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**Original Research**

# The Sensory And Protein Test On Dimsum Processes Shrimp (*Penaeus merguensis)*

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**ABSTRACT**

***Background:*** *Dimsum is a food from the Chinese region which is quite popular in Indonesia which has high nutritional value. Shrimp shells is one of the highest sources of active compounds for the amino acid group. This study was to determine the difference in protein content in dimsum cooked with different processing techniques.*

***Methods:*** *This type of research is descriptive with quantitative descriptive research design.The method used in this research is sensory test and quantitative analysis using a uv-vis spectrophotometer instrument. Ultraviolet light absorption measurements were carried out at a wavelength of 542 nm. This research were analyzed using univariate analysis which aims to explain and describe the characteristics of each research variable. And protein test result were made by plotting the absorbance value obtained against the concentration using the Microsoft excel.*

***Results:*** *The results showed that the shrimp dimsum had a protein content in GDK, KDK, GTK and KTK respectively 0,0307%; 0,0358%; 0,0385%; and 0,0521%. The statement that processing provides a decrease in protein levels, this is due to the use of high temperatures during the processing process resulting in denatured protein. The decrease in protein content is caused by the occurrence of denaturation and protein coagulation. The higher the temperature, the greater the amount of a densaturated protein, where at 50oC protein has experienced denaturation*

***Conclusion:*** *It is necessary to test the food quality of the processed shrimp dimsum (Penaeus merguensis) and further research needs to be developed using other better methods such as the Bradford method.*

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## INTRODUCTION

People only eat the meat while the head and skin are removed and this makes the shrimp waste perishable and can pollute the environment, even though the discarded shrimp waste also has benefits, including shrimp shell flour, and the nutritional content

of untreated shrimp waste flour is as follows: water content 8.96%; dry matter 91.04%; crude protein 39.62%; crude fiber 21.29%; crude fat 5.43%; ash 30.82%; calcium 15.88%; phosphorus 1.90% and BETN 2.92%. Meanwhile, the chitin content of processed shrimp waste flour is 10.55% and this value is lower than that of unprocessed shrimp waste flour of 15.24% (Mirzah & Filawati, 2013). Shrimp is high in protein. Shrimp contains active compounds that are beneficial to humans.

Active compounds have an important role for the health, growth and development of the human body. According to (Trung & Phuong, 2012) in shrimp contained active compounds that can be found are chitosan, minerals, lipids, protein carotenoids which have high economic value. In relation to the active compound (Zhao, Huang, Zhang, Chen, & Jiang, 2011) suggested that shrimp is one of the highest sources of active compounds for the amino acid group.

Protein is a group of macronutrient materials. Unlike other macronutrients (carbohydrates and fats), protein plays a more important role in the formation of biomolecules such as nucleoproteins, enzymes, hormones, antibodies, and a means of muscle contraction rather than as a source of energy. However, if the organism is lacking in energy, this protein can also be used as an energy source (Mirzah & Filawati, 2013) (Sumantri, 2013). Shrimp meat which has a high protein content can be processed as processed food such as shrimp dimsum. With high protein content and organoleptic properties that include shape, color, taste, and texture, shrimp dim sum can be a processed product that is in demand.

Food is defined as everything originating from biological sources, agricultural products, plantations, forestry, fisheries, animal husbandry, waters, and water, both processed and unprocessed intended as food or drinks for human consumption, including food additives, food raw materials, and other materials used in the process of storing, processing, and or making food and beverages (Hidayah, 2011) (Indonesia, 2012). One of the foodstuffs that come from shrimp is Dimsum.

Dimsum is a typical food from China. It is very appetizing. It comes from the Cantonese language which means steamed snacks, dim sum is usually served with chili sauce as a taste connoisseur. Dimsum snacks that have high nutritional value are usually filled with meat, chicken, fish, shrimp, fruits, and vegetables. Dimsum is a food from the Chinese region which is quite popular in Indonesia. Dimsum is served in the form of small snacks, either steamed or fried, and is usually served with tea (Kah, 2014).

