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# REVIEW OF SALTED TRICHOGASTER PRODUCTS IN INDONESIA

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## ABSTRACT

This review article aims to analyze the potential for developing the processing of salted trichogaster into salted fish products. The method used is a literature study from primary sources (articles published in licensed journals) and secondary sources (reference books). Based on the literature study results, salted trichogaster is a local Indonesian fish that can be processed into salted fish products. The production of salted fish is very popular with Indonesian people and has the potential to be developed. The technique of making salted fish is easy to implement using simple equipment. Sustainability and business development of salted fish products need to be pursued using a SWOT strategy (Strength-Weakness-Opportunities-Treats).

Keywords : salting, quality, development, SWOT



## INTRODUCTION

Salted trichogaster is one of the favorite foods for the Indonesian people and has high economic value. This preparation is made from swamp fish preserved through a salting and drying process (Tambunan et al., 2017). In the salting process, the water content in the fish's body is reduced to a certain point so that bacteria cannot live and thrive. The slender and thin body of the salted trichogaster makes this fish easy to dry and crispy when eaten. Besides being sold in dry conditions, salted trichogaster are often sold fresh.

Salted trichogaster is used for salted fish because these fish are widely found in swamp areas that have not been used optimally and are also widely cultivated either intensively or not. Salted trichogaster distribution areas in nature are found in several areas in South Sumatra. Swamp finches live in swamps, lakes, calm water flows, and generally, lowland wetlands, including rice fields and irrigation canals. Their distribution is widespread following the flood flow during the flood season—the number of salted

trichogaster produced and caught in the dry and rainy seasons. In addition, some salted trichogaster are also produced by cultivation. Due to the abundance of salted trichogaster, a preservation method was made in the form of salted fish. So that the fish last longer, and it is done to anticipate damage or deterioration of the quality of the salted trichogaster, which is not sold out in the market.

Processing maximizes the benefits of catches and aquaculture products and diversifies the activities and commodities produced (Directorate General of Processing and Marketing of Fishery Products 1996). Fish is a perishable food. Fish meat quickly undergoes a process of decay and quality degradation because fish meat has high water content, neutral pH, soft texture, and high nutritional content, making it an excellent medium for bacterial growth. Therefore, fish must be handled quickly or processed into a product. Processing activities significantly affect the socio-economic conditions of fishers or fish farmers. As described above, the production of salted trichogaster both from catch and aquaculture is relatively abundant. So, the need for a way to preserve the product so that it does not rot quickly, namely by making salted fish.

In addition, processing salted trichogaster into salted fish provides a livelihood for fishers and cultivators. Salted trichogaster is a processed fish that is entirely in demand by the people of Indonesia. Abundant ingredients, relatively easy processing methods, and enormous market demands make these salted fish preparations an ample opportunity to be produced.

How to make salted fish is through a process of drying and salting. Dried salted fish such as salted trichogaster is the most straightforward way to make it. Fish innards are cleaned and discarded then the fish meat is dried and dried in the sun (Alim, 2004). The fish drying process can be done by drying in the sun or the oven. Drying using an oven has the advantage of adjusting the temperature and heating time. In addition, by using an oven, the production of salted fish is not dependent on the weather, and the quantity can be more. The purpose of drying is to reduce the moisture content of the material to a limit where microorganisms and enzyme activities that can cause spoilage will stop; thus, the dried material can have a long shelf life. In general, the advantage of this preservation is that the material becomes durable with a small volume of material, making it easier to transport.

Salted trichogaster is an essential commodity in several regions in Indonesia, such as Kalimantan, Java, and Sumatra (DPP South Kalimantan, 2017). Various processed salted trichogaster is very popular with local people because it tastes good and can be processed with various preparations. Salted trichogaster has high economic value because it acts as the primary source of animal protein, especially in rural areas (Murjani, 2011). Due to its high economic value, utilizing salted trichogaster commodities can provide livelihoods for local communities. Suitable for cultivators, fishers, fish processors, or sellers.

Besides being liked because of its delicious taste, behind that salted trichogaster has good nutritional content for the human body. The proximate content of salted trichogaster (*Trichogaster* sp) is 79.27% water, 3.16% ash, 5.08% protein, and 3.50% fat (Putra et al., 2017). Although due to the heating process, the nutrition of the fish is reduced. Because all foodstuffs are exposed to high direct heat, light or oxygen will cause a considerable loss of nutrients. However, the processing can benefit several nutritional components of the food, namely changes in nutrient content levels, increased digestibility, and decreased various anti-nutritional compounds (Sundari et al., 2015). This article aims to analyze the potential of developing salted trichogaster processing into salted fish products.



