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Identification Test Of Borax And Formaline Content In Food Sold At Laguboti Market

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Abstrak

Food is one of the human needs in everyday life. As a basic need, these foods must contain nutrients to be able to fulfill this function and be safe. Preservatives and dyes seem to be inseparable from various types of processed food and beverages. The purpose of this study was to determine the presence or absence of borax and formalin in food sold at the Laguboti Market. Based on Permenkes Number 033 of 2012 concerning food additives, borax is not allowed in food. If borax and formalin are consumed by humans, it will have a negative impact on the body. This study used a descriptive method, namely the scientific method and the simple method and was carried out in July at the Chemistry Laboratory of STIKes Arjuna Laguboti with a total sample of 14 food samples purchased from different food vendors at the Laguboti Market. Based on the results of a qualitative analysis on borax using the scientific method and the simple method obtained from 3 meatball samples and 3 rice cake samples, none of the meatballs contained borax. In formalin Using the scientific method and simple methods obtained from 5 samples of tofu and 3 samples of wet noodles containing formalin.

Keywords: Food, Borax, Formalin, Qualitative Test

INTRODUCTION

According to the World Health Organization (WHO) food is all the substances the body needs, except for water, medicines and other substances used for treatment. Food is one of the human needs in everyday life. As a basic need, these foods must contain nutrients to be able to fulfill this function and be safe, preservatives and dyes seem to be inseparable from various types of processed food and beverages (Tahir et al., 2019). According to data from the Food and Drug Monitoring Agency (BPOM), in Indonesia there are around 20 million cases of food poisoning per year (Dewi, 2019), incidents of poisoning due to consuming food occupy the highest position, namely 66.7%, compared to poisoning due to other causes. such as drugs, cosmetics, and others. One of the causes of food poisoning is the presence of food additives such as formaldehyde, borax, and textile dyes in food (Kholifah, 2018).

Borax has another name, sodium tetraborate is commonly used as an antiseptic and cleaning agent, besides that it is also used as a raw material for making detergents, wood preservatives, wood antiseptics, cockroach (pest) control, ant exterminators and others, while formalin is a formaldehyde compound in water with an average concentration of 37% and 15% methanol and the rest is water. The use of formalin, among others, as a germ killer so that it is used as a floor cleaner, warehouse, clothes and ships, fly repellent and other insects, material for making artificial silk, dyes, glass mirrors and explosives (Adinugroho, 2013).

According to the Regulation of the Minister of Health of the Republic of Indonesia No.1168 of 1999, borax and formalin are classified as food additives which are not permitted in Indonesia. The reason why borax and formalin are prohibited from being used is because borax and formalin cause many diseases for health. Borax can cause brain, liver and kidney disorders. In large quantities borax causes fever, anuria, coma, central nervous system damage, cyanosis, kidney damage, anemia,

vomiting, diarrhea, fainting, and even death. (Silitonga, 2020), and formalin will cause irritation and burning sensation to the mucosa of the nasal cavity, mouth and upper respiratory tract if it enters by inhalation. When ingested in high concentrations it causes acute symptoms in the form of irritation in the mouth, esophagus, ulcers in the digestive tract, chest and stomach pain, nausea, vomiting, diarrhea, gastrointestinal bleeding, metabolic acidosis, kidney failure and even death (Linda et al., 2016).

The Food and Drug Supervisory Agency (BPOM) found a number of dangerous components in 7,200 samples of Ramadan snacks or takjil for 2022 at food sales centers in various cities. BPOM carried out identification of food controls from March 28 2022 to May 6 2022. This activity was carried out independently by 73 BPOM Technical Implementation Units (UPT) spread throughout Indonesia, as well as in an integrated manner in collaboration with regional apparatus. A total of 109 samples or 1.51 percent contained ingredients that were prohibited from being used in food. The details are Formalin 0.72 percent, Rhodamine B 0.45 percent, and Borax 0.34 percent. And the results of research on meatballs in the city of Medan from 27 samples showed that 80% of the samples examined contained borax with a content of 0.08% - 0.29% (BPOM, 2022).

The scientific method is a scientific process to gain knowledge systematically based on physical evidence. Scientists play observations and form hypotheses in their attempts to explain natural phenomena, and the simple method is a method that is carried out simply in research (Nurkhamidah, 2017).

