

Detecting Sodium Borax in Meat Processed Food Using Turmeric

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ARTICLEINFO	A B S T R A C T
Article history: Received: 12/07/2020 Revised: 22/08/2020 Accepted: 01/11/2020	Borax as a dangerous preservative has been informed by the government by prohibiting the use of borax to preserve food. The use of borax is specifically regulated and limited by national health and safety laws. In simple terms, borax can be recognized by its presence in food by using a toothpick covered with turmeric. Toothpicks that have been smeared with turmeric will turn yellow according to the color of the turmeric but will turn orange when they are pricked into processed meat foods such as meatballs, sausages, and nuggets that contain
Keywords: Sodium Borax, Meat, Turmeric	of borax. This is because turmeric contains curcumin which can detect the presence of borax in food. After all, curcumin can break down the borax bonds into boric acid and bind it to a complex rosin compound or commonly known as a boron cyano curcumin complex. The results of testing samples taken from two supermarkets and three traditional markets using turmeric as a reagent and the medium were toothpicks showed that 74% of processed food, including meatballs, nuggets, and sausages, contained borax and 26% did not contain borax Copyright © 2020 Jurnal Mantik. All rights reserved.

1. Introduction

Various foods that are sold today are not free from preservatives both chemically and physically, aiming to be able to maintain the food ingredients themselves so they are not easily damaged and last a long time so that consumers can still consume them. The definition of the preservative itself according to Safnowandi (2012) is a method used to make food have a long shelf life and maintain the physical and chemical properties of food.

The purpose of food preservation is made so that the food can last a long time, of course, it requires various preservatives according to the structure of the food. Fruits can be preserved with salt and sugar such as pickled fruit as well as vegetables. Fish can also be preserved with salt like salted fish. Salt is a harmless natural preservative. How about processed foods such as meatballs, sausages, and nuggets so that they last a long time, the answer is to stick with preservatives. Based on information from cattle practitioners November 11, 2016 (edy@sapibagus.com) stated; There are some traders who in the manufacturing process use borax to make the flour chewier like meat, this makes meatball processed food considered less safe food by BPOM. Several types of processed meat products such as sausages contain high levels of fat and cholesterol and sodium which can potentially cause heart disease, stroke, and hypertension if consumed in excess (Erna Dwi Astuti dan Widagdo Sri Nugroho, 2017).

Chicken nuggets are one of the foods produced by chicken meat that has a certain taste, usually golden yellow. Currently, chicken nuggets are one of the fastest-growing processed chicken meat products. Chicken nuggets are a chicken product formed from minced meat that relieves breadcrumbs and eggs and is then fried or grilled. This restaurant's ready-to-eat food will usually be fried in vegetable oil or coconut oil. Chicken nuggets were invented in 1950 by Robert C. Baker, a professor of food science at Cornell University, and published as an unauthorized academic work. Innovation from Dr. This baker makes it possible to form chicken nuggets in any condition. And the McDonald's recipe for Chicken Mcnuggets was first created on commission from McDonald's with Tyson foods in 1979 and the product went on sale in 1980 (Sukowati, 2014).

Nugget companies generally use TBHQ (Tertiary Butyl Hydroxy Quinoli), MSG (Mono Sodium Glutamate), dimethylpolysiloxane anti-foaming agent, sodium, and hydrogenated soybean oil. The manufacturing process of course uses ingredients that remove the protein (Dewi Kania, 2018). There are so many types of food preservatives, from those that are natural, namely by using salt and sugar to using chemicals. Not all chemicals are declared safe to use to preserve food, one of which is borax with the

chemical name Sodium Tetraborate Decahydrate or Sodium Borate (Sodium Borate). Unfortunately, the type of sodium used by food companies does not clearly state the type of preservative that is used, it only says "sodium" while the types of sodium vary including sodium benzoate, sodium hydroxide, sodium nitrate, and so on. This must be addressed so that food can be preserved with preservatives that are not dangerous. The government has informed the government that sodium borax as a dangerous preservative is to prohibit the use of borax to preserve food. The use of borax is specifically regulated and limited by national health and safety laws. Borax is not safe for consumption as food in excessive doses, but ironically excessive use of borax as a component in food has spread throughout the world (Dewi Kania, 2018).

Regulation of the Minister of Health Number: 472 / Menkes / Per / V / 1996 concerning Safeguarding of Hazardous Materials for Health states that chemicals are essential in improving human welfare, and their use is so wide in various sectors, including industry, agriculture, mining and so on. In short, chemicals with various products derived from them have become an inseparable part of everyday life. However, the thing to be aware of is the tendency to misuse several hazardous chemicals in food. Hazardous chemicals that are often misused in food include borax, formalin, rhodamine B, and methyl yellow. The four chemicals are prohibited from being used for food, by the applicable laws, and regulations (Arifin, M. 2012). In simple terms, Borax can be recognized by its presence in food by using a toothpick covered with turmeric. Toothpicks that have been smeared with turmeric will have a yellow color according to the color of the turmeric but will be dark brown to orange when they are pricked into meatballs, sausages, or chicken nuggets containing borax. This is because turmeric contains curcumin which can detect the presence of borax in food. After all, curcumin can break down the borax bonds into boric acid and bind it to a complex rosin compound or commonly called a boron cyano curcumin complex. So, when food containing borax is pricked using a toothpick that has been covered with turmeric, it will change color to brownish-red or orange. So that in this practical way, simple borax identification can be confirmed wherever we look at preserved processed meat foods.

