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| TIME SUBMITTED | 16-JUN-2020 08:40PM (UTC+0700) | WORD COUNT | 2633 |
| SUBMISSION ID | 1344835910 | CHARACTER COUNT | 11694 |



Preference test of biscuit products from pumpkin seeds (*Cucurbita* sp.)[☆]



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Received 2 October 2019; accepted 17 October 2019

KEYWORDS

Biscuit;
Pumpkin;
Flour;
Children

Abstract

Objective: To produce a new food product in the form of snacks or biscuits by using pumpkin seed flour and evaluate the preference of consumers.

Methods: There were five treatments in the biscuit production. They were F1 (60 g of pumpkin seed flour and 240 g of wheat flour), F2 (120 g of pumpkin seed flour and 180 g of wheat flour), F3 (180 g of pumpkin seed flour, 120 g of wheat flour), F4 (240 g of pumpkin seed flour, 60 g of wheat flour), and F5 (300 g of pumpkin seed flour). The parameters were organoleptic test.

Results: The results show the best treatment based on the trained and consumer panelists assessment was the biscuit treatment using 20% pumpkin seed flour.

Conclusion: The best treatment based on trained and consumer panelists assessment was the biscuit treatment using 20% pumpkin seed flour.

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Introduction

Snacks is food consuming in addition to the main meal time of the day. It can provide sufficient energy supply

³ Peer-review under responsibility of the scientific committee of the 1st International Conference on Nutrition and Public Health (ICNPH 2019). Full-text and the content of it is under responsibility of authors of the article.

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for the body.^{1,2} Biscuits are one of good ready-to-eat food. Snacks for elementary school children have to exhibit a good quality. Based on research conducted by Kristianto, the nutritional content of snacks for elementary school children is still under the provisions of nutritional content of snacks. The addition of pumpkin seed flour in the manufacture of biscuit products is expected to increase the nutritional value.³

The bioactive component of pumpkin seeds is based on the National Nutrient Database in the United State Department of Agricultural, suggesting that in 100g of pumpkin seeds there is an energy content of 559 kcal, carbohydrates

<https://doi.org/10.1016/j.enfcli.2019.10.115>

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10.71 g, protein 30.23 g, fat 49, 05 g, 6 g fiber, 16 IU vitamin A, 58 µg vitamin B9, 4987 mg vitamin B3, 7 mg sodium, 809 mg potassium, 46 mg calcium, 8.82 mg iron, magnesium 592 mg, 4543 mg manganese, phosphorus 1233 mg, selenium 9.4 mg, and zinc 7.81 ritmg.⁴ A new food product must go through an acceptance test. The purpose of the acceptance test is to find out whether a particular commodity or sensory nature can be accepted by the community. A commodity or food even though it has a lot of nutrients, but if it is not liked and not accepted by the community, the food still has no value.⁵

Considering the nutritional content and bioactive ingredients in pumpkin seeds, this research aims to see the difference between five treatment on pumpkin biscuit and the preference of consumers.

Method

Design

It was a descriptive study with 5 different treatments on pumpkin biscuit.

Population and study setting

There were 15 trained who had good sensitivity and had the ability to assess through selection and exercises. The male panelists were 4 (26.6%) and female were 11 (73.3%). On the other hand, the number of consumer panelists were 30 elementary school children at fourth and fifth class.

Variables

Variables for this study are organoleptic.

Data collection

Biscuit preparation

Pumpkin seeds (*Cucurbita* sp.) we obtained from markets then dried for ±7 h by sun. After that, it grinded until fine, then sieved using a 32 mesh sieve. Some ingredient used in the biscuit preparation, such as pumpkin seed flour, wheat flour, egg yolks, refined sugar, margarine, baking soda and vanilla. With addition baking soda, vanilli as a fragrance or flavoring, and refined sugar. These are the following treatments and

- F1: 60 g of pumpkin seed flour and 240 g of wheat flour.
- F2: 12 g of pumpkin seed flour and 180 g of wheat flour.
- F3: 18 g of pumpkin seed flour, 120 g of wheat flour.
- F4: 24 g of pumpkin seed flour, 60 g of wheat flour.
- F5: 300 g of pumpkin seed flour.

Organoleptic test

The five formulations tested by hedonic tests, namely very like (5), like (4), ordinary (3), dislike (2), and dislike (1). Trained panelists presented a questionnaire to assess the five biscuit products based on the parameters of color, aroma,

taste, and texture. The testing method used in this standard is a hedonic test using a range rating scale: very like (5), like (4), ordinary (3), dislike (2), and dislike (1). One of the conditions for receiving the test is that panelists may not know the ingredients used in the product being distributed (single blind design). Samples labeled with random codes.

Hedonic Scale Determination

Interval was calculated by:

$$\% \text{ Score Range} = \frac{100}{\text{the number of scale}} = \frac{100}{5} = 20$$

This means

Very dislike = 0–20%

Dislike = 21–40%

Neutral = 41–60%

Like = 61–80%

Very like = 81–100%

The result of preference test has to be calculated the lowest and the highest score by using the following equation

X : the lowest score (indicator of very dislike) = score

× the number of panelist

Y : the highest score (indicator of very like) = score

× the number of panelist

Data analysis

Data were analyzed using non parametric Kruskal-Wallis test. Then to find out the score of each product analyzed using a Likert Scale.

