

EXAMINATION OF HAZARDOUS FOOD ADDITIVES (BORAX) IN MEATBALLS IN THE CITY OF GORONTALO

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ABSTRACT

Currently, the use of borax in food or food ingredients is very often carried out by several food manufacturers, such as meatballs, noodles, crackers and dried fish. The actual function of borax is that it is used by the non-food industry as a cleaning agent, wood preservative, soldering agent, antiseptic and cockroach control. This study aims to identify the borax content in the meatballs sold in Gorontalo City and to find a relationship between the knowledge and attitudes of traders towards the existence of the borax content in the meatballs they sell.

The method in this study uses a qualitative approach with a descriptive research type. The type of data used is primary data in the form of obtained by conducting initial observations and interviews , laboratory tests accompanied by documentation, as well as secondary data in the form of literature data and government policies regarding food additives. The number of samples is 10 samples, taken from 10 Meatball seller in Gorontalo City .

The results of the study were that eight samples of meatballs were negative or did not contain borax and there were two samples of meatballs that were positive or contained borax. This was indicated by the color change on the curcumin paper turning brown if the result was positive and if the result was negative, the curcumin paper did not change color .

Keywords: Borax , Meatballs , BTP

INTRODUCTION

In everyday life, humans cannot be separated from food or food, where food or food is already a primary need for humans [13]. Food safety, quality and nutrition, food or food is everything that comes from biological sources and water, whether processed or not processed, which is intended as food or drink for human consumption, including food additives, food raw materials, and food ingredients. others used in the process of preparing, processing, and or making food or drinks.

In general, the use of food additives is often used with the aim of protecting

products from microbiological damage. However, it turns out that there are also many who deliberately use food additives (BTP) for certain purposes with ingredients that are not permitted or prohibited. This will have an impact on consumer health. There are several purposes for adding borax to meatballs, including: giving a dense texture, crispness, increasing elasticity and providing a savory and long-lasting taste [13]. Even though the actual function of borax is used in the non-food industry as a cleaning agent, wood preservative, soldering agent, *antiseptic*, and cockroach control [14].

Meatballs may not contain borax because meatballs containing borax can cause health problems such as poisoning, with symptoms of skin irritation, respiratory tract and digestive disorders such as nausea, persistent vomiting, abdominal pain and diarrhea. [6]. And symptoms of severe poisoning can cause skin rashes, decreased consciousness, respiratory depression and even kidney failure. Consuming meatballs containing borax in the long term can cause circulatory depression, tachycardia, cyanosis, seizures to coma. In addition, central nervous disorders, cutaneous abnormalities and growth retardation and toxicity to the embryo or fetus can also occur [11].

In Gorontalo Province, the presence of borax is often found in food. Research conducted by the Food and Drug Monitoring Agency (BPOM) in Gorontalo in 2015 showed that 15% of positive food products contained harmful BTP such as borax, formalin, rhodamin B and *methanyl yellow*. Then in 2017, through the mobile car program (mobling), BPOM Gorontalo found four samples that did not meet the consumption requirements of the 412 samples examined. BPOM again conducted borax and formalin tests on wet noodle products and obtained the results of the examination, namely that there were three wet noodles containing borax and 14 wet noodles containing formalin.

Based on the results of preliminary observations conducted by researchers, in the city of Gorontalo there are many meatball sellers who sell meatballs both on the roadside, near campuses and offices and other public places. The people of Gorontalo City like meatballs a lot and sometimes make meatballs their main food or snack food when office/campus breaks come, so it is necessary to detect borax in meatballs, because there is a lot of public interest in meatballs being sold, so that the meatballs

consumed by the public are safe from food additives such as borax.

Based on the background above, the researcher is interested in conducting research on examining dangerous food additives (borax) in meatballs in the City of Gorontalo.

Food Additives (BTP) are ingredients or mixtures of ingredients which naturally are not part of the food raw materials, but are added to food to affect the nature or form of the food, including coloring agents, preservatives, flavourings, anti-clots, bleaching and thickeners. Food can be divided into three types, namely: fresh food, processed food and certain processed food. Fresh food is food that has not undergone processing. Processed food is food that is processed in a certain way or method, with or without food ingredients. Meanwhile, certain processed foods are processed foods intended for certain groups in an effort to maintain or improve the quality of health [19].

