

Evaluating shawarma restaurants' commitment to food safety in Jordan: A survey study

تقييم التزام مطاعم الشاورما بسلامة الغذاء في الأردن: دراسة استقصائية



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الملخص

تدرس هذه الدراسة أداء سلامة الغذاء في مطاعم الشاورما في عمان، حيث يشكل ضعف ضبط الجودة مخاطر صحية. وتستعرض معايير ضمان الجودة، والرقابة التنظيمية، وتأثير التعليم والمعرفة على الامتثال لتحديد الثغرات والتوصية بالتحسينات. استهدف 237 مطعمًا في منطقة الجامعة باستخدام منهج تحليلي وصفي، باستخدام استبيان منظم من 74 بندًا يغطي سبعة أبعاد لسلامة الغذاء. واستخدم التحليل الإحصائي، بما في ذلك معاملات ارتباط بيرسون، وألفا كرونباخ، وتحليل التباين، لتقييم مستويات الامتثال والتأثيرات الديموغرافية. تظهر النتائج التزامًا قويًا بقواعد الأمن الغذائي، وخاصة مثل إدارة الغذاء والدواء الأمريكية (FDA) والتقصير التنظيمي. ومع ذلك، لا يزال التنفيذ وتوزيع الموارد بحاجة إلى تطوير.

أعطيت سلامة العمال الأولوية على شهادات الصحة وردع الأضرار، إلا أن ضبط درجة الحرارة والنظافة وإزالة بقايا الطعام بحاجة إلى تحسين. يُعد ضبط المتاعب والنقاء وتحصيل الطعام من القضايا الرئيسية في ضمان الأمن، وبينما يُحسن ضبط المخالفات والتدريب الامتثال، فإن المشاركة المركزة في مناقشة الاختلافات الديموغرافية أمر بالغ الأهمية. يُوصى بوضع خطة عامة تجمع بين القواعد المارمة والرقابة النشطة والعمل الجماعي بين السلطات وعمال المطاعم للحفاظ على قيم سلامة الغذاء والنهوض بها. ويشمل ذلك وضع قواعد إعلامية، وإجراء مراجعات دورية، وتنفيذ برامج مراقبة ذاتية، وبناء تعاون بين مسؤولي الرقابة، وأصحاب المطاعم، وأخصائيي الصحة.

الكلمات المفتاحية: النظافة، التعامل مع الأغذية، إدارة المخاطر، سلامة المستهلك، إدارة المطاعم، جودة الأغذية

ABSTRACT

This study examines food safety performance in shawarma restaurants in Amman, where poor quality control poses health risks. It reviews quality assurance standards, regulatory oversight, and the impact of education and knowledge on compliance to identify gaps and recommend improvements. A total of 237 restaurants in the university area were targeted using a descriptive analytical approach, using a 74-item structured questionnaire covering seven dimensions of food safety. Statistical analysis, including Pearson correlation coefficients, Cronbach's alpha, and analysis of variance, was used to assess compliance levels and demographic influences. Findings show strong devotion to nutrition security rules, mainly Food and Drug Administration (FDA) ideals and organizational lapse; however, implementation and resource distribution need development. Worker security was prioritized over health diplomas and damage deterrence, but temperature control, cleanliness, and left-over removal need improvement. Hassle control, purity, and food loading are key issues in safeguarding security. While controlling lapses and training improve compliance, targeted involvement in talking about demographic differences is essential. A general plan mixing severe rules, lively checking, and teamwork between authorities and restaurant operatives is recommended to uphold and progress food safety values. This contains informing rules, leading regular reviews, and instructing self-monitoring programs, developing a cooperative energy between controlling forms, restaurant landlords, and health specialists.

keywords: Hygiene, Food Handling, Risk Management, Consumer Safety, Restaurant Management, Food Quality

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Evaluating Shawarma Restaurants' Commitment To Food Safety In Jordan: A Survey Study

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Abstract

This study examines food safety performance in shawarma restaurants in Amman, where poor quality control poses health risks. It reviews quality assurance standards, regulatory oversight, and the impact of education and knowledge on compliance to identify gaps and recommend improvements. A total of 237 restaurants in the university area were targeted using a descriptive analytical approach, using a 74-item structured questionnaire covering seven dimensions of food safety. Statistical analysis, including Pearson correlation coefficients, Cronbach's alpha, and analysis of variance, was used to assess compliance levels and demographic influences. Findings show strong devotion to nutrition security rules, mainly Food and Drug Administration (FDA) ideals and organizational lapse; however, implementation and resource distribution need development. Worker security was prioritized over health diplomas and damage deterrence, but temperature control, cleanliness, and left-over removal need improvement. Hassle control, purity, and food loading are key issues in safeguarding security. While controlling lapses and training improve compliance, targeted involvement in talking about demographic differences is essential. A general plan mixing severe rules, lively checking, and teamwork between authorities and restaurant operatives is recommended to uphold and progress food safety values. This contains informing rules, leading regular reviews, and instructing self-monitoring programs, developing a cooperative energy between controlling forms, restaurant landlords, and health specialists.

