

INNOVATION OF ENBAL PRESS FOR FARMERS TO INCREASE PRODUCTIVITY AND LOCAL FOOD SAFETY

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Abstract

Enbal is the Kei language name for cassava, it's just that cassava that is generally known to the public is different from cassava in the Kei Islands. This enbal is a cassava with high levels of cyanide acid, which can be toxic to living things, including humans. The partner of the Student Creativity Program for the Application of Science and Technology (PKM-PI) is Mrs. Melia Meturan who has been in the business of processing and selling enbal products for more than 30 years and is still doing enbal processing products in the traditional way. To produce enbal, the method is by removing the liquid contained in it, the production activities start from peeling, washing, then grating and then squeezing by pressing using wood and stone. In a week, Mrs. Melia was able to produce 2 enbal lulun or enbal love as many as 15 – 20 packages, with a price of Rp 12,000 per package, so that in a month Mrs. Melia obtained sales of Rp 960,000. With the Press Tool of the PKM-PI team, the partners only need 20-30 minutes to produce 1 enbal of scrubs and are able to produce 8 enbal of scrubs in a week, the moisture content produced is only 7%, besides that the food products produced are protected from dust and dirt. A sale for a month can reach Rp. 3,840,000. Partners are also equipped with sanitation and hygiene training in processing foodstuffs.

Keywords: Hygienic, Press equipment, Productivity, Sanitation, Toxic Cassava.

INTRODUCTION

In addition to the famous tourist attractions in the Kei Islands, the typical food of this region also has its own attractions. Enbal is a typical food of the Kei Islands, apart from being a staple food of the community, enbal is always used as a souvenir for tourists visiting the Kei Islands. Enbal is the kei language name for cassava or cassava, it's just that cassava that is generally known to the public is different from cassava in the Kei Islands. This enbal is a cassava with high levels of cyanide acid, which can be toxic to living things, including humans. To produce enbal, by the community it is processed by removing the liquid contained in it, the production activities start from peeling, then grating and then squeezing by pressing using wood and stone (figure 1). This activity has become a hereditary heritage of the people of the Kei Islands.

The partner of the Student Creativity Program for the Application of Science and Technology (PKM-PI) is Mrs. Melia Meturan who has been in the business of processing and selling enbal products for more than 30 years. And so far, it is still doing enbal processing products in this traditional way. In fact, the partner has 2 locations for the enbal press process in the partner's enbal garden and behind the partner's house. In Figure 1, it is clear that the process of making enbal in the traditional way by using wood and large stones to remove the toxic liquid from the poisonous cassava.



Figure 1. PKM-PI Team with partners, and Enbal press process in mitra plantation and *Enbal Press* tool behind partner's house

Based on information from partners, the process of making this enbal scrub takes between 3 to 4 days to produce dry enbal. The next thing will be the printing process by burning and drying it to be sold and consumed.



Figure 2. Partner's Enbal products (Enbal Lulun and Enbal Love)

In the left picture is an enbal product that has just been pressed with traditional tools or by the community it is often called enbal lulun, while in the right picture is enbal love or enbal flower, which is a consumption product of the derivative of enbal lulun products, by burning and in the sun, generally this enbal love is consumed as a substitute for rice or as a snack to accompany drinking coffee or tea. In a week Mrs. Melia is able to produce 2 enbal lulun or enbal love as many as 15 – 20 packages (1 package has 6 pieces) with a price of Rp 12,000 per package, so that every week Mrs. Melia can earn Rp 180,000 to Rp 240,000 or in a month Mrs. Melia gets sales of Rp 960,000, based on the results of an interview with Mrs. Melia, His Enbal products are in great demand even in a week can reach 40-50 packages, it's just that his biggest obstacle is the enbal processing process which takes up to 4 days, even up to a week if the weather conditions rain. The production of enbal scrubs in addition to taking a long time and damaging trees is also related to food safety, where enbal products are easily polluted with dust and dirt, besides that the liquid from *the enbal press* is also left alone and causes an unpleasant odor and is dangerous if drunk by animals. Based on the problems of these partners, it is important to create an Innovation of *Enbal Press* Equipment to increase productivity and local food safety.

LITERATURE REVIEW

Enbal or rubber cassava (*Manihot Esculenta* Crantz) was originally a staple food of the people of the Kei Islands, along with the increasing number of tourists and high market demand for processed food products typical of this region (enbal) so that the people today are processed with various types of various flavors and can be used as souvenirs typical of this region for tourists. In addition to the local market, this product with various flavors of enbal is also sold in various regions

in Indonesia such as the capital city of Maluku Province, Makassar, Manado, Jakarta, North Maluku, and Papua to foreign countries. Enbal with original flavor (enbal love and enbal lempeng) and innovation the flavors of peanuts, chocolate, cheese and other souvenir products are very favorite for tourists and local people who want to travel outside the area. Enbal as a typical souvenir of the Kei people is a type of food that is quite durable and can last for 3-4 months. Enbal can be stored as a family food provision, homecoming or long trip, snacks, and even a mandatory provision for prospective pilgrims (Ubjaan and Paulina, 2021).

For a long time, the people of the Kei Islands have made a type of rubber cassava known as "Enbal" as the main food commodity and also by the people today it is used as a substitute for rice, based on the classification, there are two types of cassava, namely sweet cassava and bitter cassava. The criteria for sweet and bitter are based on the level of cyanide acid (Hydrogen Cyanide - HCN) contained in cassava tubers (Polnaya et al., 2016).

