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Review article ANCHOVY Products SALTED (*Stolephorus sp.*)

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Abstract

Anchovies are important economical fish in Indonesia and are processed into salted anchovy products. This article aims to review salted anchovy products from the processing process and product quality. Based on the literature review obtained information on the stages of processing salted anchovies are as follows: Sorting, cleaning, salting and drying. The quality of salted anchovy products in Indonesia is regulated based on SNI number: 3461.1: 2013, namely a maximum salt content of 10%, a maximum water content of 60%, a maximum insoluble ash content in acid of 0.3%, Salmonella and vibrio cholerae must be negative, total bacteria a maximum of 10^5 colonies / gram and the number of Staphylococcus aureus a maximum of 10^3 colonies / gram.

Keywords: quality, salting, drying, protein, shelf life.

INTRODUCTION

Anchovies are small pelagic fish that is widespread in the coastal waters of Indonesia. This anchovies have a huddled life. A horde of anchovies can be hundreds to thousands of heads. Anchovies are small with a length of about 6-9 cm, but some reach 17.5 cm.

Anchovies like other fish are perishable. The shelf life of fresh anchovies stored at room temperature (25- 29⁰C) lasts only 1 day. Processing of these anchovies becomes

very important to do. The processing process is carried out as an effort to utilize fish so that it can be used as much as possible as food.

The processing of anchovies requires accuracy and accuracy in how to process them so that the quality of the product does not fall and is maintained hygienic. This is certainly related to the way anchovies are processed, where anchovies are included in the type of fish that are prone to *spoilage (perishable food)* if left for a long time will experience changes due to physical, chemical and microbiological influences.

If the processing of anchovy products is not good, it will cause many side effects related to health as well, for example it can interfere with the gastrointestinal tract, breathing, hypertension (high blood pressure), unconsciousness to coma. Chronic effects that can be caused are severe irritation, liver disorders, kidney disorders, digestive system disorders and can cause cancer in humans (Purba et al., 2015).

Anchovies are relatively easy to obtain in the market and are cheaper compared to other fish. Anchovies are also low-fat fish and are not too fishy because the urea content is not too high (Isnanto, 2012). Anchovies have an advantage, that is, they can be consumed throughout their body including their bones.

Anchovies are usually processed in the form of salted anchovies and fresh anchovies. The difference between the two is that the processing of fresh anchovies does not use salt, while salted anchovies are processed using salt in a ratio of 6 kg of salt to 30 kg of anchovies. Salting is one of the preservation methods with the principle of salt penetration into fish meat, and is influenced by various physical and chemical factors, such as diffusion, osmosis, and a combination of chemical and biochemical processes depending on the type of fish (Eko, 2003). This article aims to review salted anchovy products from the processing process and product quality.

Morphology and Taxonomy of Anchovies

Morphological features of field anchovies (*Stolephorus sp*) have a characteristic white and medium-sized body. The body color of anchovies is slightly reddish. The body is rounded elongated (*fusiform*) or slightly compressed to the side (*compressed*). There is a silver-white sash beside his body that extends from head to tail. The scales are small and thin very easily loose, the maxillary bone may extend to reach the gill slits. The caudal fins are torn and do not merge with the anal fins and the

abdominal spines are only present between the pectoral and ventral fins which are no more than 7 pieces. Dorsal fins are generally without pradorsal spines, partially or completely behind the anus, short with a weak radius of about 16 – 23 pieces. The upper weak radius of the pectoral fin is not elongated (Supryadi 2008). The teeth are located on the jaw.



Figure 1 Salted Anchovies (*Stolephorus sp.*)

According to Burhanuddin (2008) the classification of anchovies is as follows:

Kingdom : Animalia
Phylum : Chordata
Sub phylum: Vertebrae
Class : Actinoperygii
Order : Clupeiformes
Falimi : Engraulididae
Genus : *Stolephorus*
Species : *Stolephorus sp.*

Anchovies are neritic resources, because their spread is in waters near the coast in areas where the process of increasing water mass (*upwelling*) occurs. Anchovies are among the economically important fish in Indonesia.

Exploitation of anchovies generally uses boat chart fishing gear, where this fishing gear has a high production rate and is active in nature. In general, the availability of anchovies resources is very dependent on growth, where the fish will experience continuous growth throughout its life. Growth is related to the problem of increasing in

the number and size or dimensions of individual organ cell levels that are commonly measured by measuring weight, length, lifespan, and metabolic balance.

The nutritional content of fish is of high quality because all parts of its body can be consumed. Anchovies bones contain a lot of protein and calcium. The nutritional composition of fresh anchovies for every 100 grams consists of 82 grams of water, 16 grams of protein, 1.0 grams of fat, 1 mg of iron, 500 mg of calcium, 500 mg of phosphorus, and 77 kcal of energy. The nutritional content of anchovies both fresh and dried is higher than that of other fish (table 1).

