below utilized to analyze the data and assess the hypothesis at a significance level of alpha 0.05.

*Mean*. This method involved summarizing an entire dataset with a single number that represented the central point or typical value of the data. It was employed to evaluate the significance of the relationship between food safety knowledge and sanitation conditions in local restaurants, focusing specifically on addressing questions 1 and 2 of the research 1 and 2 of the study.

*Pearson r*. This method summarized the attributes of a dataset, focused on describing the strength and direction of the linear relationship between two variables. It was utilized to assess the importance of the

correlation between food safety knowledge and sanitation conditions among staff members in local restaurants, specifically addressing research question 3 of the study.

## RESULTS AND DISCUSSIONS

This section provided the examination and explanation of the data collected from employees in Barangay Tibal-og, Santo Tomas, Davao del Norte, employed in nearby restaurants, regarding their food safety knowledge and sanitation conditions. The organization of the data was structured according to the research problem outlined in Chapter 1.

### Level of Food Safety Knowledge in terms of Food and Foodborne Diseases

Table 2 displays the extent of food safety knowledge concerning food and foodborne illnesses. The table indicated that the average mean was 4.36, categorized as very high in the descriptive assessment, with a standard deviation of 0.65. This indicated that a consistently high level of food safety knowledge regarding food and foodborne diseases was manifested in local restaurants.

The analysis indicated that item number 3, focused on the presence of all microorganisms causing food poisoning, obtained the highest mean score of 4.41, with a SD of 0.68, signified a high level of manifestation in local restaurants. On the other hand, item number 2, which defined safety food as suitable for consumption after eliminating spoilage and contamination factors, received the lowest mean of 4.30 and a SD of 0.67, also indicated a very high level of manifestation. Despite being ranked the lowest, this suggested that food safety knowledge regarding food and foodborne diseases was consistently observed in local restaurants. All items related to food and foodborne diseases ranged between 4.30 and 4.41, with an equivalent description of very high, indicated that the overall average of food safety knowledge concerning food and foodborne diseases is consistently demonstrated in local restaurants. These findings highlighted that the level of food safety knowledge regarding food and foodborne diseases in local restaurants in Santo Tomas, Davao Del Norte, was notably high, particularly due to the significant presence of microorganisms that caused food poisoning.

**Table 2**  
*Level of Food Safety Knowledge in Terms of Food and Food-borne Diseases*

Items	SD	Mean	Descriptive Level
1. Food safety was important for the health of society.	0.61	4.36	Very High
2. Safety food was a food that was suitable for consumption by removing all kinds of spoilage and contamination factors.	0.67	4.30	Very High
3. All microorganisms cause food poisoning.	0.68	4.41	Very High
<b>Overall</b>	<b>0.65</b>	<b>4.36</b>	<b>Very High</b>

The findings indicated that the employees possessed a solid understanding of sanitation practices related to food safety, and maintaining cleanliness effectively within the restaurants. The result was consistent with earlier research by Ma et al (2019) stated the importance of understanding food poisoning when preparing food, and shows how street food vendors are becoming increasingly concerned about food safety. Additionally, handling, preparing, and cooking high-risk foods correctly was crucial for preventing foodborne illness (FDA, 2021). Thus, knowledge on high-risk food of street food vendors imparted useful affect how to handle food properly (Cho et al., 2020).

### Level of Food Safety Knowledge in terms of Personnel Hygiene

Table 3 illustrated the degree of food safety knowledge concerning personal hygiene. The table indicated an average mean of 4.35, classified as very high in the descriptive evaluation, with a standard deviation of 0.66.



This indicated a consistent manifestation of a high level of food safety knowledge regarding personal hygiene in local restaurants.

Table 3

**Level of Food Safety Knowledge in terms of Personnel Hygiene**

Items	SD	Mean	Descriptive Level
1. All personnel working in the food production area were carriers of microorganisms and may contaminate the food.	0.68	4.44	Very High
2. Personnel used separate shoes and clothing in the food production area.	0.57	4.30	Very High
3. Personnel working in the food industry payed attention to their hygiene for food safety.	0.74	4.31	Very High
<b>Overall</b>	<b>0.66</b>	<b>4.35</b>	<b>Very High</b>

Within the realm of Food Safety Knowledge related to Personnel Hygiene, the assessment revealed that the highest mean score of 4.44, accompanied by a standard deviation of 0.68, was attained for item number 1. This item highlighted that all staff members operating in the food production zone were carriers of microorganisms and could contaminate the food. The high descriptive equivalent indicated a consistent observation of this aspect. Conversely, item number 2, focusing on personnel utilizing distinct shoes and attire in the food production zone, obtained the lowest mean score of 4.30, with a standard deviation of 0.57, indicating a very high level of comprehension. Despite being ranked the lowest, this suggested that the food safety knowledge regarding personal hygiene was consistently evident in local restaurants. These findings underscored that preventing foodborne illnesses in local restaurants in Santo Tomas, Davao Del Norte, was achievable through adherence to good food hygiene practices, which reduced the risk of contamination by pathogens like bacteria, viruses, and parasites. The health of consumers and the success of businesses in the food industry relied on strict adherence to food hygiene regulations.

