

CHAPTER I

INTRODUCTION

1.1 Background of The Research

Now a day people concern more about agricultural and food industry than before since market needs increase. One of an important agricultural in Thailand is rice because rice is one of the export products that have high export volume. Jasmine rice is the most well know Thai rice because of its smell and taste. Many countries try to grow Jasmine rice in their country even Thai people try to grow them in other parts of Thailand but the smell, the taste and the shape of the rice are not the same as the original. Therefore, Jasmine rice can only grow in the northeast of Thailand and it has long shape.

Thailand is one of the big rice exporters in the world. In each year, Thailand exports more than five million tons of rice to many countries such as Italy, Netherlands, Indonesia, Taiwan, China, Malaysia, Russia, etc. In the world rice market, there are very high competitions so only big and strong company can survive. In order to survive and become one of the top companies in the world market, Thai company needs to improve rice quality and be a head of other by using new technology such as transforming technology like organic rice coating.

Health has become one of an important issue that people concern in today life. So organic products including organic agricultural are well know such as organic rice.

There are many ways to transform agricultural products, which increase product quality and add value to product such as frozen process, coating process, drying process, etc.

Coating process is quite a new process in organic rice industry. In the coating process, organic paste is used to coat on the rice. This makes the rice has many favor.

In this research, improving quality of rice operational process is considered since it increases opportunity to compete with competitors, and also increase productivity. The benefits from the research will directly return to the organic rice industry itself and other industries.

In order to improve the quality of rice operational process, each process needs to be understandable, problems need to be analyzed and solved by using FMEA technique (Failure Mode and Effect Analysis) and some of the process will need to be redesign. One major problem that occurs in the rice operational process is broken rice which occurs from the coating process and drying process. By using this technique helps the industry solve problems that are occurring, find ways to improve these processes and protect these processes from any future problems.

1.2 Company Background

This is a small size organic rice industry which transforms some of the organic rice to coated organic rice in order to increase quality, value added and value creation. The main raw material which is rice comes from various organic farms in Thailand. But for Jasmine rice, it comes from organic farms in the northeast of Thailand where this part can produce about 80% of Jasmine rice of the whole country.

This company does not only sale normal organic rice such as Fragrant Thai Wild Rice, Bio Jasmine Rice, etc. but also sale coated organic rice. The rice is coated with special organic paste which is made by the company itself. The paste has many favors such as Tom Yum Spices, Holy Basil, Seafood, Tom Kha Spices, Green Curry, Coconut and Pandanus Leaf, etc.

Since this is an organic industry so every process need to be focus carefully from the beginning to the end.

In the beginning, company focus more on international market than domestic market especially European market because organic products are well know in this market. But for Asian market including Thai market do not know much about organic and do not interested in this kind of products. But now a day, Thai people and Asian

people concern more about their health and they are more familiar with organic products. So these influence the company to invest more in domestic market.

Since the products are convenience product, easy to cook and easy to buy so customers are vary such as supermarket, airline, etc.

Even though rice is a seasoning product but the company has enough rice to produce for the whole year since large amount of rice is kept in the storage. The capacity of the operational process is about two tons per day.

Organic rice process starts from transporting rice to the factory. Since rice contain dust, so dust collection is the first process that should be done. Then rice will be moved to rice coating process. The rice is coated by using brush. After rice is coated, brush screw conveyer transfers the coated rice to drying process. The drying process use gas burner which has 55 – 70 degree Celsius. Since the drying process and the cooling process connect to each other so the rice will be automatically transfer. The cooling process has 25 degree Celsius. Then it is transferred to packing process. Every package must be detected by metal detector for safety. Then the finish product will be carried to the warehouse.

The rice operational process is shown in the production process chart.

