

BACTERIOLOGICAL QUALITY OF TABLEWARE IN CULINARY TOURISM CENTERS

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ABSTRACT

Bacteriological Quality of Tableware in Culinary Tourism Centers. Culinary centers should pay attention to the process of washing tableware, if it was not good to cause health problems. Microbiological preliminary tests in the culinary tourism center calculated the number of germs on 12 tableware traders found 6 tableware did not met the requirements. This study aims to determine the process of washing tableware in culinary centers; this study was a descriptive studied with purposive sampling. Data collection used observations and laboratory tests was analyzed descriptively used tables in the form of narrative; the results of the examination of tableware in the form of plates, spoons, forks, and glasses found germ numbers. While the examination of clean watered coliform total parameter was 48 CFU/m2. The washing process obtained results of 60% qualified and 40% did not qualify because it did not comply with the provisions; the conclusion of this studied was found the number of germs on tableware, as well as clean watered on the total coliform parameters were not qualified, in the washing process most of them were not qualified, so the advice of the researcher was that traders must pay attention and increase knowledge about the technique of washing tableware and draining the watered reservoir regularlyments below. I thanked everyone for their suggestions to improve this converter.

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INTRODUCTION

Food is important for human life because its role is to provide the body with energy and nutrients, build new tissue in the body, regulate and prevent disease, and be a source of replacement for old body cells. ⁽¹⁾. Foodborne disease is a disease that is spread through bacteria-contaminated food. Food contamination can occur in food ingredients, water, food waste, serving hands, or food that is ready to be served. ⁽²⁾. Cutlery is a major factor in the spread of disease because unhygienic eating utensils can spread disease through food ⁽³⁾.

Cases of food poisoning often occur in various places where cleanliness is not guaranteed, such as when the tools used are unhygienic and exposed to road dust due to heavy traffic. Symptoms of food poisoning are a dry mouth and difficulty swallowing ⁽⁴⁾. Food can be contaminated by direct contact with unhygienic eating utensils, and there are microorganisms in it, so it can cause digestive disorders in humans who consume it. ⁽⁵⁾.

Based on data from the Surabaya City Health Service, there were four types of extraordinary events reported in 2019. Based on these cases, food poisoning was the most prevalent in

2019, affecting a total of 16 individuals. Patients were in the age range of 5–9 years, and one patient was 20–44 years old ⁽⁶⁾.

Cleanliness is very important, especially in public places. Public places such as hospitals, restaurants, and street vendors often provide a variety of food and drinks to those who work there ⁽⁷⁾. A restaurant that offers a variety of food does not guarantee that the food quality is good. Contamination can occur at any time, including when using unhygienic eating utensils ⁽⁸⁾. According to the Ministry of Health (2009), the correct way to clean cutlery is to separate dirt and food residue from it, soak it, wash it with soap, wash it with clean running water, wash it with hot water, and then dry it.

The Surabaya City Government established a Culinary Tourism Center, which aims to make it easier for buyers or visitors to find the food they want, with a capacity of 40 stalls available for traders. The preliminary microbiological tests, which counted the number of germs on 12 traders' cutlery, revealed that 6 of them did not meet the required standards. Based on the results of observations, it was found that there were a number of germs caused by traders not using protection on food utensils after washing cutlery, cracks on plates, and improper washing of cutlery.

Preliminary microbiological tests, which counted the number of germs on 12 traders' cutlery, revealed that 6 of the cutlery did not meet the required standards. Based on the observations, it was determined that the traders' failure to use protective measures on food utensils was the cause of the high number of germs. After washing the cutlery, cracks appeared on the plates. The surrounding environment can contaminate cutlery. This research aligns with Amallia's findings from 2021, which indicate that traders often use inadequate washing and storage methods for cutlery, leading to inappropriate germ counts ⁽⁹⁾. The aim of this research is to determine the microbiological quality of cutlery at the Culinary Tourism Center.

MATERIALS AND RESEARCH METHODS

This research uses a descriptive design to describe the washing process at the Culinary Tourism Center. This research was carried out from December 2022 to May 2023. The variables in this study were the number of germs on cutlery in the form of forks, plates, spoons, and glasses, total coliform in clean water, and the process of washing cutlery.

