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Total Quality Management Practices in the Production Department of Casual Food and Beverage Establishments

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Abstract

A restaurant's production department is considered one of the important areas for successful food and beverage operations. This study was anchored to determine the efficiency level of total quality management practices in kitchen operations among casual restaurants. The study also looked into problems encountered in kitchen operations. This study used descriptive research design to answer the food and beverage operations of selected casual dining restaurants in consonance with the total quality management practices. A valid and reliable tool was used with 25 respondent establishments in the study. The results of the study were treated using IBM SPSS. The study results showed that most restaurants operate for five (5) years or less, having ten (10) employees and less with 76 to 100 seating capacity. It was established that the Food and Beverage establishments were very efficient in the aspects of employee hygiene, food preparation, and kitchen operations but only efficient in preventing cross-contamination and sanitation practices. The study identified significant differences in the efficiency level in some variables using the establishment's profile, such as the number of years in operation, number of kitchen personnel, and seating capacity. The results of the findings would be useful for owners and managers of food and beverage establishments, especially in identifying areas for continuous improvements along with total quality management.

Keywords: Total quality management; continuous improvement; food production; casual restaurants

Introduction

The food industry aims to ensure its products' harmlessness and provide important information for its business partners along the food chain and consumers (Masum, 2019). There are numerous restaurants everywhere; they serve various dishes and different types of food uniquely. The good quality of the food and service by any restaurant is defined as meeting the consumer's expectations as if promised by the restaurant. The food should be properly prepared and the service should be on time and well-mannered. Many restaurants are unable to maintain their taste for a specific dish. Consistency in taste is what customers expect and is defined as quality food. Moreover, quality food is what is promised by the restaurant (Muhammad, 2019). Food safety and quality audits are used widely in the food industry for various reasons, such as to evaluate management systems, obtain certifications to certain food safety and quality standards, assess the condition of premises and products, and confirm legal compliance, among others.

The restaurants' primary objective is to provide comfort and satisfaction to guests without compromising the operational efficiency of the business. People today are so busy that most of the time they cannot find opportunities to spend their mealtime at home. In line with these, food operators started to create plans and execute the idea to provide the best product and services to customers that would not compromise the business's operational efficiency, leading to customer satisfaction (Barlan-Espino, 2017). Food safety is a fundamental health concern dependent on various factors such as changing global food production patter, public expectations, and international trade policies. As a member of the World Trade Organization, the Philippines has agreed to follow the Uruguay

Round of Trade Organization, the Sanitary and Phytosanitary Agreement, and Technical Barriers to Trade that permits countries to take legitimate measures to protect the life and health of their consumers about food safety matters (Rustia et al., 2021). Food safety implies the absence of, or acceptable and safe levels of, contaminants, adulterants, naturally occurring toxins, or any other substance that may make food injurious to health on an acute or chronic basis. Food contamination can occur at any stage of food production, and a high level of foodborne disease is caused by improperly prepared or mishandled foods. Food safety is a major concern in the Philippines for locals and tourists. Food safety in developing countries like the Philippines is especially challenging given its complex interaction with economic, social, and political factors that affect equally important food security and nutrition issues. (Collado, et al., 2015). The online food business is growing due to restrictions brought about by the pandemic. Training regarding acceptable procedures becomes crucial in reducing, if not eradicating, incidences of foodborne disease (FBD) outbreaks. Awareness and application of food safety protocols are of paramount importance in preventing FBD in the country, particularly during the COVID-19 pandemic (Limon, 2021). Everyone has the right to safe, nutritious, and sufficient food. Still today, almost one in 10 people fall ill, and 420,000 die after eating contaminated food. When food is unsafe, children cannot learn, and adults cannot work. Human development cannot take place. Foodborne diseases impede socioeconomic development by straining healthcare systems, impairing productivity, and harming national economies, tourism, and trade. Unsafe food containing harmful bacteria, viruses, parasites, or chemical substances causes more than 200 diseases, ranging from diarrhea to cancer. Foodborne diseases may lead to long-lasting disability and death. In the Philippines, over 17,000 people had acute bloody diarrhea in 2018. Food can become contaminated at any point, from production to consumption. While the primary food safety responsibility lies with food producers, many foodborne diseases are caused by improperly prepared or mishandled food at home, in the foodservice establishments, markets, or even on farms. More work needs to be done for food safety, including enforcement and implementation of food safety regulations, capacity-building of food safety inspectors, provision of adequate funding and human resources, and improved communication. Leaders and policymakers at the national and local levels must have a stronger political will to prioritize food safety and go beyond the “business as usual” and “traditional” approaches (Weiler & Fernandez, 2019).

