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REVIEW ARTICLES; UTILIZATION OF SHRIMP HEAD FOR FLAVOR POWDER

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ABSTRACT

This article aims to examine the use of shrimp head into flavor powder. Shrimp head has the potential to be used as a food additive, one of which is as a flavor powder. An important factor in the manufacture of flavor powder is the process to reduce the water content to a certain extent so that it can inhibit the growth of unwanted microbes. It is hoped that the shrimp head flavor powder can be used as an alternative for the community in the use of Monosodium Glutamate (MSG) because if consumed in excess it can cause dizziness, nausea and increase in appetite.

Keywords: monosodium glutamate, water content, potency, food additives.

INTRODUCTION

In Indonesia there are more than 50 shrimp processing industries for export. Shrimp is exported in frozen form after separating the head, legs, and skin. With the separation process, it will produce a large amount of waste, which is around 36-45%.

If this waste is not handled properly, it will have a negative impact on the environment because the waste can increase *biological oxygen demand* and *chemical oxygen demand.* The waste from the shrimp processing industry actually contains nutrients that can be used as food. One of them is a source of crude protein of 53.4 (%wk) (Correa et al., 2012).

According to Suptidjah et al., (1992), waste from the shrimp processing industry can be categorized into several types according to the processing of shrimp, including: a) Waste in the form of shrimp heads, usually a by-product of freezing fresh headless shrimp. b) Waste in

the form of shrimp shells or headless, is also a by-product of the second quality frozen shrimp industry or shrimp canning industry. c) Mixed waste, which is a mixture of head and skin which is usually a by-product of the shrimp canning industry.

Waste generated from the shrimp freezing industry includes shrimp heads. This waste is generated about 40-45% of the total weight of fresh shrimp. Shrimp head has the potential to be used as a food additive, one of which is as a flavor powder. Flavor is the sensation produced by food ingredients when placed in the mouth, especially those caused by taste and smell. The composition of the food and the compounds that are the giver of taste and smell interact with the receptors of the organs of taste and smell to produce signals that are carried to the central nervous system to give effect to the flavor (Zuhra, 2006). Therefore, this article aims to examine the utilization of shrimp heads into flavor powder.

Shrimp Head Flavor Powder Flavor

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Other factors that affect the overall quality of the product in addition to taste and smell are texture (fineness, toughness, granularity and viscosity). Changes in viscosity can change the taste or smell that arises because it can affect the speed of stimulation of the olfactory receptor cells and salivary glands (Zuhra, 2006).

The potential for industrial waste in the form of shrimp heads is quite large, which can reach 36-49% for the head of the total body weight. Shrimp head has an amino acid composition, one of which is glutamic acid of 20.45 mg which can meet daily protein needs. Utilization of this waste potential is still not optimal. Therefore, the use of shrimp heads in the form of natural flavor powder is expected to increase the economic value of shrimp head waste.

Figure 1. Shrimp Head Flavor Powder (Source: cookpad.com)

Based on the manufacturing process, this flavor is distinguished into natural or natural, synthetic (artificial), and *identical* natural(processed from natural ingredients to produce synthetic flavors). Natural flavors can be taken from natural ingredients, for example, onion flavor derived from onion extract, chicken flavor obtained from chicken juice, shrimp flavor derived from shrimp broth, and many others. Artificial flavorings are made from synthetic ingredients. An example is the synthesis of chemicals derived from petroleum derivatives. These ingredients have characters such as constituents of certain flavors. For example, butyl cinamaldehyde which is known to have a taste similar to flowers (jasmine and lilies), butyl butyrate which is known to have a taste similar to pears and pineapples, and so on are also various amino acids that can resemble the taste of meat or chicken. These amino acids can also be synthesized from chemicals where these chemicals are ingredients that can be used to prepare flavor components.

