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STRATEGIC RESEARCH ON PREVENTING FOOD SAFETY INCIDENTS IN HIGH-END HOTELS

JiaSui Wang*, RunXia Chen, TianTian Feng, HuanYu Lin, DingHua Nan
School of Hotel Management, China University of Labor Relations, Beijing 100048, China.
**Corresponding Author: JiaSui Wang*

Abstract: Food safety is a core competitive advantage for luxury hotels. This case study analyzes the food safety management system of Hotel A through in-depth interviews and literature review, focusing on its governance structure, operational practices, and existing challenges. The results show that Hotel A has built a three-tier "strategy-operation-implementation" responsibility framework, integrated the HACCP system with digital management tools, and established lean supply chain management as a key competitive strength. However, it still faces bottlenecks such as cost pressures, talent shortages, and multi-format standardization difficulties. Based on these findings, targeted strategies are proposed, including optimizing the dual-inspection process, enhancing scenario-based training, building resilient supply chains, converting safety practices into brand value, and adopting intelligent technologies for cost reduction and efficiency improvement. This study provides both theoretical insights and actionable guidance for food safety governance in the high-end hospitality sector.
Keywords: High-end luxury hotel; Food safety; HACCP; Supply chain management; Risk prevention

1 INTRODUCTION

In recent years, frequent food safety incidents in the global hospitality industry have raised widespread public concern over health risks and brand credibility. For luxury hotels, food safety is not only a basic compliance requirement but also a core component of brand value and service competitiveness [1–3]. Compared with ordinary hotels, luxury hotels feature higher-grade ingredients, more complex catering formats, and stricter customer expectations, which bring greater challenges to risk prevention and quality control [4–5]. However, inappropriate management in procurement, processing, storage, or distribution can easily lead to cross-contamination, temperature abuse, or supply chain disruptions, resulting in irreversible damage to brand reputation and economic losses [6–7]. With the continuous improvement of consumer health awareness and the normalization of industry supervision, establishing a rigorous and efficient food safety prevention system has become an inevitable choice for the sustainable development of luxury hotels.

Extensive studies have been conducted on food safety management in the hospitality sector. Some scholars explored the implementation of the HACCP system in mid-to-high-end hotels and demonstrated its positive effect on risk control [8]. Others focused on staff training, hygiene practices, and digital supervision tools to improve operational stability. Digital management platforms and IoT monitoring have also been proven effective in enhancing real-time control capabilities [9]. However, most studies targeted economy or mid-range hotels, while systematic research on luxury hotels remains limited. Existing literature paid less attention to ultra-high-standard supply chain traceability, scenario-based training gaps, cost-benefit conflicts, and multi-format standardized management, which are unique dilemmas in luxury hotel operations [10]. Therefore, a targeted analytical framework is still lacking to guide food safety hazard prevention in high-end hospitality settings.

Against this background, this study takes Luxury Hotel A as a case to explore practical strategies for preventing food safety hazards. The marginal contributions are threefold. First, it reveals a three-tier management structure covering strategy, operation, and execution, reflecting the organizational logic of luxury hotel food safety governance. Second, it identifies practical bottlenecks including cost pressures, talent shortages, and training–operation mismatches. Third, it proposes targeted strategies such as optimized dual-inspection, scenario-based training, resilient supply chains, digital upgrading, and brand value transformation. The findings enrich the theoretical system of hospitality food safety management and provide operational references for luxury hotels to strengthen risk prevention, improve service quality, and maintain sustainable brand competitiveness.

2 CURRENT STATUS AND ANALYSIS OF FOOD SAFETY IN HIGH-END HOTELS

2.1 Distinguishing Feature

1. Food service constitutes the core business of a hotel; every stage—from ingredient procurement to final consumption—is closely interconnected, and any oversight may compromise overall food safety. Food safety is intrinsically linked to the hotel's reputation, while high-quality food services also contribute to the development of other businesses such as accommodation and conference organization.

2. Sudden food safety risks exhibit high unpredictability and randomness, potentially occurring at any stage or position. These risks may arise from chemical contamination, seasonal variations, or specific raw materials, and can manifest at any time, necessitating heightened vigilance and prompt response.
3. Severity: Luxury hotels are synonymous with high quality; a safety incident can rapidly erode public trust and severely damage the brand image. The repercussions extend beyond a single hotel, potentially affecting the entire hotel chain or even the entire industry. Such a chain reaction is difficult to contain, with economic losses and social impacts that are immeasurable.

