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TESTING THE TOTAL BACTERIA PLATE NUMBERS ON WET CAKES THAT FOR SALE IN THE CENTRAL MARKET OF THE CITY OF GORONTALO

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ABSTRACT

Wet cakes are cakes that have a high water content so that they are soft in texture and usually have a sweet taste. The Total Plate Number Test is to calculate the number of bacterial colonies that grow on the media from the sample dilution. The research objective was to determine the ALT of bacteria in wet cakes sold in the Central Market of Gorontalo City. This research is descriptive with a qualitative approach. The sampling method used purposive sampling with a sample size of 15 wet cakes. Bacterial ALT test on wet cakes using the surface method (surface / spread plate). Data were analyzed descriptively and presented in tabular form. The results of the study were obtained from 15 samples of wet cakes, there were 6 samples that exceeded the maximum limit set by BPOM RI Number 13 of 2019, namely CM cake samples in morning collection (2.3 x 104 CFU / g),

Keywords: Damp cake, bacteria, Total Plate figures

INTRODUCTION

Health is a condition that shows the condition of the human body both physically and mentally. A healthy body condition can be obtained by maintaining food intake in the body, such as paying attention to the safety of these foods in terms of cleanliness and avoiding foods that have the potential to cause disease. Unhealthy food has the potential to endanger, if it does not meet the standards of nutrition, quality and safety so that it disturbs human health conditions. Thus the selection of food is an effort to prevent food products that can endanger health and foods that do not meet standards [14].

One of the food choices that the community doesn't pay attention to is traditional snack foods such as cakes. Wet cakes are ready-to-eat food, and are often found on the side of the road or in the market. Wet cakes can be processed from several ingredients including flour, water, eggs, and sweeteners. If the food ingredients and equipment used in the processing of wet cakes are not clean, it will cause a disease caused by pathogenic microbes. Therefore, pathogenic microorganisms will develop in the human digestive tract, so that it can cause digestive tract disorders such as diarrhea [8].

Gorontalo City Central Market is one of the largest markets in Gorontalo City and as a shopping center for the community to meet their daily needs, located in the district. Southern City, Gorontalo City. Based on the survey results, there were 11 sellers of wet cakes who were placed specifically but there were 5 sellers of wet cakes who mingled with other foodstuff sellers. The condition of the market environment is very worrying because it lacks hygiene and the place for traditional snacks is open without being covered by plastic food or put in a glass refrigerator [16].

A place to buy and sell that is less hygienic is one of the factors that can cause traditional street food to be contaminated by

microbes. Some types of microorganisms that contaminate food materials, for example microorganisms originating from the air (Micrococcus spp and Sarcina spp), water (Escherichia Coli bacteria), humans (Staphilococcus aureus bacteria, Salmonella serovars and Shigella spp), equipment (Salmonella bacteria, Listeria, Entterococcus, Pseudomonas, and Clostridium) and food additives (Staphilococcus aureus bacteria, Escherichia Coli, Salmonella sp, and Enterobacteriaceae) [17].

Food that has been contaminated by microbes and if consumed by the public will trigger disease originating from pathogenic microbes, one of which is Escherichia Coli. If the number of Escherichia coli bacteria in the human digestive tract exceeds normal limits, it will cause diseases such as cholera, dysentery, gastroenteritis, diarrhea and various other digestive tract diseases [9].

If there is microbial contamination on wet cakes, it is necessary to check the Total Plate Number (ALT). ALT is one of the parameters that aims to determine the number of bacteria that have experienced growth and development in wet cakes, besides that it can refer to determining the safety and quality of food. Based on the Food and Drug Administration of the Republic of Indonesia Number 13 of 2019, the maximum limit of microbial contamination in wet cakes with ALT test parameters is 1 x 104 CFU / g [2].

There are 2 samples out of 25 samples of wet cakes in the big market of Palangka Raya City, which do not meet the standards for consumption because they have a germ rate above 1.0 x 105 colonies / g [8]. Klepon cake in Songgolangit market, Ponorogo Regency, there are 1 out of 3 sellers, namely seller B does not meet the requirements because the results of the examination exceed the maximum limit of 1 × 104 koloni / g [6]. The ALT results from steamed sponge samples stored for 3 days at room temperature (270C) showed that the 3 producers exceeded the maximum limit that had been set at 1 × 104 colonies / g [18].

The number of bacterial contaminants in wet cakes (yoke and filling cakes) at the Central Market of Gorontalo City, and the results of his research from 5 sampling locations, there were samples of filling way cakes in three locations (A, B and D) did not meet the maximum contamination limit set by SNI 1 x 104 CFU / g, while the sample of the yoke cake was also contaminated by bacteria but did not exceed the predetermined maximum limit [13].

