TRAINING MODULE

SHRIMP DUMPLING FORMULATION AND PRODUCTION STANDARD

Instructor : ERIKA ARISETIANA DEWI, S.Pi, MP
NIP : 19840314 200604 2 003
Institute : BPPP Banyuwangi

THE AGENCY FOR MARINE AND FISHERIES RESEARCH AND HUMAN RESOURCES
FISHERIES TRAINING AND EXTENSION INSTITUTE
BAYUWANGI (BPPP)
2022

Nama : ERIKA ARISETIANA DEWI, S.Pi, MP
NIP : 19840314 200604 2 003
Unit Kerja : BPPP Banyuwangi

BADAN RISET DAN SUMBER DAYA MANUSIA KELAUTAN DAN PERIKANAN
BALAI PELATIHAN DAN PENYULUHAN PERIKANAN (BPPP) BANYUWANGI
2021

CHAPTER I
PREFACE

1.1. BACKGROUND

The development of various processed fishery products can be an alternative to foster the habit of consuming fishery products, especially shrimp for the people of Indonesia. This at the same time can be an effort to increase the nutritional value of the community. One of the processed shrimp products is shrimp dumplings, which are popular among the public. This food is usually served when dining at a restaurant that serves dim sum food. Dimsum itself is a term in Cantonese which means snack. Dumpling usually consists of minced fish or shrimp meat and mixed vegetables, wrapped in a sheet of skin made of flour dough. There are various types of dumplings, one of which is jiaozi which contains minced meat and vegetables, usually cooked by boiling and has a thick skin.

Technically, processing shrimp dumplings is very easy and can be done by anyone. From economic perspective, shrimp dumpling processing appears as an attractive business opportunity. In terms of fulfilling community nutrition, shrimp dumplings can be used as a means of supporting nutritional adequacy considering that this product is high in protein. The quality of shrimp dumplings is determined by the raw materials, various kinds of additives such as flour and vegetables, and their ratio in the dough. Meanwhile, other factors that affect the quality of shrimp dumplings include the standard of its formulation and its processing technique.

For people who like dumplings but avoid consuming beef or chicken for health reasons, shrimp dumplings, which are rich in omega-3 and protein, can be an option. In addition, the price of meat is quite expensive, so it is necessary to diversify the basic ingredients for making dumplings so that dumplings remain of high quality and while the price remains affordable. One way to reduce dependence on meat is to find substitute ingredients by using other food

ingredients for making dumplings. In this case, the alternative raw material chosen is shrimp.

1.2 The General Learning Objectives

After completing this lesson, the training participants can understand and know about fishery product processing technology, especially regarding the standard formulation and production of shrimp dumplings.

1.3 The Specific Learning Objectives

After completing the training, participants will be able to:

a. Knowing and preparing various types of tools for producing shrimp dumplings.
b. Knowing and preparing standard formulations of ingredients for the production of shrimp dumpling.
c. Knowing how and able to produce shrimp dumplings.
d. Knowing how and able to package shrimp dumplings.

CHAPTER II

SELECTION OF SHRIMP AS MAIN INGREDIENT

2.1. Selecting Main Ingredients

Shrimp dumplings are basically no different from other types of meat dumplings, both in form and processing. The difference is the main raw material. Dumplings are generally shaped or printed to resemble ingots (ancient Chinese currency) or money bags, although in its development dumplings are formed into many variants of forms.

Figure 1. Dumpling Shape

Shrimp dumplings are made from a mixture of shrimp meat, vegetables, flour and spices. The processing process can be done with simple kitchen technology and the results will be better if done using modern equipment (machines). Thus the shrimp dumpling business can be developed by traditional processors in a small scale business set up as well as by industry.

Basically almost all types of shrimp can be used to make shrimp dumplings. Shrimp raw materials must be fresh, not physically damaged and of good quality. The quality of protein (actin and myosin as the texture of shrimp dumplings) in shrimp must be high with good water binding capacity. The quality of the raw materials greatly affects the elasticity of the shrimp dumplings produced. The better the quality of the raw materials used, the more delicious and chewy the results will be.

Shrimp meat used can be fresh shrimp meat or frozen shrimp meat. The handling of each raw material is different, depending on the type. Shrimp is one of the special fishery products because it has a specific aroma and has high nutritional value. Shrimp is known as a food source that has very high protein and water content, therefore it is a very perishable food or easily contaminated by spoilage bacteria. Shrimp quality decline is caused by factors originating from the shrimp body itself or environmental factors. Therefore, good handling is needed so that the quality of the shrimp can be maintained until the shrimp is consumed by consumers or until the shrimp is processed further, one way is by freezing or cooling.