Keywords: Hygiene, Food Handling, Risk Management, Consumer Safety, Restaurant Management, Food Quality

Introduction

Assuring food safety needs strategic planning, severe oversight, and efficient management to protect public health and support food security (Chhetri, 2024). Food quality is determined by inherent qualities such as source, texture, and processing, while poor regulation can lead to contamination and foodborne diseases (Du et al., 2022; Azad et al., 2019; Akinsemolu & Onyeaka, 2024).

Shawarma, an extensively consumed dish in Jordan, poses contamination risks due to its preparation technique. Insufficient cooking and treatment create circumstances for pathogens, such as *Salmonella* (Al-Khusaibi, 2019; Fung et al., 2018). Between 2022 and 2023, 163 of Amman's 3,981 shawarma formations were shut due to health defilements (GAM, 2025).

Food safety rules reduce contamination risks through strict hygiene, good food storage, and constant temperature monitoring (Mahunu et al., 2024). Improving production procedures and applying required food safety training in Jordan are critical for approval (Al-Tarawneh & Al-Najjar, 2025; Hana et al., 2022). Yet, inadequate information among handlers highlights the necessity for better training (Al-Nasraween et al., 2018).

Weak application of health rules in Amman's shawarma restaurants has led to defilements such as contaminated meat and unsafe cooking performs. In spite of current food safety rules, foodborne diseases are underreported due to incomplete surveillance and issues like mass meetings and dependence on refugee labor (Todd, 2021).

Improper meat storage, especially for chicken, increases contamination risks, promoting microbial development such as *Enterococcus faecalis* and *Campylobacter jejune*, both related to gastrointestinal diseases (Adebayo, 2023). Globally, foodborne diseases affect over 10% of the population, with diarrheal illnesses producing nearly four billion cases yearly (Todd, 2017). Small food trades with insufficient cleanliness additional worsen the matter (Ababio & Lovatt, 2014). This study measures acquiescence with food safety values and classifies the main areas for development.

This study assesses quality assurance measures in Jordanian shawarma restaurants, highlighting the significance of inspections, self-monitoring, and health managers registering with the General Organization for Food and Drugs. The research emphasizes Hazard Analysis and Critical Control Points (HACCP) plans, such as keeping a cooking temperature of 75°C and ensuring proper washing and sanitization of vegetables, to improve food safety (Motarjemi & Warren, 2022).

This study surveys the efficiency of food safety assurance in Amman's University Region shawarma restaurants, compliance with food safety regulations, controlling lapse, and application challenges. It also discovers the association between acquiescence and issues such as gender, job, age, knowledge, and education.

Statement of Problem

The study's problem lies in the weak implementation of food safety standards in shawarma restaurants in the University Area of Amman, despite the existence of existing regulations and health rules. This leads to increased risks of food contamination and disease transmission. This weakness is evident in key aspects such as temperature control, general hygiene, food waste disposal, and improper meat storage, in addition to a lack of training and information among employees. This situation reflects a gap between declared policies and actual implementation, and underscores the need for a scientific assessment to identify shortcomings and develop practical recommendations to address them.

Significance

This study derives its importance from its ability to shed light on the level of compliance with food safety standards in one of the most popular and sensitive food sectors in Jordan: the shawarma restaurant sector. It provides a thorough scientific assessment of quality assurance and regulatory oversight practices and demonstrates the impact of education, knowledge, and

training on compliance with health regulations, enabling the identification of gaps and improvement of preventive measures. The findings also enhance the ability of regulatory authorities and restaurant owners to develop proactive plans and sustainable policies that improve consumer safety and reduce health risks associated with foodborne illnesses.

Objectives

This study aims to investigate the following research questions: To what extent are food safety standards implemented in Amman's University District shawarma restaurants?. What quality assurance systems are associated with improved compliance in shawarma restaurants?. What role does the Food and Drug Administration play in contamination prevention?. What challenges do restaurants face in meeting food safety standards?. Are there significant differences in compliance based on demographic factors?

