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Overview of Food Handler Sanitation Hygiene and the Presence of Bacteria *Escherichia Coli* on Prepared Food at Hospital X Surakarta

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ABSTRACT

Introduction: Hygiene and sanitation of food handlers and food quality in hospitals are crucial for preventing the spread of disease. Although SOPs mandate that food handlers use Personal Protective Equipment (PPE) during work, the reality on the ground still does not meet established standards. *E. coli* is one of the most frequently encountered bacterial food contaminants. The aim of this study was to describe the sanitation hygiene of food handlers and the presence of *E. coli* bacteria in ready to eat food at Hospital X Surakarta. **Method:** This research is a quantitative descriptive study conducted in January–February 2025 at Hospital X Surakarta. The sample consisted of 16 food handlers (total sampling) and 9 processed food samples (purposive sampling). Data were collected through observation, questionnaires, and laboratory tests using the Most Probable Number (MPN) method according to SNI 2897:2008. The analysis was conducted descriptively and quantitatively based on the standards of the Indonesian Minister of Health Regulation No. 1096 of 2011. **Results:** The results showed that 31.2% of food handlers at Hospital X Surakarta did not meet hygiene and sanitation requirements. Based on laboratory tests, 9 food samples did not contain *Escherichia coli* bacteria. **Conclusion:** A total of 31.2% of food handlers were found not to meet hygiene requirements; however, laboratory test results showed that 100% of finished food samples were free from *Escherichia coli*.

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INTRODUCTION

Hygiene sanitation refers to the prevention of food contamination whether from ingredients, people, places, or equipment to ensure food is safe for consumption. Food handlers are those responsible for food processing, and their hygiene and sanitation requirements are regulated under the Indonesian Minister of Health Regulation No. 1096 of 2011 concerning Hygiene Catering Sanitation (Ministry of Health of the Republic of

Indonesia, 2011). Poor hygiene and sanitation among food handlers are significant factors that contribute to food poisoning (Anjasmara, 2024).

Sanitation hygiene plays a crucial role in preventing food poisoning, particularly throughout the food processing chain from receiving raw materials, storage, processing, to serving food to consumers. Failure to adhere to hygiene standards at any stage can increase the risk of cross-contamination caused by the transfer of pathogenic microorganisms from unhygienic equipment, work surfaces, or workers, which may lead to foodborne illnesses. Therefore, the implementation of strict and continuous hygiene protocols, including disciplined personal hygiene practices by food handlers, proper cleaning and sanitization of equipment, and maintaining a processing environment that meets food safety standards, is essential to ensure food quality and safety. These measures directly contribute to protecting public health (Makhunga & Hlongwana, 2024).

Food poisoning can occur due to bacterial contamination by *Escherichia coli* (*E. coli*), which produces harmful toxins in food. The main cause of food poisoning is poor hygiene and sanitation during food processing. Consumption of contaminated food can result in toxin formation, leading to symptoms such as vomiting, diarrhea, fever, and abdominal cramps. The incubation period for *E. coli* infection ranges from 3 to 8 days (median 3–4 days), and most patients recover within 10 days (WHO, 2018). According to the 2023 Surakarta Health Profile, there were 46 reported cases of food poisoning, four of which resulted in death, indicating that foodborne illness remains a serious public health problem (Surakarta City Health Office, 2023). Consuming food contaminated with enteropathogenic *E. coli* can cause severe diarrhea (Sapitri & Afrinasari, 2019).

Escherichia coli is one of the most common bacterial contaminants found in food. This bacterium originates from human and animal feces and can contaminate food through unhygienic handling practices (Rokot et al., 2023). *E. coli* is also used as a key indicator of food hygiene, as its presence serves as an early sign of contamination that may cause disease (Maharani et al., 2022).

The Regulation of the Minister of Health of the Republic of Indonesia No. 1096/Menkes/SK/VI/2011 on Hygiene Catering Sanitation states that the total number of germs in food and drink should not exceed 100 colonies/cm², and *E. coli* should not be detected on the surface of utensils. Cleaned utensils must be dried on rust-proof racks using sunlight or artificial light, and must not be wiped with a cloth. Artificial light refers to ultraviolet (UV) or drying lamps specifically designed for equipment drying (Ministry of Health of the Republic of Indonesia, 2011). Symptoms caused by *E. coli* infection include vomiting, abdominal cramps, fever, and diarrhea, with an incubation period of 3–8 days and recovery within approximately 10 days (WHO, 2018). Food contaminated with enteropathogenic *E. coli* can lead to severe diarrheal disease (Sapitri & Afrinasari, 2019).