The study findings indicated that the employees upheld proper personnel hygiene practices to ensure food safety within the restaurants. These results aligned with Jaiswal's (2019) research, which highlighted the importance of food handlers possessing the necessary knowledge and skills to maintain cleanliness and adhere to food safety standards. Furthermore, according to Taner Tuncer et al. (2020), ensuring hygienic practices among food handlers is essential for minimizing the risk of food contamination in food establishments. Among these practices, maintaining hand hygiene was highlighted as more effective in preventing foodborne illnesses compared to cleaning and disinfecting surfaces that interact with food. Hence, it is crucial for food handlers to prioritize their hygiene routines as overlooking this aspect could compromise food safety. Additionally, as mentioned by Hillier MD (2020), the use of hot water for handwashing facilitates the opening of pores in the hands, aiding in the elimination of microorganisms.

**Level of Food Safety Knowledge in terms of Kitchen and Equipment**

Table 4 presents the assessment of food safety knowledge concerning kitchen and equipment. Item number 3 achieved the highest mean score of 4.47, signifying a very high level of understanding, with a SD of 0.65. On the other hand, item number 2, with the lowest mean of 4.26, still reflected a very high level of understanding, with a SD of 0.73.

The collective food safety knowledge regarding kitchen and equipment resulted in an overall mean of 4.39, demonstrating a very high level of comprehension. This implied that the procedures associated with kitchen and equipment was always manifested in local restaurants. Furthermore, a SD of 0.68 on the total mean indicated that the variability in sanitation practices concerning kitchen and equipment was close to the mean. This implies that employees had similar responses to this aspect. These findings highlighted that a good

understanding of food safety principles ensures that kitchen surfaces, utensils, and equipment are adequately cleaned and sanitized to eliminate harmful pathogens.

**Table 4**

*Level of Food Safety Knowledge in terms of Kitchen and Equipment*

Items	Mean	SD	Descriptive Equivalent
1. Grounds of the food production and service areas be smoothed, well-maintained, and kept dry.	4.26	0.73	Very High
2. Service personnel held the spoons, forks, and knives by the mouthparts.	4.46	0.67	Very High
3. Cleaning materials and food stored separately.	4.47	0.65	Very High
<b>Average</b>	<b>4.39</b>	<b>0.68</b>	<b>Very High</b>

The findings aligned with Auriga's (2020) research, which underscored the significance of not only maintaining a clean and sanitized kitchen and equipment but also practiced good hygiene. He also added that educating workers and food handlers about potential kitchen hazards was deemed essential, as pathogens have the potential to spread to various surfaces such as hands, cutting boards, utensils, countertops, and both cooked and raw food. Moreover, the findings corroborated the notion put forth by Okpala and Ezeonu (2020) that maintaining a clean and healthy kitchen is crucial for upholding a high standard of food hygiene and microbiological safety. Additionally, Kwol et al. (2019) underscored the significance of food service employees comprehending and actively engaging in food production and preparation tasks, including equipment maintenance in food handling zones, to reduce the chances of food contamination and ensure food safety protocols are upheld.

### Level of Food Safety Knowledge in terms of Contamination

Table 5 depicted the assessment of food safety knowledge regarding contamination. The average mean score was 4.25, with a SD of 0.66. It indicated a very high level of understanding. This suggested that the knowledge of food safety in terms of contamination was always manifested. Item number 1 obtained the highest average of 4.30, with a SD of 0.56, indicating a higher level of understanding. Item number 3 had the lowest mean of 4.19. All items related to contamination fell within the range of 4.19-4.30, with a descriptive interpretation of very high.

