E-ISSN 2654-9999
P-ISSN 2774-1923

JOURNEY
Journal of Tourismpreneurship, Culinary, Hospitality, Convention, and Event Management
POLITEKNIK INTERNASIONAL BALI

Volume 9 Issue 1, June 2026, pages: 217-224

# FOOD SAFETY TEMPERATURE MONITORING AT THE MONTAGE BIG SKY HOTEL IN THE UNITED STATES

**I Made Artha Kusuma Jaya[1*], Ni Luh Supartini[2]**
Hospitality Study Program, Institut Pariwisata dan Bisnis International[1*2]
arthakusuma59@gmail.com

Received: 09/04/2026 Revised: 20/05/2026 Accepted: 20/06/2026

**Abstract**

This study aims to determine the influence of temperature control in the pizza-making process and to understand the storage management mechanisms for raw materials and cooked materials in the kitchen of the Montage Big Sky Hotel, United States. Temperature control is a crucial factor in modern food safety systems as one of the Critical Control Points (CCP) based on the principles of Hazard Analysis and Critical Control Points (HACCP) to prevent the growth of pathogenic microorganisms and cross-contamination. Using a descriptive qualitative approach through participatory observation during an internship period, the researcher directly observed daily kitchen operational procedures. Data collection was also supported by semi-structured interviews with the Chef de Cuisine, Sous Chef, and kitchen staff, alongside temperature log documentation. The results indicate that the Montage Big Sky kitchen has implemented a structured and sustainable temperature control system. Daily temperature monitoring is consistently conducted for chiller and freezer facilities utilizing temperature log sheets. In the pizza-making process, dough fermentation temperature is strictly controlled to maintain yeast activity stability, while baking is performed at an adequate high temperature to ensure the destruction of pathogenic microorganisms. Furthermore, the storage of raw and cooked materials is separated using closed containers and systematic shelf arrangements. Overall, the field implementation aligns with standard operating procedures (SOP) and HACCP principles, though staff discipline and consistent managerial supervision remain essential to maintain service quality and food safety for hotel guests.

**Keywords:** Food Safety, Temperature Control, Food Storage Management, HACCP, Pizza

## 1. INTRODUCTION

The international hospitality industry is currently developing at a rapid pace, bringing ever-higher demands for quality of service, not only in terms of facilities and comfort, but also in the aspects of health and consumer safety. One of the most crucial parameters in hotel operations, particularly within the Food and Beverage Product department, is the assurance of food safety. International-scale hotels, such as the Montage Big Sky Hotel in the United States, which serve global guests with premium service standards, are obligated to implement strict food processing and storage procedures to maintain their reputation and avoid legal risks due to food contamination.

In a professional kitchen environment, food is produced in large volumes with complex variations; therefore, the potential for biological, chemical, or physical hazards becomes significantly high if not managed systematically.

Among the various food products served in hotels, yeast-dough-based products like pizza possess their own critical characteristics within their production chain. The pizza-making process involves stages that are highly sensitive to environmental parameters, ranging from the storage of fresh raw materials, the dough fermentation process (proofing), to the final stage of baking. Operational discrepancies at any of these stages can have a fatal impact on the sensory quality of the product and, most importantly, on the food safety aspect itself. Consequently, science-based supervision that references measurable parameters is absolutely necessary in the daily operations of hospitality kitchen production.

In modern food safety management systems recognized globally, temperature control is identified as one of the primary factors to prevent, inhibit, or eliminate the growth of pathogenic microorganisms. Spoilage or disease-causing bacteria, molds, and yeasts (foodborne illness) have specific temperature zones known as the danger zone, where they can multiply very rapidly. Failure to maintain proper storage or processing temperatures outside of this danger zone will accelerate the degradation of food quality and increase the risk of poisoning for consumers. According to Irawan (2023), based on the principles of Hazard Analysis and Control Points (HACCP), the control of this temperature parameter is categorized as a Critical Control Point (CCP). Through proper CCP identification, kitchen management can establish safe critical temperature limits, conduct regular monitoring, and execute rapid corrective actions whenever parameter deviations occur (Narada, 2021).

In the daily kitchen operations at the Montage Big Sky Hotel in the United States, temperature monitoring is implemented continuously across the entire flow of food materials. The main challenge in the field frequently arises within raw material storage management. Hotel kitchens manage two broad categories of materials: raw materials, which are vulnerable to carrying natural biological contaminants, and cooked materials or ready-to-consume products. If these two categories of ingredients are not managed separately through adequate storage systems—such as dividing them into chiller, freezer, and dry storage facilities—the risk of cross-contamination will increase significantly (Arisandi et al., 2019). Rack arrangements, the use of tightly closed storage containers, and the implementation of clear labeling systems serve as crucial supporting instruments to separate these two types of ingredients in the storage area.