The restaurant industry represents an important sector in many countries economies (Mensah & Mensah, 2018). According to the level of service clients receive, the restaurant business consists of four major segments. (1) Full service, i.e., usually offering menu selections and the price can vary between moderate and greatly expensive; (2) Quick service, i.e., fast-food chains and casual restaurants that offer buffets and take-out service and emphases on minute preparation and serving time, and relatively inexpensive; (3) Eating and drinking place segment that includes caterers and refreshment stand vendor; (4) Retail host can be restaurants that located within gas stations and grocery stores like franchisees of major brands, such as specialty coffee or fast-food chains (Akers, 2019). The food industry, specifically the restaurant sector, is an important segment of society that changes the living style due to the impact of the health pandemic. With the onset of static quarantine pronouncement at the government's national and local levels, the restaurant sector resorted to a delivery arrangement whenever dining-in was impossible. Dalin-Kaptzan (2022) cited that food delivery is the trend this year. According to him, it has never been easier for food companies to reach their customers. Restaurant delivery has grown 20% in the last five years; while estimates differ, online food delivery sales are estimated to grow as high as – 40% of total restaurant sales. Restaurant chains are increasingly partnering with multiple third-party fleets to expand their delivery footprint across all their stores and at all times of the day.

The increased interest of consumers in food safety and quality matters, triggered mainly by recent food scandals, has enabled the public and private food sectors to develop a variety of food safety and quality standards. (Kotsanopoulos and Arvanitoyannis, 2017). Quality has become a fundamental issue for organizational success in today's dynamic business environment. In line with the concept of quality, Total Quality Management (TQM) has been seen as a revolution in management whereby it not only began to exert its strong effect on the national business system but is also referred to as a comprehensive approach for total organizational performance improvement (Yeng et al., 2016). The continuous improvement in good practices and implementation of hazard analysis and critical control points (HACCP) remains crucial for food hygiene quality safety. Food processors are obliged to ensure food products meet the required quality safety standards through food safety standards. If quality management works, moral values must be developed and maintained. Good practices have a common objective if carried out effectively and efficiently: to compulsorily ensure a high-quality level of food product hygiene and consumer safety (Okpala & Korzeniowska, 2021). HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement, and handling, to manufacturing, distribution, and consumption of the finished product (Hazard Analysis and Critical Control Point, n.d.).

According to Esinulo (2018), in his study on food safety participated by nursing students of selected universities in Baguio City, food, alongside other basic human needs, remains indispensable for survival and healthy thriving. However, on the contrary, human survival becomes threatened when this everyday necessity becomes a source of potential hazard due to negligence, lack of adequate knowledge, or unsafe practices, as the case may be. People's food safety knowledge, attitude, and practices play a major role in the incidence of foodborne diseases; therefore, they must be constantly assessed. Food safety is linked with food sanitation, as emphasized in the report of Catajan (2019). She cited an ordinance setting standards to safeguard public health and ensure the cleanliness and overall sanitation of all business establishments operating in Baguio. The measure also includes standards for preparing, storing, and serving food and drinks. This legislative measure is given another phase of importance in a report written by Epian (2022), indicating, among others, a high level of engagement of the local executive body in "*making Baguio City a healthy happy urbanized city.*" The article mentioned that the mayor is bent on cleaning up Baguio, emphasizing cleanliness during the inspections of the establishments, adding that poor sanitation leads to various diseases. This move stemmed from the 15-point agenda of the city government formulated by the executive and legislative departments. The said legislative measure is proof that the current administration under Mayor Benjamin Magalong has acknowledged a barrage of problems for the city government to manage, including problems on environmental degradation, peace and order, and health and sanitation, among other concerns. The 15-point agenda also stresses focusing more on the health and well-being of city residents, especially children, that led to the inspection of business establishments serving foods to comply with the city's health and sanitation code.

