Indonesia International Institute for Life Sciences

ENRICHMENT PROGRAM REPORT

Analyzing The Work Process and Manpower to Produce Optimal Output in Cocktail Sausage

STUDY PROGRAM
Food Technology

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Analyzing The Work Process and Manpower to Produce Optimal Output in Cocktail Sausage

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School of Life Sciences

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?Analyzing The Work Process and Manpower to Produce Optimal Output in Cocktail Sausage

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I, Natasia Angelica Surya Putri, do herewith declare that the material contained in my thesis entitled:

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ABSTRACT

Work process, either in the working time or manpower, is crucial in production; therefore, continuous improvement is conducted to ensure optimal production, reducing idle time, increasing output, or affecting rework within one product, all according to the kaizen principle. The study's goal was to observe and compare the working time of the cocktail sausage production using the same working time (ST) and different working times (DT). The ST is the current working time for all workers, 08:00 - 16:00, while DT is where each production process, the worker will have different times in the schedule. The processing time, output, and rework were assessed during the project. The result shows that DT has reduced workers' idle time, increased output, and lower rework compared to ST. The different working time is also suitable because the worker immediately works on their designated part, making it more efficient.

Keywords: *Cocktail sausage, kaizen implementation, processing time, output, rework*

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On this occasion, the writer would like to thank all of the employees of PT. Garindo Food International for their warm welcome and assistance during the internship, either moral or material. Thank you especially to:

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5. Sir. Adhi, as the head of the QC department
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LIST OF ABBREVIATIONS

DT	Different Working Time
QC	Quality Control
R&D	Research and Development
SOP	Standard Operational Procedure
ST	Same Working Time
WWTP	Waste Water Treatment Plant

I. INTRODUCTION

1.1 Brief History of the Company

PT. Garindo Food International is a company that is a part of Suri Nusantara Jaya (SNJ), which is an exporter as well as an importer of fresh meat, frozen meat, and processed meat. The factory is located in Bekasi International Industrial Estate, also known as Kawasan Industri Hyundai, at Lippo Cikarang, Bekasi. The factory was built in 2021 and already operated in early 2022.

1.2 Vision and mission of the Company

The company's vision is to become a place where the employees are prosperous and valuable to the public. While the missions are 1.) to work sincerely to give the best service to the customer with a reasonable price, 2.) to have professional, honest words and deed human resources, and 3.) to have employees welfare according to their responsibilities and attitude from each individual.

1.3 Production of The Company

The company produces various meat and poultry products, such as sausage, meatballs, nuggets, beef slices, and beef cuts. The type of sausage products includes sosis bakar mini, sosis bakar jumbo, and sosis cocktail (chicken and beef) in **figure 1**. The beef slices in **figure 3** include sukiyaki, teriyaki, shabu flank, and shabu short plate. Also, the regular meatballs are in **figure 2**.

Figure 1. Sausage variants. *Obtained from (PT. Garindo Food International brochure)*

Figure 2. Regular meatballs. *Obtained from (PT. Garindo Food International brochure)*

Figure 3. Variant of the beef slice. *Obtained from (PT. Garindo Food International brochure)*

Figure 4. Nuggets. *Obtained from (PT. Garindo Food International brochure)*

1.4 The Company's Organizational Structure

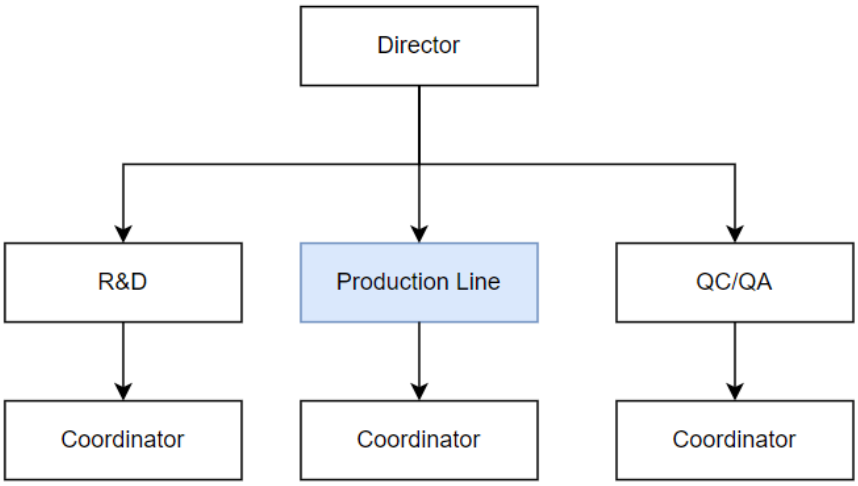

Figure 5. Company's organizational structure

As shown in **figure 5**, the company comprises the director and the supervisor of each department, Research and Development (R&D), Production, and Quality Control (QC). There is PIC's standby for intercepting raw materials, machinery, storage, etc. Lastly, some workers operate the production according to their designated tasks.

1.5 Student's unit or department

The writer works in the production department, where the job is to supervise and conduct production according to the schedule and SOP. Only one person is handling it at the moment, my supervisor, so while undergoing the internship, contributes by helping in the office and the field. The department organizes the process from the beginning, raw material, to the end product, the finished product stored in the storage. Raw material management is from calculating the raw material needed for each product to making a purchase order for the upper management. Other things include scheduling each week of the production schedule, supervising each step, and coordinating with the R&D and QC departments.

II. INTERNSHIP ACTIVITIES

2.1 Working Conditions at PT. Garindo Food International

The internship took place at the factory in Cikarang. The factory was located in Hyundai Industrial Estate. The internship period was four months (± 16 weeks) with 7 hours of working time and 1 hour of break time. The working hours start from 08:00 - 16:00. The conditions of the factory itself were still under construction on the outside, but the inside was already operational for production. There were several rooms aside from the main production line, such as an office, R&D laboratory, QC laboratory, cold storage, storage for raw material, labeling room, cartooning room, locker room for employees, etc. Even though there are already workers in the factory and the office, they still lack suitable manpower. The reason is that the factory was considered new, and employee recruitment is still ongoing. When undergoing the internship period, we have become the bridge between the employees in the factory and the supervisor in the office.

