

Organoleptic Quality And Protein Content Of Banana Heart Shredded (*Musa Paradisiaca* L.) With The Addition Of Tuna

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ABSTRACT

This study aims to determine the effect of adding tuna to the organoleptic quality and protein content of the best banana heart shredded meat. This research has been carried out at the Agricultural Sciences Laboratory of the Tolitoli Mujahidin College of Agricultural Sciences in Tuweley Village, Baolan District, Tolitoli Regency, Central Sulawesi Province from June to August 2021. This study used a Completely Randomized Design (CRD) method, which consisted of 6 treatments, namely r0 (100 g banana heart and 0 g tuna), r1 (100 g banana heart and 10 g tuna), r2 (100 g banana heart and 20 g tuna), r3 (100 g banana heart and tuna fish). 30g), r4 (100 g banana heart and 40 g tuna), r5 (100 g banana heart and 50 g tuna) with three replications. The parameters observed were organoleptic tests including color, aroma, taste, texture, protein content, water content and analysis data with analysis of variance. The results showed that shredded banana heart had a very significant effect on the value of color, aroma, taste, texture, protein content and water content. Shredded banana heart with the addition of tuna, which is the most preferred by the panelists is the shredded banana flower produced in treatment r5 with a ratio of 100 g of banana heart and 50 g of tuna. From the results of chemical analysis, the highest protein content was in the r5 treatment with a value of 42,98%. The highest water content was in the r3 treatment with a value of 9.37%. This is in accordance with the quality requirements of shredded according to SNI 7690-2013, where the protein content is at least 30% and the water content is maximum 15%.

Keywords:

Banana Heart,
Shredded Banana
Heart, Tuna Fish

INTRODUCTION

Banana buds in Indonesia are abundant in proportion to the production of bananas every year. The total production of bananas in 2019 in Central Sulawesi province produced 24,488.00 tons, including bananas produced in Tolitoli district which was 5,470.00 tons. This amount includes various types of bananas that can be used for banana heart. (BPS, 2019)

Banana heart has good content, so banana heart has the potential to increase its value both economically and for consumption. The nutritional content of banana buds tends to be high, including 90.2 g of water, 31 kcal of energy, 1.2 g of protein, 0.3 g of fat, 7.1 g of carbohydrates, 30 g of calcium, and 0.1 g of iron. (DKBM 200543-44). However, banana heart is less preferred if it is consumed directly for that

banana heart can be further processed into shredded alternative products.

One of the uses of banana heart in processing can be used as abon. Abon made from banana heart is processed into a product that has many health benefits. Because the banana heart itself has a fairly high amount of fiber. However, shredded banana heart has low protein. The low protein content of shredded banana buds needs to be supplemented with high enough protein sources.

Central Sulawesi is geographically below the equator. This position gives it a distinct advantage in the form of rich diversity of marine and fishery products. The diversity of fishery and marine products provides an added value for the community when marketed in processed form, either in semi-finished or finished form.

Tolitoli Regency is one of the regencies in Central Sulawesi, which has fishery potential. The largest fishery products in the waters of Tolitoli Regency are skipjack, tuna, kite, selar, kuwe, anchovies, and mackerel. Data from the Department of Marine Affairs and Fisheries of Tolitoli Regency in 2014 showed that the total production of tuna fish in Tolitoli Regency was 13,059 tons (DKP Tolitoli Regency, 2020).

Fish is a source of animal protein that is needed by humans, namely as a source of energy, helping and maintaining growth, enhancing body resistance from disease and facilitating physiological processes (Restu, 2016). Fish contains 72.2% water, 21.3% protein, 2.14% ash, 0.38% fat and 3.97% carbohydrates [5][4].

Shredded fish is a type of dry food with a distinctive shape made from fish meat that is

boiled, sliced, seasoned, fried, and pressed. The business of making shredded fish has a positive impact, both for entrepreneurs and the local community [22]. Shredded has a protein content of up to 20%, fat and carbohydrates up to 20% and a low water content of less than 10% [11][12][14]. Therefore, shredded food can be classified as dry food or has a low water content, so shredded food has a relatively long shelf life.