**Salted Trichogaster**

Sepat siam (*Trichogaster trichopterus*) is a freshwater fish with a relatively broad distribution. Some areas that produce a lot of processed salted trichogaster include Jambi, especially from Kumpeh and Kumpeh Ulu, South Sumatra, and South Kalimantan; however, many are also found on Java. Salted trichogaster usually live in waters of rivers, swamps, lakes, or smaller streams of water. Not a few of these fish are also cultivated in various regions. Salted trichogaster can consume zooplankton, small crustaceans, and various insect larvae (Setiawan, 2008). Salted trichogaster can also eat pellets and other processed feed in the cultivation process.

Salted trichogaster has a flat body (compressed); the body is covered with rough scales, blackish and dull. Salted trichogaster has an additional respiratory apparatus in the form of a labyrinth. Salted trichogaster has a thick mouth, small, narrow, and short snout

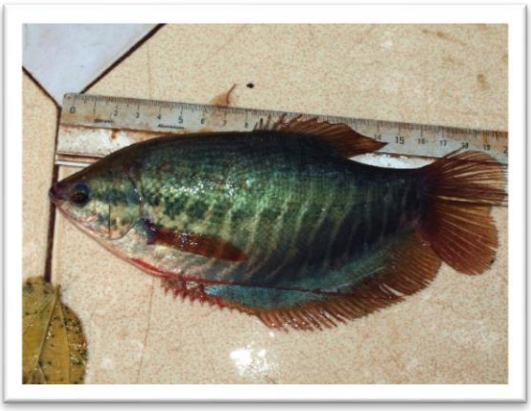
but can be poked (protractile). Salted trichogaster has an upper lip with the lower lip, and only the upper jaw lip is folded. Salted trichogaster has two nostrils but no barbels. The lateral line on the finfish (linea lateralis) is like a straight line, and the arrangement is complete but not perfect.

**Taxonomic Classification of Salted Trichogaster**

Sepat siam (*Trichogaster trichopterus*) is a fish that is commonly used to make salted trichogaster. In English, salted trichogaster rawa is called snake-skin gourami, referring to the mottled color pattern on the sides of its body. Taxonomically, according to Saanin (1968) in Muchlisin (2008), the bog fish (Trichogaster trichopterus) are as follows:

Kingdom : Animalia
Filum : Chordata
Kelas : Osteichthyes
Ordo : Percomorphoidei
Famili : Osphronemidae
Genus : Trichogaster
Spesies : *Trichogaster trichopterus*





**Gambar 1.** Sepat Siam
Sumber: id.wikipedia.org

**Availability of Salted Trichogaster in Indonesia**

Salted trichogaster can be found in almost all freshwater areas in Indonesia, such as Java, Kalimantan, and Sumatra. According to the South Kalimantan DPP report (2017), salted trichogaster can be produced by 3,051.7 tons in swamp waters and 1,951.8 tons in river waters in South Kalimantan. Not only in public water, salted trichogaster have also been widely cultivated in various regions in Indonesia.

However, salted trichogaster in nature in some areas have begun to be rivaled by invasive fish, such as tilapia and red devil. If the sustainability of salted trichogaster in nature is disturbed, it will impact the level of salted fish production itself. Moreover, cultivators are more interested in cultivating other fish, such as catfish, goldfish, tilapia, and ornamental fish.

**Salted Trichogaster Production Trends in Indonesia**

Salted trichogaster is fish consumption and also a source of protein. Besides being sold fresh in the market, salted trichogaster is also preserved in the form of salted fish and is traded in Indonesia. About 50% of fish catch is processed traditionally, and salted fish is one of the traditional processed fish products consumed by many people (Muchtadi et al., 2000). Processing salted trichogaster into salted fish is the most common processing carried out in Indonesia. It is supported by (Rinto & Parwiyati, 2009) statement that research on trichogaster swamp fish is generally still limited to salted fish products, while other processed products are considered to be still few. It indicates that the most common processed salted trichogaster is salted fish.

All levels of society generally consume salted fish, but people's knowledge of salted fish that is safe and good for consumption is still lacking. Most of the salted trichogaster spread on the Indonesian market are still added with formalin to extend shelf life (Astawan et al., 2004). Because of the high production, the public's interest in fish, especially salted trichogaster, is still less competitive with other commodities. Cases of distribution of formalin fish are found in the Jakarta area and its surroundings, even reaching several areas in Indonesia (Ministry of Health RI 2009). Some people, especially producers, know that formalin is dangerous if used as a preservative. However, its use continues and tends to increase because the price is relatively low compared to preservatives that are not prohibited (Hastuti, 2010).

