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ORGANOLEPTIC HEDONIC QUALITY AND CHEMICAL ANALYSIS ON STICKS SEAWEED Kappaphycus Alvarezii WITH FORTIFICATION FLOUR REBON SHRIMP (Mysis sp.) Rita Marsuci Harmain1, Faiza Dali2, Winawanti Amrullah3 State University of Gorontalo, Faculty of Fisheries and Marine Science, Jend. Sudirman Street Number.6, Gorontalo City, Post code96128, Telp (0435) 821125, Fax (0435) 821752, E-mail rmarsuci@yahoo.com ABSTRACT Rebon shrimp (Mysis sp.)

is one of the potential of fisheries in Gorontalo province which is on a lake Limboto. Rebon shrimp in the form of flour can be utilized through the fortification of processed products such as seaweed sticks Kappaphycus lvarezii. The research aimed to produce seaweed sticks with fortification rebon shrimp flour was selected based on the test organoleptic quality hedonic include texture, colour, aroma and flavor and chemical. This research was carried out in several stages that is the preparation stage and making flour shrimp and analysis.

The organoleptic hedonic quality test using semi panelist and chemical using Indonesia National Standartd (2006). The data organoleptc hedonic quality that was received will be analyzed used non-parametric statistical method if significantly different Kruskal Wallistes followed by multiple comparation. The results showed that with the fortification of rebon shrimp flour 7.5

% in the organoleptic quality of the panelists preferred heconic value criteria organoleptic appearance intact, neat, clean, somewhat pale yellowish color value of 7.12, rebon shrimp and seaweed scent less value 7,40 , rebon shrimp and seaweed flavor less strong value of 8.40, and dried shrimp and crunchy texture of 8.32 Results of the

chemical quality of the product seaweed sticks has a water content of 1.26%, ash content of 19.84%, 18.33% protein content, fat content of 36.40%, and 24.17% carbonydrate content. Keyword: seaweed sticks K.alvarezii, flour, rebon shrimp Mysis sp, hedonic organoleptic quality, chemical quality PRELIMINARY Diversification of food that originates in the potential of marine fisheries is in addition to exploiting the potential of marine fisheries as well as the fulfillment of the consumption of animal protein.

One of fishery potentials that need to be developed is a type of seaweed Kapapphycus alvarezii be one result of the diversification of food products fortified with fish non rebon (Mysis sp.) In the form of seaweed sticks K.alvarezii. Utilization rebon on seaweed sticks K.alvarezii because rebon always available throughout the season, but is still lacking in diversification of non-processed fish products are generally confined as a flavor enhancer.

Rebon generally marketed already experiencingthe drying process. In addition to the availability of rebon throughout the season also supported by the availability of seaweed K.alvarezii which is one of the excellent potential non-fish fishery resources very rapidly cultivated in the area, especially in Gorontalo Province. Seaweed K.alvarezii and flour rebon on the product stick can add nutritional value especially protein, fiber and minerals besides it can add a distinctive flavor to enhance the value of consumption on the stick product.

Due to the growing stick products is still dominated by raw materials are lacking in nutrients, especially animal protein, minerals and fiber are generally the most widely made extra flour or has a relatively high carbohydrate contet. Another altemative to further enrich the nutritional content of the product that sticks with the addition of seaweed and flour rebon so the need for nutrients, especially animal protein, minerals and fiber, especially during the growth and health care can be met.

According PERSAGI (2009) in Fitriyani et al (2013), the protein content owned rebon very high. At rebon fresh protein 16.2 g and in dried from, namely 59.4 g. In addition to the calcium content of 100 g dry rebon is 2,306 mg (16 times the calcium in cow's milk 100 g), phosphorus content is 625 g and the iron content is 21.4

g (8 times the iron content of 100 g beef), In addition Fitriyani et al (2013) suggested

that rebon susceptible to decay if not handled properly and quickly processed. Therefore the use of rebon that has been processed through the drying process in powder form so it is easy to add to processed products and the products can last long.

So based on that, the purpose of this study is to analyze the organoleptic quality of hedonic based on appearance, aroma, flavor, texture and chemical seaweed sticks K.alvarezii fortified flour rebon. MATERIAL AND METHODS The tools used for the manufacture of seaweed sticks. K.alvarezii fortified flour rebon consisting of scales, pans, knives, cutting boards, mixers, sieve, mixer, blender, display devices, and stove.

