

# Design of Automated Processing Equipment Shallots (PEBMO) To Improve Product Quality Shallots

Elsanda Merita Indrawati<sup>1, a \*</sup>, Hisbulloh Ahlis Munawi<sup>1, b</sup>, Agus Suwardono<sup>1, c</sup>, Rachmad Santoso<sup>1, d</sup>

<sup>1</sup>Faculty of Engineering, Universitas Nusantara PGRI Kediri, Kediri, East Java, Indonesia

<sup>a</sup> [elsanda@unpkediri.ac.id](mailto:elsanda@unpkediri.ac.id); <sup>b</sup> [ahlismunawi@unpkediri.ac.id](mailto:ahlismunawi@unpkediri.ac.id); <sup>c</sup> [agussuwardono@unpkediri.ac.id](mailto:agussuwardono@unpkediri.ac.id); <sup>d</sup> [santosorachmad@gmail.com](mailto:santosorachmad@gmail.com);

\*Corresponding Author

Whatsapp number: [085733191897]

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## ABSTRACT

For farmers onion, red onion quality is required to be maintained and prioritized, as the quality affect the selling price in the market. There are three types of quality of onion, which is of high quality red onion, red onion, medium quality and low quality onion. The third quality of onion was always found in every harvest, only a percentage of each crop are changing in every quality. Onion have lower quality will have a selling price is also very low, this has resulted in farmers losing money if yields lower quality onions have a high percentage. The best way to overcome the loss factor is to cultivate the red onion into a low-quality food products of high quality, so for that tool "PEBMO" is a solution to overcome the problems of onion farmers. Tools "PEBMO" designed to be able to make high quality products fried onions. This tool is designed to have 3 working system, ie peeler onion, red onion chopper, and oil drainer. With the tool "PEBMO" farmers can cultivate shallots low quality products easily and quickly, because farmers do not need to be difficult to peel and chop the onion using the manual method. In addition the tool is equipped with a tool that prevents the oil drainer fried onion products are completely free of oil and durable. Besides these tools also make fried onion products more hygienic and healthier because they have low levels of oil content. So with the "PEBMO" can improve the quality of low red onion into food products with high quality and price.

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## 1. INTRODUCTION

Sekoto village is a village located in the district of Kediri. Sekoto village is very fertile village and has a vast agricultural land, most of the population lives from agriculture sector with major commodity crops are crops of onion. In the village of farmland Sekoto shallot has a high productivity as evidenced by Banon an area of 500, equivalent to 7000 square meters can produce 10 tons of red onion onion sebesar one harvest.



**Figure 1.** Preliminary Survey of Agricultural Condition Onion Fertile



**Figure 2.** Preliminary Survey Results Shallots are Abundant Harvest.

Red onion becomes a commodity crops high level permintaanya good market for raw onion or shallot to refined, this is because the onion one herb that is always used in every Indonesian cuisines, so the demand for onion in Indonesia is very high either. However, despite the high market demand for red onion did not make the onion farmers prosper. This is because the price of onions in the market depends on the quality of onion sold. Onion

that have good quality will be sold with a high selling price and low quality onion would be sold at a very low price, even not sold. Whereas in fact each onion harvest the farmers do not always get a good quality red onion.

Based on the interview to one of the onion farmers in the village of the District Sekoto Badas onion farmers suffering occurs when commodities were cheap in the market shallots and onion crop pests resulting in a very low quality of onion because most of the onion harvest rot. In 2017 the price of onion cost in the market resulting from crop failure where, onion crop pests capers which resulted in the leaves wither and the disease Grandong which resulted in the onion bulbs rot, the impact of crop failure that onion prices be dropped and reduced yields more than 60%. In July 2019 onion harvest occurs, but it does not make onion prices crept up in the market, this only resulted in onion prices plummeted by more than 50% is on the normal price of onion reached 10,000-20,000 per kg to 6.000-12,000 per kg. This causes farmers to lose because the harvest is not worth the cost of planting and maintenance. So based on the results of these interviews can be concluded that many factors causing low onion prices in the market.

Dewi, Saharia, and Defina (353: 2013), stating that the shallots are crops that are easily damaged both in the process of growth and post-harvest, where the onion plants can also experience the immutability which can tend to harm the farmers as a result of post-harvest activities that bad. Many farmers attempt to suppress the results of low quality onion productivity, among others, with the growing media processing techniques, the provision of a variety of nutrients, protein, and vitamins. But there had been no attempt by farmers to cultivate the red onion into a low-quality food products of high quality directly. So far, farmers sell low quality onion directly to middlemen who are rewarded with a very low price.

Seeing this, the authors designed a tool "PEBMO" which is a tool that can process yields low quality onion fried onion into products of high quality. This tool is designed to have three work function, namely peeler onion, red onion chopper, and oil drainer. In addition the use of a "PEBMO" This also reduces the productivity of product processing time is much shorter, efficient, and produce onions that are durable, so that the product onions fried red produced has a high quality.