Based on the physical form of flavor can be classified into three classes, namely liquid *(liquid Flavorings),* forms an emulsion *(emulsion Flavorings)* and paste or solid form *(paste or solid Flavorings).* Flavor is caused by the presence of flavor compounds *(flavoring agents)* which are present in very small amounts in foodstuffs. Structural components in living cells that are the largest source of flavor forming are proteins, fats, and carbohydrates. Flavor-forming components of fishery products are mostly found in mollusk and crustacean meat. The results showed that mussel meat, shrimp and crab have a higher aroma and taste than fish meat (Damuningrum, 2002).

The Process of Making Shrimp Head Flavor Powder

Process of making shrimp head flavor powder is done by:

1. Washing the shrimp head thoroughly.
2. Shrimp heads are chopped into small pieces with the aim of increasing the surface area so that the protein content in the shrimp heads can come out.
3. Add water with a ratio of shrimp head: water that is 1: 2.
4. After being heated to a temperature of 800^{o}C for ± 1 hour, then filtered and the dregs removed, the filtrate is obtained which is then concentrated with a mixture of ingredients.
5. To make shrimp head flavor powder, first prepare 1000 ml of shrimp head boiled water filtrate, then add dextrin.
6. Add the garlic, onion, salt and pepper and mix until evenly distributed.
7. After that it is dried using a dryer with a granulator. Drying for ± 3 hours with a temperature of 1000^{o}C.
8. After the results dry into a powder, then cooled and stored in a plastic seal.

Utilization of Shrimp Head Flavor Powder

According to Saenab et al., (2010), frozen shrimp processing waste is in the form of tail, skin and head. Utilization of shrimp head waste is only used for petis, chitin and animal feed. According to Sahara et al., (2011), shrimp head waste can be used as feed. Shrimp head waste is known to contain a lot of chitin and chitosan which contains an amine group which functions to kill spoilage bacteria in feed. Shrimp head has a relatively high nutritional content so that it can still be used.

Flavor is a food additive that can emphasize the taste in a food. The development of the seafood-based flavor industry in Indonesia is seen to be increasingly in demand by the public. However, currently the flavor that is often consumed by the public is a synthetic flavor. According to Cahyadi (2009) there are several synthetic flavors circulating in the market which if consumed in excess can cause health effects, for example *Chinese Restaurant Syndrome* caused by the use of *monosodium glutamate* (MSG).

Utilization of shrimp heads can be used as the right target in the field of aquaculture with the aim of obtaining added value and producing useful products. From various existing studies, it was found that various uses of shrimp waste have a higher economic value. One of them is an effort to utilize the protein content contained in the head of the shrimp. The protein present in shrimp heads can be extracted and hydrolyzed for various applications such as in

the baby food industry, food supplement industry, and other food industries. Shrimp heads also have the potential to be used as food additives. One of them is as a flavor powder. The flavor with the basic ingredient of shrimp head is expected to replace the synthetic monosodium glutamate (MSG) flavor that is commonly consumed by the public.

Product Quality of Shrimp Head Flavor Powder

There has been research on making flavor from shrimp head waste extract. Flavor from shrimp head waste can be obtained by extracting shrimp heads with salt water at a certain temperature and time. Cambero et al., (1998) stated that shrimp flavor was obtained by boiling shrimp heads in water in a ratio (1:2) at 85^{o}C for 30 minutes with the addition of 0.5% NaCl. However, the extract obtained has a relatively low shelf life and the active components in it are easily degraded during storage. Based on this research, an alternative product was developed in the form of flavored vannamei shrimp head extract which was spray dried . The advantages of this technique are that the operating system is simple, can produce with large capacities, and is very suitable for products that are not heat resistant (Desai and Park 2005). Extract dried by spray drying is expected to have better stability during storage than liquid form because it has a relatively low water content, so it is hoped that damage to active components can be minimized and facilitate handling during the production process.