Based on the description above, this is the basis for researchers interested in examining the total plate count of bacteria in wet cakes sold in the central market of Gorontalo City, so that the maximum limit of bacteria in wet cakes consumed by the community can be found.

RESEARCH METHODS

This type of research is a descriptive study using a qualitative approach which aims to test the ALT on the wet cakes sold in the Central Market of Gorontalo City.

The sampling location was carried out at the Central Market of Gorontalo City and the sample examination site was carried out at the Microbiology Laboratory of Bina Mandiri University Gorontalo. The population in this study were all the cakes sold in the Central Market of Gorontalo City. The sample size in this study was 15 samples of wet cakes taken in the morning (08.00), afternoon (13.00) and evening (16.30), so that from the three times each 5 types of wet cake samples were taken from 5 wet cake sellers. in Gorontalo City Central Market based on sample criteria.

In this study, researchers used a purposive sampling technique, in which the research sample was selected according to the criteria that the researcher had set. The inclusion criteria in the study were wet cakes taken in the morning, afternoon and evening, and wet cakes that had a lot of moisture. Exclusion criteria are wet cakes that are taken other than at the specified time (when the market will be closed), wet cakes that have a little moisture content.

The instrument in this research is the tool used in this research is autoclave, incubator, volume pipette, bunsen lamp, erlenmeyer flask, measuring cup, tube rack, petri dish, beaker, test tube, stirring rod, colony counter, vortex, analytical balance scales and hotplate. The materials used aresamples (wet cakes) sold at the Central Market of Gorontalo City, aquades, 0.9% NaCl, Nutrient Agar (NA), cotton and aluminum foil.Then the first step is to sterilize the tools and materials to be used, after which 13.8 grams of NA media are made. Prepare 1 beaker containing 9 ml of distilled water and 5 test tubes containing 9 ml of 0.9% NaCl. Give labeling to the 3 test tubes, namely 101, 102 and 103.Weighing 1 gram of the wet cake sample using an analytical balance, then put it in a beaker containing 9 ml of 0.9% NaCl then stir it until it is homogeneous, so that a dilution of 101 is obtained. Then take 1 ml from dilution 101, then put it in the first test tube containing 9 ml of sterile 0.9% NaCl and in the vortex, the first test tube is called dilution 102. The same treatment is carried out on the second and third test tubes. Next, take 1 ml of dilution 101 and put it in a petri dish containing NA media. The same treatment is carried out from a dilution of 102 to 103. After that, smooth the sample on the NA media using a stirring rod, with the aim of evening the sample with the media. After solidifying, the plates were incubated at 37 ° C for 24 hours in an inverted position. After 24 hours, observe and count the number of bacterial colonies growing on the petri dishes using a colony counter.

The data analysis used is to describe the research results obtained from laboratory tests and will be processed descriptively and presented in tabular form. The operational definition in this research is:

1. Wet cake: a type of traditional food that can be processed from several ingredients including flour, sweetener, water and eggs.
2. Total plate number: the number of colonies contained in the wet cake, which aims to determine the number of bacteria eligible or not.

RESEARCH RESULT

Based on the results of research on 15 samples of 5 types of wet cakes taken in the morning (08.00), afternoon (13.00) and evening (13.00) from 5 cake sellers, the results obtained can be stated in the table as follows:

Table 4.2 ALT Test Results on Wet Cakes

Kode Sampel	Waktu Pengambilan	ALT (CFU/g)
Kue CM	Pagi (08.00)	$2,3 \times 10^4$
	Siang (13.00)	$5,2 \times 10^4$
	Sore (16.30)	7×10^4
Kue CI	Pagi (08.00)	$2,6 \times 10^3$
	Siang (13.00)	$2,7 \times 10^3$
	Sore (16.30)	$2,8 \times 10^3$
Kue KU	Pagi (08.00)	$1,2 \times 10^3$
	Siang (13.00)	$2,9 \times 10^3$
	Sore (16.30)	3×10^4
Kue L	Pagi (08.00)	1×10^4
	Siang (13.00)	$1,2 \times 10^4$
	Sore (16.30)	$1,4 \times 10^4$
Kue K	Pagi (08.00)	$1,2 \times 10^3$
	Siang (13.00)	2×10^3
	Sore (16.30)	> 300 dan < 30

DISCUSSION

Based on the results of research that has been carried out on 15 samples of wet cakes taken by purposive sampling technique in the morning (08.00), afternoon (13.00) and evening (16.30) from sellers at the Central Market of Gorontalo City, it is found that 6 of the 15 samples are The test exceeds the predetermined maximum limit, namely, for example, CM cake samples for morning (2.3 x 104 CFU / g), afternoon (5.2 x 104 CFU / g), and afternoon (7 x 104 CFU / g) samples.), KU cake on take (3 x 104 CFU / g), L cake on take (1.2 x 104 CFU / g) and afternoon (1.4 x 104 CFU / g).

