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Analysis of the Presence and Risk Factors of Bacteria *Escherichia Coli* In Orange JuiceIn Takengon 2023

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ABSTRACT

Oranges are one of the fruits that are easily obtained and have many health benefits. Oranges are generally consumed in the form of juice. Fresh fruit juices that are widely consumed by the public are usually made from a mixture of fresh fruit, ice, sugar, or milk without any heating process in their processing, causing fruit juice to be at high risk of being contaminated with E. coli. The presence of E. coli in water or food is also considered to have a high correlation with the discovery of germs in food. The purpose of this study was to determine whether orange juice was contaminated with Escherichia coli bacteria.. This type of research uses a qualitative method where data collection is carried out by interview. The results of the study, based on the results of the examination from the Laboratory that out of 10 juice samples, there were 3 samples containing Escherichia coli bacteria, namely in sample codes k3, k7 and k9. Contamination is likely to occur due to less clean handlers and using uncooked mixing water. The presence of Escherichia coli bacteria in drinks or food is also considered to have a high correlation in the discovery of food pathogens.

INTRODUCTION

Eating and drinking are very important for human life, because the food and drinks we consume must not only meet nutritional needs but must also be safe in the sense that they do not contain microorganisms and other materials that pose a danger to human health. In addition, food and drinks should contain compounds that are needed to restore and repair body tissues, development and produce energy for the benefit of various activities in producing life (Sukamto et al., 2008).

In general, Escherichia coli bacteria are known to be normal in the digestive tract of humans and animals. Its presence outside the human body is an indicator of sanitation, whether food and drinks are contaminated by human waste or not. The presence of Escherichia coli bacteria in water or food is also considered to have a high correlation with the discovery of disease germs (pathogens) in food (Kurniadi Y, et al. 2013).

Based on PERMENKES 492 of 2010 concerning Drinking Water Quality Requirements, it states that the content of Escherichia Coli bacteria in drinking water is 0/100 ml, therefore drinking water should not exceed the specified level. If drinking water is contaminated with Escherichia Coli or Coliform bacteria that exceed the food requirements, it will cause diarrhea (PERMENKES, 2010).

Orange juice is a drink made from fruit and water or without added sugar. Fruit juice is processed using a blender by mixing the composition of several fruits, water, and other additions (Suci et al., 2020). Fresh fruit juice that is widely consumed by the public is usually made from a mixture of fresh fruit, ice, sugar, or milk without any heating process in its processing, causing fruit juice to be at risk of being contaminated with Escherichia coli (Zuraida, 2019).

Orange juice has a sweet taste, high water content, affordable price, and high vitamin C content (ranging from 27-49 mg/100 grams of fruit flesh) so that it can be consumed by all levels of society, especially children. Vitamin C is useful as an antioxidant in the body, which can help

prevent cell damage due to the activity of free radical molecules. Oranges can be consumed in various ways, including by eating the fruit directly and can also be drunk in the form of juice (Kusuma et al., 2017).

Based on the results of the researcher's survey that in Takengon in Central Aceh Regency there are many orange juice sellers on the side of the road using carts or containers, in school canteens, in market areas, and in cafes. This orange juice itself is widely favored by the community because of its sweet and sour taste. This is what prompted researchers to want to conduct research on the Analysis of the presence and risk factors of Escherichia coli bacteria in orange juice. The focus of this research is as follows: To find out where orange juice is sold that contains E. coli bacteria, to analyze possible risk factors for contamination by Escherichia coli bacteria.

METHOD

This research is a qualitative research, namely obtaining a description of the presence of Escherichia coli bacteria in orange juice. The research approach uses a descriptive approach. The objects of this research are orange juice, containers, water, risk factors, containers, and water. For the subjects of this research there are 10 places selling orange juice. There are two types of data used in this study, namely: Primary data is data obtained directly through observation of bacterial examination in the Laboratory and interviews with informants or respondents. Researchers will interview informants to obtain information about the process of making orange juice. Secondary data is additional data in the form of information that will complement primary data. The additional data in question includes documents or archives obtained from various sources, existing supporting photos, or photos produced by themselves, as well as data related to this study. Data collection in this study was carried out by taking samples of orange juice and then checking for the presence of e-coli in the Gajah Putih University Laboratory of Agriculture.

