

Determinantion of Formaldehyde in Tofu from Betung Banyuasin Market, South Sumatra

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ARTICLE INFO

Keywords:
Formaldehyde,
Tofu,
Tumeric.

ABSTRACT

Formalin is a hazardous chemical substance to public health which is often used in tofu products. Tofu is a vegetable product usage as a source of protein derived from soybeans, a protein that is needed by humans growth. This study aims to test the presence or absence of formalin content in tofu sold in the Betung Banyuasin market, South Sumatra. A qualitative method is used in the form of a color test by adding turmeric solution. The results of the qualitative test showed that the tofu contained negative formalin. The color test was carried out using a turmeric solution. In conclude, of the color test showed that 6 negative samples contained formalin, indicated by the solution not changing, namely the orange color of the natural color of turmeric did not change

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1. Introduction

Food is one of the most essential needs for humans life. By the increasing of population, the demand for food will increase. Thus, a healthy food and free from Food Added Materials (BTP) which is toxic to the body must be avoided, on the other hand consumed food a free toxicity material is a mandatory [1]. Good and safe food product has high nutritional and protein content, and is free from food additives (BTP) as well as chemical compounds that can interfere with digestion system. substances that are harmful to the human body such as formalin, borax, insecticides and other food additives[2].

Based on the Regulation of the Minister of Health of the Republic of Indonesia Number. 722/MenKes/Per/IX/88, Formalin is prohibited from being used as a food additive [3] One of the Food Additives (BTP) is Formalin. Formalin is an active compound that can bind to food ingredients such as protein, fat and carbohydrates [4]. Formalin is a solution of formaldehyde [5] Ikatan antara formaldehid dan protein, diantaranya membentuk ikatan silang yang sulit dipecah . Formalin juga merupakan suatu zat yang bersifat toksik apabila terkonsumsi dengan kadar di atas batas yang diperbolehkan maka akan merusak organ dalam tubuh, namun jika zat tersebut dikonsumsi dalam kadar yang relatif kecil secara terus menerus akan terakumulasi

The bonds between formaldehyde and proteins, among others, form cross-links that are difficult to break. Formalin is also a substance that is toxic and hazardous if consumed at levels above the permissible limit, but if the substance is consumed in relatively small levels it will continuously accumulate [6]. The impact of formalin can cause headaches, chronic nasal inflammation (rhinitis), nausea, damage to body organs such as the liver and kidneys [7] Tofu food product is often added formalin. That is prone to damage, so it is not uncommon for tofu products to be added with preservatives such as formalin to make it longer storage time[8]. Betung Banyuasin market, in Banyuasin Region South Sumatra is traditional market that is crowded with visitors to fulfill their daily consumes.

Based upon those regulation, researcher conducted research about the determination formaldehyde content in Tofu that curculated in Betung Banyuasin Mareket. That Tofu are suspected contain formalhyde as preservative. Determination of formalhyde contain in sample is conducted by adding Tumeric solution which is affordable natural igredients that ever people can find it easily.

2. Methodogy

The method used in this research is Experiment, which is an experimental activity that aims to determine the effects that arise, as a result of certain treatments. In this study, researchers examined the formalin content in tofu using a colouring method by adding turmeric solution [9] which is based on a change in color so that it can be observed. The sample declared positive if the orange turmeric solution then changes color to brick red in the analyzed tofu, each tofu sample was tested 3 times [10].

2.1 Instrument

Tools and materials in this study were tofu samples obtained from the Betung Banyuasin market, south Sumatra, H₂O, Turmeric, Beaker glass, stopwatch, mortar, and knife.

2.2 Tecnique Sampling

The sampling technique in this study used purposive sampling. Purposive sampling is a sampling method intentionally based on research considerations only. Samples were white Tofu taken at six seller in Betung Banyuasin Market, South Sumatra Province. Furthermore, the sample will be analyzed at the Health Laboratory, Faculty of Health, Universitas Kader Bangsa Palembang. The analyzed tofu samples were ground with a mortar and pestle. While the manufacture of a turmeric solution is by blending 500 grams of turmeric then squeezed and the solution is transferred to a beaker.