Hospitals are public institutions that provide health services, including nutritional care for patients. To support medical services, the Nutrition Department of Hospital X Surakarta must implement food processing procedures that meet hygiene and sanitation standards. This hospital was selected as the research location because it offers accessible facilities, complete data, and competent human resources, which support the research process. Observations at Hospital X Surakarta indicated that food handler hygiene and sanitation were not yet optimal. Several food handlers did not comply with the Nutrition Installation SOP, which requires the use of special clothing while working. This noncompliance increases the risk of cross-contamination in food served to patients, potentially affecting the quality of nutritional services and patient health. Therefore, evaluating hygiene and sanitation practices among food handlers and improving

compliance with SOPs are essential to ensure food safety and support the optimal recovery of patients.

Food handlers at Hospital X Surakarta are responsible for preparing various types of food served to patients, including rice, eggs (boiled or omelet), galantine, and various vegetables. The food processing process must adhere to hygiene and sanitation principles to ensure the safety and quality of the food provided. Food is closely related to health; therefore, food handlers must practice proper hygiene behaviors in handling food (Nur Fitryana et al., 2021). One key factor determining food quality is the selection of ingredients. Processed food ingredients must be fresh—for example, vegetables should not change in color, shape, or texture, and meat quality must be ensured through proper sourcing (Dewi et al., 2021).

High bacterial levels in food are often caused by poor personal hygiene. As a preventive measure, it is essential to improve food handlers' awareness of hygiene practices. Proper sanitation includes cleaning food preparation areas, washing hands before and after serving patients, covering the mouth when coughing or sneezing, and using clean utensils according to standard operating procedures (SOPs). Sanitation and food handler behavior are crucial, as they are directly related to cross-contamination. The main indicator of food contamination is the presence of *E. coli* bacteria. Consumption of food contaminated with *E. coli* can cause serious digestive problems (Maharani et al., 2023). Additionally, *E. coli* can contaminate not only food and beverages but also water sources, rendering them unsafe for consumption.

This research is highly relevant for raising awareness among food handlers about the importance of hygiene in preventing *Escherichia coli* contamination in food. Infections caused by *E. coli* can result in diarrhea, gastroenteritis, and other gastrointestinal disorders, particularly in individuals with weakened immune systems. Therefore, this study aims to contribute to improving food safety by identifying potential sources of contamination and reducing the risk of *E. coli* spread. The findings are expected to support efforts to enhance hospital service quality through better implementation of hygiene and sanitation practices among food handlers.

Based on the background above, and considering the importance of monitoring food hygiene, the researcher is interested in conducting a study titled: "Description of Food Handlers Hygiene and Sanitation and the Presence of *Escherichia coli* in Prepared Food at Hospital X Surakarta."

LITERATURE REVIEW

Hygiene is an effort to prevent disease by maintaining personal and environmental cleanliness (Taqia et al., 2021). Sanitation is a comprehensive effort that includes actions aimed at preventing events that may harm human health and ensuring environmental conditions remain safe and healthy (Taqia et al., 2021). Food hygiene and sanitation involve monitoring food, individuals, environments, and equipment that may cause disease. Food management must be carried out in accordance with health standards because food can serve as a medium for disease transmission (Istiqomah, 2023).

Food handlers are individuals involved in various stages of food management, including preparation, processing, storage, transportation, and serving. The Indonesian Ministry of Health (2006) defines food handlers as individuals responsible for managing food throughout these stages (Darmapala, 2019). Food handlers play a crucial role at every step of food processing, as they are potential sources of disease transmission and food contamination. Therefore, food handlers must maintain good health and hygiene to prevent food contamination (Darmapala, 2019).

Escherichia coli is a Gram-negative, rod-shaped bacterium that is facultatively anaerobic. It can exist as either a commensal or pathogenic organism and belongs to the family *Enterobacteriaceae*. *E. coli* normally inhabits the human intestine and reproduces in environments associated with humans (Alfan, 2019). This bacterium is commonly found in the digestive systems of humans and animals and is frequently used as an indicator of fecal contamination and poor sanitation in water, food, milk, and other dairy products (Istiani & Agustiani, 2021). According to the Regulation of the Minister of Health of the Republic of Indonesia No. 1096/Menkes/Per/VI/2011, the acceptable limit for *E. coli* in food is 0 per gram of sample, and in beverages, it must be 0 per 100 mL of sample (Ministry of Health of the Republic of Indonesia, 2011).