2.2 Internship Tasks

As the writer works in the production line department, the writer supervises the production inside the factory. At the beginning of the internship, the writer learned the whole process of production, from raw materials to finished goods. When supervising the production, observe each product's production and report and discuss problems. For example, the smokehouse's capacity to produce sausages. Learning about the mechanism of the machine and how to fix the problem. The production also calculates yield or output and analyzes the possibility of a decrease or output in the process. Besides supervising and solving problems, the writer learned the importance of efficiency and effectiveness in production, whether in the flow, machine, or human resources.

2.2.1 Production Supervision

Supervise the production within the factory. The supervision wasn't limited to one product, but other products produced that day, according to the production schedule (e.g., sausages, meatballs, nuggets, beef slices, and jumbo meatballs). While supervising, the writer also checked the production sheets that were distributed each day. This was done every day while the production was running.

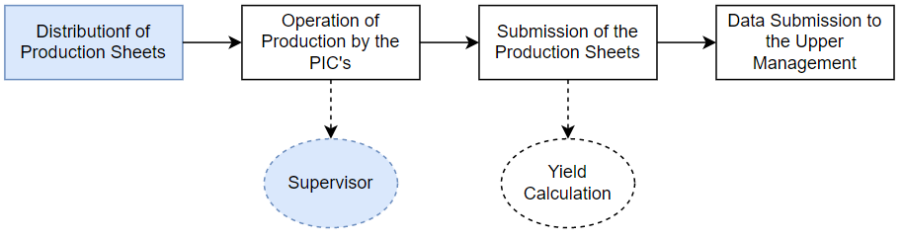

Figure 6. Flow process of Production Supervision

2.2.2 Yield Calculation

The writer calculated the yield of products, specifically the processed product (e.g., sausage, meatballs, and nuggets), at the end of each day and submitted the report to the supervisor. This was done on a non-consecutive day according to the production schedule.

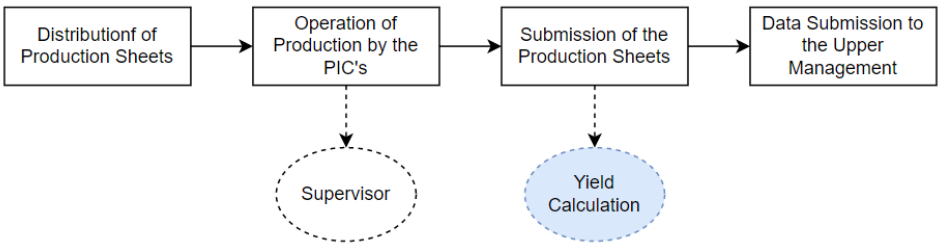

Figure 7. Flow process of Yield Calculation

2.2.3 Factory Audit

The factory audit was done once a month, where the writer collaborated with the QC department to check the factory's cleanliness, machine and equipment capability, and area observations. If an input or problem occurs during the audit, the report should be submitted to the supervisor, and further actions should be taken to tackle the problem.

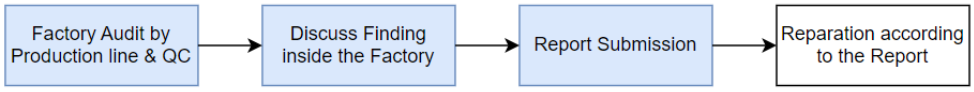

Figure 8. Flow process Factory Audit

Even though the main internship role is in the production department, the writer has been allowed to assist in the R&D and QC departments. Assisting the R&D department with trials on making new food products, beef patty, smoked beef, and conducting sensory analysis. While in the QC department, the writer assisted in the quality control of each product. If problems occur with the product, it'll be discussed with the production line department or supervisor.

2.3 Comparison between the Theory and Practice

Since this is a meat processing company, the products are processed and made from beef and poultry. Starting from the raw material component, process, and finished product. While undergoing the internship, the writer learned about microorganisms, meat types, packaging, etc. It can be correlated between the things the writers learned from the classes (e.g., meat science and technology, fundamentals of food packaging, food microbiology, etc.) at university and implemented in the field. The theories that are learned, such as various of meat suitable for the product, types of packaging, various types of microorganisms in the meat, conducting simple sensory analysis, and even process that affects the quality of the products, are useful in the field. However, some new knowledge is learned, such as how to perform production effectively and waste water treatment plant (WWTP).

2.4 Difficulties During The Internship

There are difficulties in the field and theory while undergoing the internship, either for the project or general tasks. Examples include smokehouse machine failure, vacuum packaging failure, cutting machine problems, and beef sliced unappealing appearance. Even though there are simple problems that the team can tackle, the supervisor willingly helps assist either on the project or the field.

2.4.1 Smokehouse Machine Failure

The smokehouse machine had a problem where the sausage hanging at the top of the trolley didn't get cooked or smoked, resulting in uncooked sausages. When the writer met the smokehouse technician, the person said the machine steam was initiated from the top side to the bottom and would flow up in the center. The steam couldn't get through to the top because of the fully packed trolly sausage, or the steam pipe was partially blocked (because it doesn't get proper maintenance). To encounter this the trolly was not filled up fully, and the steam pipe was cleaned.

2.4.2 Vacuum Packaging Failure

The packaging failure occurred in the vacuum and sealing machine, where some packaging couldn't be sealed properly. The reason is that the machine rubber band for sealing was broken or too hot. The factory technician had to change the rubber band every 3 weeks.

2.4.3 Sausage Cutting Machine Problems

While doing sausage production, the sausage cutting machine was used to cut the twist of the sausage to separate it from one another. Though sometimes, the machine had a problem where the sausage was cut in the body, or the twist didn't get cut. The reason is that the adjustable gap could be too tight or loose, so proper preparation and maintenance with the technician should be conducted before using it.