Table 1. Nutritional content of various types of fish and their preparations

(Source: Aryandi and Darmayanti, 2014)

Type	Energy (cal)	Protein (g)	Fat (g)	Calcium (mg)	Phosphorus (mg)	Iron (mg)
Milkfish	129	20	4.8	20	150	2
Cork	74	25.2	1.7	62	176	47
Salted fish	193	42	1.5	200	300	2.5
Goldfish	86	16	2	20	150	2
Mackarel	03	22	1	20	200	1
Fried cathfish	252	19.9	19.1	23.8	232	1.2
Selar	142	27	3	60	200	3
Fresh rebon	81	16.2	1.2	757	292	2.2
Dried rebon	299	29.4	3.6	2306	255	21.4
Sardines	338	21.1	27	354	434	3.5
Powderes anchovies	227	60	2.3	1209	1225	3
Dry anchovies	170	33.4	3	1200	1500	3.6
Fresh anchovies	144	32.5	0.6	1000	1000	3
Tilapia	89	19.7	1	96	29	1.5
Dried shrimp	295	62.4	2.3	1209	1225	6.3

Stages of Processing Salted Anchovies

In making salted anchovies, which is the main job is salting and drying, however, there are several stages of activities that are actually carried out, namely as follows:

a. Sorting (*selection*) of raw materials

At this stage, the work carried out is actually choosing anchovies so that they are uniform, because the size of the anchovies is relatively uniform. Here, the selection of fish of other species that are too large in size is carried out in combination with anchovies.

b. Cleaning

Cleaning is carried out using clean water which is carried out on the troughs. After cleaning the anchovy raw materials are put in the space provided such as other cement tubs.

c. Salting

Salting or salting is carried out after cleaning. The salt given is pure salt which is usually a high NaCl content (>90%)

d. Drying

The anchovies that have been processed in salting are then washed again and dried in the sun on para-para. The drying place is free from shading with the aim that sunlight can be used entirely. These para-para are generally made of bamboo that has been split, has a length of about 4 m, a width of 3 m and a height of about 1.5 m. drying activities must also be accompanied by a reversal process that is minimally carried out 2-3 times per day. Before the fish is completely dry, every afternoon the fish is put in a roofed place with the aim of not being scalded by rainwater. The length of drying depends on the weather but generally takes about 3-5 days. Then, to check the anchovies are dry or cannot be held atau sedkit pressed with their hands

Quality of Salty Anchovy Product

Food safety is a necessary condition and effort to prevent food from possible biological, chemical, and other contamination that can interfere with, harm, and endanger human health. In addition to these various contaminations, food also becomes unsafe due to the condition of raw materials, additives, and equipment used in the food processing process. Meanwhile, the environment and handlers involved in the food management process can also participate in determining the condition of food safety (Kurniawati, 2017). Product quality is also important, especially for anchovy products which are in great demand by the public.

Upaya realizing the quality assurance system in Indonesia, the government has issued a standardization policy through Government Regulation No.102 of 2000 concerning "National Standardization" which is furthermore the PP referred to in the agricultural sector through the decrees of the Minister of Agriculture No.170 of 2006 concerning the Implementation of National Standardization in the agricultural sector. This decision also contains the quality assurance system policy in the agricultural sector..

The quality of salted anchovy products in Indonesia is regulated based on SNI 3461.1: 2013, as contained in Table 2.

Table 2. Quality requirements for salted anchovies (*Stolephorus sp*) (SNI 3461.1:2013)

Composition	Unit	Score
a. Sensory		
- Appearance, Min	Number (1-9)	7 negative
- Mushroom	Number (1-9)	7 negative
b. Microbial Contamination		
- ALT, max	Colon gram	Max 1 X 10 ⁵
- <i>Escherichia coli</i>	APM/GRAM	<3
- <i>Salmonella</i> *	Per 25 grams	Negative
- <i>Vibrio cholerae</i> *	Per 25 grams	Negative
- <i>Staphylococcus aureus</i> *	Colony gram	1,0 x 10 ³
c. Chemical		
- Salinity	%	Max 10
- Water content	%	Max 60
- Ash content is not in acid	%	Max 0,3
Notes * when needed		

Factors that must be considered to obtain salted anchovy products according to SNI are that the raw materials (anchovies) must be fresh and the processing stages must be carried out carefully and the processing site must be clean and hygienic. Fresh anchovies have the characteristics of kenampakkan: whole, clean, white, and brilliant. Smell: fresh specific type. Texture: compact, dense and elastic

Conclusion

Based on the literature review, information on the stages of processing salted anchovies is as follows: Sorting, cleaning, salting and drying. The quality of salted anchovy products in Indonesia is regulated based on SNI number: 3461.1: 2013, namely a maximum salt content of 10%, a maximum water content of 60%, a maximum insoluble ash content in acid of 0.3%, Salmonella and vibrio cholerae must be negative, total bacteria a maximum of 10^5 colonies / gram and the number of Staphylococcus aureus a maximum of 10^3 colonies / gram.

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