Beyond the storage area, the specific process of pizza making at the Montage Big Sky Hotel becomes an important point of observation because it involves controlling temperature during the biochemical and physical phases of the dough. During the fermentation stage (proofing), room temperature and time duration must be controlled precisely so that the yeast (Saccharomyces cerevisiae) can activity optimally to produce carbon dioxide gas. If the environmental temperature is too high, the dough will undergo over-fermentation, which triggers a dominant sour taste and destroys the elasticity of the dough's gluten (Irmawati et al., 2025). Conversely, if the temperature is too low, the metabolic activity of the yeast will be inhibited, causing the dough to fail to rise perfectly. After the fermentation phase is complete, the next critical step is the baking process inside a high-temperature oven. Baking not only serves to cook the dough and bring out the desired color, aroma, and texture characteristics, but it also acts as a destruction step

(killing step) to eliminate any pathogenic microorganisms that might have been carried over during the dough preparation process.

Although modern technological devices such as digital temperature readers and daily temperature log sheets are fully available at the Montage Big Sky Hotel, the real effectiveness of this food safety system ultimately relies heavily on the human factor. Kitchen staff discipline in conducting regular checks, data entry accuracy, and consistency of supervision by management are the primary determinants of successful standard operating procedure (SOP) implementation in the field (Kusumawardhani, 2019). Even the slightest fluctuation in behavior or negligence from the kitchen crew has the potential to create a hazardous gap that undermines overall hotel operational standards.

Based on this background, an empirical analysis of how temperature control and food material arrangement are conducted in an international-scale hotel kitchen becomes highly essential to study. This research aims to comprehensively examine the influence of temperature parameter variations on the pizza production process, evaluate the mechanism for separating the storage of raw and cooked food materials, and analyze the compliance of daily operational practices in the field with the universally applicable HACCP standards in the global tourism and hospitality industry.

## 2. LITERATURE REVIEW

Food safety is a fundamental pillar in the operations of the international hospitality and modern culinary industries to ensure that food consumed by guests does not cause illness or health disorders. According to Sucher, K. P., & Halpern (2014), assuring food safety in star-rated hotels involves strict supervision at every stage of the culinary supply chain, ranging from receiving raw materials, storage, and processing, to final service to consumers. Food contamination can originate from biological hazards (bacteria, viruses, parasites), chemical hazards (toxins, cleaning residues), or physical hazards (foreign objects). Failure to mitigate these contamination risks not only has fatal consequences for consumer health in the form of foodborne illness outbreaks, but can also destroy the reputation and legal operational status of the hotel business.

As a preventive measure against contamination risks, the international hospitality industry implements food safety management systems based on Hazard Analysis and Critical Control Points (HACCP). Irawan (2023) explains that HACCP aims to shift the focus of traditional supervision, which relies on end-product testing, toward a preventive approach at every stage of production. One of the primary pillars of HACCP is the determination of Critical Control Points (CCP), which are operational steps that can be control in a measurable manner to eliminate or minimize food safety hazards to a safe limit. Narada (2021) emphasizes that each identified CCP must have explicit critical limits, a regular monitoring system, and responsive corrective action documentation in the event of operational parameter deviations.

Controlling temperature parameters is the most effective control instrument to stop the multiplication rate of pathogenic microorganisms in professional kitchen areas. Bacteria, molds, and yeasts experience a highly exponential growth phase when they are within the danger zone temperature range. According to the Food and Drug Administration (2022), uncontrolled temperature fluctuations in the kitchen area will accelerate the degradation of the organoleptic quality of food ingredients and multiply the population of disease-causing bacteria. Therefore, monitoring and maintaining daily temperature logs (temperature log sheets) in cold storage facilities (chillers and freezers)

are crucial documentation instruments that must be disciplined executed by the kitchen crew.

Unstructured storage of food ingredients in the kitchen area is a primary stimulant for cross-contamination, which is the transfer of harmful microorganisms from raw food materials to cooked food or ready-to-consumer products. Based on an empirical study by Arisandi et al. (2019), cross-contamination can be significantly reduced through the physical separation of storage spaces between raw materials and cooked materials. Systematic shelf arrangement (such as placing raw materials at the bottom and cooked materials at the top), utilizing airtight containers that are tightly closed, and implementing a day-dot labeling system are indicators of successful storage management in hospitality kitchens.