2.4.4 Beef Slice Unappealing Appearance

There is also a problem in beef slice production, where when it is vacuumed, the beef slice shrinks, making it unappealing or unrecognizable. The reason for the unappealing appearance is that the formation of the beef slice is untidy or stacked by one another. Thus, when it is vacuumed, the meat shrinks or deforms. To tackle this, when the beef slice is stacked, it will be formed neatly and inserted carefully into the plastic packaging.

2.4.5 Internship Project

While working on the project, several things needed to be discussed with the workers on the field and the supervisor, which sometimes led to some problems such as the time, raw materials, and workers, before conducting the project; though, discussion, and input from other departments and the director, the project ran smoothly. However, there is still a lack of supporting literature or journal regarding problem-solving in the work process, manpower, and machinery.

III. PROJECT DESCRIPTION

3.1. Introduction

PT. Garindo Food International produces different products daily according to the schedule and the availability of raw materials. So, there is sometimes constant production or not for the products each week, though the working time of all workers is the same. The production operates with a batch system each day (1 batch equals 100kg), excluding the beef slice because it operates on the weight. A Batch system is a method of manufacturing identical or similar items produced together for different-sized product runs (Haji & Haji, 2010). The same system is applied in cocktail sausage production.

Sausage is a processed meat product with a long cylindrical shape cased in either plastic or collagen skin. The company, as previously mentioned, produces many types of sausage, one of which is cocktail sausages. It is a small sausage, usually made from beef or chicken meat and served hot or cold as a snack (Soltanizadeh et al., 2010).

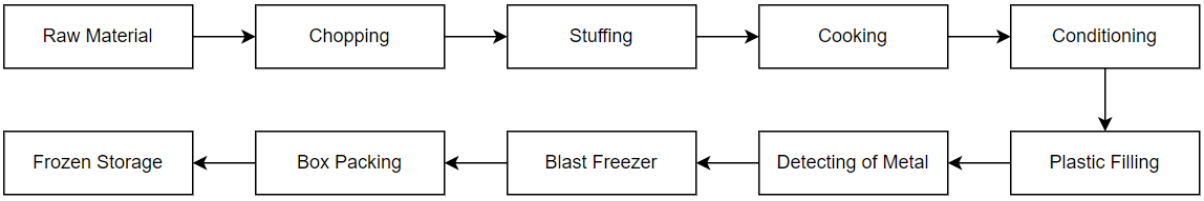

Figure 9. flowchart of cocktail sausage production

There is various process for making cocktail sausage, as seen in **figure 9**. The process starts with grinding the meat into small pieces to be processed in the bowl cutter. After that, it is chopped again and mixed with emulsion, flour, ice, and various flavoring in the bowl cutter for about 15 minutes. When the mixture is done, it is then transferred into the filling machine, which will be stuffed inside a collagen casing and twisted according to the standard size (1 batch, approximately 20 minutes). The sausage is then hung in the trolly to be transported into the smokehouse, where it will be cooked and smoked for ± 30 minutes. After it is done, the sausage will be cooled down before cutting and packaging. After it is packaged, it is put through a metal detector machine, into the blast freezer before the box packing, and stored in the frozen storage.

During the process of cocktail sausage production, there will be idle time between processes. Idle time is when an employee or machine that is not operating that should be used for performing productive activities (Kukuh, 2015). There is the idle time between each process in the production of cocktail sausage where each process commences after they got the requirement ready from previous steps (e.g., the bowl cutter has to wait for the meat from the grinder, the filling machine has to wait for the mixture from the bowl cutter, and so on). This occurs when the worker has the same start for their working time, currently 08:00 - 16:00. These can be improved or changed on the working time of each process to reduce the

idle time (in terms of processing time), increase output and minimize rework. The improvement inside the industrial scale applied the kaizen principle.

Kaizen or rapid improvement processes in products used in the industry. According to a study by REWERS et al. (2016), the application of kaizen in the factory could increase productivity, reduce idle time, increase the quality of the products, and even increase production efficiency. In the Food and Beverage (F&B) industry, it is a method to improve business performance but also benefits the process and organization (Bogdan et al., 2021). The improvement in the industry could use the DMAIC analysis, which stands for Define, Measure, Analyze, Improve, and Control. It is where to define the problems, measure process performance, analyze the root causes of variation or poor performance, improve process performance, and control the improved process (Idrissi et al., 2016), in this case, in the production of the cocktail sausages where there is the idle time which affects the production. A study by Rahmanian & Rahmatinejad (2016) stated that working time in production could affect the process and the employee's performance. When there's a different start on the working time, the idle time of the employees could be reduced because before they start the designated process, the items from the previous steps are done. Small changes in the production process, such as working time, could benefit various aspects as they can result in major changes over time.

The difference in the working time affects the output and rework of the products, as it can also correlate with the idle time between each process and the number of batches in the cocktail sausage that could be done in a day. As for now, with the same working time, the cocktail sausage production only produces 1 - 1.2 tons per day. Though the writer and supervisor calculated and predicted the total output of the cocktail sausage could be up to 1.5 - 1.8 tons per day. Therefore, the company strives to fix working time to improve the work process and manpower in cocktail sausage production.

3.2 Scope, Objective, and Hypothesis of the Project

The project's scope is aligned with the active working time, the process of making cocktail sausage, and the manpower. The independent variable is the working time of the process where there are the same working times (ST) and different working times (DT). The parameters assessed are processing time, output, %rework, and cause of rework.

The objectives are as follows;

a. Analyze work processes and manpower to produce optimal output in cocktail sausage production in processing time, output, %rework, and cause of rework.
b. Determine the most suitable work processes and manpower to produce optimal output in cocktail sausage production.

