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Creative Products from Cassava Peel Waste to Be Delicious and Nutritious Snacks, Desa Sukamanah, Megamendung District, Bogor Regency

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A B S T R A C T

Starting from concerns about cassava skin waste and utilizing materials that are around, the villagers Sukamanah, Megamendung District, Bogor Regency, through this community service, dares to innovate by processing unused food ingredients into a type of product with high economic value. Cassava has long been used as food for the people of Indonesia. Especially in the land of Sunda, cassava has its own place on a par with rice. The tubers, which are usually used as food, are processed by boiling, frying and steaming. Usually the cassava that is to be processed is only targeted at the tubers, while the skin discarded because they are considered waste and can no longer be used. Through this activity, they are finally able to use cassava peels to become a light snack that is delicious to eat and has a sale value. Cassava skin is made into other processed products in the form of chips Crispy cassava skin from waste is made into delicious and nutritious snacks.

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INTRODUCTION

Service is one of the Tridharma of Higher Education which is mandatory to implement in order to apply research results directly to the community. One form of community service that is carried out is counseling and training in making chips from cassava peels that are delicious and have a sale value . Cassava skin chips are a form of food diversification made from cassava peels which have good nutritional value so that they can be used as healthy snacks for families. The community service carried out in Sukamanah Village, Megamendung District, Bogor Regency with material for making cassava peels into Chips as a healthy family snack because it is in accordance with the potential of the area that produces cassava and there are already several household businesses making cassava chips, so that the cassava skin waste that is produced when processed will be more economically valuable. Based on the results of the dedication that has been carried out, this cassava peel chip product is quite accepted by the community as seen from the results of the hedonic test and is feasible to be made into a business based on the results of an analysis of economic calculations.

Garbage is a problem faced by all countries in the world. Not only developing countries, but also developed countries, waste is always a problem. The problem caused by waste is a very serious problem in developing countries like Indonesia. This problem has even become a social, economic, and cultural problem. The increasing population and the development of industries in Indonesia have caused the increase in waste production to become increasingly uncontrollable. Moreover, small industries that cannot process waste or waste properly. Waste or garbage will only accumulate in the TPA (Final Disposal Site) and cause an unpleasant odor that will disturb the surrounding community and cause many diseases. Waste or garbage can damage the environment as well as the surrounding ecosystem because of its pollution. Waste is residual material after the end of a process. Garbage consists of organic waste and inorganic waste. Organic waste is waste that can be decomposed by nature so it decomposes easily. For example food scraps, animal carcasses, plant carcasses, and others. Inorganic waste is waste that cannot be decomposed by nature, so it does not decompose easily. For example plastic, bottles, cans, glass, and others. Cassava peel is one of the organic wastes that easily decomposes and rots. Cassava peel waste after being separated from cassava will quickly decompose because of the water content in cassava peels so that microorganisms easily grow and make cassava peels decompose quickly. The potential for cassava peel waste in Indonesia is very abundant, in line with the existence of the Indonesian state as one of the largest cassava producers in the world. Cassava production in Indonesia reaches more than 20.8 million tonnes annually. If cassava skin is contained in every cassava and its presence reaches 16% of the cassava weight, then every year there are around 3.3 million tons of cassava skin that is not used and turns into waste so that cassava skin is easy to obtain. Cassava peel waste can be easily obtained from home industries that have fried cassava or fried chips businesses, tapioca flour factories, and cassava agents in traditional markets. Cassava peel waste is no longer used and will only make the environment dirty

so that over time it will cause bad odors and become a hotbed of disease. Waste can damage environment Also ecosystem in surroundings due to pollution. Waste is leftover material after the end of a process. Waste consists of waste organic and inorganic waste. Cassava skin including wrong an organic waste that easily decomposes and decomposes. Cassava peel waste can be easily obtained from industries home Which own business cassava fry or chips fry And agent cassava Which There is in markets traditional. In general, cassava skin is only used as feed cattle, compost nor bioenergy Skin cassava including wrong One organic waste so that easy to decompose and rot. Cassava skin waste can easily obtained from home industries that have businesses fried cassava or fried chips and cassava agents There is in traditional markets.