1.3 Production Process Chart

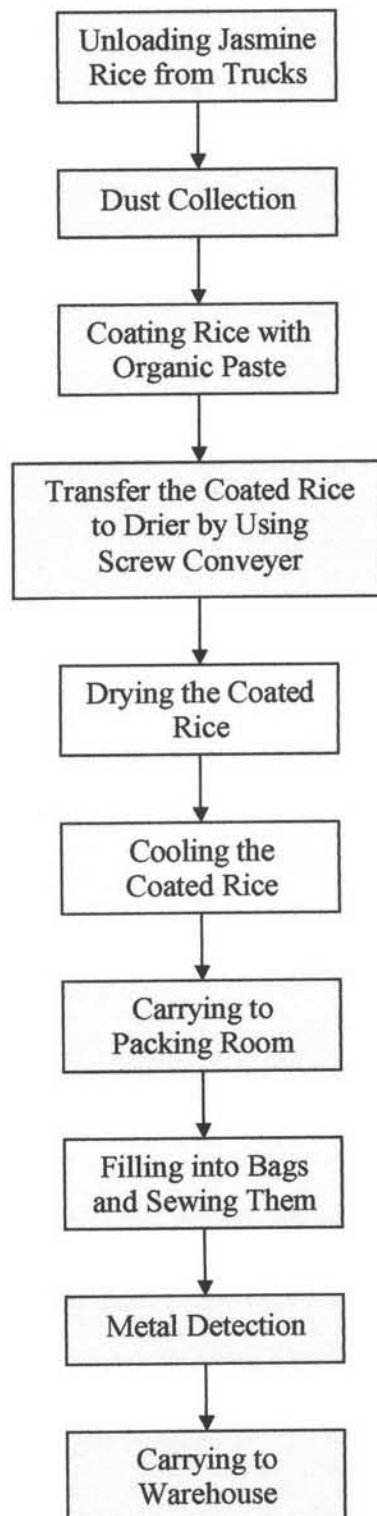


Figure 1: Production Process

1.4 Coating Process Chart

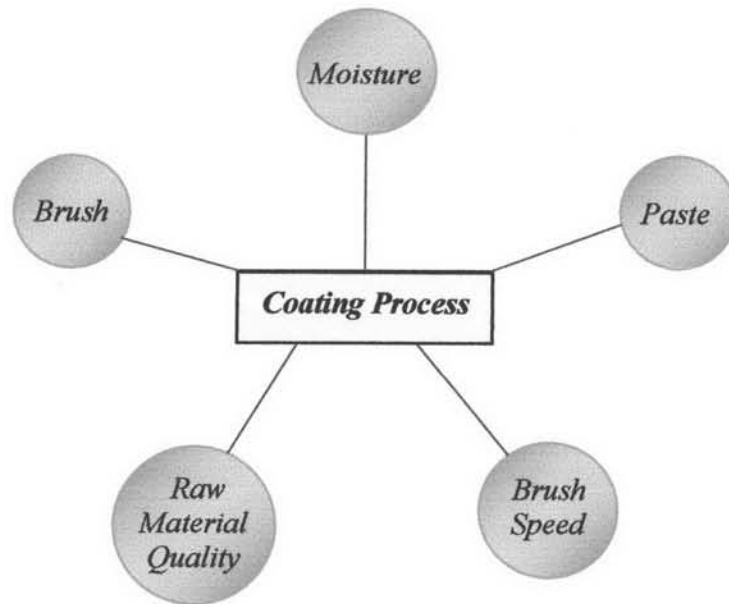


Figure2: Coating process and its operational factors affecting product quality

1.5 Drying Process Chart

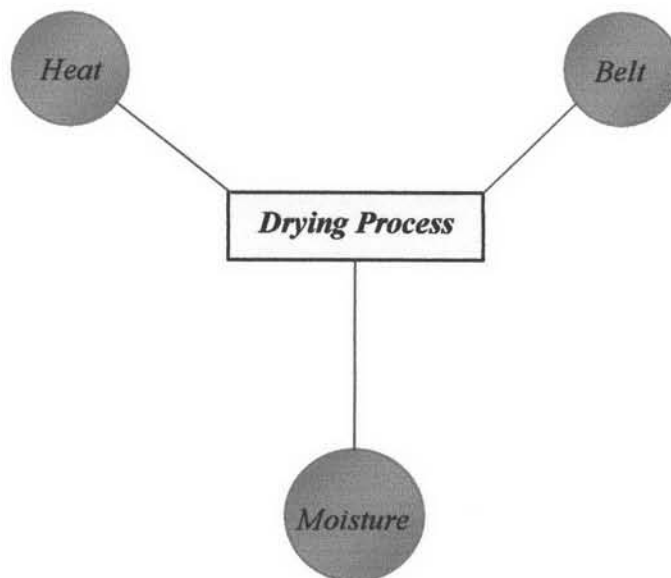


Figure3: Drying process and its operational factors affecting product quality

1.6 Statement of Problems

There are several problems occurring in the rice operational process, but the major problem which has high lost is broken rice.

From the collected data, it shows that about 10% of rice in both coating process and drying process is broken. So the total broken rice is about 20% of the whole operational process. For other processes, there are no sign of broken rice occurred. Therefore, broken rice occurs from only two processes which are coating process and drying process in the production line.

The coating process chart illustrates factors that might cause rice to be broken. These factors are

- *Raw Material Quality* : Since rice has many grades so rice quality is considered.
- *Brush* : This involves with the design of brush.
- *Brush Speed* : It is the number of turn in each coating process which depends on the paste type.
- *Paste* : There are many paste types. Each paste has different viscosity.
- *Moisture* : Consider moisture in rice.

For drying process chart, it illustrates factors that might cause broken rice. These factors are

- *Heat* : The temperature in the dryer.
- *Moisture* : Consider moisture in coated rice.

- *Belt* : This is a moving belt which transfers rice to the lower level of the dryer.

Between coating process and drying process is the Screw conveyer transfers coated rice from the coating process to drying process. Even though it does not break the rice, but the existing screw conveyer does not spread the rice efficiently when the rice fall on the belt. In the screw conveyer, there is a brush which spread the rice on the belt. Therefore, the brush in the screw conveyer might be another factor that causes the previous factors to break the rice.

1.7 Objective of The Research

The objective of this research is to improve the organic rice operational process by using FMEA technique in order to reduce the amount of broken rice.

1.8 Scope of The Research and Assumption

The assumption of this research is

- Raw material has 14% of moisture and there is about 1-2% of broken rice mix with raw material.

The scopes of the research are

- The improvement will be conducted at the case study plant.
- The study will emphasize on the factors affecting the coating and the drying processes as shown in figure2 and figure3 in order to improve the amount of broken rice.

1.9 Expected Results

The expectation that this research will achieve are

- Reduce the amount of broken rice in the operational process
- Improve standard rice coating process procedure
- To be able to use this research as a guideline for other industry

1.10 Research Procedure

1. Study about the operational process of the rice factory and the related material as shown in literature.
2. Collect important information.
3. Analyze and summarize the information and problem in each process. Link them to the scope of the research.
4. Implement new design in the operational process.
5. Collect all the information and data after the implementation.
6. Identify the expectation of the results after implementation.
7. Analyze and summarize the result and also conclude about the achievement after improving operational process.
8. Prepare thesis draft.
9. Thesis examination.