The population in this study were all traders at the Culinary Tourism Center, totaling 28 traders. The research sample was determined using a purposive sampling method of 5 traders with a total sample of 20 pieces of cutlery in the form of plates, spoons, forks, and glasses, as well as 1 sample of clean water. Purposive Sampling was carried out with certain considerations or benchmarks, namely grouping outlets according to the type of menu, cutlery that is often used, such as plates, spoons, forks, and glasses, cutlery that does not use rattan plates and greaseproof paper, and the sanitary condition of the outlet. the dirty one.

Data collection uses observation sheets as a tool for assessing the tableware washing process. This instrument is referred to as PMK No. 14 of 2021. Laboratory tests for checking germ numbers on cutlery and checking the quality of clean water microbiologically with total coliform parameters refer to PMK No. 2 of 2023. Apart from that, observations are also carried out to ensure that the behavior of food processors is consistent with the results of interviews and the requirements that have been set. Tabulation and editing are used to process research data. Data from laboratory tests and observations was descriptively analyzed using tables and described in narrative form.

RESEARCH RESULTS AND DISCUSSION

Table 1. Results of checking germ numbers on eating utensils at culinary tourism centers

No.	Types of Cutlery	Results		Percentage (%)
		M.S	TMS	
1.	Plate	3	2	60%
	Spoon	4	1	80%
	Fork	5	0	100%
	Glass	3	2	60%
	Amount	15	5	75%

Table 1 shows that the number of germs that meet the requirements on plates is 60%, spoons are 80%, forks are 100%, and glasses are 60%. The number of germs that do not meet the requirements on cutlery is due to the absence of a process to separate food waste first, washing without using soap, and drying cutlery without using a clean cloth.

The number of germs on cutlery is influenced by several factors, including the composition of the cutlery, the initial condition of the cutlery, washing water, washing bucket, and washing capacity. ⁽¹⁰⁾ It is important to pay attention to the material used in the tableware, namely that it is made from a safe and non-hazardous surface layer that does not emit dangerous substances or toxic metals. Chemicals and pesticides are stored in separate rooms, away from food processing areas and washing areas ⁽¹¹⁾.

Incorrect washing techniques risk causing food contamination by bacterial microorganisms ⁽¹²⁾. This research aligns with the findings of Aulia Mulya et al.'s (2021) study, which suggests that improper washing techniques or lack of flushing (soaking) can influence the presence of germs on cutlery. Additionally, when draining cutlery, the shelves remain open, potentially leading to contamination ⁽¹³⁾. In 2020, Sahani, W. conducted research which revealed that the use of cutlery, such as bowls, spoons, glasses, and plates, did not meet hygiene requirements due to poor washing and storage techniques, as well as the frequent use of cloth towels during drying, which resulted in contamination during storage and lack of protection.

To reduce the number of germs on cutlery, particularly when washing cutlery, detergent, cold water, and hot water are used to remove grease. When washing cutlery, you should use three buckets. The first bucket is for washing, the second bucket is for rinsing, and the third bucket is for disinfection. Rinsing can also be done directly with running water. Cutlery that has been cleaned or washed should dry by itself under sunlight or artificial light. Drying should not require a cloth. Cutlery is stored in a closed location or in a place that is protected from sources of pollution or contamination by destructive animals ⁽¹⁵⁾.

Clean Water Check

The Culinary Tourism Center's examination of clean water with total coliform parameters at the Culinary Tourism Center showed results of 48 CFU/100 ml. This means that the total coliform in the clean water does not meet the requirements. The Minister of Health Regulation No. 2 of 2023 stipulates that the total coliform in clean water should not exceed 0 CFU/100 ml. The PDAM water used at the Culinary Tourism Center is clean.

A water reservoir is used to store clean water before use. Various factors, including corrosion in the pipe network, loose connections between pipes, low water pressure in the pipes, and the presence of bacteria, can cause water pollution. This research aligns with the findings of Cholid's 2022 study, which suggests that the use of water that does not meet the required standards during the washing process can lead to the improper cleaning and washing of cutlery ⁽¹⁶⁾.