Samples that did not exceed the maximum ALT limit were 9 samples, CI cake samples in the morning (2.6 x 103 CFU / g), afternoon (2.7 x 103 CFU / g) and afternoon (2.8 x 103 CFU / g) samples.), KU cake for morning pick up (1,2 x 103 CFU / g) and afternoon (2.9 x 103 CFU / g), L cake for morning pick up (1 x 104 CFU / g), K cake for morning pick up (1,2 x 103 CFU / g) afternoon (2 x 103 CFU / g) and evening (> 300 and <30 CFU / g).

Bacterial growth is indicated by the formation of a white circle on NA media. The results of the study for negative control were not overgrown with bacterial colonies. In accordance with the research that has been done by previous researchers, for negative control the results of the study were not overgrown with bacterial colonies, this indicates that the media and solvents used in the study were sterile [7].

Maximum limit of microbial contamination in food with ALT test parameters is 1 x 104 CFU / g [2]. Based on the predetermined conditions, 6 out of 15 samples can be declared ineligible for consumption because they have a germ count above 1 x 104 CFU / g, while 9 samples that have been studied meet the requirements for consumption. There was microbial contamination in 19 of the 25 samples of wet cakes sold at Pasar Besar Palangka Raya City, and there were 2 samples of wet cakes that had germ numbers exceeding the maximum limit of microbial contamination on wet cakes, namely sample 13 with an average germ count of 3.1. x 105 colonies / g and sample 15 with an average germ count of 9.5 x 105 colonies / g [8].

The microbial contamination obtained in the 6 samples of wet cakes that had been studied, namely CM cake samples for morning, afternoon and evening collection, KU cake for afternoon and afternoon pick-up at Gorontalo City Central Market were suspected to be caused by several factors, especially from environmental factor. Based on the results of observations during sampling, samples that were contaminated by microbes were thought to be from a wet cake selling place near meat and vegetable sellers, while samples that were not contaminated by microbes were placed in a special place for cake sellers and did not mix with other sellers.

Factors that can affect the occurrence of microbial contamination in wet cakes are the place where the wet cakes are sold which is close to other sellers who sell vegetables and meat, dirty environmental conditions, the density of sellers and buyers so that it affects microbial pollution because the activities carried out will contaminate the wet cakes besides the lack of cleanliness of the equipment used, such as the container for placing wet cakes and the tongs used to collect wet cakes [18].

Based on the results of the research that has been done, the presence of microbial contamination in the wet cake samples taken in the morning, afternoon and evening has increased the number of microbes. This is due to the long time selling the wet cakes, because the processing technique of the wet cakes is cooked by steaming so that the wet cakes emit moisture which will cause the moisture content in the wet cakes to increase. Therefore, wet cakes that have a higher moisture content tend to have a short shelf life and are easily damaged because they can grow bacteria [5]

Microorganisms that grow in wet cakes can convert these foods into organic substances that have less energy. In this conversion the bacteria obtain the energy

they need. However, there are several species whose metabolic products are exotoxins that are harmful to human health. If the toxin enters the human digestive tract, poisoning symptoms will occur, such as stomach pain, vomiting, and diarrhea. The wet cake that is consumed is almost always contaminated with various microorganisms. But usually it does not become infected or poisoned, either because the microorganisms that contaminate the cake are harmless or because of the small number of microorganisms [4].

Foodborne disease is a disease caused by food contaminated by microorganisms or toxins. The main cause of the occurrence of foodborne diseases such as food poisoning, diarrhea and typhoid is due to a lack of hygiene and health behavior, so that agents can easily enter the body through the food consumed. There are several types of bacteria that often cause diseases caused by food contaminated by microbes, namely Salmonella, Escherichia coli, Listeria, Clostridium perfringens, Bacillus aures, Staphlococcus aures, and Clostridium botulium [13].

CONCLUSION

Based on the research it can be concluded that of the 15 samples of wet cakes, there are 6 samples that exceed the maximum limit set by BPOM RI Number 13 of 2019, namely CM cake samples in morning (2.3 x 104 CFU / g), afternoon (5.2 x 104 CFU / g), and evening (7 x 104 CFU / g), KU cake for afternoon pick-up (3 x 104 CFU / g), L cake for lunch (1,2 x 104 CFU / g) and afternoon pick-up (1 , 4 x 104 CFU / g).

Furthermore, some of the suggestions put forward by the author are:

1. The seller should pay more attention to places selling wet cakes, namely sanitation and hygiene, so that they are not easily contaminated by microbes, and consumers should be more careful in buying wet cakes, which is to pay attention to the cleanliness of the place of sale before buying.
2. It is hoped that other researchers will proceed to the next stage, such as identifying the type of bacteria from the ALT test on wet cakes at the Central Market of Gorontalo City.

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