

Pringsang Chips As An Innovation Of Solid Waste Tofu In Bilasundung Area, Paokmotong Village, East Lombok Regency

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Abstract

The purpose of this research is to create new innovation for the Pringsang chips product in the Bilasundung area, Paok Motong Village, East Lombok Regency. The method used is descriptive qualitative by collecting data through observation, interviews, and literature. Pringsang is a chips made from solid waste tofu; the waste of tofu production that is disturb the environment. However, the chips production doesn't have great taste and it make consumer be bored. Pringsang chips need an innovation of pranging chips with the addition of local flavors variant. This chip could be developed into more variants using local seasonings from famous Lombok dishes to provide better flavors with local taste.

Keywords: *solid waste tofu, Pringsang Chips, local culinary.*

1. Introduction

Waste is a remainder produced from a production process, both industry and domestic (household). Waste is often undesirable and disturbs the environment because it is seen as having no economic value (Arief, 2016). The existence of waste is a serious environmental problem. There are various negative impacts caused by waste which can disturb the environment and the health of humans and other living things.

The existence of waste can have a negative impact on the environment and the health of living things, especially if the waste contains hazardous and toxic materials or known as B3 waste. The characteristics of this type of waste is explosive, toxic, combustible, corrosive, and can cause infection to death. According to Indonesia Government Regulation No. 18 of 1999 in Riyanto (2014), B3 waste is the remnant of a business and/or activity containing hazardous or toxic materials which due to their nature and/or concentration and/or amount, both directly and indirectly, can contaminate and/or damage the environment and/or can endanger the environment, health, human survival, and other living things.

In the United States, the issue of toxic waste has become a serious discussion with the Resource Conservation and Recovery Act (RCRA) Act of 1970. This regulation assigns the US Environmental Protection Agency (EPA) by protecting human health and the environment from improper arrangements for the disposal of hazardous waste by issuing and enforcing regulations on such wastes (Riyanto, 2014).

Humans have a variety of ideas and ways to be able to reduce the existence of waste around them. One of the ways is to create processed food waste products into new food products that are useful. The processed food product is one of the economical sources of income for people. Processing of food product becomes one of the income sources that fulfill daily living necessities for society; it grows as food becomes the main necessity for human life. Creativity and skills in concocting seasoning to create a product that could be favored by consumers are basic assets to improve quality of the product.

Tofu is a very popular food in Indonesia. Tofu is used by Indonesian as favorite daily food and highly digestive (Purwaningsih, 2007). This is a simple, cheap, and nutritious food. Tofu is made from soybean; a secondary crop that contains high protein. Soybean belongs to Leguminosa family, Papilionidae sub-family, Glycine genus, and Max species. Soybean (Glycine Max) is used as basic ingredients for processed food. Other than tofu, soybean is also used as basic ingredient for tempe (soy cake), soy sauce, tauco (preserved soybeans), soy milk, soy cheese, soy powder, and so on.

There are many factories across many regions in Indonesia that produce tofu, one of them is in Bilasundung. Bilasundung is an area within Lombok Timur Regency that is well-known as tofu-production area. Tofu production becomes the main job for most of the people in this area other than working as labors. While tofu factories in this area are home factories which are owned by individuals, they can recruit many workers that are also from nearby areas. Those labors are divided into tofu maker, tofu laborer, distributor, and so forth. Tofu production is the main income sources for most of the people in Bilasundung.

This tofu production in Bilasundung tofu factories produces plenty of product waste. Based on *Kamus Besar Bahasa Indonesia*, waste has three meanings, (1) residue of production process, (2) valueless or worthless

ingredients for ordinary or main use to create or wear, (3) damaged or defective goods in production. Based on one of those definitions, waste is a residual product that could damage the environment if there is no effort to fix that.

As a waste, the presence of tofu residual product in Bilasundung could be dangerous for the surrounding environment. Whether it is a solution or solid waste, it has an unpleasant smell. One of the solid waste that will excrete rotten smell if it is left alone for several days is called as *ampas tahu* (solid waste tofu). The solid waste is a waste that has many classifications based on the source as follows.