**Table 5**

*Level of Food Safety Knowledge in terms of Contamination*

Items	Mean	SD	Descriptive Equivalent
1. Counter, knives, and clothes were factors of cross-contamination to food.	4.30	0.56	Very High
2. Raw and cooked food stored together.	4.26	0.73	Very High
3. Meals that were not consumed after the service not be served by eating for consumption and discarded.	4.19	0.69	High
<b>Average</b>	<b>4.25</b>	<b>0.66</b>	<b>Very High</b>

Contamination, often stemming from improper handling of raw food and moist products, was a significant contributor to foodborne illnesses and transferred bacteria from one food item to another if not managed correctly (Carter, 2021). A recent study published in the American Journal of Tropical Medicine and Hygiene (2023) focused on assessing the food safety knowledge of meat handlers in Ethiopia, emphasizing the crucial role of contamination control in maintaining safe food handling practices and preventing foodborne illnesses.



Similarly, a study conducted on food safety knowledge, attitudes, and practices among street food handlers in the North Dayi District of Ghana highlighted the importance of preventing cross-contamination through the adoption of proper hygiene practices and food handling protocols. The research stressed the significance of regular handwashing, proper food storage, and the segregation of raw and cooked foods to reduce the risks of contamination (Samapundo et al., 2022).

### Level of Food Safety Knowledge in terms of Temperature Control and Food Preservation

Table 6 illustrates the assessment of food safety knowledge related to temperature control and food preservation. The descriptive assessment indicated a very high level of understanding, with an average mean score of 4.41 and an overall SD of 0.65. This indicates that food safety knowledge in terms of temperature control and food preservation is always manifested in local restaurants.

The equivalent description for all items related to temperature control knowledge was very high, ranging from 4.36 to 4.46. Item number 2 got the highest mean score of 4.46, with an equivalent description of very high, indicated that the understanding that microorganisms were killed by freezing food was consistently evident. Conversely, item number 3 got the lowest mean score of 4.36, also with an equivalent description of very high, highlighted the importance of refrigerator temperature in slowing down microbial growth and maintained constant temperature regulation. This underscored the employees' high level of understanding regarding temperature control practices, which were consistently observed.

These findings emphasized that having the proper knowledge ensures that perishable foods are stored at the correct temperature. Additionally, recognizing the importance of keeping hot foods at or above 140°F (60°C) and cold foods at or below 40°F (4°C) is essential in inhibiting the proliferation and transmission of pathogens.

**Table 6.**

*Level of Food Safety Knowledge in terms of Temperature Control and Food Preservation*

Items	Mean	SD	Descriptive Equivalent
1. Frozen food stored at negative eighteen degree Celsius.	4.41	0.68	Very High
2. Microorganisms were killed by freezing food.	4.46	0.68	Very High
3. Refrigerator temperature slowed down the microbial growth.	4.36	0.59	Very High
<b>Average</b>	4.41	0.65	<b>Very High</b>

In line with the findings, a study by Al-Mohaithef et al. (2021) highlighted the critical importance of proper temperature control in preventing microbial growth and foodborne diseases, emphasizing the expectation for food handlers to possess a solid comprehension of critical temperatures. Moreover, Putri & Susanna (2021) emphasized that knowledgeable and well-trained food handlers with positive attitudes and correct food handling techniques are crucial in preventing food contamination. Additionally, understanding the significance of temperature control for food safety, as noted by Saeed et al. (2021), has a positive impact on preserving food quality and safety.

### Summary on Food Safety Knowledge

In Table 7, a summary of food safety knowledge was presented. The descriptive equivalent was very high, with an overall mean score of 4.35 and an overall SD of 0.66. On the contrary, Contamination had the lowest mean of 4.25, also with an equivalent description of very high and a SD of 0.66. Despite being ranked the lowest, this signifies that contamination in local restaurants in Santo Tomas, Davao del Norte, was always manifested. These results emphasize the importance of improving food safety knowledge in local food establishments in Santo Tomas, Davao del Norte, with a specific focus on enhancing safety measures concerning kitchen and equipment.

**Table 7**

*Summary on Food Safety Knowledge*

Indicators	Mean	SD	Descriptive Equivalent
1. Food and Food-Borne Diseases	4.36	0.65	Very High
2. Personnel Hygiene	4.35	0.66	Very High
3. Kitchen and Equipment	4.39	0.68	Very High
4. Contamination	4.25	0.66	Very High
5. Temperature Control and Food reservation	4.41	0.65	Very High
<b>Overall</b>	4.35	0.66	<b>Very High</b>

The results aligned with the idea of Trafialek et al. (2018) and Osaili et al. (2022), indicated that the four factors of food safety knowledge played a crucial role in ensuring the safety of food. Furthermore, the study by Taha et al. (2020) emphasized that food handlers' knowledge of and adherence to good hygiene procedures for food safety not only raised awareness of the issue but also had a positive impact on how they handle food.