The hypothesis for the project are;

H_0: there is no significant difference between the same working time and different working time

H_1: there is a significant difference between the same working time and different working time

3.3 Methodology

The research design, as seen in **figure 10,** comprises two variables, the same working time (ST) and different working time (DT). The working time is applied in each processing step of cocktail sausage production, as seen in **figure 9**.

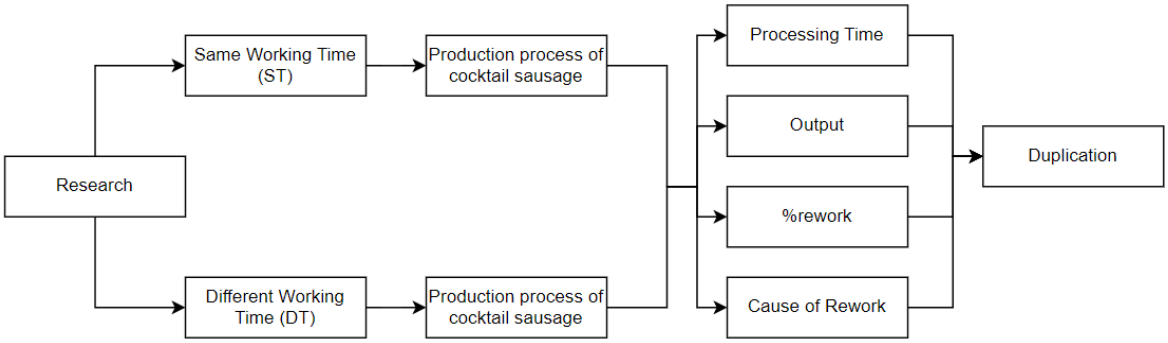

Figure 10. The project's research design

The production of cocktail sausage will generally commence. However, the project's method uses the same working time as the control and a different working time as the variable, ST and DT. As for ST, the start of the working time for each process and workers are the same, 08:00 - 16:00. While DT, the start of each process and worker differs; the bowl cutter will start at 07:00, stuffer will start at 08:00, the smokehouse will start at 09:00, and packing will start at 10:00. As for the project period, the ST and DT should have duplication though with the lack of raw material and the already fixed demand, the DT could only take one time while ST can do duplicate. The batches were also different, where ST had 12 batches while DT had 15.

3.3.1 Processing Time

The processing time of each process will be taken using a production sheet distributed to the PIC of each process, starting from the chopping to the packing **(Appendix B &C)**. According to a study by Utomo (2018), processing time could be calculated by calculating the start of each batch to the end (including internal and external events while undergoing the process for each batch). The time will be noted in each batch and will be average. As for the manpower, the ST has the same number and workers in each process though DT has an increased number of workers in the packing steps.

3.3.2 Output

The output is determined by the total number of finished goods produced by the end of the day; it is presented in the packing production sheets in **Appendix B & C**. The data is usually given in kilograms/day. Whereas all of the kg/batches will be accumulated.

3.3.3 %Rework

The %Rework is obtained by the data presented at the end of the process: the packing. Usually in the unit of a kilogram (kg) and already accumulated from the whole batches. The data was then calculated using the formulation below.

$$\%Rework = \frac{total\ rework\ (kg)}{total\ output\ predicted\ (kg)}\ x\ 100$$

Figure 11. %rework formulation

3.3.4 Cause of Rework

The cause of rework, is observed and analyzed by creating a fishbone analysis to determine the possibility of the rework. The major fishbone categories that could have caused the problems are man, machine, and materials. The fishbone diagram was made with a reference from a journal by Alfatiyah et al., 2020.

3.4 Result and Discussion

3.4.1 Processing Time

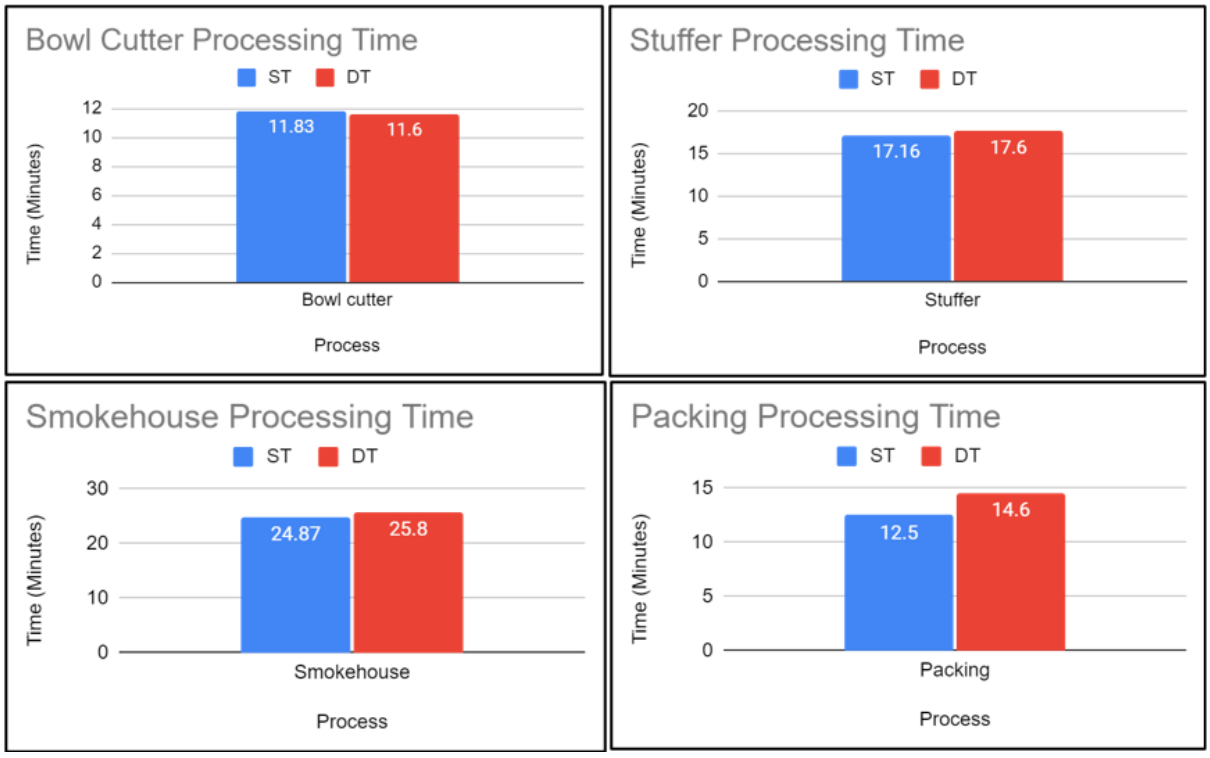

Figure 12. Graphs processing time between ST and DT in cocktail sausage production

