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Artikel

Nyonya Bening: Innovation of Crispy Chips Based on Ganyong (*Canna discolor L*) Enriched with Nutrients “Sayur Bening” as a Companion Food for Pregnant Women with Lachanophobia

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ABSTRACT

Lachanophobia is a specific phobia characterized by an excessive and irrational fear of vegetables. Pregnant women may experience lachanophobia, or an excessive fear of vegetables, due to several psychological and physical factors specific to pregnancy, such as hormonal changes, morning sickness, negative experiences and perceptions, and pregnancy-related anxiety. Lachanophobia especially in pregnant women has a significant impact on the health and mother and the development of the fetus she is carrying. This study aims to obtain a crispy chip brownie formulation made from *Canna discolor L* enriched with clear vegetable nutrients to be developed into complementary foods that can fulfill nutrients for pregnant women with Lachanophobia. This research uses the experimental method of raw material formulation as well as through organoleptic tests to determine public acceptance. The best formula is a formula that can produce Brownis Crispy Chips of *Canna discolor L* tubers “Sayur Bening” in accordance with the criteria reviewed based on aspects of taste, aroma and texture that can be accepted by the community, especially pregnant women. Based on the formulation test, formula 3 is the best formula that produces products with the appropriate level of crispness, good taste without bitterness, and a pleasant aroma without the typical vegetable aroma. Based on the organoleptic results of 15 panelists, including 10 non-pregnant women and 5 pregnant women, Crispy Chips “Vegetable Clear” Brownis can be accepted by the public, including pregnant women. Crispy Chips “Sayur Bening” is expected to support local food diversification in Indonesia, improve food security, support sustainable agriculture, and improve the welfare of local farmers, also in line with the goals of the SDGs program.

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INTRODUCTION

Lachanophobia in pregnant women is a condition where a pregnant woman experiences an intense or morbid fear of vegetables. While it may sound uncommon, this condition can have a significant impact on a pregnant woman's health and nutrition as well as the development of her unborn child. When a pregnant woman experiences lachanophobia, she may find it difficult to meet her optimal nutritional needs due to the avoidance of healthy, nutrient-rich foods found in vegetables. Concerns related to this condition can also increase the stress levels of the expectant mother, which can negatively affect her pregnancy as well as her mental health. Lachanophobia disorder in pregnant women is not trivial. In addition, lack of proper nutrition in pregnant women can potentially increase the risk of pregnancy complications, such as premature birth, low birth weight, or other developmental problems in the fetus (Antony and Barlow, 2010).

Canna discolor L tubers are one type of root crop that has great potential as a local food in Indonesia. *Canna discolor* L tubers have long been consumed in various regions in Indonesia. This plant is quite easy to find and thrives in various types of soil, especially in tropical regions such as Indonesia. The nutritional content of *Canna discolor* L tubers is very rich in nutrients such as complex carbohydrates, fiber, protein, vitamins, and minerals, so it can provide additional energy so that it can meet daily nutritional needs. *Canna discolor* L tuber plants have good adaptation to dry environmental conditions, so they can be an important food source during the dry season. This strengthens the role of *Canna discolor* L tubers as a reliable food source in areas with tropical climates (Subagio and Sumardiyono, 2003).

The existence of the *Canna discolor* L tuber plant has great potential as a substitute for wheat flour in Indonesia. Apart from its good nutritional content, *Canna discolor* L tubers can also be processed into *Canna discolor* L flour which can be used as a substitute for wheat flour in making bread, cakes, noodles, and various other processed products. This shows the flexibility and potential of *Canna discolor* L tubers in replacing wheat flour in various food recipes. In addition, it can also open up new opportunities in the local food industry as well as provide benefits for health and the environment.

Sayur Bening are a popular dish in Indonesia. Sayur Bening can be customized with available ingredients and can combine various vegetables according to what is available at home. The ingredients are simple and the taste is delicious, often the choice of pregnant women in their daily diet. By using spinach that we can find in the yard, sweet corn that we can easily get at the vegetable seller, carrots, and *Boesenbergia rotunda* as spices that characterize clear vegetables, in addition to easy and fresh taste Sayur Bening also have rich vitamins.

