

## **Study Of Germ Numbers In Washing Tableware With Soaking Technique On Food Traders In Kelun Village, Madiun City**

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### **ABSTRACT**

*Food is an important element in maintaining human health, so food safety must be free from contamination caused by bacteria and other harmful materials. The principles of food hygiene and sanitation include the control of premises, equipment, processors, and foodstuffs. One of the sources of food contamination is unclean cutlery, which can cause foodborne diseases and food poisoning. Based on the standard of the Indonesian Minister of Health Regulation No. 1096/Menkes/Per/VI/2011, the cutlery used must be free from germs and *E. coli*. However, the results of a study in Kelun Village, Madiun City, show that many food vendors do not meet these hygiene standards, with the number of germs on tableware exceeding safe limits. This study aims to examine the cleanliness level of food vendors' tableware based on the washing techniques used, as well as provide recommendations on more effective washing methods in reducing germ rates. The results of this study are expected to increase the awareness of traders and the public on the importance of cleanliness of tableware to prevent the spread of disease.*

**Keywords:** *food safety, germ rate, hygiene sanitation, foodborne disease, washing techniques*

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### **INTRODUCTION**

Food is one of the most important things for human health, so the safety of the food consumed needs to be free from contamination both caused by bacteria and other ingredients. The principle of food hygiene and sanitation is the control of 4 factors of food health, namely the place or building, the equipment used, the person who processes it, and the processed material. One of the important things is that cutlery and cookware are at risk of cross-contamination which can lead to *food borne disease* and food poisoning. This can be caused by several things, including food contamination by viruses, fungi, and pathogenic bacteria found in food so that it contaminates food (Kurniati et al., 2021).

The bacterial content in tableware must be in accordance with the standards According to the Indonesian Minister of Health Regulation No.1096/Menkes/Per/VI/2011 concerning jasaboga sanitary hygiene requirements, namely tableware that is in direct contact with food that is ready to be served must not contain germ numbers that exceed 0 colonies/cm<sup>2</sup> and do not contain *E.coli*. If it exceeds the specified number of germs, it means that it does not meet the health requirements (Permenkes RI, 2011).

Germ number is a calculation of the number of bacteria based on the assumption that each bacterial cell living in suspension will grow into a colony after being incubated in a suitable culture medium and environment. After the incubation period, the number of colonies that grow is calculated from the results of the calculation is an estimate or conjecture of the

number in the suspension. The number of disinfectants of this cutlery is used as an indicator of the cleanliness of the tableware that has been washed (Assagaf, 2022).

Based on WHO data, unsafe food containing harmful amounts of bacteria, viruses, parasites, chemical or physical substances makes people sick, causing acute or chronic diseases resulting from more than 200 diseases, ranging from diarrhea, cancer, to permanent disability or death. An estimated 600 million – almost one in 10 people in the world – fall ill after consuming contaminated food resulting in 420,000 premature deaths (WHO, 2022).

Based on data from the UPTD of the Tawangrejo Health Center in Madiun City in 2023, there were 82 cases of diarrheal disease found in Kelun Village (Secondary Data on Diarrhea Cases at the Tawangrejo Health Center, 2023). In line with this, WHO said that around 70% of cases of diarrheal disease are caused by food contaminated by pathogenic bacteria such as *Escherechia coli bacteria*.

Based on the results of a preliminary survey conducted on Monday, June 3, 2024, of traders in Kelun Village, there are still many traders who do not pay attention to the safety of the food sold, such as in the process of washing tableware, they do not use running water, but only use a tub filled with water and are used to wash tableware repeatedly until the water becomes cloudy. So that this can increase the high number of germs in tableware that will enter and contaminate consumers who use these tableware. Based on the results of laboratory tests of the Magetan Academy of Environmental Health (AKL), which has been sampled on 3 traders by swab examination of tableware with the standard of Permenkes RI No.1096/Menkes/Per/VI/2011, namely: 78 Colonies/cm<sup>2</sup>, 43 Colonies/cm<sup>2</sup>, 33 Colonies/cm<sup>2</sup>, which means that the swab test of cutlery from the three traders does not meet the standard quality requirements of 0 colonies/cm<sup>2</sup>.

