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ARTICLE REVIEW PINDANG COB (EUTHYNNUS AFFINIS)

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ABSTRACT

Pindang cob is a traditional fish processed product that is highly developed in Indonensia. This review article aims to get information on the stages of making cob pindang, the quality standards of cob pindang and the benefits of consuming cob pindang Based on the literature study obtained the following information: The stages of making cob pindang consist of 7 stages, namely the selection of raw materials, preparation of equipment and materials, weeding and washing, preparation of fish, salt and seasoning, boiling fish and storage. The quality standards of cob pindang are assessed based on organoleptic, chemical and microbial parameters. The benefits of consuming cob pindang are preventing heart disease, maintaining brain function and health, supporting bone health, preventing thyroid damage and maintaining eye health.

KeyWords

Benefits, health, kangker, manufacture, quality

Inroduction

The catch of cob fish has continuously increased. According to KKP (Ministry of Marine Affairs and Fisheries) data, the number of cob fish catches in the 2017-2020 period has increased the number of catches. In 2017, the number of cob catches amounted to 471,008.91 kg and then in 2018 amounted to 542,759.56 and in 2019 amounted to 592,056.00 kg. The number of cob fish catches in 2020 decreased, the catch was only 123,363.00 kg.

The catch of this cob fish is mostly processed into various processed, one of which is the cob pindang. Pindang fish is a fairly popular exercise in Indonesia. This traditional preparation ranks second only to salted fish. Pemindangan is a technique of processing and preservation by boiling / cooking fish in a salty atmosphere for a certain period of time in a container and then there is a process of reducing water content to a certain extent (Pandit 2007). This review article aims to get information on the stages of making cob pindang, the quality standards of cob pindang and the benefits of consuming cob pindang.

Classification, Morphology and Habitat of Cob Fish

The classification of cob fish according to Saanin (1984) is:

Kingdom : Animalia
Phylum : Chordata
Class : Teleostei
Order : Perciformes
Family : Scrombidae
Genus: *Euthynnus*
Species : *Euthynnus affinis*

Cob fish have morphology that is a medium-sized body shape, elongated like a torpedo, has two dorsal fins separated by narrow gaps. The first dorsal fin is followed by a narrow gap, the second dorsal fin is followed by 8-10 additional combs. The first dorsal fin of the cob fish has 10 segments of hard fingers, while the second dorsal fin consists of 12 segments of weak fingers. Cob fish do not have swimming bubbles. The body color on the back of the cob fish is dark bluish and on the sides of the body and abdomen is silvery white (Oktaviani 2008).

Cob fish is a fast swimmer fish, alive and *clustered (schooling*) when foraging and has a bright color. The swimming speed of fish can reach 50 km / h. This swimming ability is one of the factors that cause its spread can include a fairly large scale of space (geographical area), including some species that can spread and migrate across oceans, even in the ocean waters of Indonesia to be one of the main migration destinations of fish swarms, both from the southern hemisphere of the Indian Ocean and from the northern hemisphere of the Pacific Ocean. In general, this cob fish is located around sea level to a depth of 100 m (Dahuri 2008).

Availability of Cob Fish in Indonesia

Based on KKP statistics from 2017-2020, the number of cob fish marine fishery production is as follows:

Table 1. Fish Production Amount Statistical Data

Province	2017	2018	2019	2020
Total	**471.008,91**	**542.759,56**	**592.056,00**	**123.363,00**
ACEH	34.722,19	75.141,95	24.290,00	6.278,00
BALI	15.709,67	22.650,43	17.323,00	6.615,00
BANTEN	3.327,15	8.316,53	27.708,00	23
BENGKULU	6.089,19	8.491,02	4.398,00	0
IN YOGYAKARTA	389,59	539,76	551	52
JAKARTA	13.583,50	3.684,18	2.821,00	993
GORONTALO	8.949,56	12.804,40	11.746,00	5.749,00
JAMBI	5,4	0	5	0
WEST JAVA	17.789,04	5.705,62	22.835,00	522
CENTRAL JAVA	18.770,37	15.193,16	10.669,00	1.219,00
EAST JAVA	62.414,53	49.318,68	47.087,00	15.702,00
WEST KALIMANTAN	11.611,36	16.415,34	5.939,00	2.164,00
SOUTH KALIMANTAN	3.535,76	20.420,41	11.414,00	1.878,00
CENTRAL KALIMANTAN	431,7	44,96	480	321
EAST KALIMANTAN	1.920,87	8.119,30	10.223,00	2.625,00
NORTH KALIMANTAN	0,02	320,08	176	85
BANGKA BELITUNG ISLANDS	45.062,78	9.884,63	4.888,00	1.099,00
RIAU ISLANDS	50.675,42	14.824,46	36.119,00	9.440,00
LAMPUNG	14.085,09	9.425,75	9.233,00	4.611,00
MALUKU	28.632,53	41.293,85	46.298,00	10.642,00
NORTH MALUKU	6.133,29	18.708,16	20.278,00	6.674,00
WEST NUSA TENGGARA	10.481,98	16.805,64	19.341,00	13.175,00
EAST NUSA TENGGARA	7.528,07	19.866,10	13.190,00	0
PAPUA	34.708,58	2.548,30	2.935,00	0
WEST PAPUA	524,72	20.209,63	4.621,00	3.816,00

RIAU	11,94	459,12	0	0
WEST SULAWESI	592,79	10.317,48	10.588,00	4.767,00
SOUTH SULAWESI	32,16	29.087,16	34.343,00	10.396,00
CENTRAL SULAWESI	937,47	2.647,79	103.850,00	257
SOUTHEAST SULAWESI	10.727,04	22.509,24	17.932,00	5.896,00
NORTH SULAWESI	4.133,30	44.404,68	28.991,00	2.327,00
WEST SUMATRA	41.308,28	21.713,79	24.113,00	2.663,00
SOUTH SUMATRA	0	490,39	6.389,00	786
NORTH SUMATRA	16.183,60	10.397,60	11.282,00	2.588,00

Cob Fish Pindang Processing Stage

Pemindangan is a traditional product that has a distinctive taste so much liked by the community. Pemindangan is a technique of processing and preservation by boiling / cooking fish in a salty atmosphere for a certain period of time in a container and then there is a process of reducing water content to a certain extent (Pandit 2004). According to Ilyas (1980) the basic principles of development are:

1) Kill or reduce bacteria through heating
2) The addition of salt can kill or inhibit the growth of bacteria left in fish
3) There is a reduction in the moisture content of fish meat. The success of the development process is strongly influenced by the level of freshness of fish as raw materials, salt quality and environmental conditions (Afrianto and Liviawaty 1989).

The success of the development process, is strongly influenced by several things as follows:

1) Fish freshness

All fish of various types and various levels of freshness can be used as raw materials for cultivation. However, this will greatly affect the quality and selling price of the pindang fish produced. If the raw materials of the fish are less fresh, it will produce pindang fish that is too salty and the meat is destroyed.

2) Salt

The quality of salt used for the cultivation process affects the quality and durability of the resulting pindang fish. Good salt contains >96% NaCl.

3) Sanitation and hygiene

The condition of the equipment and the environment where the development process must be clean and healthy so that the pindang fish produced is of good quality.

4) Packaging and storage

Pindang fish must be stored in a clean, cool and closed place so that kualitasnya does not decrease during the storage and distribution process.

Making pindang fish can be done in various ways. The choice of how to fish can depend on the type of fish and the container used. But when viewed from the way it is made, all of them have the same principles, namely:

1) Selection of raw materials

The fish to be processed should be separated based on the type, freshness level and size of the fish. Usually fish that are often processed in this way are cob fish (*Ethynus affinis*), skipjack (*Katsuwonus pelamis*) and others.

2) Preparation of equipment and materials

Containers used for the manufacture of pindang fish can be made of iron / zinc or clay. In addition to the pouring container, you also prepare knives, filters, cutting boards, dried banana leaves or dried bamboo leaves, salt and seasoning (if needed).

3) Weeding and washing

- To facilitate the handling process, place the fish in separate settings according to size, type and freshness level. In large fish, it is necessary to weed by removing the contents of the stomach, gills and scales. Then the body of the fish is split or cut into pieces according to the desired size. to facilitate the process of pouring or can also be in a whole state depending on our tastes
- In medium-sized fish simply cleaned gills, scales and stomach contents. Disposal of stomach contents is done by pulling it from the hole over culum (gill cap) so that the abdominal wall is not damaged (torn)
- The washing process is carried out with clean running water, so that the fish are completely clean.
- Drain the washed fish thoroughly in the plastic basket container that has been provided. In this slicing process, the fish is neatly arranged with the stomach facing down so that there is no stagnant water in the stomach.
- After the fish is slightly dry, weigh the fish so that it can know the amount of salt and seasoning needed in the pouring process.