METHOD

This research was conducted at the Agricultural Sciences Laboratory of the Mujahidin Tolitoli College of Agricultural Sciences in Tuweley Village, Baolan District, Tolitoli Regency, Central Sulawesi Province in August 2021. This study used a completely randomized design (CRD) with the following treatments:

r0 : Banana heart 100 g and the addition of tuna 0 g

r1 : Banana heart 100 g and the addition of tuna 10g

r2 : Banana heart 100 g and the addition of tuna 20g

r3 : Banana heart 100 g and the addition of tuna fish 30g

r4 : Banana heart 100 g and the addition of tuna 40g

r5 : Banana heart 100g and tuna fish addition 50g

Each treatment was repeated 3 times, so 18 treatments were obtained. The mathematical formula for a completely randomized design (CRD) is as follows:

$$Y_{ij} = \mu + A_i + (ij)$$

Y_{ij} : Observation of the main factors at the i -th level of the j . test

μ : Middle value

A_i : The effect of the main factor on the i -th level

(ij) : The effect of error from the main factor of the i -th level and the j -th test

Data analysis was carried out using variance and data processing using Microsoft excel. If the results show a significant or very significant effect, then proceed with the DMRT (Duncant Multiple Range Test) 5% or 1% further test.

The process of making shredded banana heart with the addition of tuna. The process of making shredded banana heart which is added with tuna fish is making banana heart fiber, banana heart is cleaned by removing parts that cannot be used, banana heart is sliced into small pieces, banana heart that has been sliced into small pieces is then soaked in salt solution for 30 minutes and washed clean, heart bananas are boiled for 30 minutes, then cooled, then chopped until they become fibers. The second stage of making tuna fish fiber is: Whole and fresh fish are separated from the bones using a stainless steel knife, the fish meat has been separated and then washed with water until clean, the fish has been cleaned and then steamed for 15 minutes, the fish meat is cooked, then cooled after cold shred the meat until it becomes fibers. The stages of making banana heart floss are: Banana heart fiber and tuna meat fiber that have been steamed and shredded mixed until homogeneous based on the treatment being tried, then sauteed with added coconut milk and spices that have been mashed and then cooked for

30 minutes over low heat while continuing Stir, cook until it turns brown for 30 minutes.

RESULT AND DISCUSSION

1. Organoleptic Test Results

Based on the results of variance showed that shredded banana heart with the addition of tuna has a very significant effect on the color of shredded banana heart. The average level of preference of the panelists, amounting to 30 people, on the color of the banana heart shredded based on the organoleptic test is presented.

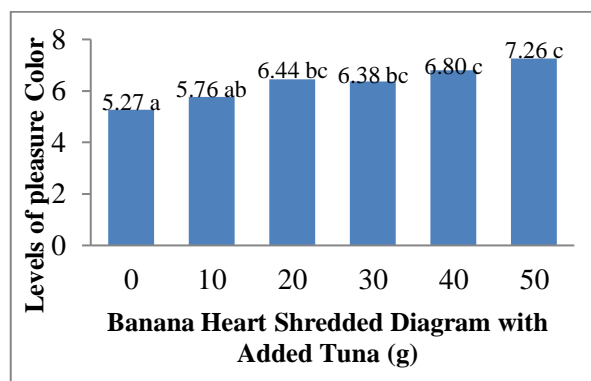


Figure 1. Graph of the average number of observations of the color of banana heart shredded with the addition of tuna

The average value of the organoleptic test on the color of the highest shredded meat was shredded made with r5 treatment with a value of 7.26 (like) the criteria for very brownish color and the lowest average value of the color organoleptic test was shredded made with treatment r0 with a value of 5.27 (do not like) brown color criteria.

Furthermore, the results of Duncan's test at a level of 1% obtained showed that the treatment of 100 g of banana heart and 50 g of tuna fish (r5) was significantly different from the other treatments. Panelists prefer banana heart shredded made with r5 treatment.

The results of Dara's research (2017) stated that there was a significant effect on treatment D (25% banana heart and 75% tuna) with a very brown color and the color of shredded meat that was most preferred by panelists was treatment D (25: 75) with a value of 4.46. in the likes category. While in Jusniati's research (2017), the color of shredded banana heart with the addition of tuna was highest in treatment A (50% banana heart and 50% tuna).

According to [11] the intensity of the color depends on the length, temperature and chemical composition of the surface of the material. Color is an indicator that can be directly seen by the sense of sight. So that the color becomes the first indicator that is directly seen or observed by the panelists.

Differences in color when frying can be caused by differences in heat entering the ingredients. Color is one of the factors that determine quality and visually color appears first and is sometimes very decisive, so that it is used as an important organoleptic attribute in a food ingredient [24][25]. In general, all treatments of shredded banana heart with the addition of modified tuna can be accepted by the panelists.