As shown in **Figure 12**, the DT in the stuffer, bowl cutter, and packing is descriptively higher than ST, while the bowl cutter is lower than ST. There are no significant differences in the processing time in each process between ST and DT, excluding the packing, where DT is higher than ST by 2.1. The stable processing time between ST and DT, according to Kurata et al. (2015), the same number and workers on the same machine will result in stable processing between one batch and another. The reason is also that the same worker already had the skill and experience to do their tasks. However, the DT has a different number of people on the packing because people from other machines, such as bowl cutters, stuffers, and smokehouses, join to assist in the packing. The graph doesn't use standard deviation because the data was too low (ST has 2 while DT has 1) and doesn't have a mean. If there is low data, the standard deviation will increase, indicating that the data will be farther away from the means (Hamilton et al., 1990).

Table 1. Number of workers between ST and DT

Process	ST (worker)	DT (worker)
Bowl Cutter	2	2
Stuffer	2	2
Smokehouse	1	1
Packing	17	22

The same number and people have also handled each process, as seen in **table 1** (number of workers), excluding packing on DT, whereas there is an increase of people to 22 because the people from other machines are joining. Though the number of people in the packing in DT shows an increasing number of workers, the processing time is higher. It can be caused by the lack of skill from the workers who are not used to packing, either in inserting the product into their package or sealing it or an error in the machine (Kurata et al., 2015).

Table 2. working time between ST and DT in cocktail sausage production

Type	Process	Time	Time (in minutes)
ST	Bowl Cutter	08:42 - 11:27	225
	Stuffer	09:10 - 14:10	240
	Smokehouse	10:00 - 14:12	192
	Packing	11:29 - 15:07	158
DT	Bowl Cutter	07:24 - 10:33	189
	Stuffer	08:20 - 11:25	185
	Smokehouse	09:35 - 12:11	156
	Packing	10:20 - 16:15	235

Table 2 shows that while performing ST, the stuffer process has to wait for the mixture from the bowl cutter, thus resulting in a setback for about an hour, and it continuously affects the

next steps. While DT, the process immediately commences when the workers arrive, with a little setback because of machine preparation (± 10 - 15 minutes). It can also be seen that even though DT has shorter time than ST, it reduces higher output. The different working time reduces the idle time between each process because when the next steps are going to commence, the product or material for that step was already created (Kukuh, 2015).

3.4.2 Output

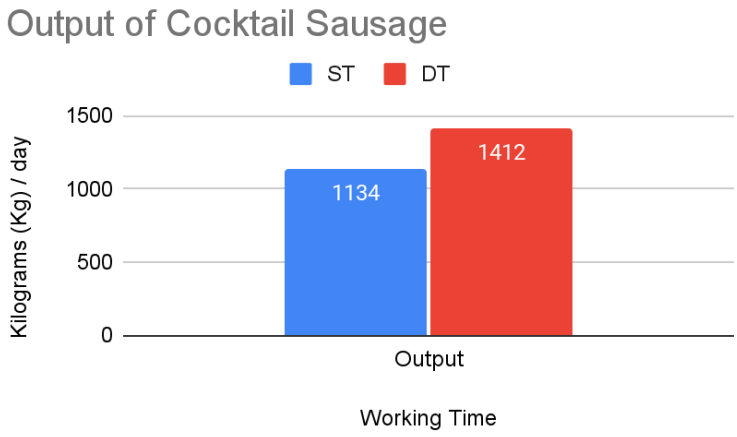

Figure 13. Graph output between ST and DT in cocktail sausage production

Figure 13 shows the output of cocktail sausage produced per day. It can be seen that there are significant differences between ST and DT, whereas DT has descriptively higher output compared to ST. The increase in output also correlates with the increase of the batch where ST has only 12 batches (1.2 tons) while DT has 15 batches (1.5 tons). There are no error bars in the graph, and the reason is that the data was too low (ST has 2 data while DT has 1) and doesn't have a mean.

The output between ST and DT is different because of the increment of the batch, whereas ST is 12 batches and DT is 15 batches. The ST is 12 batches because it is the maximum batch of cocktail sausage produced per day according to what the production has been running, while when DT, there were a total of 1.5 tons produced (15 batches). The reason for the increased number of batches is when applying different times between each process, the idle time is reduced, and the worker straight went into their designated tasks (Kukuh, 2015). Other than that, some factors affect the decrease in the sausage in terms of weight in some processes. In the early process, there's the thawing of meat before the grinding, whereas the thawing results in weight loss due to drip loss (Kim et al., 2013). The cooking process in the smokehouse contributes not only to skin formation but also when it is cooked, there is moisture loss, affecting the sausage's weight (MITTAL et al., 1987).

