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Research Paper

Biosecurity Detection on Meat Satay In Padang Barat District, Padang City

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ABSTRACT:*The most common processed meat and cuisine of West Sumatra is satay. Almost all local residents and visitors to West Sumatra, especially the city of Padang, like satay. This study aims to detect the safety and hygiene of beef satay sold in West Padang District, Padang City. This study uses purposive sampling with the criteria; The satay is sold in Padang Barat District, Padang City, made from meat, which has not been and has been roasted, immediately finished a day and stored in the freezer or with added preservatives. Based on the results of biosecurity showed that 13 out of 20 samples were contaminated with E.coli bacteria and there were 2 samples contaminated with Staphylococcus aureus bacteria and no samples were contaminated with Salmonella, sp. In the formalin test, all samples were formalin negative and free of borax. The researcher suggests that meat satay sellers in Padang District, Padang City must always maintain and improve sanitation hygiene in the process of producing and serving satay.*

KEYWORDS: *Biosecurity, Formalin, Hygenic, Satay, Safe*

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I. INTRODUCTION

Law Number 18 the Year 2009 article 58 paragraph 1 states that «To guarantee safe, healthy, intact and halal animal products, the Central Government and Regional Governments following their respective authorities carry out supervision, inspection, testing, standardization, certification, and product registration. animal. » Supervision of the provision of halal food starts from upstream to downstream. One source of food that we usually consume is beef. Beef can be obtained easily in the markets [1]. However, the slaughtering process is still carried out at Slaughterhouses located in each district and city. In producing ASUH meat, two certifications must be owned by RPH, namely the Veterinary Control Number certification issued by the Office that carries out the Veterinary Public Health function in the Province and the halal certification from the MUI [2].

According to the Regulation of the Head of the Food and Drug Supervisory Agency No. 20 of 2019 concerning Supervision of Food Packaging classifies materials that are permitted to be used as Food Packaging into two groups:

1. Food Contact Substance, namely any substance intended to be used as a component of food packaging materials used in the manufacture, packaging, packaging and storage of food, which is in use is not intended to provide technical effects on food (BPOM Regulation No. 20 of 2019).

2. Food Contact Materials, namely food packaging materials intended to come into contact with food. includes active food packaging, smart food packaging, adhesives, ceramics, cork, rubber and elastomers, glass, ion exchange resins, metals and metal alloys, paper and cardboard, plastics, regenerated cellulose, silicones, fabrics, waxes, woods, polishes, and coating (BPOM Regulation No. 20 of 2019).

Extraordinary events (KLB) of food poisoning in Indonesia for the period 2000-2015, the results of research using a systematic and quantitative study approach state that outbreaks are increasing every year. 60% of food poisoning is thought to be caused by bacteria, without being proven by laboratory test results that the cause of the outbreak was due to bacteria. The highest pathogenic bacteria that cause food poisoning include *Escherichia coli, Bacillus cereus, Staphylococcus sp., and Salmonella* [3].

Almost all people and visitors in West Sumatra, especially Padang City like satay. Many satay traders can easily be found scattered throughout the city of Padang. The large number of satay sales that have not

undergone inspection has created unrest for people who will buy satay. This study aims to ensure its cleanliness and safety to create clean and safe food for consumption by the wider community.

II. METHODS

This study uses purposive sampling with the following sample criteria:
1.Satay sold in West Padang District, Padang City
2. Satay made from meat
3. Satay that has not been and has been burned
Satay that runs out a day and is stored in the freezer or with added preservatives.

Biosecurity Detection

- *Escherichia Coli* Test [4]

Solid and semi-solid samples were weighed aseptically as much as 25 grams or measured 25 ml of liquid samples and then put in sterile containers or Stomacher plastic. Then the meat sample was added with 225 ml of sterile BPW0.1% solution and blended for 1-2 minutes. This is a solution with a dilution of 10-1. Using a sterile pipette, 1 ml of the suspension was transferred to the BPW solution to obtain a dilution of 10-2. 1 ml of sample was taken from the 10-2 dilution using a sterile pipette and put into 9 ml of BPW solution and incubated at 350 C for 18-24 hours. Observation and reading of the results by counting the purple colonies.