The culinary manufacturing process based on yeast dough, such as pizza, features dual critical control points that are highly sensitive to environmental temperatures. The first stage is dough fermentation (proofing), where the metabolic activity of yeast (Saccharomyces cerevisiae) converts carbohydrates into carbon dioxide gas. Irmawati et al. (2025) explain that the temperature of the proofing room must be precisely controlled; excessively high temperatures trigger over-fermentation, which damages gluten stability and makes the dough too sour, while excessively low temperatures inhibit yeast performance, causing the dough to fail to rise. The second critical stage is baking in a high-temperature oven. Besides aiming to cook the dough and bring out optimal visual characteristics and crust texture, the baking process acts as a killing step (biological destruction step) to ensure the total eradication of pathogenic bacterial cells that may have been carried over during the dough preparation process.

Although kitchen infrastructure has been equipped with modern technological devices such as smart digital thermometers and automated monitoring systems, the actual effectiveness of the HACCP system ultimately relies on human behavior factors. Kusumawardhani (2019) states that operational staff discipline, data reporting accuracy, and consistency of supervision by management are the primary determinants of successful food safety standard operating procedure (SOP) implementation. Minor negligence or low food safety awareness among the kitchen crew can create biological hazard gaps that threaten the overall service quality standards of the hotel.

## 3. RESEARCH METHODS

This study was designed using a descriptive qualitative approach with an empirical case study method. The qualitative approach was intentionally selected to describe, evaluate, and comprehensively understand the field phenomena regarding how the food safety temperature monitoring system and the storage mechanisms for raw materials and cooked materials are implemented in daily professional kitchen operations. The entire series of data collection, observation, and field assessment in this study was conducted at the Food and Beverage Product Department, specifically within the production kitchen area of the Montage Big Sky Hotel located in Montana, United States. This research activity was carried out during the industrial internship period which ran from 2025 to early 2026. The selection of this location was based on the relevance of the hotel as an international luxury accommodation that implements very strict global food safety standards by referencing local regulations and the principles of Hazard Analysis and Critical Control Points (HACCP).

The core object examined deeply in this study includes temperature monitoring procedures as one of the Critical Control Points (CCP) in the process of dough making

through pizza baking, as well as the mechanisms for managing, separating, and arranging the storage space for raw food materials and cooked food materials. Meanwhile, the research subjects or informants were determined using a purposive sampling technique, which is the selection of samples based on eligibility criteria and a profound understanding of the research topic. The primary informants involved in this study included the Chef de Cuisine, the Sous Chef, and several senior kitchen staff who are directly responsible for quality control and food safety assurance in the kitchen of the Montage Big Sky Hotel.

To ensure data trustworthiness through technical triangulation, data in this study were collected through three primary methods simultaneously. The first method was participant observation, in which the researcher engaged directly and actively in daily operational activities in the kitchen, focusing on the discipline of temperature checks, document completion, pizza proofing and baking processes, as well as the physical separation of food placement inside the chillers and freezers. The second method was conducted through semi-structured interviews, where the researcher carried out in-depth question-and-answer sessions with key informants using a flexible interview guide to gather information regarding the hotel's Standard Operating Procedure (SOP) policies, constraints faced by staff in the field, and corrective actions taken if temperature parameter deviations occurred. The third method was documentation, involving the collection of secondary data such as official hotel documents, SOP forms, photographic documentation of kitchen facilities, and daily temperature log sheets used to monitor the performance of cooling units.

Furthermore, the data analysis process was conducted interactively and continuously by referencing the qualitative data analysis model which comprises three main stages. The first stage was data reduction, performed by sorting, focusing, simplifying, and abstracting raw data from field notes of observations, interview transcripts, and temperature log documentation into information relevant to the research focus. The second stage was data display, where the reduced data were organized into structured narrative texts, monitoring tables, or operational flowcharts so that relationship patterns and actual conditions in the field could be logically understood. The final stage was conclusion drawing and verification, where the researcher formulated final conclusions based on the presented data patterns, and then performed a deep verification by comparing them against the established theories of food safety, HACCP principles, and applicable SOPs to assess the success rate of the temperature monitoring system at the Montage Big Sky Hotel.

