



THE PROXIMATE COMPOSITION OF BONYLIP BARB FISH MEAT CREAM SOUP

Junianto**, Qurrata Ayuni Karimah*, Evi Liviawaty**, Rusky Intan Pratama**

**) Student of Faculty of Fisheries and Marine Science, Padjadjaran University, Bandung – Sumedang KM 21 Jatinangor 45363, Indonesia
E-mail: qrrtyn0717@gmail.com*

****) Lecturer at Faculty of Fisheries and Marine Science, Padjadjaran University, Bandung – Sumedang KM 21 Jatinangor 45363, Indonesia
E-mail: anto_lisc@yahoo.com*

KeyWords

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ABSTRACT

This research aims to obtain the proximate composition of bonylip barb fish meat cream soup. Proximate parameters that were observed were water content, protein content, and fat content were determined using the methods of the Association of Official Analytical Chemists (AOAC). This research was conducted at Technology of Fishery Products Laboratory of Faculty of Fisheries and Marine Science Padjadjaran University and proximate analysis conducted at the Food Technology, Pasundan University. The study was conducted in May-July 2019. The method used was experimental treatment with the addition of 30% bonylip barb fish from dried material. Cream soup with addition of bonylip barb fish meat comprising with cream soup without addition of bonylip barb fish meat and SNI 01-4967-1999. The results of the research on the proximate test of bonylip barb fish cream soup showed that cream soup contained 5,40% water content, 8,32% protein content, and 6,70% fat content.

INTRODUCTION

Currently innovations in the development of food products with nutritional enrichment from fish have started to be carried out. Such as the addition of bonylip barb fish caviar to processed stick products [1]. One of the other processed food products that can be done with nutritional enrichment is cream soup. Soup is a liquid which is prepared from vegetables, fish or meat using with water, juice or stock and some thickening agents and fall under heterogenous category of food. Usually there are two kinds of soups like thick soup and clear soup. Thick soups are prepared by mixing powder of cereal or pulse flour, cream and eggs [2]. Cream soup are one of the top foods wich people like so much with other fast food item. It is actually a part of modern daily life. Soup is very much convenient to eat. It is now fulfilling the consumer's social requirements [3].

Nutritional enrichment in cream soup products is currently focused on enrichment of vegetable ingredients such as enriching vitamin from three green leaves such as *moringa oleifera*, *solanum trilobatum*, *centella asiatica* [4], and antioxidant and mineral from ridge gourd peel (*Luffa acutangula*) [5]. The enrichment of animal-based cream soup that has been done is protein enriched instant fish soup mix [6], and enriched catfish oil microcapsules at instant mushroom cream soup [7]. There are so many studies have already done on instant soup but a few studies on fish soup [6]. It is necessary to develop enrichment of cream soup with fish meat ingredients because fish meat itself contains very high protein compared to other animal meat. According to Sulastri (2014) the protein content in fish is the second largest content after the water content [8]. Fish is an excellent protein source because it is known to have a high protein level and has essential amino acids almost entirely needed by human body [17]. the protein content percentage of Bonylip Barb is 15.99% [9].

The addition of fish meat to a food product can increase nutritional value which can be seen from its proximate composition. The addition of bonylip barb fish meat to processed cream soup products have added value and highly nutritious of cream soup product. So that it can compare with SNI standards that predetermined. Based on several problems that have been described above, it is necessary to do research on the proximate analysis of bonylip barb fish meat cream soup products.

MATERIAL AND METHODS

Place and Time

This research was conducted May – July 2019 at Technology of Fishery Products Laboratory of Faculty of Fisheries and Marine Science Padjadajaran University for making cream soup and Food Technology Laboratory of Technology Faculty, Pasundan University for proximate analysis.

Materials and Tools

The tools used in this research are scales, knives, pans, spoons, spatulas, stoves, blenders, steamer, meat grinders, measuring cups, thermometers, timers, and bowls for making cream soup. The materials used in this research are bonylip barb meat, mocaf flour, maizena flour, skim milk powder, corn oil, salt, sugar, white pepper powder, garlic powder, MSG, and water. Chemical materials needed for proximate analysis are HCl, hexane solvent, H_2SO_4 , $CuSO_4$, K_2SO_4 , aquades, NaOH 30%, H_3BO_3 , and tashiro indicators [9].