Material to be used is seaweed K.alvarezii in a dry form, rebon dry, sticky rice flour, eggs, butter, garlic, onion, flavorings, salt, coconut, milk, vanilla, and cooking oil. Organoleptic test equipment that hedonic quality score sheet.

Testing tools chemical that is oven, saucer porcelain, desiccator, thermometer, digitals scales, forceps, furnaces, timer, hot plate, pipette, distilled water, filter paper, pumpkin destruction, stone boiling, hood, erlenmeyer, distillation steam, pipettes, glass measuring, concentrated H2SO4, HgO, H2SO4, NaOH, Na2S2O3, H2BO3, indicator (a mixture of methyl red and methylene blue), and HCl, flash, soxhlet, measuring cups, petroleum ether.

Research procedur Research procedure includes the stages of research and data analysis. Research stages consist of: Preparation of flour rebon (Mysis sp.) Materials used are rebon fresh from the fish auction place in Gorontalo. Before the manufacture of products stick, firs performent the manufacture of flour rebon based Suarnaya (2012).

Drying was conducted at the Laboratory BPPMHP Gorontalo province. Flow rebon manufactureof flour can be seen in Figure 1. Figure 1. Flow diagram of the manufacture of flour rebon (Suarnaya (2012), which has been modified Preparation of seaweed sticks with the addition of flour rebon (Mysis sp.) Is based on trial and error Fromulation use of the material composition in the manufacture of flour rebon seaweed sticks K.alvarezii done by trial and error.

Material composition K.alvarezii seaweed and spices used can be seen in Table 1. The composition of seaweed and spices Table Material Composition _Compisition

_Percentage _ _Seaweed K.alvarezii _19 g _10 % _ _Glutinous rice flour _100 g _47,84 % _ _Sugar _60 g _28,70 % _ _Egg _27 g _12,92 % _ _Coconut milk _0,87 g _0,42 % _ _Margarine _0,32 g _0,15 % _ _Garlic _0,77 g _0,37 % _ _Red Onion _0,77 g _0,37 % _ _Vanilla _0,32 g _0,15 % _ _Description: % concentration = Total material x number % concentration Source: Dangkua (2013), which has been modified The procedure of making stick for seaweed concentration K.alvarezii based on the best research conducted by Dangkua (2013), while the concentration rebon flour were added in the manufacture of sticks is 5%, 7.5%, and 10%.

Grass pulping flow diagram is shown in Figure 2. Figure 2. Flowchart of making porridge seaweed K.alvarezii (Dangkua, (2013) Sticks made consists of 3 formulations rebon concentration of 5%, 7.5%, and 10% and the concentartion of seaweed used fixed at 10%. Seasoning mashed, whipped eggs and sugar using a mixer.

Once mixed evenly with seasoning, put glutinous rice flour, vanilla, coconut milk, margarine, and salt to taste and stir until blended. Once the dough is evenly mixed, then molded by using a printer, and fried at a temperature of 170o C for 3 minutes. Then analyzed organoleptic stick products, and products will be analyzed chemically. Chronology of the research process can be seen in Figure 3.

The data analysis consist of Organoleptic analysis quality hedonic Hedonic quality organoleptic test parameters is the appearance, colour, texture, aroma and flavor. Hedonic quality scale used is worth 1-9, the number of panelist 30-36 semi-trained and materials presented at random (BSN 2006). Sensory test results were analyzed by non-parametric statistic Kruskal-Wallis method.

If the results obtained are significantly different to do furthe study using Multiple Comparison test or Duncan's test (Meilgaard et al. 1999). Texture all observational data analysis and organoleptic value are tabulated and statistically processed using SPSS 16 software. determination of selected products by using an index that interest Bayes methods.

Bayes method is one technique used to analyze the decision making the best of a number of alternatives with the aim of producing an optimal acquisition or best result. Optimal desicion making will be achieved when considering various criteria (Marimin

2004). Before analysis by Bayes method, performed to rangk on several parameters observed with interes the referenced index based on previous studies on snack products and according to experts. Based on these sources, the interests of the selected criteria adapted to the type of research conducted.

The characteristics and value of the interests of sticks of seaweed is added to the flour rebon seen in Table 2. Table 2. characteristics and value the importance of seaweed sticks K.alvarezii added flour rebon. Number _Parameters _Basic Parameters Consideration _value _ _1 _Texture _a good stick products is having a savory flavor and crunchy texture that is preferrend by everyone (Suarni, 2009). –changes in the texture of the material can affect the speed of the onset of stimulation to the cell receptor (Winarno, 1997).