### Level of Sanitation Condition in terms of Restroom

Table 8 displayed the assessment of sanitation conditions regarding restrooms. The average score was 4.26, categorized as very high in the descriptive equivalent, with an overall SD of 0.68. This suggested that the sanitation conditions concerning restrooms in local restaurants in Santo Tomas, Davao del Norte, was always evident. All items in the table scored between 4.17 and 4.38, with a level description ranging from high to very high.

The findings highlighted that maintaining proper sanitation conditions in restrooms was crucial in preventing the transfer of pathogens to other areas, especially food preparation and serving areas. Contamination from hands or surfaces in restrooms facilitated the spread of bacteria and viruses to food and utensils, ultimately increased the risk of foodborne illnesses. By ensuring high standards of cleanliness and hygiene in restrooms, the potential for contamination and the associated risk to food safety can be significantly reduced.

**Table 8**

*Level of Sanitation Conditions in terms of Restroom*

Items	Mean	SD	Descriptive Equivalent
1. The toilets and urinals were well-maintained and clean.	4.22	0.71	Very High
2. Trash bins were available and not full.	4.17	0.69	High
3. The floor was clean.	4.38	0.66	Very High
<b>Average</b>	4.26	0.68	<b>Very High</b>

The results were in line with the study by Adam, Adongo, and Dayour (2021), which emphasized that the physical environment quality of a restaurant, including aspects like restroom facility condition, decor, spatial layout, and ambient conditions, played a significant role in customer satisfaction. A well-maintained and clean restroom contributed to customers' contentment, acceptance, happiness, and joy when dined at a restaurant. Research by Kim & Bachman (2019) indicated that over 80 percent of consumers view dirty restrooms as a reflection of the overall cleanliness of a restaurant. Customers were more likely to consume up to 25 percent more in a restaurant where they feel comfortable using the restrooms.

Furthermore, Lee (2020) cited that customer who reported high levels of satisfaction often described restaurant facilities as cozy, well-maintained, and clean. This underscores the importance of maintaining cleanliness and hygiene in all areas of a restaurant, including restrooms, to enhance customer satisfaction and overall dining experience.

## Level of Sanitation Conditions in terms of Dining Room Experience

In Table 9, the level of sanitation conditions regarding the dining room experience was presented. The overall mean score was 4.29, with a standard deviation of 0.68, indicated a very high level of sanitation conditions. This suggested that the dining room experience in local restaurants in Santo Tomas, Davao del Norte, was always evident.

The range of 4.25 to 4.37 for all items in the Dining Room Experience, with a descriptive level of very high, suggested that customers were content and satisfied with the dining room experience at local restaurants in Santo Tomas, Davao del Norte. This indicated that the dining room environment and overall experience provided by the restaurants met or exceeded customers' expectations, contributing to their happiness and satisfaction.

The findings highlighted the critical importance of maintaining correct temperature levels for preserving the taste, texture, and overall quality of food. Poor sanitation practices, such as unclean display units or improper storage, resulted in temperature control issues that had a detrimental effect on food quality. By ensuring proper sanitation and adherence to temperature control measures, restaurants uphold the integrity of their food products and provided customers with safe and high-quality dining experiences.

**Table 9**

*Level of Sanitation Conditions in terms of Dining Room Experience*

Items	Mean	SD	Descriptive Equivalent
1. The food smells fresh.	4.37	0.64	Very High
2. The food was in good quality.	4.25	0.68	Very High
3. Hot and cold foods were served/displayed at the right temperature.	4.25	0.72	Very High
<b>Average</b>	4.29	0.68	

Serhan (2019) stated that the quality of food and beverages encompasses aspects such as taste, freshness, nutrition, and portion size, which are essential components of food quality measurement. Food and beverage quality was a fundamental product of food service operations and was meticulously assessed for factors like temperature, texture, flavor, and aroma. Additionally, the restaurant's atmosphere affects the happiness of customers (Tian, et al. 2020). Furthermore, as noted by Kim (2022), the influence of the dining atmosphere on customer behavioral intentions was influenced by customer involvement, underscoring the significant role of ambiance in shaping customer behavior. The dining environment, included factors like cleanliness, comfort, and aesthetics, played a crucial role in enhancing the overall dining experience and influencing customer satisfaction and behavior.