Therefore, people need to be more careful in choosing and buying salted trichogaster. In addition, there is a need for innovation and other ways to make salted salted trichogaster more durable and inexpensive. So, manufacturers want to switch from formalin to a safer preservation method. It is to maintain the production of salted trichogaster and increase public interest in salted salted trichogaster.

**Salted Trichogaster Processing Stages**

Making salted fish can be done in the dry and wet processes. The dry processing steps are carried out as follows: Weigh salt or NaCl as much as 5% of the weight of the fish. Next, sprinkle salt on the bottom of the container. Arrange the fish regularly on top of the salt layer. Make sure that the belly of the fish is facing the bottom of the container. Then sprinkle salt over the fish so that the entire surface of the fish is covered with salt. The salt layer forms the basis for the next fish layer, and so on until it reaches the surface of the container. On the top layer, sprinkle salt again until it covers the entire surface of the fish so that the fish are not infested with flies. The next step is to cover the top of the container using a weighted board. The salting process for salted trichogaster ranges from 12 to 24 days, depending on the level of freshness of the fish. The salting process is declared over marked by a change in the texture of fish to become firm and dense.

The wet processing stages are carried out as follows: Make a saturated salt solution, which will be used as a salting medium. Then the salted trichogaster to be salted is put into a container in layers. The next step is to put the saturated salt solution into the fish container until all the fish are submerged in the saltwater. Cover the top surface of the container with a weighted board and leave it until the salting process is complete, which is indicated by the change in the texture of the fish meat to become firmer and denser.

After the salting process is finished, both dry and wet, the salted fish are washed with clean water to remove any dirt from the salt. Then the fish is drained until it is scorched. After that, the fish are dried in the sun to dry. At the time of drying, it is better if the part of the split fish is placed facing up so that it can be exposed to the sun. Fish should be turned over frequently to speed up the drying process. Avoid fish from possible

exposure to dust and dirt. Drying is declared complete when the fish's body is pressed with the index finger without leaving any pressure marks.

The factors that affect the drying speed of fish are a) the speed of the drying air; the faster the air, the faster the fish will dry. b) Air temperature, the higher the air temperature, the faster evaporation. c) Humidity, the more humid the air, the slower the evaporation process. d) Thickness of fish meat, the thicker the fish meat, the slower the drying process. e) The airflow position towards the fish's body, the smaller the air position towards the fish's body position, the faster the fish dries. f) Fish's nature/body content, fish with high-fat content will be more challenging to dry.

**Quality of Salted Fish Products According to Indonesian National Standards**

The requirements for the quality of processed fish products of dried salted fish species based on the Indonesian national quality standards are as follows:

| Jenis Uji | Satuan | Persyaratan Mutu |
|---|---|---|
| **Organoleptik** | | |
| -Nilai minimal | | 6,5 |
| -Kapang | | negatif |
| **Mikrobiologi** | | |
| -TPC, maksimum | koloni/gram | $1 \times 10^5$ |
| -*Escherichia coli*, mak | MPN/gram | < 3 |
| -*Salmonella** | per 25 gram | negatif |
| -*Vibrio cholerae* * | per 25 gram | negatif |
| -*Staphylococcus aureus** | per 25 gram | $1 \times 10^3$ |
| **Kimia** | | |
| -Air, maksimum | % b/b | 40 |
| -Garam, maksimum | % b/b | 20 |
| -Abu tak larut dalam asam, mak | %b/b | 1.5 |

Sumber data : BBPMHP, Jakarta,1993/1994
Keterangan ; tanda * bila diperlukan (rekomendasi)

To obtain salted trichogaster products according to SNI quality, it has several requirements: the fish must be fresh, obtained from uncontaminated waters, and always in a cold state (cold chain). Water used as an auxiliary material for activities in the processing unit meets the requirements for drinking water quality by the provisions concerning the requirements for monitoring drinking water quality. All equipment and equipment used in handling dried salted fish have a smooth and flat surface, do not peel, do not rust, are not a source of micro-organisms contamination, are not cracked, and are easy to clean. All equipment is clean before, during, and after use.