3.4.3 %Rework

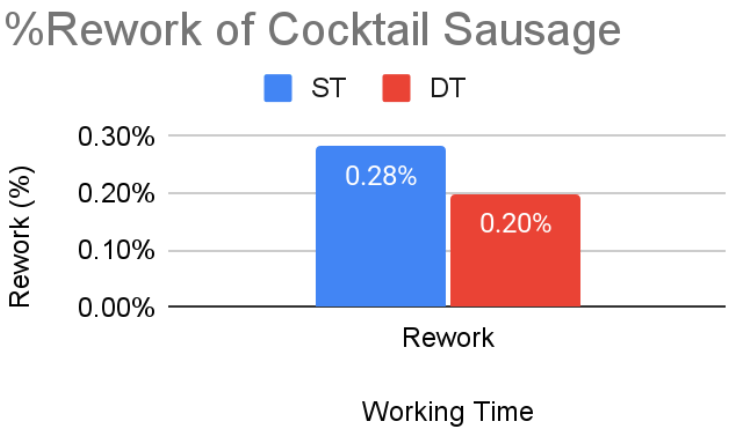

Figure 14. Graph %rework between ST and DT in cocktail sausage production

Figure 14 shows the %rework of the cocktail sausage. It can be seen that ST is descriptively higher than DT. The rework percentage is based on the data obtained from the packing sheets **(Appendix B & C)**, where ST has 3.4 kg out of 1.2 tons while DT has 4 kg out of 1.5 tons. Aside from rework, there are decreases while undergoing production. There are no error bars in the graph, and the reason is that the data was too low (ST has 2 data while DT has 1) and doesn't have a mean.

The production of cocktail sausage will have some rework. Rework is a food product that is not up to standard or needs reprocessing (Inderfurth et al., 2006). ST rework is higher than DT, which can cause the workers to rush production because their working time has not been used effectively, causing setbacks in production and waiting for the mixture/product to be made (Kukuh, 2015).

3.4.4 Cause of Rework

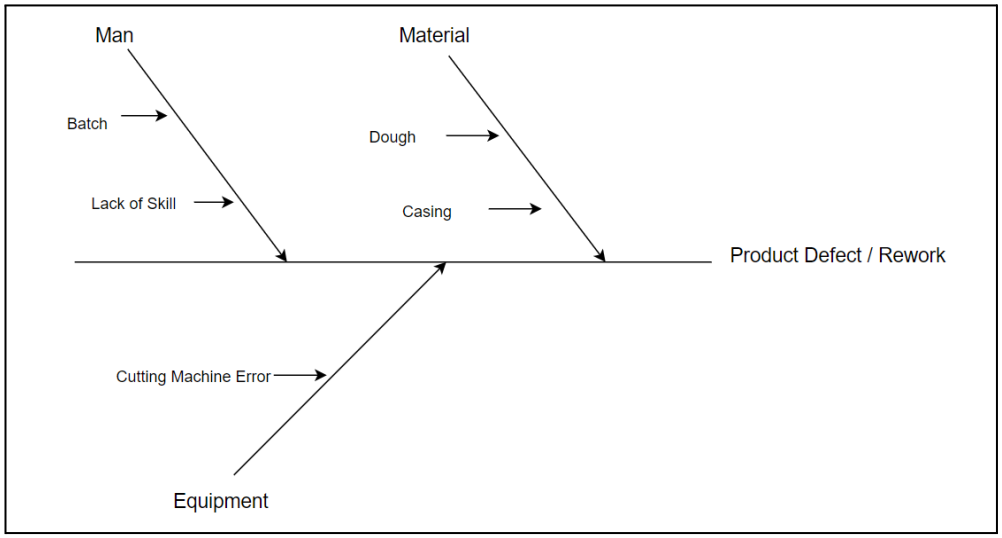

Figure 15. fishbone diagram for the cause of product defect/rework in cocktail sausage

Figure 15 is a fishbone diagram of the possibility that causes product defects or rework. There are three main categories; man, equipment, and material. Under each category, there are subcategories. The product defect was not only because of the worker's lack of skill or the batch but also because of other factors such as machine failure or the mixture being processed. Those factors are the cause of the product defect in the production of cocktail sausage, which is in line with a study by Alfatiyah et al. (2020), whereas product defect could occur because of either man, material, machine, or even environment.

Based on **figure 15,** workers' lack of skill could be a factor for rework. In packing, the additional workers from other machines may need help to pack appropriately, considering it still uses manual packing. There is also a system batch where the rework could occur because the product didn't fulfill the standard or human error. Other than that, equipment malfunction occurs, in this case, the sausage cutting machine. The defective product sausage caused by the sausage cutting machine could be because when the machine operates, the sausage goes through the machine. The adjustable gap that is a conveyor could be too loose or tight so that the sausage may have been cut on its body or didn't get cut, a.k.a still attached (Hammer & Stoyanov, 2010). Therefore, proper maintenance and preparation need to be conducted. According to Sivaks et al., 2021, the sausage material could be the cause, such as in the mixture where it could be not homogenized enough in the bowl cutter or not appropriately cooked in the smokehouse. The non-homogenized mixture or uncooked sausage will result in a starchy compound because of the flour. The sausage casing that is made from collagen could burst while cooking in the smokehouse either because of the excessive filling or the smokehouse temperature was too hot, considering collagen casing is thin and made out of protein and could snap when there's an excessive mixture expand while cooking (Osburn, 2002). These factors are approximately the same between ST and DT due to the same processing steps, manpower, and environment inside the factory that occurred during it. So, not only because of the workers but from other things such as material and equipment as seen above.

3.5 Conclusion and recommendation

The production of cocktail sausage has been observed using the same working time (ST) and different working time (DT) in each process. The summary can be seen in **Table 3**.

Table 3. summary between ST and DT in each parameter

Parameters	ST	DT
Processing Time	There's no significant difference between them except the workers will have idle time.	There's no significant difference except there won't be any idle time for the worker's
Output	Lower	Higher
%Rework	Higher	Lower

Cause of Rework	The cause of the rework are the man, material, and equipment for both ST and DT because of the same process

Considering all aspects from processing time, output, and %rework, the suitable work process is DT considering there's no significant difference between ST. However, it reduces the idle time for the process and the workers, produces higher output, and has a lower %rework. As a result, the project's objective of analyzing and determining the suitable work process to produce optimal output in cocktail sausage has been achieved.