In the spray drying process, aneeded *carrier agent is*. The *carrier agent* addedwill become microencapsulated with the aim of protecting the outer wall and layer of the material to be dried, so that the resulting material will be protected from denaturation and loss of volatile components (Garshallaoui et al., 2007). Ambarwati (2008) also carried out spray drying on vannamei shrimp head waste using the *carrier agent* maltodextrin and gum arabic without any combination. The results showed that *carrier agent* gum arabic concentration 5% and maltodextrin 15% obtained the best results on physical and chemical parameters. In organoleptic parameters, the use of *carrier agent* gum arabic is relatively preferable to the use of *carrier agent* maltodextrin. However, gum arabic is known to be quite expensive.

In addition, the results of further research conducted by Saleh et al., (2017) showed that the proximate composition of the shrimp head was 80.15% water, 14.67% protein, 0.93% fat and 2.64% ash. The nutritional content can be used as a flavoring powder. Flavors are formed from the combined results of taste sensations obtained from the food ingredients used. According to Pratama et al., (2013), the manufacture of powdered flavor requires complex compounds, namely volatile and non-volatile in the form of glutamic amino acids which play a role in providing a savory taste. The flavor of the vannamei shrimp head extract powder can

be developed by adding glutamic free amino acids to the product. One example of a type of food that is known to contain the amino acid glutamate in a fairly high amount is tomatoes.

Shrimp Head Flavor Powder Market Segmentation

Until now, most of the food products favored by the public are processed using food additives, both natural and synthetic. Flavoring is a food additive that is often used in food. The use of flavorings aims to add flavor or just strengthen the taste of a processed food. Over time, changes and developments in food from the taste and form of food are growing. Various kinds of processed foods are now present which have resulted in food producers competing to produce delicious and delicious food to meet consumer needs. Food seasonings are created with the aim of making processed foods more delicious (Juita et al., 2015).

One of the food additives that is often consumed by people in processing food is Monosodium Glutamate (MSG). According to Nuryani and Jinap (2010), MSG is a sodium salt that binds to an amino acid in the form of glutamic acid. Even though it is used as a flavoring in cooking, excessive use of MSG is known to cause dizziness, nausea (Chinese Restaurant Syndrome) and an increase in blood salt levels (Nuryani & Kensaku, 2006). Other effects include cancer, damage to the nervous system and eyes, and disorders of pregnancy and the fetus (Sabri et al., 2006).

Natural flavor orflavoring *naturalflavoring* is a flavoring that can be made from basic ingredients that contain protein. The materials used can be derived from animal or vegetable protein. The use of natural ingredients can produce a taste that is as savory as synthetic flavoring. The addition of spices can affect the taste, color and aroma of food. Natural spices such as garlic, onion, white pepper have a delicious aroma that can add to the taste of natural flavoring (Widyastuti, 2016).

The main ingredient that can be used as a combination to make *natural flavoring* is shrimp head. Shrimp heads are known to have a high nutritional content in the form of protein. According to Rathore (2018), shrimp heads have a protein content of 43.12%. Bawinto (2015) states that the head and shell of shrimp can be processed into broth that can give a savory taste to the processed food. Besides being able to be used as a taste enhancer, shrimp heads and shells also have benefits that can fight free radicals ten times better than fruits and vegetables because shrimp heads contain the antioxidant astaxanthin.

An important factor in the manufacture of natural flavoring is the process of reducing the water content to a certain extent. It is used with the aim of inhibiting the growth of unwanted microbes. Currently, people's preference for the use of flavoring is very high. However, until now some of the flavorings used in the market are still controversial, so it is

necessary to research alternative natural flavorings by utilizing fishery products that contain lots of glutamic acid. **Conclusion**

Shrimp head has the potential to be used as a food additive, one of which is as a flavor powder. An important factor in the manufacture of flavor powder is the process to reduce the water content to a certain extent so that it can inhibit the growth of unwanted microbes. Shrimp head flavor powder is expected to be used as an alternative for the community in the use of Monosodium Glutamate (MSG) because if consumed in excess it can cause dizziness, nausea and increase in blood salt levels.

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