

012051

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Submission date: 18-Nov-2021 06:16PM (UTC+0800)

Submission ID: 1706477850

File name: ritonang_2021_IOP_Conf._Ser._Earth_Environ._Sci._888_012051.pdf (368.59K)

Word count: 2258

Character count: 11220

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To cite this article: S N Aritonang *et al* 2021 *IOP Conf. Ser.: Earth Environ. Sci.* **888** 012051

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Chemical properties of dadih from Tanjung Bonai Regency, Tanah Datar District, West Sumatera, Indonesia

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Abstract. Dadih derive from buffalo milk which is put into a bamboo tube and covered with banana leaves or plastic and then fermented at room temperature for 1-2 days until it forms lumps. This study aims to determine the nutritional value content (protein, fat, moisture content, pH and acidity). The research method is descriptive method and laboratory analysis. The sample used as material for this research is dadih from 5 farmers in Tanjung Bonai Regency, Tanah Datar Regency. The results showed that the protein content for Dadih ranged from 5.08 - 7.08%, fat content 5.57 - 8.09%, water content 72.38 - 78.74%, pH 4.4 - 4.9 and acidity 1.26-1.51%. From this research, it is concluded that the Tanjung Bonai Dadih has good nutritional value.

Keywords: Dadih, traditional food, protein, fat, acidity

1. Introduction

Buffaloes are a native livestock from warm and humid regions, especially in the northern tropics. Buffalo is a large ruminant group that has high potential in providing animal protein, namely meat and milk. The types of buffalo that are mostly kept in Indonesia are the swamp buffalo and riverine buffalo. According to the Central Statistics Agency, the total population of buffalo in West Sumatera is 123,159 while the population of buffalo in Tanah Datar is 10,191.

West Sumatera has kept buffalo since several centuries ago and has an important function as part of customs and has become a symbol of the traditional culture of West Sumatera, which was the territory of the Minangkabau Kingdom in the past. Buffaloes are generally kept in rural areas to help local community farming, especially in cultivating rice fields. Apart from the power for the processing of rice fields, meat and milk from buffalo are equally important products.

Buffalo produces milk which has been high economic value and important in human nutritional needs. Buffalo in West Sumatera produce 1.5 to 2 L / day of milk [1]. The people uses buffalo milk to be processed into a traditional West Sumatera food known as "**Dadih**". Dadih is made simply by pouring buffalo milk into a bamboo tube and covered with banana leaves or plastic, left for two days at room temperature and natural fermentation will occur [2].

Dadih is one of the functional foods, it contains Lactic Acid Bacteria (LAB) which are probiotics it contains lactic acid bacteria (LAB) which are probiotics. Probiotics are live microbes that have a positive effect on health when consumed in certain amounts [3]. LAB are a group of bacteria that convert lactose into lactic acid⁴. LAB are referred to as bio preservatives because they contribute to inhibiting the growth



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of other bacteria, especially pathogenic bacteria and have a positive impact on human health⁵. The use of LAB by humans has been carried out for a long time, namely for the food fermentation process. Currently LAB is used for preservation and to improve the texture and taste of food ingredients.

Fermented milk products such as yogurt, kefir and Dadih are one aspect of biotechnology that uses beneficial bacteria for health. Many areas in West Sumatra produce Dadih; one of them is the Tanjung Bonai District, which is in Tanah Datar Regency. This area is a producer of Dadih because it is one of the main production centers for buffalo cattle with a large population of buffalo. The milk production is 20,927 liters/year, which is more than the 13 sub-districts in Tanah Datar Regency. This encourages most farmers to use buffalo milk for Dadih. Lactic acid bacteria (LAB) contained in Dadih's has great potential for health and their use as a natural preservative in the food industry.

2. Materials and methods

The material used in this study is dadih from five farmers in different area in Tanjung Bonai Regency, Tanah Datar. This research was carried out with the experimental method. farmer in 5 different areas, Two tubes of dadih were taken from farmer in five different areas and then analyzed in the laboratory for chemical Analysis (protein, fat, moisture, pH and TTA). Description of samples described in Table 1 below.

Table 1. Samples description.

Code Samples	Source	Name of The Owner
A	Desa Koto	Aprizal
B	Desa Kayu Meranting	Asril
C	Desa Guguak Sikabu	Yasrimal
D	Desa Situga	Hasbi
E	Desa Situga	As

Source: Research data

Result and discussion

This analysis is shown to obtain the nutritional value of dadih. The results of the chemical analysis of dadih can be seen in the Table 2.