-*Staphylococcus aureus* test [5]

For the meat sample (solid) as much as 25 grams of the sample is weighed aseptically or measured the liquid sample is as much as 25 ml, then put in a sterile container or Stomacher plastic. Added 225 ml of sterile BPW solution and homogenized with a stomacher for 1-2 minutes. This is a solution with a dilution of 10-1. Using a sterile pipette, 1 ml of the above suspension was transferred and put into the BPW solution to obtain a 10-2 dilution. A further dilution (10-3) was prepared by taking 1 ml of the sample from the 10-2 dilution using a sterile pipette and adding it to 9 ml of the BPW solution. In the same way, further dilutions of 10-4, 10-5 and so on are carried out, as needed. The test was carried out with positive control, i.e. a positive test result.

- *Salmonella*, sp Test [6]

Weigh as much as 25 grams of the sample or measure 25 ml for solid and semi-solid samples, and put them in a sterile container. For the meat sample, add 225 ml of lactose broth and homogenize with a stomacher for 1-2 minutes at low speed. The suspension is transferred to an Erlenmeyer or sterile container. Incubated at 350 C for 24 hours ± 2 hours. Each enrichment medium was taken in one colony with loop/ose needles inoculated/scraped onto HE, XLD, and BSA. Incubated at 350C for 24 hours ± 2 hours. For BSA, if it is not clear, it can be incubated again for 24 hours ± 2 hours.

Preservative Detection

- Formalin Test [7]

Samples were taken approximately 1 gram, then crushed using a mortar. Then dissolved with aquadest approximately 10 ml. Take 5 ml of the extract, add 5 drops of reagent 1 then add 1 spoon of reagent 2 and mix it by shaking it. Observed color changes (positive purple color, negative color does not change to yellow).

-Borax Test [8]

Samples were taken approximately 1 gram, then crushed using a mortar. Then dissolved with aquadest approximately 10 ml. Take 1 ml of extract, add 15-20 drops of reagent 1, homogenized by shaking and then dip in reagent 2 (turmeric paper). Then the turmeric paper is dried in the sun for 10 minutes. Observed color changes (positive brick red color, negative color)

III. RESULTS AND DISCUSSION

Biosecurity Detection

Testing of bacteria *E. coli, S. aureus,* and *Salmonella* sp., on meat satay that has not been burned and that has been burned was carried out separately. The number of colonies found in the test was counted manually. Based on the data shown in the table 1, we can see that in samples of meat satay that have not been burned, 13 out of 20 samples were contaminated with E.coli bacteria, and the number of colonies was above SNI. The presence of E. coli bacteria on the hands of food processors can occur because, after defecation, food processors do not wash their hands thoroughly [9]. Meanwhile, in the *S. aureus* test, 2 samples had not been burned, which were contaminated, namely the Riki 2 sample and the Laby 2 sample with the number of colonies being 100 and 230 colonies, respectively. The maximum limit of *Staphylococcus aureus* contamination in processed meat products based on the SNI 7388:2009 standard is 1x102 clones/g. Riki 2's sample with 100 colonies means it is

still within the maximum limit. In contrast to the results found in the Labay 2 sample of 230 colonies. Then for *Salmonella* sp test results, it was found that all samples tested were not contaminated by *Salmonella*, sp. According to SNI 7388:2009, *Salmonella*, sp bacteria in food must be negative for every 25 g of sample. When compared with the results of Palupi research [10], the results of biosecurity testing on meat satay are better than those on frozen chicken. No *Salmonella*, sp bacteria were found in the meat satay, possibly because the meat had been boiled and had been burned. So that the water content in the meat has been reduced. Water is a medium of transportation between meat fibers so water content plays an important role in the life of microorganisms [11].

Table 1. *E. coli, S. aureus* and *Salmonella* Sp Bacteria Test Results on Meat Satay

No	Sample Code	*Ungrilled*			*Grilled*		
		E. coli	*S. aureus*	*Salmonella sp*	*E. coli*	*S. aureus*	*Salmonella sp*
1.	SD01	11350	0	0	265	0	0
2.	SD02	430	0	0	<10	0	0
3.	SD03	250	0	0	70	0	0
4.	SD04	< 3	0	0	>10	0	0
5.	SD05	>3	0	0	>10	0	0
6.	SD06	>3	0	0	620	0	0
7.	SD07	>3	0	0	695	0	0
8.	SD08	>3	0	0	390	0	0
9.	SD09	645	0	0	95	0	0
10.	SD10	1655	0	0	<10	100	0
11.	SD11	>3	0	0	5	0	0
12.	SD12	>3	0	0	240	0	0
13.	SD13	< 3	0	0	<10	0	0
14.	SD14	30	0	0	345	0	0
15.	SD15	>3	0	0	>10	0	0
16.	SD16	10300	100	0	8700	0	0
17.	SD17	14500	0	0	2842	0	0
18.	SD18	10650	0	0	13000	0	0
19.	SD19	2164	230	0	15	100	0
20.	SD20	< 3	0	0	<10	0	0

Detection of Preservatives

Formalin Test

The next test performed on the meat satay sample was the formalin test. A total of 20 samples of meat satay were tested for formalin using merkkit. The results of the formalin test observations on meat samples can be seen in the image below.