In the future, the same principle or method could be applied in other production processes to improve the production workflow continuously. As for the data, to expand the result, a suitable period for collecting the data is needed, ± one month. Continuous improvement is beneficial not only for the workflow but also for the company. Also, additional training and supervision are needed to ensure the process runs smoothly.

IV. SELF-REFLECTION

As the writer reflected and memorized about the whole four months of internship at PT. Garindo Food International. The writer has gained new friends and soft and hard skills, either new or improving existence. The new skills gained in the production line are the effectiveness, efficiency, and integrity of working in the office and inside the factory. The writer learned various machine functions, raw materials handling, product scheduling, the FIFO system, and solving problems from the perspective of production and R&D, and QC. Also can assist in the R&D and QC departments, conducting new trials, sensory evaluations, and quality checks on the products. The writer could use this knowledge in future career in the Food and Beverages Industry, especially in the meat industry. The writer may not be an expert on some things not learned on campus, but have hard-working and have a tremendous curiosity to learn them.

Even though these past two years of online classes have been conducted with few lab skills, it doesn't stop the writer from exchanging or applying the knowledge they have learned in the company. Classes in i3L, such as Meat Science and Technology, Food Microbiology, sensory evaluation, and Food Chemistry, are beneficial while undergoing an internship that focuses on processed meat products. As the writer mentioned, the writer has the opportunity to contribute to the R&D and QC departments. In the RnD department, we conduct trials with different meat, sensory evaluation on the existing product or other dry raw material, and raw material analysis. While in the QC department, the team conducts quality checks not only for one product but the whole product produced by the company. Discuss the cause of the defect, microorganisms on the meat and dry material, etc.

Other than hard skills or lab skills, the writer also developed soft skills that have been learned not only there but with the help also from BRIGHT sessions that i3L has been conducting—learning new ways of thinking, working as a team with the supervisor and the worker, and establishing a bridge between them—developed innovative ideas for products and the flow of production.

The writer's presence at the company during the internship is impactful by assisting the supervisor with the tasks because of the still lack of manpower, exchanging and discussing the possible outcome of the process, product, and innovation. The project is also beneficial because it may be a future system for the company. I'm grateful for the opportunity given and the chance to discuss also while undergoing internship with the director, Mr. Boediono Tandu, who is also a Food Technologist.

V. CONCLUSION & RECOMMENDATION

During the internship, the writer learned various skills, including in the production line department, which is new knowledge aside from the ones the writer learned in university. Also, learning and gained valuable experience from the field supervisor, the director, and fellow i3L members that joined the internship. Finally, the writer could apply the knowledge gained from theory and laboratory classes to practice through the tasks/activities/assistance in other departments assigned to the writer.

Some recommendations could be improved, recruitment of new employees in the R&D, production line, and QC department. Also, upgrade and add lab equipment for R&D and QC, especially in QC, since there are still minimum tools for analyzing. While there is still undergoing recruitment, the positions that should be increased is the packing considering many employees from other machines join after there are done with their designated tasks.

The writer spoke to the director about the internship placement, and he gladly accepted and opened more internship opportunities here at PT. Garindo Food International. The reason is that he greatly appreciates the knowledge and is willing to share about the food and beverage industry, especially in meat processing. This could benefit the students at i3L if they search for internships. Also, i3L internship programs help prepare students for future careers and apply theoretical knowledge to practical ones.

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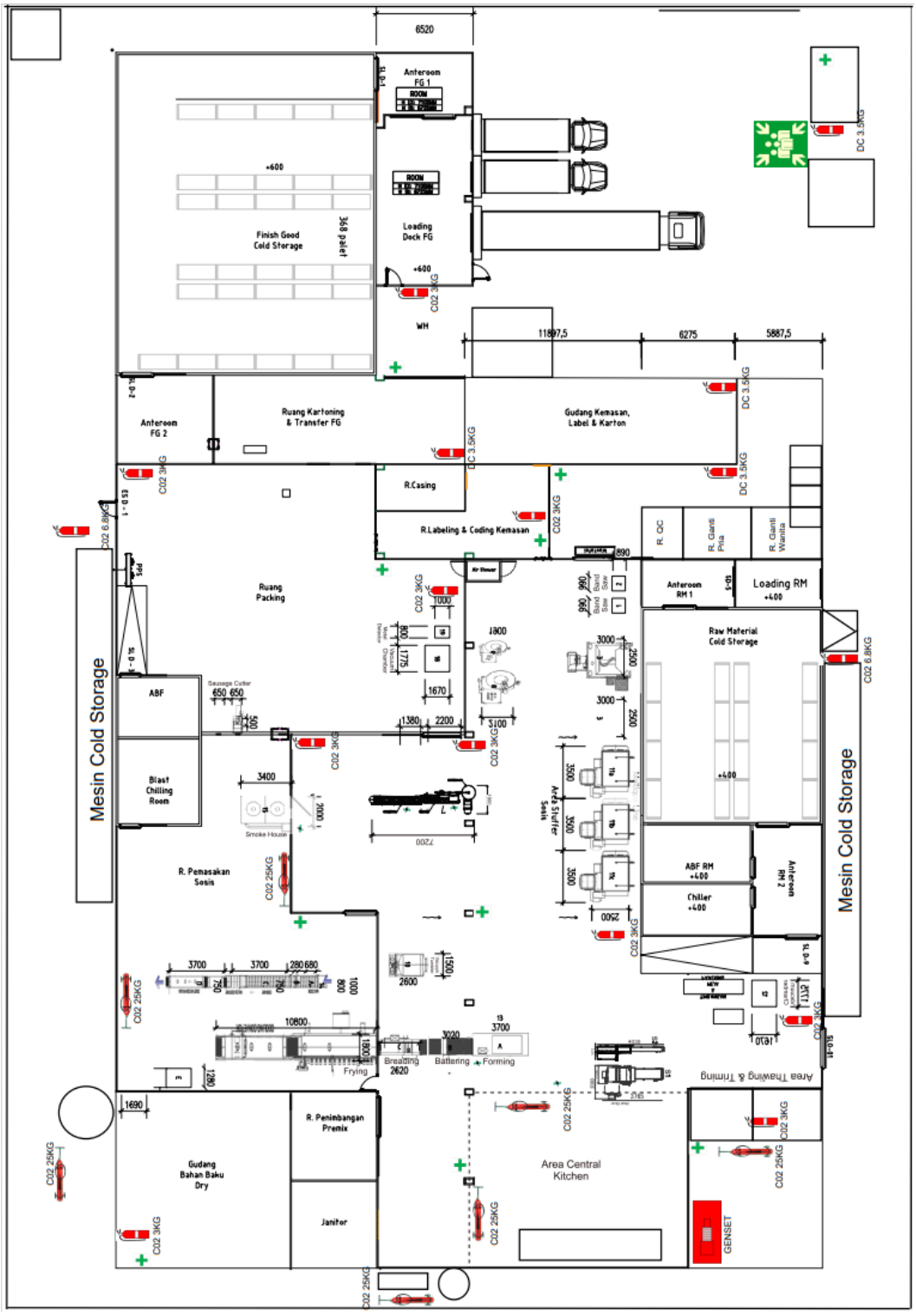
APPENDICES



