Use of eggfruit on the making of toast bread

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Abstract. Eggfruit has high nutritional value and good function for health but their consumption still low and the fruit is unfamiliar for most of the Indonesian citizen. This study aims to determine the acceptance of panelists on the eggfruit toast bread produced. This experiment was used experimental method by using Block Randomized Design which was repeated two times with nine eggfruit substitution treatments, namely A = 0%, B = Puree 10%, C = Puree 20%, D = Puree 30%, E = Puree 40%, F = Flour 5%, G = Flour 10%, H = Flour 15%, dan I = Flour 20%. Tests conducted include physical analysis that is color and texture; chemical analysis that is water content, total ash content, protein content, fat content, fiber content, salt content, carotene content, and vitamin C content; and organoleptic tests by hedonic methods on overall appearance, crust color, crumb color, uniformity of pores, tenderness, weakness, flavor, and taste. The results showed that panelists acceptance of eggfruit toast bread produced has the criteria of dislike-like for overall appearance, crust color, crumb color, uniformity of pores, tenderness, weakness, and flavor, while for taste is ordinary-like.

1. Introduction
The location of Indonesia in the equator has benefited from the high diversity of tropical plants to produce throughout the year. An example of tropical fruit plants in Indonesia with less utilization is eggfruit (Pouteria campechiana) [1]. In Indonesia, eggfruit is found in Bogor and Bandung. The fruit produced is marketed to certain traditional markets or sold on the roadside as souvenirs. One of the sapodilla sales centers on the roadside is along the Bandung-Cianjur highway, precisely in the Cipatat area. Consumers in Indonesia consume it in fresh form. Mature eggfruit has a characteristic slippery and thin fruit skin, orange fruit flesh, and like flour. The fibrous and soft fruit texture with a deep yellow color causes the brown sapon fruit to leave yellow in the teeth so that the fruit is less preferred.

The dense yellow color of the fruit shows the high content of vitamin A (santofil, β-carotene) [2]. In addition to vitamin A, the nutritional content that dominates are carbohydrates, fats and vitamin C [3]. The high nutritional value has made people in origin traditionally processed foods such as custard, ice cream, pancakes, jam, and marmalade [4].

The busyness of the Indonesian people, especially in big cities today, really requires speed and practicality in processing food. At breakfast, people choose bread as the main menu [5]. The bread that is widely circulated today has almost the same variant, especially for the type of bread. To overcome this, it is necessary to develop bread products that have more varied colors and nutritional value [6]. Based on the nutritional value of eggfruit, it is possible to produce bread products with the addition of eggfruit. Therefore, by observing the problem of the lack of use of eggfruit in Indonesia and the lack of
bread variants on the market, we conducted research on the production of eggfruit bread as a diversified product.

Bread is a product obtained from wheat flour dough fermented with bread yeast and baked, with or without the addition of other food ingredients and food additives permitted [7]. Toast bread made with a little sugar or not at all [8]. Usually, the use of sugar in toast bread is only used in the acceleration of the fermentation process [9]. Principally making bread consists of mixing, fermentation, forming, and roasting [10]. The main secret of making good and quality bread from time to time is knowledge about flour, raw materials used, and experience [11]. To determine bread has good characteristics must have a standard that fulfills two categories, namely the outside (volume, crust color, the burning, shape, fracture and tear, and crust) and the inside (grain, texture, crumb color, flavor, and taste) [12]. This study aims to determine the acceptance of panelists on the eggfruit toast bread produced.

2. Method

The method used in this study is experimental method using a Randomized Block Design consisting of nine eggfruit substitution treatments, namely A = 0%, B = Puree 10%, C = Puree 20%, D = Puree 30%, E = Puree 40%, F = Flour 5%, G = Flour 10%, H = Flour 15%, dan I = Flour 20% with two replications (duplo). Data obtained from observations, then averaged and discussed in description.