4) Preparation of fish

- After turning, the fish are arranged neatly and regularly in the container that has been provided. Try to measure uniform

fish in each place (container) of cultivation, so that the resulting pindang fish has a uniform quality and taste

- The bottom of the container is usually coated with woven bamboo or dried banana leaves so that the fish do not stick to the bottom of the container and not scorched.
- On the wall to the bottom near the base of the panic made a small hole that is easily opened and closed to remove the residual liquid of the pouring.

5) Salt and seasoning

- In the process of pouring, salt serves to give a savory taste to the fish, lower the water content in the fish's body and inhibit the growth of rotting bacteria. In addition to salt, usually added spices such as garlic, bay leaves and galangal. The types and seasonings used are tailored to the tastes of consumers
- The salt used is crystal in shape and sprinkled on each layer of fish evenly. The salt used ranges from 5-25% of the total weight of the fish being fished. The more salt used, the taste of pindang fish is saltier while if the salt is too little then the durability of pindang fish becomes reduced. After all the fish and salt are arranged in the container, then add enough water.
- In addition to using crystal salt, you can also use a saline solution that is poured into a container that already contains fish. The concentration of the solution is adjusted to taste. All fish must be submerged so that the taste and quality of pindang fish produced is uniform.

6) Boiling fish

- After the preparation of the fish, the salt and seasoning is completed. Close the container tightly, usually above the lid given a ballast. The boiling process lasts for 2-4 hours depending on the size of the fish being picked up.
- During boiling, carry out periodic checks. If necessary add enough water to speed up boiling. When the fish is cooked, the remaining boiling water is removed by opening the hole cover at the bottom of the container. This waste water is accommodated to be used as a raw material for making soy sauce or fish petis.
- Let the pindang fish remain in the pouring container until it cools and the pindang fish is ready to be marketed. During the marketing process, pindang fish remains in the pouring container

7) Storage

Packaging and storage of pindang fish must be strictly considered so that the quality of pindang fish does not decrease. Fish containers must be tightly closed so as not to be contaminated by dirt from the outside and stored in a dry and cool place. Do not store containers in hot or humid places, because it will cause the activity of bacteria and rotting enzymes to increase again.

Quality Standards of Cob Fish Pindang Products

Cob fish pindang products must be in good quality condition when they arrive in the hands of consumers. Good product quality can be known by several observations including, raw material quality testing, organoleptic testing and microbiology of cob fish pindang and proximate analysis.

A. Quality testing and organoleptic of fresh fish

Organoleptic testing of raw materials is a test to find out the quality of raw materials through senses in the form (eyes, gills, mucus, odors, and textures) to see whether the raw materials used are still fresh and still feasible for consumption, using the SNI score sheet of fresh fish raw materials (SNI 01.2729 - 2013).

Table 2. Quality and safety requirements of fresh fish

Test Parameters	Unit	Requirement
a. Organoleptic	-	Min. 7 (score 1-9)
b. Microbial contamination*		
- ALT	Colony/g	5,0 10^5
- Escherichia coli	APM/g	< 3
- Salmonella	-	Negative/25 g
- Vibrio cholera	-	Negative/25 g
- Vibrio parahaemolyticus	APM/g	<3
c. Metal spruce*		
- Arsen (As)	mg/kg	Max. 1,0
- Cadmium (Cd)	mg/kg	Max. 0,1
	mg/kg	Max. 0,5**
- Mercury (Hg)	mg/kg	Max. 0,5
	mg/kg	Max. 1,0**
- Tin (Sn)	mg/kg	Max. 40,0
- Lead (Pb)	mg/kg	Max. 0,3
	mg/kg	Max. 0,4**
d. Chemistry*		
- Histamine***		Max. 100
e. Chemical residues*		

- Chloramphenicol****		There can't be
- Malachite green and Ieuchomalachite green****		There can't be
- Nitrofuran (SEM, AHD, AOZ, AMOZ)****		There can't be
f. Biological Toxins*		
- Ciguatoksin*****		Undetected
g. Parasites*		There can't be

Note

- When needed

** For predatory fish

*** For fish scombroidae (*scombroid*), clupeidae, pomatomidae, coryphaenedae

****For farmed fish

B. Organoleptic testing and microbiology of cob fish pindang

Organoleptic testing or sensory of the final product and microbiology is a test to find out the quality of the final product worthy of consumption and liked by consumers through five senses by referring to SNI sensory pindang fish (SNI 229-2009) in the form of (appearance, smell, taste and texture).