2. Methods

2.1 Type of Research

The type of research used in this research is experimental, to be precise, Pre-Experimental Design. This design is useful for obtaining initial information on the questions in the study. This form of Pre-Experimental Design focuses on one group pretest and posttest (One-Group Pretest-Posttest Design) by reviewing how before the experimental treatment (Pretest) is then compared with after the experiment (Posttest) so that the treatment results can be known more accurately.



Fig 1. Pretest and Posttest Design

2.2. Location and time of Research

The research was carried out in Medan Marelan Subdistrict with the research time starting in May 2020. **2.3. Sample**

The research sample by taking data from 2 (two) supermarkets and 3 (three) traditional markets that sell processed meat ingredients in Medan City, Medan Marelan District.

2.4. Data Collection

Data collection in this study was carried out in two ways of measurement consisting of:

a) Interview

The first measure is qualitative by interviewing traders or sellers of meatballs, sausages, and chicken nuggets in supermarkets and traditional markets to get the information needed as well as buy meatballs, sausages and chicken nuggets with different labels (brands). According to Bogdan and Taylor (in Saryono, 2010), qualitative methodology is a research procedure that produces descriptive data in the form of written and spoken words from people and observed behavior or called interviews.

b) Laboratory Observation

Make in-depth observations then record the changes made in the laboratory to get maximum results.

2.5. Methods of Analysis

The data analysis in this study used a paired sample T-test which serves to see the measurements before and after the experiment was carried out. A paired sample t-test is often referred to as a paired-sample t-test. The t-test for paired sample data functions to compare the means of two variables for a single sample group. This test calculates the difference between the values of two variables for each case and tests whether the difference is the mean is zero (Sari Wahyuni Arlinda & Chairul Azhar (2011).

3. Result and Discussion

3.1 Pretest

There are two supermarkets and three traditional markets that sell processed meat foods with various brands from different producers which were used as research samples, namely Supermarket A, PD Supermarkets for their traditional markets namely Tr Market, L Market, and BD Market.

Table 1 Before Doing the Borax Test with Turmeric (Pretest)							
Supermarket (SM)	Traditional Market	Types	of processe	Borax content			
	(PT)	Meatball	Nuggets	Sausage			
SM-A		-	-	-	Negative		
SM- PD		-	-	-	Negative		
	PT- Tr	-	-	-	Negative		
	PT-M	-	-	-	Negative		
	PT- BD	-	-	-	Negative		

3.2 Posttest

After taking the sample, a borax test was conducted with turmeric as a reagent and the mediator was a wooden toothpick. Soak toothpicks for 30 minutes to get maximum results, namely the characteristic yellow turmeric which is then dried using a dryer then it can be used as a mediator to detect borax content. Observation of test results using the sense of sight or megascopic showed that meatballs, nuggets, and sausages containing borax were marked by a change in color on the toothpicks from yellow to orange, while toothpicks that did not contain borax remained yellow, the results can be seen in table 2 and figure 1 to 6. **Table 2**

After Doing Borax Testing with Turmeric						
Supermarket	Traditional Market	Types of processed meat			Borax content	
(SM)	(PT)	Meatball	Nuggets	Sausage		
SM-A		+	-	+	Two were positive for borax	
SM- PD		-	+	+	Two were positive for borax	
	PT- Tr	+	-	+	Two were positive for borax	
	PT-M	+	+	+	All positive for borax	
	PT- BD	+	-	+	Two were positive for borax	



Fig 1. Nuggets and Sausage in Supermarkets "PD"



Fig 2. Nuggets, Sausage and Meatball in Supermarkets "A"



Fig 3. Traditional Market "Tr" that Sells Meatballs, Sausage dan Nuggets



Fig 4. Supermarkets 'A"



Fig 5. "M" Markets Starts to Open from 5 am to 1 pm.



Fig 6. BD Market Opens from 3 pm to 7 pm





Fig 12. Total Percent of Borax from Two Supermarkets and Three Supermarkets

4. Conclusion

Based on the results of the posttest and pretest carried out, the conclusions that can be drawn are as follows:

- a) Before the borax test was carried out on processed foods from samples, namely meatballs, nuggets, and sausages from two supermarkets and three traditional markets, the presence of borax had not been found.
- b) After testing for borax with a toothpick mediator covered with turmeric, 74% of processed food, including meatballs, nuggets, and sausages, contain borax and 26% do not contain borax.

5. References

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