METHODS

This type of research is quantitative descriptive which aims to describe the hygiene and sanitation practices of food handlers and the presence of bacteria *E. coli* on processed food at Hospital X Surakarta. The study was conducted from January to February 2025 and took place at Hospital X Surakarta, which was chosen because the hospital is an institution with a high risk of foodborne disease transmission, so it is important to assess the implementation of hygiene and sanitation of food handlers. The study population included all 16 processed food handlers at Hospital X Surakarta, and the entire population was sampled using a total sampling technique. In addition, this study also used nine processed food samples taken from the kitchen of Hospital X Surakarta. Food sampling was carried out using a purposive sampling method, namely selecting samples based on the types of food most frequently prepared and served to patients. This study involved two interrelated types of samples, namely human samples (food handlers) who were the subjects of hygiene and sanitation practice assessments, and processed food samples that were the objects of laboratory examination to detect the presence of bacteria *E. coli*.

The research data came from questionnaires and laboratory test results. The research data were obtained through three stages of data collection, namely (1) direct observation, (2) filling out questionnaires, and (3) laboratory tests. Observations were conducted directly in the food processing area to assess the implementation of hygiene and sanitation of food handlers in accordance with the guidelines of the Minister of Health of the Republic of Indonesia Regulation Number 1096/Menkes/Per/VI/2011 concerning Hygiene and Sanitation of Catering Services. The questionnaire used was also compiled based on the indicators in the regulation and filled out directly by respondents (food handlers). Furthermore, laboratory tests were conducted on nine processed food samples to determine the presence of bacteria *E. coli*. Testing was conducted in a health laboratory using the Most Probable Number (MPN) method in accordance with the Indonesian National Standard (SNI) 2897:2008 concerning the Testing Method for Microbial Contamination in Food Products.

The research instruments consisted of observation sheets and hygiene and sanitation questionnaires referring to the Indonesian Minister of Health Regulation No. 1096 of 2011, as well as laboratory test result sheets based on the MPN method in accordance with SNI 2897:2008. The data collection procedure was carried out sequentially, starting from direct observation of hygiene behavior and sanitation conditions of food handlers in the hospital kitchen, then continued with respondents filling out questionnaires to obtain supporting data, and finally taking and examining food samples in the laboratory. Data analysis was carried out descriptively quantitatively, by calculating the frequency and percentage of the results of observations, questionnaires, and laboratory tests. The results were then compared with the standards stipulated in the Indonesian Minister of Health

Regulation No. 1096 of 2011 and food microbiology quality standards based on SNI 2897:2008 to assess the level of fulfillment of hygiene and sanitation and safety of processed foods.

RESULTS AND DISCUSSION

Respondent characteristics consist of several divisions, including age, gender, education level, and length of service.

Table 1 Respondent Characteristics (N= 16)

Characteristics	Categories	Frequency (n)	Percentage (%)
Age	23-35 years (early adulthood)	5	31.2
	36-48 years (middle adulthood)	4	25
	49-56 years (late adulthood)	7	43.7
Gender	Man	1	6.2
	Woman	15	93.7
Level of education	Junior High School	1	6.2
	SMA	13	81.2
	Diploma/Master's	2	12.5
Working Years	1-10 Years	9	56.2
	>10 Years	7	43.7

Table 1 shows that 7 respondents (43.7%) were aged 49-56 years old because older people have more experience and therefore tend to better understand the importance of sanitation hygiene. The 15 female respondents (93.7%) were female because women are more responsible for sanitation aspects. Respondents based on education level showed that 13 respondents (81.2%) had a high school education because individuals with higher education tend to better understand the importance of sanitation hygiene. Based on length of service, 9 respondents (56.2%) had worked for 1-10 years because older workers tend to be accustomed to and know sanitation hygiene procedures in the workplace.

The food handlers observed consisted of 15 women and 1 man. The assessment was conducted through observation using a questionnaire. The results of the observations of food handlers at Hospital X Surakarta can be seen in Table 2.