3. Results and discussion

3.1. Physical characteristics

Physical testing is color and texture [13]. Color testing is done using chromameter, while texture testing is done using Texture Analyzer. The color test analyzed is L*. This value shows the brightness of the color (value) and has values from 0 (black) to 100 (white). The L* value indicates reflected light that produces white, gray, and black chromatic colors. The texture of fresh bread is expressed in units of gram force (gf). This unit shows the amount of compressive force to penetrate the white bread. The results of physical analysis of eggfruit toast bread can be seen in Table 1.

| No. | Characteristics | 0% | Eggfruit Puree | Eggfruit Flour |
|-----|-----------------|----|----------------|----------------|
|     |                 |    | 10% 20% 30% 40% | 5% 10% 15% 20% |
| 1.  | Colour (L*)     | 80,40 | 65,52 67,00 66,15 63,01 | 66,01 64,49 65,44 58,66 |
| 2.  | Texture (gF)    | 1143 | 1058 4220 3005 1767 | 780 1511 365 695 |

Based on Table 1 shows that the higher the substitution of eggfruit puree and flour, it tends to decrease the value of L* eggfruit toast bread. This is because the color of the toasted bread produced is darker with the higher substitution of eggfruit puree and flour used. Eggfruit toast bread has a lower L* value compared to toast bread without eggfruit substitution (control). This is because the eggfruit toast bread has a different color with toast bread without eggfruit substitution (control), which is brownish yellow. The lower the L* value, the darker the color of the toasted bread.

In Table 1 it can be seen that the eggfruit puree toast bread has a higher texture value than the eggfruit flour toast bread. This is due to the eggfruit substitution used in puree toast bread is larger, namely 10-40%, so the resulting toast bread has a harder texture. Eggfruit flour toast bread has a texture value that tends to approach the texture of toast bread without eggfruit substitution (control). This is because the eggfruit substitution is used only slightly, namely 5-20%, so the eggfruit flour toast bread has almost the same texture as toast bread without eggfruit substitution (control).

3.2. Chemical characteristics

Chemical testing is water content, total ash content, protein content, fat content, fiber content, salt content, carotene content, and vitamin C content [13]. The results of the chemical analysis of eggfruit toast bread can be seen in Table 2.
Table 2. The results of the chemical analysis of eggfruit toast bread.

| No. | Chemical Composition | 0% | Eggfruit Puree 10% | Eggfruit Puree 20% | Eggfruit Puree 30% | Eggfruit Puree 40% | Eggfruit Flour 5% | Eggfruit Flour 10% | Eggfruit Flour 15% | Eggfruit Flour 20% |
|-----|---------------------|----|-------------------|-------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|
| 1.  | Water (%)           | 35.62 | 37.42 | 32.13 | 33.67 | 31.40 | 34.71 | 34.10 | 34.48 | 34.13 |
| 2.  | Total ash (%)       | 2.231 | 2.264 | 2.733 | 2.813 | 3.004 | 1.862 | 1.865 | 1.522 | 1.721 |
| 3.  | Protein (%)         | 8.224 | 8.232 | 8.313 | 8.627 | 8.759 | 8.334 | 8.326 | 8.544 | 8.777 |
| 4.  | Fat (%)             | 3.272 | 2.116 | 2.454 | 2.617 | 2.847 | 2.102 | 2.457 | 2.730 | 2.828 |
| 5.  | Fiber (%)           | 1.681 | 1.202 | 1.644 | 1.976 | 2.072 | 1.475 | 1.650 | 1.955 | 2.118 |
| 6.  | Salt (%)            | 0.156 | 0.248 | 0.249 | 0.250 | 0.277 | 0.248 | 0.249 | 0.277 | 0.280 |
| 7.  | Carotene (ppm)      | 13.82 | 20.48 | 20.92 | 21.37 | 22.53 | 20.62 | 20.83 | 21.68 | 23.21 |
| 8.  | Vitamin C (mg/100 g)| 11.74 | 17.29 | 18.75 | 19.87 | 21.26 | 17.96 | 19.41 | 19.74 | 20.60 |

Based on Table 2 shows that the higher the substitution of eggfruit puree and flour, the higher the chemical composition of eggfruit toast bread, except for water content. This is because water added decreases with increasing substitution of eggfruit puree and flour used. The chemical composition of eggfruit toast bread has a higher value compared to toast bread without eggfruit substitution (control), except water and fat content.