Dimsum when steamed has a soft texture, and when fried gives a crunchy texture. According to (Salamah, Purwaningsih, & Kurnia, 2012) explained that processing provides a decrease in protein levels, this is due to the use of high temperatures during the processing resulting in denatured protein. Based on the description above and the lack of information received by the public regarding the quality of protein digestibility in shrimp, especially the skin which has been processed with various processing techniques, the authors are interested in making shrimp-based dimsum (Penaeus merguensis) with different processing techniques, namely the process of steaming and frying with processed shrimp and shells to determine whether there is a difference in the protein content of shrimp contained in processed food from the way of processing.

After knowing the difference in protein levels, readers and the public can choose the appropriate processing method so that the nutritional value of the protein in dimsum is not wasted. Therefore, the authors are interested in conducting research to determine

the sensory test results and protein content in processed shrimp dim sum *(Penaeus merguensis).*

## MATERIALS AND METHOD

This research was conducted in February 2021 in the laboratory analysis of the herbalization of pharmaceutical and food analysis majors. This research is a descriptive type with a quantitative descriptive design because it describes or describes a sample objectively with data in the form of numbers or data shaken, and the variables used in this study are single variables, namely sensory tests and processed protein tests of shrimp dimsum (Penaeus Merguensis).

The research material is Aquades, Cuso4, KN4C4H4O6, NaOH, BSA (Bovin Serum Albumin), Crystal Ammonium Sulfate, Canetat Can. Aquades, Cuso4, KN4C4H4O6, NaOH, BSA (Bovin Serum Albumin), Ammonium Sulfate Crystal, Gapar Asetat.Dimsum Steamed Shrimp Meat, Steamed Dimsum Shrimp Meat and His Skin, Dimsum Fried Shrimp, Dimsum Fried Shrimp Meat and His Skin.

The research tools is UV-vis spectrophotometer, aker glass, measuring cup, drops pipette, stirring rod, takar pumpkin, glass funnel, analytic scales, vortex, centrufugal, micropipet, kuvet, panca indra.

The course of research implementation phase of the course of this study includes the process of processing the shrimp dimsum with its composition as in Table 1. The manufacture of shrimp dimsum is carried out with four variations namely steamed dimsum shrimp meat, steamed dimsum shrimp meat and its skin, fried dimsum shrimp meat, fried dimsum of shrimp meat and its skin. The four types of shrimp dimsum has the same recipe, which distinguishes the addition of shrimp skin and processing techniques.

After making the four types of shrimp dimsum, namely sensory tests and protein tests on each type of shrimp dimsum. After the sensory test includes observations in color, aroma, taste and texture of the processed shrimp dimsum by using the Panca Indra which includes senses of vision, smelling, flavoring, and taste, and protein tests with UV-Vis spectrophotometer instruments, the first stage is done, the sample preparation by taking 100 grams on each samples of the shrimp dimsum, then put it in a blender and added with 500 ml of distilled water, mashed to a liquid, after it is filtered using filter paper.

The liquid obtained is the filtrate of each samples of the shrimp dimsum which will be measured by the level of protein. The second stage is the procedure for determining the protein content with the biuret method. Starting with the manufacture of biuret reagents, as many as 150 mg of copper (II) sulfate (Cuso4. 5H2O) and 600 mg of potassium sodium tartat (KNAC4H4O6.4H2O) dissolved in 50 mL of distilled water in 100 ml of flask.

The solution plus 30 ml of sodium hydroxide is 10% while shaking and then plus distilled water until the sign line (Abdurrahman, 2013). After that, the construction of the Bovin Serum Albumin (BSA) parent solution, as many as 500 mg of bovin serum albumin was weighed carefully and was dissolved in distilled water until 10.0 ml so that the maternal solution (LI) was 5.0% or 50,000 ppm after that was dilution 10x by taking 1 ml of Li and put in a 10 ml gym, and the concentration becomes 0.5% or saman with 5000 ppm. Furthermore, the procedure for making a raw curve in the Kuvet is included

in the parent solution, biuret reagent, and distilled water with compositions such as the table 2.

