POLITEKNIK
SULTAN SALAHUDDIN
ABDUL AZIZ SHAH

JABATAN KEJURUTERAAN MEKANIKAL

SESI JUN 2019

TAJUK PROJEK:

MEREKABENTUK DAN MEMBANGUNKAN PROTOTAIP MESIN PENGASING BIJI CILI KERING

AHLI KUMPULAN:

NAMA	NO PENDAFTARAN
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PENYELIA: ENCIK AHMAD FAKARUDDIN BIN MOHD FAUZI

AKUAN KEASLIAN DAN HAK MILIK

TAJUK : DRIED CHILLI SEED

SEPARATOR SEED

HOLDER (DCSSM) SESI : JUN 2019

1. Kami, **1. MOHD AKHRAM KHAN BIN ASKANDAR KHAN**
2. AQIL HUSYAIMI BIN ABDUL HISHAM

adalah pelajar tahun akhir **Diploma Kejuruteraan Mekanikal, Jabatan Kejuruteraan Mekanikal, Politeknik Sultan Salahuddin Abdul Aziz Shah,** yang beralamat di **Persiaran Usahawan, Seksyen U1, 40150, Shah Alam, Selangor.**

2. Kami mengakui bahawa DRIED CHILLI SEED SEPARATOR MACHINE (DCSSM) dan harta intelek yang ada didalamnya adalah hasil karya/ reka cipta asli kami tanpa mengambil atau meniru mana-mana harta intelek daripada pihak lain.

3. Kami bersetuju melepaskan pemilikan harta intelek DRIED CHILLI SEED SEPARATOR MACHINE(DCSSM) kepada Politeknik Sultan Salahuddin Abdul Aziz Shah bagi memenuhi keperluan untuk penganugerahan **Diploma Kejuruteraan Mekanikal** kami.

Diperbuat dan dengan sebenar-benarnya

diakui oleh yang tersebut;

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di Politeknik Sultan Salahuddin Abdul Aziz Shah, pada .....

Di hadapan saya, AHMAD FAKARUDDIN BIN MOHD FAUZI
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.....
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sebagai penyelia projek pada tarikh:.....

APPRECIATION

Grateful for the Divine wish and congratulations on our great visit to the Prophet Muhammad, we were able to successfully complete the final project within a set period of 6 months without facing any difficult issues as a condition of conferring a Mechanical Engineering Diploma in the June 2019 session. We thank everyone involved directly and indirectly, especially our supervisor Mr Ahmad Fakaruddin Bin Mohd Fauzi who has provided us with all the guidance, advice, encouragement and constructive criticism we have been able to complete in our final project report. Not to mention friends and family members who have been very helpful in terms of finances and finances in completing this final project assignment. We are grateful to Allah SWT for this final project. We hope this report can serve as an example and a guide to the parties involved in the future.

ABSTRACT

Separation process of dried chili seed is a massy process and it will be easier if there is got a machine to do the process. Currently the machine that are used in this process can't to make sure separate the chili seed cleanly. By this project the machine is invented with a water spinning process as an additional process to make sure all the seed can be separate from the dried chili. The main objective of this project is to develop a prototype machine to complete all the process of dried chili seed separation. The machine can be divided by three main section which are shredder feeder hopper and water spinning drum. Most of the section is made by using a food grade metal to avoid contamination. Dried chili will be inserted to the shredder hopper to slice it smaller than the origin size. The first phase of separation process is starting on the cut dried chili to smash out the seed from the chili. The last phase is the cut chili will be soaking into a spinning water drum with a high speed water jet circulation, in this process the cut chili will be more clean than currently method which is only use a water pump machine.

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CHAPTER 1

1.1 INTRODUCTION

The seeds stuck into channel appendices which eventually became the media germs / bacteria nest and breed as the infection that causes inflammation of the appendix [2]. Moreover, cooking with Nowadays, dried chilies become one of important ingredients especially in Asian dishes. Hot and spicy meals provided by dried chilies always make some people to feel spicy-butdelicious and therefore they become more desirable to be tasted. However, consumers face many problems or bad effects of the dried chilies especially concerning with its effects for human health. Consuming foods that contains chilies seeds for a certain period may cause appendicitis. Appendicitis disease is generally caused by bacterial infection, but there are several possible factors originators who until now could not clearly know. Among the factors blockage (obstruction) in the lining of the channel (lumen) appendix by feces pile / hard fecal material (fekalit), hyperplasia (enlargement) lymphoid tissue, worm diseases, parasites, foreign bodies in the body, the primary cancer and stricture [1]. Chilies seeds cannot be digested in human feces and therefore they are slipped into a channel as salty things, nor hardening feces (constipation) in a very long time there may be chilies seeds makes the dishes become yellowish and therefore reduces appetite. As far as this issue is concerned, the chilies seeds need to be removed as much as possible before cooking. However, preparing unseeded chilies manually requires tedious steps and time-consuming in industries. For housewives, dried chilies are used in a small quantities normally ranges between 15 to 30 pieces per serving and therefore to undergo such tedious manual process of cutting, boiling, squeezing and blending which take more than 15 minutes is unreasonable if looking at the simple meals to be served daily. In addition, manual process using bare hands and this process leads to another uncomfortable situation where operators feel hot of the chilies on their hands due to direct contact with the dried chilies which are being processed.

1.2 BACKGROUND RESEARCH

Chili Shredder Machine is a solution to cleaning a dried chili from a seed. It makes the process easier & clean without a massy works thus save a time also, dried chili is a common ingredient in malay foods, dried chili must be cleaned properly to avoid a bad taste on a food. In terms of save energy consumption, this machine is more efficient compared to the previous vibrator machine because it eliminates more human energy and electricity by integrate all the process in one machine. The metal food grade (stainless steel 304) is the main material used on fabrication this machine to protect the quality of the food from the corrosion contamination also to keep maintain the taste of chili paste without any weird effect.

1.3 PROBLEM STATEMENT

Food industries is one of the biggest long terms opportunity to expand but there are a lot of problems in food production especially to remove a chili dried seed. Currently a traditional method is used widely and consume a lot of human energy. Furthermore the current method also need the dried chili to be boiled first to make is soft and easy to clean it. Roughly the cost of this process is high and the process is slow. Undergoing a survey is a must before executing any design projects. This method is agreed Mr Ahmad Fakaruddin Bin Mohd Fauzi and supported by Mr Mohd Hariz Bin Samian Therefore, to understand the problems as well as to make sure the product to be developed matches exactly with what customers need, a survey has been conducted to 50 respondents consisting of 25 restaurants owners and another 25 respondent's are housewives from range 31-40 years old in Malaysia. This survey shows that 50% respondents used dried chilies in their cooking and 90% respondent realize the risk of consuming chilies seeds in their meals. 75% of them remove chilies seeds manually by bare hands and the rest admit that they just simply cook with seeds.

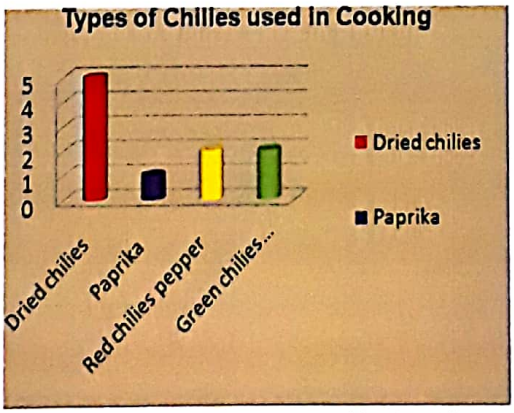


Fig. 1. Types of Chilies used in Cooking

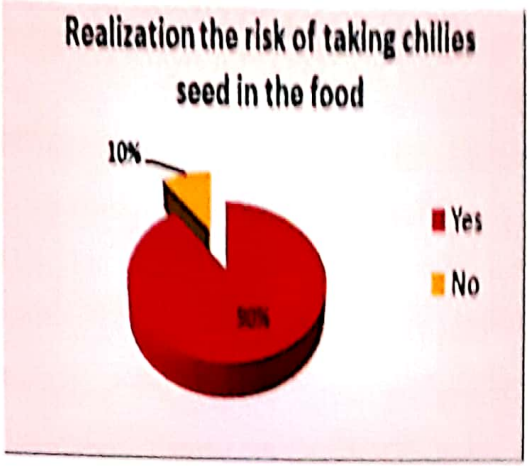


Fig. 2. Realization the risk of taking chillies seed in the food

Currently restaurant workers and housewives cut chilies manually using scissors and remove the seeds using sieves as shown in Fig. 3

Fig. 3. Sieve used to remove the chili seed. Chili will be inserted into the filter, and then squeezed by hand to remove the seeds.