Based on observations conducted over two days, the hygiene of food handlers at Hospital X Surakarta showed good conditions. The observation results above are representative of all respondents because all respondents were used as samples, where all food handlers use PPE completely and correctly. Food handlers wear aprons, gloves, and head coverings when preparing food, and carry out hygiene procedures by washing their hands with running water and soap. Afterward, food handlers dry their hands using a clean cloth or rag. Washing hands, although a minor activity and often overlooked, has proven effective in preventing food contamination. These practices have met the standards of the Indonesian Minister of Health Regulation No. 78 of 2013 concerning Guidelines for Hospital Nutrition Services, which also regulates the use of PPE by food handlers. These results are in line with research conducted by Siti Fatimah (2022), showing that food handlers use PPE in accordance with the SOP, namely wearing aprons, head coverings, and masks correctly and in a clean condition (Fatimah et al., 2022). This shows a tendency that food handlers have knowledge regarding good food hygiene and sanitation (Pandiangan et al., 2024).

Table 2 Results of Observation of the Questionnaire of Prepared Food Handlers at Hospital X Surakarta

Variables	Observation Results	Standard	Is
Wearing work clothes	Always	Always	**MS**
Wearing an apron	Always	Always	**MS**
Wearing a face mask	Sometimes	Always	**TMS**
Wearing a head/hair covering properly	Always	Always	**MS**
Wear gloves when preparing food	Always	Always	**MS**
Always wear proper work shoes when working	Sometimes	Always	**TMS**
Wash your hands with soap before work & after going to the bathroom	Always	Always	**MS**
Dry your hands with a clean cloth after washing your hands.	Always	Always	**MS**
Short & clean nails	Always	Always	**MS**
No talking while working	Sometimes	Never	**TMS**
Do not spit in the work area.	Never	Never	**MS**
No smoking during processing	Never	Never	**MS**
Do not scratch body parts during processing	Never	Never	**MS**
Touching food with utensils	Always	Always	**MS**
Not currently sick	Never	Never	**MS**
Throw rubbish directly in the bin when in the kitchen	Always	Always	**MS**
No yawning while working	Never	Never	**MS**
Do not eat or chew food and drinks while working	Never	Never	**MS**
Use a tissue to cover your nose when sneezing/coughing	Always	Always	**MS**
Do not wear jewelry other than a wedding ring while working.	Sometimes	Never	**TMS**
Food handler certificate	Sometimes	Always	**TMS**

Note: Description: MS = Meets requirements/TMS = Does not meet requirements

Based on the results of a study conducted on 16 food handler respondents at Hospital X Surakarta, it was found that only 11 people (68.7%) met hygiene requirements and complied with the applicable SOP, while 5 handlers (31.2%) did not meet the requirements. Therefore, it can be concluded that food handlers at Hospital X Surakarta do not fully meet the hygiene requirements for food handlers.

Based on table 3 above, it is known that the sanitation hygiene facilities at Hospital X Surakarta of the 12 observation objects studied, there are 9 (nine) observation objects that meet the requirements for sanitation hygiene facilities and there are 3 (three) observation objects that do not meet the requirements for sanitation hygiene. The objects that do not meet the requirements are those that do not have additional toilets for every additional employee up to 25 people. Likewise, the ratio of 1 bathroom for 30 people does not meet the standards for sanitation hygiene facilities in hospitals and the minimum standard used is 1 bathroom for 10-20 employees. So, it can be concluded that the sanitation hygiene facilities at Hospital X Surakarta do not meet the requirements. Hygiene sanitation in the Indonesian Minister of Health Regulation No. 1096/MENKES/PER/VI/2011 concerning hygiene and sanitation of catering services.

Healthy and safe food is a crucial part of promoting public health. Hospital patients, in particular, require special attention to ensure that food quality is bacteria-free and physically safe. To ensure this safety, bacteriological quality checks can be performed on finished food samples. In this study, food sample checks were conducted over three days using the following parameter *E. coli*.

