JURNAL PENGABDIAN PADA MASYARAKAT
ISSN 2540-8739 (print) | ISSN 2540-8747 (online)
http://ppm.ejournal.id

OPEN ACCESS

Vol. 5, No. 1, 2020

DOI: 10.30653/002.202051.250

Design of Fishing Smoke (saltization) Equipment and Its Process for Improving the Economy Community in Lampulo Banda Aceh

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A B S T R A C T

Wooden fish (Keumamah) is made from tuna fish. It is one of the characteristic main commodities from Aceh Province where it is bordered by two major oceans of the world, the Indian Ocean and the Malacca Strait. This geographical condition is very favorable because the ocean stores abundant marine products, especially tuna fish and tongkol fish. The keumamah is one of the traditional favorable food product in Aceh. In Aceh, that excess fish from the rest of the fishermen's catch will usually be preserved by means of saltization, fumigation and boiling. However, wooden fish have not been able to provide a wider economic improvement impact on the surrounding community, especially the lampulo coastal area which incidentally as a fisherman. So there needs to be an increase in the economy for home-scale entrepreneurs in Aceh province. Development of fish processing equipment shaped like cupboards, sturdy, sleek, and ergonomic combined with packaging design, sales techniques and marketing management and entrepreneurship for small business groups in lampulo-Banda Aceh. The development of fish processing equipment shaped like cupboards, sturdy, sleek, and ergonomic combined with sales and marketing management techniques and entrepreneurship for these small business groups will develop tuna fish products that can be processed with various types of culinary food such as: fish nuggets, crackers fish, fish balls, and kemamah. The problem can be solved when fish processing methods emerge to become a variety of culinary, with higher production capacity to the community about good and right fish processing. This fish processing innovation in the form of processing fish into a variety of culinary that combines several processing functions such as smoking, grinding, drying, etc.

Keywords: Culinary Processing, Product Diversification, Small Industry, Tuna Fish.

Received:	Revised:	Accepted:	Available online:
21.09.2019	12.10.2019	27.11.2019	14.02.2020

Suggested citation:
Fradinata, E., & Kesuma, Z. M. (2020). Design of Fishing Smoke (saltization) equipment and its process for improving the economy community in Lampulo Banda Aceh. *Jurnal Pengabdian Pada Masyarakat, 5*(1), 213-220. https://doi.org/10.30653/002.202051.250

Open Access | URL: http://ppm.ejournal.id/index.php/pengabdian/article/view/250

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INTRODUCTION

Lampulo is the place which located in Kuta Alam sub-district where it is one area that produces a variety of fish from the sea caught by fishermen in nature ocean, in this area there are also large enough Fish Auction Center (Tempat pelelangan ikan, TPI). The culinary entrepreneurs of fish species to obtain abundant sources of raw materials for various types of fish. At least ten to twenty tons of fish caught landed at the Lampulo Ocean Fisheries Port, Banda Aceh, are wasted without selling points. Based on this huge potential situation, it is necessary to help the fishermen, especially who live in the area of the ships struck above the Tsunami house.

The culinary processing business of tuna fish which is abundant at any time has not been much developed by the surrounding community. Usually the fishermen or the community only sell fresh fish caught to consumers. On this condition, it might be necessary to encourage further development of fish products with various types of products such as fish nuggets, fishballs , common fish and fish crackers, etc. The catch of tuna fish at the lampulo fish auction (TPI) is very abundant every day. There are about 30 large-scale fishing boats that lean back every day and unload their catches. This abundant yield will provide an opportunity for the processing business world in the field of tuna fish processing.

Figure 1. Tuna fish in lampulo fish auction centre (TPI)

In the fishing area of Lampulo village, kuta alam sub-district, almost 80% of the productive age population work as fishermen, fish processors, where the community in this area still needs further guidance in order to increase their knowledge and skill, capability and transfer of fish processing technology and its variations.

Fish catches of fishermen in the village of Lampulo are quite large, but are not used optimally. Fish can be a source of food preserved with various types of products. There is still a rush of people around the tourist area for entrepreneurship in processing products from raw fish. Collection of wood fish processing is not a problem because the results of this processing can be marketed in the Aceh region and outside Aceh. Almost all rice stalls in Aceh provide wood fish menu (Keumamah) so that the market share is very promising.

The processed fish products produced will be marketed around tourist attractions, for example in the area of the ship above the tsunami house, tsunami museum, in several districts in Aceh and will be tried to market to other provinces in Indonesia. The market potential in the tourist area of the ship above the tsunami house is very promising

because every day visiting by domestic and foreign tourists who visit in the area in one after another. The results of our interviews with the guardians of the tsunami tourism area of at least 15 - 100 people every day always have visitors. Not to mention the market potential in all districts and throughout Indonesia is still very promising to sell culinary products based on fish. The following is a description of the marketing area of the ship above the Lampulo tsunami house, the sub-district of the natural capital of Banda Aceh.

In accordance with the government program, namely the empowerment of marginal communities and people's economy, it is necessary to explore all the potential that exists in a fishing or rural area, including excavation and utilization of natural resources (natural resources) and human resources (human resources).

