

# Bacterial Contamination of Food Handlers in X Hospital Palembang

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**Abstract.** The food handlers in Hospital with the bad personal hygiene could be a potential source of infection of a pathogenic organism. The responsibility of hospital food handlers is greater compared with the common food handlers such as in restaurants, etc. This is because they should provide the healthy food to the patients in Hospital who might have low immunity, and the contaminated food could have very dangerous consequences. This study aimed to investigate the potential contamination of food handlers in X hospital, Palembang. The study was carried out by a cross-sectional method on food handlers. There were 30 respondents examined in this study. The bacterial examination was conducted by following the standard procedures of World Health Organization (WHO). The results showed that there were 11 (36.7%) from 30 respondents positively contaminated by *Escherichia coli* and there all respondent contaminated in samples were women. There was no worker contaminated by *Staphylococcus aureus*. The study proved that in X hospital of Palembang, there were some food handlers contaminated by *Escherichia coli*.

## 1 Introduction

The food handlers in Hospital with the bad personal hygiene could be a potential source of infection of a pathogenic organism [1-4]. The contaminated-food could occur at any point during the bacterial journey through production, processing, distribution, and preparation [2] [5-6]. The risk of food contamination depends on the health status of food handlers, personal hygiene, and knowledge, and practice of food hygiene [7-8]. Foodborne disease are a public health problem in the developing countries such as Ethiopia [4][9], Nigeria [7], Iran [10], and Indonesia [11-12].

The global incidence of foodborne diseases is difficult to estimate, but in 2005, there were 1.8 million people died from diarrheal diseases generated by foodborne. A large proportion, in this case, can be attributed to food and drinking water pollution [13-15]. The

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most concerned bacterial contamination in food handlers is *Escherichia coli* [7][11][16-19] and *Staphylococcus aureus*[5][18-19].

*Escherichia coli* or *E. coli* is one of the main species of gram-negative bacteria. In general, these bacteria can be found in the large intestine of humans and feces[18-19]. Most of *E. coli* are harmless but some types such as *E. coli* type O157: H7 could influence serious food poisoning in humans such as bloody diarrhea due to the resulting exotoxin called Vero-toxins [18][20-21]. In the other hand, *Staphylococcus aureus* well known as one of the most important bacterial species in the field of food microbiology and it had been considered as a foodborne danger [18] [22]. It was reported by EFSA in 2013 that there were 386 outbreaks of *S. aureus* representing 7.4% of all outbreaks reported in the European Union [21]. Food poisoning by *S. aureus* is gastroenteritis with vomiting and with or without diarrhea and it was characterized by a short incubation period, usually 2-4 hours. This is due to the consumption of foods containing enterotoxins [18][23]. However, due to the importance of contamination detection in food handlers, this study aimed to investigate the potential contamination of food handlers in X hospital, Palembang.

## 2 Materials and Methods

The study was conducted using a cross-sectional method to determine the bacterial contamination in food handler in the X hospital of Palembang. The number of respondents is 30 samples (n=30) in which 5 respondents (16.0%) are men and 25 respondents (83.3%) are women. The bacterial sample examination follows the standard procedures [23], rectal swabs to test for *E. coli* bacteria [8] and use swabs on the hands to test for *S. aureus* bacteria[21]. The swab sampling and laboratory examination were assisted by environmental health center staff in the city of Palembang.

## 3 Results and Discussions

The results of the examination on food handler contaminated with *E. coli* and *S. aureus* are shown in Table 1. The number of food handler contaminated *E. coli* and *S. aureus* 11 respondents (36.7%), and 0 respondent (0%) in which all the contaminated workers are women. The main factor why all the contaminated food handlers were women because most of the respondents are women. Moreover, the result of this study is correlated with some reported- work which showed that most of the food handler was contaminated by *E. coli*. For example, Lazarevic *et al.* reported that the most frequently isolated bacterial in the examination of hands and clothes of food handlers in the hospital is *E. coli* which were 24.6% from 77 respondents [24]. In addition, Nasrolahei *et al.* determined the number of contaminated food handler in the hospital and the result showed 29.2% of 220 respondents positively contaminated *E. coli* [18]. Similar with the previous results, Oundo *et al.* conducted a research in several Hotels in Kenya and the results presented 1.2 % from 262 respondents, 4% from 253 respondents and 1.8 % from 885 respondents were positively contaminated by *E. coli* in the city of Diani, Malindi, and Nairobi, respectively [25].

**Table 1.** Contaminated-bacterial results on food handlers at X hospital in Palembang

Gender	<i>Escherichia coli</i>	<i>Staphylococcus aureus</i>
Men (n=5)	0	0
Women (n=25)	11	0
Total (n=30)	11	0

The result showed that all the respondents were not contaminated by *Staphylococcus aureus*. It indicated all the food handlers were free from the contamination of *Staphylococcus aureus*. The most possible reason was the limitation in the number of respondents. In addition, it might represent the good personal hygiene and environmental sanitation in the X hospital. This result was different with the reported-work of Castro *et al.* which reported 11,1% from 162 respondents in hospital contaminated by *S. aureus* in food handlers [21]. The similar result with Castro *et al.* [21] was also reported by Zagloul *et al.* [25] and Nasrolahei *et al.* [18] in which *S. aureus* had contaminated 17.5 % from 35 samples and 46% from 220 samples of food handler hands, respectively.

This results could be a benchmark of X hospital to increase their worker hygiene and environmental sanitation to push down in a number of contaminated workers. In addition, some training for food handlers might be done to increase the personal hygiene of the worker to reduce the bacterial contamination in hospital. This efforts was similar with the research of some experts [1] [24-32].

## 4 Conclusion

The study found the contamination in food handler hand of X hospital in Palembang. There were 36.7% from 30respondents positively contaminated by *E. coli* in which all the samples were women. There was no worker contaminated by *S. aureus*. The result of this study could be a benchmark of X hospital to increase their worker hygiene and environmental sanitation to push down in the number of contaminated workers. Some training for food handlers might be the solution to increase the personal hygiene of worker to reduce the bacterial contamination in hospital.

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