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Efforts to Improve Hygiene for Making Soybean Tempe



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Abstract

The hygiene of soybean tempe processing begins with the selection of soybeans, the use of boiling facilities, and the use of water. The purpose of this activity was to improve the hygiene of making soybean tempe. The activities carried out were identification of needs and interventions. The target of the activity was the soybean tempe maker of Kel. Bendo Kec. Kepanjen Kidul of Blitar City. The activities were carried out on February – April 2022. The efforts made in the program were replacing the boiling facilities made of stainless steel, giving Chlorine 70% tablets to water sources, and Chlorine powder 40% to water reservoirs. The results of these efforts were the number of e-colli in the water after intervention dropped to 2 MPN/100 mL, odorless boiled water, ferrite tasteless soybeans, and tempe becomes more durable.

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INTRODUCTION

Tempe is the result of fermented soybeans and Indonesian specialties since centuries ago. Tempe is produced and consumed for generations by the family (BSN, 2012). The fermentation process makes soybean seeds as simple compounds that are easily digested. Tempe, originally known in Java, especially Yogyakarta and Surakarta. Tempe producers are not only around Central Java, but have spread throughout Java, including in East Java Province. In Blitar City, tempe production is even carried out as a home industry and main occupation.

Tempe production tends to be inherited from a family who was also a producer at that time. As a tradition, tempe production is sometimes carried out in residential areas and using facilities that do not meet food processing requirements. The process of processing soybeans into tempe requires good facilities and sufficient time.

Tempe derived from soy has high benefits for adult health. Tempe as a food contains high vegetable protein and isoflavones (like the structure of the female hormone estrogen). Soy products are promoted for menopausal symptoms,

bone health, improving memory, high blood pressure, and high cholesterol levels (NIH, 2020).

Hygiene of facilities and water used to process soybeans into tempe are the main things that need attention. Observations on the manufacture of tempe found that the equipment and water did not meet the specified requirements. All requirements for facilities and water for processing are required to comply with (BPOM, 2012; DinKes-Yogyakarta, 2020; Menkes-RI, 1990; SekNeg-RI, 1996). Based on the explanation, it is necessary to carry out community service activities about improving the hygiene of making soybean tempe.

METHODS

The activity was done by intervening the facilities and the water used. The target of this activity was one of home industry of tempe who had been active for 8 years. The activity was carried out in February – April 2022. The place of the activity was in Kel. Bendo Kec. Kepanjen Kidul of Blitar City. The intervention targets were soybean cooking equipment and water used for soybean processing.

RESULTS

The facilities used to process soybeans are shown in Figure 1 below.



Before (d: 58 cm, h: 110 cm)



After (d: 80 cm, h: 80 cm)

Figure 1: Soybean processing facilities before (drum) and after (stainless steel)

Microbiological test carried out by regional health laboratories of Blitar City. The standards used were set by the Ministry of Health of the

Republic of Indonesia (Menkes-RI, 1990), namely microbiological content (total coliform) < 50 MPN/100 mL (non-piped). The results of

microbiological test of clean water used for processing the soybeans and tempe were

presented in Table 1 below.

Table 1: The results of microbiological test of water

| | Microbiological test (MPN / 100mL) | | |
|----------------|------------------------------------|--------------|--------------|
| | 1 (10-03-22) | 2 (24-03-22) | 3 (06-04-22) |
| Total Coliform | 1600 | 550 | 2 |

DISCUSSION

Tempe making is categorized into two main activities, namely soybean processing and fermentation process. Soybean processing needs to be carried out with the main requirements, especially boiling facilities, and water (BSN, 2012). The boiling equipment used as in Figure 1 before the intervention was made of iron that did not meet food processing standards which looked rusty and pliable.

Steel and iron are materials that are easy to obtain and use. However, iron and steel have different strengths when used as a means. The difference between iron and steel is in the microstructure and its properties include strength, ductility, damping power (Kristianingrum). Based on the microstructure, iron when used for food processing is at risk of mixing ferrite in food while steel never occurs. In nature, steel has advantages over iron.

The use of soybean boiling facilities using steel provides its own advantages. According to the workers verbally, the advantages of using a steel boiler are that the boiling capacity increases, the heat spreads quickly so that the boiling time becomes faster, the boiling water does not smell like ferrite, and the size makes it easier to clean after use. Another reason is that steel is a safe, healthy, durable, and able to withstand high pressure (Putrikrislia, 2021).

The water used in processing soybeans and tempe is required to meet health requirements. The initial Coliform total (Table 1) shows that the water used is not very feasible. Disinfection efforts by giving a Chlorine 70% tablet known as kaporit is put into a water source. Chlorine was obtained from regional health laboratories of Blitar City. After two weeks of administration of chlorine, a re-examination (second) was performed, and the test results were 550 MPN/100 mL. Furthermore, a re-examination (third) obtained the test results of 2 MPN/100 mL,

means that it meets the requirements for food processing Indonesia (Menkes-RI, 1990).

Chlorine or kaporit is known as a disinfectant which is effective in killing pathogenic bacteria that live in water. However, it should be noted that the use should not be excessive because it will endanger human health (Herawati & Yuntarso, 2017) and the time for adding chlorine is required to be at least 5 hours before the water is used. Efforts to kill pathogenic bacteria are also carried out in water reservoirs before use by adding as much as 2 g/100L of water (CV_Zamzam, 2011) which is carried out every 21.00 WIB so that it has a dissolving time of more than six hours before use.

Efforts to disinfect the water used for processing can be felt by the benefits of verbal statements. The stated benefits are that the boiled water does not smell, the water looks clearer, and the tempe produced does not rot quickly. Efforts to improve the boiling facilities and water as the basis for licensing of suitability of space utilization for home industry and business. The licensed of suitability of space utilization given by the Head of the Investment Officer of Blitar City, Numbered: 503/000121/410.113.3/2022 on April 26, 2022. The business registration number was given by the Government of Republic of Indonesia Numbered: 1105220013605 on May 11, 2022.

CONCLUSION

Boiling facilities and water were the main requirements for processing soybeans into tempe. Efforts had been made to replace stainless steel facilities and provide Chlorine 70% and 40% as a disinfectant for pathogenic bacteria in the water. Efforts for hygiene were proven by obtaining a Certificate of Sanitation Hygiene Eligibility from the Blitar City Government.

SUGGESTION

Soybean cooking utensils should be made of stainless steel and e-colli in the water must meet the standards to prevent tempe spoilage.

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