Global Scientific JOURNALS

GSJ: Volume 10, Issue 4, April 2022, Online: ISSN 2320-9186
www.globalscientificjournal.com

REVIEW OF RED PEDA FISH PRODUCTS

By Junianto[1], Fathan Fauzan[2] and Putri Sahrani Alif[3]

1) lecturer of Fisheries department staff _ Universitas Padjadjaran

2) Students of Fisheries Study Program – Universitas Padjadjaran

Keyword :
Quality, Traditional processed, Fermentation, Salting, Manufacture, The distinctive, Red peda fish

ABSTRACT

Red peda fish is a traditional processed product from fisheries in Indonesia. This product is very well liked by most of the people of Indonesia. The purpose of this article is to review red peda fish products in terms of the manufacturing process and quality. Based on the results of the review above, there are two processes of making red peda, namely salting and fermentation. The quality of peda fish is strongly influenced by the freshness of mackerel used, the concentration of salt used and the length of the fermentation process.

Introduction

Red peda fish is a traditional Indonesian processed product made from mackerel (Rastrelliger sp). Mackerel fermented spontaneously, without the addition of a starter. The bacteria that play a role in the fermentation process are bacteria that are resistant to salty substrate conditions because in the manufacturing process there is the addition of salt. According to Fahri et al (2014), the bacteria that play a role in the peda fermentation process are the bacteria found in the fish body and the environment where the fermentation is carried out.

Red peda fish has a distinctive taste and aroma like other fermented products. The resulting taste and aroma are caused by the compounds produced during the fermentation process. Indonesian people like the taste and aroma of the red peda fish product.

Mackerel as the main ingredient in making peda fish is easily available in Indonesia. Mackerel is a small pelagic fish and belongs to the group of red meat fish. According to Nur et al (2017), the nutritional content of mackerel meat in every 100 grams contains 76 grams of water, 22 grams of protein, 1 gram of fat, 20 mg of calcium, 200 mg of phosphorus, 1 g of iron, vitamin A 30 SI and vitamin B1 0,05 mg.

Red peda fish in Indonesia are produced commercially by producers belonging to the home industry group. Making red peda is very easy, just salted and then fermented until it produces a distinctive aroma and taste. Each processor has a different method, especially in the application of salt and the duration of fermentation so that the resulting product with a different taste. Therefore, the article aims to review red peda fish products in terms of the manufacturing process and quality.

Red Peda Making

The salting process followed by a fermentation process is the main stage in making red peda. The fermentation process is intended to obtain a product that has a distinctive flavour. The bacteria that play a role during the fermentation process in the manufacture of peda fish are naturally salt-resistant bacteria, including Corynebacterium, flavobacterium, acinobacter, halobacterium, micrococcus, and cytophaga.

The stages of making red peda fish are as follows: Fresh mackerel is weeded, which is removing the contents of the stomach and gills. Disposal of the contents of the stomach is done through the gills by pulling it slowly. Furthermore, the weeded mackerel is

cleaned with running water so that the mucus and blood and dirt that are still attached to the fish's body disappear. Then it is drained, which is to condition the fish so that the water or liquid that is still attached to the fish's body is lost. The next stage is to carry out the salting process. Salt and mackerel are put in a container that is arranged in layers. The first layer above the bottom of the container is salt, then the fish is then salted, and so on until it reaches the surface of the container, then the container is closed. So the bottom layer is a layer of salt and the top layer is also salt. This salting process is carried out for 3 to 7 days. After that, the fish are removed from the container while being cleaned of salt attached to the fish's body, then drained for about 3 hours. During the draining process is maintained so as not to be infested by flies. The next stage is the fermentation process, in which the salted fish are stored in crates or containers/ baskets that are arranged in layers and then the basket is tightly closed. The condition of the basket/container is cultivated to be dry, this can be done by covering the walls of the basket with dried banana leaves or paper. The fermentation process is allowed to continue for 1-2 weeks until the meat is brownish red, soft and has a distinctive spicy aroma. Then the peda fish is removed from the basket and after that, it is drained by aerating for 6 hours so that the fermentation process stops completely. Red peda fish products as shown in Figure 1.

Figure 1. Peda Fish Products (Marine and Fisheries Education Center, 2015)

Events that occur during salting in the manufacture of peda fish

During the salting process occurs the entry of salt particles into the body or fish meat by osmosis. The entry of salt particles into the fish's body can cause the deepest free water in the intercellular space of fish meat tissue to decrease because it is absorbed by the salt. According to Tariq et al (20014), the entry of salt particles into the fish's body tissue during the salting process will stop if there has been a balance between the solution in the fish's body and the salt solution outside the fish's body.

The absorption of free water in fish body tissues will cause the water content to decrease. As a result, there is a slowdown in bacterial activity and also chemical reactions that occur in the fish's body. Various studies have also reported that the application of a higher salt concentration in the salting process results in a final product with lower water content. The research results of Tariq et al (2014) showed that the use of salt at a concentration of 20% in the manufacture of red peda obtained a water content of 57.09% red peda products while at a higher salt concentration of 40% the water content of red peda products was 53.83%.