**Describe the Marketing of Salted Trichogaster Products in Indonesia**

The management of salted fish products is a profitable business. The nutritional content in salted fish is relatively complete, so many people buy it to consume it. In addition, salted fish is a relatively cheap and affordable product to be traded to all levels of society. Generally, the output generated from processing salted trichogaster into salted fish is by obtaining salted fish ready to be marketed and consumed. Before doing the distribution/marketing of salted fish until finally, the salted fish reaches the hands of consumers. Business actors can carry out several forms of promotion to further increase sales. One way is to do promotions through social media where products are packaged to attract a lot of people's interest to buy the products offered.

The distribution of salted fish can be divided into several ways, such as producers directly to consumers, producers distributing salted fish to collectors and then to consumers, and producers distributing salted fish to collectors, retailers, and finally to consumers. This distribution pattern depends on the coverage area of the salted fish products being marketed, not only the marketing focus. However, it can be distributed in other cities or regions in Indonesia. The hope is that with more salted fish products sold, it will increase people's income in the area. Salted trichogaster is one of the fish whose existence is still abundant and has high economic value.

Marketing salted fish products in Indonesia is generally done by direct and indirect marketing. Direct marketing is done utilizing consumers who can come directly to the seller and order it over the phone. Usually, orders in large quantities are made in the market. This direct marketing aims to get closer to potential consumers; besides that, consumers can choose their salted fish, which they think is still good. Indirect marketing is done by marketing their products by bringing orders to consumers to the place where they sell salted fish. Then several alternative strategies can be arranged based on the SWOT matrix analysis.

ST strategy (Strengths-Treats), this strategy is to use the company's strengths to overcome threats. The strategy that can be used is that the salted fish product entrepreneur asks the fish supplier to pay attention to the size requested; otherwise, the demanded quota will be reduced, and the purchase price will be lowered and providing guidance in making

salted fish. W-T strategy (Weaknesses-Treats) is based on company activities that are defensive in nature and try to minimize existing weaknesses and avoid threats. The strategy that can be done is to increase the size of salted fish according to Standard Operating Procedures by improving the availability of funds and improving the process of making salted fish that is not in accordance with Standard Operating Procedures by improving the availability of transportation to get raw materials.

**What Should be Improved on Salted Trichogaster Products to Make It More Attractive to The Public**

Sustainability and business development of salted fish products in Indonesia need to be carried out. One of the development strategies that can be implemented is the SWOT (Strength-Weakness-Opportunities-Treats) strategy. The strategy can be described as follows:

Strength-Opportunities (SO) Strategy

SO strategy is a strategy by using their strengths to take advantage of current opportunities. The strategies that can be applied are as follows:

a. Maintaining the quality of the products produced is guaranteed so that public demand for this salted fish business increases.
b. Maintaining affordable product prices in increasing public demand for this salted fish business.
c. Add product variety to attract consumers.

Weaknesses-Opportunities (W-O) Strategy

It is a strategy to minimize weaknesses in taking advantage of existing opportunities. Some of the strategies implemented are as follows:

a. Increase the amount of capital so that the marketing area for the salted fish business is wider
b. Maintain product quality
c. Strive to obtain raw materials in order to meet market demand

Strength-Treats (ST) Strategy

It is a strategy by using the strengths possessed by the company in dealing with threats that come from the company; strategies that can be applied include:

a. Improving the quality of the products produced in maintaining the salted fish business
   An important thing for this salted fish business is to improve product quality in order to be able to overcome existing threats; quality is an advantage to achieving market advantage.
b. Build customer trust
   This salted fish business can trust customers to believe in the products they produce; this is done by utilizing some of the strengths of this business.
c. Develop technology so that the products created are easy to market
   This salted fish business is still far from technology in terms of marketing the products it produces; for this reason, this business must be able to take advantage of the current state of affairs which is already sophisticated. In order to efficiently promote this business through online media.

Weaknesses-Treats (WT) Strategy

It is a strategy used to minimize the weaknesses and threats that exist in the salted fish business; the strategies are:

a. Doing additional capital to compete with competitors
b. Equalize the price with the quality of salted trichogaster
c. Innovate on the salted fish business so that it can compete with competitors

## CONCLUSION

Based on the literature study results, salted trichogaster is a local Indonesian fish that can be processed into salted fish products. The salted fish products produced are very popular with the people of Indonesia and have the potential to be developed. The technique of making salted fish is easy to implement using simple equipment. Sustainability and business development of salted fish products need to be pursued using a SWOT strategy ((Strength-Weakness-Opportunities-.Treats).

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