Quality requirements for water, ash, and NaCl as standard references are a maximum of 40%, 1%, and 2.5% respectively [7]. The value of water, ash, and salt content of eggfruit toast bread, respectively ranged 31.40-37.42%; 1.522-3.004%; and 0.248-0.280%. The water and salt content of eggfruit toast bread produced to fulfill the requirements of SNI 01-3840-1995, except ash content. This is because the test criteria are different. In this study, the total ash content was calculated, while the SNI for ash content did not include salt and was calculated on the basis of dry ingredients, so the results would be different.

3.3. Organoleptic characteristics

Organoleptic testing was done with the hedonic test for eggfruit puree and flour toast bread. The test was conducted by a semi-trained panelist of 15 people. This test was conducted to determine the level of preference of panelists for eggfruit puree and flour toast bread. Characteristics tested include overall appearance, crust color, crumb color, uniformity of pores, tenderness, weakness, flavor, and taste [14]. The results of the organoleptic analysis of eggfruit toast bread can be seen in Table 3.

Table 3. The results of organoleptic analysis of eggfruit toast bread.

| No. | Composition | Eggfruit Puree 10% | Eggfruit Puree 20% | Eggfruit Puree 30% | Eggfruit Puree 40% | Eggfruit Flour 5% | Eggfruit Flour 10% | Eggfruit Flour 15% | Eggfruit Flour 20% |
|-----|-------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|
| 1.  | Overall appearance | 3.73 | 3.13 | 3.27 | 2.87 | 3.13 | 3.73 | 3.00 | 2.73 |
| 2.  | Bread skin color | 3.47 | 3.47 | 3.13 | 2.93 | 2.73 | 3.40 | 3.60 | 3.27 |
| 3.  | Bread color | 3.67 | 3.40 | 3.20 | 2.67 | 3.07 | 3.07 | 3.00 | 2.87 |
| 4.  | Pores uniformity | 3.20 | 3.47 | 3.07 | 2.80 | 3.00 | 3.13 | 3.13 | 3.13 |
| 5.  | Tenderness | 3.00 | 3.33 | 3.27 | 2.80 | 3.27 | 2.87 | 3.33 | 3.07 |
| 6.  | Flaws level | 2.93 | 3.27 | 2.50 | 3.20 | 3.20 | 3.20 | 3.33 | 3.07 |
| 7.  | Aroma | 2.87 | 3.07 | 2.60 | 2.47 | 3.13 | 3.00 | 3.20 | 2.80 |
| 8.  | Taste | 3.00 | 3.87 | 3.47 | 3.33 | 3.40 | 3.67 | 3.60 | 3.60 |

Based on Table 3 shows that the higher the substitution of eggfruit puree and flour, it tends to decrease the level of preference of the panelist towards the overall appearance, crust color, crumb color, uniformity of pores, tenderness, weakness, and flavor. Conversely, the higher substitution of eggfruit puree and flour, it tends to increase the level of preference of panelists for taste. This is because the toasted bread that is produced has a different taste from toast bread in general, namely, there is an eggfruit taste. The higher the substitution of eggfruit puree and flour, the more the eggfruit flavor increases.

In Table 3 it can be seen that the average value of panelists preferences for overall appearance, crust color, crumb color, uniformity of pores, tenderness, weakness, flavor, and taste range from 2.73-3.73;
2.73-3.60; 2.67-3.67; 2.80-3.47; 2.80-3.33; 2.80-3.33; 2.47-3.20; and 3.00-3.87. This shows that the average level of preference of the panelists for the eggfruit toast bread produced has the criteria of dislike-like, except for the taste is ordinary-like.

4. Conclusion
Panelists acceptance of eggfruit toast bread produced has the criteria of dislike-like for overall appearance, crust color, crumb color, uniformity of pores, tenderness, weakness, and flavor, while for taste is ordinary-like.

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