The cold temperature of the raw material for shrimp meat greatly affects the texture of the shrimp dumpling dough. In addition, when making the shrimp dumpling mixture, make sure that no shrimp shells are included in the shrimp dumpling mixture.

2.2. Characteristics of Fresh Shrimps

Good quality shrimp will look fresh, with a distinctive color and aroma. But if it looks pale with a rancid smell, the shrimp is said to be rotten. The organoleptic characteristics of high-quality or fresh shrimp are as follows:

1. Skin: light and clear in color, intact, no broken or loose parts, has not changed color, skin is still firmly attached to the flesh and the joints between the segments are still solid,
2. Eyes: round, black, appear bright and luminous,
3. Meat: the texture is chewy (indicating the rigormortis stage is still in progress), the meat and other body parts have a specific fresh smell and taste sweet,
4. When placed in water, the shrimp will sink.
5. There are no black spots.

Meanwhile, shrimp that begin to rot can be identified by their organoleptic characteristics as follows:

1. Skin: brownish red, pale and a lot of mucus, the skin already looks loose and easily peels off,
2. Eyes: discolored, sunken, white and not luminous,
3. Meat: soft and mushy texture and foul smelling,
4. Color: reddish (discoloration) as a sign of oxidation,
5. There are color spots on the skin / carapace caused by black spots (BS),
6. When placed in water it floats on the surface.

Shrimp quality decline is caused by factors originating from the shrimp body itself and environmental factors. This decrease in quality occurs by autolysis, bacteriology and oxidation. The decline in the quality of fresh shrimp is closely related to its chemical composition and body composition. As a biological product, shrimp is included in perishable foodstuffs when compared to fish. Therefore, the handling of fresh shrimp requires fast and careful treatment. The structure of the shrimp body has a close relationship with its shelf life. The head is the part that greatly affects the shelf life because this part contains digestive enzymes and spoilage bacteria.

Fresh shrimp in accordance with SNI-01-2728.1-2006 are fishery products with raw materials that have been treated as follows: washing, sorting, and cutting or without cutting heads, cooling/freezing and packaging. As for the quality requirements of fresh shrimp can be seen in the following table:

Test Type	Units	Requirements
a. Organoleptik	Figure (1-9)	Min of 7
b. Microbial Contaminant*		
– TVC	Colony/g	Max of 5,0 x 10^5
– Ascherechia coli	MPN/g	Max <2
– Salmonela	MPN/25 g	Negative
– Vibrio cholera	MPN/25 g	Negative

c. Cemaran kimia*		
– Kloramfenikol	µg/kg	Max 0
– Nitrofuran	µg/kg	Max 0
– Tetrasikin	µg/kg	Max 100
d. Filth		Max 0
NOTE* If Needed TVC = Total Viable Count MPN = Most Probable Number		

CHAPTER III
FORMULATION STANDARD AND PRODUCTION PROCESS OF SHRIMP DUMPLING

3.1. Raw Material

Shrimp dumplings are food products made from mashed shrimp meat, mixed with vegetables, flour and spices, shaped or molded to resemble ingots (ancient Chinese currency) or money bags and cooked by steaming or can use the potstickers cooking method, which is boiling and frying the dumpling at the same time using a frying pan. Dumplings are cooked in a flat frying pan using a mixture of water and oil until the water runs out and the oil is left behind so that the bottom of the dumplings turns brown due to the continued cooking process by the oil.

As the main ingredient for dumplings, handling of shrimp raw materials must be carried out as soon as prawns are caught. The initial treatment is to sort and dispose of the head. Sorting is done by separating shrimp based on quality and size. Sorting is done carefully, quickly, thoroughly and sanitarily. Then, the removal of the head of the shrimp needs to be done as soon as possible, because in the blood vessels of the head (cephalothorax) there are lots of polyphenol oxidase enzymes that cause black spots. Besides, the head of the shrimp is a source of contamination, because 75% of the spoilage bacteria originate in the intestines that are in this section. Subsequent handling, the shrimp are washed several times with clean and cold sea or fresh water by adding ice cubes to the washing water. Washing is done until the washing water is no longer cloudy. Then it is cooled by filling it with crushed ice that is fine enough so that the ice crystals do not injure/ damage the shrimp meat.