## Level of Sanitation Condition in Terms of Exterior

In Table 10, the level of sanitation conditions regarding the exterior of local restaurants in Santo Tomas, Davao del Norte, was presented. The overall mean score was 4.28, with a standard deviation of 0.69, indicated a very high level of sanitation conditions. This suggested that the exterior areas of the local restaurants in Santo Tomas, Davao del Norte, was always evident. Item number 3 gets the highest average score of 4.37, with a SD of 0.61, indicating a very high degree of sanitation conditions in terms of exterior. Item number 1 had the lowest mean of 4.14, with a SD of 0.61. Despite Item No. 1 having the lowest average score, it still achieved a descriptive level of high, indicating that consumers are satisfied with the sanitation conditions in terms of the exterior of local restaurants in Santo Tomas, Davao del Norte. The range of scores for all items fell between 4.14 and 4.37, signifying a standard of sanitation ranging from high to very high, demonstrating the consistent satisfaction of consumers with the cleanliness and hygiene of the exterior areas of the local restaurants. The findings underscored the importance of a clean exterior in signaling good hygiene practices, which reassures customers about food safety and overall cleanliness standards maintained by the restaurants. Conversely, the

presence of overflowing trash bins, litter, or pests around the entrance can raise concerns about sanitation standards and deter diners from choosing to dine at a specific food establishment. Ensuring a tidy and well-maintained exterior is essential not just for making a favorable impression but also for building trust among customers regarding the restaurant's hygiene standards.

**Table 10**
*Level of Sanitation Conditions in terms of Exterior*

Items	Mean	SD	Descriptive Equivalent
1. The overall appearance of the building exterior was well-maintained.	4.14	0.71	High
2. The parking lot was clean and there was no litter.	4.33	0.74	Very High
3. The signage was clean and in good repair.	4.37	0.61	Very High
<b>Average</b>	<b>4.28</b>	<b>0.69</b>	<b>Very High</b>

Sanitation conditions, particularly in the exterior environment of a restaurant, play a crucial role in shaping customer perceptions and ensuring food safety. The exterior encompasses various elements such as the building façade, outdoor seating areas, landscaping, parking lots, and entrance cleanliness. Maintaining high standards in these areas is essential as they serve as the initial points of contact for customers and significantly impact their overall dining experience (S.M., & Sahu, G., 2022). By giving importance to cleanliness and hygiene in outdoor areas, restaurants can establish a favorable initial impression and inspire trust in customers regarding the excellence and safety of their dining setting. The cleanliness of the exterior environment plays a significant role in setting customer expectations and creating a positive first impression. A well-maintained exterior not only attracts customers but also influences their perception of the establishment. Research by Sulek and Hensley (2019) emphasized that the external appearance of a restaurant, which includes cleanliness and upkeep, is a crucial factor in both attracting new customers and retaining existing ones. Customers often link a clean exterior with the overall hygiene and quality of the establishment, influencing their decision to dine there.

Outdoor areas, including patios and seating spaces, require diligent maintenance to mitigate potential health risks. As per Jang and Namkung (2020), the cleanliness and maintenance of outdoor dining spaces are vital in improving the complete dining experience, resulting in higher customer satisfaction and encouraging return visits.

### Level of Sanitation Conditions in terms of Food Handling

Table 11 showcased the evaluation of sanitation conditions concerning food handling. Item number 3 achieved the highest mean score of 4.22, with a standard deviation of 0.72, denoting a very high descriptive level. On the other hand, item number 1 had the lowest mean of 4.14, with a standard deviation of 0.69, indicating a high descriptive level. The overall mean score was 4.17, with a standard deviation of 0.70, highlighting a high standard of sanitation conditions. This suggested that the sanitation conditions in term of food handling of local restaurants in Santo Tomas, Davao del Norte was evident.

A SD of 0.70 in the overall mean suggests that the measures of sanitation conditions in terms of food handling were closely clustered around the mean. These findings indicate that the employees of the local restaurants in Santo Tomas, Davao del Norte, achieved high results due to their knowledge of how to prepare safe food during the food preparation process. The employees were well-trained and knowledgeable about handling food, making it easier for them to adhere to correct procedures and ensure the safety of the food offered to their customers. This dedication to following correct food handling procedures helps uphold elevated levels of food safety and quality in the establishments.