## 4. FINDINGS AND DISCUSSION

Based on the results of participant observations, semi-structured interviews, and daily operational evaluations in the production kitchen area of the Montage Big Sky Hotel, United States, food safety temperature monitoring has been implemented in a structured manner as a manifestation of the commitment to international-scale quality service assurance. This implementation encompasses three crucial domains of culinary operations, namely cold storage facility management, biochemical-physical parameter control in the pizza manufacturing process, and storage space arrangement mechanisms to reduce the risk of cross-contamination.

### 4.1 Analysis of Temperature Control in Cold Storage Facilities

As an essential preventive measure to mitigate the growth of pathogenic microorganisms, the kitchen at the Montage Big Sky Hotel operates two primary types of cooling devices: chillers and freezers. Field observations indicate that the use of chillers is specifically intended to maintain the freshness of highly perishable fresh ingredients, while freezers are utilized to secure the stock of frozen food materials.

Temperature monitoring activities are conducted periodically and documented in writing through daily temperature log sheets, which are directly validated by the kitchen supervisor. This administrative and practical procedure aligns with the fundamental principles of Hazard Analysis and Critical Control Points (HACCP), where low-temperature storage facilities are categorized as a Critical Control Point (CCP). Through consistent daily recording, temperature fluctuations that could cause food ingredients to enter the danger zone range (the temperature zone for bacterial growth) can be responsively detected and handled before any degradation of organoleptic quality or physical spoilage occurs.

### 4.2 Parameter Control of Temperature in The Pizza Production Process

The pizza production process in the kitchen of the Montage Big Sky Hotel serves as an important point of observation because it involves biochemical and physical transformations of the dough that are highly sensitive to environmental temperature changes. Observations during the fermentation stage (proofing) indicate that room temperature stability and duration are the primary determinants of the final pizza dough quality. Precise temperature control during this stage successfully maintains the metabolic activity of the yeast (Saccharomyces cerevisiae) at a constant rate. Field conditions demonstrate that strict temperature oversight eliminates the risk of over-fermentation, which potentially destroys the elasticity of the gluten network and triggers a dominant sour taste due to excess organic acid production. It also prevents dough rising failures caused by excessively low room temperatures.

After the fermentation phase is completed, the next critical step is the baking process inside a specialized high-temperature oven (wood stone oven). The constant high-temperature settings applied in daily operations have proven effective in thoroughly cooking the dough and bringing out optimal visual characteristics, such as a golden-brown color and an ideal crust texture. From a food safety science perspective, the exposure to high thermal energy during this baking process acts as a biological destruction step (killing step) that eradicates all pathogenic microorganisms, molds, or yeasts that might have been introduced via cross-contamination during the dough preparation process. The technical parameters of the digital oven temperature control instrument and the actual pizza baking process in the field are presented in Figure 1.1 and Figure 1.2.

**Figure 1.** Temperature Settings for Baking Pizza
Source: Researchers (2026)


**Figure 2.** Pizza Baking Process in the Kitchen
Source: Researchers (2026)

### 4.3 Storage Management and Cross-Contamination Prevention

In addition to monitoring thermal temperature parameters, research findings show that the layout of the food storage space in the kitchen of the Montage Big Sky Hotel implements a clear physical zoning concept to suppress the risk of cross-contamination. Kitchen management applies a strict separation between the storage area for raw materials, which are vulnerable to carrying bacterial loads or natural external contaminants, and the categories of semi-finished foods as well as cooked materials that are ready for guest consumption.

Technically in the field, the success of this spatial management is supported by three operational pillars: the use of tightly sealed storage containers to prevent exposure to droplets or aerosols between ingredients, a vertically structured shelf arrangement system (placing cooked food on the upper shelves and raw materials on the lower shelves), and disciplined application of a labeling system. This hygienic arrangement practice has proven effective in minimizing indirect contamination and completely aligns with the HACCP-based operational guidelines universally applicable in the global hospitality industry.

Although comprehensive digital monitoring technology is available, the actual effectiveness of food quality assurance in the kitchen of the Montage Big Sky Hotel ultimately relies heavily on human behavior factors. The discipline of the kitchen crew in performing periodic checks, the accuracy of log data reporting, and the consistency of managerial supervision by the Chef de Cuisine and Sous Chef are vital determinants that transform the monitoring system from a mere administrative formality into a living operational culture implemented for consumer safety.