2. *Vlafor*

Based on the results of the variance, it showed that the shredded banana heart with the addition of tuna had a very significant effect on the aroma of the shredded banana flower. The average level of preference of the panelists, amounting to 30 people, on the aroma of shredded banana blossoms based on organoleptic tests

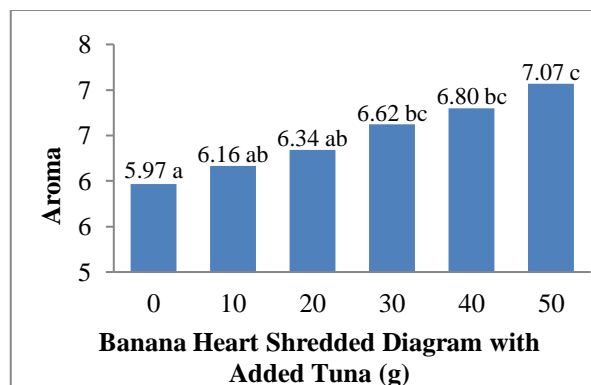


Figure 2. Graph of the average number of observations of the aroma of shredded banana heart with the addition of tuna

The highest average value of organoleptic test on the aroma of shredded meat was shredded made with r5 treatment with a value of 7.07 (like) the criteria for the slightly distinctive aroma of shredded fish and the lowest average value of organoleptic aroma test was shredded made with r0 treatment with the value of 5.97 (do not like) the criteria for the typical aroma of banana heart shredded. Furthermore, the results of Duncan's test at a level of 1% obtained showed that the treatment of 100 g of banana heart and 50 g of tuna fish (r5) was significantly different from the other treatments. Panelists prefer banana heart shredded made with r5 treatment.

The results of [4] stated that there was no significant effect on treatment C (50% banana heart and 50% tuna fish) and the most preferred flavor of abon by panelists was treatment C (50: 50) with a value of 4.16 in the like category. Meanwhile, in [9], the aroma of shredded banana heart with the addition of tuna was highest in treatment A (50% banana heart and 50% tuna fish).

The high value in the r5 treatment (100g banana heart and 50g tuna fish addition) was due to the

large concentration of fish so that the dominant banana flower aroma did not appear. Aroma is one of the determinants of the quality of food products in the food industry, aroma testing is considered important because it can quickly provide results of an assessment of the product, the odor substance is volatile (evaporates), slightly soluble in water and fat [17].

3. Flavor

Based on the results of the variance, it showed that the shredded banana heart with the addition of tuna had a very significant effect on the taste of the shredded banana heart. As for the average level of preference of the panelists, which amounted to 30 people, the taste of shredded banana blossoms was based on organoleptic tests.

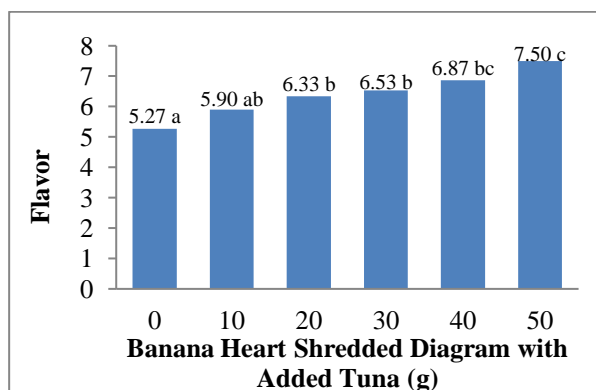


Figure 3. Graph of the average number of observations of the banana heart shredded taste with the addition of tuna

The highest average value of organoleptic test for abon taste was shredded made with r5 treatment with a value of 7.50 (like) savory taste criteria and the lowest average value of organoleptic test was shredded made with r0 treatment with a value of 5, 27 (dislike) criteria not savory.

Furthermore, the results of Duncan's test at a level of 1% obtained showed that the treatment of 100 g of banana heart and 50 g of tuna fish (r5) was significantly different from the other treatments. Panelists prefer banana heart shredded made with r5 treatment.

The results of [4] stated that there was a significant effect on treatment D (25% banana heart and 75% tuna fish) and the floss taste that the panelists liked the most was treatment D (25: 75) with a value of 4.45 in the like category. Meanwhile, in [9], the taste of shredded banana heart with the addition of tuna was the highest in treatment B (55% banana heart and 45% tuna).