Objectives of the Study

In order to establish adherence to TQM practices and address the impact of the COVID-19 pandemic in general, the study attempts to determine operational efficiency in the production department or kitchen among selected restaurants in Baguio City. Specifically, the study will describe total quality management (TQM) practices in light of the present pandemic to understand the present predicaments encountered by the restaurant sector. It is also important to find out problems encoun-

tered in the production section among selected restaurants in Baguio City in sustaining quality management.

Materials and Methods

This study utilized a descriptive method to explore the operational efficiency in the production department or kitchen among selected restaurants in Baguio City. The study used a questionnaire survey and considered kitchen personnel in the production area of the 25 restaurant establishments. The questionnaire was tested for its validity and reliability through a sample size where it was established to be highly reliable. The researchers sought the approval of the establishments' managers and, after that, distributed and retrieved the questionnaires. The data privacy of participants was protected, and data gathering procedures aligned with the Data Privacy Act of 2012. There was at least one respondent in each of the food establishments. The statistical tools used in this study include frequency, percentage, weighted mean, and analysis of variance **(**ANOVA). A Likert scale was utilized for the analysis and interpretation of the quantitative data with the following range: 1.00 - 1.75 = Very Inefficient (VI); 1.76 – 2.50 = Inefficient (I); 2.51 – 3.25 = Efficient (E); and 3.26 – 4.00 = Very Efficient (VE). The data gathered were processed using IBM SPSS. The findings and results of the study will be disseminated to the hotel and restaurant association of Baguio to properly address the challenges and concerns identified.

Results and Discussions

The 25 participating restaurant establishments are distributed as follows: 11 (44%) are operating for at least five (5) years, seven (7, 28%) of which are established for 6-10 years, five (5, 20%) from 11-15 years while the remaining two (2, 8%) restaurants are in business from 15 to 20 years. In terms of the number of kitchen employees, most of the establishments have at least 10 (11, 44%) employees in the production area or kitchen, some with eight (8, 32%0) workers while only three (3, 32%) employees only in each of the remaining restaurants that participated in this study. Data on the establishment's seating capacity showed that the majority (19, 76%) of them have 76-100 seats, five (5, 20%) seats, and only one (1, 4%) with 20 to 50 seats available for dining service.

Table 1 presents the various practices referred to in this study: personal hygiene; cross-contamination prevention and sanitation, food preparation; and restaurant assessment on the aspect of kitchen operations.

Table 1. Level of efficiency in TQM practices

A. Personal Hygiene	**Mean**	**SD**	**Description**
1. I wash my hands for at least 20 seconds with soap and running water	3.80	0.41	VE
2. I wash my hands before and after preparing food.	3.64	0.49	VE
3. I wash my hands after sneezing and coughing.	3.88	0.33	VE
4. I wash my hands after handling garbage.	3.76	0.52	VE
5. I wash my hands after using the toilet.	3.76	0.44	VE
6. I cover my mouth when sneezing or coughing.	3.84	0.37	VE
7. I wear a clean apron and clothing when preparing food.	3.76	0.44	VE
8. I change my clothing and apron when they get dirty.	3.52	0.71	VE
9. I remove any jewelry when preparing food	3.56	0.71	VE