This time-consuming and troublesome processes in separating dried chilies seeds are the main reason why dried chilli seed separator machine is introduced in which aimed to help separating the seeds at small scale quickly and effectively. Currently in malaysia markets there are a few dried chili seed remover machine. In a normal operation the various of machine before doesn't remove the seed in a good result, because the seed still stick at the chili. There is no such a machine operating by using a water jet circulation to ensure the seed can be removed perfectly.

1.4 OBJECTIVE

Dried Chili Seed Separator Machine (DCSSM) is a solution to clean a dry chili seed. It make the process easier & clean without a messy works thus save a time also, dried chili is a common ingredient in malay foods, dried chili must be cleaned properly to avoid a bad taste on a food. In terms of save energy consumption, this machine is more efficient compared to the previous vibrator machine because it eliminates more human energy and electricity by integrate all the process in one machine. The metal food grade (stainless steel 304) is the main material used on fabrication this machine to protect the quality of the food from the corrosion contamination also to keep maintain the taste of chili paste without any weird effect

1.5 PROJECT SCOPE

I. The machine is designed for small & medium industrial usage.

II. Only specific for dried chili.

III. Remove a chili seed with a minimum labour cost.

1.6 RESEARCH INTERESTS

Dried Chilli Seed Separator Machine (DCSSM) is used for small industry, housewives and restaurant. For those who are need dried chilli to cooking and supply chilli sauce can be related to this product. It's good for a saving time and energy. However, this product only use for a small industry because a machine is not have large space. This machine can help separating the seeds at small scale quickly and effectively.

1.7 CHAPTER SUMMARY

In conclusion from the implementation of this project can learn the appropriate way for a study using the above topics. Objectives are study to set a goal for a project and the goal should be achieved after dried chilli seed machine ready to be created. Then the problem statement is the key to creating a project. This is because the problem statement can create facilitate the problems arising from public problem. In addition, the scope of the study that limits a project where the scope of study facilitates the achievement of the objectives and goal of a project.

REFERENCES

[1] P. C. Majumdar, Appendicitis Curable by Homoeopathic Medicine, B. Jain Publishers, 2005, ISBN 8170216273

[2] Appendicitis, John Blair Deaver, Reprint Edition, Kessinger Publishing, LLC, 2010 ISBN 1166490963 pp.638

[3] Karl T.Ulrich (2002). Product Design and Development Second Edition, NY.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The research included the internet,reference book,observation and experiences.

This study carried out by studying the machine parts and the concept of material that has existed before to use for our machine.The machine before are on the market at this moment are good but there is still a shortage in terms of price as well as the resulting size. Existing machines have no process for cleaning, just do the crushing process. In that case, we want to make and create a machine that complements overall the processes of grinding and cleaning. Discuss about the price, should have be reasonable and in accordance with the function and cost used to produce the machine.

The size of a machine must depend for an users. For a large machine is especially in industry because they need to supply more for product. The study to be comparable to all the data to obtain the information that can really be used. It aims to ensure that the project to be produced will benefits the user.

2.1.2 Ergonomics

In doing this machine there are problems like ergonomic effects caused by certain factors. Referring to the Journal "The Role of Ergonomics in Occupational Safety and Health", Ayodhya, Telkom University, Ergonomics is the science, art and technology application to harmonize between all the facilities used in the activity or work with human capabilities and limitations both physically and non physical so quality overall life is better. Ergonomics or also known as Human Factors Engineering is a discipline that always places human beings at the center of attention (human centered design) holistically and integratively in a work system where humans engage in them.

> According to International Ergonomics Association (IEA), ergonomics is defined as:
>
> "The scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance"

2.1.3 Work Safety

Referring to the Journal "The Role of Ergonomics in Occupational Safety and Health", Ayodhya, Telkom University, Safety comes from English which is a word of safety and is usually associated with the condition of a person from accident or near accident. . As a matter of facts safety as a scientific approach and as a practical approach to studying factors that can cause accidents and attempt to develop ways and approaches to minimize the risk of accidents.

2.1.4 APPENDIX DISEASES

1. Chilies seeds cannot be digested in human feces and therefore they are slipped into a channel as salty things, nor hardening feces (constipation) in a very long time there may be the seeds stuck into channel appendices which eventually became the media germs / bacteria nest and breed as the infection that causes inflammation of the appendix.

2. Appendicitis disease is generally caused by bacterial infection, but there are several possible factors originators who until now could not clearly know. Among the factors blockage (obstruction) in the lining of the channel (lumen) appendix by feces pile / hard fecal material (fekalit), hyperplasia (enlargement) lymphoid tissue, worm diseases, parasites, foreign bodies in the body, the primary cancer and stricture.

2.1.5 MEANING OF MACHINE

A machine (or mechanical device) is a mechanical structure that uses power to apply forces and control movement to perform an intended action. Machines can be driven by animals and people, by natural forces such as wind and water, and by chemical, thermal, or electrical power, and include a system of mechanisms that shape the actuator input to achieve a specific application of output forces and movement. They can also include computers and sensors that monitor performance and plan movement, often called mechanical systems.

2.1.6 HISTORY

Figure 2.1.6: Flint hand axe found in Winchester.

The hand axe, made by chipping flint to form a wedge, in the hands of a human transforms force and movement of the tool into a transverse splitting forces and movement of the workpiece. The hand axe is the first example of a wedge from which most machines are based. The second oldest simple machine was the inclined plane (ramp), which has been used since prehistoric times to move heavy objects.

2.2 CONCEPT / THEORY

After identifying the problem, the advantages of research, objectives, scope and terminology, literature review will be conducted first to ensure further steps can be taken. In this chapter we will discuss terms related to the project to be carried out. Concepts and theories will also be explained about this project. This term is very important to know and understand before a more detailed description of our project titled. Dried Chilli Seed Separator Machine (DCSSM) has some important concept when the machine work for grinding and cleaning process available idea from Mr Hariz.

Opinion based on research and discovery, supported by data and discussion. This theory is also an analysis of the relationship between one fact and the other facts that will be collected and made into data. Theoretical statements are generally

accepted temporarily and not conclusive definitions.

2.2.1 GRINDING

In the process of grinding, perfect perfection is often not given priority. But if using the correct equipment, the grinding process will be more blend perfectly. There are several way is must choose a rotating stainless steel blade or a stainless steel single shaft shredder rotating blade.

Figure 2.1.1 example for rotating blade.

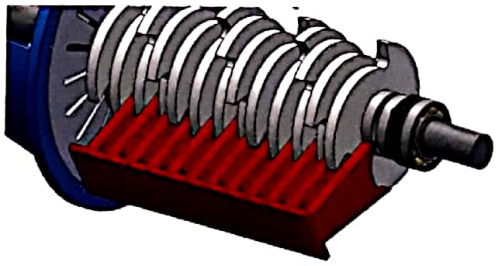


Figure 2.1.2 example single shaft shredder rotating blade.

FIGURE	PROPERTIES	DESIGN	OPERATION

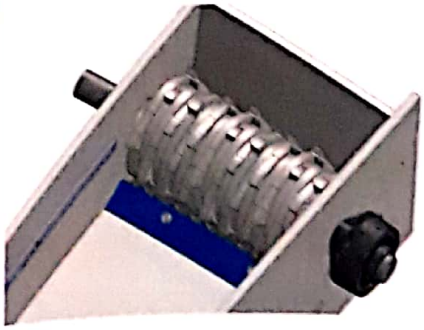
	✓ Single shaft shear shredder ✓ Insert a dried chili and it will be shraded by the by shaft. ✓ Prefectly work ✓ Not require high speed motor	"shaft" shape	Semi auto
	✓ Cut & vibrate the chili ✓ High volume production ✓ Fabricated by using stainless steel	Rectangle	Semi auto
	✓ Cut and vibrate the chilli ✓ High speed motor to generate ✓ Must using a stainless steel ✓ Cheap and simple to create ✓ Easy to install	Shaft knife blade	Semi auto

Table 2.1 compared for blade

2.2 CLEANING PROCESS

Currently in malaysia markets there are a few dried chili seed remover machine. In a normal operation the various of machine before doesn't remove the seed in a good result, because the seed still stick at the chili. There is no such a machine operating by using a water jet circulation to ensure the seed can be removed perfectly.

There are a several method used before to remove a chili seed, traditionally it starting by using a knife and also a scissor. By using this method the quantity of chili can be clean is small and it will make a worker exhausted also make a finger become hot.