Appendix A. Factory Layout of PT. Garindo Food International

Batch	Processing Time												Output (kg)	%Failure (%rework)
	Grinder		Bowl Cutter		Filling		Smokehouse		Cutting		Packing			
	Working Time	Mins	Working Time	Mins	Working Time	Mins	Working Time	Mins	Working Time	Mins	Working Time	Mins		
1	Don't have one (immedietly goes to the bowl cutter)		08:42 - 08:54	12	09:07 - 09:22	15	09:48 - 10:15	27	Merged with packing		10:42 - 10:58	16	92	3.4 kg (0.28%)
2			08:55 - 09:07	12	09:26 - 09: 40	14					10:59 - 11:12	13	82	
3			09:08 - 09:20	12	09:40 - 09:58	18					11:13 - 11:28	15	89	
4			09:21 - 09:32	11	10:06 - 10:20	14	10:42 - 11:08	26			11:29 - 11:47	18	83	
5			09:33 - 09:45	12	10:24 - 10:40	16					12:54 - 13:13	19	89	
6			09:46 - 09:58	12	10:40 - 10:55	15					13:14 - 13:26	12	88	
7			10:00 - 10:12	12	10:55 - 11:08	13	11:24 - 11:50	26			13:27 - 13:38	11	86	
8			10:14 - 10:26	12	11:11 - 11:26	15					13:39 - 13:47	8	91	
9			10:27 - 10:39	11	11:26 - 11:40	14					13:48 - 13:58	10	87	
10			10:41 - 10:53	13	11:43 - 11:59	15	13:36 - 14:03	27			13:59 - 14:25	26	84	
11			10:57 - 11:09	12	13:10 - 13:28	18					14:26 - 14:37	11	90	
12			11:15 - 11:27	12	13:29 - 13:50	21					14:37 - 14:56	19	173	
Total			X	143	X	188	X	106	X		X	178	1134	
Avg	X			11.91		15.66		25.75				14.83	X	

Appendix B. Accumulated ST Data from Production Sheets

Batch	Processing Time												Output (kg)	%Failure (%rework)
	Grinder		Bowl Cutter		Filling		Smokehouse		Cutting		Packing			
	Working Time	Mins	Working Time	Mins	Working Time	Mins	Working Time	Mins	Working Time	Mins	Working Time	Mins		
1	Don't have one (immedietly goes to the bowl cutter)		07:33 - 07:44	11	08:08 - 08:21	13	08:59 - 09:25	26	Merged with packing		10:13 - 10:29	16	92	4.0 kg (0.2%)
2			07:45 - 07:57	12	08:24 - 08:40	16					10:30 - 10:42	12	96	
3			07:59 - 08:11	12	08:40 - 08:58	18					10:43 - 10:56	13	94.5	
4			08:12 - 08:24	12	09:04 - 09:20	16	09:40 - 10:06	26			11:09 - 11:21	12	92.5	
5			08:25 -08:37	12	09:20 - 09:38	18					11:22 - 11:30	8	95.5	
6			08:38 - 08:49	11	09:44 - 09:59	15					11:30 - 11:34	4	92	
7			08:50 - 09:01	11	10:03 - 10:18	15	10:47 - 11:13	26			11:31 - 11:36	5	94.5	
8			09:02 - 09:13	11	10:18 - 10:35	17					11:36 - 12:09	33	91.5	
9			09:14 - 09:26	12	10:39 - 11:00	21					12:10 - 12:24	14	92	
10			09:27 - 09:39	12	11:00 - 11:14	14	11:28 - 11:53	25			12:25 - 12:37	12	94.5	
11			09:40 - 09:51	11	11:14 - 11:30	16					12:40 - 12:49	9	89	
12			09:52 - 10:04	12	11:30 - 11:50	20					13:02 - 13:14	12	94.5	
13			10:06 - 10:18	12	13:40 - 14:07	27	14:29 - 14:55	26			15:20 - 15:36	16	94.5	
14			10:20 - 10:32	12	14:07 - 14:25	18					15:37 - 15:51	14	94.5	
15			10:35 - 10:47	12	14:30 - 14:50	20					15:52 - 16:32	40	104.5	
Total			X	175	X	264	X	129	X		X	220	1412	
Avg	X			11.6		17.6		25.8				14.6	X	

Appendix C. Accumulated DT Data from Production Sheets

Appendix D. The writer with interns and the director of PT. Garindo Food International

Appendix E. The writer with interns and the supervisor's

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