2.2 Current Status of Food Safety Management in High-End Hotels

International studies indicate that the implementation of the HACCP system in Kenya's four-star and five-star hotels is influenced by environmental factors, including resource availability and staff training levels.
A study on food safety and hygiene practices in Malaysian hotels demonstrated that qualitative research methods provide valuable insights into the actual implementation of hotel food safety management systems. Research on food safety and hygiene practices in medium-sized hotels in Nigeria indicated that systematic management is crucial for ensuring food safety. A study on guest satisfaction in five-star hotels indicates that the quality of food and beverage services is a key factor influencing guest satisfaction.

2.3 The Establishment of a Three-Level Responsibility Framework

Through semi-structured in-depth interviews with three respondents at different hierarchical levels—specifically one food safety manager, one pastry chef, and one Western kitchen intern—guided by a pre-designed interview protocol and analyzed via thematic coding, this study found that luxury Hotel A has established a three-tier management framework comprising “Strategy,” “Operation,” and “Implementation.”
The Strategic Management Team (Food Safety Manager) is responsible for developing, implementing, monitoring, and continuously improving the hotel's food safety management system. Its primary responsibilities include system development and maintenance, compliance management, supplier management, and early risk warning. This level focuses on macro-level organizational structure and risk assessment.
The operational management team (head chef) is responsible for on-site hygiene management, process monitoring, team training, and emergency response. Appointing a competent and responsible hygiene manager to oversee hotel food safety is more critical than providing hygiene training to kitchen staff. This level focuses on on-site management and operational control.
The Basic Operations Layer (front-line chefs) is responsible for inspecting ingredients, performing cooking procedures, recording temperatures, and providing attentive service. The kitchen in luxury hotels is designed to deliver a completely risk-free and impeccable experience, meeting regulatory requirements and exceeding food safety standards.

2.4 The Application of Digital Management Tools

The luxury hotel A extensively employs digital tools in its food safety management. Software solutions such as Xishi'an 365 and Yikang Food Safety 365 have transformed food safety control from an empirical approach to data-driven, precise management. The application of Yikang Food Safety 365 software in recording temperatures during both the cooking process and post-cooking stages has effectively ensured stringent safety controls throughout the culinary workflow.
The temperature control standard reference table indicates that different types of ingredients have strict temperature requirements. For sashimi-grade seafood, the acceptable temperature range is-2°C to 2°C, with storage temperatures ranging from 0°C to 2°C; for caviar, the acceptable temperature range is-3°C to 0°C, storage temperatures are-2°C to 0°C, and thawing is strictly prohibited. These stringent temperature standards serve as the key distinguishing feature between high-end luxury hotels and ordinary hotels.

2.5 The Ultimate Standard for Supply Chain Management

The food safety management of luxury hotel A relies heavily on the highest standards of supply chain management. The four key criteria for supplier selection include: basic compliance (global and local certifications), quality and scarcity (origin and variety certifications), safety and traceability (full-chain traceability and third-party testing reports), and operational and service capabilities (customization and flexibility).
The "dual-inspection" mechanism during raw material receipt is a distinctive practice in high-end luxury hotels. The inspection is conducted by at least two individuals—typically the on-duty head chef or deputy chef and the dedicated chef responsible for the specific ingredient—with interns assisting and taking notes for learning purposes. Prior to the inspection, calibrated infrared thermometers and probe-type thermometers, sterilized white cutting boards and tasting spoons, as well as sterilized knives and food-grade disposable gloves must be prepared.

2.6 The Ultimate Standard for Supply Chain Management

The color coding system serves as a fundamental tool for high-end hotels to prevent cross-contamination. Red represents raw meat (including livestock and poultry), blue represents seafood (including sashimi), green represents vegetables and fruits, and white represents cooked and ready-to-eat foods. Kitchen utensils used for raw foods must not come into contact with cooked foods and must be disinfected immediately after use (by spraying with 75% alcohol or soaking in hot water exceeding 82°C for 5 minutes). The use of cloths is strictly prohibited in high-end hotels, which constitutes a key hygiene standard distinguishing them from ordinary hotels.

The luxury hotel A has established a tiered training mechanism. The Food Safety Manager receives continuous professional training, while the head chef is trained through daily on-site guidance, and intern chefs undergo daily training. The daily food safety training led by the Food Safety Manager has become a critical procedural requirement.

