

# **BUILDING DESIGN OF MES BANCHI (MACHINE PRODUCING BANANA CHIP) WITH UTILIZATION OF THERMOCOUPLE “K” TYPE**

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## **ABSTRACT**

**The purpose of this research is to create a Banana Chip Making Machine that is equipped with thermocontrol, so that the temperature of the frying oil is better maintained. Methodology This study designs the Banana Chip Making Machine, where the slicing process uses an eccentric blade system, then enters the frying pan with a controlled cooking temperature. The results of this study produced Banana Chip Making Machine, where during the trial, it was found that the capacity of 4 kg / hour, where 20 minutes for incision and 40 minutes for frying with a frying temperature reached 250 degrees Celsius. The findings of this study found designs and Banana Chip-making Machines with thermocontrol.**

**Keywords: Slicing Machine, Banana, Thermokontrol, Frying**

## **I. INTRODUCTION**

Banana chips are snack products made from banana and fried slices, with or without food additives allowed (SNI 01-4315-1996). Banana chips also have some

benefits for the body. For the eyes, the content of vitamin A in the banana chips guard and protect the health of the eyes so as to prevent myopic eyes. For intestinal digestion, fiber content present in banana chips can help prevent intestinal diseases such as colon cancer symptoms. Banana chips contain many essential nutrients for the body, such as natirum, potassium, carbohydrates, and protein. In 100 grams of banana chips have calories of 518 kcal, fat content 34 grams, carbohydrates 58 grams, and protein 2.3. In addition, banana chips also contain vitamin A, vitamin C, calcium, iron, vitamin B6, vitamin D, vitamin B12, and magnesium (Wikipedia, 2016).

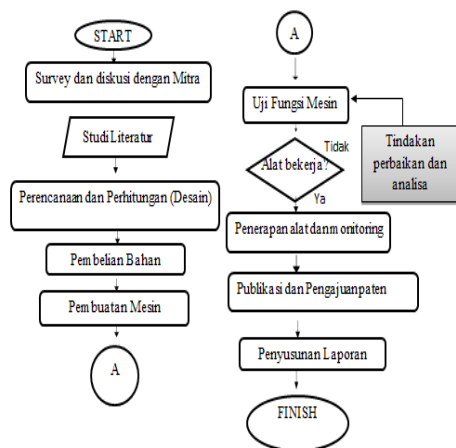
## **II. BACKGROUND**

Based on the results of research and observation of SMEs Banana Chips owned by Mrs. Sundari and her husband in Ngebret area of Morowudi village, Cerme District, Gresik regency, East Java. The manufacture of banana chips belonging to Partner SMEs consists of three stages of slicing, slicing and frying. Problems faced by SME Partners is the process of slicing and frying process banana chips are still manual and takes a long time. In addition,

the temperature used during the frying process is uncertain because it still relies on the traditional fuel of firewood. So the maturity level of banana chips is uneven, the thickness of banana chips that are less evenly distributed, less hygienic and result in the workers get tired quickly. The purpose of this PKMT activity is to increase the effectiveness of banana chips production with indicator: frying process is done by semi-automatic banana chips machine equipped with temperature controller (K Type Thermocouple Sensor) and alternative fuel

### III. METHOD

To achieve the objective of this activity, the method used in the manufacture (MESS BANCHI) Banana Chip Producing Machine with the Utilization of Type K Thermocouple Sensor in the implementation of Student Creativity Program This technology is displayed on the following flowchart.



Gambar 1. Alur pelaksanaan program PKM

#### Survey and Discussion with Partners

This activity is the first step in finding the data of partner problems, such as the number of partner products that produce 100 bales per day per basket 2kg banana chips, banana chips processing which still using manual method starting

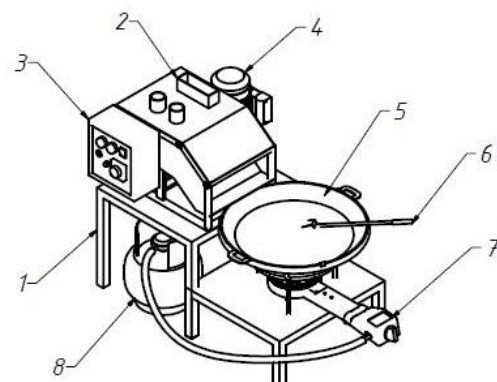
from slicer and frying process, and other related sub-issues with the economic, social, welfare and health aspects of partners.

#### Study of literature

The Literature Study contains a series of search and assessment activities of relevant and reliable sources in the collection of material and become a reference in writing this PKM. The literature we use is Mechanical Dynamics (Ramses Y. Hutahaeen, MT), and Book of Machine Elements Volume I (G. Niemann, Anton Budiman, Bambang Priambodo), Instrument Control, and (Robert L Mott) mechanical design. In this stage, there are reference designs, workings, and security systems in the manufacture of Mes Banchi

#### Design and Calculation (Design)

After having the required data, the PKM-T team "MES BANCHI" performs planning and calculates the elements of the machine element in mechanical design. In this case the team designed the tool using Inventor 2016 software ranging from concept images to detail images. as shown in the picture below:



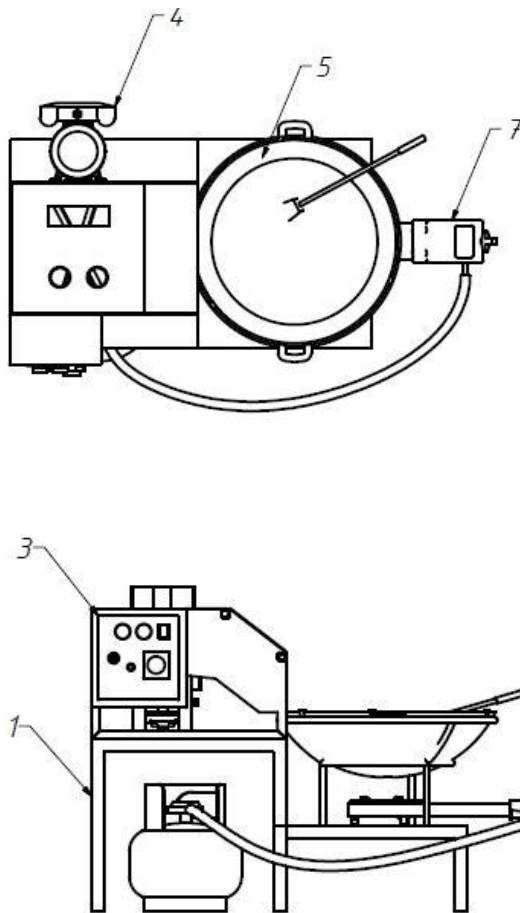


Figure 2. Banana Chip Making Machine with thermocontrol

### Purchase of Materials

Data collection needs of tools and materials according to the level of need. Selection of components in terms of price and quality of goods used so that the results achieved later in accordance with the initial target and adjust the allocation of funds available. Materials needed include stainless steel, thermocouple. Therefore, it is necessary to purchase materials used in machining.

### Machine Making

Once everything is available, including the tools and support tools that will be used, then the next step is the manufacture or assembly of the machine. Usually this process takes a long time but our target is 1 month for machining work. If you encounter obstacles and problems usually use the services of a public workshop or hire a handyman to finish

making the machine, but here we try to make the machine itself.

### Test Machine Function

The Mes Banchi test (banana chip machine) is intended to ensure that the performance of each component of the machine's output can function as expected. Testing will be done at our partner's place, in SME Good eternal jaya (ukm banana chips) owned by bu sundari and husband in gresik area

### Corrective action and analysis

Not always when the test tool directly get satisfactory results. Therefore, if the test results of the tool are not in accordance with what we expect to do failure analysis and corrective action.

### Implementation of Machines and Monitoring

After the machine has been tested and get good results and maximum, then the machine submitted to the partner, and testimony in order to get a partner opinion how the performance in the machine. Monitoring is done to monitor the condition of the machine used by the partner, then documented and taken also analyzed datas.

### Publication and Filing of Patents

The results of our program will be published both scientifically and mass media with the aim that people know the benefits generated by the machines we make. Given the enormous benefits of "Mes Banchi", we will propose patents related to the machines we make according to the needs of partners, because these tools are very potential to be

developed in the community, especially the partners.

### Report Creation

Reporting is done after all stages are completed so that the results obtained from making the machine can be explained in detail according to the data obtained.

### IV. Results

Based on the manufacturing process and assembly, then obtained Banana Chip Making Machine equipped with thermocontrol as shown in the following figure.

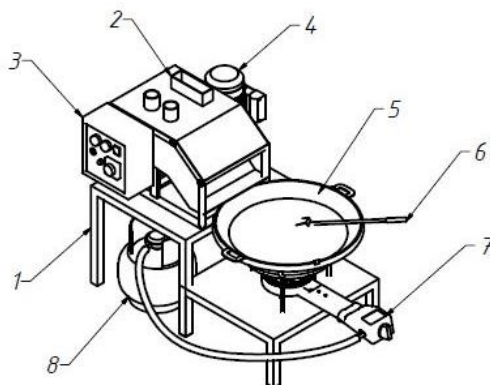


Figure 3. Banana Chip Making Machine with thermocontrol

Table 1. Engine specifications

No.	Description	Information
1	Dimension	(65 x 65 x 80) cm
2	Capacity	4 kg/jam
3	Mover	Motor listrik
4	Heat source	LPG

After the machine is finished manufacturing, the next stage of activity is to test the engine to determine the performance of the machine.

Table 2. Data of machine test results

Referring to the results in Table 2 can be said that the machine can work well. This can be seen from the kinera of the machine that shows all the components work well especially at the temperature that can be controlled during the process of frying banana chips and feels in accordance with the needs during the production of banana chips in partner SMEs.

Based on the test results of the machine, the machine is said to be eligible to be sent to partner SMEs. The next stage of the machine is applied in partner SMEs.

### Discussion

Based on the results of machine implementation and monitoring in partner SMEs, it is obtained that the process of slicing and frying banana chips become more practical because of the engine with electric motor drive so as to speed up the production process, where 20 minutes for slicing and 40 minutes for frying with a frying temperature of 250 degree of celcius and capacity to 4kg / hour In addition, the partner SMEs feel happy with this PKM activity, and hope that with this activity, the process of making banana chips to be 2 times more effective and efficient so as to increase the productivity of his business manjadi 2-fold.

### V. CONCLUSION

Implementation of Mes Banchi (Banana Chip Producing Machine) With Utilization of K Type Thermocouple Sensor is very useful for SME banana chips so that the production process becomes 2 times more effective and efficient which initially 80 minutes for the frying process to 40 minutes and the incision process from 30 minutes to 10 minutes. As for the production capacity increased which initially only 2kg / hour now become 4kg / hour. For the process of

frying becomes more practical because the engine is done with electric motor drive, the frying process is equipped with thermocouple sensor so that the temperature can be controlled fry up to 250 degrees Celsius.

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PERANGKAT  
PEMBELAJARAN  
PRAKTIKUM  
INSTRUMENTASI DAN  
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SISTEM MEKATRONIKA  
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