Sheet Jam Formulation from a Mix of Seaweed and Pineapple Fruit

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Abstract

The aim of this study was to obtain a formula of sheet jam from a mixture of K. alvarezii seaweed and the best pineapple based on organoleptic hedonic sheet jam test. The results of preliminary research for cooking time based on trial and error is 60 minutes so that jam can be made in sheet form. The main research results on the characteristics of a mixture of jam sheets between seaweed and pineapple fruit concluded that the chosen formula was sheet jam with a comparison of seaweed and pineapple material of 1: 2.

Keywords: Sheet jam; K. Alvarezii; pineapple; organoleptic

Introduction

Seaweed is a low-level form of thallus plant (stem) branching, can live in the sea and ponds with depth can still be reached by sunlight. Seeaweed is included in a large group of algae plants that visible with the naked eye without a magnifying tool and benthic can live by attached to a substrate in marine waters (Atmadja 2009 in Sulistijowati, 2009).

Based on pigment containment, seaweed can be divided into classes red algae (Rhodophyceae) which has a dominant pigment fikoeretrin (phycoerethrin) and phycocyanin (phycocyanin); brown algae (Phaeophyceae) which has a dominant fucoxantin pigment; green algae (Chlorophyceae) which has a dominant chlorophyl pigment; and blue-green algae (Cyanophyceae) (Atmadja 2009 in Sulistijowati, 2009).

The seaweed Kappaphycus alvarezii originally known as Eucheuma cottonii. The genus Eucheuma is a popular term in the field of commerce for producing carrageenan seaweed species. The official name for the species Eucheuma cottonii determined based on phylogenetic studies and the type of carrageenan contained in it so changed to Kappaphycus (Doty, 1986). Similarly Syamsuar statement (2007) that Eucheuma cottonii is one type of red seaweed and changed its name to Kappaphycus alvarezii as carrageenan produced include kappa carrageenan fractions, thus taxonomically called Kappaphycus alvarezii. The name "Cottonii" generally known and commonly used in the world of national and international trade.

K. alvarezii seaweed in Indonesia have not been utilized optimally. So far only used as industrial raw materials carrageenan and agar-agar, but the seaweed can also be used as food, feed or medicines (Faqih and Yahya, 1999). In the field of medicine and pharmacy grass is one of the foodstuffs that have also been widely used as materials for health supplements. Seaweed can be added in a wide variety of food products. Examples of food products that use seaweed as an additional ingredien is stick seaweed, seaweed dodol, jam seaweed, seaweed chips and many more, including seaweed crackers (Faqih and Yahya, 1999).

Based on the explanation put forward, in this study, the authors conducted a formulation of jam making seaweed in sheet form with pineapple as additional material. The reason for adding pineapple because butter is generally made from fruit so that consumers are more accustomed to consuming products of fruit jam. The addition of pineapple is also intended to give the jam sheet product the taste of the fruit to be accepted by consumers, while the sheet form choosed because this form is very practical in presentation compared with the jam in typical form. According to Yenrina et al (2009), the making of jam in sheet form is intended to increase the shelf life and value-added products because it is very practical in presentation compared with the jam in a typical form.

Research Methodology

The tools used in the making of sheet jam of mixed seaweed and pineapple are digital scales,

stove, blender, stainless steel pot, thermometer, wooden stirrer, stainless steel blade, plastic basin, and sheet jam mold size 10 x 10 cm. Tools of organoleptic test is the hedonic score sheet and hedonic quality, digital scales, oven, deksikator, balance analytic, scoop samples, porcelain saucer, Kjeldahl pumpkin, measuring cups, pipettes, filter paper, pumpkin fat, electric heating, Crucibe, cotton bells (forceps), containers (plastic / glass), ashing furnace and a 0.3 mm sieve for chemical test. The raw material in the making of seaweed jam sheets are dried seaweed, sugar, fresh water, and pineapple meat. For chemical test material used is K2SO4, H2SO4, HgO, NaOH, HNO3, HCl, N-Hexane, distilled water, petroleum ether, Enzymes termamyl, pepsin, HCl, pankreatin, 2-propanol, butyl hydroxy toluene, tetra butyl ammonium hydroxide, methanol, vitamin C standard solution, ethanol, and ferric chloride.

Preliminary research on the additional material sugar refers to the results of research conducted by Ramadan (2011), which is as much as 90% sugar. Cooking temperature refers to research conducted by Ramadan (2011) and Princess et al. (2013) with a temperature range of 90 - 95^{o}C. However duration of cooking in the making of sheet jam does not refer to the results of their studies because of differences in water content in the material composition of seaweed and pineapple with the composition of the water content in the materials used by Ramadan (2011) and Princess et al. (2013). Cooking duration used in this preliminary study based on trial and error that is for 60 minutes. Cooking for 60 minutes can produce a product the desired jam in sheet form.

Proportion of the composition of the materials used seaweed porridge and gruel pineapple and sugar used in the manufacture of sheet jam is in the treatment of primary research, with a ratio of Seaweed : Pineapple : Sugar, namely Treatment A = 1 : 2 : 90%; Treatment B = 1 : 1 : 90%; and Treatment C = 2 : 1: 90%.