Based on the explanation above, it is necessary to do research on the identification test for borax and formalin content in food sold at the Laguboti Market using the scientific method and simple methods.

RESEARCH METHODS

This research uses a qualitative research type with a descriptive design, using the scientific method and simple methods to determine the presence or absence of borax and formaldehyde in the food sold at the Laguboti Market. The research was conducted in the Arjuna Laguboti STIKes Chemistry laboratory in July 2022. The sampling technique in this study was purposive sampling, the population in this study was from several sellers of meatballs, rice cake, tofu and wet noodles at the Laguboti Market, so samples were taken from meatball stalls, rice cake stalls , seller of tofu, seller of different wet noodles sold at Laguboti Market. The tools used in this study were filter paper, blender, filter paper, petri dish, measuring cup, glass beaker, knife, gloves, mortar and stamper, stir bar, while the materials used were turmeric, borax as an active control ingredient, samples (Tofu, meatballs, wet noodles and rice cake), aquades, young papaya.

RESULTS AND DISCUSSION

Based on research that has been done on 3 samples of meatballs, 3 samples of rice cake, 3 samples of wet noodles and 5 samples of tofu. sold at the Laguboti Market which were examined at the Arjuna Laguboti STIKes Chemistry Laboratory, the following results were obtained:

Organoleptic

Before identifying the contents of borax and formalin using the scientific method and the simple method, an organoleptic examination was first carried out on the sample which included color, taste, smell and texture, so the following results were obtained:

Table 1 Organoleptic examination

No	Sample	Color	Taste	Smell	Texture
1.	Meatball A	Light brown	Tasty	Typical	Springy
2.	Meatball B	Brownish white	Tasty	Typical	Springy
3.	Meatball C	Light brown	Tasty	Typical	Springy
4.	Lontong A	White	Bid	No smell	Springy
5.	Lontong B	White	Tasty	No smell	Springy
6.	Lontong C	White	Tasty	No smell	Springy
7.	Tahu A	White	Tasty	Typical	Mushy (soft)
8.	Tahu B	White	Bid	Typical	Mushy (soft)
9.	Tahu C	White	Bid	Typical	Mushy (soft)
10.	Tahu D	White	Bid	Typical	Mushy (soft)
11.	Tahu E	White	Bid	Typical	Mushy (soft)
12.	Wet Noodle A	Yellow	Salty	Typical	Springy
13.	Wet Noodle B	Yellow	Salty	Typical	Springy
14.	Wet Noodle C	Yellow	Salty	Typical	Springy

Identification Of Borax And Formalin Content

After the organoleptic examination, the next step is to grind the sample with a blender and mortar to test the identification of the borax and formalin content in each sample.

Table 2. Results of identification of borax content in samples

No	Sampling	Sample Name	Pengujian			
			Scientific Method (Flame reaction)	Result	Simple method (curcumin paper)	Result
1.	I	Meatball A	Yellow flame	Negative	Yellow	Negative
		Meatball B	Yellow flame	Negative	Yellow	Negative
		Meatball C	Yellow flame	Negative	Yellow	Negative
		Lontong A	Yellow flame	Negative	Yellow	Negative
		Lontong B	Yellow flame	Negative	Yellow	Negative
		Lontong C	Yellow flame	Negative	Yellow	Negative
2.	II	Meatball A	Yellow flame	Negative	Yellow	Negative
		Meatball B	Yellow flame	Negative	Yellow	Negative
		Meatball C	Yellow flame	Negative	Yellow	Negative
		Lontong A	Yellow flame	Negative	Yellow	Negative
		Lontong B	Yellow flame	Negative	Yellow	Negative

3.	III	Lontong C	Yellow flame	Negative	Yellow	Negative
		Meatball A	Yellow flame	Negative	Yellow	Negative
		Meatball B	Yellow flame	Negative	Yellow	Negative
		Meatball C	Yellow flame	Negative	Yellow	Negative
		Lontong A	Yellow flame	Negative	Yellow	Negative
		Lontong B	Yellow flame	Negative	Yellow	Negative
		Lontong C	Yellow flame	Negative	Yellow	Negative