By Because That, processing waste skin cassava become chips Skin Cassava is method best For process cassava skin waste , cassava skin waste must be utilized or processed so as not to damage and pollute the environment. Processing of cassava skin waste can be used as animal feed, compost and bioenergy. In addition, cassava skin can be used as culinary preparations in the form of cassava skin chips . Cassava skin chips are no less tasty and delicious than the cassava tuber chips themselves. Cassava skin chips have their own value because they are made from processed cassava skin waste which is considered useless. In addition, the processing of cassava skin chips has a high selling value and is profitable so that in addition to reducing waste from cassava peels it also increases people's income.

There is demands innovation the make Village Sukamanah who is required to have an idea that can used in order to solve problems in the Village Sukamanah in utilise. The problem that is; The amount waste wasted vain, Still low creativity public about utilization waste.

Sukamanah Village was chosen as the best village in Indonesia so that it became example for other villages. Creativity and Innovation in Sukamanah Village becomes a the challenge to survive to be the best village in Indonesia. One of the majority inhabitant in the village Sukamanah is a farmer and para MSME actors. For the sake of advancing Micro, Small and Medium Enterprises and farmer groups local government is one of the roles to help increase innovation especially during the Covid-19 pandemic. Apart from the demands innovation product is key to boost the economy.

The flagship innovation launched at Sukamanah Village is Skin Chips Cassava (rikulsi). Processing of cassava skin waste can be used asfeed cattle, compost nor bioenergy. Besides That, skin cassava can utilized as processed culinary form Chips Skin Cassava (rikulsi).Therefore, the processing of cassava skin waste into Cassava Skin Chips is method best for processing cassava peel waste.

This innovation was created in order to solve the problem of leather waste cassava And For utilization waste Which innovative will increase knowledge in managing leather waste cassava, reduce amount waste skin cassava, And increase income society . Innovation is something process For change chance become idea Which can marketed.

Innovation Also is something combination vision For create something idea Which Good And constancy as well as dedication For maintain the concept through implementation. With entrepreneurial innovation creating both new production resources and managing resources Which There is with enhancement mark potency For create capital (Machfoedz and Machfoedz, 2004).

In innovation, many challenges are faced by the same organization in process Which creative Which present, And management play role important. Creativity is also a process for generating ideas where Innovation is result, But creativity And innovation each other related (Gupta, 2007). There is demands innovation the make Village Sukamanah Which required For own idea Which can used in framework solve problem in Village Sukamanah in utilise. The problem that is : The amount waste Which wasted vain, Still low creativity public about utilization waste.

Society is one of the roles that must innovate. Innovative utilization of waste will increase knowledge in manage waste skin cassava, reduce amount waste skin cassava, And increase income public. As for Objective Innovation riculsion:

1. Objective General, Reduce amount waste skin cassava
2. Objective Special, Increase income public, Increase creativity public

Benefit innovation for public between other : Public can entrepreneurship, Increase empowerment public. Business Opportunity Cassava skin chips can be an alternative snack that is popular with the public. Utilization of cassava skin will be combined with various flavors such as sweet, spicy sweet, cheese, and others. The use of various flavors is used to meet the tastes of different consumers. Cassava skin chips have a high crude fiber content so they are safe for consumption. The crude fiber in cassava skin chips has a function to help speed up the excretion of food scraps through the digestive tract in a fiber-free state. Therefore, processing cassava skin waste into cassava skin chips is the best way to process cassava skin waste. Besides being able to reduce waste from cassava peels, it also increases the income of the surrounding community so that it can improve the community's economy and keep the body healthy.