10. I take a bath before and after preparing food.	3.88	0.33	VE
Sub Means	3.74	0.48	VE
B. Cross-contamination, Prevention, and Sanitation	Mean	SD	Descrip-tion
1. I clean my working area before and after food preparation.	3.88	0.33	VE
2. I use the same knife to cut raw meat, poultry, and vegetables.	2.80	1.12	E
3. I sanitize knives used for raw foods before using them for other types of food.	3.68	0.75	VE
4. I use different chopping boards for raw meat, poultry, bread, fish, and fresh vegetables and fruit.	3.64	0.64	VE
5. I use sanitizer when washing service utensils (plates, mugs, and spoons).	3.64	0.64	VE
6. I wear my apron when I go to the restroom.	1.36	0.76	VI
7. I talk, sing, and whistle during my preparation/cooking/packing	1.56	0.58	VI
8. I eat during my preparation/cooking/packing.	1.64	0.64	VI
9. I handle money during my preparation, cooking, and packing.	1.56	0.58	VI
10. I use my cell phone during my preparation/cooking/packing	1.72	0.98	VI
11. I use gloves when handling raw foods.	3.08	0.95	E
12. I change gloves between handling raw and ready-to-eat foods	3.20	0.82	E
13. I use protective clothing (apron) when handling raw foods.	3.68	0.56	VE
14. I use a cap when I handle food.	3.72	0.61	VE
15. I use a cap and mouth cover/spit guard/mask while handling food.	3.84	0.37	VE
Sub Means	2.87	0.69	E
C. Food Preparation	Mean	SD	Descrip-tion
1. I practice first in and first out when handling food.	3.36	0.57	VE
2. I keep raw foods separate from cooked and ready-to-eat foods.	3.64	0.57	VE
3. I properly clean the food storage area before and after storing new products.	3.52	0.59	VE
4. I check the refrigerator's temperature before storage.	3.60	0.65	VE
5. I store cooked foods in the refrigerator separately with the label.	3.44	0.51	VE
6. I leave the leftovers at room temperature for a few hours and then freeze them.	1.68	0.99	VI
7. I thaw (frozen substance, such as food to become liquid or soft as a result of warming.) frozen fish, meat, and poultry using running water	2.24	0.93	I
8. I inspect raw materials before buying and using them in my food products.	3.56	0.51	VE
9. I use an appropriate thermometer to check the temperature of the food.	3.52	0.59	VE

10. I check food expiry dates.	3.92	0.28	VE
11. I label my food products as to their ingredients.	3.48	0.71	VE
12. I label my food products as to their ingredients.	3.24	0.93	E
Sub Means	3.27	0.65	VE
D. Assessment of the Restaurant on the Aspect of Kitchen Operations	Mean	SD	Description
1. The kitchen can accommodate a maximum of 7-10 employees adequate for working	3.76	0.44	VE
2. The kitchen is well equipped with a range, working table, sink with faucet, cabinets, drawers with lockers, and refrigerators	3.80	0.41	VE
3. Sinks are provided with proper drainage and grease traps to prevent the clogging of pipes	3.80	0.41	VE
4. Electric fans and exhaust fans are installed for air circulation and proper ventilation	3.88	0.33	VE
5. The kitchen is properly lighted, well-ventilated, screened, and has exits	3.88	0.33	VE
6. The kitchen layout allows smooth traffic flow, and employees can work freely without interference from others	3.52	0.59	VE
7. The kitchen rules and regulations are strictly implemented.	3.52	0.59	VE
8. All cooking equipment is available.	3.56	0.58	VE
9. Waste bins are provided with proper waste disposal signage.	3.64	0.57	VE
10. The stock of ingredients is always complete	3.16	0.80	E
Overall Mean	**3.65**	**0.50**	**VE**

Legend: Very Inefficient (VI), Inefficient (I), Efficient (E), Very Efficient (VE)

All indicators in Table 1 (A, 1-10) under personal hygiene are always observed (M=3.65), implying its importance during food production. Food safety has become a major worldwide problem. Sanitation and personal hygiene are very important in our life. Food safety not only protects the food production process but can also improve health and provide nutrition. Hygiene, sanitation, and food safety are prerequisites in food preparation. It includes various aspects of personal hygiene, clothing, equipment, and the working premises for processing or manufacturing food (Mansor et al., 2018). Washing hands after sneezing and coughing and bathing before and after preparing food (M= 3.88) generated the most observed practices. Changing clothing and apron when they get dirty (M = 3.52) is one of the practices that the kitchen employees likely observe. The data shows that restaurant workers are aware of the essential contribution of personal hygiene in the production area.