Procedure of major research implementation is based on the design of a study conducted by Ramadan (2011) with little change (modification) by the author. The design of the study was conducted in two stages: the first stage is the stage of making pineapple fruit pulp and seaweed porridge, and the second stage is the formulation of making jam. Determination of the optimal selected products using the index i.e. interest Bayes methods for retrieval of the best decisions by considering various criteria (Marimin in Ramadan, 2011).

Tests were performed on the stage of formulation is the favorite organoleptic test (hedonic) SNI 01-2729.1-2006. A hedonic organoleptic test was conducted to determine the level of consumer preferences towards a product through the assessment of product attributes to seaweed jam sheets. Organoleptic hedonic assessment scale for food products that 1-9 is as follows: 9 = Extremely like; 8 = Very like; 7 = Love; 6 = Somewhat like; 5 = Neutral; 4 = Less like; 3 = Do not like; 2 = Very dislikes; 1 = Extremely dislike.

Data analysis included data analysis organoleptic hedonic jam seaweed sheets and data analysis sheet jam elected. Panelists assessment results obtained from hedonic organoleptic test analyzed using non-parametric statistical methods Kruskal-Wallis test (Walpole, 1993). Organoleptic data analysis was done with the help of the software Statistical Package For Social Science 16 (SPSS 16). If the analysis results obtained significant results further test using the Duncan test to determine any treatment that gives a significantly different effect on the parameters analyzed.

The data obtained from the chemical test (moisture content, ash content, protein content, fiber content, and vitamin C), hedonic organoleptic quality and microbiological quality (TPC) selected products analyzed qualitatively. The data analysis was conducted to determine the hedonic organoleptic quality, chemical quality and microbiological quality of a product jam seaweed sheets elected.

Results and Discussion

Sheet jam organoleptic

Appearence

Histogram of sheet jam organoleptic value on its appearance can be seen in Figure 1.

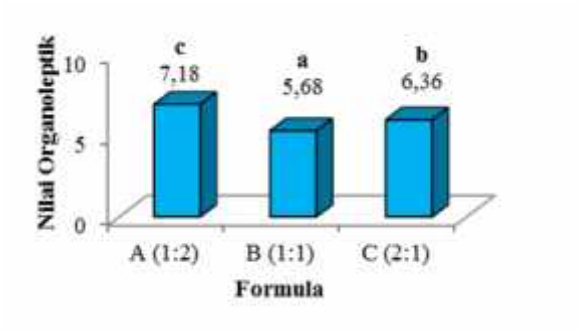

Figure 1 Histogram of organoleptic test results on sheet jam appearance. Values followed by different letters indicate significantly different results (p <0.05).

Kruskal-Wallis test results showed that the appearance of sheet jam of seaweed and pineapple mixture in three formulations showed significantly different results (p <0.05). Further test results with Duncan test, the appearance of the sheet jam product formulation A significantly different from the appearance of the sheet jam formulations B and C, and the appearance of the sheet jam formulation B significantly different from the appearance of formulations C. This is due to differences in the amount of the material composition of seaweed and pineapple meat used, thus affecting the appearance of the sheet jam. The more ingredients of seaweed used, the darker appearance of the sheet jam.

Color

Histogram of organoleptic value on the color of the sheet jam can be seen in Figure 2.

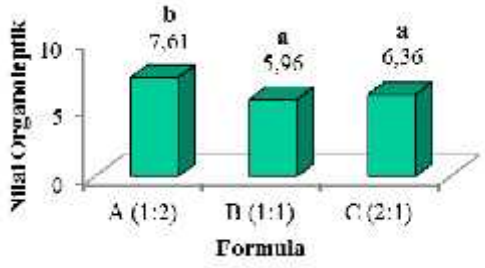

Figure 2 Histogram of organoleptic test results sheet jam color. Values followed by different letters indicate significantly different results (p <0.05)

Kruskal-Wallis test results showed that the color of sheet jam from a mixture of seaweed and pineapple on all three formulations showed significantly different results (p <0.05). Further test results with Duncan test, color formulations A sheet jam significantly different from the color of the sheet jam formulations B and C, while the color of the sheet jam formulation B is not significantly different from the color formulations C. This is due to differences in the amount of the material composition of seaweed and meat pineapple used thus affecting the color of the sheet jam. The more the amount of seaweed used, the color of the sheet jam getting tanned. Conversely the more pineapple fruit ingredients used, the appearance of more and more yellowish sheet jam.

Aroma

Histogram onof organoleptic value sheet jam aroma can be seen in Figure 3.

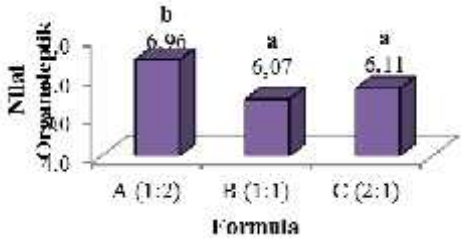

Figure 3 Organoleptic test results on sheet jam aroma. Values followed by different letters indicate significantly different results (p <0.05).

