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Food Hygiene and Sanitation at the Jakarta Pondok Gede Hajj Embarkation Dormitory: Food Safety Efforts for the Hajj Pilgrims

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Abstract

Several health risks are associated with performing Hajj pilgrimage. Food poisoning is a major cause of diarrhea and vomiting during Hajj. Food hygiene is an effort to control aspects of food, people, places, and equipment that could cause disease or health problems. This study aimed to describe food hygiene and sanitation efforts implemented in 2023 at the Jakarta Pondok Gede Hajj Embarkation Dormitory in Jakarta, implemented in 2023 to safeguard foods for the Hajj pilgrims. Using a descriptive qualitative design with a document analysis approach, this study examined activities during the pre-embarkation and embarkation periods. Pre-embarkation efforts included inspecting the kitchen environment and coaching the catering team, while during the embarkation period, activities involved checking the hygiene of catering services, inspecting foods brought by pilgrims, and assessing the quality of food and drink. This study found that the dormitory kitchen did not meet the necessary facilities and infrastructure requirements, affecting food safety. Additionally, food handlers did not fully comply with hygiene and sanitation standards. This study emphasized the necessity of meeting hygiene requirements in the kitchen, food handling, equipment, and ingredients since the pre-embarkation period.

Keywords: food safety, Hajj, hygiene, sanitation

Introduction

The Hajj pilgrimage takes days to a month for the regular Hajj program, with all its pillars and obligations requiring a healthy body and physical condition.[1] Hajj carries several health risks that can interfere with the pilgrimage.[2] A health risk that might occur is diarrhea, which is common during the pilgrimage. Food poisoning is a major cause of diarrhea and vomiting during the pilgrimage. Over the past 12 years, the number of reported cases of food poisoning has ranged from 44 to 132 cases in each Hajj season.[3] Providing healthy food is the key to preventing food poisoning. Efforts to prevent food poisoning include food hygiene and sanitation, focusing on cleanliness in handling, storing, and serving foods. Risks for microbiological, chemical, and physical contaminations can be reduced by maintaining the cleanliness of the environment, equipment, and food handlers. This means a crucial aspect of food safety, aiming to ensure that food is free from hazards that can cause illness.[4,5]

Poor food processing will allow food contamination with pathogenic bacteria. Bacterial contamination can come from food processing and storage not paying attention to hygiene sanitation requirements, such as poor hygiene of food handlers and food storage at unsafe temperatures. The study of gastrointestinal cases in Sudanese pilgrims during the 2017 Hajj season showed that the main possible cause of the outbreak was food contaminated with *Bacillus cereus* and *Clostridium perfringens*, with the most likely contributing factors being poor hygiene levels of food handlers and food storage at unsafe temperatures.[6]

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During the regular Hajj program, the Indonesian Government must provide food for Hajj pilgrims in Hajj embarkation and dormitories in Indonesia and Saudi Arabia, using a catering system. At embarkation, the congregation gets three meals and two snacks.[1] Seeing any risk for health problems caused by food among Hajj pilgrims, the government must protect foods consumed during the Hajj pilgrimage.[6] The food protection at Hajj embarkation and dormitories is performed through food hygiene and sanitation activities as an effort to control aspects of food, people, places, and equipment that could result in disease or health problems.[7,8]

Food hygiene and sanitation efforts at a Hajj embarkation start from the pre-embarkation period and continue until the embarkation period when the Hajj pilgrims' health is inspected.[7] Hajj embarkation is the airport where prospective Hajj pilgrims depart directly to Saudi Arabia. Meanwhile, the Hajj dormitory is the location for organizing and arranging activities during departure and return. It is located in the city where the airport of departure is located.[9]

Jakarta Pondok Gede (JKG) Hajj Embarkation serves prospective Indonesian Hajj pilgrims from Jakarta and Banten Provinces with the departure at Soekarno Hatta International Airport and the JKG Hajj Embarkation Dormitory as the place for organizing and arranging departure and return activities. JKG Hajj Embarkation is one of the largest embarkations in Indonesia to dispatching pilgrims from Jakarta and Banten Provinces. It also organizes the departure of pilgrims from Lampung Province and parts of the West Java Province.[10,11] There remain few studies on food hygiene and sanitation at the Hajj embarkation; therefore, this study aimed to describe food sanitation and hygiene efforts implemented in 2023 at the JKG Hajj Embarkation Dormitory to safeguard the foods for the Hajj pilgrims.