Handwashing is one of the most important things a person can do to prevent food poisoning when preparing food. Hands can spread germs in the kitchen. Some of these germs, like *Salmonella*, can make any very sick. Washing hands frequently with soap and water is an easy way to prevent germs from spreading around the kitchen and to other foods (Handwashing: A Healthy Habit in the Kitchen. (n.d.). The importance of handwashing in food preparation cannot be

underestimated; it is a key tenet of good food hygiene. Anyone preparing food, at work or home, washing hands well and often, lest anybody can face the consequences.

Bacteria can spread easily through physical contact. In a kitchen, this can spread into the prepared food. The washing of hands means reducing the likelihood that any bacteria present will transfer to a second location (The Importance of Handwashing in Food Preparation, 2017). All staff should wear clean clothes when working with food. Ideally, they should change into clean work clothes before starting work and not wear these clothes outside food preparation areas. Clothes can bring dirt and bacteria into food preparation areas. Wearing clean clothes helps to prevent this. Ideally, all staff should wear light-colored with no external pockets. It is also a good idea to wear a clean apron or disposable apron over work clothes. Work clothes should minimize skin coming into contact with food and prevent hairs, fibers, and the contents of pockets (which can carry bacteria) from getting into food. Light colors show dirt clearly. Aprons help to stop dirt and bacteria from getting onto work clothes, and they can be removed easily for washing or thrown away if disposable (Safe Method. Personal Hygiene and Fitness To Work, n.d.).

Respondents have different levels of observation on Cross-contamination Prevention and Sanitation (B, M = 2.87) practices implying that some of the indicators are either mostly or least observed during working in the kitchen. This result also connotes that restaurant employees understand the implication of poor sanitation causing cross-contamination on food and, therefore, must be prevented from posing a threat to human consumption. Cross-contamination occurs when harmful bacteria are transferred to foods, which can result in serious health risks like food poisoning or unintended exposure to food allergens. When cross-contamination occurs, disease-causing microorganisms, like bacteria and viruses, are transferred from one food to another. As a result, cross-contamination is one of the leading causes of foodborne illness. Cross-contact is most frequently caused by unwashed cutting boards, hands, or kitchen tools like knives and tongs. If the kitchen staff members know how to prevent cross-contamination by correctly storing and preparing food, the business can save the time and money wasted on improperly handled food (How to Prevent Cross-Contamination, 2020). Cleaning the working area before and after food preparation (M = 3.88) is always practiced in the kitchen area, while wearing an apron to the restroom (M = 1.36) is never observed.

Maintaining a clean work environment is critical in preventing foodborne illness. Bacteria can grow on unsanitary surfaces and then contaminate food. Just because a work surface looks clean does not mean it is sanitary. It is important to always ensure that you clean and sanitize a work area before starting to prepare food (9 Workplace Sanitation, n.d.). The restroom is an example of how germs can prowl and is often the most unexpected place. Thus, maintaining a serious environmental risk is critical to protecting public safety. It is where bacteria become airborne and could land on food taken into a restroom (White, 2017). Talking, singing, and whistling during food preparation/cooking/packing as well handle money during food preparation, cooking, and packing. (M = 1.56) Moreover, some practices are avoided. These practices restaurant employees generally observed (M = 3.27) the different food preparation practices. The kitchen personnel always perform the following: checking the food expiry dates. (M= 3.92), keeping raw foods separate from cooked and ready-to-eat foods (M=3.64), checking the refrigerator's temperature before storage (M=3.60), inspecting raw materials before buying and using them in my food products (M=3.56), properly cleaning the food storage area before and after storing new products (M =3.52), using an appropriate thermometer in checking the temperature of the food (M=3.52), labeling the food products as to their ingredients (M= 3.48), and observing first in and first out when handling food (M-3.36), stor-

ing cooked foods in the refrigerator separately with the label (M=3.44). Most of the time, respondents label the food products according to their allergy risks and ingredients (M= 3.24).

