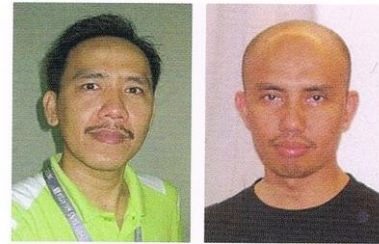


Sambelingkung - a traditional fish product from South Sumatera, Indonesia



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Sambelingkung is a traditional fish product of South Sumatera made by boiling, steaming and frying fish flesh, with the addition of spices. The resulting product, with soft texture, taste and distinctive flavour, can be consumed as a dish with rice or bread.



Fish makes a vital contribution to the survival and health of a significant portion of the world's population. The importance of fish in providing easily digested protein of high biological value is well documented due to the presence of essential amino acids. Fats from fatty fish species contain polyunsaturated fatty acids (PUFAs),

namely EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) (omega-3 fatty acids), which are essential for proper growth of children and are not associated with the occurrence of cardiovascular diseases such as coronary heart disease. It is also a rich source of vitamins. Vitamin A from fish is more readily available to the body than from plant

techniques in order to retain quality and increase shelf life. There are several technologies available to fulfill this purpose, which will result in different or similar products using raw fish material. The technology varies from traditional methods, which use simple equipment and few additives, to modern technology which needs more sophisticated equipment and several additives.

Many home based traditional processed fish products such as *sambelingkung* are produced in South Sumatera.



foods. Vitamin D, present in fish liver and oils, is crucial for bone growth since it is essential for the absorption and metabolism of calcium. The minerals present in fish include iron, calcium, zinc, iodine (from marine fish), phosphorus, selenium and fluorine. These minerals are highly 'bioavailable', meaning that they are easily absorbed by the body.

Many kinds of traditional fish products can be found in Indonesia and other countries. These traditional products have their own specific and unique characteristics.

Fisheries production in South Sumatera

However, fish is a highly perishable product and proper preservation right from harvesting, handling, processing and distribution is very important for maintaining fish quality. Processing of fish involves primarily the application of preservation

South Sumatera is one of the provinces in Indonesia which has great fisheries potential. The annual production of the fish has been increasing over the last few years. Inland water resources such as rivers, swamp areas (*rawa*) and small lakes (*lebung*), which are the natural habitat for snakehead fish, dominate fish production in South Sumatera. Consequently, the snakehead plays a dominant role in South Sumatera fisheries resources.

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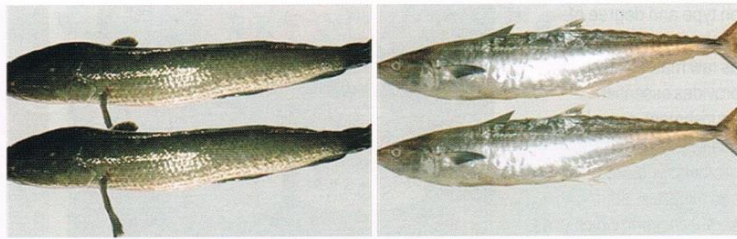
PROCESSING

Fish-based products in South Sumatera

South Sumatera has produced a lot of processed fish products. Most of those products are made in the traditional way by home-scale industries, and modern technologies have not been applied. Some of these indigenous foods are *pempek* (fried fish sausages), *tekwan* (boiled fish sausages), *kemplang* (special crackers) and *sambelingkung* (dried shredded fish). Others are Indonesian traditional fish-based products such as *ikan asin* (dried salted fish), *ikan salai* (smoked fish), *terasi* (shrimp paste), *bekasam*, *peda* and *rusip* (fermented fish).

One of the famous fish-based products is *sambelingkung*. Commonly, it can be consumed as a dish with rice and bread or used as a filler in cakes. *Sambelingkung* is dried shredded fish with soft texture and tasty flavour. Its appearance is similar to that of *serundeng* or fish floss in Malaysia. While fish floss uses coconut milk as an ingredient, *sambelingkung* uses shredded coconut. The texture of fish floss is rougher than that of *sambelingkung*.

Sambelingkung can be produced from both freshwater and marine fishes, but to obtain better quality, fishes with fibrous flesh are preferred as it contributes to the texture of



Fresh water fish like snake heads and marine fish like mackerel fish are the common raw material for *sambelingkung*.

the final product. The freshwater fish that is usually used as raw material for *sambelingkung* is snakehead (*Channa striata*), while the marine fish used commonly is mackerel (*Cybium commersoni*). In recent times, local companies in South Sumatera have started to improve upon *sambelingkung* production by using other fishes, such as white snapper and catfish, as raw material.

Processing of *sambelingkung*

The production process of *sambelingkung* consists of five steps. These are selection, steaming, mixing of spices, frying and pressing. In the first step, raw fishes must be selected, eviscerated and cleaned. The fish

are steamed for 15 minutes until they become tender, and the flesh is then separated from the bones. The steamed fish have to be shredded into smaller sizes then mixed with shredded coconut and spices.