If the washing water is contaminated with bacteria, the bacteria will stick to the eating utensils and enter the water along with the food consumed ⁽¹⁷⁾. The presence of Coliform bacteria in clean water may be caused by fecal contamination at the water inlet, or by water sources that are close to or connected to several water bodies that have toilet facilities from local residents, or by the reservoir itself. The restaurant's water storage tank was not

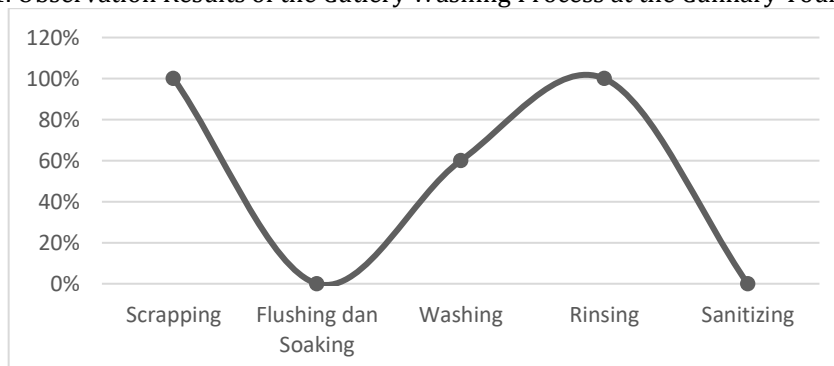
covered, allowing organisms to enter the water. Furthermore, if the water tank is not drained, pathogenic bacteria can grow ⁽¹⁸⁾.

Total coliforms are typically found in soil or plants and are not dangerous. However, the presence of total coliforms often signals the presence of other pathogens and indicates contamination. The presence of coliforms in water is most likely due to contamination during construction or pipe repairs ⁽¹⁹⁾. Coliforms are used as an indicator of water pollution by pathogenic bacteria. When there are coliform bacteria in the water, this indicates that the water is contaminated with other bacteria, which may be pathogenic and can cause diseases such as diarrhea. ⁽²⁰⁾.

The quality of water microbes plays a crucial role in the construction of water sources. Water sources can be polluted if their construction does not comply with requirements. These bacteria can affect the quality of water. This condition can transmit diarrheal disease through water or food contaminated with *E. coli*, *Entamoeba histolytica*, *Shigella*, *Vibrio cholera*, and other pathogens ⁽²¹⁾. Based on the explanation above, traders at Culinary Tourism Centers need to pay attention to water distribution channels to ensure they are not contaminated by microbes that can endanger health, and clean or empty water reservoirs (water containers) to prevent microbial growth.

Washing Process for Cutlery

Diagram 1. Observation Results of the Cutlery Washing Process at the Culinary Tourism Center



The assessment using the dishwashing process observation sheet classified the results as good. In fact, the research findings from three outlets (60%) on the dishwashing process met the requirements, as they aligned with the assessment using the observation sheet. Tableware cleanliness is caused by improper washing methods and the use of water that does not meet the requirements ⁽²²⁾.

The observation sheet revealed that at the Culinary Tourism Center, five traders perform the task of scraping or separating dirt before washing to prevent it from clogging the washing tub drain. Flushing and soaking is the act of dousing water and soaking it in hot water at a temperature of 60 °C. Based on the observation sheet's results, it was discovered that as many as five traders did not soak cutlery in hot water. Washing is washing tableware using detergent. Based on the results of the observation sheet, we know that all traders wash cutlery with sponges and use sunlight soap, while the other two traders do not use sponges. Rinsing means washing eating utensils with clean, running water and always changing them. According to the observation sheet, as many as five traders wash cutlery with running and clean water. At the Culinary Tourism Center, five traders do not implement sanitation.