No	Solid Waste Sources	Type of Waste Generated
1	Housing	Waste paper, food, plastic, cloth, leather, wood, glass, metal, ash, electronic devices, batteries, oil, used tires, computers, mobile phones.
2	Industry	Industrial household waste, leftover food, packaging, ash, hazardous waste
3	Trade area	Styrofoam, plastic, paper, food, wood, metal, glass, electronic waste.
4	Office space	Similar to commercial area waste
5	Process Industry	Slag, tailings
6	Construction	Ceramic floors, concrete, steel, wood
7	Hospital	Infectious waste, chemicals from laboratory waste, pharmaceutical waste
8	Agriculture	Pesticides, straw, stems, leaves
9	Garbage (wet trash)	Solid waste in wet conditions and room temperature of 20-30 °C containing organic matter that is easy to rot and easily decomposes due to microorganisms (biodegradable). Example: leftovers, vegetables
10	Dry Trash	Solid waste containing organic and inorganic materials that do not easily decompose and break down by microorganisms (non-biodegradable). Examples: paper, plastic, cans, zinc, aluminum, cellulose, broken glass
11	Dust and Ash	Waste piles resulting from incomplete combustion of solid materials and are usually small in size making it easy to fly
12	Dead Animal	Solid waste due to the death of animals that easily rot with a very pungent odor
13	Street Sweeping	Solid waste scattered on the streets. Example: paper, plastic, leaves, food wrap
14	Industrial Waste	Solid waste from industrial activities
15	Bulky Waste	Solid waste is sourced from used materials. Example: electronic devices
16	Hazardous Waste	Solid waste in the hazardous category which is generally called B3 waste (hazardous and toxic material). Example: hospital and laboratory waste.

Source: Solid Waste Treatment Techniques (2017)

Based on the table above, solid waste tofu is a waste sourced from the food industry. Because of the solid waste tofu's presence is adverse for the environment, Bilasundung people use the waste. This solid waste tofu is used by people in the area as several things, such as ingredients for livestock food, products to be resold, and processed as another processed food like *Keripik Pringsang* (Pringsang Chips). This chips' production is a side job for people in the area. Commonly, the production of solid waste tofu is handled by women to support their family financial condition. *Keripik Pringsang* then will be distributed and sold to the people.

However, another problem that happens in *Pringsang Chips* production is the lack of a chip variants that seems to have a monotonous and boring taste. Therefore, there is an urgent need for new creations on the flavors of chips that can develop chips into more diverse products and will be more favored by the public.

2. Research Methodology

The method that is used in this research is a qualitative research method. Qualitative research is data collection on a natural background that is intended to interpret the happening phenomenon (Anggito & Setiawan, 2018). A research method is defined as structured and systematic scientific activities that have theoretical and practical objectives (Raco, 2010).

This qualitative research method becomes a system and means to elaborate on the problems and discussion in this research. The steps that will be taken in this research are observation, experiment, and literature review. The research will be done in June-July 2019. The researcher chooses *Gubuk Lekok*, Bilasundung, Paok Motong Village, Masbagik Sub-district, Lombok Timur Regency, Nusa Tenggara Barat Province, Indonesia.

Observation will be done through collecting data on how Pringsangchip is produced in the chosen location. Then, the researcher will also do closer and direct experiment with the chip. This is done to find, through trial and error, the right innovation in producing Pringsangchip as it fits with the research's objective.

Several interviews will be done to collect essential and important information from tofu and solid waste tofu makers in Bilasundung. This step will give a big contribution as an information source for the research and the writing.

Literature review in this research is done with an objective to build better literature support for this research. Literature exploration will be done through collecting information on how to use the ingredient, nutritional facts, and other needed data that is related to the research writing.