Method of Research

This study adopted a descriptive-analytical approach, using SAS (2012) to analyze data dispersion, central tendencies, and interrelationships between variables. The study targeted 237 shawarma restaurant owners in the University District of Amman, which has a population of 880,830 (GDS, 2024).

Data were collected from restaurant proprietors, food safety managers, and directors through a structured survey, tested for dependability and soundness. Secondary sources, containing educational studies and scientific papers, were added to the theoretical studies.

The survey comprised 74 staff members divided (Owners, supervisors and administrators) into two sections: the first gathered demographic data, including gender, job title, age, knowledge, and educational background, while the second measured food safety factors such as safety assurance, worker safety, food storage, skewer contamination, kit, cleanliness, waste management, and pest control.

A five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used to quantify responses, with mean scores categorized as low (1.00–1.32), medium (1.33–3.66), and high (3.67–5.00). This organization ensured a precise valuation of food safety application (McLeod, 2019).

Academic specialists studied the survey for relevance, simplicity, and adequacy, validating it for accuracy. Content validity requires essential correlation coefficients above 0.25 ($p < 0.05$) (Hamed, 2016). While associations (0.641–0.901) indicate definite reliability crosswise food safety measures.

Construct validity was confirmed by Pearson (Moments) correlations, with values above 0.25 ($p < 0.05$). Cronbach's alpha ranged from 0.800 to 0.929, with a total of 0.980, indicating strong reliability. Normal distribution and multicollinearity tests verified the data for statistical analysis.

Data analysis was conducted using SAS (2012), using descriptive statistics (means, standard deviations, and frequencies) to summarize the results. T-tests and analysis of variance (ANOVA) assessed differences based on gender, job position, age, experience, and education, while Pearson's correlation coefficient examined the relationships between food safety variables. Cronbach's alpha measured internal consistency, and normality tests ensured the data were suitable for inferential analysis.

The study followed ethical guidelines, ensuring participants' confidentiality and informed consent. However, limitations include the small sample size, reliance on self-reported data, and short session duration, which may have affected the study's depth and results.

Results and Discussion

General Characteristics of the Research Sample

The survey collected demographic and professional data, including gender, job title, age, experience, and education. The sample consisted primarily of males (65.8%) and restaurant owners (46.0%), followed by food safety supervisors (39.2%) and administrative staff (14.8%).

The largest age group was 35 to under 40 years old (30.4%), while the least represented was under 25 years old (3.4%). Most participants had 15 or more years of experience (43%), and the smallest group had less than 5 years (14.7%). In terms of education, bachelor's degree holders constituted the majority (46.4%), while 13.1% had a high school education or less.

These findings underscore the need for comprehensive food safety management, addressing gender disparities, and promoting continuous professional development (Zanin et al., 2017). Future research should explore how demographic factors influence compliance in shawarma restaurants (Mousa & Abdelgaffar, 2023).

Research Questions

Table 1 indicates that the food safety assurance system is highly regarded, with food safety programs and FDA directives receiving strong positive feedback. Key aspects, such as FDA directives and the FDA's role in ensuring compliance, received high ratings, underscoring the importance of regulatory support and oversight. However, the slightly lower rating for the FDA's role in ensuring the system's effectiveness suggests opportunities for improved implementation. The variability in responses regarding the FDA's provision of necessary equipment and verification of compliance highlights areas for improvement in resource allocation and consistency. Despite these challenges, the system is generally viewed positively, with opportunities to enhance regulatory enforcement and resource management. Wang and Yu (2017) proposed a food safety pre-alert system using the Internet of Things and association rule mining to monitor real-time safety data, enhancing supply chain sustainability through proactive alerts. Tian (2018) presented a real-time tracking platform that integrates supply chain risk management to improve food safety assurance. Barnes et al. (2021) review food safety inspection processes, emphasizing the importance of understanding the values and perspectives of consumers, business partners, and inspectors, while highlighting additional areas of research to strengthen food safety assurance systems.