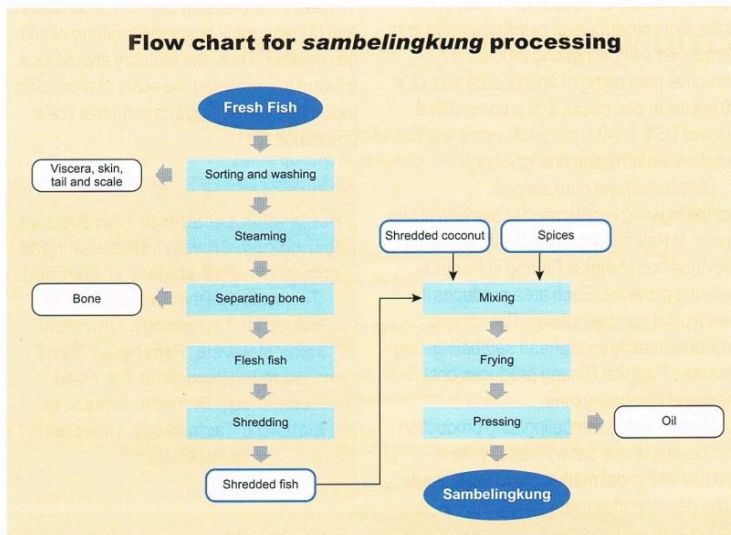
The spices used are salt, palm sugar, coriander, onion, galangal, ginger, lemon grass and garlic. Sometimes, chilli is added to get a hot taste. Spices, shredded coconut and fish must be mixed well and smoothly blended. Then mixture is fried in palm oil until it is dry and changes to brownish yellow. The cooked *sambelingkung* is put into a hydraulic press to reduce the oils. Finally, the *sambelingkung* is ready to be packed and marketed. *Sambelingkung* must be kept in a dry place and at room temperature. Nowadays, consumers prefer low fat products; this influences the *sambelingkung* producers to also ensure a lower fat content in their products. They replace shredded coconut with coconut water; the result is *sambelingkung* with lower fat content, better taste and longer shelf life.

Shelf life and nutritional information

Sambelingkung has a relatively long shelf life (> 1 year) at room temperature and low humidity storage conditions even without the addition of preservatives. This is due to its low moisture content (<2%) and water activity. No scientific research has been carried on its exact shelf life. Based on empirical observations, quality deterioration of *sambelingkung* is indicated by the detection of rancidity and darker colour. This deterioration is caused by fat oxidation.

Nutritive value of *sambelingkung* depends

Flow chart for *sambelingkung* processing



PROCESSING

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on type and degree of freshness of the fish used as raw material. Fish provides essential nourishment, especially quality protein, fat and micronutrients like vitamins and minerals. So, *sambelingkung* which uses fish as the main raw material is expected to provide essential nourishment; however, research on *sambelingkung* only covers the macronutrient (proximate) content and sensory properties while amino acid, fatty acid, vitamins and mineral content has not been widely studied yet.

Sambelingkung is well known as a nutritious traditional delicacy. It contains high protein content (up to 35%). It also has quite high fat content of around 10-26%, moisture content less than 2%, and ash content ranging from 5-7%.

Packaging and marketing

Packaging of processed fish is important as it facilitates handling during distribution within the marketing chain and storage. A little carelessness can cause damage and wastage. Currently most of the *sambelingkung* produced is packaged in a very simple way in bulk in plastic containers and sold in retail shops.

Since *sambelingkung* can be made from various types of fishes, its price also depends on the type of fish used. It is marketed at a price ranging from US\$ 12.00 to US\$ 17.00 per kg. The most expensive and highest in quality is *sambelingkung* made from snakehead.

Sambelingkung is known as an indigenous food of South Sumatera and has



Top left anticlockwise: *Sambelingkung* bulk packaged for the traditional market.
Bottom: *Sambelingkung* in modern retail packaging.

become a tourist attraction. Attractive presentation of *sambelingkung* packaging is definitely needed. Recently, *PT Meizy*, one of the local producers of *sambelingkung*, has introduced *sambelingkung* product in attractive packaging of appropriate size (2 x 50 grams in one pack), and a competitive price of US\$ 1.2-2.0 per pack, complete with nutritional information and labelling.

Distribution and marketing of *sambelingkung* is still limited to markets of two areas, ie Palembang city in South Sumatera province and Pangkal Pinang in Bangka-Belitung province. Each area produces its own typical *sambelingkung*. Palembang produces mainly snakehead *sambelingkung* whereas Pangkal Pinang produces only mackerel *sambelingkung*.

Until recently, *sambelingkung* production has been a home-based industry. As a product with great market potential, it needs to be developed in many aspects. The application of Good Manufacturing Practices

(GMP) should be implemented strictly to obtain consistent and high quality products. To meet the increasing demand, a consistent and larger supply of *sambelingkung* would be required. Thus, the industry should look forward to increasing the scale of production, including even getting into industrial scale production. ☺

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