3. Discussion

Processed Food from Solid Waste Tofu

Tofu is a food ingredient that is favored by many people. Tofu is food from China. Tofu industry in Indonesia has probably been developed since Chinese immigrant built their settlement in Indonesia. This industry, then, was developed as a livelihood source (Sarwono & Saragih, 2001).

As a food ingredient with a high content of water, tofu is well-known categorized as two groups based on its water content. Tofu with a high content of water, such as *tahu gembur*, is commonly mushy and easy to break. While tofu with low content of water that is trapped in protein, such as Kediri tofu, tend to have solid, little hard, and hardly breakable texture.

Every production process will result in two things, they are the products themselves and the residue. In tofu production, the product is the tofu itself and the residue will be waste tofu. There are two kinds of waste tofu: solid waste and liquid waste (Suprapti, 2005). Solid waste tofu is usually processed and used by people to make *oncom*, *tempe gembus*, livestock food, chip, and so on. Liquid waste tofu is called whey and it is usually used by people to create *nata de soya* (synthetical sugar palm fruit), vinegar, livestock fattening drinks, crops fertilizer, and so on.

Solid waste tofu is the residue of soybean slurry that is quickly out-of-date and has an unpleasant smell if it is not tended as soon as possible (Sarwono & Saragih, 2001). Even though it is a residue, solid waste tofu also has good nutritional value. This following table will include nutritional value that can be found in tofu and solid waste tofu.

Nutritional Value	Content/100 g Ingredient		
	Wet Soybeans	Tofu	Solid waste tofu
Energy (kal)	382	79	393
Water (g)	20	84.8	4.9
Protein (g)	30.2	7.8	17.4
Fat (g)	15.6	4.6	5.9
Carbohydrate (g)	30.1	1.6	67.5
Mineral (g)	4.1	1.2	4.3
Calsium (mg)	196	124	19
Phosphor (mg)	506	63	29
Iron (mg)	6.9	0.8	4
Vitamin A (mg)	29	0	0
Vitamin B (mg)	0.93	0.06	0.2

Source: *Daftar Analisis Bahan Makanan* (List of Food Ingredients Analysis), Fakultas Kedokteran UI (Faculty of Medicine, University of Indonesia), Jakarta 1992 in *Teknologi*

Nutritional value in solid waste tofu can be categorized at a good level. It has more energy than tofu; as well as protein, carbohydrate, mineral, and other nutritional value. This is one of the supportive factors that make the process of solid waste tofu become another food product is a right decision.

Solid waste tofu has been processed into many new food products in various parts in the world. In Japan, processed solid waste tofu waste processed to create a new food product called Okara. Okara is a traditional Japanese, Korean and Chinese dish since the 20th century. In Chinese, this dish is called *doufuza*, while in Korean it is known as *kongbiji*. Typically, Okara is served together with vegetables such as carrots, burdock, mirin (Japanese rice wine), shiitake mushrooms, *negi* (green onions), *shoyu* (soy sauce), and sometimes *konyyaku* (elephant yam) (Kazemi, 2016).

In Indonesia, one of the means to process solid waste tofu that has commonly practiced by people is solid waste tofu crackers. Based on *Kamus Besar Bahasa Indonesia* (online), cracker is a food made from flour mixture combined with blended shrimp or fish, then steamed, and sliced thinly to be fried with ease. Processing solid waste tofu to become cracker has been commonly done and developed in many regions in Indonesia. The crackers production from solid waste tofu needs another mixture ingredient. The mixture ingredient that is usually used is tapioca flour to bind the waste. The seasonings are baking soda, food bleach, salt, broth flavoring, *monosodium glutamate*, garlic, and coriander (Muharman, 2014).

Pringsang Chips Bilasundung

Bilasundung is a small area that is located in Paok Motong Village, Masbagik Sub-district, Lombok Timur Regency, Nusa Tenggara Barat Province, Indonesia. The society here mostly consists of people within middle to lower economical power. There are variants of profession, they are farmer, labourer, crafts people, and government administrators. However, majority of the people work as tofu makers in tofu home factories.