Figure 1. Formalin Test Results

Based on the picture, in the sample, we can see that there is no color change in all the test tubes. Of the 20 samples tested, it was assumed that all of them were formalin negative because there was no color change in the solvent. A positive result of formalin will show the color of the solution changed to purple and for a negative form of formalin the color does not change. The analysis carried out on the formalin test is a qualitative analysis, where the test can only determine the presence or absence of formalin but cannot determine the level of formalin contained in food. Qualitative analysis was conducted to state the presence or absence of formalin in a material being tested. However, the qualitative test could not show the amount of formalin content in the material. The easiest qualitative analysis to do is by adding certain chemicals (reagents) to materials suspected of containing formalin, resulting in a distinctive color change [12].

Some of the short-term negative effects caused by formalin exposure are respiratory and digestive tract irritation, vomiting and dizziness. Long-term effects can cause damage to the liver, kidneys, heart, spleen and pancreas due to aging [13].

Borax Test

The results of the borax detection test in meat samples stored in the refrigerator that were tested using test paper can be seen in the image below.

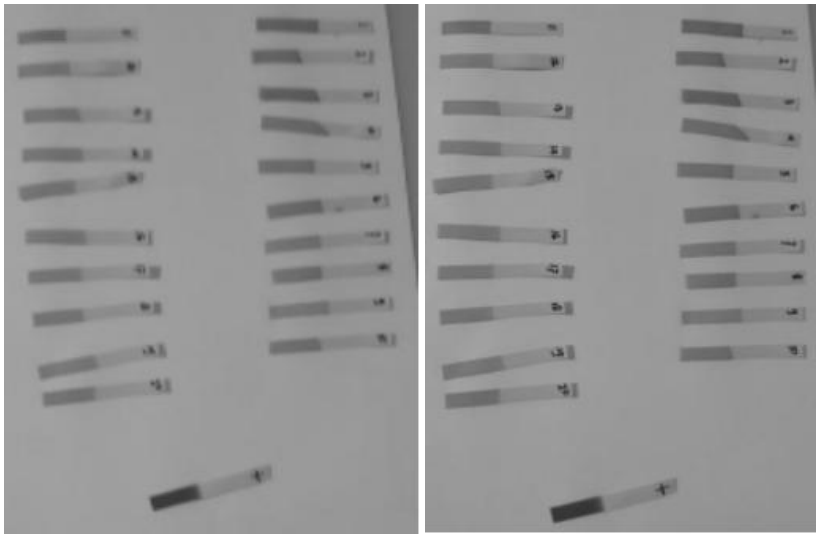

Figure 2. Borax Test Results

Based on the picture above, it can be seen that all the samples tested were negative for borax. This can be seen from the difference in the color of the test paper between the sample (top paper) and the control (bottom paper). Kholifah and Utomo [14] stated that the color change of curcumin from yellow to brownish red. The results of a negative borax test on 20 samples of meat satay taken in Padang Barat District, Padang City stated that the satay sold was free of borax additives, so it was safe to eat.

Borax is a compound in the form of crystals, white color, odorless, soluble in water, and stable at normal temperature and pressure. Borax is usually used as a preservative, an antiseptic, and cockroach repellent. However, borax is often misused as a food additive to increase the taste and shelf life of food [15]. The negative impact of using borax in life can have a very bad impact on human health. Borax has a very dangerous toxic effect on the human metabolic system just like other food additives [16].

CONCLUSION

Testing of *Escherichia Coli* bacteria on 20 samples of unroasted meat satay, 19 samples of bacterial colonies was found above SNI and 1 sample below SNI, namely Labay 3. In the *Staphylococcus aureus* test on unroasted meat satay, bacterial colonies were found above SNI code Labay 2 i.e. 230 colonies. For samples that have been burned, no colonies were found above SNI. While the *Salmonella* sp test, 20 samples of meat satay that had not been burned and 20 samples of meat satay that had been burned was found to be negative for *Salmonella*, sp. Testing of borax and formalin on 20 samples of satay meat with negative results.

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