Table (1): Means, Standard Deviations, and Importance Level for the Food Safety Assurance System, according to SAS (2012)

Paragraphs	Rank	Mean	SD	Importance Level
1. Food safety programs exist.	1	4.22	0.714	High
2. I receive adequate FDA guidance on food safety procedures.	3	4.15	0.731	High
3. The FDA ensures the food safety system functions effectively.	7	4.00	0.755	High
4. Management ensures employees follow food safety regulations.	2	4.19	0.722	High
5. Management regularly verifies compliance with food safety standards.	5	4.08	0.742	High
6. Management provides necessary equipment for food safety compliance.	6	4.05	0.751	High
7. New and storage employees collaborate on food safety practices.	4	4.12	0.733	High

The Food Safety Assurance System achieved a high importance level with a mean of 4.12 ± 0.08 . Table 2 highlights the strong emphasis on employee safety within the food safety assurance system, with all measures rated as extremely important. Particular priority was given to practices such as requiring health certificates before hiring, replacing infected employees to prevent contamination, and granting sick leave. While regular health checks were also considered important, their implementation showed some variability. Low standard deviations across all items indicate broad agreement on the importance of safety practices, while the relative variability in responses reflects the need to enhance the consistency of application of these practices to support employee safety and ensure food safety.

Roseman et al. (2017) emphasized the role of employee safety in restaurants, stating that psychological empowerment improves food safety performance, quality, and store revenues. Nabeel and Alamgir (2018) highlighted the need for improved health and safety monitoring, particularly in South Asian restaurants, where poor conditions and limited regulations contribute to unsafe environments. Their analysis of restaurant inspection reports in New York City revealed a significant proportion of establishments with unsafe working conditions. Harris et al. (2023) examined the effect of transactional leadership on food safety compliance, finding that employees who felt responsible and understood safety regulations were more compliant, with greater enforcement of safety disciplinary measures.

Table (2): Means, Standard Deviations, and Importance Level for the Employee Safety, according to SAS (2012)

Paragraphs	Rank	Mean	SD	Importance Level
1. Employees must provide a certified health certificate before employment.	1	4.28	0.701	High
2. I conduct periodic health checkups for employees.	4	4.21	0.731	High
3. Sick employees are given leave to recover.	3	4.23	0.727	High
4. Injured employees are replaced, ensuring no food contamination.	2	4.25	0.715	High

Employee Safety achieved a high level of importance, with an arithmetic mean of 4.24 ± 0.03 . Table 3 highlights the significant focus on food storage practices, particularly in preventing contamination and spoilage through measures such as checking expiration dates and storing chemicals separately from food ingredients. While the safety of cold storage is generally recognized, adherence to specific practices, such as strict temperature control in dry and frozen storage, appears to be less prevalent. Although there is a clear understanding of basic food safety principles, the findings suggest a need to improve temperature control and contamination prevention. Generally, consistent responses demonstrate widespread recognition of the importance of food storage practices, while marked variation reveals the need for targeted training and more systematic implementation to enhance food safety.

Ghazali et al. (2024) emphasize the role of food safety management systems (FSMS) in reducing foodborne illnesses and enhancing customer confidence in Malaysian restaurants. FSMS certification helps communicate food safety, sanitation, and nutrition standards, enhancing restaurant credibility and service quality. Bello et al. (2021) highlight the challenges of food preservation, particularly food waste, in Nigerian restaurants, particularly with fresh foods. Their study calls for improved surplus management practices to reduce waste and improve food storage. Similarly, Elsaed and Ibrahim (2020) found that chefs in Egyptian restaurants often lack awareness of proper food storage hierarchies, leading to spoilage and contamination. They recommend developing clear guidelines to improve storage practices and ensure food safety.

Table (3): Means, Standard Deviations, and Importance Level for the Food Storage, according to SAS (2012)

Paragraphs	Rank	Mean	SD	Importance Level
1. I check chicken and meat expiration before preparing shawarma.	1	4.45	0.689	High
2. Chemicals are stored away from shawarma ingredients.	2	4.41	0.693	High
3. Dry storage temperature is maintained between 20°C and 25°C.	11	4.16	0.727	High
4. Food is stored at least 15 cm above the ground.	4	4.35	0.702	High
5. Food items are dated and rotated per FIFO.	5	4.33	0.705	High
6. I know the ideal refrigerator temperature.	6	4.30	0.707	High
7. I know the ideal freezer temperature.	12	4.11	0.729	High
8. The restaurant ensures safe refrigerated and frozen food storage.	8	4.25	0.717	High
9. Raw and ready-to-eat foods are properly separated.	3	4.39	0.699	High
10. Food is protected from contamination in cold storage.	10	4.20	0.722	High

Paragraphs	Rank	Mean	SD	Importance Level
11.Raw meat is not left outside the fridge for over three hours.	9	4.22	0.719	High
12.I know proper frozen food defrosting methods.	7	4.27	0.713	High

Food Storage achieved a high level of importance, with a mean of 4.29 ± 0.10 .