Processed food products from solid waste tofu in Bilasundung are different from in other regions. The solid waste tofu product in this region is in the form of chips. Based on *Kamus Besar Bahasa Indonesia* (online), chip is a food made from potato, sweet potato, and so on that is sliced thinly and then be fried. Bilasundung people name this processed solid waste tofu chips with "Pringsang". These Pringsang chips are made with simpler ingredient and shorter time. If the process of making solid waste tofu to become crackers needs days or even weeks, chips that are made from solid waste tofu needs only one or two days; it depends on the heat level of the day. The ingredients needed are also simpler; only solid waste tofu and several seasonings.

From the texture and form, there are differences between crackers and chips. Crackers commonly have round form, small, denser, yet with fragile solid texture, while chips commonly have thin, lighter, and hard solid texture. Meanwhile, Pringsang chips from Bilasundung have a unique form. It has a big, long, and irregular texture. This becomes a unique characteristic of Pringsang chips from this small area in Lombok island.

The process to make Pringsang chips is relatively simple. The used ingredients are squeezed solid waste tofu and dried rice, while the seasonings are only salt and a bit MSG. The steps to produce the chips are as following steps.

First, solid waste tofu is mixed with dried rice; both are residual ingredient and main ingredients for Pringsang chips. The addition of dried rice is to give additional flavor and strengthen the chips' form.

Second, add seasonings with a reasonable amount. The used seasonings are simple seasonings that can be found easily in the local area; it is adjusted with people economical and social condition in the rural area. The people in the village prefer using natural and traditional seasonings. This is done to keep the traditional and natural flavor from the produced foods.

To get more savory taste, the chips makers usually add pepper and coriander as seasonings. These two ingredients are mashed up and mixed with salt and MSG. This mixture of seasoning is then used as another flavor for Pringsang chips produced by Bilasundung people.

Third, seasoned solid waste tofu then is sliced thinly to be fried. No machinery is used to slice the mixture, it is done directly using hands with a small plastic sheet. The mixture is made into smaller pieces.

Fourth, the smaller pieces of solid waste tofu mixture are laid and line up on *kelabang*. *Kelabang* is drying container that is made from woven sliced bamboo. After that, the mixture is dried in the sun.

Fifth, the dried pieces are fried with highly heated oil. After it is cooked, Pringsang chips are wrapped and ready to be sold.



The product marketing process of *Pringsang* chips is through distributing it into nearby stores or sold in traditional markets. The price of a pack of Pringsangchips is IDR 1.000. This is very cheap and can be accessible by everyone, especially for people with middle and low income. Pringsang chips are usually consumed as snacks or complimentary food by people in the local area.

New Innovation for Bilasundung's *Pringsang* Chips

Pringsang chips that are processed from solid tofu waste in Bilasundung area is one of the effective and innovative methods to decrease waste from tofu production. Other than that, the production of these chips become one of the livelihood sources for people in the local area to fulfill their daily needs. However, there are three minus points in Pringsangchips, they are (1) less hygienic production process, (2) lack of flavors' variant in the products, and (3) small scale of distribution and marketing.

The Pringsangchips maker in Bilasundung are women; most of them are housewives. They produce chips together in a united workload with other chips makers. They make the chips from their own house. However, the production location choice is sometimes worrying. Some of them do it in unhygienic places, such as in front of the house or on the terrace that is usually located right beside on the road. This location has a high potential to contaminate the chips mixture with dust and vehicle emission.

In addition to the unhygienic production process, the dull seasoning choice becomes a minus point from these chips. Simple seasonings make consumers more easily bored. Especially there are many chips products with plenty of flavors variant. This chip will be harder to survive if there are any innovation and improvement in its flavor. Thus, a breakthrough is needed to create new flavors for the chips to survive and compete with other chips products.

New additional seasoning could be used as the right choice to overcome this existing flavor problem. The additional seasoning can be provided from instant seasoning powder in the market, such as *balado*, cheese, barbeque, and any other kinds of seasonings. However, this kind of seasoning powder is not good for health for they contain preservatives and food coloring substance.