Making this tool is a method based on the analysis of the situation in the field so designed tool "PEBMO" in the hope that it can produce a processed food product quality onion with modern production processes and short processing time. Manufacture of refined products, namely fried onion field shares based on survey results, stating the price of the processed form of onion fried onion tend to be more stable than the raw onion.

The design of the onion processing tool automatically notice a few things in the design process, namely (1) the efficiency in the use, operation of automated processing equipment shallot onion is very easy to use, this is because the tool only as a tool carriers; (2) the efficiency of

time, the time required in the processing of onion relatively much shorter than the processing onion manual system, (3) hygienic, appliance consisting mostly of steel materials that are safe for foodstuffs, other than that the tool is equipped with a drainer oil, so that the processed onion products produced will be low oil and crisper, (4) the efficiency in the removal, red onion processing equipment can be assembled, making it easy to transport or packaging tools.

The purpose of community service activities, namely: (1) create a design tool Onion Automatic Processing (PEBMO) to improve the quality of food products and high-quality fried onions; (2) to increase the health value of the products, value-added products, and the economic value of products with red onion processing using the tool Onion Automatic Processing (PEBMO).

## 2. METHODS

The method will be done in this research is the development of a framework and making of design planning tool "PEBMO" and design tool "PEBMO". Development of a framework serves to explain the outline of the sequence of work to be carried out.

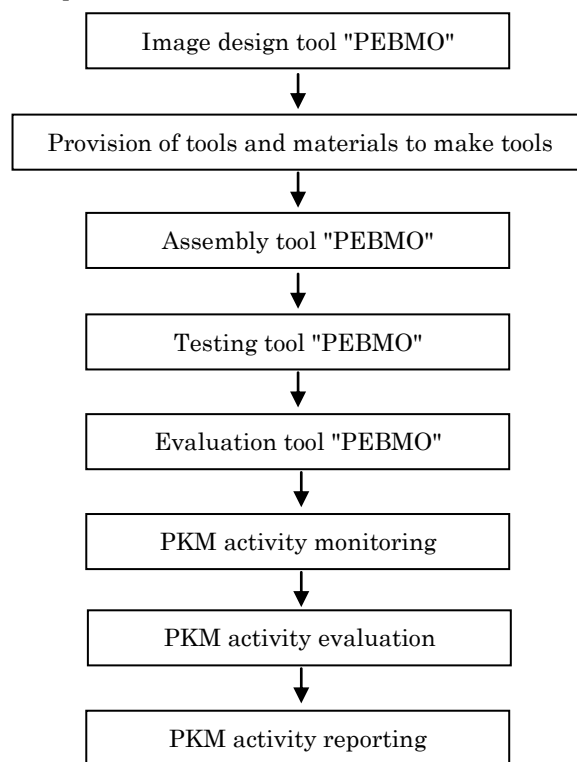


Figure 3. Framework of Tools "PEBMO"

## 3. RESULTS AND DISCUSSION

### 3.1 Design of Tools PEBMO

Red onion automatic processing tool (PEBMO) is designed to produce a processed food product quality onion with modern production processes and short processing time. Red onion automatic processing tool consists of several constructions, namely:

### 3.1.1 Construction Onion Peeler

Materials for the manufacture of red onion peeler, which consists of dynamo, stainless plate, rubber peeler, klaker, pulleys, banbel, axles, and hoses. The main ingredient selected stainless with some consideration, namely: (1) because the working system of water-related tool, the selected materials that are not easily corroded steel; (2) material is safe and hygienic stainless steel; (3) do not give a bad influence on foodstuffs. The diameter of the onion peeler is the length 1000 mm, width 1000 mm and height of 500 mm. The diameter of the tool adapted to the capacity of the peeled onion is once processing as much as 5 kg, in addition to the design of the tool also pay attention to efficiency in the use, maintenance, and removal tools.



**Figure 4.** Construction Equipment Performance First peeler Onion

### 3.1.2 Construction Tools Onion Chopper

Onion chopper tool made of angle iron, plate sainlist, cutting blades, magneto, capacitor, as. Use of the tool dynamo enabled in order to work automatically without using manpower, in addition to the use of dynamo makes the processing time becomes faster. Onion chopper tool uses two blades for cutting onions, it is intended that the results of the pieces of onion has a diameter of great thinness.



**Figure 5.** Construction Equipment Second-performance chopper Onion

### 3.1.3 Construction tool oil drainer

Oil drainer tool is designed with the goal of keeping the product fried onions become more healthy and durable. The materials used for the manufacture of oil drainer tool which consists of dynamo, sainlist plate, angle steel, banbel and stainlish sieve. Oil drainer tool diameter is 500 mm long, 500 mm wide and 500 mm high with a capacity of 2 kg of onions.