Spinach is a vegetable that has a high iron content which can be useful for preventing anemia. Spinach is also a source of calcium, vitamin A, vitamin E and vitamin C, fiber, as well as betacarotene and is a vegetable that is easily available anywhere (Rukmana, 2006). Sweet corn is very good for health because it has a low glycemic index that is beneficial for maintaining blood sugar stability, besides that sweet corn contains carbohydrates (sugar, dietary fiber), fat, protein, volatile acids, vitamin A, vitamin C, magnesium, and potassium so it is good for pregnant women as a solution to reduce sugar and foods with other artificial sweetener content to minimize the risk of large birth babies. Carrots are a rich and complete source of nutrients. Besides being known as a source of pro-vitamin A (beta-carotene), it also contains a variety of other important nutrients such as Protein, Carbohydrates, Phosphorus and Vitamin C. *Boesenbergia Rotunda* spice is widely used and found in traditional medicinal herbs. Apart from being a spice, it is also used for medicines, such as for the treatment of skin diseases, diseases related to the respiratory tract, sinusitis, asthma, phlegm, abdominal pain, constipation, swelling, rheumatism, hepatitis, eye pain, and treatment of women after childbirth (Dalimarta, 2003; Wu, 2002). *Boesenbergia rotunda* spice contains antibacterial, anti-inflammatory, analgesic, antipyretic, antitumor, anti-HIV, and antioxidants.

Based on the dangers caused by the psychological disorder Lachanophobia, as well as an analysis of the nutritional content of a portion of sayur bening, we have a new breakthrough in providing innovative side dishes for pregnant women. This sweet-tasting light snack with the name Crispy Chips is enriched with sayur bening nutrition in it. Crispy Chips with enriched "Sayur Bening" nutrition is an alternative side food product that contains high iron, carbohydrates, and fiber needed by pregnant women with Lachanophobia. Crispy Chips in the form of thin Brownis cookies with *Canna discolor* L tuber flour as raw material can be a careful step in the local food diversification program.

METHODS

The research method is a technique or method used in research activities so that the implementation and results of the research can be scientifically accounted for. The research used is experimental research. Experimental research is research used to examine an object by conducting a real experiment in the field (Arikunto, 2006). This research was conducted through experiments in making Brownis Crispy Chips which were adjusted to the right amount of ingredients, so that the final product of Brownis Crispy Chips "Sayur Bening" met the criteria.

Research on the process of making Brownis Crispy Chips "Sayur Bening" was conducted in Candimulyo Village, Dolopo District, Madiun Regency. In the first stage, the process of making spinach flour and *Canna discolor* L flour. Spinach flour is made by first washing it, then steaming it until it wilts, then drying it in the sun. Similar to making spinach flour, *Canna discolor* L flour also goes through the same process as spinach flour. After the washing process, the *Canna discolor* L is thinly sliced and then dried under the sun for approximately 2-3 days depending on the intensity of the sun's heat.

The ingredients needed to make Crispy Chips "Sayur Bening" are *Canna discolor* L tuber flour, margarine, eggs, corn juice, dates, and *Boesenbergia rotunda*, carrot powder, milk powder, spinach flour, cocoa powder, cornstarch and salt. The tools used in making Crispy Chips "Sayur Bening" include whisk, oven, basin, blender, and other stirring tools. In the first stage, mix 1 egg, 4 tbsp corn juice, dates, keys, and carrots then beat until foamy. The next step is to add the chocolate bar solution and melted margarine, stirring until evenly distributed. Then add all dry ingredients such as *Canna discolor* L tuber flour, milk powder, spinach flour, cocoa powder, and a pinch of salt and stir until evenly distributed. The dough is then poured on a baking sheet that has been lined with parchment paper. Then add toppings according to taste and in the oven for about 25 minutes.

Sensory testing, also known as organoleptic testing, has been used since humans began using their senses to assess the quality and safety of food and beverages. Human preferences play a vital role in the acceptance and value of a product (Setyaningsih et al, 2010). Items that receive positive sensory feedback by meeting and satisfying consumer expectations are considered to have high sensory quality. Data collection was obtained from the results of filling out questionnaires based on three different samples and three evaluation aspects: taste, texture, and aroma.

The consumer panel for the "Crispy Chips Nyonya Bening" product consisted of 15 panelists, including 10 non-pregnant women and 5 pregnant women. The panelists filled out questionnaires according to instructions for the Crispy Chips product, indicating whether they liked or disliked it using a scoring scale from 1 to 5.

Tabel 1. Categories

No	Skala	Kategori
1	5	Very Good
2	4	Good

3	3	Okay
4	2	Bad
5	1	Very bad

RESULTS AND DISCUSSION

The result of this research is the Crispy Chips “Sayur Bening” formula then tested for quality from the aspects of taste, aroma, and texture. In the experiment of making Crispy Chips “Sayur Bening”, three formulas were used to test the quality and success of the Crispy Brownies product. The three formulas included differences in the composition of milk powder and Canna discolor L flour.