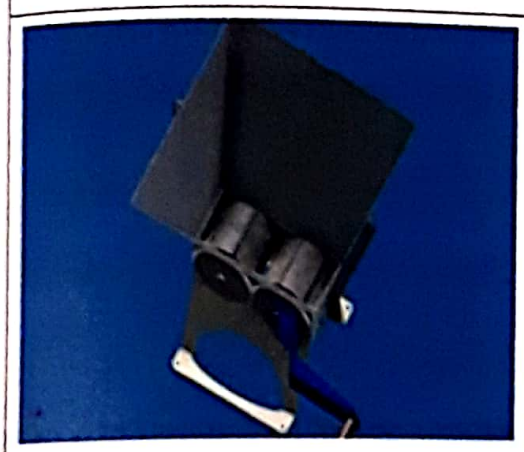
Waterpump and filter are put in a stainless steel tank with diameter 50cm X 50cm. By using a water jet,must been have refill water on the drum tank to remove a seed still stick at the chilli and to clean a chilli after blended.

Figure 2.2.1 waterpump for cleaning process

Figure 2.2.2 stainless steel tank 50cm X 50 cm

2.3 TYPE OF DRIED CHILLI SEED SEED IN THE MARKET

Most of the machine are using in food industrial only meanwhile most of housewife just used a scissor and knife. Food industry need a machine for a big scale production. Below is an example a chili seed remover that used in industry. Basiccally the function is good but the result is not satisfied because there are still got a chili seed on the chili.

FIGURE HOPPER	PROPERTIES	DESIGN	OPERATION
	✓ Mechanical work ✓ Use hand ✓ Simple and small ✓ Need a gear ✓ Double shredder shaft	"hopper V shape"	Manually
	✓ Mechanical work ✓ 2 in 1 for exercise and work ✓ Belt to transmit power efficiently ✓ Hard frame ✓ Double shaft rotating blade	"Hopper bicycle mode"	Manually

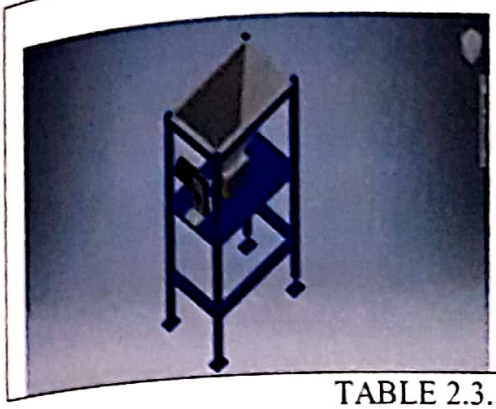
	✓ Electrical motor ✓ Hard frame ✓ Low vibrate ✓ Single rotating shaft	"Table hopper V shape"	Semi auto

TABLE 2.3.1 COMPARE OUR MACHINE

2.4 MATERIAL&COMPONENT

Iron or plate is the raw material of the plate in the form of sheets which in making it used as raw material making various kinds of equipment and equipment in making industry need such as machine, transport vehicle body, and also widely used as raw material making a body frame.

The plate material itself can certainly be made of various type materials. The type of plate or plate material can be grouped into two parts, ferro metal and non-ferro metal plate materials. In market itself sell iron plate with several types of plate that are widely used, among other as follows.

However, the plate of hopper must be a stainless steel because the fact that it can withstand corrosion from most oxidising acids means its durability makes it easy to sanitise and it is suitable for kitchens and food applications. Although the risk is minimal, poorly constructed stainless steel cookware can potentially leach a small amount of nickel into food.

High-quality stainless steel provides a cooking surface which will resist heat, not react with food, flake or leach harmful chemicals into food. That why must 304 stainless steel need to install hopper shredder machine. For the hopper frame, it does not require the use of stainless steel and will use another steel.

Type of material machine:

I. Stainless steel 304 plate

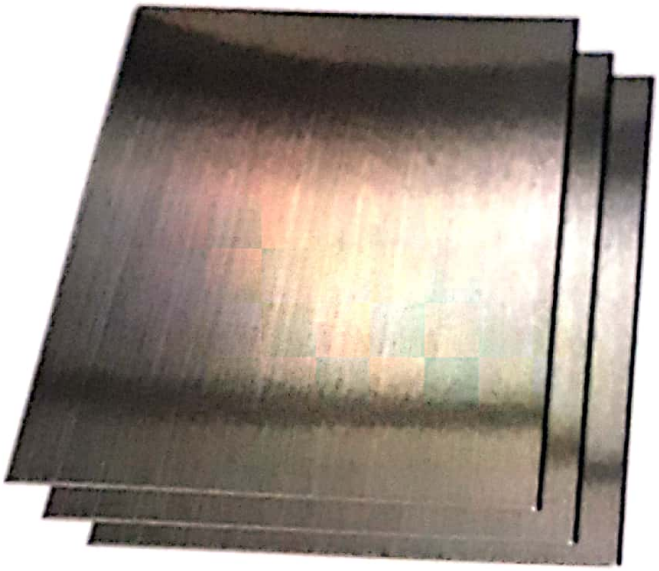


FIGURE 2.4.1 STAINLESS STEEL (304)

Both steels are durable and provide excellent resistance to corrosion and rust. 304 stainless steel is the most versatile and widely used austenitic stainless steel in the world, due to its corrosion resistance. Stainless steel 304 physical properties:

- Density: 8.03g/cm.
- Electrical resistivity: 72 microhm-cm (20C)
- Specific Heat: 500 J/kg °K (0-100°C)
- Thermal conductivity: 16.3 W/m-k (100°C)
- Modulus of Elasticity (MPa): 193 x 10^3 in tension.
- Melting Range: 2550-2650°F (1399-1454°C)

II. Hollow structural steel frame

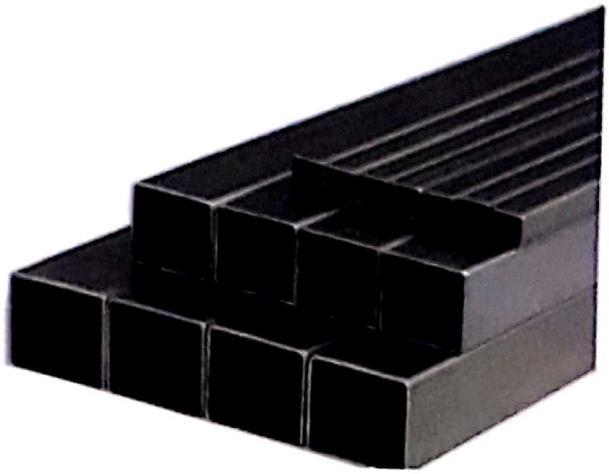


Figure 2.4.2: hollow structural steel

HSS members can be circular, square, or rectangular sections, although other shapes such as elliptical are also available. HSS is only composed of structural steel per code. HSS is sometimes mistakenly referenced as hollow structural steel. Rectangular and square HSS are also commonly called tube steel or box section. This need for frame to install a part for machine.

Strength Structural Steel Structural steel is extremely strong, stiff, tough, and ductile, making it one of the leading materials used in commercial and industrial building construction. Mechanical properties are also used to help classify and identify material. The most common properties considered are strength, ductility, hardness, impact resistance, and fracture toughness. Most structural materials are anisotropic, which means that their material properties vary with orientation.

III. Ball bearing

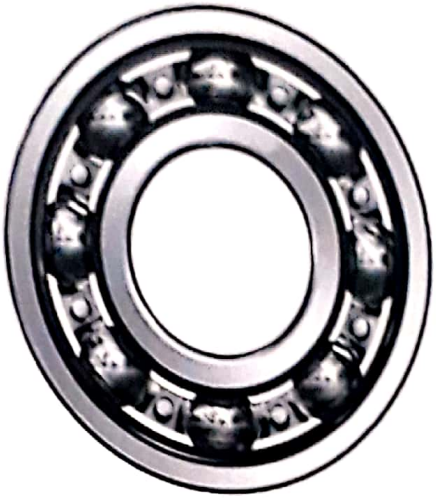


Figure 2.4.3: Ball bearing

A ball bearing is a type of rolling-element bearing that uses balls to maintain the separation between the bearing races. The purpose of a ball bearing is to reduce rotational friction and support radial and axial loads. A simple bearing, like the kind found in a skate wheel, vehicle, machine and other. Bearings reduce friction by providing smooth metal balls or rollers, and a smooth inner and outer metal surface for the balls to roll against. These balls or rollers "bear" the load, allowing the device to spin smoothly.

This ball bearing use for connection for shaft shredder to support radial and axial load for a machine when it work. For a number of reasons, few bearings reach their full designed life expectancy. The principle causes of damage and premature bearing failure are inadequate/improper lubrication, contamination, overload, and improper handling and installation.

Radial ball bearings:

- Deep groove ball bearings.
- Angular contact ball bearings.
- Duplex angular contact ball bearings.
- Four-point contact ball bearings.
- Double-row angular contact ball bearings.
- Self-aligning ball bearings.