The target is to increase community welfare, which has been analyzed simply in the introduction. The outputs of this community service are: Method of Smoked fish (saltization) with Various Processed Products such as Fish Meatballs, Nugget, Fish Crackers, Fish Mangut, Krispy fish, Satay fish, and Shredded fish, etc.

METHODS

Design of Equipment

The selection of fish smoke equipment is based on survey data conducted in the lampulo area where the ruminant fish marketed experienced a sufficient smoke (saltization) process before the cooking process (Šimko, 2005). However, there are several obstacles faced when smoking in the house of the house becomes a problem where it cannot be carried out perfectly when the rains come (rainy season) so that the fish will easily wrestle and reduce the level of quality of raw materials (Nugroho & Sanjaya, 2018).

The results of these field observations, we conclude that there is a need for a tool based on simple technological development so that when the smoke (saltization) process takes place it will not change the quality of the material (Sebayang, 2002).

Qualitative Methods

This section will look at how qualitative or interactionist issues have been incorporated into some models of ergonomics. It starts with macro ergonomics and goes on to look at participatory ergonomics (level) before looking at exploratory sequential data analysis (ESDA) and francophone ergonomics, which both seem to be using either qualitative methodologies (ESDA) or espousing an interactionist philosophical position.

The engineering side, Stauffer and Kirby recommend that design engineering should rely on the following: (a) relationships with markets, consumers and design information (b) supporting product release in the market and (c) equating product features with the value of the community (customers value) to ensure the continuity of returns, especially the small industries of Stauffer and Kirby (Ahya, 2004)

The product design development stage according to states that the generic process of product development has five important stages namely the development of concepts, the design of the product system level, the detailed design, testing and evaluation, and testing of the production process (Ulrich & Eppinger, 2004).

The following is a hierarchical list of primary, secondary and tertiary needs for fish smokers. The grouping results obtained in common needs are expressed as follows:

1) Heater can smoke large amounts of fish (effective) (Siswiyanti, Wulandari, Ubaidila, & Widodo, 2008).
2) This tool uses hot coals so that the heat produced is more stable.
3) This tool has a working principle that is air conditioning through the help of a room flooded with smoke from combustion.
4) Using a chimney that works to get rid of burning smoke.
5) The resulting air circulation causes conditions in the absorption chamber to obtain relatively the same temperature.
6) Equipped with ash disposal to avoid dirty around the heater
7) Prices are relatively cheap so they can be affordable by the middle class and lower
8) The quality of material from aluminum allows the selection of this lighter tool easily moved but able to resist rust.
9) In terms of ergonomics do not get tired quickly, because after the embers ignite, this tool can be left and work alone.
10) The safety of using this tool is very good because the model is closed so it does not cause a spark.
11) Maintenance is relatively easy because simple and with maximum results.
12) Cheap and easily available charcoal fuel.
13) Equipped with handles to push tools to move.
14) The main function of reducing the water content contained in fish, so that fish are more durable.
15) To view and control temperature, equipped with a temperature thermometer.
16) Because it can accommodate fish with a lot of capacity, the energy expended for once smoking will be more.
17) Profits (profits) will be increased because the production capacity produced is more.

Based on the above literature, the design of making an optimal fumigation machine tool for fish smoke (saltization) needs which will produce environmentally friendly fish smoke equipment. This tool is able to reduce the amount of smoke to the eyes, nose and lungs of other fish smokers. This tool is ergonomic, mobile and portable (Nurmianto, Wessiani, & Megawati, 2018). This tool is shaped like cupboards, sturdy and sleek dimension P x L x T equal to 500 cm x 200 cm x 150 cm where in the middle in the cupboard is divided 2 parts horizontally to maximize the use of smoke and hot air in direct contact with fish objects- fish. This tool will also be equipped with a temperature indicator tool that weighs approximately 80 kg (Nurmianto, 1996). The hope is that this tool will be able to smoke about 150 fish in a fish with a smoking time of 45 minutes. This tool is also equipped with a chimney 1 and 2 inches in diameter (10.16 cm) along the 1 meter that can be removed pairs into 3 parts. Overall this tool can reduce the amount of smoke and pollution that interfere in the fishing village so that it can improve safety, comfort, and health for its users.

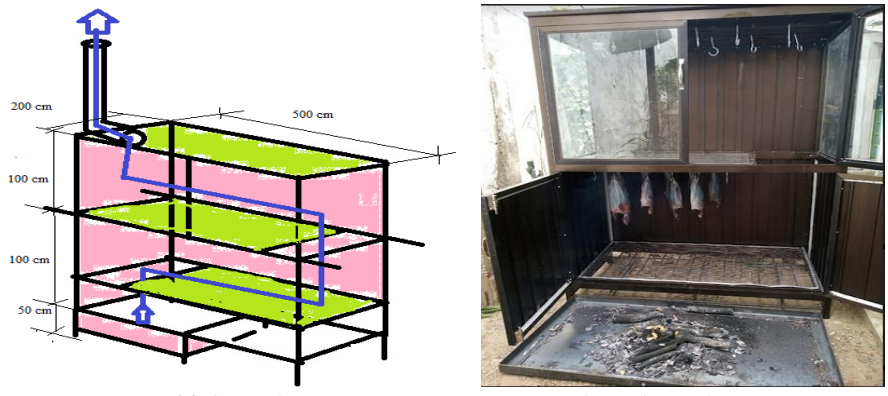
The advantages of this innovation are that it is practically shaped like a cupboard, sturdy and sleek and can be operated in the rain because it is equipped with a cover at the top; Ergonomic can be designed and redesigned according to the size of its users;