Expiration dates are meant to serve as a guideline on the quality of food products and safety for consumption. Mishandling fresh food at room temperature for an extended period is prone to developing foul odor, flavor, or appearance; thus, consuming it may be unsafe. According to Hebebrand (2021), food products often come with an expiration date. Manufacturers and stores sometimes use different wording for expiration dates. The dates on food labels are not usually related to food spoilage. Instead, the dates tell how long food maintains the best taste and texture. Anderson and Li (2020) mentioned that food and ingredient manufacturers often include production dates, optimal consumption dates, and spoilage information. There are many other ways to identify expired foods and ingredients if there is no precise expiration date. Often there will be a change in the color, texture, consistency, odor, and taste caused by microbes and oxidation. Microbes that spoil foods and ingredients are undesirable bacteria, fungi, and yeasts that can grow in our food products. These microorganisms feed off the foods' nutrients and can cause serious harm to humans if consumed. Bacteria such as listeria and botulism can invade foods and, if consumed, can cause us to become critically ill. Less harmful bacteria, fungi, and yeasts will grow on foods making them inedible.

Leaving leftovers at room temperature for a few hours and then freezing them (M=1.68) is never practiced, while thawing meat and fish products using running water is sometimes (M=2.24) observed. Letting uneaten food linger on the counter for more than 2 hours is an unacceptable practice. The longer a dish sits at room temperature, the more susceptible it is to bacteria growth. It is important to thaw foods safely because bacteria can multiply when food is left out of the refrigerator for more than two hours and only one hour if the temperature is hotter. There are three ways to thaw meat and fish products, but thawing in running water is not among them. These include using cold water, the microwave, or even inside the refrigerator by placing the frozen food on a plate or in a container to catch any juices that may leak or keeping the item on the bottom shelf of the refrigerator. Due to the limited time to thaw food before cooking, it is safe to cook foods from a frozen state — but your cooking time will be approximately 50% longer than for fully thawed foods. Most frozen vegetables can be cooked without thawing (Klemm, 2020).

The back-of-house operations of a restaurant are always the busiest**.** In a restaurant kitchen, food is prepared on a large scale. Multiple batches of the same dish are made throughout the day. The kitchen staff is always on their toes, creating and recreating enjoyable meals for customers. The pressure is higher when chefs get repeat orders (Singh, 2019). The overall operations of restaurant kitchens in Baguio City are generally above the acceptable standards (M=3.65), implying that the majority of the essential requirements are met in terms of staff, equipment, ventilation, space requirements; waste, and disposal systems; and kitchen policy among others. Lighting and ventilation (M=3.88) are considered the most important aspects of kitchen operation among restaurants in Baguio City. This result is collaborated by the position of Singh (2019), saying that Constant smoke, fire, and other fumes tend to blacken the kitchen walls and block the ventilator fans. The data not only makes the restaurant kitchen look bleak but also makes it unhealthy for people to work and cook there. As a part of the kitchen management solution, safety must be considered a priority.

In terms of stock of ingredients, restaurant establishments make sure there is a sufficient inventory (M=3.16). Because food is the majority of a restaurant's inventory, how well a restaurant handles inventory is vital to its success. At its core, inventory management helps companies know how much stock to order and when. Inventory management helps restaurants keep the right amount of food and ingredients on hand so they have enough stock to serve all customers and avoid spoilage

and loss. Restaurants are more likely to find long-term success if they practice effective inventory management (Jenkins, 2021).

Table 2. Problems encountered in kitchen operations

Problems Encountered in Kitchen Operations	Mean	SD	Descrip-tion
1. Delayed delivery of stocks	2.12	0.53	I
2. Interchanging the cost of commodities and supply	2.20	0.50	I
3. Shortage or low water supply	1.84	0.69	I
4. Lack of necessary equipment and machines	2.00	0.96	I
5. Malfunction of equipment and machines	1.80	0.82	I
6. Pilferage and leftover foods	1.68	0.48	VI
7. Ventilation is not properly working	1.92	0.70	I
8. Lack of supplies for the operation	2.00	0.58	I
9. Waste segregation program not followed	1.76	0.66	I
10. Clogged sinks result from delays in service	2.48	1.05	I
Overall Mean	1.98	0.70	I

Legend: Very Inefficient (VI), Inefficient (I), Efficient (E), Very Efficient (VE)