Table 2. Formulation of Crispy Chip Canna discolor L with “Sayur Bening” Nutrition

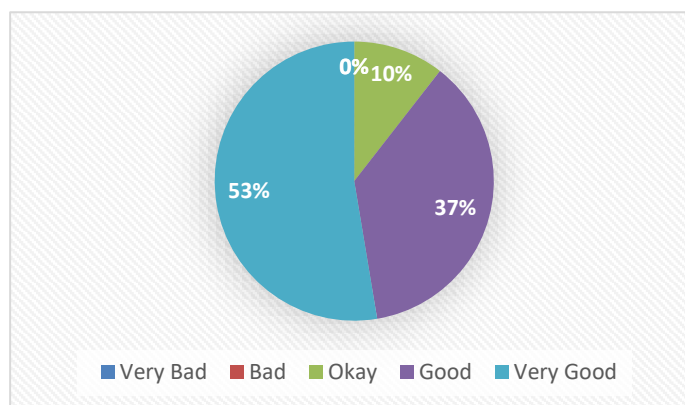
Jenis Bahan	Formula 1	Formula 2	Formula 3
Canna discolor L tuber flour	15 gram	20 gram	10 gram
Cornstarch	20 gram	15 gram	10 gram
Spinach powder	10 gram	10 gram	10 gram
Milk powder	15 gram	10 gram	20 gram
Product characteristics	Solid, crispy, not bitter	Crumbly, crispy, not bitter	Chewy, sticky, not bitter



Picture 1. Crispy Chip enriched with nutrients Sayur Bening

The sensory quality testers used were taster assessors totaling 15 people who assessed the quality of Crispy Chips “Sayur Bening” consisting of 10 people in normal conditions and 5 pregnant women. The data obtained was then analyzed so that conclusions were obtained on the quality test of Crispy Chips “ Sayur Bening ”. The quality of Crispy Chips “Sayur Bening” is seen from the aspects of taste, aroma, and texture using 3 levels of hedonic quality scale with categories of good, sufficient, and less. The results of the Crispy Chips “Sayur Bening” quality test in terms of taste, aroma, and texture obtained from 15 raters are in the good category.

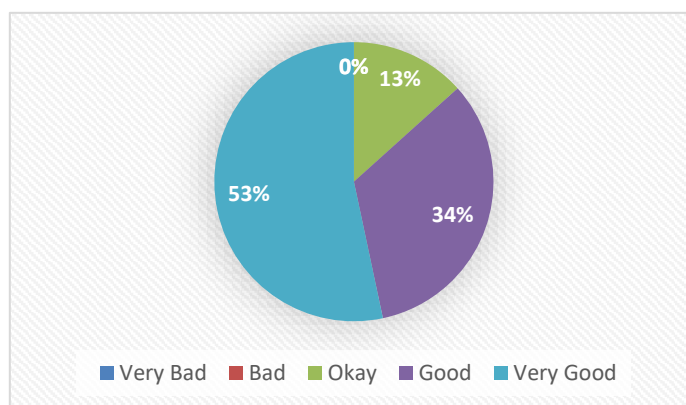
- a) The quality of Crispy Chips “Sayur Bening” from the aspect of taste.
- Taste is the impression obtained by the sense of taste, namely the tongue that tastes like sweet, bitter or sour. In terms of the quality of good pastry flavor, Crispy Chips “Sayur Bening” is in the good category and in accordance with the benchmark, namely sweet. Based on the organoleptic data recap on taste, 20% of respondents indicated that the flavor of Crispy Chips was acceptable, as they found the innovation intriguing. Meanwhile, 27% said the taste was good, noting that the brownie flavor matched that of other brownies available on the market. Additionally, 53% stated the taste was excellent, highlighting it as a new innovation worth further development, with a delicious flavor and complex nutritional value. They also felt the Crispy Chips innovation was highly beneficial.



Picture 2. Diagram of diagram of organoleptic test results on taste aspect

b) The quality of Crispy Chips "Sayur Bening" from the aspect of aroma

The aroma of a food is one component that affects the attractiveness of consumer interest in a product. Judging from the quality of the aroma of good pastries, Crispy Chips "Sayur Bening" is in the good category and in accordance with the specified benchmark, namely the aroma of a typical Brownie cake. Based on the organoleptic data recap on taste, 13% of respondents indicated that the flavor of Crispy Chips was acceptable, noting a slight vegetable taste. Meanwhile, 34% said that the aroma of Crispy Chips was similar to that of other chips on the market. Additionally, 53% stated that the aroma was very fragrant, with dominant notes of bread and chocolate rather than vegetables, making it appetizing and enticing for snacking.