After exactly 10 minutes, the absorbance is read at λ 542 nm against the blanks consisting of aquades. The third stage is measured protein content in the sample of the shrimp dimsum by taking a number of samples filtrates, then deposited first with the addition of crystal ammonium sulfate to approach the saturation of ammonium sulfate in the solution. After that the protein settled, separated by centrifugation at a speed of 11,000 rpm for 10 minutes, then it was separated.

The precipitate which is a protein is then dissolved again with a pH of 5 to 5 ml of acetic acid. Then the solution formed each is put into a reaction tube and is added with 5 ml biuret reagents. Then stir using Vortex, and left for 10 minutes. After it was poured into the Kuvet and measured by the wavelength that had been obtained from the measurement of the previous standard curve (modification of Abdurrahman, 2013). The next stage is that data analysis is carried out using univariate analysis and presented in the form of tables and narratives.

**Table 1.** Composition of shrimp Dimsum

| **Ingredient** | **Formula** | **Formula ii** | **Formula iii** | **Formula iv** |
|---|---|---|---|---|
| Shrimp (82,25%) | 250 gram shrimp meat | 250 gram shrimp | 250 gram shrimp meat | 250 gram shrimp |
| Garlic (3,14%) | 9,5 gram | 9,5 gram | 9,5 gram | 9,5 gram |
| Leek (1,6%) | 5 gram | 5 gram | 5 gram | 5 gram |
| Salt (1,16%) | 3,5 gram | 3,5 gram | 3,5 gram | 3,5 gram |
| Pepper (0,98%) | 3 gram | 3 gram | 3 gram | 3 gram |
| Sesame oil (3,29%) | 10 gram | 10 gram | 10 gram | 10 gram |
| Oyster sauce (4,27%) | 13 gram | 13 gram | 13 gram | 13 gram |
| Cornstarch (3,29%) | 10 gram | 10 gram | 10 gram | 10 gram |
| **Processing technique** | **Steam** | **Steam** | **Fry** | **fry** |

**Table 2.** Standard Preparation

| **Li (µl)** | **React biuret (µl)** | **Aquades (µl)** | **Rate of BSA (%)** |
|---|---|---|---|
| 300 | 800 | 1900 | 0,05 |
| 600 | 800 | 1600 | 0,1 |
| 900 | 800 | 1300 | 0,15 |
| 1200 | 800 | 1000 | 0,2 |
| 1500 | 800 | 700 | 0,25 |

## RESULTS

### Sensori Test

The results of the sensory test on the sample shrimp dimsum of 4 types have the following data:

**Table 3.** Sensory Test Results On Shrimp Dimsum

| **Types of Dimsum** | **Appearance** | **Smell** | **Flavor** | **Texture** |
|---|---|---|---|---|
| Steamed dimsum with shrimp shells | Bright product specifications, no mucus, | product specific strength | product specific strength | quite solid and a bit rough |

| Types of Dimsum | Appearance | Smell | Flavor | Texture |
|---|---|---|---|---|
| | reddish color | | | |
| Steamed dim sum without shrimp shells | Bright product specifications, no mucus | product specific strength | product specific strength | Quite solid, and soft |
| Fried dimsum with shrimp shells | Bright product specifications, no mucus, reddish color | product specific strength | product specific strength | Quite solid, crunchy, and a bit rough |
| Fried dim sum without shrimp shells | Bright product specifications, no mucus | product specific strength | product specific strength | Quite solid, crunchy, and soft |

The results of the sensory test of the shrimp dimsum indicate that all sample shrimp dimsums have a demonstration with a value of 7, namely bright specific products, and without mucus, but only the shrimp dimsum is steamed and fried with the shells that has a reddish color appearance. To smell and the taste of all types of shrimp dimsum has a value of 9, which is a strong specific product.

The texture of the four types of dimsum has a value of 7 with the explanation of skinless steamed shrimp dimsum which is quite dense and soft, for leather shrimp dimsums have a pretty solid texture, crispy and soft, while the texture of the dimsum of steamed shrimp with the shells has a pretty solid texture and somewhat Rough. And the texture of the dimsum of fried shrimp with the shells is quite solid, crunchy and rather rough.