Method

This study applied a descriptive qualitative design with a document analysis approach. Hence, documents related to implementing supervision on food hygiene and sanitation at the JKG were limited. This study described the supervision of food hygiene and sanitation at JKG Hajj Embarkation Dormitory from the pre-embarkation to the embarkation period of Hajj embarkation implemented by the Class I Soekarno Hatta Port Health Office in 2023 as an effort to safeguard foods for Hajj pilgrims. Descriptive study is a method attempting to describe and interpret objects as they are.[12] The document analysis method is a qualitative approach, examining and interpreting data to reveal meaning, gain understanding, and arrive at a conclusion from reports and documents on the results of activities.[13] The document in question is the health supervision report of the JKG Hajj Embarkation owned by the Class I Soekarno-Hatta Port Health Office.

This study was conducted on May 13-18, 2024 at the JKG Hajj Embarkation Dormitory. The variables analyzed were activities during the pre-embarkation period, including environmental health checks for food processing kitchens and catering guidance. The embarkation period includes inspecting the sanitation of the catering services, screening of food brought by pilgrims, and checking the quality of food and drink. The assessment of environmental health aspects in food processing kitchens included floors, walls, ventilation, waste disposal channels, cleanliness of the kitchen space, facilities and infrastructure, lighting, room division, and drinking water. Catering coaching was conducted through training for the food handlers.

The data was obtained from the results of the analysis of the pre-embarkation JKG Hajj Embarkation Dormitory sanitation inspection report, the daily report of the Environmental Risk Control Unit during embarkation, and the implementation of prospective Hajj pilgrims' health at the JKG Hajj Embarkation in 2023 at the Class I Soekarno Hatta Port Health Office report, during the Islamic calendar of 1444 Hijriah (2023) Hajj season. The data obtained was processed and displayed in graphs, numbers, and narratives.

Based on the reports above, the results of the Environmental Health Inspection (EHI) of the kitchen for food processing are divided into four categories based on the yes answer score. The "poor" category got a yes answer score of <65%; the "sufficient" category got a yes answer score of 65-74%; the "good" category got a yes answer score of 75-84%, and the "excellent" category got a yes answer score of 85-100%.

Results

Pre-Embarkation Period

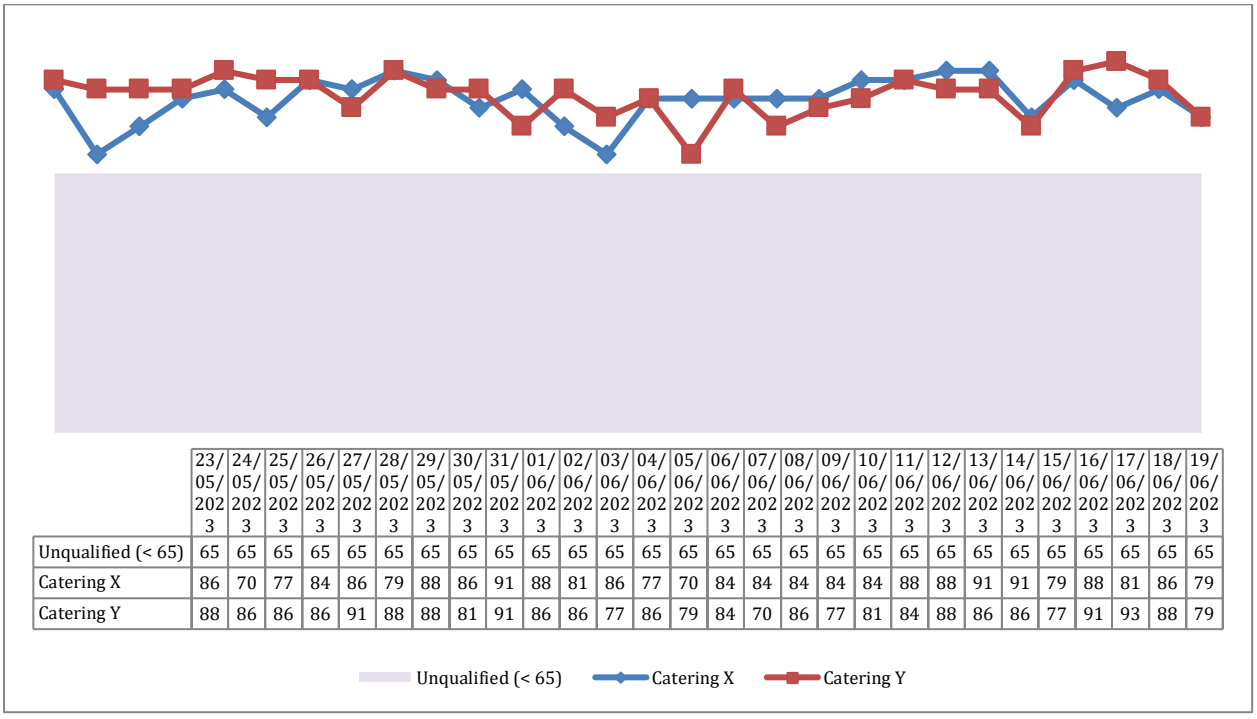
The pre-embarkation period began with a health check on the kitchen environment, where food processing was carried out twice: six months (D-6 months) and a week (D-1 week) before the embarkation period. The inspection results were divided into four categories: poor, sufficient, good, and excellent. The D-6 months inspection was in the poor category (yes answer score = 60.19%). This was because the kitchen still had several problems, such as the