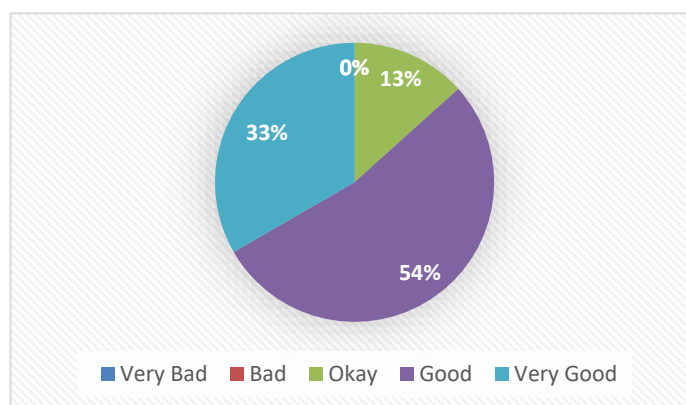


Picture 3. Diagram of diagram of organoleptic test results on taste aspect

c) The quality of Crispy Chips "Vegetable Bening" from the aspect of texture

Texture is the value of touch on a surface whether it is rough, smooth, soft and hard on a product. Judging from the quality of the texture of good pastries, Crispy Chips "Sayur Bening" is in the good enough category and in accordance with the benchmarks, namely crispy and sturdy. Based on the recapitulation of organoleptic data regarding texture, 13% of respondents stated that the texture of the Crispy Chips was acceptable, noting a slight vegetable texture. Meanwhile, 33% mentioned that the texture of Crispy Chips was similar to other crispy chips available on the market. Additionally, 54% of respondents described the

texture as soft and crunchy, as it felt light and not hard when bitten, making it suitable for consumers of all ages.



Picture 3. Diagram of diagram of organoleptic test results on taste aspect

With the potential success of the Crispy Chips “Sayur Bening” product, it can be the right step in overcoming the problem of Lachanphobia in pregnant women (Faridah, 2014). The sweet and crispy taste and texture of Crispy Chips “Sayur Bening” can be a snack that contains complex nutrients, especially for pregnant women who are active. So that by consuming Crispy Chips “Sayur Bening” can support nutritional intake for pregnant women.

The use of *Canna discolor* L in the Crispy Chips “Sayur Bening” product is one of the efforts in increasing the diversity of food consumption in Indonesia. Efforts to include the *Canna discolor* L food program into the daily diet, the community will gain access to diverse sources of nutrition, help reduce dependence on certain types of food, and increase food security. The local food diversification program by utilizing *Canna discolor* L can also be a means to empower local farmers. By providing training on *Canna discolor* L cultivation, product processing, and marketing, local farmers can increase their income and create jobs in rural areas.

By optimally utilizing the potential of *Canna discolor* L, local food diversification programs in Indonesia can successfully improve food security, support sustainable agriculture, and improve the welfare of local farmers (Rahmat, 2020). Local governments and related institutions especially in East Java can provide support in the form of policies, training, and technical assistance for the development of *Canna discolor* L farming. These measures will assist farmers in increasing production and marketing of *Canna discolor* L products. By utilizing the existing potential and support from various parties, *Canna discolor* L have bright prospects in supporting food security, farmers' welfare, and the development of the food industry in East Java.

Crispy Chips “Sayur Bening” products can be used as creative ideas for the community. Due to the abundant availability of raw materials, and the unique composition of the product has a higher economic value than other processed pastries. In terms of crunchy texture, Crispy Chips “Sayur Bening” products can be stored in dry and airtight containers to maintain the crunchy texture. Market Crispy Chips “Sayur Bening” is not only intended for pregnant women who experience Lachanophobia but also for children who are difficult to eat vegetables and adolescent girls who have menstruated, because there is a nutritional profit in the form of iron (Fe) contained in Crispy Chips “Sayur Bening”.

In addition to being in line with the local food diversification program, the Crispy Chips “Sayur Bening” product innovation is also in line with the goals of the SDGs program. Local food diversification programs, such as the development of food potential utilization of *Canna*

discolor L in East Java, are closely related to the Sustainable Development Goals (SDGs). The development of the food potential of *Canna discolor* L can increase the income of farmers and communities in the East Java area, thus potentially reducing poverty levels, which is in accordance with the first goal of the SDGs. In addition, it cannot be denied that the second SDGs goal is also closely related to the local food diversification program by utilizing *Canna discolor* L, so this step can increase the availability and accessibility of quality food for the people of East Java. This helps in reducing hunger and malnutrition.

CONCLUSION

Crispy Chips with enriched nutritional content "Vegetable Bening" is an alternative side food product that contains high iron, carbohydrates, and fiber needed by pregnant women with Lachanophobia. Lachanophobia is not good for fetal growth and can result in optimal nutritional deficiencies. Crispy Chips is also safe because the manufacture does not use any artificial sugar at all. Crispy Chips in the form of thin Brownis cookies with *Canna discolor* L flour as raw material can be a careful step in the local food diversification program, the Crispy Chips "Sayur Bening" product innovation is also in line with the goals of the SDGs programs.

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