Table 3 Observation Results of Sanitation Facilities at Hospital X Surakarta

Object of Observation	Yes	No	Is
Clean, safe, sufficient and pressurized water source	√		**MS**
There is a wastewater tank from the kitchen, bathroom, toilet and rainwater channels that are smooth, good and do not stagnate.	√		**MS**
Every time there is an increase in employees up to 25 people, there is an addition of 1 toilet (1 toilet: 1-10 people)		√	**TMS**
Every time there is an increase in employees up to 30 people, there is an additional 1 tourist unit (1 unit: 1-30 people)		√	**TMS**
1 bathroom: 1-30 people		√	**TMS**
There are trash bins that are sufficiently covered, anti-flies, anti-cockroaches, anti-rats and lined with plastic bags that are always removed every time they are full.	√		**MS**
Aprons available	√		**MS**
Masks available	√		**MS**
Gloves available	√		**MS**
Head coverings are available for those who do not wear the hijab.	√		**MS**
Work shoes available	√		**MS**
Hand washing facilities with soap and wipes available	√		**MS**

Note: Description: MS = Meets requirements/TMS = Does not meet requirements

Table 4 Results of Bacteriological Examination of Prepared Food at Hospital X Surakarta

Day/Date	Sample Type	Check up result *Escherichia coli*	You are not dead.	Unit	Is
I/18 Feb 2025	Boiled egg, rice & vegetables	0	<1.1 CFU/Gram	Cfu/g	**MS**
II/19 Feb 2025	Galantine, rice & vegetable soup	0	0	Cfu/g	**MS**
III/20 Feb 2025	Omelette, rice & timlo vegetables	0	<1.1 CFU/Gram	Cfu/g	**MS**

Note: Description: MS = Meets requirements/TMS = Does not meet requirements

The data in Table 4 above show that the samples of finished food that have been tested in the microbiology laboratory meet the quality standards as required by the Minister of Health Regulation No. 2 of 2023, which is the implementing regulation of Government Regulation (PP) No. 66 of 2014 concerning Environmental Health. Based on observations, the implementation of food hygiene and sanitation at Hospital X Surakarta has begun from the process of receiving food ingredients to distributing food to patients. Hospital X Surakarta applies strict standards regarding the quality of food ingredients received, including the cleanliness of the food ingredients. This is in line with the opinion of Bachyar Bakri (2018) that food ingredient receipt is a series of observing, testing, recording, and reporting food ingredients that have been confirmed (Bakri et al., 2018).

Food handlers are also required to keep short, clean nails; refrain from smoking, spitting, scratching, yawning, and eating or chewing food while food is being prepared. This can lead to the spread of bacteria into the food being prepared. Food contamination can lead to illnesses known as foodborne illness (foodborne disease), the entry of food into the body due to contamination by microbes. Poor equipment hygiene plays a significant role in the growth and spread of germs (Rulen & Intarsih, 2021). Therefore, all food handlers must use special tools when in contact with food; this is done to reduce contamination. Food handlers dispose of waste directly in the appropriate place to prevent contamination of food, thereby reducing the risk of disease spread and maintaining the quality of service

at Hospital X Surakarta. This is in line with the opinion of Achnia Azla (2023), that the results of observations of food handler behavior are very good (95%). During the processing process, handlers do not scratch their hair, nose, or between their fingers/nails, do not smoke, wear masks, and do not chew while processing food (Azla & Pratiwi, 2023).

Food handlers in terms of health at Hospital X Surakarta must be healthy and undergo health checks, which is important to maintain food quality and safety. This is in line with research conducted by Iqdhana Chantika, where the results showed that every food handler undergoes a health check before being accepted as a handler at the Nutrition Installation of Gambiran Regional Hospital, Kediri City, and health checks are carried out once a year (Chantika et al., 2016). Based on the Minister of Health Regulation Number 1096/Menkes/Per/VI/2011 concerning Hygiene and Sanitation of Catering Services, food handlers must be in good health, as evidenced by a medical certificate, and must not suffer from typhus, cholera, tuberculosis, hepatitis, or be germ carriers (Ministry of Health of the Republic of Indonesia, 2011).

Meanwhile, other observations regarding food handlers show that some food handlers' hygiene practices do not meet food handler requirements, such as the use of masks, which are important in preventing cross-contamination between handlers and the food being processed. The use of masks is considered difficult and impractical for food handlers, one reason being the hot air. During the food processing process, food handlers often talk, even though this practice is not recommended because it can increase the risk of contamination. This study is in line with research conducted by Dela Elisa (2024), which shows that 50% of respondents have poor behavior in using masks during the cooking process. This is because wearing masks during the processing process can cause respondents to feel shortness of breath and heat due to the steam and heat produced during cooking (Elisa et al., 2024).

