The Color Characteristics on Shrimp Shumai *Litopenaeus Vannamei* with Carrots (*Daucus Carota*) Add

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Abstract **-**Shumai is a type of snack made from ground meat wrapped in a thin skin and steamed. In this research, shrimp shumai is made with the addition of carrots. The addition of carrots aims to improve the appearance of the color on shrimp shumai. The treatment in this study is adds 0%, 10%, 20% and 30% of carrots to shrimp shumai with an organoleptic test using 100 untrained panelists, continued with color test L, a, b, and chemical test for the best treatment of color and organoleptic parameters. The addition of carrots affects the parameters L, a, b, and organoleptic appearance. But it did not significantly affect organoleptic parameters of aroma, taste, and texture. Shrimp shumai which have the higher carrots concentration have a lower value of L, a higher value of a and b, and has a high value of consumer's attraction, as evidenced by organoleptic test.

Keywords: shumai, shrimp *Litopenaeus vannamei*, carrots, additional, color

I. Introduction

Completing the food needs is not always by the main food, but also by the additional food. One of the additional foods or snacks that are popular in Indonesian peoples is shumai. Fish shumai are processed food that uses a minimum of 30% of fish/ shrimp, or surimi, flour, and other ingredients which wrapped with dumpling skin and steamed (SNI, 2013). 100 grams of shrimp shumai content 13 g of protein, 28 g of dietary fiber, 3.5% of vitamin C, and 3.2% of vitamin A (Nutritionix, 2018).[1]

Carrots are one of the vegetables that are rich of beta carotene. Beta carotene is a yellow-orange pigment. Carrots are tubers of carrot plant (*Daucus carota*) in an intact, clean, and fresh. The color yellow-orange in carrots are obtained from the beta carotene pigment (SNI, 1992).[2]

Cooked shrimp actually has a reddish color, but when processed into shumai, the color produced is pale orange tends to be white, making it less attractive to consumers. Based on Purukan *et al*. (2013), a product with the addition of carrots most preferred by panelists has a high nutrient content compared with the standard. Based on the description, the aim of this research is to study the effect on shrimp shumai with carrots add.[3]

II. Material and Method

Material

All of the materials were purchased from Local Market. The materials that used in this research is shrimp vannamei (*Litopenaeus vannamei*), carrots, egg white, tapioca flour, dumpling skin, onion, garlic, pepper, salt, and ice cube.

Sample preparation

The process is beginning with weighing each ingredient, 200 grams of shrimp meat, 20 grams of onion, 7 grams of garlic, 50 grams of tapioca flour, 30 grams of egg white, 8 grams of salt, 2 grams of pepper, and 40 grams of an ice cube. All ingredients are mixed and blended with a food processor. The grated carrots with different proportions in 4 treatments (SU1 = 0%, SU2 = 10%, SU3

= 20%, SU4 = 30% of carrots) added to the dough and stirred until mixed well. The dough wrapped in dumpling skin and steamed for 30 minutes, then lifted and cooled at room temperature for 15 minutes.

Organoleptic analysis

To choose the most like shrimp shumai in every treatment, an organoleptic test was used. Organoleptic test of shrimp shumai samples was performed by 100 consumers (student at Brawijaya University). The organoleptic test was using hedonic method.

Color analysis (L, a, b)

The color (L, a, b) of shrimp shumai with carrots were measured using a CR 400 chromamometer. To measure the internal color of shumai, the samples were cut and analyzed by the device.

Statistics analysis

In this research, all experiment was done with four treatments and five replicates. Analysis of variance (ANOVA) followed by Tukey test for color analysis and Kruskal-Wallis test for organoleptic analysis at $p < 0.05$ was done on the experimental data using SPSS software.

III. Result

Organoleptic test was used to determine the acceptability of panelist for shrimp shumai with carrots added. Organoleptic test was performed by 100 consumers with hedonic method. Hedonic test is an organoleptic analysis test that is used to determine the level of preference of a product by giving an assessment or score on the characteristics of product. The result of organoleptic test on shrimp shumai with carrots adds can be seen in Figure 1.