IV. Mild Steel

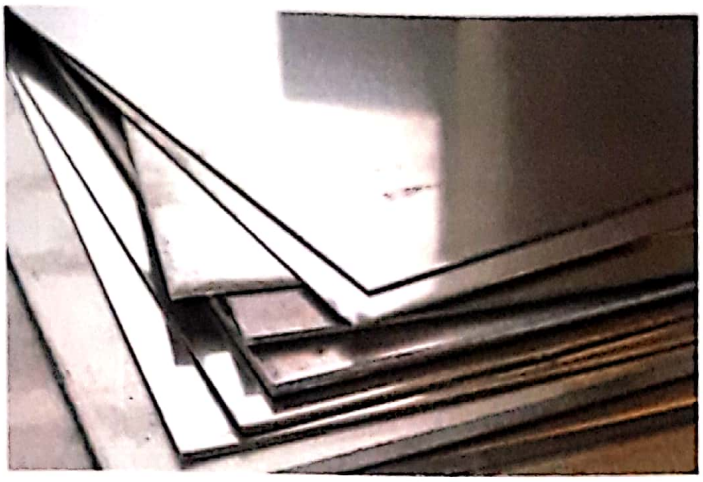


Figure 2.2.4: mild steel plate

Physical Properties Strength Mild steel has a high resistance to breakage. Mild steel, as opposed to higher carbon steels, is quite malleable, even when cold. This means it has high tensile and impact strength. Higher carbon steels usually shatter or crack under stress, while mild steel bends or deforms.

The heat treatment develops hardness, softness, and improves the mechanical properties (such as tensile strength, yield strength, ductility, corrosion resistance and creep rupture. ... Bolts and studs are supposed to be made from mild steel (up to 0.25% carbon) with characteristic toughness and ductility.

Mild steel is a type of carbon steel with a low amount of carbon. It is actually known as "low carbon steel". Mild steel also has a high amount iron and ferrite, making it magnetic. Mild steel, also known as carbon steel, will rust over time unless it is treated with some sort of protective coating to prevent the steel from cording. Elements that are introduced to steel like molybdenum, titanium and chromium can improve the corrosion resistance of steel, but it does not make the steel rust proof.

V. Grinder motor

Figure 2.2.5: grinder motor

Stanley angle grinder with 580W motor with plenty of power, strong and efficient, tailored for the heavy-duty users. Body design based on ergonomic principles, easy to control, reduce fatigue caused by prolonged use long durability, outstanding.

****Specifications****

- Model STGT5100
- Power 580W
- Wheel diameter (4") 100mm
- Spindle thread M10
- No-load speed 12000rpm
- Cord set length 2.0m
- Wide 53mm
- Length 255mm
- Weight 1.55kg

VI. Polyvinyl Chloride (PVC)

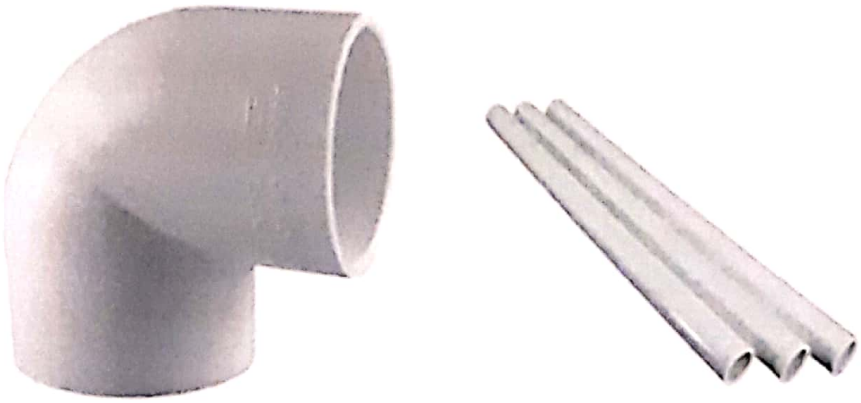


Figure 2.4.6: PVC pipe

PVC in British abbreviation for polyvinyl chloride; a synthetic thermoplastic material made by polymerizing vinyl chloride. The properties depend on the added plasticizer. The flexible forms are used in hosepipes, insulation, shoes, garments, etc. Rigid PVC is used for moulded articles. It's the white plastic pipe commonly used for plumbing and drainage. PVC stands for polyvinyl chloride, and it's become a common replacement for metal piping. PVC's strength, durability, easy installation, and low cost have made it one of the most widely used plastics in the world. Function install PVC from water pump to upper tank drum for water spinning chilli seed used to carry high pressure water.

2.5 Machine Component

From the design that are produced, its needs to be analysed to identify the specific components that are suitable to used in machine fabrication process. It is a crucial process to ensure the result of cleaning process is good and satidfied to meet a customer requirements. Below is the list of components that are on planning to used:

i. Hopper / feeder
ii. Slicer blade
iii. Vibrator deck
iv. Water circulation drum
v. Water circulation motor
vi. Filter
vii. Mild steel plate
viii. Grinder motor
ix. Speed adjustment electric motor
x. Hollow structure steel
xi. Ball bearing
xii. Stainless steel shaft
xiii. Pvc pipe

2.6 SURVEY COST COMPONENT FOR MACHINE

No	Item	Quantity	Price (per unit)	Amount
1	Water circulation drum	1	RM 157	RM 157
2	Water circulation motor	1	RM 61.50	RM 61.50
3	HSS (HOLLOW STEEL)	6m (1.5 X15) in	RM 8	RM 24
4	Filter	0.45m(d)	RM 100	RM 100
5	Grinder motor	1	RM 70	RM 70
6	Speed adjustment electric motor	1	RM 10	RM 10
7	Hopper mild steel	7x3 feet	RM 2.60	RM 53
8	Ball bearing 20cm (d)	2 pcs	RM 15	RM 30
9	Shaft	8inch	RM 5	RM 5
10	Blade	15	RM 0.3	RM 5
		Total		RM 492.5

TABLE 2.6 COMPONENT COST

2.4 CHAPTER SUMMARY

Of course, a good study, is a result of good rules and regulations. Using the methods described above, researches hope will be able to follow its own unique standards and qualities. This literature review also aims to facilitate research to obtain information. Its is such guide to researchers in producing this study. In the researcher, we get this information as well, the researchers agree with the ethics of research that investigators must adhere to.

A literature review surveys book, scholarly articles, and any other sources relevant to a particular issue, area of research, or theory, and by so doing, provides a description, summary, and critical evaluation of these works in relation to the research problem being investigated. Literature review are designed to provide an overview of sources you have explored while researching a particular topic and demonstrate to your readers how your research fits within a larger field of study.

A literature review may consist of simply summary of a key resources, but in the social sciences, a literature review usually has an organizational pattern and combines both summary and synthesis, often within specific conception categories. A summary is a recap of the important information of the sources, but a synthesis is a re-organization, or a reshuffling, of that information in a way that inform how you are planning to investigate a research problem. The analytical features of a literature review might:

- Give a new interpretation of old material or combine new with old interpretations,
- Trace the intellectual progression of the field, including major debates,
- Depending on the situation, evaluate the resources and advise the reader on the most pertinent or relevant research, or
- Usually in the conclusion of a literature review, identify where gaps exist in how a problem has been researched to date.