Table 4 indicates a strong general focus on shawarma skewers' safety, particularly in sourcing certified meat, ensuring proper cooking temperatures, and adhering to use-by labels. However, there are discrepancies in adherence to specific safety measures, with less emphasis on strict temperature control, hygiene practices, and separate preparation areas, indicating potential gaps in knowledge and implementation. While the use of thermometers and cross-contamination prevention practices enhances safety, reliance on subjective sensory assessment raises concerns. Adherence to freshness, proper skewer weight, and timely cutting reduces risks, but the practice of disposing of shawarma rather than freezing it highlights the need for balanced waste management. Despite high public awareness, targeted training and reinforcement are essential to improve adherence to best practices and ensure consistency in food safety protocols. Studies highlight significant contamination risks in shawarma skewers, with bacterial presence and histamine levels often exceeding safety limits. Sallam et al., (2021) warned of the potential health risks of histamine in ready-to-eat shawarma in Egypt. El-Fakhrany et al., (2019) reported high bacterial counts in chicken shawarma, emphasizing the need for strict hygiene and microbial monitoring procedures. Ajaja et al. (2022) found that 89.4% of shawarma samples in Benghazi were contaminated, and that antibiotic-resistant bacteria pose a serious risk of foodborne illness. These findings underscore the need for stricter safety procedures in shawarma preparation.

Table (4): Means, Standard Deviations, and Importance Level for the Shawarma Skewer Contamination Safety, according to SAS (2012)

Paragraphs	Rank	Mean	SD	Importance Level
1. Chicken and meat come from approved suppliers.	3	4.40	0.691	High
2. Chicken is cooked to at least 75°C internally.	2	4.41	0.688	High
3. The restaurant has a probe thermometer.	14	4.12	0.721	High
4. Employees can use the probe thermometer.	4	4.28	0.695	High
5. The shawarma skewer's surface is at least 50°C at 1 cm depth.	7	4.22	0.708	High
6. The skewer weight does not exceed 60 kg.	16	4.08	0.718	High
7. Food products have production and expiration labels.	1	4.44	0.681	High
8. Displayed shawarma is contamination-free.	5	4.25	0.700	High
9. Shawarma is sliced only at the time of sale.	9	4.20	0.709	High
10. I taste shawarma before selling.	10	4.18	0.710	High
11. I detect contaminated food by taste.	13	4.13	0.718	High
12. Temperature and time control bacterial growth.	19	3.98	0.739	High
13. I am aware of foodborne illnesses.	11	4.17	0.711	High
14. I use fresh chicken daily, avoiding frozen meat.	8	4.21	0.710	High
15. Shawarma is discarded, not frozen.	15	4.11	0.722	High
16. Raw and cooked foods are stored separately.	6	4.23	0.703	High
17. Raw chicken and meat are prepared on a separate table.	17	4.04	0.731	High
18. A plastic apron is worn when preparing shawarma.	18	4.01	0.726	High
19. Old shawarma is not mixed with new.	12	4.15	0.713	High

The Shawarma Skewer Contamination Safety achieved a high level of importance, with a mean of 4.19 ± 0.13 .

Table 5 highlights the critical role of equipment and facilities in shawarma preparation, particularly in temperature control, equipment cleanliness, and sanitation. Despite strong adherence to these basic safety measures, personal hygiene practices, such as training on handwashing and covering hair, need improvement. The availability of cleaning materials and employee use of gloves reflect strong preventative measures, but aspects such as restrictions on

wearing jewelry and hair care require greater attention. These findings point to the need for focused training and reinforcement to ensure consistent adherence to hygiene and maintenance protocols.

Rodriguez and Samaniego-Puertas (2023) emphasize the need for strict hygiene management in the food service sector, emphasizing the importance of sanitation and safety systems in preventing foodborne illnesses. Kanyan et al., (2016) highlight the role of well-managed equipment and facilities in ensuring consistent service quality. Garayoa et al., (2017) recommend regular supervision, employee training, and monitoring of high-risk surfaces to maintain food safety and proper equipment use practices. Together, these studies call for the implementation of comprehensive hygiene policies and operational management to maintain food safety and quality in restaurants.

