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UJI KUANTITATIF KADAR PROTEIN PADA TEMPE KEDELAI DAN LAMTORO

The Quantitative Test Of Protein Levels In Soybean And Lamtoro Tempeh

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ABSTRAK

Pangan merupakan kebutuhan yang paling esensial bagi manusia untuk mempertahankan hidup dan kehidupannya. Kualitas pangan salah satunya dapat dari zat gizi yang terkandung di dalamnya. Usaha penganekaragaman pangan dapat dilakukan dengan mencari bahan pangan baru atau bahan dari pangan yang sudah ada dan dikembangkan menjadi bahan pangan yang beraneka ragam. Penggunaan biji lamtoro sebagai bahan dasar pembuatan tempe merupakan salah satu wujud dari diversifikasi pangan. pengambilan sampel pada penelitian ini adalah *Simple Random Sampling* dengan jumlah sampel sebanyak 2 tempe kedelai dan 2 tempe lamtoro. Pengumpulan data penelitian menggunakan eksperimen. Pada penelitian ini didapatkan hasil yang berbeda dari masing-masing tempe kedelai dan tempe lamtoro.

Kata kunci*:* kedelai, lamtoro, tempe, uji kuantitatif

ABSTRACT

Food is the most essential requirement for humans to maintain life and living. One of the quality of food can be from nutrients contained in it. Efforts to diversify food can be done by finding new food ingredients or materials from existing food and developed into a diverse food material. The use of lamtoro seeds as the basis for making tempeh is one form of food diversification. Sampling in this study is Simple Random Sampling with a total sample of 2 soybean tempeh and 2 lamtoro tempeh. Research data collection using experiments. In this study, different results were obtained from each soybean tempeh and lamtoro tempeh.

Keyword*: soybean, lamtoro, tempeh, quantitative test*

INTRODUCTION

Food is the most essential requirement for humans to maintain life and living. Food as a source of nutrients (carbohydrates, fats, proteins, vitamins, minerals, and water) is the main foundation for humans to achieve health and well-being throughout the life cycle (Setyaningsih, *et al*., 2009). The need for food increases with the increasing population. Various types of food are produced by increasing the quantity and quality to meet the food needs of the community. Meeting the needs of food can also be done by optimizing the use of diverse food sources in addition to increasing the amount (Nurapriani, 2010)

One of the qualities of food can be from the nutrients contained in it. Nutrients are substances in food that organisms need in growth and development that are used directly by the body including carbohydrates, fats, vitamins, and proteins, minerals.

Nutrients can be obtained from food obtained in the form of food juices from the breakdown of the digestive system (Almatsier, 2009). Humannutritional needs can be met through diversification of food. The effort to diversify food can be done by finding new food ingredients or materials from existing food and developed into a variety of food ingredients with prices that are relatively affordable by the community (Setyaningsih, *et al*., 2009).

The increase in soybean prices continues to cause the craftsmen and tempe companies to improvise in the manufacturing process to reduce production costs. Some tempeh craftsmen often reduce the size of tempe to smaller, put soybean shells, corn groats, pieces of young papaya, coconut pulp, or lamtoro into soybeans that are ready to be

given yeast. This will reduce the nutritional value of tempeh and harm consumers. This problem should not need to occur if Indonesia has done self-sufficiency in soybeans or diversified basic ingredients for making tempeh (Sayudi, 2015).

The use of lamtoro seeds as the basis for making tempe is one form of food diversification to reduce pressure on food demand and prices. Food diversification is one of the important instruments to reduce pressure on food demand and prices as well as to obtain diversity in nutrients (Pratiwi, 2018).

Lamtoro seeds (Leucaena leucocephala) are a group of peas that are usually consumed when young or dry seeds. Lamtoro seeds have a relatively high protein content when compared to other grains, which ranges from 30-40%. In Indonesia, young lamtoro seeds can be made botok and vegetables, while dried lamtoroseeds can be made tempeh. Lamtoro seeds also contain several other important substances, including calories, carbohydrate, calcium, phosphorus, iron, and vitamins A, B1, C (Rosida, 2014).

Based on the results of research Rosida, et al., (2009) note that the highest levels of lamtoro gung soybean tempe protein in the proportion of soybean: lamtoro gung 70: 30% is equal to 14, 29%. The results of Sayudi, *et al*. (2015) showed that the highest protein content of soybean emptor lung is in the proportion of 100% soybean seeds in the amount of 21, 947%. The research of Muthmainna, *et al*., (2016) used lamtoro seeds as a basis for tempeh and protein produced at 7.9%. Based on the description above, the researcher wants to know the protein content in soybean tempeh and lamtorotempe in the MunjunganTrenggalek market. Besides, researchers wanted to examine the protein content of lamtorosoybean tempeh without mixture and duration of fermentation**.**

METHODS

Tool

The tools used in this research are spectrophotometer, analytical balance, test tubes, tube racks, pipettes, measuring cups, filter paper, hammerheads.