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CHAPTER 3

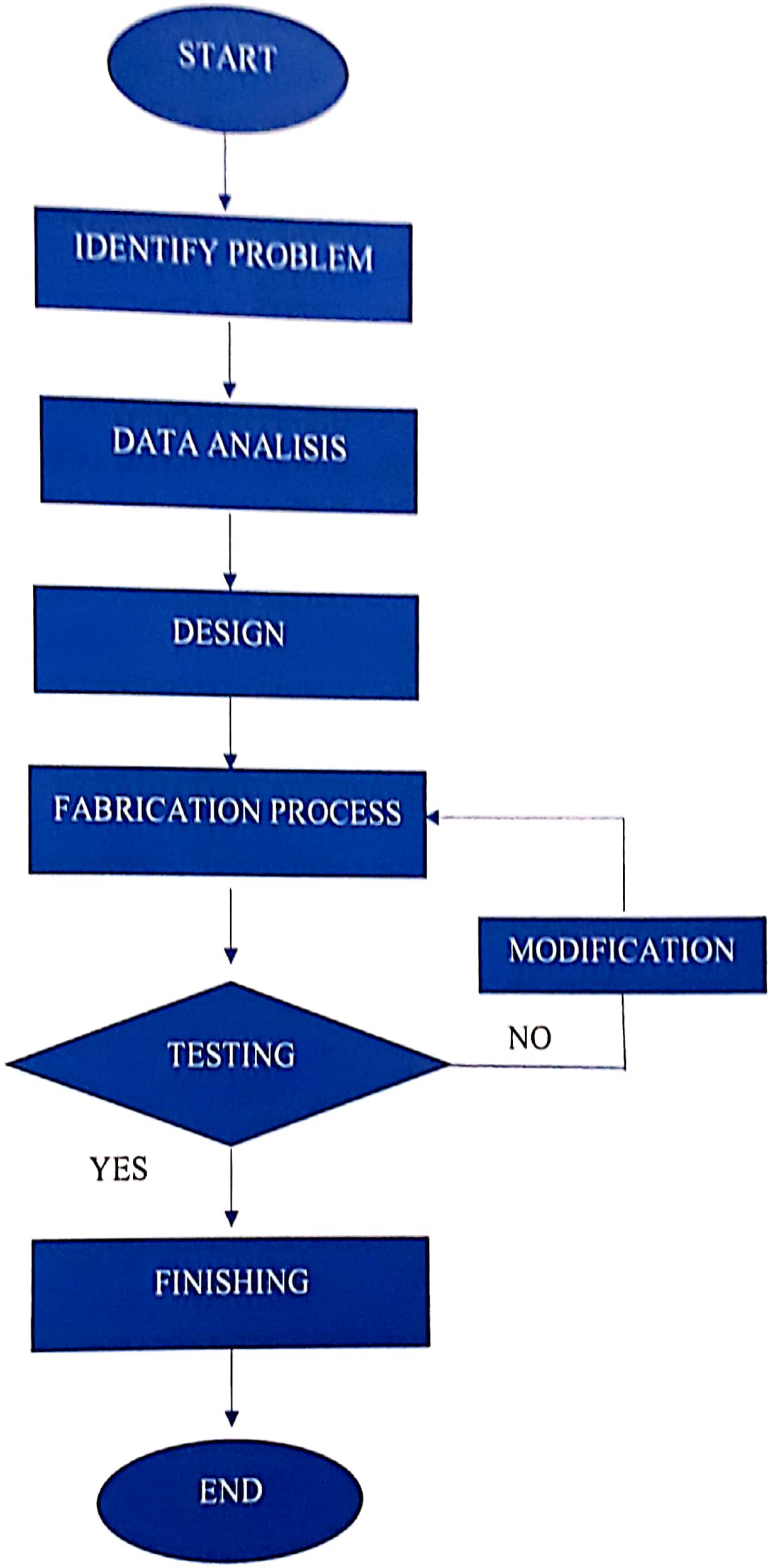
METHODOLOGY

3.1 INTRODUCTION

Metadology is a method or a notation used to do a detailed project. These steps are very important in performing this project to ensure the project has been completed at a predetermined time. In addition, there are ways to test the litter-seed-splitters.

In producing a project, a few steps to pass before the project is complete. These steps must be done with full precision so that they can produce something murky and quality project. In producing this project there are several steps done. The next description will explain the steps of methodology.

3.2 METHODOLOGY FLOW CHART



3.3 TOPIC DISCUSSION

The selection of the title is the earliest step to be prevented before starting the project work. The project that we've sought to match for the Diploma level of the Diploma, because that's a final project in this Mechanical engineering Diploma course.

Besides, a selection of corresponding projects that help creative and innovative minds at the same standard form of one person's mind and as high as the level of knowledge of which individuals and electronic use and mechanical.

After the project is selected, the title of the project needs to be selected based on its ability to interest others to find out more about the project in close probability. The title that could impress others represent the initial status of the project.

And once the appropriate title is to be elected, the step to pass is to choose equipment and components of project to do. Besides, the components of the involved should identify the correct, so it can be possible and not cause a major problem to get it. Because the harder component to come up will affect the project that will make because it might take a long time to get it.

3.3.1 IDENTIFY PROBLEM

The beginning of this study was to identify the problem of the existing machine whether it can clean the chilli seeds completely or not. therefore, our plan is to ensure that dried chilli seeds can be completely isolated.

3.3.2 ANALYSYS

The data obtained is collected, processed and analyzed to enable the next step and the determination of the study as required in the objective

3.3.3 DESIGN

Before a dry chilli seed isolation machine was implemented, the design was designed to identify stable characteristics to accommodate large quantities of chilli at a time and to process it well. rather, the design is intended to be before the project is carried out, it can be described before the project is even implemented and it will provide the required information to build a dry chilli seed separator.

3.3.4 IMPLEMENTATION

Once a dry chili seed separator machine has been prepared, the machine should be tested to see if it works and can isolate the dried chilli seeds completely or not. in turn, a dry chili of 500g was used to test the machine. After that, the result was that the machine worked well and was able to isolate the dried chilli seeds.

3.3.5 METHOD OF DATA COLLECTION

In order to carry out this study, a data collection method has been implemented to obtain data that is important for the analysis stage. Among the methods of data collection is the questionnaire method. Data collection can be classified into two types: primary and secondary data.

3.3.6 PRIMARY DATA

Primary data are important data in the study. without the main data, the objectives of the study would not have been achieved. the process of data collection was done through the distribution of questionnaires to respondents. therefore, 220 respondents were randomly selected.

3.3.7 SECONDARY DATA

Secondary data sources consist of literature reviews and other sources such as theses, books related to the field of study, local newspapers, journals and other publications related to the study being conducted. the material was analyzed accordingly and served as the basis for this study.

3.3.8 SAMPLING

sampling involves the preparation of dried chillies for testing on machines. Dry chili weighs 500g before testing. then, the time for the 500g dried chillies to be completely separated and the percentage of the dried chilli seeds will be taken into account. this sampling to determine how much time it will take as well as the percentage of dried chillies to be isolated

3.4.1 PROCUDE MACHINE

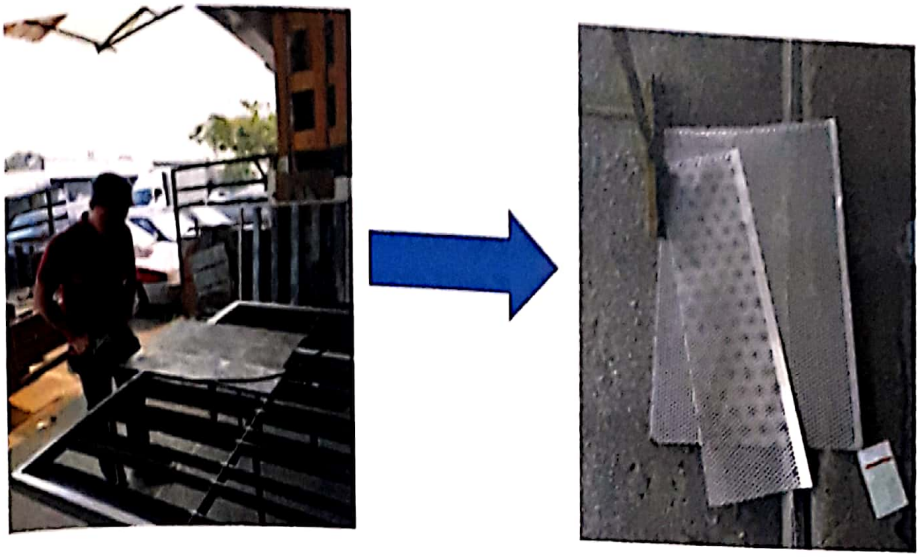


Figure 3.4.1 i: cut the net.

Figure 3.4.1 i shows the first step in producing the project. Metal nets are sketch first according to measurement. This net will be put in the mid-stock pot layer so that chili seed that lays will fall down through the net. The next step is to cut the net into the circle form so that we can put it in the stock pot.

Figure 3.4.ii: install filter and holder.

Once the net cut in the round form, the next step to complete the stock pot is to install the pump filter with holder. The pump filter installed to avoid chilli seeds from blocked pump that could cause the pump fail to flow water.

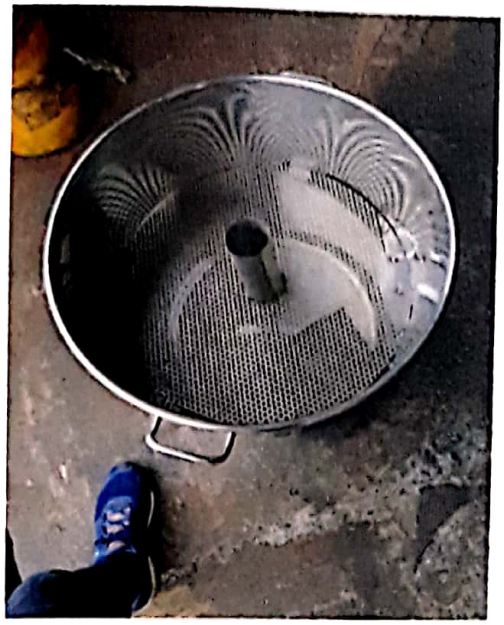


Figure 3.4.1 iii: complete results.