Research Method

The method used in this research is the experimental method. The treatment used is by adding bonylip barb fish meat to cream soup based on dry materials, are follows:

1. Treatment A (control) : without the addition of bonylip barb fish meat (0%)
2. Treatment B : additional 30% of bonylip barb fish meat

The formulations used in this research are refer to Abdurrasyid (2018) research with some modified. The formulation are follows:

Table 1. Formulation of Making Cream Soup		
Materials	Treatment	
	A	B
Mocaf Flour	10,00	10,00
Corn Flour	18,00	18,00
Skim Milk	25,00	25,00
Corn Oil	3,00	3,00
Sugar	6,00	6,00
Salt	2,00	2,00
White Pepper Powder	1,00	1,00
Garlic Powder	1,00	1,00
MSG	2,00	2,00
Water	500,00	500,00
Bonylip barb Fish Meat	0	20,4

Source: Abdurrasyid (2018) modified

The procedure for making cream soup refers to the research that has been done (Abdurrasyid 2018) with some modified.

- Bonylip barb fish fillets are steamed for 10 minutes then smoothed using meat grinder
- Water is prepared as much as 400 ml, then the ground meat has been blended first with water.
- Prepared material I consisting of 25 g of skim milk and 6 g of sugar is dissolved in 50 g of hot water first and then put into a solution of water and fish that have been prepared and heated beforehand slowly while stirring until homogeneous.
- Material II which consists of 3 g corn oil, 2 g salt, 1 g pepper, 1 g garlic, and 2 g of flavoring put in the mixture while stirring until homogeneous.
- Material III consisting of 18 g of cornstarch and 10 g of mocaf flour dissolved with 50 g of water put into the mixture gradually while stirring until evenly mixed.
- Cream soup is heated at 60° - 70°C until thickened.

Parameter Observed

Chemical test is in the form of proximate analysis, with the aim for knowing the value of nutrient content of cream soup. The nutrient content consists of water content, ash content, protein content, lipid content and carbohydrates content. The proximate data analysis observed were water content by gravimetric method (AOAC 2005), ash content, protein content by micro-kjeldahl method (AOAC 2005), and lipid content by soxhlet method (AOAC 2005) [10]. Explanation of nutrient content of sample is described after the laboratory result is obtained, and then it is compared with SNI 01-4967-1999 to know the difference of nutrient content from the sample.

Water Content

An empty porcelain cup is dried in an oven at 105°C for 15 minutes. The porcelain cup is cooled in a desiccator. After being cold, an empty porcelain cup is weighed and noted its weight. The sample was weighed 5 g and placed in a porcelain dish. The sample was dried with an oven at 105°C for 3 hours. After the process, the sample and the cup are cooled again in the desiccator. The dried sample along with the cup was weighed again and the botot was recorded. Calculation of the percentage of moisture content of a wet base can be calculated using the following formula:

$$\text{Water Content (\%)} = \frac{(\text{cup weight} + \text{sample}) - (\text{cup weight after drying})}{(\text{sample weight})} \times 100\%$$

Protein Content

Protein analysis was carried out by micro kjeldahl method. A sample of 0.1 g was put into a 30m kjeldahl flask. Added K₂SO₄ (1.9 g), HgO (40 mg), H₂SO₄ (2.5 mL) and several kjeldahl tablets into the sample. Samples are boiled until they are clear (1-1.5 hours); cooled and transferred to a distillation device. Then rinse with water as much as 5-6 times with distilled water (20 mL). 40% NaOH solution was added to the test tube 20 mL. The liquid in the end of the condenser is accommodated with 125 mL erlenmeyer containing H₃BO₃ solution and 3 indicator drops (0.2% methyl red mixture in alcohol and 0.2% methyl blue in alcohols with a ratio of 2: 1) which is below the condenser. Distillation is carried out until approximately 200 mL of distillate is mixed with H₃BO₃ and the erlenmeyer indicator. Destilat is titrated using 0.1N HCl until the color changes to red. Protein levels can be calculated using the following formula:

$$\text{Nitrogen (\%)} = \frac{(\text{mL HCL sampel} - \text{mL HCL blanko})}{\text{mg sampel}} \times 100\%$$

$$\text{Protein Content (\%)} = \% \text{ nitrogen} \times \text{faktor koreksi (6.25)}$$