_5 _ _2 _Taste _Taste is a very important parameter in determining the level of consumer acceptance of food products (Erawaty, 2001). - Pain is one of the factors which determine consumer decisions to accept or reject a food product (Astawan, et al., 2004). _5 _ _3 _Appearance _One organoleptic seen by consumers as a whole, in general, consumers choose foods that have attractive appearance (Jusuf, 2011) _4 _ _4 _Color _Color is one of the factors that determine visual acceptance of a product (Winarno, 2008) _3 _ _5 _Aroma _Aroma determine the level panelists acceptance of a product.

Typical aroma good or very influential on consumer tastes (Josep, 2011) _2 _ _ Chermical analysis include water content, ash content, protein, fat and carbihydrates to follow procedures based on the Indonesian National Standard (BSN 2006). RESULTS AND DISCUSSION Determination of selected products the three formulations seaweed sticks fortified flour rebon was analyzed with Bayes method.

Bayes methods used to produce the optimal decision to consider using various criteria (Marimin, 2004). Parameters that are considered important to the product K.alvarezii seaweed sticks with the addition rebon is the texture, flavor, appearance, color and aroma last. The analysis with Bayes method can be seen in Table 3. Table 3. Results of rangking organoleptic value Bayes method parameters _Sample _ _ _A (5%) _B (7.5%) _C (10%) _ _Texture _0,350 _0,795 _0,265 _ _Taste _0,350 _0,795 _0,265 _ _Color _0,615 _0,410 _0,205 _ _Appearance _0,318 _0,477 _0,159 _ _Aroma _0,106 _0,318 _0,212 _ _Total Value _2,099 _2,795 _1,106 _ _Ranking _2 _1 _3 _ _ Based on the results of rangking

organoleptic value of the fifth parameter assessment using Bayesian methods in Table 3, the product is chosen according to the results of rangking formulation B, namely seaweed sticks with the addition of flour rebon 7.5%.

Based on the results of the of rangking can be said that sticks seaweed formulation B is selected product or sticks of seaweed K.alvarezii rebon most preferred by the panelists. Appearance characteristics and ahemical uality hedonic K. alvarezii seaweed stick flour shrimp Rebon Selected The results of chemical analysis and organolpetic quality of seaweed stick K.alvarezii rebon alacted flour can be seen in Table 4. Tabel 4. Results of chemical analysis and organoleptic quality of seaweed sticks K.

alvarezii flour rebon Criteria Testing Terms _Results _Quality Snacks Extrudate (BSN, 2000) _ _Organoleptic Appearance Aroma Taste Texture Water content Ash Protein content Fat content Carbohydrate _ Intact, neat, clean, color rather pale yellowfish Aroma shrimp and grass sea less taste shrimp and grass less Powerful sea Dry, Crisp 1.26% 19.84% 18.33% 36.40% 24.17% _ - Normal Normal - Max 4% - Max 38 % - _ _ Organoleptic analysis of the results of the hedonic quality seaweed sticks K.alvarezii fortified flour rebon elected conducted to determine the quality of seawed sticks chosen based on the criteria of appearance, aroma, flavor, and texture.

The results of the analysis based on assesment of the panelists described as follows. Appearance Organolpetic analysis of the results of the hedonic quality seawed sticks K.alvarezii fortified flour rebon obtained value of 7.12 with the criteria intact, neat, clean, somewhat, pale yellowfish color/somewaht dark. Rather pale yellowfish color/somewaht dark due to the addition of flour rebon.

Yellowfish color due to the frying process. The tendency to form this color is caused by a group of proteins. According Kusnandar (2011), the phenomenon of color change on fod caused by compounds containing amine groups (amino acids, proteins, or other compounds that contain amine groups). This is consistent with the findings that protein in shrimp can affect the formation of color on seaweed sticks K.alvarezii fortified flour the rebon.

Aroma Organoleptic analysis of the results of hedonic quality seaweed aroma K. alvarezii fortified flour rebon obtained value of 7.40. The appropriate range of values, criteria

seaweed K. alvareziifortified flour rebon that is slightly scented shrimp sticks. Shrimp scent is derived from flour rebon raw materials used in the manufacture of seaweed sticks K. alvarezii. Aroma shrimp affect the taste of seaweed sticks.

According Astawan et al. (2004) taste very decisive difference in assessment of food product. This is because the taste response by the sense of taste and flavor is an interaction between the aroma, taste and texture of food. According to Winarno (1997), the texture and consistency of the material will affect the flavor caused.