**Table 11**

*Level of Sanitation Conditions in terms of Food Handling*

Items	Mean	SD	Descriptive Equivalent
1. Food was cooked adequately.	4.14	0.69	High
2. Flies were kept away from food.	4.15	0.70	High
3. There was no foreign object in the food or drinks.	4.22	0.72	Very High
<b>Average</b>	<b>4.17</b>	<b>0.70</b>	<b>High</b>

The results are consistent with recent studies emphasizing the importance of training in enhancing the efficiency of food handlers. Training programs that focus on proper handling techniques, appropriate approaches, and effective delivery methods have been shown to benefit food handlers significantly (Young et al., 2019). According to Taha et al. (2020), food safety training leads to improved efficiency among food handlers, resulting in reduced food loss due to mishandling. Proper training not only minimizes waste but also reduces the occurrence of foodborne illnesses. Moreover, findings from Jubayer et al. (2020) emphasized that proficient food handlers in the baking sector exhibit a heightened comprehension of food safety protocols and guarantee the secure and appropriate management of food in contrast to untrained handlers. This underscores the significance of ongoing training and education for food handlers to sustain elevated levels of food safety and quality in food service establishments.

### Level of Sanitation Conditions in Terms of Employee

Table 12 presents the assessment of sanitation conditions concerning employees. The overall mean score of 4.82, categorized as very high in the descriptive evaluation, suggests that the sanitation conditions regarding employee practices in local restaurants in Santo Tomas, Davao del Norte, was always evident. This reflects a firm dedication to cleanliness and hygiene among the restaurant staff, guaranteeing a safe and hygienic environment for both employees and customers. The range of scores for all items in sanitation conditions related to employees falling between 4.95 and 4.97, with a descriptive level of very high, further emphasizes the exceptional sanitation standards maintained by the employees at the local restaurants in Santo Tomas, Davao del Norte. This consistent demonstration of high sanitation conditions among the staff underscores their dedication to upholding cleanliness and hygiene practices in the workplace, ensuring a safe and healthy environment for all individuals involved.

**Table 12**

*Level of Sanitation Conditions in terms of Employee*

Items	Mean	SD	Descriptive Equivalent
1. Servers did not touch food when serving it.	4.53	0.61	Very High
2. The servers' hands were clean.	4.97	0.17	Very High
3. The employee is wearing proper attire and looks neat and clean.	4.95	0.32	Very High
<b>Average</b>	<b>4.82</b>	<b>0.36</b>	<b>Very High</b>



Implementing food safety and hygiene regulations can aid employees in comprehending their responsibilities in following proper work protocols, leading to a secure and hygienic work environment that promotes an efficient workforce (Rennie, 2020). Additionally, many food establishments mandate that their staff wear designated uniforms or other protective clothing while on duty to maintain cleanliness and hygiene standards (Hickman, 2020). According to the study by Abubakari et al. (2019), approximately 97.6 percent of customers consider employee hygiene to be a crucial factor that influences their intention to return to a food establishment. Customer return intention is vital for the success and longevity of any food business, highlighting the significant impact of employee hygiene practices on customer satisfaction and loyalty. Ensuring that employees maintain high standards of hygiene and cleanliness not only contributes to a positive dining experience but also plays a key role in building customer trust and loyalty.

Among all the items, employees received the highest average score of 4.82 with a SD of 0.36 reflecting a very high degree of sanitation conditions in terms of employee practices. On the other hand, food handling received the lowest mean score of 4.17 standard deviation, still reflecting a high level of sanitation conditions. This summary underscores the importance of maintaining cleanliness and hygiene standards across all aspects of restaurant operations, with a particular emphasis on the critical role of employees in upholding sanitation practices. The study highlighted the critical importance of sanitation conditions in restaurants, emphasizing that maintaining high standards is crucial for ensuring food safety and shaping customer perceptions. The research indicated that good food safety practices among food handlers were closely linked to factors such as training, supervision by health professionals, and routine medical checkups. This underscores the necessity for comprehensive sanitation protocols within the restaurant industry to uphold cleanliness, hygiene, and ultimately, the safety of the food served to customers (Gizaw, Teka, and Abreha, 2021). By prioritizing sanitation practices and implementing robust protocols, restaurants can enhance food safety, customer satisfaction, and overall operational excellence.

Maintained hygiene across various areas such as restrooms, dining spaces, and exterior environments, including parking lots and entrance cleanliness, plays a crucial role in ensuring a positive customer experience and upholding food safety standards. Regular cleaning and sanitizing of food preparation surfaces, proper food storage practices, and effective pest control measures are essential practices recommended by the FDA and the National Restaurant Association to prevent contamination and ensure compliance with food safety regulations (Citron Hygiene, 2023). The findings indicate that local restaurants in Santo Tomas, Davao del Norte have already adopted these measures to improve the quality of their food offerings.