damaged floor and ceiling, no grease trap in the waste channel of the meat and fish cutting room, no special room for storing dry and wet foods, no shelves for storing equipment, the dirty space around the kitchen, and the waste channel clogged with rubbish and dirt. After some repairs on D-1 week, a reexamination was carried out with the results reaching a score of 79.61% or in the good category, where repairs were made to the floor and ceiling, and grease traps were installed in the waste channel, but not all the kitchen waste water channels were connected to the grease traps.

The development of catering services at the JKG Hajj Embarkation Dormitory was carried out through counseling activities on sanitary hygiene and vector control in food processing for food handlers working to serve food for the Hajj pilgrims and officers at the JKG Hajj Embarkation. The counseling began with a pre-test and delivery of material on the policy of sanitary hygiene certificates in the fast food businesses, washing equipment, sanitary hygiene requirements in food processing places, specific requirements, and principles of food hygiene and sanitation. It was then continued with a discussion of questions and answers related to common problems at the JKG Hajj Embarkation Dormitory kitchen during the embarkation period. The activity ended with an EHI post-test. The lowest score in the pre-test was 25%, and the highest was 75%, with an average of 52.5%. After the delivery of material, discussion, and handwashing practice, the post-test was continued with the lowest score of 65% and the highest score of 95%, with an average score of 75%.

Embarkation Period

Sanitary checks on catering services at the Hajj dormitory were done daily through EHI at the JKG Hajj Embarkation Dormitory's public kitchen. In 2023 or 1444 Hijriah, in the Islamic calendar, there were two catering service providers operating in the kitchen. Catering X served food for Hajj pilgrims, and Catering Y served food for Hajj Pilgrimage Organizing Committee/*Panitia Penyelenggara Ibadah Haji* (PPIH) at the JKG Hajj Embarkation Dormitory. The results of the EHI on those two providers varied each day but were still in the qualified category, with no inspection results and a score of less than 65% (Figure 1). The average assessment during the embarkation period for Catering X and Y was both in the good category at 81.64% and 81.89%, respectively. The findings in terms of aspects of food hygiene and sanitation encountered each day are outlined in Figure 2.



	23/05/2023	24/05/2023	25/05/2023	26/05/2023	27/05/2023	28/05/2023	29/05/2023	30/05/2023	31/05/2023	01/06/2023	02/06/2023	03/06/2023	04/06/2023	05/06/2023	06/06/2023	07/06/2023	08/06/2023	09/06/2023	10/06/2023	11/06/2023	12/06/2023	13/06/2023	14/06/2023	15/06/2023	16/06/2023	17/06/2023	18/06/2023	19/06/2023
Unqualified (< 65)	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Catering X	86	70	77	84	86	79	88	86	91	88	81	86	77	70	84	84	84	84	84	88	88	91	91	79	88	81	86	79
Catering Y	88	86	86	86	91	88	88	81	91	86	86	77	86	79	84	70	86	77	81	84	88	86	86	77	91	93	88	79

Figure 1. The Environmental Health Inspection Results of Catering X and Y at JKG Hajj Embarkation Dormitory from May 23 to June 19, 2023