The high value in the r5 treatment (100g banana heart and 50g tuna fish addition) was due to the large concentration of fish so that the dominant banana flower aroma did not appear. Taste is the most important part in terms of the taste of a food product that can attract someone and can create an impression of processed food products. Taste can be felt by the sense of taste (Cahyadi, 2012)

4. Texture

Based on the results of the variance, it showed that the shredded banana heart with the addition of tuna had a very significant effect on the texture of the shredded banana heart. The average level of preference of the panelists, amounting to 30 people, on the texture of the banana heart shredded based on the organoleptic test.

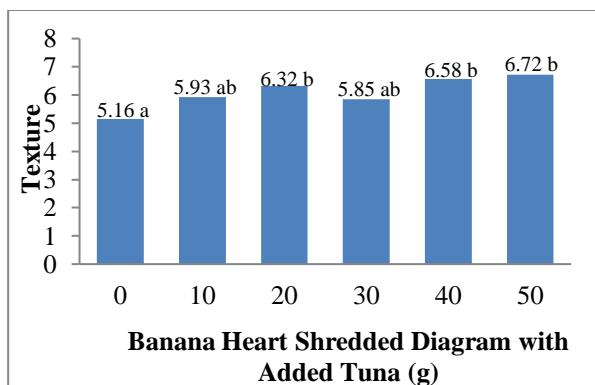


Figure 4. Graph of the average number of observations on the texture of banana heart shredded with the addition of tuna

The highest average value of organoleptic test for shredded texture was shredded made with r5 treatment with a value of 6.72 (somewhat like) crunchy texture criteria and the lowest average value of organoleptic texture test was shredded made with r0 treatment with a value of 5,16 (disliked) very very dry texture criteria.

Furthermore, the results of Duncan's test at a level of 1% obtained showed that the treatment of 100 g of banana heart and 50 g of tuna fish (r5) was significantly different from the other treatments. Panelists prefer banana heart shredded made with r5 treatment.

The results of [4][6] stated that there was a significant effect on treatment D (25% banana heart and 75% tuna fish) and the floss aroma that the panelists liked the most was treatment D (25: 75) with a value of 4.3 in the like category. While in [9], the color of shredded banana heart with the addition of tuna was highest in treatment A (50% banana heart and 50% tuna).

Texture is one of the most important criteria in a product because it greatly affects the image of the food. The common texture in shredded products is

crunchy and a savory sensation in the mouth. Good texture can increase the level of consumer preference for a product. The textures of all treatment combinations were difficult to distinguish by the panelists because the textures of banana heart and tuna fish had almost the same character.

5. Protein Level

Based on the results of variance showed that shredded banana heart with the addition of tuna has a very significant effect on the color of shredded banana heart. As for the average level of protein content in banana heart shredded

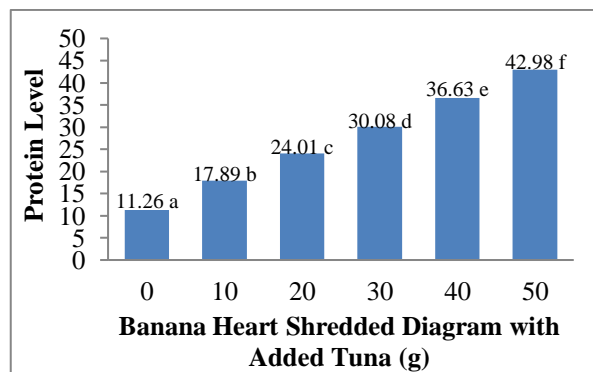


Figure 5. Graph of Average amount of Protein Level

The value of protein content in the sample of shredded banana heart r5 (100g banana heart and 50g addition of tuna) was higher than the treatments r0, r1, r2, r3, and r4. The sample is the best sample of total protein content in the best sample, namely treatment r5 with a value of 42,98% while the lowest total value in treatment r0 (100g banana heart) is 11.26%.

The high protein content in the r5 treatment was caused by the higher the concentration of tuna, the higher the protein content produced. Tuna has a high protein content of 28.3% while banana heart has a protein content of 1.6% [1]. This is in

accordance with [9] statement that the protein content is also influenced by the number of fish used, of course, to get a high protein value, a lot of fish must be used as well. This is in accordance with the quality requirements of shredded meat according to SNI 7690-2013 where the protein content of shredded meat is at least 30%.

According to [24][25] protein is a source of amino acids containing C, H, O and N which are not owned by fats and carbohydrates. Protein is a nutrient that is very important for the body, because this substance in addition to functioning as a producer of energy in the body also functions as a building and regulating substance.