Shrimp dumpling is a gel form (thickness) of shrimp meat, so that in the processing it must be carried out carefully so that in the final process it has good gel properties in springiness and appearance. The properties of the gel formed were influenced by the treatment during processing and influenced by the structure of the shrimp meat (muscle) and its chemical composition. The

characteristics of shrimp meat are basic properties, in the sense that they cannot be improved in quality. Thus, in order to obtain a good gel quality, it is important to note that during the processing, the meat components that will support gel formation are not damaged or degraded.

3.2. Additives

a. Cornstarch

In the manufacture of shrimp dumplings, a binder needs to be added to maintain the stability of protein binding to water and fat so that the texture of shrimp dumplings is more stable. The choice of binder is based on good water fiber, good color, low price, good taste and does not interfere with the taste of the shrimp dumpling product.

Cornstarch is flour derived from corn starch which is high in starch and gluten content. The choice of cornstarch as a binder in shrimp dumpling products is because cornstarch contains starch which will have an influence on the composition or texture of the shrimp dumpling product. In addition, cornstarch was chosen because it has a better binding ability during the cooking process and has lower fat content.

b. Wheat Flour

Wheat flour used in the manufacture of shrimp dumpling shells is a type with moderate gluten protein content. Wheat flour is flour made from wheat seeds through a milling process. In wheat flour there is gluten protein, which is a compound in wheat flour that is chewy and elastic. There are several types of wheat flour sold in the market based on the gluten protein they have, namely:

(1) Low protein wheat flour, containing between 8-9% gluten protein which is suitable for making foods with a dry or crunchy texture.
(2) Medium protein wheat flour, containing about 10-11% gluten protein which can still be used to make foods with a dry texture, but is more suitable for making foods that require a medium dough rising.

(3) High protein flour has 11-13% protein content. This flour is suitable for making dough that requires high rising.

c. Chinese Cabbage

One of the vegetables used in shrimp dumpling products is Chinese Cabbage which is included in the group of leaf vegetable that contain complete nutrients that meet the requirements for human nutritional needs. Chinese Cabbage can be consumed raw or processed into various kinds of dishes. Chinese Cabbage is favored because of its taste and its vitamins content. 100 grams Chinese Cabbage leaves contained 6460 IU of vitamin A, 102 mg of Vit. B, 0.09 mg Vitamin C, 220 mg and contains calcium and potassium.

d. Chives

Chives is one of the plants that is used as a flavoring ingredient as well as food fragrances and a mixture of various dishes. Scallion has a specific aroma so that the dishes with scallions become fragrant and have a more delicious and delicious taste. The nutritional value contained by leeks is also high, so it is favored by consumers.

In 100 grams of chives there are 89.83 grams (g) of water, 1.83 g of protein, total fat: 0.19 g, 7.34 g carbohydrates, 2.6 g fiber, 72 milligrams (mg) calcium, 1.48 mg iron, magnesium: 20 mg, phosphorus : 37 mg, potassium 276 mg and other substances.

e. Egg whites

The type of egg used in making shrimp dumplings is chicken egg and the egg part used is egg white which functions as a binder for other ingredients in the dough, gives a delicious taste, and gives the dough an even and smooth texture. The amount of egg white is about 60% of the egg weight. Eggs have an emulsifying power so as to maintain the stability of the dough. Egg white is part of the egg with the most components in the form of water, namely 87% followed by 10.9% protein, 1% fat, 1% carbohydrate and 0.6% ash.

f. Other additives

Other additional ingredients are needed to add to the taste of the shrimp dumplings to create a delicious taste. Flavoring ingredients are needed such as: ginger, soy sauce, sesame oil, pepper, salt, sugar and garlic.

3.3. Shrimp Dumpling Formulation Standard

1. Raw Material Standardization

a. Free from unwanted physical and chemical changes due to enzymes, microbial activity, rodents, insects, parasites and damage caused by pressure, cooking and drying
b. Free from microorganisms and parasites that cause food borne illness
c. Within a shelf life (not expired)

2. Ingredient composition

Shrimp dumpling dough:

- 800 gr prawn meat
- 150 gr chicory, finely chopped
- 6 cloves of garlic finely chopped
- 50 grams of thinly sliced scallions
- 1 tablespoon ginger water (2 pieces of crushed ginger plus 1 tablespoon water)
- 5 tablespoons cornstarch (75 grams)
- 2 egg whites
- 2 tbsp soy sauce
- 5 tbsp sesame oil
- 1 tbsp sugar
- 1 tsp salt
- 1 tsp pepper

Dumping wrapper:

- 150 grams of medium protein flour
- 150 grams of cornstarch
- 225 ml of boiling hot water
- 3 tbsp cooking oil
- 1/2 tsp salt

Coating/ spread :

- 5 tbsp vegetable oil
- 2 tbsp sesame oil

3.4. Shrimp Dumpling Equipments

1. Equipment Standardization

a. The equipment used is made of materials that are safe for processing and do not contaminate food products.
b. Equipment used during food processing is well sanitized.