IMPLEMENTATION AND METHODS

The research method used in the manufacture of cassava skin chips is an experimental method or the manufacture of cassava skin chips. In the process of making cassava skin chips, the first thing to do is to separate the inner and outer cassava skins. Wash cassava skin with running water until clean. After being washed clean, the cassava skin is boiled until the color turns brown. It takes approximately 45 minutes until the cassava skin is cooked and becomes soft. This boiling process is used to remove the HCN content found in cassava skin and also facilitates the molding process. The printing process is carried out when the cassava skin has cooled. Cassava skin is printed with a circular mold with a diameter of approximately 3 cm. After printing, the cassava skin is washed again and soaked with water, iodized salt, and flavoring. Soaking is done for 3 days with soaking water which must be replaced every day.

If it is not replaced every day, there will be the potential for bacteria to appear on cassava skin. Replacing this soaking water, so that the cassava peels

which contain HCN compounds which are toxic, also dissolve in the soaking water so that the HCN compounds are lost from the cassava skins. The longer the soaking of cassava peels, the more durable the results or products produced will be because the bacteria will die in the soaking process and the HCN compounds will dissolve in the soaking water. In addition, soaking the cassava skin with water, iodized salt, and flavoring will give the cassava skin a taste and make the spices permeate perfectly. The next process is frying cassava skin. Cassava skin is fried in two frying pans. The first frying is done for approximately 30 seconds to ripen the cassava skin. After that, the cassava skin is drained to remove the oil content. Before doing the second frying, cassava skin must be cooled first in a closed container and away from sunlight.

The cooling process is carried out for approximately 6 hours. After cooling, the cassava skin will be fried a second time for about 30 seconds so that the cassava skin has a flaky and crunchy texture when eaten. After that, the cassava skin chips are drained on paper so that the oil in the cassava skin chips is absorbed on the paper so that the cassava skin chips can last longer and keep their freshness. After the cassava peel is crispy, it is drained. You can add some powdered spices with various flavors such as spicy, sweet, sweet spicy, cheese or original flavor.

RESULTS AND DISCUSSION

The material needed in the processing of cassava skin chips is the white inner cassava skin. Good quality cassava skin is characterized by a brown outer skin, and a pure white inner skin. Cassava is harvested in approximately 12 months. Cassava peel material is obtained from cassava food manufacturers, tapioca flour factories, and cassava agents in traditional markets. The additional material used is iodized salt. This salt is used to soak cassava skin. In addition, there are flavorings that are used to give flavor to the cassava skin and cooking oil to fry the cassava skin until it becomes crispy. The tools needed in the processing of cassava skin chips are round molds that are used to cut cassava skin so that later it has a round shape. Then, you need a gas stove, frying pan, knife, boiler, cutting board, scale, and basin.

The color produced from frying cassava skin chips has a brownish or golden color. In the frying pan, it must be stirred frequently and the oil used must also be a lot so that the cassava skin chips have an even brown or golden color and there are no burnt cassava skin chips. Frying is done twice, it must be ensured that the fire from the gas stove is medium and evenly distributed so that the cassava skin chips do not burn and are perfectly cooked. The frying time for all cassava skin chips must also be the same so that all cassava skin chips are the same color and uniform. In addition, the cooking oil used must also be considered. Do not use cooking oil repeatedly because it will greatly affect the color of the cassava skin chips and is also not good for health. The taste of cassava skin chips is very dependent on the duration of soaking and the frying process. The longer the cassava skin is soaked, the better the taste of the cassava skin chips will be because more salt and flavoring are absorbed by the cassava skin. And in the frying process, you have to be careful because if the cassava skin chips burn,

they will have a bitter taste and are not fit to eat. If cassava skin chips have different ripeness, the taste will also be different.