6. Water content

Based on the results of variance showed that shredded banana heart with the addition of tuna has a very significant effect on the color of shredded banana heart. As for the average water content of shredded banana heart.

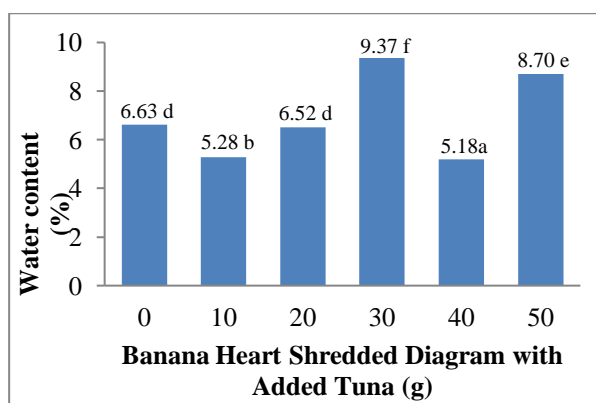


Figure 6. Graph of Average amount of water content

The value of protein content in the sample of shredded banana heart r3 (100g banana bud and 30g tuna fish addition) was higher than the treatments r0, r1, r2, r4, and r5. This sample is the best sample of total protein content in the best

sample, namely treatment r5 with a value of 9.37% while the lowest total value in treatment r4 (100 g banana heart and the addition of tuna fish 40 g) is 5.18%.

The high water content in treatment r3 (100g banana buds and 30g tuna fish addition) was due to the higher concentration of banana buds, the higher the water content produced in shredded, because banana buds bind more water, so water is still present in large quantities. This is also suspected because the cooking temperature has decreased because the frying process uses a gas stove whose temperature does not use a temperature setting. This is in accordance with the statement of [15] that the decrease in water content is influenced by the processing process, namely at the frying stage, because the free water contained in the ingredients evaporates or comes out when the ingredients are fried, the free water contained in the ingredients is directly evaporated by the heat of the pan and oil. as an intermediate medium so that some of the free water contained in the material network can evaporate or be reduced. According to [10] that the composition of fried food will determine the amount of oil absorbed. Foodstuffs with a high water content will absorb more oil because the more free space left by the water that evaporates during frying.

[4][9] stated that the decrease or increase in water content was caused by a process of evaporation and absorption of food ingredients caused by environmental air.

Water content is a very important quality parameter for a snack product, including shredded, because water content is a liquid

substance that allows reactions that can reduce the quality of a food ingredient. The lower the water content of a product, the higher the durability of the product [24][25]. This is in accordance with the quality requirements of shredded according to SNI 7690-2013 where the maximum shredded water content is 15%.

CONCLUSION

The organoleptic result of shredded banana heart with the addition of tuna, the most preferred in terms of taste is the R5 treatment which is made from 100 g of banana heart and 50 g of tuna. From the analysis results, the highest protein content was in treatment r5 with a value of 42.98% and the highest water content was in treatment r3 with a value of 9.37%. Abon made in all treatments had fulfilled the requirements for shredded according to SNI 7690-2013 where the protein content was at least 30% and the air content was a maximum of 15%.

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REFERENCES

- [1] Astawan, M. and A. L. Kasih. 2008. Various Benefits of Food Colors.
- [2] PT.Gramedia. Jakarta. Central Bureau of Statistics. 2019. Production of Fruit Crops. Central Sulawesi
- [3] National Standards Agency. 2013. Shredded Beef. SNI7690.1:2013. Jakarta: National Standardization Agency.
- [4] Dara, W., & Fanyalita, A. 2017. Effect of Tuna Fish Substance ((*thunnus sp*) on organoleptic and chemical quality of banana heart shredded (*Musa acuminata balbisiana colla*) Journal of Sainstek 9(1): 1-7
- [5] Deni, S., Hardjito, L., & Salamah, E. 2007. Utilization of Tuna Fish Meat as Kamplang Crackers and Characterization of the Products Produced. Scientific Journal of Agribusiness and Fisheries. 6(2), 6-14.
- [6] Maritime Affairs and Fisheries Service of Tolitoli Regency. 2020. Fisheries Potential of Tolitoli Regency
- [7] DKBM. List of Food Ingredients. 2005. Jakarta.