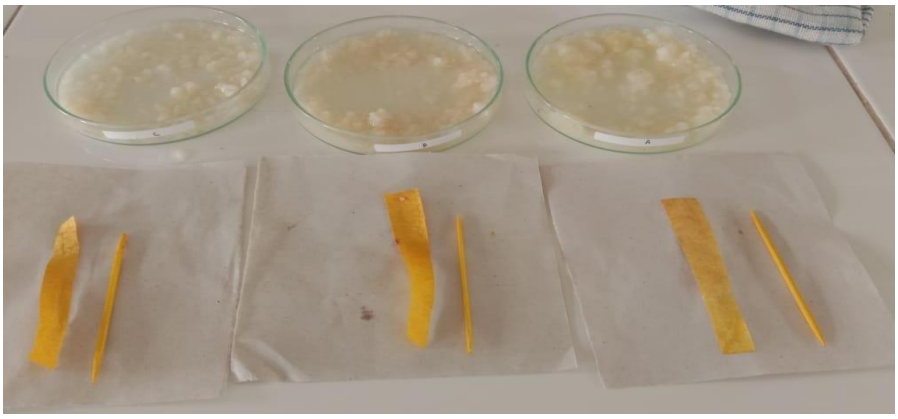

Figure 1. The results of taking rice cake samples using the simple method

Figure 2. The results of taking lontong samples using the scientific method

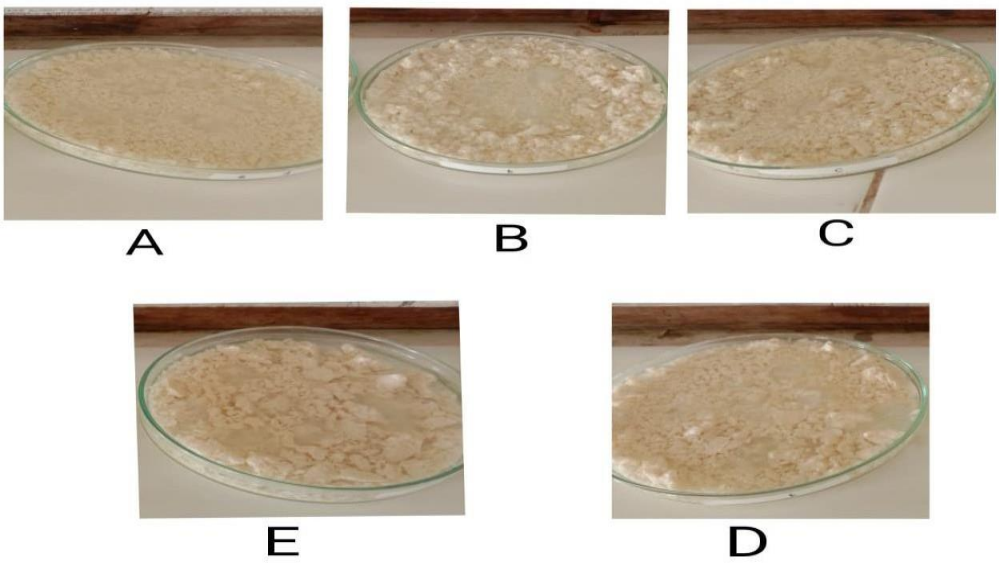

Figure 3. Results of the formalin test on tofu using the simple method

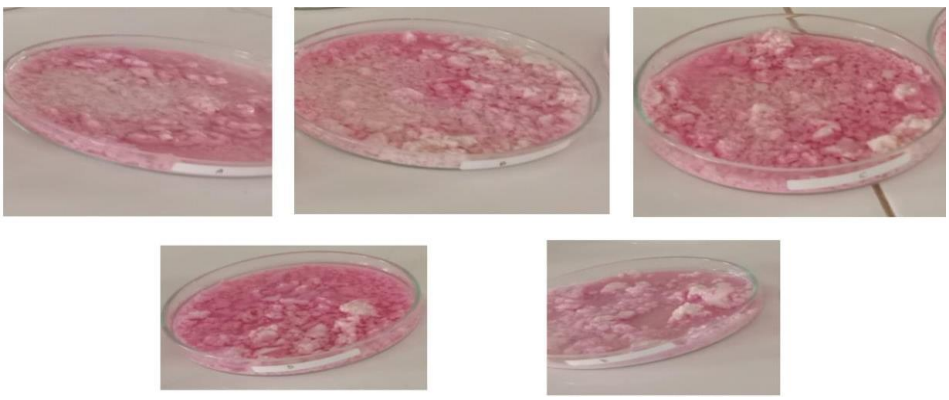

Figure 4. Results of formalin testing on tofu scientific method

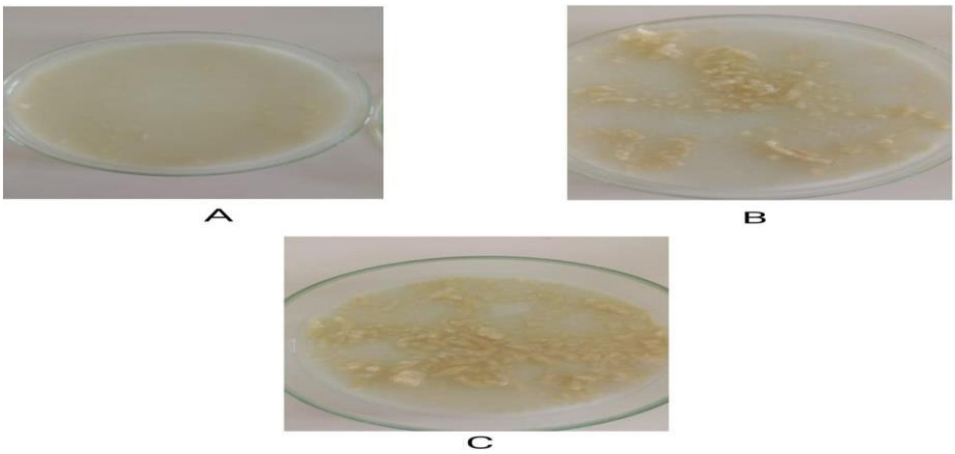

Figure 5. Results of the formalin test on wet noodles using the simple method

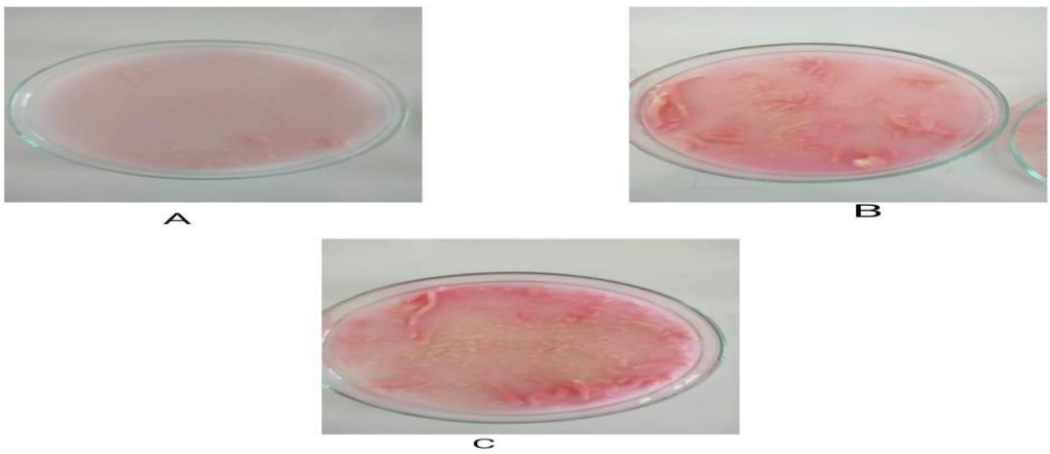

Figure 6. Results of formalin testing on wet noodles scientific method

Table 3 Results of identification of formalin content in the samples

No	Sampling	Sample Name	Testing			
			Scientific Method (Flame reaction)	Result	Simple method (curcumin paper)	Result
1.	I	Tofu A	Purplish pink	Positive	Clot	Positive
		Tofu B	Purplish pink	Positive	Clot	Positive
		Tofu C	Purplish pink	Positive	Clot	Positive
		Tofu D	Purplish pink	Positive	Clot	Positive
		Tofu E	Purplish pink	Positive	Clot	Positive
		Wet noodle A	Purplish pink	Positive	Clot	Positive
		Wet noodle B	Purplish pink	Positive	Clot	Positive
		Wet noodle C	Purplish pink	Positive	Clot	Positive
2.	II	Tofu A	Purplish pink	Positive	A little clot	Positive
		Tofu B	Purplish pink	Positive	A little clot	Positive
		Tofu C	Purplish pink	Positive	A little clot	Positive
		Tofu D	Purplish pink	Positive	A little clot	Positive
		Tofu E	Purplish pink	Positive	A little clot	Positive
		Wet noodle A	Purplish pink	Positive	Clot	Positive
		Wet noodle B	Purplish pink	Positive	Clot	Positive
		Wet noodle C	Purplish pink	Positive	Clot	Positive

3.	III	Tofu A	Purplish pink	Positive	A little clot	Positive
		Tofu B	Purplish pink	Positive	A little clot	Positive
		Tofu C	Purplish pink	Positive	A little clot	Positive