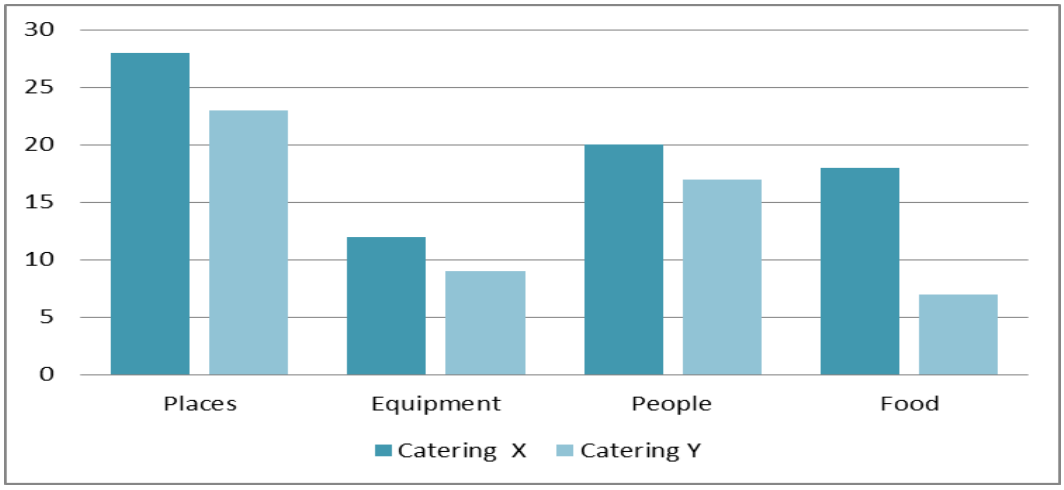


Figure 2. Findings of Food Hygiene and Sanitation Aspects at Catering X and Y During the Embarkation Period

Findings or nonconformities that occurred daily were related to the kitchen where food was processed in both Catering X and Y. Problems often encountered were related to kitchen cleanliness, flies, grease traps not being cleaned daily, and problems with garbage and wastewater disposal. Nonconformities related to the food handler aspect were in second place. The frequent nonconformities encountered were related to habits of food handlers smoking in the kitchen, throwing cigarette butts carelessly, still wearing some accessories (jewelry) while doing their job, and not all of them complying with using personal protective equipment such as masks and gloves.

The food aspect was the third most frequently encountered aspect. The nonconformities encountered included not covering dry food and vegetables with pallets, sorting food ingredients and arranging the messy ingredients in the chiller, not maintaining the cleanliness of the chiller or refrigerator, and not immediately covering cooked food. At the same time, the nonconformities related to food equipment that was often encountered were stoves not cleaned immediately after work was finished, water and tubs used to wash the equipment not immediately disposed of and cleaned, and the placement of washed equipment not in a clean place.

The selection of Hajj pilgrims' food prioritizes perishable foods, such as rice, *lontong* (an Indonesian dish made of compressed rice cake in the form of a cylinder wrapped inside a banana leaf), rissole, vegetables, vermicelli, fried noodles, and shredded chicken. Hajj pilgrims from Banten Province were more likely to carry these foods as supplies during the trip to Jakarta. The purpose of this activity was to prevent the occurrence of food poisoning due to food that has passed its serving date. Checking the quality of food and drink includes organoleptic examination and sample banks at each mealtime (three main meals and two snacks). The sample bank was stored at a temperature of <0°C for 2 x 24 hours for investigation purposes in case of food poisoning among the pilgrims and officers.

Chemical and microbiological quality testing of food and drink was conducted on food ingredients and cooked food samples. Food testing was carried out on formalin, borax, and food coloring parameters, and the results showed that no hazardous chemicals were found in the food. Tests of cooked food were carried out to determine the content of pathogenic bacteria in cooked food. Of the 20 cooked food samples that underwent microbiologically testing, there was one sample of congregate food, an omelet, containing *Escherichia coli* bacteria.

Discussion

Sanitary inspection of the JKG Hajj Embarkation Dormitory kitchen indicated some unresolved problems at D-1 week still existed. This ultimately affected the sanitary conditions of the kitchen for food processing during the embarkation period, referring to flies, dirty grease traps, and clogged waste channels. The results of the EHI of the dormitory kitchen carried out daily by the Port Health Office sanitation officers showed that there were discrepancies related to the kitchen: problems were still found that were closely related to waste disposal channels. According to the Indonesian Minister of Health Regulation Number 2 of 2023, catering kitchens are required to have a waste channel connected to a grease trap before being discharged into the city sewerage.[14] The grease trap functions to filter the grease and food processing residues in the kitchen, thus not clogging the channel, generating odors, and inviting disease-transmitting insects such as flies and cockroaches.[8]

Efforts to foster the food handlers had already been made during the pre-embarkation period. However, during the

embarkation period, problems related to the food handlers comprised their smoking behavior in the kitchen and noncompliance in using personal protective equipment. Sustainable training for the food handlers is crucial, not only through counseling during the pre-embarkation period, but it should also be carried out continuously and periodically by catering service providers. Noncompliance of food handlers will affect levels of hygiene and quality of the processed food. A previous study discussing food safety practices during the 2022 Hajj season revealed that catering service providers in Makkah and Madinah, Saudi Arabia, showed that food handlers from trained establishments were more likely to comply with food safety practices compared to food establishments with untrained food handlers.[15] Factors closely associated with the food handlers' compliance were kitchen hygiene, commitment to health requirements, food handling, and food storage practices.[5]