Restaurants (Table 2, M = 1.98) undoubtedly experienced certain issues and concerns in their daily operations. This result implies that it is inevitable for this sector to encounter problems in its day-to-day operations. All businesses are suffering today. One industry that is especially visible and emblematic of our economic struggles is restaurants. Restaurants are struggling due to the pandemic. Restaurant owners must find creative solutions to survive in this new environment (Mohammed, 2020). Pilferage and handling of leftover foods (M=1.68) are major concerns among restaurant players in Baguio City. Leftover food is something no restaurant can avoid. It accumulates at the end of the working day and is often just thrown away at night. Food waste has no place in the kitchen, so it will be removed from the setting as soon as possible for health and safety reasons. Many restaurants start from scratch daily because customer safety and satisfaction are their number one priority. Another concern restaurants found to affect kitchen operations causing a delay in service, is sink clogging (M=2.48). Clogged kitchen sinks are among the most common drainage issues to plague because food debris and soap residue are nightmares for smooth draining. Among the few causes include washing the dishes after dinner, food washed off of the plate down the drain scrubbing and rinsing the frying pan, among others (Team HomeServe., 2020).

The significant values (Table 3) are less than 0.05, indicating that there are significant differences in the level of efficiency in the observance of personal hygiene, specifically the washing of hands with soap and water (.004) and avoidance of cross-contamination practices(.049) among restaurant establishments that are in business operating longer than others.

This result implies that the number of years of existence defines observance of food standard procedures. The best way to gain customers' trust is personal hygiene in the restaurant and implementing hygiene standards and procedures for the staff. Each person working with food must maintain a high degree of cleanliness, thus, it is extremely important to maintain food health standards (Behmen-Milicevic, n.d). The most important tool in a kitchen is the knife to complete any kind of work. Because the right tools will make a job or cooking easier, it is very effective in preparing a

great meal (Yummiest Food, 2021). Using knives to cut certain foods is one step closer to preventing foodborne illnesses (Alfaro, 2022).

Table 3. Significant differences in the level of efficiency in TQM practices based on years of operations

1.1. wash my hands for at least 20 seconds with soap and running water	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	5.637	3	1.88	5.98	0.004
Within Groups	6.603	21	0.31		
Total	12.240	24			
2. I use the same knife to cut raw meat, poultry, and vegetables.	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.190	3	3.06	3.09	0.049
Within Groups	20.810	21	0.99		
Total	30.000	24			

The data in Table 4 shows less than .05, indicating significant differences in efficiency in terms of food cross-contamination (0.040), prevention, and food preparation (0.013 and 0.037). This result signifies that the number of personnel can affect the observance of TQM practices.

Table 4. Significant differences in the level of efficiency in TQM practices based on kitchen employees

Number of Kitchen Employees					
1. I sanitize knives used for raw foods before using them for other types of food.	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	4.228	3	1.41	3.21	0.040
Within Groups	9.212	21	0.44		
Total	13.440	24			
2. I use an appropriate thermometer to check the temperature of the food.	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.270	3	1.1	4.61	0.013
Within Groups	4.970	21	0.2		
Total	8.240	24			
3. I label my food products as to their ingredients.	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.998	3	1.33	3.40	0.037
Within Groups	8.242	21	0.39		
Total	12.240	24			

The finding validates the direct relationship between the number of employees and observance of personal hygiene practices and food preparation practices. Carey (n.d.) states that restaurant employees must know proper food-handling practices to ensure food safety. A well-trained staff would know how to store certain foods at their required temperatures or the need to wash their hands before engaging in the cooking process. Employees who understand food safety practices can avoid cases of food poisoning and prevent food spoilage or waste due to contamination. They also will make sure the restaurant meets all food-safety codes. Storage and packaging practices help assure proper ingredient usage and food safety. The food that is not in its original packaging must be labeled. In addition to labeling, dating items requires special attention. All foods that require time and temperature control (TCS) should be labeled (Waalke, 2022).

The data in Table 5 shows a significant level of differences with a value of less than .05 in the efficiency across the major aspects of the TQM practices attributed to the seating capacity of the establishment. This implies that the seating capacity of the restaurant has a great effect on the observance of the employees' hygiene (1 =0.001; 2 = 0.000; 3=0.000 and 4 = 0.003), cross-contamination practices (5 = -6), food preparation (7 = 0.001), and overall kitchen operations (8 = 0.041, 9 = 0.041, and 10 =0.04).