Figure 3.4.1 ii shows the stock pot are completed after the work- point work and net assembly is done. The work of assembly completed within two days. The next move is to complete the frame part of the machine.

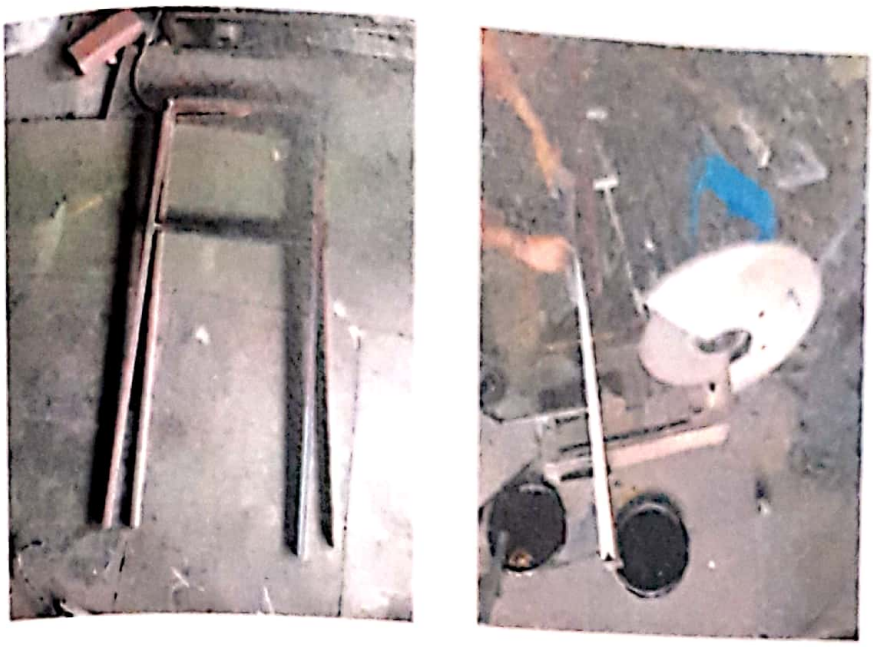


Figure 3.4.1 iv: building a frame of machines.

Once finished the stock pot, the next step is to build a frame machine. The first step is to cut at the measurement that's made. The metal cutting work needs to be measured and cut carefully to ensure the is stable.

Figure 3.4.1 v : welding frame.

In a figure of **3.4.1 v** shows welding frame is process . The type of welding we're using is a gas metal inert metal (MIG) because more appropriate frame types. The work for the rubbing done thoroughly to keep the frame stable.

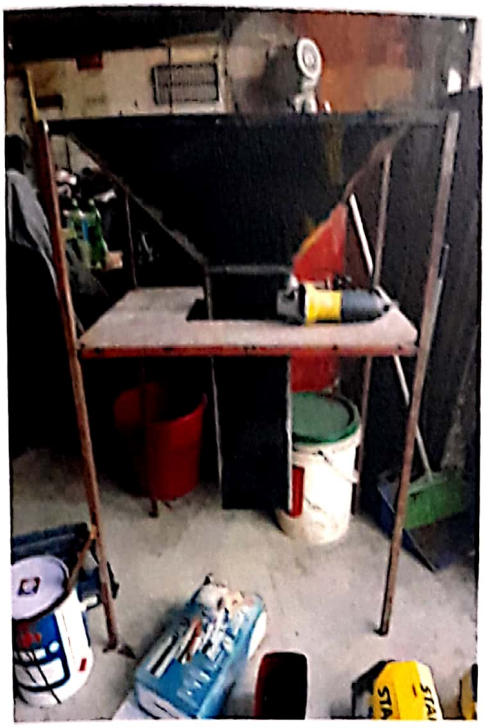


Figure 4.3.1 vi: hopper assembly.

The next step is the hopper installation on the frame. In a **figure 4.3.1 vi** shows hopper build in pyramid-shape. The material supposed to build a hopper is stainless steel because preventing rusty, because of the cost issues then we use mild to minimize the cost.

Figure 3.4.1 vii: bearing and shaft construction.

The next step is bearing assembly and shaft on a hopper as shown in figure **4.3.1 vii**. Drilling process of 6cm-sized hole is done before install the bearing. A hole Size should follow size bearing so that grip a strong bearing position.

Figure 3.4.1 : motor assembly on machines.

After assemble bearing and shaft on the hopper, the next step is motor assembling to rotate the shaft. Grinder motor was chosen because it had high speed to grind the dry chili. Grinder that sizes 4 inch and has a 580 watts power to rotate the shaft at 12000 rpm.

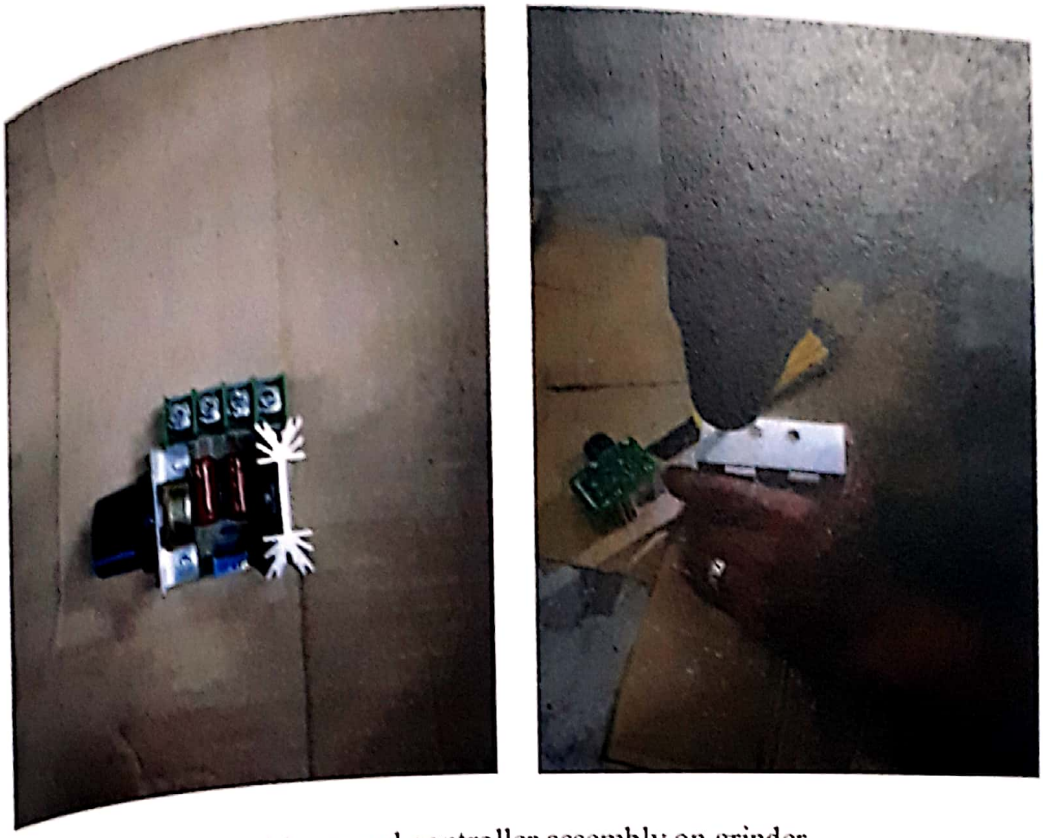


Figure 3.4.1 ix: speed controller assembly on grinder.

The final step is speed controller assembly on the motor. Speed controller installed on grinder o control the speed so that the process of grilled chili is more effective.

Figure 3.4.1 x: a complete dried chili seed shredder machine

Figure 4.3.1 x refers to the product that's ready and ready to use. The results that are complete will be tested in terms of stability and chili cutting to achieve objectives that are set.

3.5 DATA ANALYSIS

In this analysis process, the data that collected will be analyzed and the results will shown in pie charts and graph.

3.7 SUMMARY

In the beginning, design, the study product, the data collection process, the data instrument, the data linking and method analysis was made systematically in the methodological study of analysis to figure out the fact and information to support the facts and information to reconcile the facts of study and describe it clearly in this study.