Food handlers also do not wear work shoes properly; according to food handlers, the shoes provided are uncomfortable to wear. Even though the nutrition installation at Hospital X Surakarta has provided all PPE, including work shoes, for food handlers, some food handlers do not wear them while working for practical reasons. This needs to be emphasized to all food handlers at Hospital X Surakarta regarding the importance of using PPE while working to prevent unwanted things. This study is in line with research conducted by Sri Purwaningsih (2019), which shows that food handlers do not wear closed and non-slippery shoes. According to food handlers, the shoes provided feel uncomfortable and have a risk of slipping because they are slippery. Many food handlers wear flip-flops, which can trigger accidents if exposed to hot water (Purwaningsih & Widiyaningsih, 2019).

Some food handlers still fail to follow hygiene procedures, including using personal items such as earrings. Wearing earrings while handling food can be a significant source of bacterial contamination. Bacteria can multiply on earrings if hygiene is not maintained. These results align with research by Atika Dina Khairina (2018), which suggests that food handlers are advised against wearing hand jewelry due to its potential source of contamination from improper behavior (Khairina et al., 2018).

Some of the food handlers at Hospital X Surakarta do not yet have food handler certificates. These results are in line with research conducted by Ade Saputra Nasution (2020), which showed that all food handlers in this study did not have food handler certificates (Nasution, 2020). From these several findings, it is necessary for the Nutrition Installation at Hospital X Surakarta to pay attention to observing, reminding, and giving warnings to food handlers who do not meet food handler hygiene standards to avoid food contaminated by *E. coli* bacteria and to improve the quality of the food produced.

Food storage at Hospital X Surakarta is carried out according to its characteristics to avoid damage or contamination. Fresh food is stored in a *chiller* (cooler) with a temperature of 2℃–10℃, while frozen food is stored in a *freezer* with a temperature of –13℃ to –5℃. These results are in line with research conducted by Achnia Azla (2023), which shows that storage of food ingredients at the USU Hospital Nutrition Installation is carried out according to their characteristics. Fresh food ingredients are placed in a *chiller* (cooler) with a temperature of 7–10℃, while frozen food is placed in a *freezer* at a temperature of –5–0℃ (Azla & Pratiwi, 2023). Temperature control in the SOP includes cleaning, separating perishable materials, and regular temperature monitoring. Food ingredients are arranged neatly, and storage areas are clean and free of bacteria.

The presence of bacteria in food can originate from contaminated water, E. coli, unhygienic food handlers, equipment, food ingredients, and improper food processing techniques. At Hospital X Surakarta, food processing procedures are carried out according to established standards, followed by sensory inspections of taste, doneness, texture, appearance, and portion size to identify potential poisoning or patient complaints, thereby supporting microbiological testing (Azla & Pratiwi, 2023). Cooked food is then served using the bain-marie method at 60–70℃ for approximately one hour, and portioned meals are wrapped before distribution to prevent contamination.

Food safety is essential because foodborne illnesses, such as diarrhea and food poisoning, can arise from consuming contaminated food, including those containing pathogenic bacteria like E. coli (WHO, 2005). Based on the findings of this study, laboratory examinations of ready-to-eat food at Hospital X Surakarta showed that 100% of the tested samples were negative for the presence of Escherichia coli.

CONCLUSION

Based on the results of research on the description of the hygiene and sanitation of handlers and the presence of bacteria *E. coli* in the processed food at Hospital X Surakarta, it can be concluded that respondents aged 49–56 years were 7 respondents (43.7%), the majority of respondents were female (15 respondents) (93.7%), the educational level of respondents with high school education was 13 respondents (81.2%), and respondents with a work period of 1–10 years were 9 respondents (56.2%). The results of the study showed that 31.2% of food handlers at Hospital X Surakarta did not meet the hygiene and sanitation requirements of the catering service. This was seen from the handlers not wearing masks, not wearing special work shoes, talking while preparing food, wearing jewelry such as earrings, and the handlers not having a food handler certificate. The results of laboratory examinations of the presence of bacteria *E. coli* in prepared food at Hospital X Surakarta showed that 100% of the samples tested were negative for containing *E. coli*. Based on the research results, it is recommended that Hospital X Surakarta improve food handlers' compliance with sanitation hygiene standards through routine training and supervision, require food handlers to have certificates, provide regular education especially for handlers with secondary education and low length of service, and conduct routine laboratory monitoring even though current results indicate no contamination of *E. coli*.

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