Table 5. Significant differences in the level of efficiency in TQM practices based on the seating capacity

1. I wash my hands for at least 20 seconds with soap and running water	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	1.853	2	0.93	9.49	0.001
Within Groups	2.147	22	0.10		
Total	4.000	24			
2. I wash my hands after handling garbage.	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.413	2	2.21	22.60	0.000
Within Groups	2.147	22	0.10		
Total	6.560	24			
3. I wear a clean apron and clothing when preparing food.	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.813	2	1.41	17.71	0.000
Within Groups	1.747	22	0.08		
Total	4.560	24			
4. I remove any jewelry when preparing food	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.002	2	2.50	7.69	0.003
Within Groups	7.158	22	0.33		
Total	12.160	24			
5. I use different chopping boards for raw meat, poultry, bread, fish, and fresh vegetable and fruit.	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.602	2	1.30	4.00	0.033
Within Groups	7.158	22	0.33		
Total	9.760	24			

6. I use sanitizer when washing service utensils (plates, mugs, and spoons)	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.971	2	2.99	17.33	0.000
Within Groups	3.789	22	0.17		
Total	9.760	24			
7. I thaw (frozen substance, such as food to become liquid or soft as a result of warming.) frozen fish, meat, and poultry using running water	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.571	2	4.79	9.58	0.001
Within Groups	10.989	22	0.50		
Total	20.560	24			
8. The kitchen is well equipped with a range, working table, sink with faucet, cabinets, drawers with lockers, and refrigerators	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.011	2	0.51	3.72	0.041
Within Groups	2.989	22	0.14		
Total	4.000	24			
9. Sinks are provided with proper drainage and grease traps to prevent the clogging of pipes	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.011	2	0.51	3.72	0.041
Within Groups	2.989	22	0.14		
Total	4.000	24			
10. The stock of ingredients is always complete	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.1389	2	3.069	7.323	0.004
Within Groups	9.2211	22	0.419		
Total	15.3600	24			

Like every other business, effective capacity management is crucial to a restaurant's success since it helps determine how well the traffic is being managed. No matter how big or small, the establishments must ensure that every bit of the restaurant space is used to its maximum potential to provide revenue (Khan, 2021). Capacity management references the level of output a restaurant operation can sustain and still make a product or perform a service. It measures how much and effectively the business can deliver, considering every factor.

Furthermore, restaurant capacity also measures how well the business manages the traffic, from on and off-site. When traffic increases, the restaurant gets closer to its capacity. The kitchen works to keep up with the steady flow of orders, and the front-of-house seats the walk-in guests accordingly. In principle, restaurant capacity aims to keep things running at maximum efficiency and waste less (Chadwick, 2018). Seating capacity is determined by considering the required serving capacity and methodology. The seating capacity is used to size the dining area. The kitchen and all food preparation areas are determined by the number of people to be served, the food delivery methodology, the menu, the bussing style, and the storage capacities. The relationship among the various storage, preparation, cooking, serving, and cleaning functions must be carefully studied to op-

timize workflow and efficiency. Keep travel distances short and minimize the crossover of circulation paths affecting the plan for various serving styles (Mion, 2017).

Conclusion

Based on the results and analysis of the data, it is concluded that most restaurant establishments are operating for five (5) years and less, having ten (10) employees and less with 76 to 100 seating capacity. Restaurants are efficient in terms of employees' hygiene practices, food preparation, and the aspects of kitchen operations and efficient with cross-contamination and sanitation procedures. There are significant differences in some indicators of operational efficiency when grouped according to the profile of the restaurant establishments. In order to address the challenges identified in the study, the management should consider strengthening TQM practices, particularly on cross-contamination prevention, and sanitation practices; upgrading kitchen equipment including the storage facility, lighting, and ventilation. It is further recommended to revisit employees' benefits, such as training to improve productivity and the provision of workers' uniforms. This study may be used for future research on other types of food establishments and cross-references.

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