Fat Content

A sample of 0.5 g was weighed, wrapped in filter paper and placed on a Soxhlet extraction device mounted on a condenser and a fat pumpkin below. The hexane solvent is poured into a fat flask to taste according to the size of the soxhlet used and reflux is carried out for at least 16 hours until the solvent drops back into the fat flask. The solvent in the pumpkin fat is distilled and accommodated. The fat pumpkin containing the extracted fat is dried in an oven at 105°C for 5 hours. The fat flask is cooled in a desiccator for 20-30 minutes and weighed. Calculation of fat content can be calculated using the following formula:

$$\text{Fat Content (\%)} = \frac{\text{weight erlenmeyer with fat} - \text{weight empty erlenmeyer}}{\text{sample weight}} \times 100\%$$

RESULTS AND DISCUSSION

The chemical characteristics analyzed included water content, protein content, and fat content. Chemical testing is carried out through proximate testing carried out on cream soup with cream soup formulations with the addition of 30% bonylip barb fish meat. Proximate Test Results can be seen in Table 2.

Table 2. Proximate Composition

Parameter	Treatment		SNI 01-4967-1999 (Instant Cream Soup)
	0%	30%	
Water Content	5,17%	5,40%	Max 8%
Protein Content	4,97%	8,32%	Min 10%
Fat Content	5,29%	6,70%	Min 5%

Water Content

Water is one of component of food which must be considered in processing because it has a high enough influence on the appearance of texture and taste of food [12]. Water is an important component in food that has an influence on the durability of a product during the storage process. According to the result of proximate analysis, the cream soup concentration of 0% and 30% were 5.17% and 5.40%, respectively. The water content of dried cream soup is treated with the 30% addition of bonylip barb fish meat was higher than cream soup without the addition of bonylip barb fish meat (0%). This happens because the addition of bonylip barb fish meat affects the increase in water content in the soup even though the drying process has been done. According to Sari et al (2018), bonylip barb fish has a large water content wich is 81.77% [9]. In addition, according to Nurrachaman (2006), water inside the fish meat has two forms, the free water and the bound water which is kind of difficult to be removed from the fish meat even by drying it.

The water content of dry ream soup has fulfilled the requirements of SNI 01-4967-1999, which is a maximum of 8%. The low water content contained can extend the shelf life of processed products of bonylip barb fish meat cream soup. This low moisture content can reduce the growth of destructive microorganisms so that the instant cream soup flour products have a longer durability [7]. According to Sunyoto and Futiawati (2012) materials with a water content of less than 8% can reduce the growth of microorganisms and damaging chemical reactions, such as hydrolysis and fat oxidation [13].

Protein Content

Protein is a source of amino acids that contain uns C, H, O, and N which fat and carbohydrates do not have. Protein has an important function for the body, forming new tissue, replacing damaged tissue, regulating fluid balance in tissues and blood vessels [14]. Boiling and drying with heat can increase the protein content of cream soup. Processing by using heat is a major cause of changes in food nutrition [15]. Processing heat can cause many changes to proteins such as changing denaturation and improving reactions that require amino acids (Maillard reaction, melanoidin, amino acid cross bonds, etc.) (Henry and Chapman 2002) which will affect proteins in ingredients [16].

The results of protein content obtained from the proximate analgesic treatment of cream soup were 0% (control) and 30% respectively were 4.97% and 8.32%. The value of protein content in cream soup with the addition of nilem fish meat increases significantly when compared to cream soup without the addition of nilem fish meat. This nearly two-fold increase in the value of protein occurs because nilem fish are classified as high-protein fish. According to Sari et al. (2018) the protein content in nilem fish is 15.99% [9]. However, the levels of protein contained in treatment cream soups of 0% and 30% has not fulfilled the requirements of SNI 01-4967-1999, which is at least 10% [11].

Fat Content

According to Winarno (2008), fat is one of the macro nutrients that greatly affects the quality of a food product. Rancidity can occur due to the high fat contained in a food product. Fat is a collection of compounds that are soluble in organic solvents but not soluble in water (Nielsen 2010). Fat is almost found in all foodstuffs with different ingredients [14].

The main source of fat in this cream soup is corn oil. However, the composition of corn oil in both treatments was the same, so that the difference in the value of fat content in the two treatments was the addition of nilem fish meat. The results of fat content obtained from the proximate analysis of 0% and 30% cream soup were 5.29% and 6.70%, respectively. Increasing fat content in creamy cream soup 30% can be influenced by the ingredients of nilem fish, nilem fish itself contains fat, although not much. The fat content contained in nilem fish is 0.58% [9]. The main source of fat in this cream soup is corn oil. Fat content in the creamed cream soup 0% and 30% has fulfilled the requirements of SNI 01-4967-1999 quality standard which is a minimum of 5% [11]. The fat contained in food products has an important role because it can determine the texture of the product and can be absorbed longer in the stomach so as to provide a longer feeling of satiety [10].