Figure 1. Organoleptic analysis of shrimp shumai with carrots add

Treatment	Appearance	Aroma	Texture	Taste	Total
SU1 (0%)	2.83	3.02	3.15	3.10	12.1
SU2 (10%)	3.11	2.98	3.11	3.07	12.27
SU3 (20%)	3.16	3.04	3.19	3.04	12.43
SU4 (30%)	3.44	3.09	3.15	3.15	12.83

The addition of carrot treatment was significantly different ($p < 0.05$) on hedonic appearance test. The highest value is on SU4 (30%) and the lowest value is on SU1 (0%). The panelist's favorite in appearance was SU4 treatment (30% carrots add) of 3.44. According to Purukan *et al.* (2013), the color formed on the product is caused by the addition of carrots. Carotenoid is the source of orange color on carrots.[3]

The color analysis produces three notation, L* for lightness, a* for redness, and b* for yellowness. The additional carrots give significant value ($p < 0.05$) on color characteristics in shrimp shumai. The range of lightness value is 60.61 up to 63.68. The redness value has range between 6.36 to 7.61. The range of yellowness value is between 9.52 to 17.62. The graph can be seen in Figure 2.

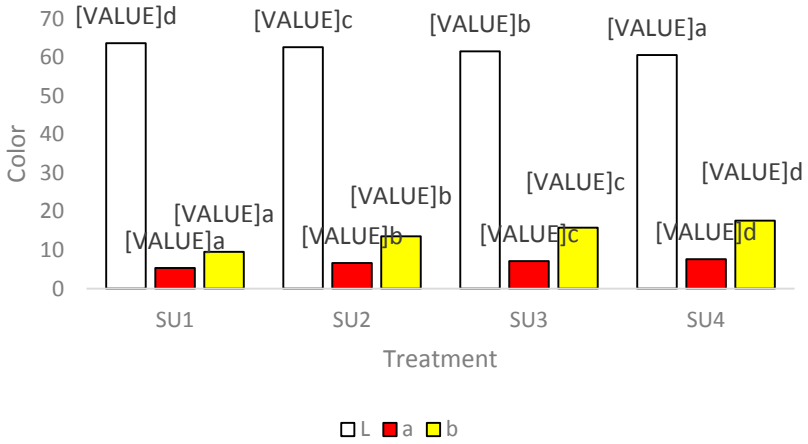

Figure 2. Graph of Lightness (L), redness (a), yellowness (b) of shrimp shumai with carrots add

IV. DISCUSSION

The parameter *a** takes positive values for reddish color and negative values for greenish, whereas *b** takes positives values for yellowish color and negative values for blue ones. *L** is an approximate measurement of luminosity, which is the property according to which each color can be considered as equivalent to a member of the greyscale, between black and white (Granato and Masson, 2010).[4]

Lightness decreases by increasing the concentration of carrots. The *L** value of shrimp shumai for each treatment has decreased, which means that more carrots add has results in dark or thick colors. Figure 2 shows that the redness and yellowness of inner color of shumai increased by increasing the amount of carrots concentration. Addition of carrots in shrimp shumai had a significant effect on these parameters of the inner color of shrimp shumai.

As the concentration of carrots increases on shrimp shumai, the result of shrimp shumai color is brighter, which is increasingly orange. Febrihantara *et al.* (2014), said that the more carrots that are added to the product will create an increasingly orange color.[5] According to Kaemba *et al.* (2017), a combination of high *a** value and low *b** value produce colors with low brightness. Whereas the combination of low *a** value and high *b** value shows bright yellow to orange.[6]

V. CONCLUSION

Carrots can be added to shrimp shumai to improve color characteristics. The addition of carrots gives a significant ($p < 0.05$) on color (L*, a*, b*) of shrimp shumai. The concentration of carrots add had an influence on the level of preference consumers.

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