Changes in the texture of the material can alter the taste and aroma that arises because it can affect the speed of the onset of stimulation of the receptor cells. Flavor Stick seaweed K. alvareziifortified fluor rebon analysis results for the taste value of 8.40 was obtained. The corresponding values can be said that the criteria seaweed sticks have a taste of shrimp and seaweed that is less strong.

Results of research conducted by Dangkua (2013), sticks seaweed without the addition rebon has a savory taste, the taste is influenced by the composition of the constituent ingredients in the formulation seaweed sticks. Some components in the formulation which is considered as a contributor to the taste of seaweed sticks are margarine, coconut milk, garlic onion.

Margarine and milk is a source of food containing vegetable fat, vegetable fat will help improve the taste of the product. Garlic and shallots is a component of the spice, which contains compounds that act alicin provide tasty and savory flavors in food. Winarno such statement (1997) that the taste is influenced by several factors: chemical, temperature, concentration and interaction with other flavor components.

The onset of response is not the same for different flavors. Texture Results of the analysis of seaweed sticks K. alvareziifortified flour rebon texture value of 8.32 was obtained. The corresponding values can be said that the stick has a dry and crunchy texture. Texture of the crunchy seaweed sticks due to high carbohydrate content in seaweed sticks and also due to the moisture content slightly.

Carbohydrate content is affected by the base material making up the sticks and the seaweed and sticky rice flour. The composition of the carbohydrates that make the

crispness of a product is amylopectin. Atmaja (2006) suggests that amylopectin role in the process of blooming, crisp and crunchy when frying.

According Indriyani (2007), in shaping the texture of seaweed fortified products have the ability to bind high water with no assistance so that the heating will trap other components and form a matrix that makes the structure more compact sticks. Chemical Characteristics of Seaweed Stick Flour Shrimp K. alvarezii Rebon Selected Water content Results of the analysis of the water content of seawed sticks K.alvarezii fortified flour rebon ie 1.26% while the restrictions set by BSN (2000) imposes limits snacks extrudate moisture content up to 4%. Based on these limits, the water content of seaweed sticks K.alvarezii fortified flour rebon meet the quality standarts of the water content of snacks extrudate.

According Suprapti (2003), the measurement of water content is very important in the diet. Measurement and determination of moisture content aiming to determine the maximum limit or range of the amount of water the content in the material. The water content of the sticks of seaweed derived from seaweed porridge water.

After experiencing the process of kneading and frying, partially undergo evaporation of water content. Fellows in Nendisa (2012) states that the water content of a food is very influenced by the treatment process. High and low water levels seaweeds sticks rebon depend on the frying process.

When the product stick frying, the water content in the sticks undergo eveporation due to heat frying oil. Adawyah (2008) state that when frying starts, hot steam flows covering the surface of the material will increase the pressure of water vapor that cause the movement of water diffusion from the material to the surface, eventually after water reduced material water vapor pressure will decrease until there is a balance to surrounding air. Results of research conducted by Dangkua (2013) in particular sticks that use seaweed to 10% moisture content of 1.73%.

The amount of water content is higher than water content of seaweed sticks with the addition of flour rebon 7.5%. It is influenced by rebon added flour and stick to water holding capacity. According Sipayung et al. (2014) the higher the use of soybean flour cookies then the water content will increase and the higher use of flour rebon cookies

then the water content decreases.

According Kusnandar (2011) water in food can be between cells, is trapped in the cell, or bound to a compound contained in the food. The degree of attachment of water will affect the role of water in chemical reaction. The presence of water in food is expressed in the form of water content. Abu Levels Results of the analysis show that the ash content of seaweed sticks K. alvarezii fortified flour rebon is 19.84%.

The high value of the ash content of seaweed sticks K. alvareziirebon derived from fresh seaweed ash content that is 22.25%, and flour rebon added. Rebon fluor drying at 60 °C and seaweed stick frying rebon at temperature of 17 °C also lead to high value ash content on the stick, this is due to the increasing temperature drying frying, the water content decreases as more ad more residue left in the material.

This is consistent statement Suseno Susanto (1994) in Sipayung et al. (2014) that the water content of dried foodstuffs will decline and lead to a higher concentration of materials left behind one mineral. Minerals are classified as inorganic nutrients called ash elements in food, because it turns out if food is burned, the organic element will disappear and organic matter (ash) remains consist of mineral (Sipayung et al. 2014).