BTP or food additive (*food additive*) can also be interpreted as an ingredient added and mixed during food processing to improve quality. In general, food additives can be divided into two major categories, namely intentional additives and accidental additives. Intentional additives are additives that are given intentionally with a specific purpose, for example to improve consistency, nutritional value, taste, control acidity or alkalinity, stabilize shape and appearance, and others. Meanwhile, accidental additives are additives that are found in food in very small quantities as a result of processing [24].

When viewed from its origin, additives can come from natural sources (eg lecithin) and can also be synthesized from chemicals that have very similar properties to similar natural substances, both in chemical composition and metabolic properties (eg ascorbic acid). which are not normally used as food and

which are not normally food-specific ingredients, having or not having nutritional value, which are intentionally added to food for technological purposes in the manufacture, processing, packaging, storage or transportation of food to produce a component or to affect the properties typical of this food.

[24]

Borax is a white crystalline compound, no Odorless and stable at room temperature. Borax is a chemical compound under the name of sodium tetraborate with the chemical formula: $\text{NaB}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$. When dissolved in water, borax will form hydroxide and boric acid (H_3BO_3) [20].

In everyday life, borax is used as a cleaner, fungicide, herbicide and insecticide which is toxic or toxic to humans. In chronic toxic (due to experiencing small amounts over a long period of time) will cause red rashes on the skin, seizures, and kidney failure. Borax can also cause irritation to the skin, eyes or respiratory tract [20].

Although not a food preservative, borax is often used as a food preservative. Boric acid or borax has long been used as an additive in various foods. Since boric acid or borax is effective against yeasts, molds and bacteria, it has since started to be used to preserve food products. This substance is also used to increase the elasticity and crispness of food and prevent fresh shrimp from turning black. In addition, borax is used in food and food ingredients as a thickener or preservative, this is caused by borax improve food structure and texture [22].

In Indonesia, the addition of borax to food has been banned. Even so, you can still find foods containing borax on the market, such as meatballs, noodles, crackers, and several types of market snacks. The harmful effects that can occur when consuming foods containing borax

are: fever, vomiting, nausea, red eyes, coughing, sore throat, headache, diarrhea, shortness of breath and bleeding from the nose [2].

Meatballs are processed meat products made from livestock meat mixed with starch and spices, with or without the addition of other food ingredients and/or permitted food additives, which are round in shape or other shapes and cooked [6]. In Indonesia, meatballs are a very popular processed food. Almost everyone likes meatballs and meatball snacks are available in many places, from large restaurants to mobile vendors, where the most meatballs are sold by mobile vendors [3].

Bakso or baso is a type of meat ball that is commonly found in Indonesian cuisine. Meatballs are generally made from a mixture of ground beef and tapioca flour, but there are also meatballs made from chicken, fish, or shrimp and even buffalo meat. In this presentation, the meatballs are generally served hot with a clear beef broth, mixed with noodles, rice noodles, bean sprouts, tofu, sometimes eggs, sprinkled with fried onions and celery. The meatballs are very popular and can be found throughout Indonesia, from street vendor carts to restaurants. Different types of meatballs are now being offered in the form of frozen foods sold in supermarkets or shopping malls. Sliced meatballs can also be used as a complement to other foods such as fried noodles, fried rice, chop suey or



Figure 3. Meatball.
(Source: Center for Animal Husbandry Training/BBPP Kupang, 2018).

Meatballs have roots in Chinese-Indonesian culinary arts. This is shown from the term "meatballs" derived from the word *Bak- So*, in *Hokkien language* which literally means 'ground meat'. Because most Indonesians are Muslim, meatballs are more commonly made from halal meat such as beef, fish or chicken. Now, most meatball sellers are Javanese from Wonogiri and Malang. Places that are famous as meatball centers are Solo and Malang which are called Malang meatballs. Malang meatballs and Solo meatballs are meatball dishes and are served with Javanese specialties. Meatballs come from China but are different from Malang and Solo meatballs. Chinese meatballs are usually made from pork or seafood and are slightly brown in color and not very round in shape. While Malang and Solo meatballs are made of beef, gray in color and very round in shape. Chinese meatballs are usually not served with abundant gravy, in contrast to Malang and Solo meatballs which are served with abundant gravy [7].