However, the current training system exhibits significant shortcomings. According to interns, the training at the French restaurant primarily consists of intensive onboarding sessions, with insufficient integration with actual workplace operations.

2.7 The Challenges

The luxury hotel A faces three major challenges in food safety management. Firstly, there is a contradiction between cost pressure and long-term value. The latest raw material traceability systems, advanced testing equipment, and high-quality consumables require substantial investment, yet the return on investment in food safety is not immediately apparent and cannot be directly measured in terms of revenue.

Secondly, there is a shortage of specialized talent, and establishing a safety culture across the entire company poses significant challenges. The market severely lacks experts with multifaceted skills—those who are proficient in modern food safety management systems, regulations, and standards, as well as possess expertise in hotel operations and management. The high employee turnover rate in the hospitality industry makes it difficult to provide continuous and effective training.

Third, diverse business models, complex supply chains, and technological innovation pose significant challenges. High-end luxury hotels typically operate multiple business formats, including premium Chinese and Western restaurants, lobby bars, banquet halls, room service, and staff cafeterias. Given the unique food safety risks associated with each format, establishing unified and clearly defined standards presents a major challenge.

3 KEY STRATEGIES FOR HOTELS TO PREVENT FOOD SAFETY HAZARDS

3.1 Optimize the "Dual Verification" Acceptance Process

1. Current Situation Analysis: The acceptance process shall be conducted by at least two personnel, typically including the on-duty head chef or deputy head chef and the dedicated chef responsible for the specific ingredient. The acceptance procedure comprises document verification, real-time measurement, sensory evaluation (via five senses), and packaging inspection.

2. Improvement Recommendations: First, establish a standardized inspection checklist. Develop a digital inspection checklist for each food ingredient, covering items such as document verification, temperature measurement standards, and sensory inspections. Inspection records are uploaded in real-time via the "Food Safety 365" APP, thereby reducing the associated costs of paper-based document management.

Secondly, train interns to participate in the goods receiving process. This enables interns to gain learning opportunities during the receiving phase and understand the entire workflow. Goods receiving is not merely an inspection task but also an educational process that facilitates interns' comprehensive understanding of the overall framework of food safety management.

Third, digitization of receipt records. Establish digital archives of receipt records for subsequent tracking and auditing. Improve the receipt process through data analysis and identify potential risk points.

3.2 Enhance Scenario-Based Training for Stall Operators

1. Current Situation Analysis: The existing training programs exhibit a disconnect between centralized instruction and practical application. Each food service stall in a chain restaurant possesses distinct food safety risk points, making it challenging for staff to rapidly master the corresponding operational details when rotating to a new stall.

2. Improvement Recommendations: First, conduct a 5-minute training session during the morning meeting. During the daily morning meeting, review the day's specific risk points and integrate the training content into daily work processes. This concise yet frequent training format enhances memory retention and skill consolidation; Second, implement a post-shift analysis mechanism. Analyze operational issues daily and provide personalized guidance. Through case studies, trainees understand the consequences of incorrect work practices and the benefits of proper methods; Third, create risk maps for each workstation. Develop detailed visual diagrams highlighting food safety risks for each workstation, emphasizing critical control points, common errors, and preventive measures to facilitate rapid comprehension and learning.

3.3 Building a Resilient Supply Chain

1. Current Situation Analysis: Imported food ingredients require extremely stringent temperature and humidity control in the cold chain—refrigeration must maintain stable temperatures between 0–4°C, while freezing requires temperatures below-18°C. Any disruption in this chain will directly compromise food safety and quality.
2. Improvement Recommendations: First, implement localized procurement. Establish partnerships with local high-quality farms to shorten the supply chain. Localized procurement not only reduces the risk of supply chain disruptions but also ensures food freshness.
Second, diversified layout. Establish an alternative supplier system for key ingredients to avoid reliance on a single source. Diversifying suppliers reduces the risk of supply disruptions.
Third, ESG auditing. Extend food safety audits to include supplier ESG assessments, thereby enhancing the overall quality of the supply chain. Comprehensive ESG evaluations help identify high-quality suppliers with potential for long-term collaboration.

