



PROCEEDING

International Conference on Research and Academic Community Services

ICRACOS 2019

Tema

Research and its application to meet the industrial era 4.0.

Saturday, September 7th 2019
07.00 a.m. – 05.00 p.m.
at Golden Tulip Legacy Hotel
Mayjend HR. Muhammad Street No. 294
Surabaya, Indonesia



Publisher :
Faculty of Mathematics and Natural Sciences,
Universitas Negeri Surabaya

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**Proceeding of International Conference on Research and Academic Community Services
(ICRACOS) 2019**

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CONFERENCE SCHEDULE OF ICRA COS 2019

“Research and Its Application to Meet The Industrial Era 4.0.”

Saturday, September 7, 2019

Golden Tulip Legacy, Jl. Mayjen HR. Muhammad No.269, Surabaya, East Java, Indonesia

Time	Session	PIC
07:00–08:00	Registration	Seminar Committee
08.00 –08.50	Opening Ceremony: 1. National anthem Indonesia Raya 2. Entertainment 3. Welcome speech (Rector) 4. Welcome speech (Seminar Committee head) 5. Pray 6. Photo session and Souvenir Delivering	Seminar Committee
08:50– 09:00	Coffee Break	
09:00– 09:40	1 st Keynote Speech: Prof. Jing Wen Lin, Ph.D (National Taipei University of Education)	Moderator: Rooselyna Ekawati, Ph.D
09:40– 10:20	2 nd Keynote Speech: Prof. Dr. H. Muchlas, M.Pd. (Universitas Negeri Surabaya)	
10:20 – 10:30	Question and Answer Session	
10:30– 11:10	3 rd Keynote Speech: Assoc. Prof. Kuniyoshi Shimizu (Bioresources Science at Kyushu University)	Moderator: Nadi Suprpto, Ph.D
11:10 – 11:50	4 th Keynote Speech: Prof. Dr. Ir. Suhono H. Supangat, M.Eng. (Professor of Information Technology at Institute Teknologi Bandung an Indonesia Railroad Commisioner)	
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13:00 – 14:15	1 st parallel session	Moderator at each room
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AN AUTOMATIC SAMBAL FILLER MACHINE

Raymond Ivano Avandi
Faculty of Sport Science, Universitas Negeri Surabaya
Surabaya, Indonesia
raymondivano@unesa.ac.id

The process of sambal filling in SMEs is ineffective, due to the traditional approach it used. The purpose of this research is to develop an alternative approach to increase the effectiveness of the machine with Created SAMKILLER, An Automatic Sambal Filler Machine, The machine performed based on volume which has set by the users. Based on simulation The machine is expected to have flow mass of 20 gram/sec and flow rate of 26.17 cm³/s. For bottle capacity of 150 gr, the sambal takes about 5.8 seconds to be filled. The machine increases production effectiveness up 2 times.

Keywords : Sambal Goreng, Automatic, Sauce Filling Machine, Screw System.

I. INTRODUCTION

The purpose of this study is to examine the problems of small and medium enterprises in the food sector, especially chili sauce production, and to find good solutions to solve them. As we know, the current problems come from the limitations of machines or technical equipment to support product production and meet market needs. Sambal is a spicy chili sauce native to Indonesia, made from red chilies until the juice is lost, resulting in a spicy taste. After adding spices, the spicy taste changes to sweet like flowers. There are many types of sauces. Each type has different ingredients and materials. However, the simplification process cannot be considered trivial. All ingredients, materials and preparation methods must be evaluated properly. then become spicy and sweet (Manawaroh and Jasmine, 2006: 2)

Today some brands of prepared, prepacked, instant, or ready-to-use sambal are available in warung, traditional markets, supermarkets and convenience stores. Most are bottled sambal, with a few brands available in plastic or aluminum sachet packaging. Compared to traditional sambals, bottled instant sambals often have a finer texture, more homogenous content, and thicker consistency, like tomato ketchup, due to the machine-driven manufacturing process. the demand of sambal in local sector increased recently, therefore the importance of sambal being a positive issue not only can increase our local income but also can promote Indonesia food brand product in other nations. Small and medium enterprises (SMEs) have an important role in supporting national economic development. To encourage high, even, equitable and sustainable economic growth, the government has prepared the Master Plan for the

Acceleration and Improvement of Indonesian Economic Development (MP3EI) 2011-2025. As an economic sector, SME productivity must be improved based on the technical aspects of SMEs, there are four areas: technology (physical equipment), humans (human resources), information (reality, information systems), orgaware (management). or guidance.). This study was conducted with the aim of understanding the role of technology in improving SME productivity. The results of the study indicate that the use of technology based on technical content in the SME manufacturing process is still low. (Astuti et al., 2013).