Sudarmadji (1997), said that the components of the ash will easily decompose or evaporate even at elevated temperatures. Protein levels Results of the analysis showed that the protein content of seweed sticks K. alvarezii fortified flour rebon ie 18.33%. The addition of flour rebon in manufacturing seaweed sticks causes the protein composition becomes high.

High levels of protein derived from wheat flour rebon rebon because it contains protein as much as 59.40%. Fat Content Far or oil is a very important food subtances transform and maintain the body's immunity and resistance. Besides fat is a source of energy more effectively than carbohydrates and proteins. The fat content of seaweed sticks K.alvarezii fortified flour rebon is 36.40%.

The fat content is lower than the quality requirements snacks extrudate is a maximum of 38%, so that the fat content in seaweed sticks K. alvarezii flour rebon meet quality standards snack extrudate. Research conducted by Dangkua (2013) that the fat sticks of

seaweed whitout the addition of flour rebon fat by 39.11%.

the fat content higher than the fat content of seaweed sticks were added flour rebon. Dhanapal et al. (2012) in Sipayung et al. (2014) stated that the depreciation levels of fat in fish or shrimp that have undergone the process of drying is mainly caused by the loss of tissue fluid during the heating process.

According to Gurr (1992), the heatinf will accelerate the movements of molecules of fat, so the distance between the fat molecules to be great and will facilitate the process of spending the fat. The process is influenced by the processing temperature and duration of heating. Besides fat content derived from seaweed sticks K.alvarezii fortified flour rebon also derived from used cooking oil when fryin.

During the frying process, the oil goes into part of the crust (the outer surface) and the outer layer (outer zone) so that it fills the empty space that was originally filled by water. Fat content also can improve the physical structure such as depelopment, softness, texture, and aroma. Carbohydrate levels Results of the analysis of carbohydrate content of seaweed sticks K.alvarezii fortified flour rebon is 24.17%.

The carbohydrate content is derived from seaweed used. Seaweed carbohydrate content based on research results Cahyani (2011) is as much as 33.30%, while the results Astawan (2009) in Sipayung (2014) reported the rebon flour contains only 3.20%. The use of seaweed in this study can increase the amount of carbohydrate in seaweed sticks K.alvarezii Fortified four rebon.

The use of seaweed in the manufacture of sticks of seaweed of sticks K.alvarezii rebon effect on carbohydrate content of sticks. Results of research conducted by Dangkua (2013) reported that sticks seaweed without adding flour contains carbohydrates rebon by 56.52%. The higher carbohydrate content than the sticks of seaweed is added flour rebon.

The use of flour rebon can reduce the carbohydrate composition of seaweed sticks, in contrast with only sticks made from seaweed. This condition is caused by a growing number of other components such as fat and protein as carbohydrate obtained from the reduction of the nutrional components, this leads to significant differences in

carbohydrate.

CONCLUSION Based on the test results Obtained hedonic organoleptic quality of that products sticks seaweed K.alvarezii fortified flour rebon of 7.5% is a product of the selected formulations with organoleptic quality hedonic value the results Showed that with the fortification of flour shrimp rebon 7.5% in the organoleptic quality of the panelists preferred hedonic value appearance intact organoleptick criteria, neat, clean, somewhat pale yellowfish color value of 7.12%, shrimp and seaweed scent rebon less value 7.40, rebon shrimp and seaweed flavor less strong value of 8:40, and dried shrimp and crunchy texture of 8:32.

Results of the chemical quality of the product of seaweed sticks has a water content of 1:26%, ash content of 19.84%, 18:33% protein content, fat content of 36.40%, and 24.17% carbohydrate content.

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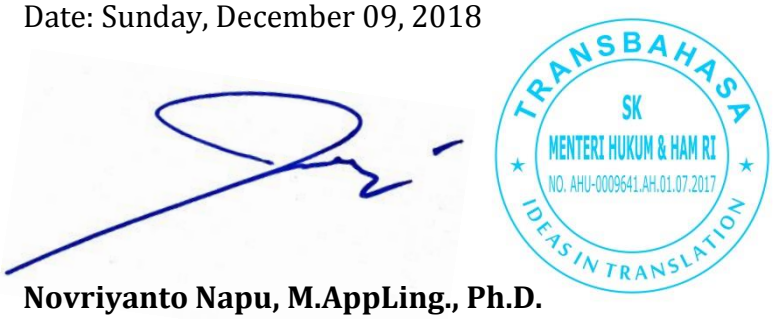

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