The texture of cassava chips depends on how long the cassava skin has been soaked. If the cassava skin is soaked for a very long time, the cassava skin chips will have a hard texture. This is because the water content in the cassava skin chips will be absorbed by the salt during soaking, which makes the cassava chips have a hard texture. The aroma of cassava peel chips with 24 hours of soaking time is different from 48 hours let alone 72 hours. Aroma Cassava skin chips with three variations of soaking have different aromas. The longer the soaking, the stronger the aroma of cassava skin chips will be. Conversely, if the soaking is faster, the aroma of cassava skin chips will not be too obvious. In addition to the duration of soaking, the frying process also affects the aroma of cassava skin chips. If the cassava skin chips are fried correctly, they will produce delicious cassava skin chips.

Conversely, if the process of frying cassava skin chips is wrong then the cassava skin chips will burn and have an unpleasant aroma. Therefore, the soaking time and the frying process greatly affect the yield or product of cassava skin chips. The appropriate soaking time, which is 3 days or 72 hours, will greatly affect the taste, texture and aroma of cassava skin chips. In the frying process one must also pay attention to the conditions of a stable and even fire, the time in the same frying pan, the cooking oil used, and the stable and even stirring of cassava skin chips.

Table 1. Procedure Riculsi

Tool		**Material**	
Stove	1 Unit	Skin Cassava	1 kg
Tube Gas 3 kg	1 Unit	Onion White	6 Clove
Wok	1 Unit	Flour Wheat	¼ kg
Pan	1 Unit	Oil	½ liter
Basin	2 Units	Spice Balado	1 Pcs
Knife	1 Unit	Spice BBQ	1 Pcs
Cutting board	1 Unit	Salt	1 Pcs
Sodet	1 Unit	Standing Pouches	10 Pcs
Scrap Fry	1 Unit	Decal	10 Pcs
pester	1 Unit		
Wipe Cloth	1 Unit		
Scales	1 Unit		

Method Making:

1. Separate Cassava with the skin.
2. Wash Skin cassava with water flowing up clean.

3. Prepare a pan and salted water, then boil cassava skin during 45 minutes.
4. After colored cassava skin brown remove and drain.
5. After cold soak skin cassava use water clean during3 days.
6. After letting it sit for 3 days, drain the cassava skin again cut match-shaped cassava skin fire.
7. Prepare a wet dough consisting of flour, garlic Which Already mashed, salt, flavoring flavor, berries water And stir until flat.
8. Input skin the cassava already in cut into the dough wet.
9. Prepare a dry dough from wheat flour, then cover with cassava skin with dry dough.
10. Heat oil in wok, Then fry skin cassava earlier until colored brown.
11. After ripe, lift and drain,
12. Chips cassava Ready in input into the *standing pouch* Andgiven sticker on packaging.

Figure 1. Convenience Information Service Innovation

Innovation RICULSION (Chips Skin Cassava) is innovation village Sukamanah by processing cassava skin that is not used for cooking though become A snack Which delicious that is RICULSION (Chips Skin Cassava). Processing cassava skin is a new way of managing cassava peel waste

CONCLUSIONS AND RECOMMENDATIONS

Cassava skin waste can be processed into snacks that have a high selling value and increase people's income. This snack is cassava skin chips which taste no less tasty and delicious than the cassava skin chips themselves. Processed by soaking cassava skin that has been cleaned for 3 days or 72 hours with water, iodized salt, and flavoring. The soaking process will greatly affect the taste, texture and aroma of cassava skin chips. In 2 times the frying process, you also have to pay attention to the condition of a stable and even fire, the time in the same frying pan so that the cassava peel chips have a good taste, aroma and texture.

The benefits of riculsi innovation. There are many ways to process cassava skin into a product, one of which is to use cassava skin which is generally not used to make a delicious snack. Sukamanah Village launched the RIKULSI (Cassava Skin Chips) innovation, which is an innovation that provides an effort for the community to process and utilize cassava skin waste by making it into a processed food product that is of great interest to the public. The benefits of RIKULSI's innovation for the community include: Reducing cassava skin waste; Adding business opportunities for the community; Improving the community's economy

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