Mobile can be carried everywhere and is lightweight; Portable can be removable, making it easier and lighter to carry and can be used indoors if it's raining outside; Smoke free because the smoke is trapped in the cupboard and after smoking, the valve can be opened then the smoke will be wasted through the chimney after which the fish can be taken; Hygienic and leave a pleasant aroma on the results of fish fuming.

RESULTS AND DISCUSSIONS

The equipment design uses a qualitative method by spreading the questioner to several design dimensions of the shape and height of the equipment that matches the average height of the mothers who will use this smoke (saltization) equipment. The questionnaire was distributed to 20 mothers to determine the height of the equipment, the height of the first-level shelves, the height of the second-level shelves, and the height of the fuel rack feed. From the results of the questionnaire, the average mothers determine the height of the fuel feed height 50 cm from the floor, the height of the shelf level one 150 cm from the floor and the rack level two 250 cm from the floor with a shelf width of 200 cm and a length of 500 cm. To streamline the use of smoke and heat, the equipment is designed with two levels where each end of the base has an empty space of 20 cm, with this model it will prolong direct smoke contact with the fuming material.

The equipment design uses a qualitative method by spreading the questioner to several design dimensions of the shape and height of the equipment that matches the average height of the mothers who will use this smoke equipment. The questionnaire was distributed to 10 mothers to determine the height of the equipment, the height of the first-level shelves, the height of the second-level shelves, and the height of the fuel rack feed. From the results of the questionnaire, it is found that the average mother determines the height measurements can be seen in Figure 2.



(a) Design of fish smoke equipment (b) Fish smoke equipment

Figure 2. The selection level of each shelf for the design of fish smoke

As for the first level design 10cm turnout is 80%, second level (60cm) 90%, third level (160cm) 7%, and fourth level (260cm) 8%. To streamline the use of smoke and heat, the equipment is designed with two levels. The first level will use more heat and smoke while in the second level the residual heat and the use of more smoke with this model will prolong direct smoke contact with the smoked material.

The picture can be seen on the profile at figure 3. The blue line is the flow direction of smoke from bottom to top. This tool (figure b) is able to reduce the amount of smoke on the eyes, nose and lungs of fish smokers.

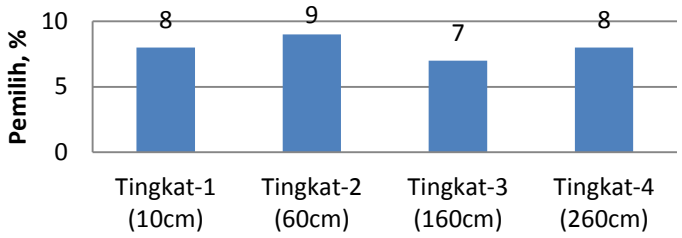


Figure 3. Profile design of two-level fish smoke equipment equipment

This tool is ergonomic, mobile and portable to help entrepreneurs feel the culinary results of tuna fish. The result of smoke fish has the smooth texture and delicious tase, it could be seen in the Figure 4.

Figure 4. Smoke fish

The activities of the results of this design will make variations in fish processing into a variety of culinary menus with the help of fish fumigation tools at the beginning of the process in the making of common fish, meatball, and nuggets. It can be seen in Figure 5.

Nugget Fishball Keumamah

Figure 5. Various culinary preparations from tuna fish

Various culinary preparations from tuna fish are fish nuggets, fish meatball processing and commonness that comes from the processing of tuna fish fumigation using two-level fumigation equipment. The market demand of these products tends to increase every month in the area of Banda Aceh and other sub-districts. The market demand can be predicted with some methods of forecasting to determine more accurate to the market products (Fradinata, Suthummanon, & Suntiamorntut, 2018).

CONCLUSIONS

The high number of local and international customer demand for culinary products made from tuna fish makes small and medium enterprises must be able to guarantee the availability of sustainable products by ignoring climate factors such as rain. There are several advantages that can be obtained in the design and products of fish smoke (saltization) equipment, are as follows: in terms of equipment design is able to make the comfort of the user to be comfortable and safe in working (ergonomic). The heating and smoke (saltization) systems produced are more optimal with raw materials. Meanwhile, in terms of the products produced can produce durable products, so as to produce a diversification of processed products sourced from tuna fish.

Acknowledgements

Authors would like to express their gratitude to Directorate General of Higher Education, Ministry of Research, Technology and Higher Education of the Republic of Indonesia for their support in this study under the skim of "Pengabdian masyarakat (PKM-DRPM 2019)".

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