In research conducted by Ncube, Kanda, Mpofu, and Nyamugure (2019), a model was put forward highlighting food handlers' food safety knowledge and attitudes as key factors influencing safe food handling practices. To improve food handlers' food safety practices, it is essential for food safety managers to concentrate on enhancing the food safety knowledge and attitudes of these individuals. Through a focus on ongoing education and training in food safety protocols, restaurants can enable their staff to uphold elevated levels of food safety and hygiene, ultimately safeguarding the health of their patrons and the prosperity of their business.

### **Summary on the Level of Sanitation Conditions**

In Table 13, the summary of sanitation conditions in local restaurants in Santo Tomas, Davao del Norte, was presented. The overall mean score was 4.36 overall standard deviation, indicating a very high of sanitation conditions. This suggests that the sanitation practices in these restaurants was always evident.

Among all the items, employees received the highest mean score of 4.82 standard deviation, reflecting a very high level of sanitation conditions in terms of employee practices. On the other hand, food handling received the lowest mean score of 4.17 standard deviation, still reflecting a high level of sanitation conditions. This summary underscores the importance of maintaining cleanliness and hygiene standards across all aspects of restaurant operations, with a particular emphasis on the critical role of employees in upholding sanitation practices.

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In a study by Ncube, Kanda, Mpofu, and Nyamugure (2019), a framework was proposed where food handlers' food safety knowledge and attitudes were identified as major determinants of safe food handling practices. To enhance food handlers' food safety behaviors, it is crucial for food safety managers to focus on strengthening the food safety knowledge and attitudes of these workers. By prioritizing continuous education and training on food safety practices, restaurants can empower their staff to maintain high standards of food safety and hygiene, ultimately ensuring the well-being of their customers and the success of their establishment.

**Table 13**

*Summary on the Level of Sanitation Conditions*

Indicators	Mean	SD	Descriptive Equivalent
1. Restroom	4.26	0.68	Very High
2. Dining Room Experience	4.29	0.68	Very High
3. Exterior	4.28	0.69	Very High
4. Food Handling	4.17	0.70	High
5. Employee	4.82	0.36	Very High
<b>Overall</b>	<b>4.36</b>	<b>0.62</b>	<b>Very High</b>

### Correlation of Food Safety Knowledge and Sanitation Conditions

The correlation analysis depicted in Table 13 indicated a notable association between Food Safety Knowledge and Sanitation Conditions in local restaurants in Santo Tomas, Davao del Norte. The correlation analysis revealed an r-value of 0.506 with a p-value of 0.001, lower than the standard significance level of 0.05, leading to the rejection of the null hypothesis. This indicates a strong and positive correlation between Food Safety Knowledge and Sanitation Conditions. Essentially, the findings suggest that the food safety knowledge within local restaurants in Santo Tomas, Davao del Norte significantly influences the sanitation conditions upheld in these establishments.

Specifically, a higher level of food safety knowledge among staff members is associated with higher standards of sanitation conditions, highlighting the importance of training and education in promoting food safety practices and maintaining a clean and hygienic environment in restaurants.

**Table 14**

*Significance of the Relationship Between Food Safety Knowledge and Sanitation Conditions*

Variables Correlated	r	p-value	Decision on H <sub>0</sub>	Decision on Relationship
Food Safety Knowledge and Sanitation Conditions	0.506	0.001	Rejected	Significant

In this research, food safety knowledge was assessed using five indicators to measure the practices followed by employees in local restaurants. Overall, the findings indicated that employees acknowledged and adhered to good standards concerning food safety practices within the restaurants. This aligns with the study by Hardstaff et al. (2019), which emphasized the significant impact of food safety knowledge on sanitation conditions. Research has consistently highlighted the importance of employees' knowledge, attitudes, and practices in preventing foodborne illnesses and upholding food safety standards.

Bensan and Annan (2022) emphasized that sanitation practices training plays a crucial role in influencing food safety behavior in the workplace. However, it is important to note that while knowledge-based training programs are essential, they may not automatically translate into improved food handling practices in the workplace. This underscores the importance of ongoing training, reinforcement, and supervision to ensure that employees effectively apply their knowledge of food safety practices in their daily work routines, ultimately enhancing food safety and minimizing the risk of foodborne illnesses. Furtehrmore, Elobeid et al. (2019) concluded that the level of food safety practices among food handlers working in fast-food restaurants at Qatar University was satisfactory, and reported a positive correlation between food safety knowledge and practice

## SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

### Summary of Findings

1. In the assessment of food safety knowledge levels, the item "Kitchen and Equipment" received the highest mean score of 4.39, indicating a very high level of understanding in this area, with a standard deviation of 0.68. Conversely, the item "Contamination" obtained the lowest mean score of 4.25, also reflecting a very high level of knowledge, with a standard deviation of 0.66. Despite being ranked as the lowest, the high mean score for contamination suggests that awareness and understanding of contamination issues in local restaurants in Santo Tomas, Davao del Norte, are consistently evident. This highlights the emphasis on maintaining cleanliness and preventing contamination in food handling processes within these establishments.