## 5. CONCLUSION

Based on the analysis and discussion regarding food safety temperature monitoring in the production kitchen of the Montage Big Sky Hotel, United States, it can be concluded that the implementation of the food safety system at this international luxury hotel operates in a highly structured and effective manner. Consistent temperature control applied to cold storage facilities (chillers and freezers) has proven capable of maintaining the stability of physical food quality and suppressing the multiplication rate of pathogenic microorganisms outside the danger zone. In the pizza manufacturing process, strict oversight of room temperature and time duration during the dough fermentation phase (proofing) successfully maintains optimal yeast (Saccharomyces cerevisiae) activity, preventing gluten structure failures and the emergence of a dominant sour taste. Furthermore, the exposure to constant high thermal energy during the baking process is proven effective as a biological destruction step (killing step) to ensure the complete eradication of contaminants. Spatial management through clear physical separation between raw materials and cooked materials, reinforced by the use of sealed containers and disciplined labeling, has also proven reliable in mitigating cross-contamination risks in the field. Overall, the entire operational sequence of food safety assurance in the kitchen of the Montage Big Sky Hotel aligns with international hospitality Standard Operating Procedures (SOPs) and the fundamental principles of Hazard Analysis and Critical Control Points (HACCP).

As suggestions for future operational development and sustainability, the kitchen management is advised to maintain and enhance the consistency of managerial supervision by both the Chef de Cuisine and Sous Chef regarding staff discipline in conducting periodic checks. Even though the available digital monitoring technological

infrastructure is comprehensive, continuous education and periodic refreshment training on the importance of food safety awareness for all kitchen crew remain absolutely necessary. This is crucial to anticipate any behavioral fluctuations or minor negligences by operational staff, ensuring that food quality and safety assurance does not merely become an administrative formality on temperature log sheets, but remains deeply embedded as a consistent work culture to safeguard consumer safety and maintain the hotel's premium reputation.

## REFERENCES

Arisandi, K. D., Trianasari, T., & Parma, P. G. (2019). Implementasi Hazard Analysis And Critical Control Point (HACCP) Dalam Penyimpanan Bahan Baku Makanan Di Hotel Discovery Kartika Plaza Hotel. Jurnal Manajemen Perhotelan Dan Pariwisata, 2(1), 55. https://doi.org/10.23887/jmpp.v2i1.22089.

Creswell, J. W., & Poth, C. N. (2018). Qualitative Inquiry And Research Design: Choosing Among Five Approaches (4th ed.). Sage Publications.

Denzin, N. K., & Lincoln, Y. S. (2018). The Sage Handbook Of Qualitative Research (5th ed.). Sage Publications.

Food and Drug Administration. (2022). Food Code: Recommendation Of The United States Public Health Service, Food And Drug Administration. http://purl.access. gpo.gov/GPO/LPS3020.

Irawan, H. D. (2023). Hazard Analysis And Critical Control Point (HACCP). Narada. https://doi.org/10.15547/tjs.2019.s.01.49.

Irmawati, I., Jumiono, A., & Amalia, L. (2025). Penerapan Sistem HACCP Di Hotel T & Y: Pengaruh Cara Penanganan Produk Terhadap Kualitas Keamanan Pangan. Jurnal Ilmiah Pangan Halal, 7(1), 141–151. https://doi.org/10.30997/jiph.v7i1. 17048.

Kusumawardhani, Y. (2019). Analisis Manajemen Risiko Berbasis ISO 31000:2009 Pada Model Optimasi Pengembangan Destinasi Wisata Spiritual. Jurnal Sosial Humaniora, 10(1), 28–39.

Marriott, N. G., Schilling, M. W., & Gravani, R. B. (2018). Principles Of Food Sanitation (6th ed.). Springer.

McSwane, D., Rue, N., & Linton, R. (2020). Essentials Of Food Safety And Sanitation (4th ed.). Pearson.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative Data Analysis: A Methods Sourcebook (3rd ed.). Sage Publications.

Narada. (2021). HACCP Untuk Pengamanan Pangan Dan Penyimpanan Bahan Makanan Dengan Pendekatan HACCP. Narada.

Sucher, K. P., & Halpern, K. (2014). Food Service Management: Delivering Safely And Efficiently. Jones & Bartlett Learning.

Sugiyono. (2019). Metode Penelitian Kuantitatif, Kualitatif Dan R&D. Alfabeta.

Wallace, C. A., Sperber, W. H., & Mortimore, S. E. (2018). HACCP: A Practical Approach (3rd ed.). Springer.

Yin, R. K. (2018). Case Study Research And Applications: Design And Methods (6th ed.). Sage Publications.