Kruskal-Wallis test results, showing that the sheet jam aromas of a mixture of seaweed and pineapple on all three formulations showed significantly different results (p <0.05).

Further test results with Duncan test, aroma of sheet jam formulations A significantly different from the aroma of sheet jam formulations B and C, while aroma of the sheet jam formulation B is not significantly different from the aroma of formulation C.

Such differences are influenced by the composition of seaweed and pineapple fruit pulp used that affect aroma of sheet jam. The more the amount of seaweed is used, the resulting sheet jam scented seaweed. Aroma seaweed mostly less preferred by the panelists. Conversely the more material used pineapple the more pineapple flavored of sheet jam produced. Panelists generally prefer the scent of pineapple.

Flavor

Histogram of organoleptic value on flavor of sheet jam can be seen in Figure 4.

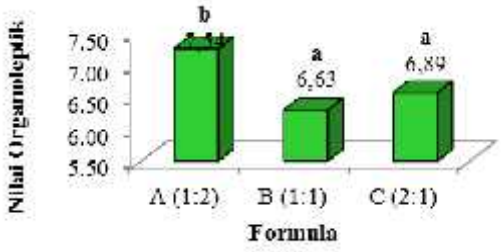

Figure 4 Organoleptic test results of sheet jam flavors. Values followed by different letters show significantly different results.

Further test results with Duncan test, flavor of sheet jam formulations A was significantly different from the flavor of sheet jam formulations B and C, while the flavor of sheet jam formulations B is not significantly different from the taste of jam formulation C. The difference is caused by the amount of seaweed and pineapple meat used thus affecting the taste of jam sheet. The more the number of materials of seaweed used, the jam flavor is influenced by the seaweed sheet. Seeth jam with seaweed taste mostly tend to be preferred by the panelists, while the greater number of pineapple fruit pulp is added, the resulting sheet jam and pineapple taste panelists tend to prefer the scent of pineapple.

Texture

Histogram of organoleptic value on texture of sheet jam can be seen in Figure 5.

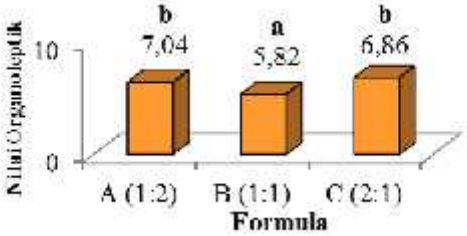

Figure 5 organoleptic test results of sheet jam texture. Values followed by different letters indicate significantly different results ($p < 0$).

Kruskal-Wallis test results show that the texture of sheet jam from a mixture of seaweed and pineapple on all three formulations showed significantly different results ($p < 0.05$). Further test results with Duncan test shows that texture sheet jam formula A significantly different from the texture of the sheet jam formulae B but not significantly different from the texture of the sheet jam formulations C, and the texture of the sheet jam formula B significantly different from formulation C. The texture of sheet jam formulation results can be affected by the composition of seaweed and pineapple fruit meat. Both types of material can affect the shape of the texture of sheet jam. The use of seaweed and meat pineapple have similar characteristics. Although jam sheets having the material composition of more seaweed has higher organoleptic value, not much different from the value of the sheet jam texture dominated by pineapple fruit ingredients.

Determining selected product

The analysis with Bayes method can be seen in Table 1.

Table 1. Results of organoleptic value ranking with Bayes method

Parametres	Samples		
	A (1:2)	B (1:1)	C (2:1)
Texture	0,530	0,265	0,795
Flavor	0,795	0,265	0,530
Color	0,615	0,205	0,410
Appearance	0,477	0,159	0,318
Aroma	0,318	0,106	0,212
Total Value	2,735	1,000	2,265
Ranking	1	3	2

Based on the results the ranking of organoleptic values of the five parameters assessment using Bayesian methods in Table 3, the product is chosen according to the results is formulation A (Ratio of seaweed and pineapple is 1 : 2). Based on the results of the ranking can be said that the formulation A of sheet jam is elected or jam sheet products most preferred by the panelists.

Conclusion

Results of research on the characteristics of the sheet jam mixture of ingredients seaweed and pineapple concluded that the formula chosen in the manufacture of sheet jam is the 1 : 2 composition between the seaweed and pineapple.

References

Ramadhan, W. 2011.Pemanfaatan Agar-agar Tepung Sebagai Texturizer Pada Formulasi Selai Jambu Biji Merah (Psidium guajava L.) Lembaran dan Pendugaan Umur Simpannya, Skripsi.Fakultas Perikanan dan Ilmu Kelautan. IPB, Bogor.

Syamsuar. 2007. Karakteristik Karagenan Rumput Laut Kappaphycus alvarezii Pada Berbagai Umur Panen, Konsentrasi KOH dan Lama Ekstraksi. www.damandiri.or.id/file/samsuaripbbab1.pdf. [22April 2014]

Yenrina R., N. Hamzah, dan R. Zilvia, 2009. Mutu Selai Lembaran Campuran Nenas (Ananas comusus) dengan Jonjot Labu Kuning (Cucurbita moschata).Jurnal Pendidikan dan Keluarga. Padang.