Anisa T. Lubis et al. (2020) stated that the results of washing cutlery in Tikala Baru did not meet the requirements because it was not equipped with hot water with a temperature of 40°C–80°C, there was no separate bucket for soaping and rinsing, and there were only two buckets for washing cutlery. After washing, cutlery is wiped using a cloth or napkin that is washed twice a week ⁽²³⁾. Washing facilities must be equipped with tubs, soap, sponges, and

disinfection materials ⁽²⁴⁾. Correct washing principles and standards must meet the necessary elements, such as the availability of sanitation facilities for hygienic and healthy washing, the presence of washing steps, and the knowledge and understanding of cleaning cutlery. Soaking cutlery allows water to soak into sticky or hard food residue, so it can be easily cleaned. Cutlery can be contaminated by the air, such as dust, causing it to be contaminated with germs ⁽²⁵⁾. To prevent contamination of eating utensils, a correct washing process must be applied. We can conclude that the washing process does not meet the required standards, as traders fail to apply the sanitizing, flushing, and soaking processes, and some continue to use unclean sponges or cloths.

CONCLUSIONS AND RECOMMENDATIONS

The germ rate in the swab examination of plates, spoons, forks, and glasses is 75%, meeting the requirements. The Total Coliform parameter, measured in clean water used to wash tableware at the Culinary Tourism Center's outlets, was found to be 48 CFU/m², which does not meet the requirements. The results of the washing technique observations show that while scraping meets 100% requirements, flushing and soaking do not meet requirements, washing meets 100% requirements, rinsing meets 100% requirements, and sanitizing meets 100% requirements. The suggestion from this research is that the community health center can carry out supervision by providing outreach and education regarding cutlery washing techniques and carrying out periodic checks on clean water sources used for washing.

REFERENCES

1. Marisdayana R, Harahap PS, Yosefin H. Cara Pencucian Peralatan Makan, Personal Hygiene Akan Pencemaran Bakteri Di Peranti Makan. *Jurnal Endur*. 2017;2(3):376.
2. Safira M. Terjangkitnya Deviasi Lewat Asupan Makan (Foodborne Disease). *J Progr Stud Inst Teknol Sumatera*. 2020;1–6.
3. Kunci K. Klausalitas Higiene Sanitasi Dengan Mutu Bakteriologis Di Peralatan Makan Pedagang Di Area Sekitar Kampus Undip Tembalang. *Jurnal Kesehat Masy*. 2016;3(3):769–76.
4. Rorong JA, Wilar WF. Keracunan Makanan Dikarenakan Mikroba. *Techno Sci J*. 2020;2(2):47–60.
5. Rochmawati AE, Rachmaniyah, Rusmiati. Mutu Bakteriologis Peralatan Makan , Personal Hygiene, serta Sanitasi Warung Kopi Di Kendangsari Surabaya Tahun 2021. *J Hig Sanitasi*. 2021;1:26–32.
6. Dinas Kesehatan Provinsi Jawa Timur. Profil Kesehatan Provinsi Jawa Timur 2019. [Internet]. 2020; tabel 53. Available from: www.dinkesjatengprov.go.id
7. Ilmi NM, Anwar MC, Subagiyo A. Uji Efektivitas Larutan Belimbing Wuluh (Averrhoa bilimbi) Perihal Penurunan Kuantitas Kuman di Peralatan Makan Kabupaten Tegal. *Bul Keslingmas*. 2022;41(2):77–84.
8. Herawati H, Sakati SN, Sumarto Z. Mutu Bakteriologis Di Peralatan Makan Di Warung Makan Kadompe Di Kota Luwuk Kabupaten Banggai. *Poltekita Jurnal Ilmu Kesehat*. 2022;16(2):200–6.
9. Amallia RHT, Sariwulan RM, Saputri A, Lestari A, Putri WU. Analisis Kuantitas Kuman Di KAMPUS X KOTA PALEMBANG Artikel Penelitian. *Jurnal Peneltian* [Internet]. 2021;12(1):57–64. Available from: <https://jurnal.um-palembang.ac.id/syifamedika/article/download/2928/pdf>
10. BPOM. Mikrobiologi Pangan. Jakarta: Direktorat Surveilans Penyuluhan Keamanan Pangan dan Bahan Berbahaya; 2003.
11. Susanna D, Indrawani YM, Zakianis Z. Pencemaran Bakteri Escherichia coli pada Makanan Pedagang Kaki Lima di Sepanjang Jalan Margonda Depok, Jawa Barat. *Kesmas Natl Public Health Jurnal* [Internet]. 2010;5(3):110–5. Available from:

- <http://journal.fkm.ui.ac.id/kesmas/article/view/143>
12. Wirastuti NWW. Klausalitas Cara Mencuci serta Disimpannya Peranti Makan dengan Kuantitas Kuman Di Tempat Pengolahan Pangan Studi Dilaksanakan di Area Kerja UPTD. Puskesmas III Dinkes Kecamatan Denpasar Utara Tahun 2022. Poltekkes Kemenkes Denpasar Jurusan Kesehatan Lingkungan 2022; 2022.
 13. Mulya A, Rahmawati R, Erminawati E. Teknik Pencucian Berdampak akan Kuantitas Kuman di Peranti Makan: Studi Literatur. *Jurnal Kesehat Lingkung J dan Apl Tek Kesehat Lingkung*. 2021;18(1):27–32.
 14. Lapasamula DR. Visualitas Higiene Sanitasi dengan Eksistensi Kuantitas Kuman di Peranti Makan di Lembaga Masyarakat Narkotika Kelas II A Sungguminasa Kabupaten Gowa. *Sulolipu Media Komun Sivitas Akad dan Masy*. 2020;19(2):282–91.
 15. Tumelap HJ. Tikala Manado. Situasi Bakteriologi Peranti Makan Di Rumah Makan Jombang Tikala Manad. 2011;1(1):20–7.
 16. Cholid KA, Darundiati YH, Sulistiyan S. Faktor-faktor Yang Berhubungan Dengan Angka Kuman Pada Peralatan Makan di Rumah Makan Wilayah Perimeter serta Buffer Area Pelabuhan Sampit. *Jurnal Kesehatan Masyarakat*. 2022;10(3):290–7.
 17. Yaqin N, Nursanti. Analisis Dampak Cemaran Zat Organik Pada Air Terhadap Perilaku Mencuci Alat Makan menggunakan Metode Permaganometri. *Jurnal Sains*. 2018;8(15):39–43.
 18. Rulen Nia B, Iin Intarsih. Analisis Keberadaan Bakteri dan Higiene Sanitasi Peralatan Makan Di Rumah Makan area Kerja Puskesmas Simpang. *Jurnal Ensiklopedia [Internet]*. 2021;3(2):179–89. Available from: <http://jurnal.ensiklopediaku.org>
 19. Pratama Y, Rachman NA. Studi Higiene Sanitasi Makanan Dengan Pemeriksaan Escherichia coli Air Pencucian dan Peranti Makan Di Pujasera X. *J Serambi Eng*. 2020;5(4).
 20. Budon AS. Studi Kualitas Bakteriologis Air Pencucian Peralatan Makan di Kantin. *Kebijakan Kesehatan Lingkungan Menghadapi Era Revolusi Ind 4.0*. 2019;23.
 21. Zulkifli A, Rahmat KB, Ruhban A. Analisa Klausalitas Mutu Air Minum Serta Terjadinya Diare Di Wawondula Sebagai Area Pemberdayaan Pt. Vale Sorowako. *Media Kesehat Politek Kesehat Makassar*. 2018;12(1):50.
 22. Rahmatullah Jati Pradopo, Sulaiman Hamzani SA. DOI: <https://doi.org/10.31964/jkl.v18i1.265>. Saringan Cangkang Telur Bebek Ef Memperbaiki Mutu Ph Serta Besi Air Sumur Bor. 2021;18(1):13–8.
 23. Anisa T. Lubis, Oksfrian Jufri Sumampouw JM. U. Visualisasi Cara Pencucian Peranti Makan dan Eksistensi Escherichia coli Pada Peranti Makan di Rumah Makan. *J Public Heal Community Med*. 2020;1(1):34–9.
 24. Inayah I, Muharram A. Klausalitas Proses Pencucian Dengan Kualitas Bakteriologis Peralatan Makan (Studi Literatur). *Sulolipu Media Komun Sivitas Akad dan Masy*. 2020;20(2):212.
 25. Dyah Suryani, Piki Paslini, Suyitno. Klausalitas Higiene Sanitasi dengan Kuantitas Kuman pada Piring di Warung Makan, Wirogunan, Kota Yogyakarta. *SEHATMAS J Ilm Kesehat Masy*. 2022;1(3):404–17.