- [8] Hastanto, N. Kuswardhani, and T. Lindriati. 2015. Feasibility Analysis of Banana Heart Shredded Industry. Faculty of Agricultural Technology. University of Jember.
- [9] Jusniati, Patang, and Kadirman. 2017. Making Shredded from Banana Hearts (*Musa Paradisiaca*) With the Addition of Tuna Fish (*Euthynnus Affinis*). *Journal of Agricultural Technology Education* 3(1): 58-66.
- [10] Karyono, 2015. Benefits and Efficacy of Banana Heart for Health. [www..mangyono.com/2015/02 Benefits-dan-Kasiat-Heart-Pisang-for-Health](http://www.mangyono.com/2015/02/Benefits-dan-Kasiat-Heart-Pisang-for-Health). Retrieved March 2, 2021.
- [11] Ketaren, S. 2008. Introduction to Food Oil and Fat Technology. Jakarta: University of Indonesia
- [12] Kusumaningtyas, Ratna Dewi. Etc. 2011. Waste Processing of Banana Plants (*Musaparadisiaca*) Into Jerky And Shredded Banana Hearts As New Business Opportunities For Rural Communities. Unpublished Field Work Practice Report. Semarang:
- [13] State University of Semarang. Kusumayanti, H., Astuti, W., & Broto, W. (2011). Fish Shredded Making Innovation as a Fish Preservation Technology. *Echo Technology*. 16 (3), 119–121.
- [14] Laksmi R. 2012. Water Holding Capacity, Ph and Organoleptic Properties of Chicken Nuggets Substituted with Boiled Eggs. *Animal Agriculture Journal*1(1): 453-460.
- [15] Mona zulistina, 2019. Organoleptic Quality and Nutritional Content of Shredded Tuna (*Thunnus Sp*) Added Ferns (*Pteridophyta*). field. Thesis. Muchtadi, D., 2010. Techniques for Evaluation of Protein Nutritional Value. Alfabeta Publisher Bandung. 190 p.m.
- [16] Noviyanti, Wahyuni, S. and Syukri, M. 2016. Analysis of Organoleptic Assessment of Cake Brownies Substitution of Wikau Maombo Flour. *Journal of Food Science and Technology* 1(1): 58-66.
- [17] Nurhidayati. 2011. Contribution of MP-ASI Biscuits with Substitution of Pumpkin Flour (*Cucurbita Moshala*) and Patin Fish Flour (*Pangasius Spp*) on Protein and Vitamin Adequacy. Research Articles. Diponegoro University.
- [18] Peng, S., Chen, C., Shi, Z., & Wang, L. 2013. Amino Acid and Fatty Acid Composition of the Muscle Tissue of Yellowfin Tuna (*Thunnus albacares*) and Bigeye Tuna (*Thunnus obesus*). *Journal of Food and Nutrition Research*, 1(4), 42–45.
- [19] Pramuditya, G; S.S. Yuwono, 2014. Determination of Quality Attributes of Meatball Texture as Additional Requirements in SNI and Effect of Heating Time on Meatball Texture. Faculty of Food Technology. Brawijaya University, Malang.
- [20] Approval. 2016. Processing of Shredded Coral Fish (*Channa pleurophthalmus*) with

- the Addition of Grated Coconut. Palangka Raya. Journal of Tropical Animal Science, 5 (1) : 22-26
- [21] Indonesian National Standard (SNI) 01-3707-1995. Shredded Quality Requirements. Jakarta. Indonesian Standardization Body
- [22] Usman, Syafaruddin, and Aisyah. 2016. Analysis of Tuna Fish Shredded Business Income (Case Study on the Business of Women Fishermen Group "FATIMA AZ-ZAHRAH" in Pattingalloang Village, Ujung Tanah District, Makassar City). Makassar. Octopus Journal of Fisheries Science, 5(2) : 499-50
- [23] Wahyuningtyas, Sri and Santosa, Wijaya Heru. 2011. Literature: Theory and Implementation. Surakarta: Yuna Pustaka.
- [24] Winarno F.G. 2008. Best Edition of Food Chemistry and Nutrition. Jakarta. Main Library Gramedia.
- [25] Winarno, F.G. 2012. Food Chemistry and Nutrition. Main Library Gramedia. Jakarta
- [26] Ismail, Andi Muhammad, and Dhanang Eka Putra 2017. "Innovation of Making Skipjack Fish Floss with the Addition of Banana Heart." Agritech: Journal of the Faculty of Agriculture, University of Muhammadiyah Purwokerto 19(1): 45-54.