Table (5): Means, Standard Deviations, and Importance Level for the Equipment and Facilities, according to SAS (2012)

Paragraphs	Rank	Mean	SD	Importance Level
1. All kitchen equipment is made of stainless steel.	5	4.38	0.696	High
2. All equipment is in good condition and easy to clean.	2	4.46	0.689	High
3. Surfaces that come in contact with shawarma are easy to clean and sanitize.	3	4.43	0.690	High
4. The restaurant has adequate lighting.	11	4.25	0.711	High
5. The temperature is suitable for preparing shawarma.	1	4.49	0.672	High
6. There is adequate ventilation during shawarma preparation and cooking.	6	4.35	0.700	High
7. The restaurant undergoes regular maintenance.	7	4.34	0.701	High
8. All restaurant staff have clean, uniform attire.	8	4.33	0.704	High
9. The uniform is sent for washing daily.	9	4.30	0.703	High
10. All staff use gloves.	10	4.27	0.709	High
11. Sanitizers and cleaning agents are available for workers daily.	4	4.40	0.693	High
12. The ceilings are in good condition, and paint does not fall onto the floor.	12	4.23	0.718	High
13. The floor is cleaned regularly.	13	4.21	0.721	High
14. Jewelry/watches are not allowed during work.	16	4.14	0.729	High
15. Fingernails are trimmed.	15	4.16	0.725	High
16. Food handlers must keep their hair short (head and face hair).	14	4.17	0.728	High
17. A hair covering must be worn when handling food.	17	4.11	0.733	High
18. Workers are trained in proper handwashing and sanitizing techniques.	18	4.09	0.731	High

Equipment and Facilities dimension achieved a high importance level with an average of 4.28 ± 0.12 .

Table 6 highlights the critical importance of hygiene and waste management, particularly in chemical sterilization, disinfection, and maintaining cleanliness in the preparation area. However, some waste management practices, such as the use of appropriate containers, prompt disposal, and proper disposal of oils, received slightly less attention, indicating areas for improvement. The data suggest a need for greater consistency in waste management practices compared to sterilization efforts. Overall, the findings highlight the need for strict adherence to hygiene protocols and effective waste management to maintain food safety standards.

Sarter and Sarter (2012) reported high contamination levels in small restaurants in Madagascar, emphasizing the need for improved hygiene and waste management to address hygiene deficiencies. Trafialek et al., (2019) found that while consumers in Poland and Lithuania value sustainability, they often disregard hygiene, with practices such as handling cutlery with bare hands contributing to dissatisfaction, underscoring the need for better hygiene standards. Md Dahlal et al., (2024) emphasize the importance of food safety and hygiene, focusing on reducing waste and maintaining high safety standards in the halal food industry.

Table (6): Means, Standard Deviations, and Importance Level for the Cleanliness and Waste Management, according to SAS (2012)

Paragraphs	Rank	Mean	SD	Importance Level
1. I use chemical sanitizers for equipment.	1	4.43	0.697	High
2. I use chemical disinfectants properly.	2	4.40	0.700	High
3. I continuously use materials to clean and sanitize equipment.	3	4.38	0.701	High
4. The surrounding area of the preparation zone is clean.	4	4.35	0.705	High
5. Workers must follow a cleaning schedule.	6	4.27	0.705	High
6. The cleaners and disinfectants used in the kitchen are effective in killing bacteria.	5	4.31	0.707	High
7. There are suitable containers for food and other waste.	7	4.25	0.713	High
8. Waste is immediately removed from the restaurant.	8	4.21	0.715	High
9. Oils are disposed of by placing them in separate containers.	9	4.19	0.721	High

The Cleanliness and Waste Management achieved a high importance level with an average of 4.31 ± 0.09 .

Table 7 highlights the significant and continuing importance of pest control in restaurants, with regular inspections of kitchens and storage areas considered the most important measures. Preventive strategies, such as insecticide application, maintenance, and the use of glue traps, are highly valued. While professional pest control services are considered somewhat less important, they remain a key aspect of maintaining hygiene standards. The data emphasize a proactive approach to pest management, suggesting the need for standardized practices or additional training to ensure consistency in inspections. Overall, these practices reflect a strong commitment to food safety through effective pest control.

Marriott et al. (2018) emphasize that effective pest control requires preventing pest entry, eliminating food sources, and using pesticides or traps as a complement to sanitation. Okpala and Korzeniowska (2021) highlight the role of HACCP and quality management in reducing pest risks through strict hygiene and sanitation procedures. Leiva and Artavia (2019) emphasize that pest control is essential to prevent cross-contamination, emphasizing the need for strict facility hygiene and management.

Table (7): Means, Standard Deviations, and Importance Level for the Pest Control, according to SAS (2012)

Paragraphs	Rank	Mean	SD	Importance Level
1. The kitchen and storage areas are regularly inspected for pests (mice, insects, etc.).	1	4.46	0.989	High
2. A pest control company or someone with pest control experience is contracted.	5	4.36	0.705	High
3. Insect killers are placed at all windows and open openings.	2	4.43	0.692	High
4. Insect killers are regularly maintained and their effectiveness is checked.	3	4.40	0.697	High
5. Glue traps are used to kill insects instead of electric zappers.	4	4.39	0.701	High

The Pest Control achieved a high importance level with an average of 4.41 ± 0.04 .