Tableware is one of the important role holders in the spread of disease due to the presence of germs. Unclean and positive cutlery containing microorganisms can transmit diseases through eating (Dewi, 2024). Cases of foodborne illness (*food borne disease*) can be affected by various factors. These factors include traditional food processing habits, storage, and serving that are not clean and do not meet sanitary requirements (Kurniati et al., 2021). In addition, toxic chemicals, or other harmful substances may cause *foodborne disease* if these substances are present in food (William, 2020). Foodborne diseases are usually toxic or infectious, caused by disease agents that enter the body through the consumption of contaminated food. Sometimes the disease is called "food poisoning" (*food poisoning*). Foodborne diseases include a range of diseases whose etiology is chemical or biological, including cholera and diarrhea, as well as several hygiene diseases (WHO, 2012).

The role of tableware in food traders is an inseparable part of the principles of food hygiene (*food hygiene*). Every cutlery (plates, glasses, spoons) must always be kept clean at all times of use. Tableware (plates, glasses, spoons) that look clean is not a guarantee that they have met health requirements. For this reason, washing equipment is very important to know basically, with proper washing will produce clean and healthy equipment (Syahrizal, 2022).

Based on the results of research that has been carried out by Khairunnisa and Budi Arianto (2023), it is stated that from the results of laboratory tests, more than 50% of the samples tested showed that the results of germ numbers exceeded the set quality standard, which is 0 CFU/m<sup>2</sup>. The highest number of germs was obtained in the sample of restaurant number 17 as much as 24 CFU/m<sup>2</sup>. The quality standard value set out in the Minister of Health

Regulation No. 1096 of 2011 is that the number of germs in tableware must be 0 CFU/m<sup>2</sup>. Thus, the sanitation of equipment in restaurants in the Lampenerut area is not safe when used for cutlery. The presence of germs on the tableware is caused by the washing process with the soaking method, there is still dirt from the previous rinse and results in the accumulation of dirt until the soaking water is cloudy and then will stain the other tableware again. If the equipment washing process goes well, the stains will not remain.

Looking at the above problems and considering the importance of supervision of food hygiene and tableware, the researcher is interested in conducting research on "Study of Germ Numbers Based on Washing Techniques of Food Traders' Tableware in Kelun Village, Madiun City".

The novelty of this research lies in its focus on the specific washing techniques employed by local food vendors in Kelun Village, particularly the soaking method, which has not been widely studied in similar contexts. While many studies focus on general food hygiene, few explore the direct impact of traditional washing methods on the cleanliness of tableware used by small food vendors. This research provides a unique angle by evaluating how these commonly used techniques affect the presence of germs on utensils.

The purpose of this study is to assess the level of germ contamination on tableware washed using the soaking method and to compare it to health standards. By investigating this specific washing technique, the study aims to provide recommendations for improving the sanitation practices of local food vendors, ensuring safer food consumption for the public. The study also seeks to raise awareness among vendors about the potential health risks associated with improper washing techniques.

The research contribution is twofold: academically, it fills a gap in existing literature regarding the impact of traditional washing methods on food safety, particularly in rural or semi-urban settings. Practically, the research offers insights that can be used by public health officials and food safety authorities to develop better guidelines and training programs for food vendors. These findings can help reduce the risk of foodborne diseases by promoting improved hygiene practices in local food establishments, contributing to enhanced public health.

## **METHOD**

This study uses a type of research that is descriptive. The research design that will be used in this study is *a cross sectional study design*. In this case, the researcher wants to find out the number of washing germs in tableware washing using the soaking method in food vendors in Kelun Village.

The population that will be used in this study is all food traders in Kelun Village who use tableware in the form of plates or bowls as many as 9 traders. The type of sample in this study is total sampling where the entire population is sampled in the study, namely as many as 9 food traders who use tableware. To determine the sampling that will be used in this study, it uses *a non-probability* sampling technique with the Total Sample method. Where the non-probability sampling technique is a method of sampling with all objects or elements in the population not having the same chance to be selected as a sample. The total sample method is a sampling technique where the number of samples is equal to the population. This study uses a total sampling technique because the number of population less than 100 is used as a total research sample.n in Kelun Village, Madiun City.

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In this study, data was collected from primary data sources, namely through laboratory examinations to determine the number of germs on traders' tableware, as well as from secondary data using observation sheets in the form of *checklist tables*. The observation sheet was used to obtain data on the washing of cutlery by soaking food traders directly.

The analysis in this study consists of an independent variable, namely the technique of washing cutlery with the soaking method, and the bound variable, namely the number of tableware germs measured by using swabs and laboratory tests.

