Logistic Regression Analysis of Escherichia Coli Contaminants on the Tofu Water in Lowokwaru Market Malang City

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ABSTRACT

The purpose of this research knows to the influence of Escherichia coli contaminants on the tofu water in lowokwaru market Malang city. The research method used analytical survey with cross sectional approach with simple random sampling and obtained 20 samples of traders. The result of the research showed that the food hygiene and sanitation the >90,2% sample of 10 (50%), the appearance and tofu the > 80% sample of 9 (45%), Up impurities Escherichia coli that sample of 0 per 100 ml sample as much 8 (40%). Based on the results logistic regression presentation and processing Tofu to Escherichia coli with significance value = 0.099 > (α= 0.05) then H0 is accept. No effect the presentation of and Tofu processing against Escherichia coli who sold street vendors. And the result of statistical test hygiene and food sanitation against Escherichia coli by using logistic regression with significant value = 0.032 < (α= 0.05) then H0 is reject so there an effect the Hygiene and food sanitation Escherichia coli sold street vendors and value of square as 0.434 means and the presentation of food hygiene and sanitation and processing Tofu affect Escherichia coli as 43,4% Therefore, it is necessary to review the place of hygiene sanitation and presentation of tofu processing sold street vendors in the market lowokwaru. Discuss. The water is very important bacteriology tofu for a measurement degree of pollution. Socialize and was conducted by means of maintaining healthy food hygiene and sanitation.

I. Introduction

Tofu is a processed soybean that has a moisture content of about 80% and 20% protein also contains carbohydrates and minerals, this causes the tofu to be a medium suitable for the growth of microbes that know easily decomposed by bacterial decay. High bacterial population levels negatively affect the quality of tofu because bacteria that grow and multiply will produce byproducts that will change the quality of tofu. Potential pollution sources to pollute the tofu can be through raw materials soy or water used during the process of making tofu. Production environments and workers can also be a source of bacterial contamination during the tofu manufacturing process. Soil and water are the habitats of many bacteria such as Escherichia coli,

Staphylococcus aurous and Bacillus cereus and spore-forming bacteria. Staphylococcus aurous is also found in the respiratory tract, skin and hair surface (Utami, 2010).

Based on the results of research Sirait (2015) on tofu marketed in the city of Medan, it was found that the soybeans produced in small businesses and marketed in the city of Medan proved from 10 samples of Tofu tested showed 4 samples of tofu containing Escherichia Coli Each sample contains the bacteria Escherichia Coli in 100 ml is 380 per 100 ml; 120 per 100 ml; 88 per 100 ml; 50 per 100 ml sample Tofu.

Based on the results of Yanti study on the tofu which marketed in Bagan Batu market mostly (58.3%) have not met the health requirements. The results of the examination, Escherichia coli highest contamination rate of 27 coli / 100 ml of sample and the lowest is 0 coli / 100 ml sample (Nurikasari, Puspitasari & Siwi, 2017).

Escherichia Coli is also a bacterial indicator of water quality because its presence in water indicates that the water is contaminated by feces, which may also contain other pathogenic enteric microorganisms. Escherichia coli becomes pathogenic if the number of these bacteria in the digestive tract increases or lies outside the intestine. Escherichia coli produces enterotoxins that cause some cases of diarrhea. (Brooks., 2010)

Standard in 2008 are Escherichia coli and Salmonella. Guidelines for The Assessment of Microbiological Quality of Processed Foods issued by the Food and Drug Administration Philippines of 2013, the bacteria required for the quality of tofu during the tofu-making process are Escherichia coli and Staphylococcus aurous coagulase positive

To determine the source of bacterial contamination in the tofu need to be identified at each stage of pollution in the process of making the tofu so that it can be done prevention. Generally research that exists today, see the total contamination of bacteria in the tofu has not been to the source of its contaminants on the grooves of the process of making tofu. To suppress the amount of contaminated bacteria contamination done by heating process with a certain temperature and time that can kill bacteria contaminated food or drink.

Escherichia coli contamination causes diarrhea to occur through contaminated water of infected human waste. In addition, transmission can also occur through contact from infected workers during processed food so that Escherichia Coli can be one of the causes of foodborne disease (foodborne disease), a disease caused by consuming contaminated food or drink.

Then, according to Preliminary Study conducted by researchers on April 7, 2017 with a clear view that many at risk for bacteria to grow and multiply on food (Tofu) sold by street vendors in the market Lowokwaru Thus researchers want to conduct research to analyze " Escherichia Coli On Tofu Water For Sale In Lowokwaru Market Of Malang ".