Table 2. Chemical analysis of dadih from Tanjung Bonai Regency

Code Sample	Protein (%)	Fat (%)	Moisture (%)	pH	TTA (%)
A	5,08	6,11	77,53	4,5	1,52
B	7,04	6,88	78,05	4,6	1,40
C	7,08	8,09	76,88	4,8	1,33
D	6,91	7,95	78,74	4,4	1,51
E	5,44	5,57	72,38	4,9	1,26

Noted: A (Aprizal), B (Asril), C (Yasrimal), D (Hasbi), E (As)

3.1. Proteins

Based on Table 2, it can be seen that the dadih protein content ranges from 5.08% - 7.08%. This result is similar with [4] research that the protein content of dadih from Kerinci Regency ranged from 5.7% - 6.6%. The results of this study are different from the results of the [1] research where the content of Dadih protein from Tanah Datar Regency was 3.79% but higher than the Dadih protein content from

Limapuluh Kota Regency which was 8.25%. Meanwhile protein content's Dadih in West Sumatera are 3,79% - 8,25%.

The difference in Dadih protein content obtained from all farmers was caused by the composition of the original milk, the manufacturing process, the activity of microorganisms during the fermentation process and the bamboo used. Each farmer uses a different type of bamboo [5]. The nutritional content of Dadih varies depending on the area of production¹¹. Another factor that causes the difference in Dadih protein content is the treatment during the Dadih making process such as adding a starter in the form of ready-made Dadih can reduce the protein content of Dadih.

The addition of this starter will increase the count of microorganisms. Increasing the count of microorganisms will accelerate their development and activity and produce protease enzymes that play a role in the proteolysis process. The faster the proteolysis process, the faster the protein will decrease. This is supported by the opinion of [1] which explains that the proteolytic process affects the Dadih protein content. Meanwhile, the increase in protein is caused because only a small portion of milk protein is degraded and used by microorganisms.

3.2. Fat content

Based on Table 2, it appears that the Dadih fat content ranges from 5.57% - 8.09%. According with the results of [4] research where the Dadih fat content from Kerinci Regency ranged from 7.9% - 8.2%. However, the results of this study were lower than those of [1], where the Dadih fat content from Limapuluh Kota Regency was 10.41%. The Dadih fat content in West Sumatra ranges from 5.14 - 10.41%.

The difference in Dadih fat between all farmer was caused by the composition of the original milk, the manufacturing process, the activity of microorganisms during the fermentation process and the bamboo used where in different areas different bamboo is used. Factor that causes the difference in fat content of Dadih is the treatment during the Dadih making process such as adding a starter in the form of ready-made Dadih can reduce the content of fat. Addition of this starter will increase the number of microorganisms. The increasing number of microorganisms will accelerate their developmental activities and their activities and produce lipase enzymes which play a role in the lipolysis process. The faster the lipolysis process, the faster the fat will decrease. This is supported by the opinion of Purwati et al.¹ which explains that the lipolysis process affects the Dadih fat content.

3.3. pH value

Based on Table 2, it appears that the Dadih moisture ranges from 4,4 - 4,9. The difference in pH value obtained from all farmer is due to the number of microorganisms and their activities contained in the Dadih. The pH value will increase with the number of lactic acid bacteria and the high lactic acid produced. Fermentation time will also affect the pH value. The longer the fermentation time, the lower the pH value will be [5]. The increase or decrease in pH is due to the conversion of lactose into lactic acid by the Lactobacillus group of microorganisms and enzymatic activity [6]. The results of this study were lower than the results of [7] research, where the pH of Dadih ranged from 5.02 to 6.01.

3.4. TTA (Total Titratable Acidity) value

Based on Table 2, it appears that the Total Titratable Acidity of Dadih ranges from 1,26 - 1,51%. The results of this study were lower than the research of [8] where the acidity level of Dadih ranged from 1.35 - 2.12%. The difference in the acidity level of the Dadih is caused by the number of acid-forming bacteria and by the pH of the Dadih. The more the number of bacteria that break down lactose into lactic acid, the maximum formed lactic acid will be and cause the Dadih to become acidic.

4. Conclusion

Dadiah derives from buffalo milk which is put into a bamboo tube and covered with banana leaves or plastic and then fermented at room temperature for 1-2 days until it forms lumps. The results showed that the protein content for Dadiah ranged from 5.08 - 7.08%, fat content 5.57 - 8.09%, moisture 72.38 - 78.74%, pH 4.4 - 4.9 and TTA 1.26-1.51%. It can be concluded that Dadiah has a good nutritional quality.

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Acknowledgment

This research was supported by BOPTN Research Funding from The Andalas University Padang Indonesia, Ministry of Research and Technology of Higher Education of The Republic of Indonesia through contract No. T/15/UN.16.17/PP.Pangan-KRP1GB/LPPM/2021. We are very grateful to the rector of Andalas University and the Minister of Research and Technology of Higher Education for funding this work.

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