This paper is the result of student research and the use of technology to provide good solutions to the problems of small and medium chili sauce industries, as well as research discussions and interviews with stakeholders providing good solutions to increase the productivity of chili sauce production. Chili sauce leaves a warm sensation on the skin. Therefore, this affects the productivity of entrepreneurs in meeting market needs and financial resources.

The purpose of this research is to provide solutions by creating an easy-to-use machine that can improve the effectiveness and productivity Therefore, we need alternative machines that can meet it's need, The solution is used *SAMKILLER MACHINE* (Sambal Goreng Filler) An Automatic Sambal Filler Machine, this machine can increase sambal production and effectiveness by at least 2 times of the original effect.

II. METHOD

A. Observation and discussion

This activity is the initial step in finding relevant data, observations and FGDs (focus group discussions) conducted by groups and producers, where the problems are discussed regarding the working conditions of producers and the limitations they face. Short-term and long-term benefits can be obtained by entrepreneurs both from technical and financial aspects. such as the ability to produce a process, the amount of demand and limitations of chili sauce production) and social aspects (lack of consumer trust in fried chili sauce products) regarding product health and cleanliness during the production process.

B. Decided Research Method

Decided research method consist design, prepare training, process mechanism, manufacture assembly ,trial and implementation

C. Creation Design

The next step is to plan and design the Samkiller device. Based on the results of discussions between the management team, teachers and colleagues, the design of the “Samkiller” device was chosen, which was then discussed by the design team and entrepreneurs. The design of this tool uses Inventor 2016 software.

D. Manufacturing Machine

After everything is ready including the tools and supporting equipment to be used, the next step is to build or assemble the part. This process usually takes a long time, but our target is 1 month for the machine. If you encounter obstacles and constraints, you can use the services of a general workshop or hire an engineer to complete the construction of the device, but here we are trying to make the device.

E. Trial and test

SAMKILLER engine testing aims to ensure that every part of the engine power can work as expected. The test was conducted at our friend, Sambal Goreng Bo Udi in Kebonsari Surabaya.

F. Implementation and Monitoring

After the device is tested and gets good and perfect results, the device is sent to a friend and shows the friend's opinion on the performance of the device. Monitoring is done to monitor the status of the device used by the partner, which is then recorded and analyzed.

G. Publication and Patents

The results of our project are published in scientific methods and mass media with the aim of making people aware of the benefits of the machine we created. Due to the many benefits created by PKM and the results of GOOGLE PATENT searches, no one has filed a patent for our device.

H. Evaluation

Vehicle assessment and repair are carried out after vehicle testing. At this time, the functional system of the device will be evaluated starting from movement, stability of form, optimal maintenance results. If the machine does not meet expectations, fault diagnosis and corrective actions will be taken.

III. RESULT AND DISCUSSION

The invention is adopts volume control method and timer contro which uses rotation of screw to deliver the sambel into the bottle. The development in rule is controlling the stream of filling handle through the

concept of 2 stages of the suction stage and press stage utilizing one wayValve (One-way valve) input and yield additionally the utilize of transmission that drives the cylinder employing a screw system where the filling machine employments the most fryer of electric engines where the engine has been coordinates with cylinder and screw transmission as a driving constrain and prepared with ECU (Electrical Control Unit) as the most controller of timer-based choke amount, which its application utilizing Daniel Bernoulli or "ASAS BERNOULLI". The Bernoulli Equation : the over specialized calculations The calculation equation to decide the measure of the cylinder tube and the speed of the cylinder movement.