2. Types of Equipment

a. A basin
b. A Spatula
c. Measuring cup
d. Spoon and fork
e. Cutting board/chopping board
f. Knife
g. Digital scales
h. Rounding mat
i. Ampia / leather grinder / rolling pin
j. Workbench
k. Steaming pot
l. food processor
m. Mug

n. Ring cutter Diameter 9 cm or 10 cm
o. Gloves and masks
p. Work outfit
q. Apron
r. Gas stove
s. Wipe cloth / plastic wrap
t. Plate
u. Box / plastic packaging
v. Dim Sum Paper

3.5. Shrimp Dumplig Production

The process of creating shrimp dumplings are as follows :

1. Making wrappers for shrimp dumplings

Use a bowl or basin with a capacity of three times the size of the ingredient formulation to provide space for the stirring or kneading process. Put the flour, cornstarch and vegetable oil in a bowl, pour hot water evenly over the surface. Leave it for a while until the water is absorbed and slightly cold. Stir with a wooden spoon or spatula then knead the dough by hand until the dough is smooth and no longer sticky. Kneading time is about 10 minutes. Add water little by little using a spoon if the dough feels too dry.

Figure 2. Dumpling wrapper dough

Round the dough, cover the surface of the bowl with a clean cloth. Leave it for 15-20 minutes. The dough that is formed is smooth and not too elastic, so that when you roll it, the dough doesn't shrivel up again. The dough also doesn't stick easily after rolling. It's different if you only use wheat flour, the dough would be very elastic and sticky to each other. Thin the dough using a wooden rolling pin or a pasta maker and the skin is molded so it's ready to be used for dumplings.

Figure 3. Ready to use dumpling wrappers

2. Making dumpling stuffing

a. Mincing the shrimp meat

Shrimp meat is mashed by pounding it in a mortar (pounded), using a food processor for the home made industry or for a larger scale business you can use a grinding machine. This treatment will produce mashed meat resembling the shape of a paste. The milling treatment (grinding) is one of the processes that has an important effect on gel formation.

The process basically aims to break down the protein fibers (myofiber) of shrimp. As is known, myofiber (myofibrillar protein) is a protein structure and a large part of shrimp protein (70-80%). Myofiber protein which is arranged on top of myofilaments, where by milling the

myofilaments will be extracted out to play a role in gel formation, namely actomyosin form. Extraction of actomyosin from this myofilament will give maximum results with the addition of salt between 2-3%. Thus, salt as a seasoning is added during the grinding process, in addition to taste purposes as well as to obtain good quality gelatinous texture of meat.

Gambar 4. penggilingan daging udang

b. Making the shrimp dough.

When using a grinding machine in the grinding process, the addition of additional ingredients is still carried out in the machine without the need to move the meat paste. If it is done manually, the dough should not be made in a mortar, blender or mixer, but should be transferred to another wider container so that it is easier to mix. The addition of flour and spices is done little by little in stages, in a grinding machine or stirred by hand if done manually until the dough is completely homogeneous. It should be repeated that the salt does not need to be added anymore because it has been mixed during the grinding process.

The stages of the manual mixing process are to prepare mashed shrimp meat, vegetables and spices that have been mashed. In a bowl, mix all the filling ingredients and seasonings, stir using your fingers or a mixing spatula until all the ingredients are well blended.

Figure 5. Shrimp dough

When using a grinding machine for grinding, additional ingredients are added to the machine without the need to remove the meat paste. If it's done manually, it's best not to make the dough in a mortar, blender or mixer, but it needs to be transferred to another wider container for easier mixing. Flour and spices are aded little by little in stages, in a grinding machine or stirred by hand if done manually until the dough is completely homogeneous. Keep in mind that salt does not need to be added anymore because it has been added during the grinding process.

The stages of the manual stirring process are: prepare crushed shrimp meat, vegetables and spices that have been mashed. In a bowl, mix all the filling ingredients and seasonings, stir using your fingers or a mixing spatula until all the ingredients are well blended.

c. Wrapping the dumplings

Place a sheet of dumpling wrapper in the palm of your hand, fill the wrapper with a spoonful of dumpling filling, bend and bring the two sides together so that it becomes a semi-circle. Press the side of the joint so that the stuffed dough doesn't come out. Fold the edges of the dough starting from the center of the dumplings to the right, turn the dumplings over and fold the rest again. Do not press too hard on the skin that is

affected by the dough, because wet dough makes the skin easy to tear/perforate.