Implementing quality assurance systems in shawarma restaurants enhances food safety by ensuring proper handling, storage, and hygiene practices. Table 8 highlights their significant impact, with pest control, hygiene, and food storage ranked as the most important factors.

Strong regulatory oversight and employee training promote adherence to critical control points (CCPs), reducing the risk of contamination and maintaining high food safety standards.

Lau et al., (2016) identified hygiene inconsistencies in restaurants, revealing poor hand hygiene and aprons despite the safety of the final products. Their findings underscore the critical role of quality assurance systems, such as Halal Control Points (HCPs), in maintaining food safety. Wongpraomas et al. (2015) emphasize the importance of food safety and quality certifications in ensuring the credibility of food standards, particularly in international trade, highlighting the role of quality assurance systems in addressing information asymmetries in global supply chains. Overbosch and Blanchard, (2022) discuss the principles of food safety and quality management, including hygiene, prevention, and transparency. They explore international standards and the integration of quality, food safety, and environmental management systems, while also highlighting challenges such as balancing broad applicability with the need for relevant detail.

Table (8): Averages, Standard Deviations, and Importance Levels of Quality Assurance Systems' Impact on Shawarma Restaurants' Food Safety, according to SAS (2012)

Paragraphs	Rank	Mean	SD	Importance Level
1. Food Safety Assurance System	7	4.12	0.08	High
2. Employee Safety	5	4.24	0.03	High
3. Food Storage	3	4.29	0.10	High
4. Shawarma Skewer Contamination Safety	6	4.19	0.13	High
5. Equipment and Facilities	4	4.28	0.12	High
6. Cleanliness and Waste Management	2	4.31	0.09	High
7. Pest Control	1	4.41	0.04	High

The impact of quality assurance systems on food safety in shawarma restaurants has a high importance level with an average of (4.26±0.09).

Impact of Personal Variables on the Application of Quality Assurance Standards in Restaurants

A test for statistically significant gender differences revealed a significant result ($p < 0.01$), with males showing a higher mean response (4.113) than females (3.750). This suggests that gender influences perceptions of the studied construct, warranting further exploration of factors such as sociocultural influences or potential biases. Future research should investigate mediating variables to better understand this disparity. Scientific evidence suggests that gender significantly influences restaurant food safety and customer satisfaction. Studies show that female managers tend to achieve higher hygiene and safety ratings (Mathe-Souleik et al., 2014), that gender-specific training enhances food handler practices (Ncube et al., 2020), and that gender-differentiated customer satisfaction influences loyalty (Cha & Borchgrevink, 2018). Therefore, incorporating gender considerations into restaurant quality assurance strategies is essential for improving operational efficiency and customer retention.

An analysis of variance (ANOVA) test revealed no statistically significant differences in perceptions of health complications based on job title ($p > 0.05$). While restaurant owners reported the highest mean (4.102) and lowest mean (3.731) for administrative staff, these differences are likely due to random variation, suggesting that job titles do not significantly influence perceptions in this context. Further research, which explores confounding variables or uses qualitative methods, could provide deeper insights.

To enhance food safety and quality assurance in restaurants, studies by Lippert et al. (2020), Lee et al., (2012), and Aquino et al. (2024) collectively demonstrate that interventions targeting worker health, training, and management must be tailored to different job roles in the food service sector.

The analysis revealed significant age-related differences in the implementation of quality assurance systems in shawarma restaurants ($p < 0.01$). The age group of 35 to under 40 years had the highest mean score (4.180), indicating stronger engagement with food safety protocols,

while the age group of under 25 years had the lowest mean score (3.421), indicating lower engagement. This highlights the potential influence of age-related factors, such as professional experience and training, on food safety practices. Further research is needed to explore the reasons behind these differences and develop age-specific training and implementation strategies.

Research by Lee et al., (2012), Seabra (2018), and Kassa et al., (2010) collectively underscores the importance of age-sensitive food safety training and strategies, particularly in individual restaurants, to address varying levels of anxiety and knowledge across age groups.