Table 3. Organoleptic requirements and microbiology of cob fish pindang

Test Type	Unit	SNI Standard
a. Organoleptic		
- Value	Numbers (1-9)	Min 7
- Mold		Negative
b. Microbial Spruce		
- ALT	Colony $^{g-1}$	Max $5{,}010^{5}$
- Escherichia coli	APM $^{g-1}$	Max <3
- Salmonella	APM 25 $^{g-1}$	Negative
- Vibrio chlerae	APM 25 $^{g-1}$	Negative
- Staphyloccocus aureus	Colony $^{g-1}$	$1*10^{3}$
c. Chemistry		
- Water	% mass fraction	Max 60
- Salt	% mass fraction	Max 10
- Histamine	Mg/kg	Max 100

C. Proximate analysis

Proximate testing in pindang fish to be tested is water content (SNI 01-2354.2-2006), ash content (SNI 2354.1-2010), protein content (SNI 01-2354.4-2006), and fat content (SNI 01-2354.3-2006).

How to Get A Suitable Product SNI

The effort to get a cob pindang product that is in accordance with SNI is referring to three points that need to be considered, a. Specifications (SNI 2717.1:2009), b. Raw Material Requirements (SNI 2717.2:2009), and c. Handling and Processing (SNI 2717.3:2009). However, such standardization has undergone an overhaul and development. Fundamental changes to this standard include: 1. Simplification of SNI Ikan Pindang from 3 parts to 1 standard. 2. Quality requirements, food safety, sensory assessment sheet and handling and processing are adjusted to the applicable provisions.

The standardization needs to be considered, based on:

1. Scope

This standard applies to saltwater pindang fish and salt pindang fish, without the addition of spices or spices, and does not apply to products that undergo further processing.

2. Normative Reference

The following reference documents are indispensable for the application of this document. Documents for reference are dated, only the mentioned editions apply. Documents for reference are undated, applying the last edition of the reference document (including all changes/amendments).

- SNI 01- 2359-1991, Fishery products, determination of salt content.
- SNI 2354.15:2017, How to test chemistry – Part 15: Determination of total Arsenic (AS) levels in fishery products.
- SNI 01-2332.2-2006, Microbiology Test Method – Part 2: Determination of Salmonella in fishery products.
- SNI 2354.10:2016, How to test chemistry - Part 10: Determination of histamine levels with Spectrophotometric and High Performance Liquid Chronomatography (KCKT) in fishery products.
- SNI 2326:2010, Method of sampling fishery products.
- SNI 2354.5:2011, How to test chemistry – Part 5: Determination of the levels of lead heavy metals (Pb) and cadmium (Cd) in fishery products.
- SNI 2729 :2013, Fresh fish.
- SNI 2332.1:2015,Microbiology test methods – Part 1: Determination of Coliform and Escherichia coli in fishery products.
- SNI 2332.3:2015, Microbiology Test Method – Part 3: Determination of Total Plate Numbers (ALT) in fishery products.
- SNI 2332.9:2015, Microbiology test method – Part 9: Determination of Staphylococcus aureus in fishery products.
- SNI 2346.2015, Sensory testing guidelines on fishery products.
- SNI 4872:2015, Ice for fish handling and processing.
- SNI 2354.6:2016, How to test chemistry –Part 6: Determination of mercury heavy metal (Hg) levels in fishery products.
- SNI 2354.2:2016, How to test chemistry – Part 2: Water content testing in fishery products.
- SNI CAC/RCP 1:2011, National Recommendation of The Code of Practical – General Principles of Food Hygiene.
- CAC/GL 21-1997), Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods.
- CAC/RCP 52-2003, Code of Practice for Fish and Fishery Products.