**RESULTS AND DISCUSSION**

**Data from Univariate Variable Research Results**

**Results of Assessment of Germ Numbers in Washing Tableware Through Soaking:**

From the results of the study, data on the number of germs in washing cutlery through soaking were obtained as follows:

<b>It</b>	<b>Sample</b>	<b>Germ Count</b>	<b>Information</b>
1	Trader 3	1 CFU/cm <sup>2</sup>	TMS
2	Traders 5	1 CFU/cm <sup>2</sup>	TMS
3	Trader 6	1 CFU/cm <sup>2</sup>	TMS
4	Trader 7	2 CFU/cm <sup>2</sup>	TMS
5	Traders 10	1 CFU/cm <sup>2</sup>	TMS
6	Traders 13	1 CFU/cm <sup>2</sup>	TMS
7	Traders 15	1 CFU/cm <sup>2</sup>	TMS
8	Traders 17	3 CFU/cm <sup>2</sup>	TMS
9	Traders 24	1 CFU/cm <sup>2</sup>	TMS

*Source: Primary data of research results*

***Table 1. Laboratory Examination Results of Sterile Numbers on Washing Tableware Through Soaking***

Based on table 1, it can be seen that from the laboratory examination of the number of tableware germs carried out on 9 traders who used the washing technique by soaking, it was found that none of them met the requirements, which means that of the 9 traders (100%) had a number of germs > 0 CFU/cm<sup>2</sup>.

**Germ Numbers in Washing Techniques Through Soaking**

Based on the results of the swab study of germ numbers in washing through immersion on 9 respondents of food traders in Kelun Village, Madiun City, it was found that all traders who used soaking washing had a number of germs that exceeded the health requirements, namely 0 CFU/Cm<sup>2</sup>. The highest number of germs from washing through immersion was found in the 8th trader, where the number of germs was 3 CFU/Cm<sup>2</sup>, then the 4th trader had a number of germs of 2 CFU/Cm<sup>2</sup>, and the other 7 traders had a number of germs of 1 CFU/Cm<sup>2</sup>. Based on the results of observations of 9 traders who used soaking washing, the results were obtained in the process of removing food waste from tableware (100%). Traders wash utensils using soap or detergent (100%). Washed tableware is placed in the draining area upside down (33.3%)

from some traders still put tableware by stacking without turning it over and placing it in an open place. The equipment in the wipes uses clean wipes and is often replaced for a number of uses or disposable ones (44.4%). In addition, another factor for some traders who do not change the water in the washing tub when it is cloudy is to speed up the performance of traders to serve their consumers. So this greatly affects the quality of the cleanliness of tableware.

According to research (Khairunnisa & Arianto, 2023) The presence of germs on the tableware is caused by the fact that during the washing process with the soaking method, there is still dirt from the previous rinse and results in the accumulation of dirt until the soaked water is cloudy and then will re-stain the other tableware. The results of this study have been reported that there is a difference in the way tableware is washed to a decrease in the number of germs in the cutlery inspected. In 20 samples with soaking washing, a high number of germs were obtained and none of them met the health requirements. Tableware with soaking washing had germ numbers in all tableware samples exceeding the threshold value. This is because the washing process carries out soaking activities and the washing tub is not clean every day which can then re-dirty the tableware that reuses the soaked water.

From the results of the research on the number of germs in the washing of tableware of food vendors using the soaking technique in Kelun Village, Madiun City, the results were included in the category of not meeting the requirements of all respondents. Traders with soaking washing techniques must pay more attention to soaking tableware because soaking is intended to provide an opportunity for water to penetrate into the food residues that stick or harden so that it becomes easier to clean. And traders should change laundry water and rags more often for a number of uses, as well as store the correct food utensils in an upside-down or tilted way.

## **CONCLUSION**

The results of the study showed that traders who used the washing method through soaking had an average germ rate of 1.33, with a percentage of 100% who did not meet the hygiene requirements.

The suggestions that can be given from the results of this study are as follows:

First, it is recommended that the public or food traders use the method of washing cutlery with running water, because it has proven to be more effective in reducing the number of germs. Second, every food vendor should have a washing sponge that is used specifically for cutlery, and the sponge should be dried after use. This aims to prevent the sponge from staying damp, which can trigger the growth of new germs or bacteria. Third, in the process of drying cutlery, traders are advised to bring a few clean wipes that are only used for a number of plates or cutlery. Another alternative is to put the cutlery in an upside down or tilted position so that it can dry naturally. Finally, cutlery should be stored in a closed place to prevent dust contamination and disturbance of animals such as rats or cockroaches.

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