		Tofu D	Purplish pink	Positive	A little clot	Positive
		Tofu E	Purplish pink	Positive	A little clot	Positive
		Wet noodle A	Purplish pink	Positive	Clot	Positive
		Wet noodle B	Purplish pink	Positive	Clot	Positive
		Wet noodle C	Purplish pink	Positive	Clot	Positive

Discussion

Based on table 2 above, it can be seen that none of the 6 samples contained borax. In the meatball and rice cake samples using the curcumin paper method (simple method) there was no brick-red color change (the paper remained yellow). In the flame method (scientific method) there is no color change (no green flame) due to the absence of borax in the meatballs and lontong.

At the time of adding H2SO4 and methanol to this sample it did not produce a green flame but there was a reddish yellow flame indicating that it did not contain borax, because the chemical compound that was heated did not decompose to produce constituent elements in gas or steam, then the atoms of the metal elements unable to absorb a number of the highest energy (excited state) in the highest energy state, the metal atom is unstable while the results in the sample which is deliberately added borax flames are florescent green (Svehla, 2012). Curcumin paper can be used as a borax detector because curcumin paper is made by soaking turmeric extract, the turmeric extract contains curcumin compounds. Curcumin can detect the presence of borax in food because curcumin is able to break down borax bonds into boric acid and bind it into a color complex (brownish red).

Based on table 4.3 above, it can be seen that the 8 samples all contained formaldehyde. In the samples of tofu and wet noodles using the scientific method (test kit), the samples contained formalin which was indicated by a pink-purplish color change in the liquid sample after being dropped by reagent A and reagent B. In the simple method (papaya sap), clumping occurred in the liquid sample due to formaldehyde content in tofu and wet noodles. The identification results of formalin in wet tofu and noodles sold at the Laguboti Market were positive. The formalin test kit is used to bind the aldehyde groups present in the sample as well as the Schiff reagent is used to bind the formalin to be released from the sample so that the formalin reacts with the Schiff reagent to produce a purplish red solution (Manoppo et al., 2014). According to the Regulation of the Minister of Health of the Republic of Indonesia No. 033 of 2012 concerning food additives, that food products may not contain formalin and borax because they can harm the human body if consumed continuously.

CONCLUSION

Based on research that has been done on 3 samples of meatballs, 3 samples of rice cake, 3 samples of wet noodles and 5 samples of tofu. which were sold at the Laguboti Market which were examined at the Arjuna Laguboti STIKes chemical laboratory, it can be concluded that the meatball and rice cake samples using the curcumin paper method (simple method) did not change the color to brick red (the paper remained yellow). In the flame method (scientific method) there was no change

in color (no green flame) due to the absence of borax in the meatballs and rice cakes, whereas in the samples of tofu and wet noodles using the scientific method (test kit) the samples were detected to contain formalin marked with there was a pink-purple color change in the liquid sample after dropping reagent A and reagent B. In the simple method (papaya sap) clumping occurred in the liquid sample due to the presence of formalin in tofu and wet noodles. The identification results of formalin in wet tofu and noodles sold at the Laguboti Market were positive.

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