2. In the assessment of sanitation conditions, the overall mean score was 4.36, indicating a high level of sanitation conditions in local restaurants in Santo Tomas, Davao del Norte. This suggests that the sanitation practices within these establishments were consistently evident and maintained at a commendable standard. Among all the items, employees received the highest mean score of 4.82, reflecting a very high level of sanitation conditions in terms of employee practices. On the other hand, food handling received the lowest mean score of 4.17, still reflecting a high level of sanitation conditions. This highlights the importance of maintaining cleanliness and hygiene standards across all aspects of restaurant operations, with a particular emphasis on the critical role of employees in upholding sanitation practices.

3. The correlation analysis between Food Safety Knowledge and Sanitation Conditions revealed a significant relationship. The overall r-value of 0.506 with a p-value of 0.001, which is less than the conventional significance level of 0.05, indicates the rejection of the null hypothesis. This signifies that there is a substantial and positive correlation between Food Safety Knowledge and Sanitation Conditions in local restaurants in Santo Tomas, Davao del Norte. Essentially, the results suggest that the food safety knowledge of the local

restaurants has a notable impact on the sanitation conditions maintained in these establishments. A higher level of food safety knowledge among staff members is associated with higher standards of sanitation conditions, emphasizing the importance of training and education in promoting food safety practices and maintaining a clean and hygienic environment in restaurants.

## Conclusions

1. In the level of food safety knowledge was very high. The results of this study showed that the food safety knowledge had influenced on sanitation conditions of the local restaurants.
2. In sanitation conditions, a very high level was emphasized. This study showed that sanitation conditions influenced local restaurants effectively. Without the presence of the safeness of the food, the restaurant would not survived. Building good sanitation conditions is considered nowadays as a key priority for restaurants' success and performance. In order to achieve satisfaction and be able to compete with competitors, the restaurants fulfilled the customer's compassion by delivering safe and clean food.
3. There was a significant relationship between the level of food safety knowledge and sanitation conditions. It meant, that the higher the food safety knowledge, the higher the good sanitation conditions. Based on the results of this study, the relationship between food safety knowledge and sanitation conditions in local restaurants was found significant. For restaurants' owners, it was hoped that this study influenced them to implant more effective strategies in terms of food safety knowledge by providing good and safe food, to emphasize positive handling practices to ensure food safety.

## Recommendations

1. Restaurant owners were advised to prioritize food safety to prevent illnesses. This includes keeping food at safe temperatures, practicing good hygiene like handwashing, using clean equipment, storing food properly, and training staff on safety rules. By focusing on these areas, restaurants can ensure the quality and safety of their food, protect customers' health, and maintain their reputation. They should also stay informed about foodborne illnesses and cleanliness, and teach their staff through training sessions. The employees were recommended to wear appropriate hairnets and follow safety protocols while at work in order to avoid hazardous practices. Attending seminars and training about food safety knowledge and sanitation conditions to gain more knowledge and learn to ensure that the food is safe and clean was suggested.
2. The employees were recommended to wear appropriate hairnets and follow safety protocols while at work in order to avoid hazardous practices. Attending seminars and training about food safety knowledge and sanitation conditions to gain more knowledge and learn to ensure that the food is safe and clean is suggested.
3. The customer may choose food establishments that have good hygiene ratings and reviews. Observe the overall cleanliness of the establishments, including the dining areas and restrooms.
4. Future researchers were encouraged to investigate the efficacy of current educational initiatives regarding food safety knowledge and sanitation standards to enhance the expertise of restaurant employees. They understand that ensuring food safety involves eliminating factors that could cause illness. This includes maintaining food temperatures at 60°C or higher, proper storage practices, using separate and sanitized utensils and equipment, and appropriate disposal of waste materials. Additionally, they ensure that food served is thoroughly cooked and prepared, leftovers are stored correctly, market-purchased food is fresh and hygienic, and food containers are adequately covered when on display. Moreover, the research provide valuable insights and relevant data to facilitate the advancement and enhancement of the restaurant industry in the future.

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