3. Product Shape Criteria

Whole fish with or without weeding is flavorful and tastes typical of pindang and packaged according to the type of processed pindang.

4. Raw Material Requirements

- Raw materials

The raw material is fresh fish according to SNI 2729: 2013.

- Auxiliary Materials

a. Water

Water used as a auxiliary material for activities in the processing unit meets the applicable provisions.

b. Ice

Ice according to SNI 4872:2015 4.2.3

c. Salt

The salt used is a salt that is worthy of human consumption.

Benefits of Cob Fish Pindang

Fish is a source of protein, also recognized as a functional food that has important meaning for health because it contains long-chain unsaturated fatty acids (especially those classified as omega-3 fatty acids), vitamins and macro and micro minerals. According to Mentang, et al (2011), omega-3 fatty acids (18:3n-3) can lower triglyceride levels and total cholesterol in the blood and can increase fat metabolism. Cob fish has a high protein content of 26.2 mg / 100g and is very rich in omega-3 fatty acids (Sanger 2010). The benefits that you can get from eating marine fish, one of which is cob fish according to Adrian (2020), including:

1. Prevent heart disease

Sea fish has high protein and lower cholesterol levels than red meat. This makes fish meat one of the good sources of healthy protein for heart health. This fact is also supported by research that shows that regularly eating fish rich in omega-3 fatty acids can lower fat levels in the blood, thereby lowering the risk of heart disease.

2. Maintain brain function and health

Sea fish, such as salmon, sardines, cobs and anchovies, are rich in omega-3 fatty acids that children need for brain development and formation. Not only that, research also found that eating sea fish containing omega-3 fatty acids is beneficial to help relieve symptoms of depression and dementia in the elderly, and good for maintaining brain health. However, clinical data supporting allegations about the effectiveness of omega-3 fatty acids in relieving symptoms of depression, dementia, and impaired brain function, so far has not been consistent.

3. Supports bone health

Vitamin D is not only formed by the body with the help of sunlight, but you can also get it by eating marine fish. Sea fish is one source of vitamin D and calcium that can support bone health and prevent certain diseases. By eating salmon about 8 grams a day can meet 75 percent of your daily vitamin D needs.

4. Prevent thyroid damage

Sea fish contains minerals that are good for thyroid disease, namely iodine and selenium. So far it is known that one of the risk factors that can increase a person's chances of developing thyroid disease is iodine deficiency, therefore sea fish can be one of the good intakes to prevent thyroid disease. Further research suggests that selenium content in marine fish may help maintain thyroid function and prevent further thyroid damage.

5. Maintain eye health

A diet high in omega-3 fatty acids obtained from marine fish or supplements has been shown to help maintain eye health. Research shows that people who regularly consume sea fish or omega-3 supplements at doses of at least 500 mg per day, are at lower risk for macular degeneration and diabetes-related retinal damage.

Pindang products are in great demand by the wider community, it is caused by several factors below, namely:

1. The product still has a taste and texture like fresh fish, so the shape of the presentation when you want to be consumed can vary according to taste.
2. The process of making pindang fish is very simple so it is easy for everyone to do.
3. Giving seasoning to the pouring process can be adjusted to the tastes and desires of consumers
4. The nutritional value of pindang fish is quite high, so it can be used as one of the sources of animal protein.
5. The raw materials of pindang fish can be taken from various levels of freshness. However, the condition of raw materials will greatly affect the production results produced.
6. Waste fluids from the pouring process, can be used for raw materials for making petis or fish sauce

Conclusion

Based on the literature study as mentioned above obtained the following information: The stages of making cob pindang consist of 7 stages, namely the selection of raw materials, preparation of equipment and materials, weeding and washing, preparation of fish, salt and seasoning, boiling fish and storage. The quality standards of cob pindang are assessed based on organoleptic, chemical and microbial parameters. The benefits of consuming cob pindang are preventing heart disease, maintaining brain function and health, supporting bone health, preventing thyroid damage and maintaining eye health.

This review article aims to get information on the stages of making cob pindang, the quality standards of cob pindang and the benefits of cob pindang.

The effort to get a cob pindang product that is in accordance with SNI is referring to three points that need to be considered, a. Specifications (SNI 2717.1:2009), b. Raw Material Requirements (SNI 2717.2:2009), and c. Handling and Processing (SNI 2717.3:2009).

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