Results

Table 1 shows that the acceptance of pumpkin seed biscuits by trained panelists based on color and aroma parameters, F1 and F2 were mostly favored by panelists 66.7% respectively. At F3, F4 and F5 most of the reception of trained panelists is accepted and disliked, i.e. 33.3%, 46.7% and 33.3%. Based on taste parameters, F1 and F4 were mostly accepted by trained panelists, which were 46.7% and 53.3%, respectively. At F3 and F4 most of the receipts of trained panelists were accepted and disliked, namely 33.3% and 46.7% respectively. In F5 most of them were very disliked, namely 46.7%. Based on texture, F1 was mostly favored by trained panelists, namely 53.3%. In F2 and F3 most of them were accepted as usual, namely 46.7%. At F4 and F5 most of them are very dislike that is 46.7% and 60%.

Table 2 shows that total acceptance of biscuit products on pumpkin seed flour by trained panelists. Based on all parameters in total, the formulation that has the highest score on color parameters is F2 (70.66%), aroma and texture parameters are F1 (72.0% and 72.3%), and the taste parameter is F3 (74, 7%).

Table 3 shows the acceptance of yellow pumpkin seed biscuits by consumer panelist based on levels of favor. Based

Table 1 Acceptance of biscuit products based on pumpkin seed flour by trained panelists.

| Parameter | Pumpkin seed biscuit formula | | | | | | | | | |
|------------------|------------------------------|------|--------------|------|--------------|------|--------------|------|--------------|------|
| | F1 (20%:80%) | | F2 (40%:60%) | | F3 (60%:40%) | | F4 (80%:20%) | | F5 (100%:0%) | |
| | <i>n</i> | % | <i>n</i> | % | <i>N</i> | % | <i>n</i> | % | <i>N</i> | % |
| Color | | | | | | | | | | |
| Very dislike (1) | 1 | 6.66 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 20 |
| Dislike (2) | 1 | 6.66 | 3 | 20 | 5 | 33.3 | 7 | 46.7 | 5 | 33.3 |
| Neutral (3) | 2 | 13.3 | 3 | 20 | 5 | 33.3 | 7 | 46.7 | 5 | 33.3 |
| Like (4) | 10 | 66.7 | 7 | 46.7 | 4 | 26.7 | 0 | 0 | 2 | 13.3 |
| Very like (5) | 1 | 6.66 | 2 | 13.3 | 1 | 6.66 | 1 | 6.66 | 0 | 0 |
| Aroma | | | | | | | | | | |
| Very dislike (1) | 1 | 6.66 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 20 |
| Dislike (2) | 1 | 6.66 | 3 | 20 | 5 | 33.3 | 7 | 46.7 | 5 | 33.3 |
| Neutral (3) | 2 | 13.3 | 3 | 20 | 5 | 33.3 | 7 | 46.7 | 5 | 33.3 |
| Like (4) | 10 | 66.7 | 7 | 46.7 | 4 | 26.7 | 0 | 0 | 2 | 13.3 |
| Very like (5) | 1 | 6.66 | 2 | 13.3 | 1 | 6.66 | 1 | 6.66 | 0 | 0 |
| Taste | | | | | | | | | | |
| Very dislike (1) | 1 | 6.66 | 0 | 0 | 1 | 6.66 | 2 | 13.3 | 7 | 46.7 |
| Dislike (2) | 0 | 0 | 1 | 6.66 | 0 | 0 | 4 | 26.7 | 5 | 33.3 |
| Neutral (3) | 7 | 46.7 | 5 | 33.3 | 5 | 33.3 | 8 | 53.3 | 2 | 13.3 |
| Like (4) | 4 | 26.7 | 7 | 46.7 | 5 | 33.3 | 1 | 6.66 | 1 | 6.66 |
| Very like (5) | 3 | 20 | 2 | 13.3 | 4 | 26.7 | 0 | 0 | 0 | 0 |
| Texture | | | | | | | | | | |
| Very dislike (1) | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 46.7 | 9 | 60 |
| Dislike (2) | 2 | 13.3 | 2 | 13.3 | 2 | 13.3 | 6 | 40 | 3 | 20 |
| Neutral (3) | 4 | 26.7 | 7 | 46.7 | 7 | 46.7 | 1 | 6.66 | 3 | 20 |
| Like (4) | 8 | 53.3 | 6 | 40 | 5 | 33.3 | 1 | 6.66 | 0 | 0 |
| Very like (5) | 1 | 6.66 | 0 | 0 | 1 | 6.66 | 0 | 0 | 0 | 0 |
| Total | 15 | 100 | 15 | 100 | 15 | 100 | 15 | 100 | 15 | 100 |

Table 2 Total acceptance of biscuit products based on pumpkin seed flour by trained panelists.