Ingredients

The materials needed are soybean tempeh and lamtoro tempeh. The materials used to determine the protein content of soybean tempeh and lamtorotempe are, BSA (Bovin Serum Albumin Solution), Reagent A (Na_2CO_3 in NaOH), Reagent B (CuSO4 in aquades), Reagent C (K-tartate in aquades), Reagent D (mixture A; B; C = 20: 1: 1), Reagent E (FiolinCiocalteu in ether).

Qualitative Test

Examination of protein levels using a spectrophotometer.

RESULTS AND DISCUSSION

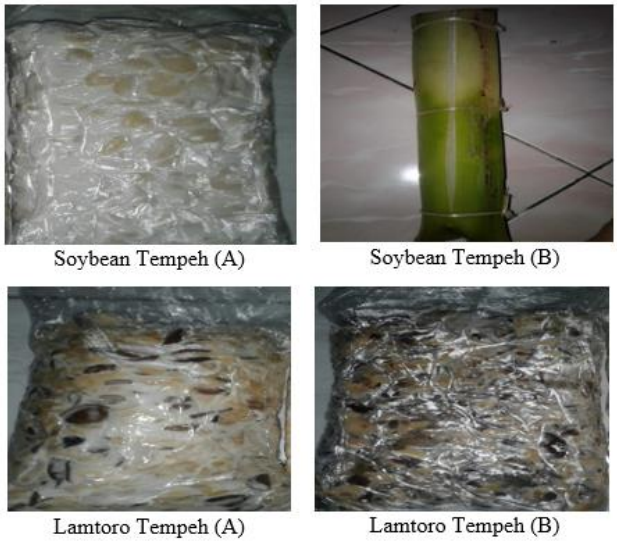
The results of measurements of soybean tempeh and lamtoro tempeh protein levels are presented in Table 1 below:

TABLE 1. Results of Measurement of Soybean and Lamtoro Tempeh Protein Levels

No	Sample	Protein Level (%) Repitation			Average
1.	T. Kedelai (A)	28,49	26,97	40,08	31,85 %
2.	T. Kedelai (B)	20,22	22.82	36,16	26,40 %
3.	T. Lamtoro (A)	19,75	19,54	19,32	19,54 %
4.	T. Lamtoro (B)	17,97	16,37	12,00	15,45 %

Based on Table 1 it is known that the average soybean tempeh protein level is higher than the lamtoro tempeh protein level. This result is in accordance with the research of Sayudi *et al*. (2015) where soybean tempeh protein content is higher, amounting to 21.947% while lamtoro tempeh protein content is 18.472%.This is because the protein content of the raw material used is different. Soybean seed protein content is 40% (Krisnawati, 2017) while lamtoro seeds have 30.81% (Nursiwi, 2018). Other factors during the process also influence, such as the reaction that occurs between the fermented material and the packaging material (Radiati, 2016), soaking and boiling the material. This may be the cause of lower lamtoro protein levels. The protein in lamtoro seeds is a globular protein. Globular proteins are soluble in saline and dilute acids, and are also more

susceptible to change under the influence of temperature so that they are denatured (Sayudi *et al*, 2015). Therefore, soybean tempeh and lamtoro tempeh products have different protein levels.



Picture 1.Soybean and Lamtoro Tempeh

Soybean tempeh (A) has higher protein content than soybean tempeh (B). This is because soybean tempeh (A) is wrapped in plastic and soybean tempeh (B) is wrapped in "dhebog" (banana stems) (**Picture 1)**.According to Rinawan (2015) tempeh wrapped in plastic will experience an acceleration of total bacterial growth which is relatively faster when compared to tempeh wrapped in leaves or banana stems. This is also influenced by the type of plastic used. Polyethene is one type of plastic that is commonly used. The permeability of polyethene to gas is quite good so that it can reduce the oxidation process and spur faster bacterial growth (Furqon et al., 2006).Therefore, in making tempeh the selection of packaging will also affect the tempeh protein content produced

The type of wrapper does not always have an effect on tempeh protein levels. Based on Figure 1 it is known that the tempeh lamtoro A and tempeh lamtoro B are both wrapped in plastic, but the protein content is different. According to Mukhoyaroh (2015) duration and curing temperature affect the tempeh protein content. This is because the number of moulds will decrease at times above 72 hours. Mold will also experience death at high temperatures. High temperatures will make tempeh too wet, tempeh smelling of ammonia or alcohol and tempeh overheating and protein denaturation occurs. This is indicated by physical changes in tempeh, where tempeh lamtoro B is blacker than tempeh lamtoro A.

CONCLUSSION

Protein content in soybean tempeh A was 31.848%, soybean tempeh B was 17.315%, lamtoro tempeh A was 22.893% and lamtoro tempeh B was 17.598%. Protein levels in soybean tempeh are higher than lamtoro tempeh.

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