**Figure 6.** Construction Equipment Performance Third Oil Peniris

### 3.1.4 Sistem Work Items Processing Equipment Automatic Onion (PEBMO)

PEBMO tool that has a working system that is paring its 3 red onions, red onion chopper, and oil drainer. The processing of onion using a manual system with a capacity of raw onion 5 kg require processing times of about 6 hours but if using a tool PEBMO processing of raw onion until it becomes a product fried onions high-quality packaging takes craftsmanship 45 minutes, so using Tools Pebmo can save processing time of about 5:05 hours craftsmanship so that the productivity by the use of a higher PEBMO tool.



**Figure 7.** Automatic Processing Equipment Shallots (PEBMO)

## 3.2 Improved Health Value, Value Added, And The Economics of Products By Means PEBMO

The use of automatic processing tool onion "PEBMO" could have an impact on several things, namely: (1) the health value of the product, (2) value-added products, (3) the economic potential of the product.

### 3.2.1 Value Health Products

The processing of onions with red onion automatic processing tool "PEBMO" make the product more hygienic because it minimizes the product comes into direct contact with humans. One final production process through the oil drainer tool, making the product contains less oil so as not to endanger the health of consumers. With manual dryer product weight of 4 kg of raw onion would be 1.2 kg of dry red onion, whereas with the tool "PEBMO" of the production process 4 kg of raw onion would be 1 kg of dried red onion. This proves if the oil content in the product fried onions with red onion automatic processing tool "PEBMO" much lower oil content compared with fried onion with manual production methods.



### 3.2.2 Value-added products

Improving the quality of products from raw onion low quality into refined products fried shallots high quality by processing tool onion automatic "PEBMO" which includes (1) the product fried onions through the production process with the "PEBMO" is much more durable than the raw onion low quality (without processing) and the processing system of conventional, ie if the raw onion processed into fried onions by using the tool "PEBMO", then fried onions will last one year, but if fried onion low quality (without processing ) that is not sold is left for 1 month without any production process, then the onion will undergo a process of decay. Besides if compared with the processing system manual or the conventional product fried onions by using the tool "PEBMO" is also still much awat this because with the manual system-level durability fried onions only lasted 3 months, (2) product fried onions through the production process with the tool "PEBMO has the texture of dry and crisp, this is because the oil content low in the product fried onions with the" PEBMO, (3) the product fried onions with the "PEBMO" has a more attractive packaging and airtight, making products to be more durable and favored by consumers.(2) product fried onions through the production process with the "PEBMO has the texture of dry and crisp, this is because the oil content low in the product fried onions with the" PEBMO, (3) the product fried onions with the "PEBMO" has a more attractive packaging and airtight, thus making the product more durable and favored by consumers.(2) product fried onions through the production process with the "PEBMO has the texture of dry and crisp, this is because the oil content low in the product fried onions with the" PEBMO, (3) the product fried onions with the "PEBMO" has a more attractive packaging and airtight, this making the product more durable and favored by consumers.

### 3.2.3 The Potential Economic Value of Products

Red onion that has low quality in the market has a price 6000-10000 per kg, if converted into product fried onions with a value shrank 4 kg of raw onion into 1 kg of fried onion products then 10,000 / kg (highest price) x 4 kg of raw onion to 40,000 rupiah. If processed into fried onions then the selling price will rise to 100 thousand / kg. This shows an increase of more than 100% if the low quality onion fried onions processed into products with good quality.

Production of fried onion using processing tool onion automatic "PEBMO" much better than the manual system, it is because (1) the result of the size of the slices of onion will equal between each other, (2) the product has a texture that is dry and krispi, (3) more hygienic and healthy products, (4) the product durable, and (5) a relatively shorter productivity. So economically provide added value and higher profits compared with fried onion products with manual systems.

Production of fried shallot onion using automatic processing tool "PEBMO" bringing the total number to be

much more increased production with a much shorter time. This is evidenced by the manual method of production of 5 kg of onion usually takes 14 hours began stripping to packaging, but with the production of fried onions using a processing tool onion automatic "PEBMO" only takes 3 hours to produce 5 kg of fried onions which starts from stripping process up to the packaging process.

## 4. CONCLUSIONS

Community service activities (PKM) has been done can be concluded as beriku, namely (1) the design processor red onion automatic "PEBMO" consists of 3 work function that is peeler onion, chopper onion, and drainer oil, ( 2) processor red onion automatic "PEBMO" could have an impact on several things, namely: the health value products where the product is fried shallots lower oil and hygienic because the product skimpy into direct contact with humans, value-added products, namely products are more durable and have packaging more attractive, the economic potential of the product is increasing prices of raw red onion into onion fried product is more than 100%.

Suggestions of activities Community Services (PKM) is still doing onion processing tool automatic "PEBMO" with a greater volume tool so that the production will also be increased.

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