| Pumpkin seed biscuit formula | Color score (%) | Aroma score (%) | Taste score (%) | Texture score (%) | Total score (%) |
|------------------------------|-----------------|-----------------|-----------------|-------------------|-----------------|
| F1 (20%:80%) | 69.3 | 72.0 | 70.7 | 77.3 | 72.3 |
| F2 (40%:60%) | 70.6 | 70.7 | 73.3 | 65.3 | 70.0 |
| F3 (60%:40%) | 58.6 | 61.3 | 74.7 | 66.7 | 65.3 |
| F4 (80%:20%) | 44.0 | 53.3 | 50.7 | 34.7 | 45.7 |
| F5 (100%:0%) | 34.6 | 48.0 | 36.0 | 32.0 | 37.7 |

Table 3 Acceptance of yellow pumpkin seed biscuits by consumer panelists based on levels of favor.

| Levels of pleasure | Pumpkin seed biscuit formula | | | | | | | | | |
|--------------------|------------------------------|-------|--------------|-------|--------------|-------|--------------|-------|--------------|-------|
| | F1 (20%:80%) | | F2 (40%:60%) | | F3 (60%:40%) | | F4 (80%:20%) | | F5 (100%:0%) | |
| | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % |
| Very dislike (1) | 1 | 3.33 | 2 | 6.66 | 3 | 10 | 3 | 10 | 6 | 20 |
| Dislike (2) | 2 | 6.66 | 6 | 20 | 3 | 10 | 4 | 13.33 | 6 | 20 |
| Neutral (3) | 8 | 26.66 | 4 | 13.33 | 8 | 26.66 | 9 | 30 | 1 | 3.33 |
| Like (4) | 13 | 43.33 | 14 | 46.66 | 8 | 26.66 | 9 | 30 | 7 | 23.33 |
| Very like (5) | 6 | 20 | 4 | 13.33 | 8 | 26.66 | 5 | 16.66 | 8 | 26.66 |
| Total | 30 | 100 | 30 | 100 | 30 | 100 | 30 | 100 | 30 | 100 |

on consumer panelist acceptance, F1 and F2 were mostly favored by panelists, namely 43.3%. F4 is mostly preferred, namely 30.0% and F5 is very preferred (26.6%).

Discussion

The purpose of the acceptance test is to find out whether a commodity or certain sensory properties can be accepted by society. A commodity or food even though it has a lot of nutrients, but if it is not accepted and not accepted by the community, the food still has no value.⁵ However, there are several aspects that can be assessed, namely perceptions of food taste, nutritional value and hygiene or food hygiene.⁶

Consumer acceptance of a product begins with its assessment of appearance, flavor and texture. Because ultimately what is intended is consumer acceptance, then organoleptic tests using panelists (trained tasters) are considered to be the most sensitive and are therefore often used in assessing the quality of various types of food to measure their storability or in other words to determine food expiration dates. Approaches with organoleptic assessment are considered to be the most practical, more cost-effective.⁷ Acceptance and preferences or consumer preferences, as well as correlations between sensory and chemical or physical measurements can also be obtained by sensory evaluation.⁷

The brown color is caused by the butter roasting process which is a maillard and caramelization reaction. Caramelization occurs when a sucrose solution is evaporated without concentration and the boiling point will bind. If the sugar continues to be heated until the temperature reaches its melting point, it begins to occur in caramelization of sucrose.⁸

The aroma of pumpkin seeds is like the aroma of a rather rancid oil. The higher the concentration of adding pumpkin seeds flour will affect the aroma of biscuits. According to Winarno, taste involves the senses of gut namely the tongue. Sensing of gecko is divided into four main gases, which are salty, sour, sweet, and bitter.⁸

Based on the explanation of the acceptance of the preference level test for consumer panelists and trained panelists, the formula chosen as the best formula is formula 1. This is because the consumer panelists have the highest percentage value among the other formulas. However, considering that formula 1 is superior in aroma and texture attribute parameters, formula 1 is chosen as the best formula. This is also because the assessment of statistical analysis where the three formulas 1, 2 and 3 have the same meaning from each attribute parameter so that by looking at the consumer

panelists who also like formula 1, formula 1 is also chosen as the best choice of trained panelists.

The formula 1 has the highest percentages (74%). Formula 1 and formula 3 have not much different percentage of preference. It indicates that with the addition of pumpkin seed flour by 60% the formula can be accepted and liked by children. The high rate of acceptance of pumpkin seed flour biscuits in formula 1 is due to the least use of pumpkin seed flour than other formulas.

Conclusion

The best treatment out of five treatment based on trained and consumer panelists assessment was the biscuit treatment using 20% pumpkin seed flour. The results of organoleptic by trained panelists showed that there was a significant effect on the acceptability of the five pumpkin seed biscuit product formulas against the four parameters, namely color, aroma, taste, and texture. The test results of preference level by consumer panelists showed that there was no significant effect on the acceptance of the five pumpkin seed biscuit products.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgments

The Ministry of Research and Higher Education of Indonesia funded this study.

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