II. Method

This research method use analytical survey with Cross Sectional approach method, that is every research subject to study observational). The population in this research is the water of tofu in Lowokwaru Market of Malang city as many as 20 merchants Sampling technique using Simple random sampling method. Independent variables are Hygiene sanitation and Presentation of Tofu processing. Dependent variable is Escherichia Coli contamination (Siyoto, & Sodik, 2015).

III. Results

From the results of research that has been obtained, can be done as follows:

Table 1 Characteristics of Research Variables

No	Characteristics	N	%
1	**Hygiene Sanitation**		
	> 90,2%	10	50
	< 90,2%	10	50
2	**Presentation and Processing Tofu**		
	≤ 80 mg/L	11	55
	> 80 mg/L	9	45

Table 2 The result of logistic regression is Hygiene of Food Sanitation and Presentation of Tofu Processing.

Variable	N	Sig
Hygiene Sanitation	20	0,032
Presentation and Processing Tofu	20	0,099

Logistic regression result got significant value 0,099> (α = 0,05) so Accept Ho hence No influence Presentation and Processing Know to contamination Escherichia Coli. And from result of statistical test of hygiene and food sanitation to contamination of e coli got significant value 0,032 <(α = 0,05) so reject Ho hence there influence of hygiene and food sanitation to Escherichia Coli contamination. R Square value of 0.434 means hygiene and food sanitation and the presentation and processing of tofu affects Escherichia Coli contamination by 43.4%.

1. Hygiene and Sanitation With Escherichia Coli Contamination

Hygiene and sanitation efforts to control the factors of food, people, places and equipment that may or may lead to illness or health problems (MOH, 2004)

Foodstuffs need to be chosen which is best viewed in terms of cleanliness, appearance and health. Food handlers in choosing materials to be processed should know the sources of good food and attention to the characteristics of good materials

According to MOH RI (2004) food storage is intended to cultivate food to be durable longer. The quality of the processed food is strongly influenced by temperature, where there

are vulnerable spots for the proliferation of pathogenic bacteria and decay at temperatures corresponding to the conditions

Know that left in the open air without immersion in water only lasts about 10 hours, while the tofu is soaked every day can last 1-3 days. These signs can be used to know the toxicity of the tofu surface, the texture becomes mushy, the color and appearance is not good and moldy on the surface. And also because some traders are selling the Tofu which is 2 days from the day of manufacture. Therefore, many bacterial bacteria appear in the water soaking tofu.

2. Presentation and Processing of Tofu And Contamination Escherichia Coli

Water as a material that is always involved at every stage of the process of making tofu, then the water has the potential as a source of contamination by pathogenic bacteria that is harmful to consumers if the sanitation is not good. Water used for food process must have quality as clean water. Some commonly found bacterial species in the water are Pseudomonas, Chromo bacterium, Proteus, Micrococcus, Bacillus, Streptococcus, and enterococcus species such as Enter bacterium and Escherichia Coli (Budi, 2010).

To maintain the quality of tofu then the use of clean water is a requirement, because the water is not clean will reduce the quality of tofu. This water is used during washing, soybean dipping, and tofu ready. In addition, personal hygiene, tools and work environments should receive attention. Good management of the above factors is important in view of the source of contaminants coming from humans, objects, soil or dust, air, food, water and pets (Sodik, & Nzilibili, 2017).

Presentation and processing of Tofu in home industry most do not qualify, because no worker who uses this apron and headgear can cause the bacteria in the bath water tofu. Of the equipment for the manufacture of the less sterile tofu because of the continuous processing that causes the lack of washing time equipment and garbage cans around the processing place is not closed so as to cause bacterial contamination. Then know that the finished making is always presented in an open state so that bacteria more easily enter and contaminate the water in the bath tofu.

IV. Conclusion

Based on the result of the research , From as many as 20 water samples Tofu known to know water has Hygiene sanitation Eligible food is> 90.2% for 10 samples (50%), while hygiene and food sanitation are not eligible ie <90.2% of 10 sample (50%). From as many as 20 water samples Tofu known that some of the water knows have the presentation and processing of tofu that meet the requirement that is> 80% for 9 samples (45%), while the

presentation and processing of unqualified tofu is <80% of 11 samples (55 %). From as many as 20 water samples Tofu is known that some water tofu has Escherichia Coli contaminant that does not fulfill the requirement that is> 0 per 100 ml sample of 12 samples (60%) with highest content value is 27 per 100 ml, while the amount of contamination Escherichia Coli eligible 0 per 100 ml samples of 8 samples (40%) with the lowest Escherichia Coli contamination value of 0 per 100 ml l. No influence of hygiene and food sanitation on Eschericia coli contamination. However, there is influence of serving and processing of tofu against Eschericia coli contamination.

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