2.3 Preparation for Tofu Simulation

Tofu samples taken as much as 10 grams were mashed by cutting into small pieces and then pounded until smooth. Then the turmeric solution is dripped on the tofu sample then let stand and observed for 30-40 minutes. The presence of formalin is indicated by a turmeric solution which turns orange to brick red on the ground [11]

2.4 Measurement

The observed variable was the color change that occurred in the orange turmeric solution to brick red when the sample was dripped.

2.5 Data Analysis

Analysis of the data obtained from this study is presented descriptively in the form of pictures and tables which are described in a narrative manner, namely describing and explaining the results of the observation process carried out qualitatively.

3. Result and Discussion

The results of the identification of the formalin content in 6 samples of white tofu (Figure 1) were carried out by a qualitative test using a turmeric solution. Each tofu sample was tested for 3 repetitions.



Figure 1. Sampel Tofu Sample

The sample was added to the turmeric solution above the sample, allowed to stand for 60 minutes, then the turmeric sample solution was taken using a dropper.



Figure 2. Tofu sample that has been dripped with turmeric solution

The results of observations on 6 samples of white tofu with turmeric solution showed that all samples were negative or did not contain formalin (Figure 2). Tofu samples that did not show a change in the orange color of the turmeric solution did not turn brick red (Table 1)[12]. Tofu samples that are positive for formalin will show a red color change. The duration of the color change in the sample can vary, this is contained in the level of formalin in the food sample [13].

TABLE 1.
RESULTS OF FORMALIN ANALYSIS IN TOFU SAMPLES SOLD IN BETUNG BANYUASIN,
SOUTH SUMATRA PROVINCE IN 2021

Sample Code	Characteristic	Observation	Result
A	White, Smooth Texture	Orange Colour	Negative
B	White, Sligly rough texture	Orange Colour	Negative
C	White, Smooth Texture	Orange Colour	Negative
D	White, Smooth Texture	Orange Colour	Negative
E	White, Smooth Texture	Orange Colour	Negative
F	White, Sligly rough texture	Orange Colour	Negative

Some white tofu containing formalin has characteristics that can be distinguished from tofu that does not contain formalin. Tofu containing formalin has characteristics such as rubbery when pressed, not easily crushed, not easily damaged or rotten, and can last longer [14]. Based on direct testing by looking at the characteristics of all tofu samples, it showed that the samples did not show the characteristics of tofu containing formalin. All tested samples have a smooth texture and are very easy to crush. While the formalin test carried out using a turmeric solution showed that all negative samples did not contain formalin and no formalin was detected [15].

This study aims to determine the presence or absence of formalin content in tofu sold at Pasar Betung, Banyuasin, South Sumatra province in 2021. Identification of white tofu samples is needed to determine the presence or absence of formalin in tofu from the results of examinations in the laboratory using qualitative methods. The formalin content analysis method using a turmeric solution is a simple and inexpensive method because it uses materials that are always available at home. The analytical method using a turmeric solution can also be applied to foods with a soft texture [16].

Based on the results of the tofu sample test, the turmeric solution was declared negative to contain formalin. Content The identification results on negative tofu do not contain formalin, marked no change in orange color to brick red. So that the tofu sold in the Betung Banyuasin market in South Sumatra is safe for consumption.

4. Conclusion

In conclude, Food additives or BTP is a harfullhazardous material for the human because it can cause cancer-causing free radicals. A healthy lifestyle by consuming food that is highly recommended because tofu is a source of high nutrition. One of the types of food consumed by

humans is tofu, tempeh as a side dish or combined with other food ingredients, but this type of food is easily contaminated with microorganisms so it is not long storage time and spoils quickly. From the results of research conducted in tofu. The result declared negative contained formalin, so the tofu sold at the Betung Banyuasin market in South Sumatra was safe for consumption, and free of BTP food-added ingredients.

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