Once data analysis is essentially the conclusion or conclusion of results and hypothesis which is whether the machine is able to extract the chili seeds

CHAPTER 4

RESEARCH AND ANALYSIS

4.1 INTRODUCTON

Once all the data and information has been obtained, the analysis is to perform on the effectiveness of dry chilli seed separation machines againts 4 types of dried chilli its is chinese dried chili, indian dried chilli, curly dried chilli and respondents perspectives it is from factory,restaurant operators and house user on machine. The results obtained in this chapter are the results from the experiments conducted in Seksyen 13 Shah Alam. The results of the experiments in the study area will be analyzed in more detail to draw conclusions based on the stated objectives of the study

The study was conducted using respondents from 5 factory operator, 5 restaurant operators, 5 house user and using 4 types of dried chili. The data obtained will be shown in graph and charts . There are several aspects that focus on:

a) Obtain data from the test ability of machine

b) Product cost

c) Respondents perspectives on dry chilli seed separation machines

i. Machine design

ii. Statisfaction with the product

iii. Difficulty level in handling

4.2 RESEARCH RESULT

4.2.1 Result of data from test ability of machine

i. The amount of quantity and time can process at a time.

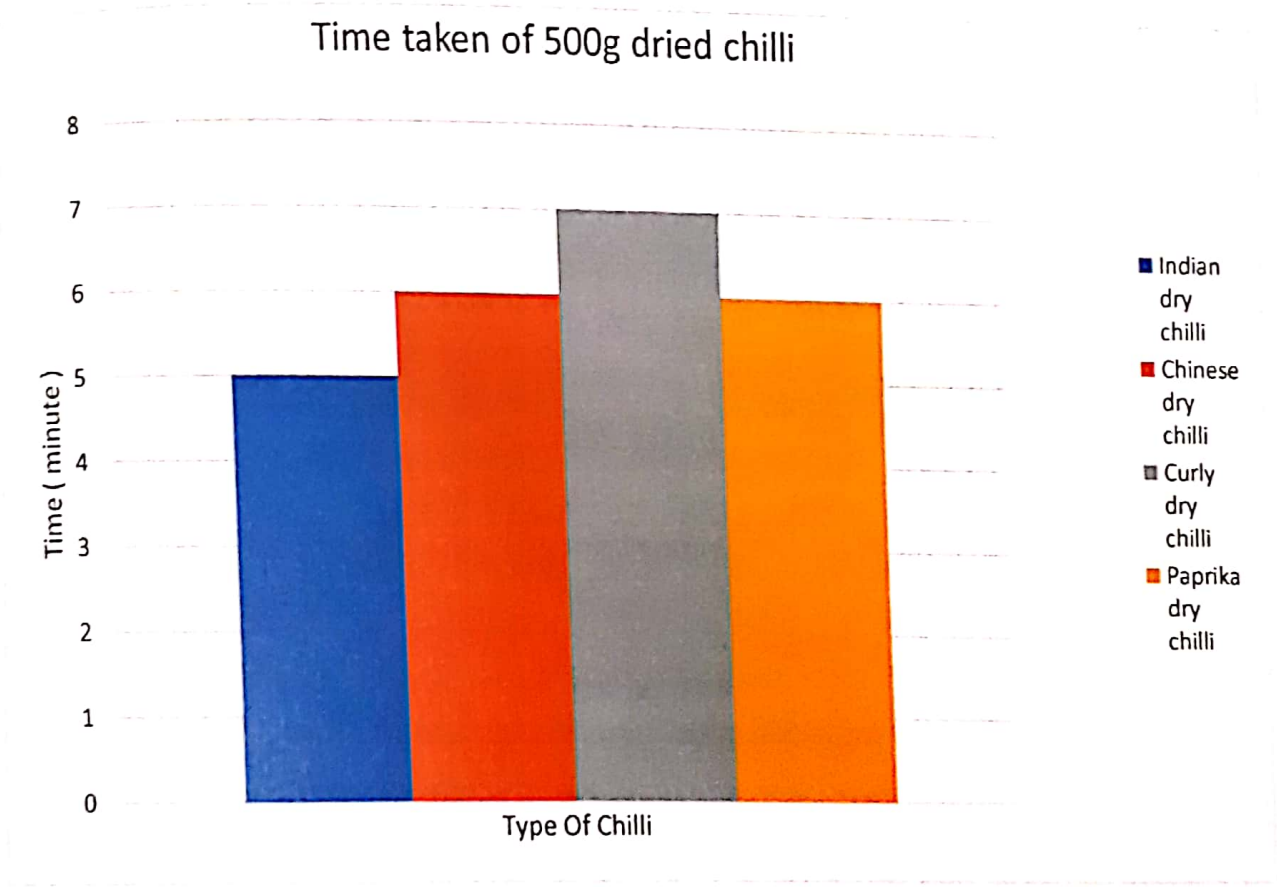


Figure 4.2.1 i: Time taken chilli seed to seperate

The test results indian the dry chili of the india getting the fastest time which is for five minutes. However, dry chilli takes 2 minutes more than an Indian chili. This because curly chili seed is harder to get scattered. Next, Chinese dried chili and paprika had the same time which is six minutes.

i. An average chili size that has been shredded

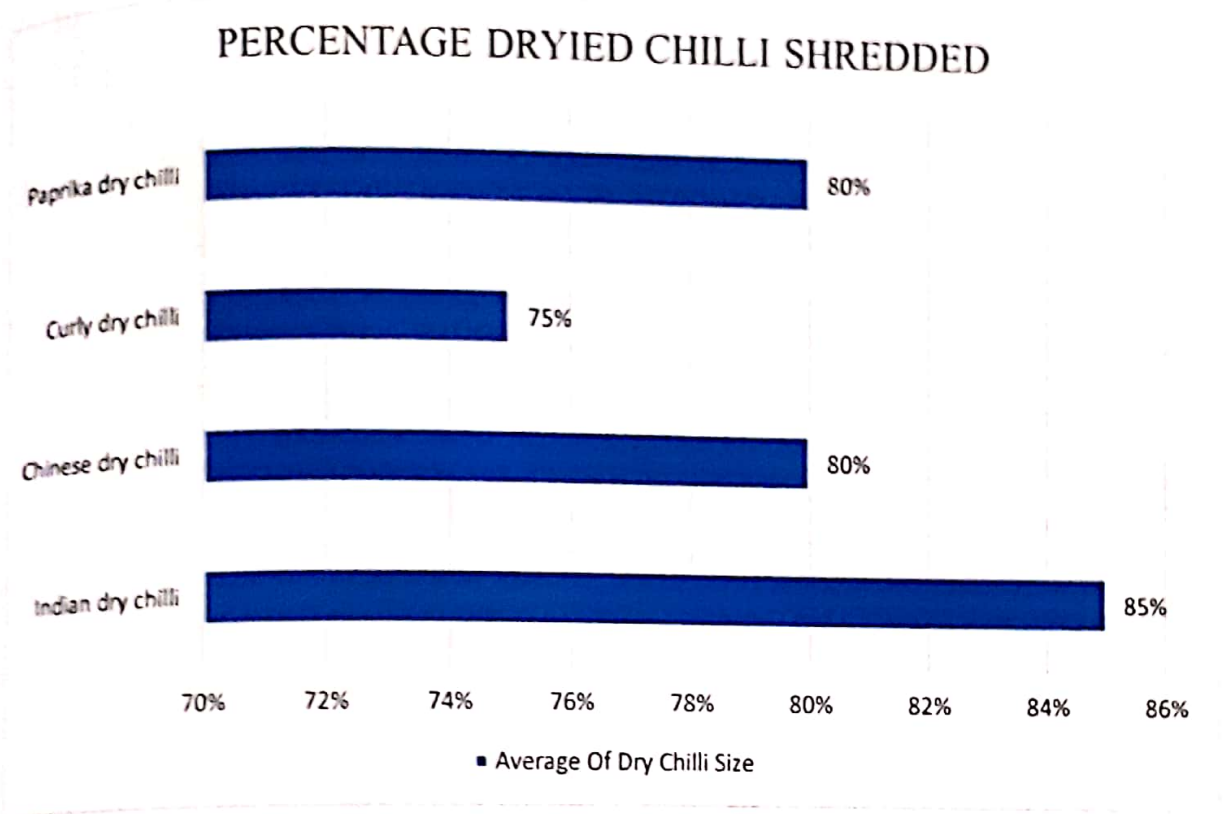


Figure 4.2.1 ii: a chart of average dry chili-chili size.

Figure 4.2.1 ii. shows size of an average chili average for four types of chili. The average size of an Indian dry chili is 85%. Whereas for the size of a Chinese dry chili and paprika was about 80% and the end of dry chilli had the least dry size of the size of the seventy-five percent which is 75%.