Figure 4. Wrapping the dumpling

The shape of shrimp dumplings can be made in a variety of ways other than the shape of ingots (ancient Chinese currency) or money bags. It can be made into semicircle shapes or a shape of a hat.

Figure 5. shrimp dumpling products

d. Cooking shrimp dumplings

Shrimp dumplings can be cooked in two ways, namely steaming or a combination of boiling and frying methods, which is called the potstickers technique. The first way is to steam it for ± 15 minutes using a steamer pan or using a steamer made of small woven bamboo commonly used in dimsum restaurants. Line the steamer with dimsum paper or grease the steaming rack with cooking oil so that the base of the shrimp dumplings doesn't stick to the bottom of the steamer. Give the arrangement distance so that the shrimp dumplings don't stick to each other.

Figure 6. Cooking Shrimp Dumplings

Prepare the oil for coating the shrimp dumplings. Stir well the cooking and sesame oils, apply on the shrimp dumplings after the steaming process, so that the dumpling skin texture remains moist when the dumplings are cold.

e. Serving

Shrimp dumplings can be served warm with the addition of tomato sauce or chili sauce. Reheating shrimp dumplings can be done easily through various methods. The first method is to serve warm shrimp dumplings by boiling. Unlike most frozen foods, shrimp dumplings can be reheated immediately without the need to leave them at room temperature. The easiest way to warm shrimp dumplings is to boil them. The boiling process can make the dimsum more juicy and chewy. To boil shrimp dumplings, fill a pot with water about two-thirds of the way. Cover and bring to a boil over high heat. Add the shrimp dumplings, and cook until bubbly, about two to three minutes. Remove and drain before serving.

The second method of serving is by heating it using a rice cooker. If you don't have a boiling pot, use a rice cooker to heat the shrimp dumplings. Heating using a rice cooker is quite easy. Heat water in the rice cooker, arrange the dimsum on the rice cooker basket. Add a little oil so it doesn't stick. Then, steam for 20 minutes. After that, remove the dimsum and let it air for about 30 seconds so that the water vapor comes out.

The next method is using a microwave. Place the shrimp dumplings in a bowl and add a little water. Put the bowl in the microwave, heat it on high for about three minutes. Take out the dumplings, let it cool for a while, and then serve.

Serving shrimp dumplings with crisper skin can be done by grilling them on Teflon. Before baking, the shrimp dumplings can be warmed first using a rice cooker. Then bake on Teflon, pour a little oil, roast the dumplings for about a minute until both sides are golden brown. The last method of serving is the steam-fry or potsticker technique, the classic method for warming using Japanese-style dumpling. In this technique, arrange the shrimp dumplings in a frying pan, then add water when the skin begins to turn golden. Next cover the pan, steam

for about 6-10 minutes. Once the water is absorbed, fry the dumplings again. This frying process can produce crispy and crunchy dumpling skin.

f. Packaging

Shrimp dumplings that have cooled are packaged in plastic boxes and tightly closed. Packaging size can be 1 kg or 5 kg, according to market demand. After plastic packaging, shrimp dumplings are packaged in cardboard or cardboard boxes. On plastic or cardboard packaging, a label can be attached saying the contents of the package and the manufacturer.

Before being marketed, shrimp dumplings can be stored in a refrigerator at a temperature of 5 °C. At this temperature, shrimp dumplings can last up to 32 days. For long distance shipping, shrimp dumplings need to be vacuum packed, then frozen in a contact plate freezer and stored in cold storage.

Figure 6. Packaging of Shrimp Dumplings

CHAPTER IV
CONCLUSION

Shrimp dumpling is a gel form of shrimp meat, in the way that processing must be done carefully to acheive gellatinous texture and springy appearance. Besides being affected by the treatment during processing, it is also influenced by the structure of the shrimp meat (muscle) and its chemical composition.

The characteristics of shrimp meat are basic properties, in the sense that they cannot be changed or improved in quality. Thus, in order to obtain a good gel quality, it is important to note that during the making process, the meat components that will support gel formation should not be damaged or degraded. The stages of processing shrimp dumplings are as follows: meat grinding, making wrappers, dough, shrimp dumpling molding, cooking, serving and packaging.