This research is a descriptive study, with more descriptive nature from the results of interviews and documentation studies. The data that has been obtained will be analyzed qualitatively and described in descriptive form. The data analysis technique used in this study is to use the steps as stated by Burhan Bungin (2013), namely: Data Collection, Data Reduction, Data Description (Data Display), and Verification and Confirmation of Conclusions (Conclusion Drawing and Verification). In this sense, qualitative data analysis is an ongoing, repetitive and continuous effort. The problem of data reduction, data presentation and drawing conclusions/verification becomes a picture of medical waste management at the Tanjung Balai Karimun Health Center in sequence as a series of related analysis activities. Furthermore, the data that has been analyzed, explained and interpreted in the form of words to describe the facts in the field, meaning or to answer research questions which are then taken only the essence. Researchers can explore further and deeper into phenomena and responses that are strange and deviant or even contradictory to the research.

In addition, researchers also need books, stationery, interview guides, and tape recorders as data collection tools. In addition to these, interviews are also conducted with the aim of collecting data in the form of information. informants or respondents. Researchers will interview informants to gather information about the process of making orange juice. Secondary data is additional data in the form of information that will complement primary data. The additional data in question includes documents or archives obtained from various sources, existing supporting photos, or photos produced by themselves, as well as data related to this study.

RESULTS AND DISCUSSION

Description of the Presence of Escherichia coli Bacteria in Orange Juice

The results of the agricultural laboratory analysis of the Faculty of Agriculture, Gajah Putih

University are as follows:

Table 1 The Presence of Escherichia coli Bacteria in Orange Juice in Takengon in 2023

No	Sample Code	Escherichia Coli Bacteria Test Results	Respondent Age (years)
1.	K.1	Negative	35
2.	K.2	Negative	21
3.	K.3	Positive	25
4.	K.4	Negative	40
5.	K.5	Negative	28
6.	K.6	Negative	24
7	K.7	Positive	27
8.	K.8	Negative	30
9.	K.9	Positive	42
10.	K.10	Negative	29

Discussion

The results of this study indicate that out of 10 juice samples examined in the laboratory, 3 contained Escherichia coli bacteria. This means that the juice consumed is not sterile from Escherichia coli bacteria. This condition is related to the habit of washing hands with soap, scratches on the hands, nails that are not cleaned. According to Budiono (2019), dirty or contaminated hands can transfer pathogenic bacteria and viruses in the body, feces or other sources to food. Washing hands is a basic thing that must be done by workers involved in handling food. Washing hands with soap followed by rinsing will remove many microbes on the hands.

Good water conditions are providing water for washing hands that is separate from washing equipment, such as using running water from a tap and a bucket that is separate for washing hands and washing equipment. Washing facilities must use several buckets/tubs provided for washing equipment, namely a tub for soaking, a tub for soaping, and a tub for rinsing (Rahayu, et al., 2016). Physical parameters can generally be identified from the physical condition of the water. The requirements for clean water quality for physical parameters are colorless, odorless, and tasteless (Minister of Health Regulation 492 of 2010). Clean water quality that does not meet the requirements indicates that the water is dirty and contaminated with microorganisms. If water in a tub/bucket that has been contaminated with E. coli bacteria is used to wash equipment, it is likely that the equipment will be contaminated with the bacteria. Another risk factor for the spread of disease is consuming drinking water that has not been boiled first. Boil water until it boils with signs of air bubbles and water vapor in the boiled water. This activity will kill bacteria that are parasites in the human and warm-blooded animal food contamination channels (Purnawijayanti, et al., 2022)

Refill drinking water must meet the established quality requirements. According to 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, namely water that has gone through a processing process or without a processing process that meets health requirements or can be drunk directly. Refill drinking water contaminated with bacteria is likely to occur during the drinking water filling process, such as the absence of a sterilization process on the water gallon. The production process that does not meet the requirements is suspected to be a factor causing the product to be contaminated. The results of this study are in line with research conducted by Rido Wandrivel, Netty Suharti, Yuniar Lestari regarding the quality of drinking water produced by refill drinking water depots. The results of the study concluded that 5 out of 9 samples contained Coliform bacteria and 3 out of 5 samples also contained E. coli. This shows that 55.6% of drinking water depots in Bungus District produce drinking water whose quality does not meet the microbiological

requirements set by the government (Wandrivel, et al., 2022).

CONCLUSION

Based on the results of a study conducted on 10 orange juice handlers around Jalan Takengon, Lut Tawar District. Of the 10 orange juice sellers, 3 orange juices were contaminated with Escherichia coli bacteria. Contamination is likely due to handlers who are not clean and use uncooked mixing water. The presence of Escherichia coli bacteria in drinks or food is also considered to have a high correlation in the discovery of foodborne pathogens. For the public, they should pay attention to the cleanliness of the water and sanitation of their regular orange juice sellers, we should consume orange juice that is made ourselves because its hygiene is more guaranteed. And it is also recommended for orange juice sellers to pay attention to sanitation and hygiene, so that the orange juice sold is not contaminated with microbes that can harm consumers.

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