Analysis of variance (ANOVA) revealed no statistically significant differences ($p=0.151$) in the implementation of quality assurance systems based on years of experience, despite notable differences. Participants with 15 or more years of experience had the highest mean (4.460), while those with less than 5 years had the lowest mean (3.910). However, these differences were not statistically significant, suggesting that factors other than years of experience may influence perceptions of quality assurance systems. Further research is needed to explore potential confounding variables. Contradictory findings exist regarding the effect of years of experience on food safety knowledge. Brown et al. (2014) found a positive association, while Osaili et al. (2013) and Abdalfata and Osman (2020) found no such relationship, underscoring the continued importance of food safety training regardless of experience level.

An analysis of variance (ANOVA) revealed a significant effect of academic qualifications on the perceived implementation of quality assurance systems in shawarma restaurants ($p=0.001$). Participants had the highest mean score (4.112), while those with a score second or lower than the mean (3.631) had a score second or lower than the mean. Consequently, higher levels of education are more likely to contribute to increased or decreased access to information. Therefore, further research is exploring the factors that influence these ratios.

Academic requirements play an important role in ensuring safe, healthy food in restaurants. However, their impact varies, with some studies emphasizing their importance on employee performance (Saa'idin and Malik, 2023), while others suggest that experience and external factors may have a more significant impact on ensuring safety standards (Samuel and Amini, 2020; Dramani, 2020).

Conclusions

Quality assurance systems in shawarma restaurants are generally considered critical and effective, supported by integrated regulatory oversight, industry best practices, and employee training. However, there are specific areas, such as temperature control and personal hygiene, that require improvement. Personal variables significantly influence perceptions, with gender and education showing significant effects, while age is a significant factor, and experience is not. Therefore, tailored interventions and continuous improvement are essential to maintaining and enhancing food safety standards. A comprehensive approach that considers both systemic factors and demographic differences is essential, with the Saudi Food and Drug Authority playing a vital regulatory role.

A comprehensive food safety strategy that combines regulatory rigor, active monitoring, and sector accountability is advocated. This approach includes developing or revising regulations to align with international standards, conducting periodic inspections of food establishments, and requiring restaurant owners to implement self-monitoring programs and register health supervisors. By focusing on clear guidelines, proactive monitoring, and industry accountability, this multi-faceted strategy aims to ensure safe and healthy food through a collaborative effort between regulatory bodies, restaurant owners, and health professionals.

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تقييم التزام مطاعم الشاورما بسلامة الغذاء في الأردن: دراسة استقصائية

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الملخص

هذا البحث يدرس أداء سلامة الغذاء في مطاعم الشاورما في مدينة عمّان في الأردن، حيث يشكل ضعف ضبط الجودة مخاطر صحية. ويستعرض البحث معايير ضمان الجودة، والرقابة التنظيمية، وتأثير التعليم والمعرفة على الامتثال لتحديد الثغرات والتوصية بتحسينات المطلوبة. استهدف البحث 237 مطعمًا في منطقة الجامعة باستخدام منهج تحليلي وصفي، من خلال تطبيق استبيان مُنظَّم من 74 بندًا يغطي سبعة أبعاد لسلامة الغذاء. واستُخدم التحليل الإحصائي، بما في ذلك معاملات ارتباط بيرسون، وألفا كرونباخ، وتحليل التباين، لتقييم مستويات الامتثال والتأثيرات الديموغرافية. تُظهر النتائج التزامًا قويًا بقواعد الأمن الغذائي، مثل إدارة الغذاء والدواء الأمريكية (FDA)؛ ومع ذلك، لا يزال التنفيذ وتوزيع الموارد بحاجة إلى تحسين. أعطيت الأولوية لسلامة العمال على الشهادات الصحية وتقليل الأضرار، ولكن التحكم في درجة الحرارة، والنظافة، وإزالة بقايا الطعام بحاجة إلى تحسين. تُعد السيطرة على المشاكل، وتحميل الغذاء قضايا رئيسية في ضمان الأمن الغذائي. وبينما يُحسَّن ضبط التدريب، فإن المشاركة المُستهدفة في مناقشة الاختلافات الديموغرافية أمر أساسي لتحسين ظروف العمل. يُوصي البحث بوضع خطة عامة تجمع بين القواعد الصارمة، والرقابة النشطة، والعمل الجماعي بين السلطات وعمال المطاعم للحفاظ على قيم سلامة الغذاء والارتقاء بها. ويشمل ذلك وضع القواعد، وإجراء مراجعات دورية، وتطبيق برامج المراقبة الذاتية، وبناء تعاون وثيق بين مسؤولي الرقابة، وأصحاب المطاعم، وأخصائيي الصحة العامة.

الكلمات المفتاحية: إدارة المطاعم، جودة الأغذية، التعامل مع الأغذية، إدارة المخاطر، سلامة المستهلك، النظافة.