Meatballs are a food made of meat. Most of the meatballs are made from beef which is ground first and molded into meat balls. Meat contains a variety of important nutrients that function as body and brain growth. Some doctors also recommend consuming meat three to four times a week. Because meat contains lots of nutrients, protein, vitamins and iron. For this reason, a substitute for meat that is suitable for daily needs is to eat meatballs. An instant solution in consuming meat everyday. Meatballs that are processed properly with a meatball making machine will also produce quality meat [7].

Bakso Solo is a hereditary business from Bakso Wonogiri, because many of our children and grandchildren have settled and opened meatball businesses in the city of Solo and its surroundings,

especially in urban areas which are strategically located on the side of the road. This food is no stranger to culinary delights in Indonesia. Without seeing the health benefits of this food, there are many consumers. Because it tastes delicious. These meatballs are very popular among the people. The prospect of this culinary business is also very profitable. Because from a consumer standpoint, everyone likes it, so this business will never stop and there will always be demand for it. In the current processing process, various entrepreneurs have used meatball printing machines. The meatball machine is very efficient in printing large meatballs. So that business actors don't have to bother printing meatball dough manually anymore. In the process of making meatballs, BTP is often added, which is often called an active chemical substance (food additive), one of which is the provision of preservatives that can prevent or inhibit fermentation, acidification or other decomposition of food caused by microbial growth. The purpose of adding borax to meatballs is to provide a dense, crunchy texture, increase elasticity and provide a savory and long-lasting taste [7].

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meat which has a high protein content which includes the milling process, mixing spices, forming meatball balls and boiling meatball balls [7].

The easy circulation of borax on the market also makes it easier for traders such as meatball traders to get it, so that researchers have done several ways to detect the presence of borax in meatballs. There are several ways to identify the presence of borax in foodstuffs, namely:

1. Testing borax with concentrated H_2SO_4 and methanol (flame test)

This test involves the element or compound in a hot, colorless flame and observes the color of the resulting flame. This test is that the atoms of the sample evaporate when they are hot, these atoms emit light when they are in a flame. Therefore, the flame occurs because of the nature of the chemical elements that are put into the flame [21].

2. Testing borax with curcumin paper (Turmeric)

Curcumin is a yellow-orange natural coloring compound found in the turmeric plant (*Curcuma domestica* valet). Curcumin can function as an indicator due to the color change from yellow to brown at a pH of around 4.5-9.9 and is able to decompose borax bonds into boric acid and bind it into a rosa color complex or called rosassianin chelate or Boron Cyano curcumin complex, namely a red substance [18].

3. Testing borax using $AgNO_3$ solution

Samples containing borax after being tested for color with $AgNO_3$ will produce a white precipitate of silver metaborate, $AgBO_2$ from a fairly concentrated solution of borax, which dissolves both in dilute ammonia solution and in acetic acid. By boiling the precipitate with water, it is completely hydrolyzed, and a brown silver oxide precipitate is obtained. Silver oxide brown precipitates are

produced directly in very dilute solutions [10].

RESEARCH METHODS

This research is included in the type of descriptive research with a qualitative approach, which is a research conducted with the aim of describing or describing an object condition objectively and then describing it. This research is to describe the results of the identification of borax in meatballs sold at several meatball sellers in Gorontalo City.

The types of data used in this study were primary data and secondary data. Primary data in this study were the results of borax identification laboratory tests along with documentation taken directly at the sampling site and sample inspection site. While the secondary data in this study are the results of data tracking and various literature and government policies regarding food additives (BTP).

The adequacy of references in this study the authors did by collecting as many data sources as possible through the results of initial observations, interviews, and documentation

To check the validity of the data in this study, researchers used the Credibility Test, the application of this method can be achieved by comparing the data from initial observations with the results of interviews and documentation. The intention is to compare what (respondents) did, in this case the meatball seller in Gorontalo City, with the interview information he gave in the interview, which remained consistent and supported by documentation in the form of photos and other data such as previous research and theories relevant to the purpose of this study.