Conclusion

Cream soup with the addition of nilem fish as much as 30% of dry weight (20.4 grams) produces a value of water content of 5.40%, protein content of 8.32% and fat content of 6.70%.

References

- [1] Iqbal, A., E. Rochima, dan I. Rostini. 2016. Penambahan Telur Ikan Nilem Terhadap Tingkat Kesukaan Produk Olahan Stick. *Jurnal Prikanan Kelautan*, 7 (2): 150-155
- [2] Radha, C., Ogunsina, B.S and Hebina Babu, K.T. (2015) Some Quality and Micro Structural Characteristics of Soup Enriched with Debittered Moringa Oleifera Seeds Flour. *American Journal of Food Science and Technology*, (3) 145-149.
- [3] Sarker, M.N.I. (2016) Poverty of Island Char Dwellers in Bangladesh. Diplomica Publishing GmbH, Hamburg.
- [4] Chandramouli P., V. S. D. Bharathi, A. Sivakami, B. Bharathiraja, J. Jayamuthunagai. 2012. Standarisasi and Nutritional Analysis of Soup Powder Prepared from *Moringa oleifera*, *Solanum trilobatum*, *Centella asiatica*. *International Journal of Future Biotechnology* 1(1): 1-16.
- [5] Shantini N., Sasikala, and Athmaselvi K.A. 2018. Development and Evaluation of Instant Ridge Gourd Peel Soup Mix. *International Journal of Engineering and Technology (IJET)*, 10 (2): 581-585
- [6] Islam, M., Md. N. I. Sarker, Md. S. Islam, A. S. Prabakusuma, N. Mahmud, Y. Fang, P. Yui, and W. Xia. 2018. Development and Quality Analysis of Protein Enriched Instant Soup Mix. *Journal of Food and Nutrition*, (9): 663-675
- [7] Hastarini E., Nabila, R. J. Napitupulu, dan S. H. Poernomo. 2019. Characteristics of Instant Mushroom Cream Soup Enriched with Catfish Oil Microcapsules. *International Conference on Food Science and Technology* 1-8
- [8] Sulastri S. Manfaat Ikan Ditinjau dari Komposisi Kimianya. Universitas Negeri Yogyakarta, Yogyakarta, 2004.
- [9] Sari, D. P, I. Rostini., A. Nurhayati., dan R. I. Permana. 2018. Meat quality of fresh Bonylip Barb and all-female hybrid Bonylip Barb (*Osteochilus hasselti Valenciennes, 1842*) fish based on organoleptic, physical and chemical characteristics. *International Journal of Fisheries and Aquatic Studies*, 6 (4): 282-290.
- [10] Sunyoto M., R. Andoyo, and I. B. Dwiastuti. 2018. Characteristics of Sweet Potato Instant Cream Soup for Emergency Food. *Jurnal Teknologi dan Industri Pangan* 29(2): 119-126
- [11] Badan Standarisasi Nasional Indonesia. SNI 01-2354.1-2006: Standar Mutu Ikan Segar. Badan Standarisasi Nasional Indonesia, Jakarta, 2006.
- [12] Irwan, W. S. 2017. Pengembangan Produk Krim Sup Instan Tinggi Betakaroten Berbasis Labu Kuning (*Cucurbita moschata*) untuk Lanjut Usia (Lansia). Institut Pertanian Bogor, Bogor.
- [13] Sunyoto S, Futiawati R. 2012. The influence of Full Cream Milk Powder Concentration on the Characteristic of "Rasi" Instant Cream Soup. *Journal of Agricultural Science Technology* 2: 1218-1231
- [14] Winarno, F. G. 2008. *Kimia Pangan dan Gizi*. PT. Gramedia Pustaka Utama, Jakarta. 251 hlm.
- [15] Fellows, P. 2000. *Food Processing Technology: Principles and Practice*. Woodhead Publ. Ltd. Cambridge
- [16] Pratama, R. I., I. Rostini, dan M. Y. Awaluddin. 2013. Komposisi Kandungan Senyawa Flavor Ikan Mas (*Cyprinus carpio*) Segar dan Hasil Pengukusannya. *Jurnal Akuatika* 4(1): 55-67
- [17] Aberoumand A. Preliminary Studies on Nutritive and Organoleptic Properties in Processed Fish Fillets Obtained from Iran. *Food Science Technology*. 2014; 34(2):287-291.