Food safety efforts made by the Class I Soekarno Hatta Port Health Office during the embarkation period have included continuous supervision on a daily basis for four aspects of food hygiene and sanitation, including the kitchen where food was processed, food processing equipment, food handlers, and food ingredients/processed food. Supervision is taken on the six principles of food processing.[8] Catering/gourmet managers who do not pay attention to the principles of food processing will produce food contamination, which can come from humans, animals, and the environment. Cross-contamination can be caused by food handlers, equipment, insects, and waste.[5]

The microbiological test results on 20 samples showed that one sample of the pilgrims' food contained *Escherichia coli* bacteria as much as 1.7 x 103 CFU/gr in the omelet. This puts the pilgrims in jeopardy since it has the potential to cause foodborne illness. *Escherichia coli* bacteria are bacteria that include normal flora in the tracts of livestock and humans.[5,16] The presence of the bacteria indicated that the omelet was already contaminated by animal/human feces. These microbiological test results were not in accordance with the environmental health quality standards in the Indonesian Minister of Health Regulation Number 2 of 2023 concerning Implementing Regulations of Government Regulation Number 66 of 2014 concerning Environmental Health because the required standard is <1.1 CFU/gr of test food ingredients.[14]

Food processing that does not pay attention to the principles of food sanitation hygiene will contribute to the risk of biological contamination from the hands of food handlers, eggshells included in food ingredients, and the possible cross-contamination from flies commonly found in the kitchen.[7,8,15] The behavior of food handlers is related to the presence of *Escherichia coli* bacteria in food. This is in line with a study conducted at the Surabaya Hajj Dormitory in 2019, which showed a relationship between the personal hygiene of food handlers and the presence of *Escherichia coli* in the foods of Hajj pilgrims at the respective embarkation.[17] The results of bacterial findings in samples of cooked food for the Hajj pilgrims had been followed up by the Class I Soekarno Hatta Port Health Office by providing a recommendation letter to the head of PPIH and the JKG Hajj Embarkation Dormitory, as well as suggestions for improvement to the catering manager to immediately take corrective steps to pay attention to the principles of food processing in every aspect of food hygiene and sanitation.[18] Attention to aspects of sanitary hygiene such as food handlers, equipment, ingredients, and cooked food must be considered from the preparation stage in the pre-embarkation period. This preparation supports the implementation of the principles of food hygiene and sanitation by catering managers.

Conclusion

Food sanitation hygiene efforts at the JKG Hajj Embarkation dormitory have been made since the pre-embarkation and embarkation periods by improving the facilities and infrastructure of the Hajj embarkation kitchen to meet the requirements, such as installing exhaust fans, building a centralized wastewater disposal system with one grease trap, dividing the room by paying attention to food processing lines to avoid cross-contamination and providing equipment storage shelves. Cross-sectoral coordination in implementing food hygiene and sanitation at the Hajj embarkations is highly useful for improving food safety for Hajj pilgrims. A further qualitative study needs to be taken with a rapid assessment procedure approach to finding out a comprehensive picture of how food sanitation hygiene is implemented at the JKG Hajj Embarkation Dormitory; therefore, problems of why food sanitation hygiene requirements are not met in the kitchen, equipment, handlers, and food can be identified.

Abbreviations

JKG: Jakarta Pondok Gede; EHI: Environmental Health Inspection; PPIH: *Panitia Penyelenggara Ibadah Haji/* Hajj Pilgrimage Organizing Committee.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee for Health Research, Faculty of Public Health, Universitas Indonesia (Ket-188/UN2.F10.D11/PPM.00.02/2024). To obtain secondary data on the results of food hygiene and sanitation supervision, the first author first submitted a data request permit to the Soekarno Hatta Health Quarantine Center to be processed, analyzed, and presented in the form of scientific writing (PP.06.02/C.IX.6/4527/2024).

Competing Interest

The authors declare that no significant competing financial, professional, or personal interests might have affected the performance or presentation of the work described in this manuscript.

Availability of Data and Materials

Data were available upon request.

Authors' Contribution

Both FH and AA conducted secondary data collection, data processing, analysis and interpretation, and writing the manuscript. BW, HR, and ZM equally provided scientific input when writing the manuscript.

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