Through this technique, researchers report the results of their research in detail, carefully so that they are able to describe properly and correctly the context of the research being carried out

RESEARCH RESULT

Table 1 Organoleptic Test Results

No	Sample Code	Color	Smell	Texture
1.	SA	Gray	Meat Special	Springy
2.	SB	Gray	Meat Special	Springy
3.	SC	Gray	Typical Meat	Springy
4.	SD	Gray	Meat Special	Springy
5.	SE	Gray	Meat Special	Springy
6.	SF	Gray	Meat Special	Springy
7.	SG	White, Greyish	Meat Special	Springy
8.	SH	White, Greyish	Meat Special	Springy
9.	SI	Gray	Meat Special	Springy
10.	SJ	Gray	Meat Special	Springy

Source: Primary Data, 2022

Based on the results of the Organoleptic Test in table 1 above, it was found that out of 10 samples there were eight samples that had normal color, smell, elasticity while there were two samples that had abnormal color, smell, elasticity

Table 2. Results of Borax Examination on Meatballs in Gorontalo City

No.	Sample Code	Origin Sample	Borax Test Results
1.	SA	Kota barat	Negative
2.	SB	Kota Barat	Negative
3.	SC	Kota Barat	Negative
4.	SD	Kota Barat	Negative
5.	SE	Kota Barat	Negative
6.	SF	Kota Barat	Negative
7.	SG	KotaTengah	Positive
8.	SH	Kota Utara	Positive
9.	SJ	Kota Utara	Negative
10.	SK	KotaTengah	Negative

Source: Primary Data, 2022

on the table 2 This shows that, out of 10 meatball samples, two meatball samples were positive and eight meatball samples were negative. This is indicated by the occurrence of a color change on the curcumin paper which changes to brownish red if the result is positive and if the result is negative then the curcumin paper does not change. color a

DISCUSSION

Several food stalls in the city of Gorontalo sell food in the form of meatballs with various flavors and a distinctive meat taste that can whet the appetite, especially for people who really like this food. In this study, the researcher started the research process by first visiting several places selling meatballs in Gorontalo City which would be used as sampling locations. After taking the sample, the researcher conducted an organoleptic test and examined the borax qualitatively at 10 meatball sample . The research results obtained were that of 10 samples , the organoleptic test results on meatballs in Gorontalo City , namely there are two samples whose meatball quality requirements are not appropriate. Meanwhile, there were eight samples whose meatball quality requirements were appropriate. After that, a borax examination was carried out on the meatballs, the result was that eight samples of meatballs were negative or did not contain borax and there were two samples. the meatball sample tested positive or contained borax.

The results of this study are in line with previous research which examined the presence of fish meatballs with the result that there were three samples (30%) of fish meatballs that positively contained borax. Another study that is in line with the results of this study was conducted by [26]. that of 12 samples there were nine positive meatballs containing borax with

the largest concentration in sample B1 of 2414.375 $\mu\text{g}/\text{mL}$.

The results of this study indicate that some meatball traders in Gorontalo City still use borax as a preservative in the meatball products they sell. This indicates that there are still traders who do not understand enough or deliberately violate the government's appeal no. 86 of 2019 so as not to add preservatives that are not intended for food such as borax. In accordance with the results of interviews with researchers and meatball sellers, there are still a number of meatball sellers who do not understand the impact of using borax. But most meatball sellers know the impact of using borax. The researcher's assumption is that this is also caused by economic and practical factors, where the price of borax is relatively cheaper compared to other preservatives, so meatball producers are desperate to add borax to their meatballs. This is in accordance with the theory previously stated that there are times when just to get a lot of profit or the food sold does not spoil quickly, the producers add harmful chemicals to the food. Even though these chemicals if added will endanger the health of consumers who consume them [26].

Although in this study it was found that there were samples of meatballs containing borax, if calculated from all samples, there were still more meatballs that did not contain borax. It was concluded that some traders already had sufficient understanding and knowledge of the dangers of adding preservatives. the borax

CONCLUSION

Based on the results of this study it can be concluded that the results of the organoleptic test on the meatballs were two samples whose meatball quality requirements were appropriate and there were eight samples whose meatball

quality requirements were not appropriate. In the borax examination, there were two samples of meatballs that were positive for containing borax and there were eight samples of meatballs that were negative for not containing borax.

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