4.2.2 Product cost

No	Item	Quantity	Price (per unit)	Amount
1	Stainless steel tank	1	RM 157	RM 157
2	Water pump	1	RM 61.50	RM 61.50
3	Pvc paip	1	RM 1	RM 1
4	Net filter	0.45m(d)	RM 100	RM 100
5	Grinder motor	1	RM 70	RM 70
6	Speed controler	1	RM 10	RM 10
7	Hopper mildsteel	7x3 feet	RM 2.60	RM 53
8	Bearing 20cm (d)	2 pcs	RM 15	RM 30
9	Shaft	8inch	RM 5	RM 5
10	Blade	15	RM 0.3	RM 5
		Total		RM 492.5

Table 4.2.2: List costs the component cost.

50cm **Table 4.2.2** shows the cost of material assigned to execute a dry chili-split project. Like 15 points of knife that used to make the precious part of the fence between the stainless steel tank, which was used to maintain water measuring x 50cm.

4.2.3 Respondent perspective on dry chilli seed separator machine

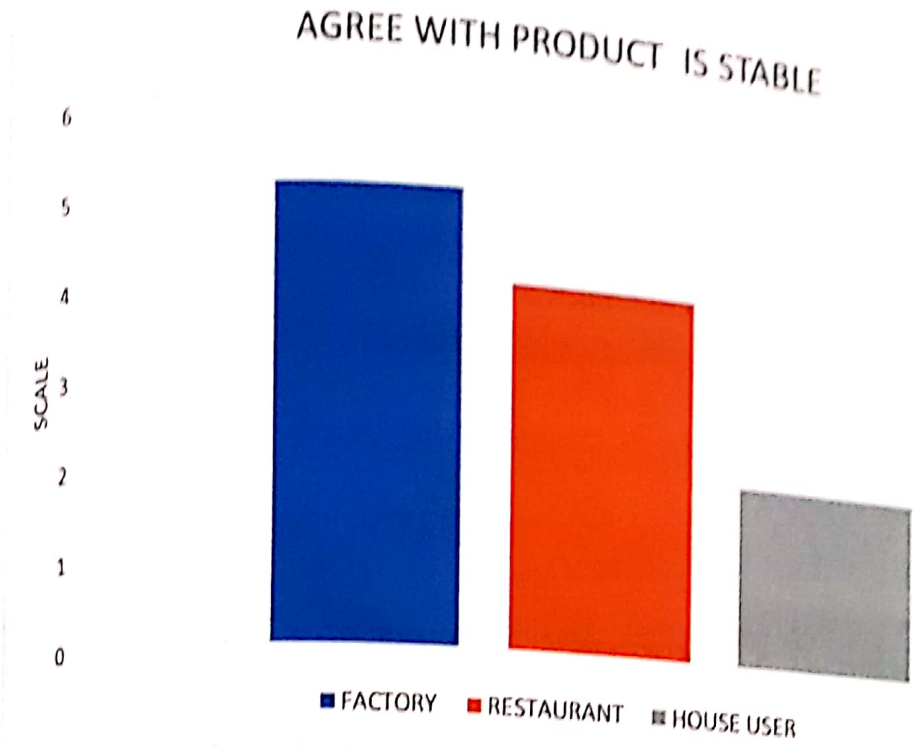


Figure 4.2.3 i: Agreeing product design is stable.

Based on the analysis of **4.2.3 i**. The most agreeable choice of designing a stable form is from he factory entrepreneurs. The restaurant managers and house user say the products are unstable.

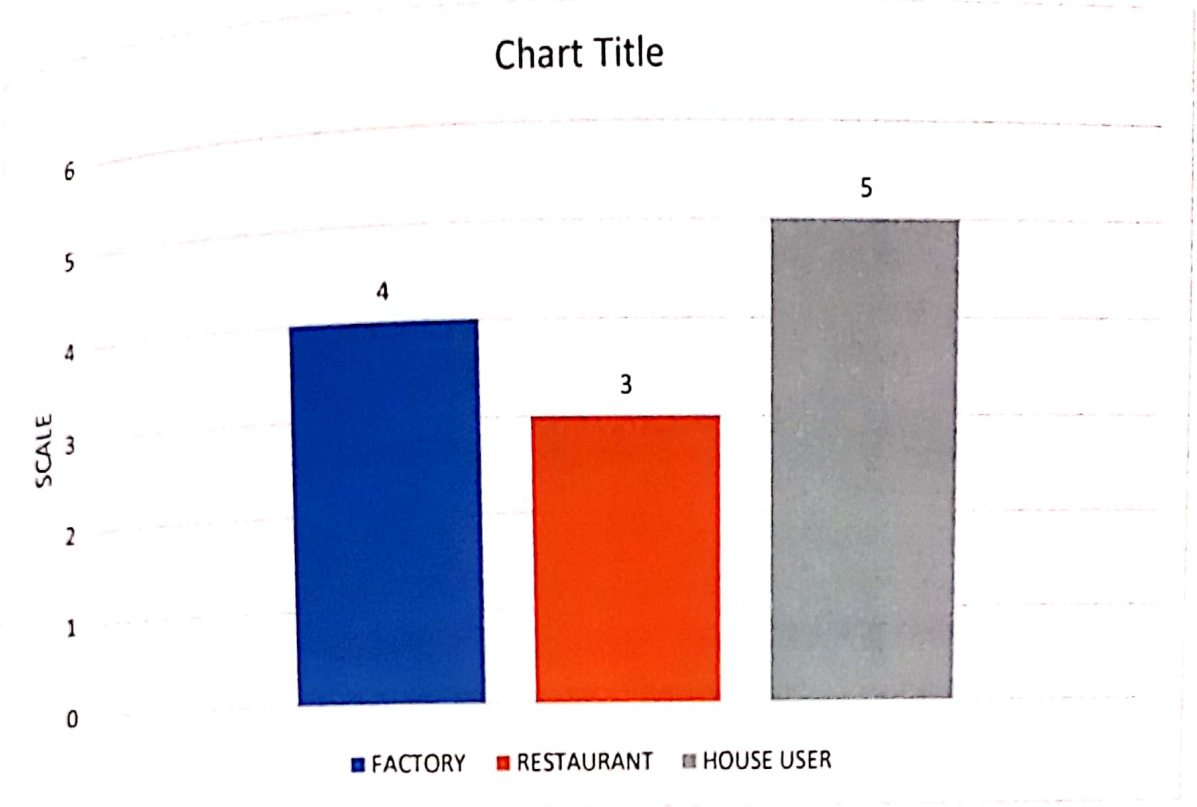


Figure 4.2.3 ii : Agree design is safe.

In the **figure of 4.2.3 ii**, the users from the house suri of most agree that the product design is safe, while 3 of the 5 businessmen agree and 4 of the 5 factories agree to design and 4 of the 5 factories agree to design is safe.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 INTRODUCTION

For this chap, the results made are based on all the results that are earned from the experiments that were run and discussions in the previous chapters. In this chapter also, the related thing is about objective research and a proposal against the study that was carried out.

5.2 DISCUSSION

For the chili seed-separator machine, the tests to turn out the chili seeds were made. The test was done according to the percentage of dry chili seed in one time with a quantity of 500g dry chili. The product has been tested for five minutes and the result of the machine will float a 90% dry chili seed within five minutes.

Besides, the result of the test not only could turn out a dry chili seed, even dried chili chili that has been processed as well clean and safe.

5.3 DISADVANTAGE AND HOW TO OVERCOME

There are some weakness identified on this machine. The first was, the design of the unstable machine causes there was a fairly strong concussion during the chili process carried out. It's because of the cost construction to build more stable designs to sustain machine parallel shakes. The idea to solve this problem is to use more quality iron and to reform the stabilized design forms to be able to sustain.

The next problem is the shredder cut the chilli completely. A strained chili should be fine to simplify chili seed to go into the water stock pot. So our proposal is to build two shaft with blades in opposite current to ensure the chili can be completely cut.

The third problem is, there's a hard way to dump water in the stock pot after they use it and then shift the stock pot. It's because of the size of a large and heavy stock pot filled with water. It can't afford to be lifted by a user. A user needs to scoop water manually. So to fix this weakness is to build a pipeline at the bottom of the stock pot so that water can come out through the pipeline.

5.4 CONCLUSION

And during the last year's project, it has given a very useful experience to the students. In performing the final year's project, this year's end, generates the thoughts of the students, to be more creative and innovative. This is because it's can manually capable of handling them. Human energy consumption can be accepted by simple control.

It's generated by a generation of empowerment. This wisdom is expected to be made as evidence of determination and knowledge we are developing machines in the food industry.

In the end, we learned the difference between traditional methods and the machines to tear out dry chili seeds. Here's to be published that this project has reached a wanted objective. Our hope, we can improve this machine so that it can benefit the users.

5.5 SUMMARY

The result of the experiment that had run over the machine, it was declared that there was reached the objective of research which determines the amount of an isolated chili chili dry chili. Besides, after a few tests were run proven that there's no problem like the damage that happened to the machine and able to maintain the machine easily and save time.

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