3.4 Transforming Food Safety into Brand Value

First, data-driven value demonstration. Establish a correlation analysis model between food safety management outcomes and customer satisfaction, online ratings, and repurchase rates. Through long-term data tracking, the commercial value of food safety investments is quantified to provide a measurable basis for management decisions and resource allocation. For example, analyze the correlation between indicators such as traceability pass rate of ingredients and back kitchen hygiene inspection pass rate, and OTA platform ratings and Net Promoter Score (NPS). This intuitively presents the positive impact of food safety on brand reputation and customer loyalty, while also providing a clear value orientation for internal management assessments.
Second, transparent disclosure. Build a multi-channel food safety information disclosure system. Display real-time back kitchen operations, ingredient sources, and daily inspection reports through in-restaurant electronic screens, or launch QR codes for dish traceability. Consumers can scan the code to view the full information of ingredients including origin, processing, and quality inspection reports. In addition, regularly release a Food Safety Management White Paper or host live-streamed back kitchen open house events to break down information barriers between consumers and hotels. Enhance consumer trust through openness and transparency, and build a brand label of "reassuring catering".
Third, brand storytelling. Deeply embed the concept of food safety into brand stories and marketing systems, elevating it from a mere compliance requirement to a core brand promise and differentiated competitive advantage. For example, create a series of brand IPs such as "reassuring ingredients" and "transparent kitchen". Convey the hotel's high-standard practices in ingredient selection, quality control, and staff training through social media, member activities, and offline salons. At the same time, share food safety management experience in scenarios such as public welfare activities and industry exchanges to shape a responsible brand image, transforming food safety into brand premium and market competitiveness.

3.5 Investing in Intelligent Technologies to Reduce Costs and Improve Efficiency

First, AI-powered back kitchen monitoring. Introduce image recognition and behavior analysis technology to build an intelligent back kitchen monitoring system. It conducts real-time monitoring of staff dress codes, operational procedures (such as raw-cooked separation, classified use of knives, hand washing and disinfection), and back kitchen hygiene. The system automatically identifies violations and issues alerts, while generating monthly compliance analysis reports to assist managers in optimizing training and management priorities. This system not only reduces the labor costs of manual inspections but also minimizes human errors through standardized control, reducing food safety risks at the source and realizing digital and visual back kitchen management.
Second, IoT temperature monitoring. Deploy IoT temperature sensors in refrigerators, freezers, and transport vehicles to enable real-time collection, upload, and cloud storage of temperature data. Once the temperature exceeds the preset safety range, the system will automatically send dual alarms via SMS and APP to managers. Meanwhile, the system can generate temperature trend reports to help managers identify equipment abnormalities and management loopholes, and optimize cold chain equipment maintenance and ingredient storage solutions. This not only reduces the cost of ingredient spoilage due to abnormal temperatures but also meets the traceability requirements of food safety supervision.
Third, predictive analysis. Integrate multi-dimensional data such as ingredient procurement data, historical safety incidents, seasonal fluctuations, and supply chain risks to build a food safety risk prediction model. Identify high-risk links and scenarios (such as ingredient supply fluctuations during holidays and perishable ingredient management in high-temperature seasons) to conduct resource allocation and process optimization in advance. For example, predict ingredient supply risks through big data analysis and lock in backup suppliers in advance; identify high-frequency violation links based on historical data and conduct targeted staff training and process improvement. This technology reduces post-rectification costs through proactive risk control, realizing a management upgrade from passive response to active prevention.

4 CONCLUSIONS

This study systematically examined the food safety governance model of a luxury hotel, identifying a three-tier “strategy–operation–execution” framework as its core organizational logic, supported by HACCP integration with

digital tools and rigorous supply chain hygiene controls. The findings highlight structural strengths while exposing operational bottlenecks, particularly the mismatch between training and on-site execution, especially for frontline interns. These observations advance the theoretical understanding of food safety management in high-end hospitality by contextualizing standard practices within the specific constraints of luxury operations, and offer targeted, actionable solutions for industry practitioners.

The study's primary contribution lies in its contextualized, practice-driven insights, which can guide similar properties in enhancing risk prevention and operational resilience. However, its generalizability is limited by the single-case design and cross-sectional nature of the interviews, which do not capture long-term dynamics. Future research should adopt a multi-case, longitudinal approach to compare models across brands and validate the impact of proposed interventions, while further investigating the link between food safety practices and key commercial outcomes to strengthen the business case for high-standard governance.

COMPETING INTERESTS

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