**Protein Test**

The results of protein tests on 4 types of shrimp dimsum are obtained by protein levels as follows:

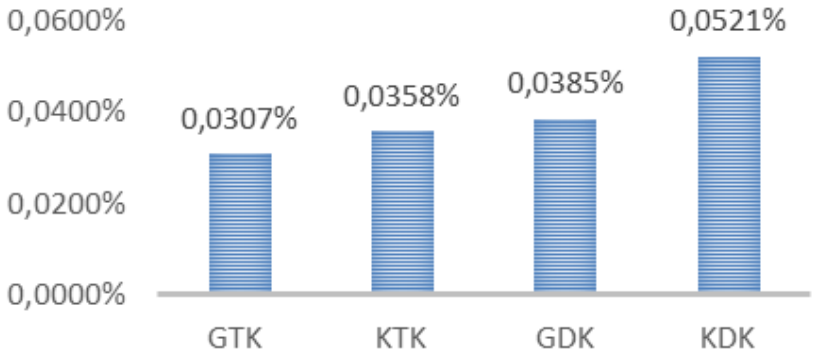


**Figure 1.** Graph Level Of Protein Levels In The Shrimp Dimsum

Information :
GDK = fried with the shells
KDK = steamed with the shells
GTK = fried without shells
KTK = steamed without shells

The graph of the level of protein levels in the dimsum of shrimp shows the level of protein levels in the shrimp dimsum. Protein levels based on the graph above show that the content of protein in 25 grams of each type of shrimp dimsum. The results of the protein content were obtained after the linear regression equation from the absorbance data was y = 67.4x + 0.1431 with R2 = 0.9701. The highest protein content is in the samples of steamed shrimp dimsum with the skin (KDK) which is 0.0521% and the lowest protein levels are in the sample of skinless fried shrimp dimsum (GTK) which is 0.0307%.

**DISCUSSION**

This research was conducted two types of tests namely sensory tests and protein tests. The sensory test has a clear clear specific product and mucus in all types of shrimp dimsum, and the appearance of reddish colors only on the steamed and fried shrimp dimsum with the skin. The specific bright appearance of the product in question is not pale and looks still fresh. And reddish colors are on the dimsum of steamed and fried shrimp with the skin, because in shrimp skin contained carotenoid compounds, especially in the form of astaxanthin red pigment, this is because Astaxanthin is one of the natural carotenoid pigments that are found in sea animals, especially salmon and the Crustacean group (Ngginak, Semangun, Mangimbulude, & Rondonuwu, 2013).

The results of the next sensory test on all types of shrimp dimsum have a strong taste and smell of specific products, namely the taste and smell of shrimp which is very strong, this is due to the manufacture of shrimp dimsum using 82.25% of shrimp meat. Furthermore, in the results of the texture sensory test that is owned skinless shrimp dimsum, it is quite dense and soft, for skinless fried shrimp dimsum has a pretty solid texture, crunchy and soft, while the texture of the steamed shrimp dimsum with the skin has a pretty solid texture and rather rough. And the texture of the dimsum of fried shrimp with the skin is quite solid, crunchy and rather rough. This is a pretty dense texture because of the addition of cornstarch.

Because Maizena is one of the results of post-harvest corn processing products that contain starch, and can be used as binders on the manufacture of siomay products or dimsum (Wardhani & Indrawati, 2016). The difference in texture between subtle and rough is caused by the difference in the formulation of the manufacture of shrimp dimsum which uses shrimp skin and does not use shrimp skin. And the difference in the texture of the dimsum that is soft when steamed and crispy when fried is in accordance with Ardhanareswari's research in 2019 on the receipt and the nutritional content of the Dimsum substituted by catfish (Pangasius sp.) and Pure Moring (Moringa Oleifera) as a toddler snack (Ardhanareswari, 2019).

In protein test results obtained the results of protein concentrations in the sampled fried shrimp dimsum sample of 0.0615, the samples of the Skin Shrimp Dimsum Tenpa Leather had a concentration of 0.0716, the samples of fried shrimp dimsum with the skin had a concentration of 0.0771, and steamed shrimp dimsum samples has a concentration of 0.1043. After knowing the concentration value (X), the calculation of protein content is then calculated with the% = x formula. FP.