The researcher explores the way to create new seasonings from natural ingredients with local taste. Utilizing famous foods from Lombok island, one of them is *Taliwang* chicken, the researcher use the seasoning as the new flavor for Pringsangchips. Considering Ethnic Sasak in Lombok island, also with many Indonesians who love spicy and hot foods, then *Taliwang* chicken seasoning is created spicy and hot to produce proper chips for people taste.

The needed ingredients to make *Taliwang* chicken seasoning are chili, red chili, onion, garlic, candlenut, and shrimp paste. These ingredients are mashed up traditionally using a tool called *ulekan* to generate more natural taste. After that, the mashed up seasonings are fried on a frying pan with a bit of oil until they smell good. Then, squeezed *munte* orange juice is added into the cooked seasonings. Next, these seasonings are mixed with solid waste tofu and stirred until be spread evenly. For the next process, it is the same with Pringsang production process explained above.

The production and addition of this local seasonings could be developed into more variants. Utilizing unique local food, the seasonings could be used to flavor Pringsang chips. There are many famous dishes from Lombok island, they are *plecing*, *beberok*, *sambel totok*, and so on. In the future, this could be a good foundation to develop more seasonings for Pringsang chips.

The production process of Pringsangchips should be done inside the house. This has to be done considering there are many Bilasunding people do the production process outside of their houses, thus there are hygiene and pollution issue. Clean location and equipment are required to assure the hygiene of the produced chips. Besides, it will keep the chips' flavor and nutritional value.

Distribution of solid waste tofu chips in Bilasunding also has to be improved. The development of the internet should be utilized more as it could be used to sell the products online. There are people inside or outside Bilasunding who use the internet, thus people should use the internet to sell their product and gain more sales effectively through online marketplace or promotion. Effective platforms that could be used are Facebook and Instagram; both are used and favored by people in Bilasunding or even all around Indonesia.

4. Conclusion

Pringsangchip is one of the innovations that has been commonly practiced by Bilasunding people to solve solid waste tofu problem. This chip is locally produced as a secondary livelihood and mostly made by housewives. With innovation, this chip could be developed into more variants using local seasonings from famous Lombok dishes to provide better flavors with local taste. In the future, it is expected for this processed food could be more accepted and applied in other regions as a solution for solid tofu waste in our environment.

Reference

- Anggito, A., & Setiawan, J. (2018). *Metodologi Penelitian Kualitatif*. Sukabumi: CV Jejak.
- Arief, L. M. (2016). *Pengolahan Limbah Industri, Dasar-Dasar Pengetahuan dan Aplikasi di Tempat Kerja*. Yogyakarta: CV Andi OFFSET
- Astawan, Made. (2008). *SehatdenganHidanganKacangdanBiji-Bijian*. JakartaTimur: PenebarSwadaya.
- Kazemi, A. (2016, Juni 4). *Do You Know What This Is? Okara*. Retrieved from Savvy Tokyo : <https://savvytokyo.com/do-you-know-what-this-is-okara/>
- Muharman, H. (2014). *A to Z Sukses Bisnis Rumahan*. Jakarta: Elex Media Komputindo.
- Purwaningsih, E. (2007). *Cara Pembuatan Tahu dan Manfaat Kedelai*. Bekasi: Ganeca Exact.
- Raco, J. (2010). *Metode Penelitian Kualitatif, Jenis, Karakter dan Keunggulannya*. Jakarta: PT Grasindo.
- Riyanto. (2014). *Limbah Bahan Berbahaya dan Beracun (Limbah B3)*. Yogyakarta: Penerbit Deepublish.
- Sarwono, B., & Saragih, Y. P. (2001). *Membuat Aneka Tahu*. Jakarta: Penebar Swadaya.
- Suprapti, L. (2005). *Teknologi Pengolahan Pangan Pembuatan Tahu*. Yogyakarta: Penerbit Kanisius.