In a study conducted by Marasabessy *et al* (2020), it was revealed that the HCN levels contained in enbal exceeded 100 mg/kg and could result in toxins to humans and animals. For this reason, the HCN levels contained in enbal must be maximally excreted so that it becomes a safe food to consume. The process of releasing cyanide acid (HCN) in enbal by the Kei people is still traditional. Enbal tuber material after being grated is then wrapped in a sack as a filtering medium. The next process is squeezed using a stone load so that the enbal water containing cyanide acid can come out.

Currently, enbal is processed by the Kei people in various forms such as enbal bubuhuk, fried enbal (roasted), enbal bunga (dried and grilled), and cheese enbal. All of these products, the raw material for grated enbal is squeezed traditionally, namely using a tree as a lever, crushed with wood and given a large stone load so that there is pressure so that the enbal water can come out. This process has been carried out for generations until now. However, this method has many drawbacks such as long squeezing time, the process is less hygienic, and the squeezing water causes an unpleasant odor at the squeezing location (Marasabessy *et al*, 2020).

Thus, it is very important to make an enbal press to answer community problems in processing local enbal food.

RESEARCH METHOD

The implementation time of the Student Creativity Program in the Application of Science and Technology (PKM-PI) is for 4 months, from May to August 2024 and is located at the partner Mrs. Melia Meturan in Dian Pulau Village, Hoat Sorbay District, Southeast Maluku Regency. The implementation of the activity consists of two stages, namely the manufacturing stage and the testing stage, for the stage of making enbal press equipment using an electric welding machine, measuring instrument and cutting grinding machine, while the materials used consist of stainless-steel plates, ULP Holo iron and triangular jacks and buckets to accommodate the squeezed water. To test the enbal press tool using, a time measuring device and a scale to measure the initial and final weight of the enbal material. To measure moisture content, the event calculates the change in sample weight divided by the weight of the initial sample and then multiplied by 100%

Data collection was carried out through interviews, observations and literature studies, the analysis techniques used to analyze the results of this activity included descriptive analysis using Microsoft Excel. Descriptive analysis is used to provide an overview of the results of the activity with the data presented in the form of tables.

RESULTS AND DISCUSSION

The manufacture of *enbal* press equipment is carried out in various welding workshops, the reason for choosing this workshop is because it is close to the team's house, so that it is easy to coordinate, besides that the PKM-PI team does not have welding skills. The activity carried out was to coordinate with the workshop owner for work, and then the team purchased tools and materials for the *enbal* press. The process of working on this *enbal* press took approximately 3 weeks. Especially for the stainless tubes on the tool, the PKM-PI team coordinated with SMK Siwa Lima Langgur by utilizing a machine workshop to round stainless tubes. After making the tubes, the team began to do tool manufacturing work in various welding workshops, accompanied directly by the workshop owner.



Figure 3. Enbal press tool manufacturing process

This *enbal* press is not only protected from dust and dirt because the process is closed, but also the time used is very short, only 20-30 minutes, in contrast to traditional tools which can reach 4 days.



Figure 4. The Difference Between Traditional Enbal Press and PKM-PI Team

After the *enbal* press is ready, the delivery process is carried out to the partner's location in Dian Pulau village, the delivery process takes 45 minutes from the workshop to the partner's house using a *pick-up car*, and then a demonstration of the *enbal* processing procedure is carried out in a

hygienic way and the use of the Enbal press to partners and the surrounding community, as well as testing the effectiveness of the use of this tool. The test results are presented in table 1, as follows.

Table 1. Test results and comparison of *Press Enbal* tools

Comparison of <i>Press Enbal</i> Method		
Description	Tradisional	Enbal <i>Press</i> Tool
Time	3 – 4 Days	20 – 30 Minutes
Up Air	15%	7%
Sanitation	Easily Exposed to Bacteria	Not exposed to bacteria
Hygienic	Easily Exposed to Dirt and Dust	Not Exposed to Dirt and Dust
Display	Untidy	Tidy

In the table, it is very clear that the difference in the results of using the traditional enbal press tool and the one made by the PKM-PI team, in a shorter time, this also answers the purpose of this activity where the products produced are maintained from sanitation and hygiene and increase partner productivity, besides that the product appearance is also neater. This is also supported by the opinion of Ngangun and Marasabessy, 2019 that the use of tools *in enbal processing must* help improve the quality of hygienic sanitation in the squeezing process because in addition to water being stored in buckets to reduce pollution, the process also uses clean water.

With this enbal press tool, partners only need 20-30 minutes to produce 1 enbal lulun and are able to produce 8 enbal lulun in a week, the moisture content produced is only 7%, the food products produced are also protected from dust and dirt. Total partner sales in a month Rp. 3,840,000. In addition, Partners have sold Enbal Lulun, with the current market price of Enbal Lulun Rp. 100,000/piece, so that partners will get additional income of Rp. 1,200,000/month.

CONCLUSION

Based on the results of PKM-PI activities, the use of enbal press equipment is very helpful in increasing the productivity of partners and enbal farmers, with the use of a short time in producing enbal 20-30 minutes, the moisture content produced is only 7%, besides that the food products produced are also protected from dust and dirt, the water from enbal squeeze is also safely stored in a bucket. It is hoped that the enbal press can be socialized to the community to local governments, with the hope that this tool can be a solution to food security and can help farmers not to damage trees as part of the enbal processing process in the traditional way.

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