$$\begin{aligned} \text{Mass of stream sambal} &= 20 \text{ gr/s} \\ \text{Thickness} &= 0.764 \text{ gr/cm}^3 \\ \text{Charge Stream sambal} &= \\ &= (\text{Massa aliran sambal}) / (\text{Massa Jenis Sambal}) \\ &= (20 \text{ gr/s}) / (0.764 \text{ gr/cm}^3) \\ &= 26,17 \text{ cm}^3/\text{s} \end{aligned}$$

$$\text{Charge Stream sambal} = \text{Suction Charge} / \text{Press charge} \\ (\text{tabung cylinder}) = \text{Charge Input} = \text{Charge Yield}$$

The distance across is indicated in a 7.5 cm cylinder tube, hence the zone of the tube base is :

$$\begin{aligned} A &= \pi \cdot r^2 \\ &= 3.14 \cdot 3,75^2 \\ &= 14,6 \text{ cm}^2 \end{aligned}$$

Calculation the speed of the Cylinder based on the release of the chili and the cylinder cross-sectional region :

$$\begin{aligned} Q &= v \cdot A \\ 26,17 \text{ cm}^3/\text{s} &= v \cdot 14.6 \text{ cm}^2 \\ v &= (26,17 \text{ cm}^3/\text{s}) / (14.6 \text{ cm}^2) \\ v &= 1.792 \text{ cm/s} \end{aligned}$$

Calculate the filling time of browned sambal utilizing the rule of "Bernoulli"

$$\begin{aligned} Q &= V : t \text{ (therefore)} \\ t &= V : Q \\ t &= 150 \text{ gram} : 26,17 \text{ cm}^3/\text{s} \\ t &= 5,8 \text{ secon} \end{aligned}$$

so that in 1 prepare filling went through 5,08 secon as mentioned before, based on problems occur. The solution is by created alternative machine to approach and increase the effectiveness of Filling Process. SAMKILLER SambalGorengFiller , An Automatic Sambal Filler machine as a Solution in order to resolve the problem and assist meet market need of entrepreneurs. SAMKILLER machine used simple component but helped solving the problems.

Table 1. Component Machine

Component	Infromation
Motor	0,37 HP/12 V
Transmisi	Bolt/Screw
Frame	Stainless - Steel 90x30x90
2 Valve	One Way Flow Control And Standart Valve
ECU	50 Watt
Push Button	-
Saklar on off	-

Table 2. Output Machine Comparison

	Konvensional	Samkiller Machine
Effectivity	12 s / Bottle	5,8 s / Bottle
Productivity	240 Bottle / Process	480 / Process

The table above shown that the usage of SAMKILLER Machine can increases production effectiveness by at least 2 times of the original effect.

The result :

This investigate brought about is Discover arrangement how to extend Effectivity of sambal Filling handle with make a model of programmed filler machine, Reenactment of the machine has been performed. The machine is anticipated to have stream mass of 20 gram/sec and stream rate of 26.17 cm³/s.

For bottle capacity of 150 gr, the sambal takes about 5.8 seconds to be filled .calculation resulted in 480 bottles/process. Thus, this machine is prepared with a simple filling strategy that's operation utilizing as it were 1 button. This machine increases production effectiveness by at least 2 times of the original effect.

The benefits of this research are:

1. The hygienic and safety of production process more secure
2. Machine Can improve productivity and effectiveness of Production
3. Assist to Solve problems in SMEs (Small and Medium Entreprises)
4. Progress the Economy Pay of business visionaries.

IV. CONCLUSION

Based on the over clarification, a sambal filling machine with 480 bottle/hour capacity with 150 g of bottle measure required 5.8 moment time which the stream mass of 20 grams/sec and stream stream is 26,17cm³ / s. This machine too employments food-grade standard materials so that the utilize of this machine gets to be more sterile. By utilizing this machine at that point the business person can increment generation capacity up to 2-times so as to progress the economy of business people.

The Goals of this paper is find effective solution of filling process in SMEs of food sector, increasing

productivity of production and promoting this solution to the people. I expected that this machine can be produce as soon as possible in order to assist the problems occurring in food sector of filling process, not only for local consumption but also have opportunities to be export in another nations

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Head of Institute for Research and
Community Services

Conference Chair



Prof. Dr. Darni, M.Hum.
NIP. 196509261990022001



Prof. Dr. Titik Taufikurohmah, M.Si.
NIP 196804131998022001







