

CHAPTER 3

PREREQUISITE PROGRAM OF HACCP

I. INTRODUCTION

Before applying prerequisite program of HACCP in the case factory, we can see from the previous chapter that both GMP and SSOP are developed on the similar basis. Both of them concentrate to improve environmental factors of food processing. In the study, we decided to develop Good Manufacturing Practice (GMP) in the case factory because uncooked rice can be categorized as a low risk product.

This chapter will describe and provide guidance to other rice exporters to assist in the evaluation of existing prerequisite programs or in the development of new programs. This section outlines the criteria that are to be met in each of the prerequisite program areas. The importance of the prerequisite programs can not be overstated. Prerequisite programs are the foundation of the HACCP plans and must be sufficient and effective. If any portion of a prerequisite program is not sufficiently controlled, then additional critical control points may have to be identified, monitored and maintained under the HACCP plans. In summary, effective prerequisite programs will simplify HACCP plans and will ensure that the integrity of HACCP plans are maintained and that the manufactured product is safe. The eight basic procedures are as follows.

- Personal Hygiene Procedure
- Pest Control Procedure
- Water Control Procedure
- Glass Control Procedure
- Cleaning Procedure
- Identification and Traceability Procedure
- Hold/Release Procedure
- Recall Procedure

II. PERSONAL HYGIENE PROCEDURE

Personal hygiene is a very important factor for good manufacturing practice. This procedure concentrates on preventing contamination from operators, and ensures safe food handling practices. Therefore, training program for workers is a significant factor to become success. Although the factory has a hygienic and accurate manufacturing process, the quality of products may be bad due to the microbiological contamination from had personal hygiene. It may be worse if the operators are ill or have infectious disease. Moreover, the microbiological hazard can contaminate devices and water used in manufacturing process, and the other

workers. There are several aspects that the HACCP team must discuss in order to determine personal Hygiene as follows.

Disease control

Any person who has an illness, open lesion, including boils, sores, or infected wounds, or any other source of microbiological contamination must be excluded from any operations until the condition is corrected.

Cleanliness

All persons who work in direct contact with food, food-contact surfaces, and food-packaging materials must conform to hygienic practices in order to protect against contamination of food. To maintain cleanliness, we should consider the following factors.

Wearing: All persons shall wear clean garments appropriate to their operation. If necessary, they must wear caps or haimets to restraint hair. According to the case company, the HACCP team agrees that all staffs and workers in production area, packing area, loading and unloading area must wear caps. However, staffs are allowed not to wear caps in the office area. Dresses between operators and daily workers are different as shown in the procedure. Furthermore, gloves are necessary for food-handling and shall be maintained in an intact, clean, and sanitary condition.

Hand-washing: Hands and fingernails are parts that frequently contact food so dirty hands and nails may cause hazards to consumers or low quality of product. Non-hygienic hands may come from transportation, works, and toilet facilities. Therefore, the company shall train employees to maintain cleanliness of hands and shorten nails. In addition, rings and painted fingernails are not permitted because they may cause food contamination. Thus, all persons shall wash their hands in conformance with hygienic practices. Microorganisms often found in hands and fingernails are Staphylococcus, Streptococcus, Escherichia, Aspergillus, Pityrosporum, Candida, Torulopsis, Epidermophyton, Microsporum and Trichophyton.

Jewelry: Unsecured jewelry, including other objects that might fall into food and equipment, should be removed prior to entering food-handling areas. Jewelry, including medic alerts, which can not be removed, is to be covered by materials which can be maintained in an intact, clean and sanitary condition. These materials must effectively protect against the contamination by jewelry of the food, food-contact surface, or food-packaging materials.

Education and Training

It is the company's responsibility to train and educate employees so that they can identify sanitation failures or food contamination. Moreover, supervisors and workers should receive adequate training in proper food handling techniques. Nevertheless, the most important thing is that the company must inform all persons the danger of poor personal hygiene and insanitary practices.

III. WATER CONTROL PROCEDURE

Water is an important factor for good manufacturing practice in the factory because water must be more or less used in food processing and cleaning. In the case company, water is used in rice-polishing process to reduce heat between each grain of rice. Therefore, water can cause sanitary problems due to contamination from microorganism, dirt, or solid metals coming with water. Each type of factory requires different quality of water because of different product. For example, in beer industry, it is preferable to add Calcium Phosphate in the water in order to reduce fermentation time. However, quality of water in all kinds of food manufacturing must equal to quality of drinking water. In other words, the water must be deprived of germs, solid metals, or dangerous substances, and shall not have bad smell and taste. The quality of water must conform to the standard of water in accordance with the announcement of Ministry of Public Health, which is illustrated in the table in the water control procedure. In the case company, although water must pass filter before using in the process, it is necessary to test quality of water every month to ensure the good hygienic product. Moreover, the preventive maintenance program is then used for inspecting and maintaining the filter. These procedures are included in the water control procedure.