Events that occur during fermentation in the manufacture of peda fish

Fermentation is the process of breaking down complex compounds contained in the substrate into simpler compounds. The decomposition reaction is a chemical reaction catalyzed by enzymes, either produced by bacteria or auto enzymes. The chemical processes that occur during fermentation in the manufacture of peda are as follows:

a. Protein denaturation

Salt will denature protein and cause coagulation so that water will come out of the fish body and fish meat will shrink.

b. Breakdown of proteins, fats and other components.

At this stage, the enzymes that play a role are enzymes derived from fish tissue and then followed by enzymes produced by bacteria. Proteolytic enzymes will accelerate the breakdown of proteins into peptide compounds and amino acids. The lipase enzyme accelerates the process of breaking down fats into fatty acids and glycerol can run well. The active lipase enzymes can be derived from muscle and adipose tissue, as well as from bacteria. The results of protein and fat degradation can produce taste compounds, the distinctive odour of peda is due to the presence of a metal ketone compound, butyl aldehyde. In addition, the high nitrogen amino acid content can also affect the spicy taste. The consistency of meter in peda is strongly influenced by the high-fat content and the presence of proteolytic enzymes that will change the texture of the fish so that it becomes meter. While the red colour on the peda occurs as a result of the interaction between the carbonyl derived from fat oxidation with amino acid groups and proteins.

Red Peda Quality Characteristics

The quality of red peda products can be assessed from two factors, namely organoleptic and nutritional content. Organoleptic assessment includes colour, taste, texture and aroma. Assessment of nutritional content includes water, protein and fat content. In general, organoleptic assessment is the first consideration in choosing a peda product.

The Center for Marine and Fisheries Education (2015) informed that red peda products that have good organoleptic quality are characterized as follows: Attractive appearance and shiny brown and red flesh colour. It has a distinctive fermented smell that doesn't smell bad. It was savoury and tasted like a fermented product. The texture is compact.

According to Irianto (2012) raw materials and enzyme activity greatly determine the colour characteristics of the resulting peda. According to Ketaren (1986), the process of hydrolysis and fat oxidation in the fish body will result in discolouration. Adawyah (2006) added the formation of red colour in Peda is due to the enzyme activity of the red/orange-forming bacteria during fermentation. Pigments found in bacteria can be classified into carotenoids, anthocyanins, tripylmethen, and phenazine pigments.

The distinctive aroma of peda is caused by the presence of metal ketone compounds and butyl aldehydes resulting from the hydrolysis of fats (Adawyah, 2006). The rancid aroma is formed due to the destruction of fatty tissue in the fish body due to the oxidation process and the fat hydrolysis process by the lipase enzyme in the fish body into fatty acids and glycerol (Irianto, 2012). The rancid aroma is also due to the presence of fatty acids and flavour-forming compounds such as aldehydes, ketones, and metal ketones due to fat oxidation and protein decomposition (Ketaren, 1986 Adawyah 2006). Irianto (2012) stated that the peda fermented product made from fish whose stomach contents are weeded produces a more rancid aroma. This is because the removal of the contents of the stomach will provide a wider surface for the oxidation process which can cause a rancid odour. A slight rancid aroma and taste are sometimes acceptable, but if it is too loud it will interfere with the taste (Irianto, 2012), and there may be an odour. This rancidity indicates the panellists' dislike of the fermented peda product.

The distinctive taste of peda is formed due to the breakdown of protein and fat in the fish's body. Fatty complex compounds are broken down into fatty acids and glycerol. Complex protein compounds are broken down into amino acids and flavour compounds such as metal ketone compounds and butyl aldehydes (Adawyah, 2006). Paparang (2013) stated that the distinctive taste of peda fish was favoured by panellists due to the presence of propionic acid compounds. This compound is produced from the decomposition of fatty compounds in fish meat. The decomposition of complex compounds in peda occurs due to enzyme activity.

A good peda has a gritty meat texture. The consistency of masir in peda is strongly influenced by the high protein content and the presence of proteolytic enzymes that will change the texture of the fish so that it becomes Masir (Adawyah, 2006). Masir texture on peda is influenced by the water content and water activity of the ingredients as well as the protein and fat content of the ingredients.

The good nutritional quality of red peda has been reported by Adawiyah (2008), which has a water content in the range of 44 – 47%. The protein content is in the range of 21 – 22%. Fat content is in the range of 7-14%. Salt content is in the range of 15 – 17%.

The quality of peda products is highly dependent on the freshness of the mackerel used and the concentration of salt and the length of time the fermentation process takes. The results of research by Fajri et al (2014) showed that giving a salt concentration of 25% of the weight of fish with a fermentation process of 21 days resulted in a very favourable red peda product. Other research results have also been reported by Tariq et al (2014) that the administration of salt concentration has a significant effect on the salt content, glutamic acid content and pH of the red pepper products produced.

Conclusion

Based on the results of the review above, there are two processes of making red peda, namely salting and fermentation. The quality of peda fish is strongly influenced by the freshness of mackerel used, the concentration of salt used and the length of the fermentation process.

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