Vextrak / Sample Weight (GR). 100%. And obtained the results of the protein content in the sample of skinless fried shrimp dimsum of 0.0307%, the samples of the leather steamed shrimp dimsum have a level of 0.0358%, the sample of fried shrimp dimsum with the skin has a level of 0.0385%, and the samples of steamed shrimp

dimsum. The skin has a level of 0.0521%. The level of protein obtained is different from the results of Sipahutar's research (2019) concerning "the determination of protein content in the dimsum of siomay using the Kjeldahl method in accordance with the Indonesian National Standard (SNI)" which states the results of the protein level obtained in the sample of shrimp dimsum which is around 11.85 % (Sipahutar, 2019).

This difference is due to the method used differently. According to (Maknunah, 2015) the Kjeldahl method was carried out to analyze rough protein content in direct food, because the analyzed is the level of nitrogen or total nitrogen so purine, pyrimidine, vitamins, large amino acids, creatina, and Creatinina is strangled as a protein nitrogen. And according to the star (2010) Biuret method analyzes protein levels based on peptide bonds for protein compilements because biuret reagents react specifically with proteins, not nucus n or amino acids.

The statement can be concluded that the test results for the UV-Vis spectrophotometry method are smaller than the Kjeldalh method. Based on research that has been carried out about the sensory test and protein test on the processed shrimp dimsum (penaeus merguensis) shows the results obtained in accordance with the research of (Mirzah & Filawati, 2013) which states that protein mummular shrimp skin flour, this is evidenced by increasing levels of protein on the type of sample of shrimp dimsum with skin. And the final result of this study also proves to the statement that processing provides a decrease in protein levels, this is due to the use of high temperatures during the processing process resulting in denatured protein according to (Salamah et al., 2012), this is evidenced by the results of the protein content that decreases during the frying pan.

The decrease in protein content is caused by the occurrence of denaturation and protein coagulation. The higher the temperature, the greater the amount of a densaturated protein, where at 50oC protein has experienced denaturation (Sari, A, & Dimas Rahadian, S.TP, 2013). Protein denaturation is a process where the change or modification of the confirmation of protein, more precisely occurs in the tertiary structure and the quartener of proteins, without the breakdown of convalent bonds. Protein will experience denaturation when heated at 50oC to 80oC.

Disaturation can change the properties of protein to be difficult to dissolve in water. Further warming can cause denaturation, namely the damage to the protein structure so that the protein will settle. From this discussion we know that in shrimp skin contains high protein and good for consumption, and in carrying out processing techniques it is better to reduce high temperature use on processed products that contain many proteins so that the protein contained in it is not denatured (Alyani, ruf, & Anggo, 2016).

## CONCLUSION

Sensory test in the shrimp dimsum sample has a result that describes between one type of dimsum with the other type of dimsum, which is a clear specific appearance of products, without mucus, and reddish colors for the type of shrimp dimsum with the skin. Dimsum of shrimp has a smell and strong sense of specific products. The texture is quite solid, and soft for the type of skinless shrimp dimsum, and a pretty solid texture, and rough for jeni dimsum shrimp with the skin.

The protein level test in the process of pressured shrimp dimsum has a value of 0.0307% in the samples of skinless fried shrimp, 0.0358% in the samples of the leather

steamed shrimp dimsum, 0.0385%, on the samples of fried shrimp dimsum with skin, and 0 , 0521% in the samples of steamed shrimp dimsum with skin. Then the processing of shrimp dimsum by steaming is better than frying processing. This is due to protein levels of smaller steamed shrimp dimsum, damage or denaturation compared to processing by frying.

Suggestions for further researchers are preferably to innovate in the processing of shrimp skin as food products. It is necessary to test the quality of food to the processed dimsum of shrimp (penaeus merguensis) so that later it will get a quality standard for consumption, and further research needs to be developed using other better methods such as the Bradford method.

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