

ESCHERICHIA COLI BACTERIA DETECTION IN DRINKING WATER DEPOTS BUNGO DISTRICT

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Water is a very important component in life, such as the use of water as drinking water, all living things, both humans, animals and plants, need water. Part of the human body consists of fluids, so water helps the body to work to carry nutrients from the stomach to all parts of the body. So that a hygienic water source is needed, through a processing process first until the water meets health requirements. The purpose of this study was to detect the presence of Escherichia coli bacteria in drinking water depots in two sub-districts in Bungo Regency, namely (Rimbo Tengah, Pasar Muara Bungo). The test was carried out at the Fish Quarantine Station and Quality Control Laboratory of Class 1 Jambi. Direct sampling with sterile bottles. The sample testing method uses the Most Probable Number (MPN) test with SNI ISO 9308-1:2014. Direct sampling with sterile bottles. The sample testing method uses the Most Probable Number (MPN) test with SNI ISO 9308-1:2014.

Keywords: *E. coli, Drinking Water Depot, Bungo Regency*

1. INTRODUCTION

The need for water is very important for life, especially the human body because water is the largest composition of substances that make up the human body, which is 68%. The need for drinking water for each person varies from 2.1 liters to 2.8 liters per day (Irianto 2004). Water is a natural component that is very important for human life. If there is no water, humans cannot live, but water can be dangerous if it is not available with the right conditions, both in quality and quantity (Suryana 2013). According to (Trihono 2010), one of the maintenance of beverages to protect public health is the supervision of the quality of drinking water, this is because drinking water is one of the environmental components that have a large enough role in life.

Water sources must go through a processing process first until the water meets health requirements, both in terms of quality and quantity. Quality standards for water media which must follow parameters periodically, namely the need for sanitation hygiene including physical, biological, and chemical parameters. Water contaminated with pathogenic bacteria can endanger health, especially having an impact on the

digestive tract which can also cause diarrhea (Anggraeni 2020).

According to (Restina, 2019), diarrhea is a disease characterized by changes in the shape and consistency of stool and an increase in the frequency of defecation three or more times a day. The most dominant cause of diarrhea is believed to be due to bacterial contamination in water or Waterborne disease including *E. coli*, Salmonella and Shigella (Tanto 2014). Waterborne disease is a disease that is transmitted directly through drinking water, where the drinking water contains pathogenic germs, causing the person concerned to become sick. One of the pathogens that cause the disease is *E. coli* bacteria (Priyono 2011).

E. coli bacteria are bacteria that can cause diarrhea. Diarrhea is one of many diseases that can be caused by poor quality of drinking water. Pathogenic microorganisms contained in feces can transmit various diseases when entering the human body, in one gram of feces can contain one billion infective virus particles that can survive for several weeks at temperatures below 10°C. There are four pathogenic microorganisms contained in feces, namely: viruses, protozoa, worms and bacteria that are commonly found in the type of bacteria *E. coli*. It is necessary to conduct

research on the presence of *E. coli* bacteria in drinking water depots in the Rimbo Tengah Village and Muara Bungo Market to determine whether the depot is contaminated by pathogenic *E. coli* bacteria. It is hoped that this research can play a role in reducing the number of waterborne diseases.

2. RESEARCH METHOD

- a. Types of research
This research uses experimental research methods carried out in the laboratory. This study was conducted to determine the presence of pathogenic bacteria, namely *E. coli* found in refill drinking water depots produced in Central Rimbo District and Muara Bungo Market.
- b. Research Time and Location
- c. This research is approximately 2-3 months. Observation of the location of refill drinking water depots and water sampling were carried out in Rimbo Tengah District and Muara Bungo Market. Bacteriological examination of water samples was carried out at the Laboratory of Fish Quarantine Station, Quality Control and Safety of Class I Fisheries, Jambi.
- d. Research Pollution and Sample
The sample population includes five refill drinking water depots in Central Rimbo District and five refill drinking water depots in Muara Bungo Market. This study uses a sample of 10 drinking water depots taken randomly as many as 10 drinking water depots in Bungo Regency.
- e. Research Tools and Materials
The tools used are autoclave, test tube, Durham tube, ose needle, test tube rack, cotton, lighter, incubator, water bath, sample bottle, cork cap, volume pipette, spirit lamp, glass beaker, 10 ml volume pipette, and petri dish. The materials used were refill drinking water samples, Lactose Broth, Brilliant green lactose broth, Mac Conkey Agar 70% alcohol, and aquadest.

- f. Coliform Test

The sample testing method uses the Most Probable Number (MPN) test with SNI ISO 9308-1:2014. Furthermore, the sample that was declared positive was continued with Mac Conkey Agar, then the results obtained were processed descriptively.

3. RESULT AND DISCUSSION

The study was conducted by taking samples at refill drinking water depots in Rimbo Tengah and Muara Bungo Market from May 2021 - July 2021. Samples were taken from all refill drinking water depots in the population. Direct sampling by buying refilled drinking water from refill drinking water depots in Rimbo Tengah District and Muara Bungo Market using new gallons. The samples that have been taken were examined microbiologically at the Laboratory of Fish Quarantine Station, Quality Control and Safety of Class I Fisheries, Jambi.

Sample testing begins with a presumptive test which aims to predict whether the sample is contaminated with bacteria that can ferment lactose and produce gas or not in a Durham tube using lactose broth media. The results of the presumptive test on 20 samples did not find a tube that was positive for Coliform bacteria.

1. Results of Drinking Water Examination with MPN Test

There were 20 samples from 10 drinking water depots that showed a negative MPN index against *E. coli*, all samples tested negative for the presence of *E. coli* pathogens.

2. Identification of *E. coli* bacteria. in Drinking Water with Mac Conkey Agar

This identification was not tested because all samples showed negative results for *E. coli*.



Figure 1. Coliform Estimation Test for SNI ISO 9308-1:2014; The results were negative, indicated by no color change and no gas in the Durham tube.

Water is the most abundant chemical compound in nature, however, in line with the increasing standard of human life, which is the main need in human life (Susan, 2003). Water is a source of life used by humans for drinking, household needs, and industrial purposes. Without water humans and other living things cannot live. If the need for water is not fulfilled, it can have a major impact on health and social vulnerability (Hanafi, 2011). According to Putri (2013), coliform bacteria are a parameter that water contaminated with these bacteria exceeds 50/100 will cause diarrhea. In the research that has been carried out, the presence of these bacteria was not detected, so it can be said that the drinking water depots in the two sub-districts in Bungo Regency were in accordance with the standards set by WHO.

This is in accordance with the Regulation of the Minister of Health of the Republic of Indonesia No. 492/MENKES/Per/IV/2010 concerning the requirements for drinking water quality, that all of them meet the requirements for bacterial examination of drinking water from 10 drinking water depots that were tested. Based on clean water standards, it is adjusted to international standards set by WHO. The standardization of water quality aims to maintain, protect, and enhance the degree of public health, especially in water treatment or business activities to process and distribute water for the general public.

3. CONCLUSION

The quality of drinking water depots in the two sub-districts in Bungo Regency (Central Rimbo and Muara Bungo Market), is in accordance with the standards of the Regulation of the Minister of Health of the Republic of Indonesia No. 492/MENKES/Per/IV/2010 concerning requirements for drinking water quality, because the research did not find bacteriology in laboratory tests.

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