IV. PEST CONTROL PROCEDURE

In the plant area, if there is not enough cleaning procedure or proper methods for keeping things in manner, the pest problem will occur. Factory area includes storage area, warehouse, stock, production lines, and surroundings. This problem will lead to non-hygienic manufacturing. The cleaning procedure is very important factor for good pest control. Therefore, it is necessary to clean the factory sufficiently to prevent or get rid of pest. In addition, the pest study should be taken into account to select the best way to prevent insects and other pests. In the case factory, pests that should be considered are night insects, birds, rats, ants, and cockroaches. Although beetles or weevils are the insects that considerably damage rice, they are not considered as the pests in the pest control procedure. The reason is that they always come along with rice and are removed in the production process (fumigation). Thus, getting rid of beetles is about process control rather than environmental control, and should be categorized in HACCP system rather than GMP.

For getting rid of cockroaches and ants, the company will subcontract a pest control company because the pest control company has more knowledge and experiences for using pesticide chemicals appropriately. Pesticides used must be registered under Food and Drug Administration of Thailand. For the other kinds of pests, the company will carry out the procedure because there is no pesticide chemical involved. After carrying out pest control program, there should be a monitoring system to measure the effectiveness of the program. In this case, it is the responsibility of safety supervisor to inspect and track the amount of pest

in the identified locations and record the results. Moreover, the equipment or things used to prevent pests should be checked consistently to maximize the protection. The use of insecticides or rodenticides is permitted only under precautions and restrictions that will protect against the contamination of food, food-contact surfaces, and food-packaging materials.

V. GLASS CONTROL PROCEDURE

Glass is one of the most dangerous physical hazards for food products. When glass contaminates products, it is very difficult to detect and separate glass from the products because it has no color and is transparent. Consequently, if the processes cannot completely eliminate glass, consumers will positively consume food adulterated by glass and finally get both internal and external injuries. Therefore, the best way to solve this problem is to prevent the contamination of glass as early as we can. The glass control procedure is then applied to prevent the contamination of glass from the external environment and working conditions. This procedure is applied in order to prevent the contamination of glass, check condition of all glass used in the production area, and illustrate the work instruction when broken glass is found.

To prevent glass from breaking into small pieces, all windows and doors in the control room, which is close to the production line, must be film-coated. Furthermore, all light bulbs in the factory should be covered by plastic lamps. However, in the production line there are some light bulbs that are installed too high to install the lamps. Therefore, they must be checked daily according to the checklist shown in the glass control procedure in order to avoid too late recognition of the contamination of glass. In addition the work instruction to clear broken glass should be written down to make all staffs and workers understand the appropriate action when broken glass is found.

There are two procedures, Identification and Traceability Procedure, and Hold/Release Procedure, involved with this procedure. For instance, when the broken glass is found in the production line, it is possible that glass could contaminate with the products. Since the inspection of glass is performed daily, products that have been produced for one day shall be traced back and hold until the problem is clarified and investigated. In some cases, it is necessary to throw the products away if it is unsure that they are not contaminated with glass.

VI. CLEANING PROCEDURE

The cleanliness of the food factory not only impresses visitors but also significantly reduce the risk of food contamination. Thus, the cleaning procedure is necessarily created to ensure that the factory is clean enough for good manufacturing practice. Since cleaning can be separated

into two major categories, which are general cleaning and machine cleaning, there should be more than one people to take responsibility of carrying out this procedure. In the case factory, we can divide cleaning tasks into three parts which are the responsibilities of three different staffs as follows.

- Safety Supervisor is responsible for cleaning floor inside and outside the factory.
- Production Supervisor is responsible for cleaning equipment, products, bag-arrangement area, and loading and unloading area.
- Technical Supervisor is responsible for cleaning machine, and production line (bucket elevator, conveyor, hoppers, and other machines).

These tasks must be written down in the forms of work schedules for ease of control and monitoring. For cleaning machines and other equipment, the cleaning schedules can refer to preventive maintenance program. However, the preventive maintenance program of the case company has only the checklists showing which parts of machine should be cleaned. Nevertheless, the word "clean" could be subjective if there is no document to refer to. Some may think that it is clean enough to wipe machines externally; on the contrary, some may think that all parts of machines must be taken out and cleaned each of their parts one by one.

VII. IDENTIFICATION AND TRACEABILITY PROCEDURE

Product identification refers to a label or mark attached on a product in order to provide the information for searching manufacturing data. Manufacturing data include issued date, no. of production line, no. of storage tank, no. of packing line, and etc. Therefore, we can rapidly know these useful data if we create a good and effective coding system by the use of EDI (Electronic Data Interchange) such as bar code system. However, the case company is not ready for using EDI due to several reasons; for example, the difference of bar code system between Europe and America makes it difficult to create coding system because the company has customers all around the world. Thus, the company decides to use a product's lot number instead. The date of packing will be stamped or labeled on the rice bags. The printing machine will be applied at the end of each packing line to print date, lot no., and production line. This information will be sufficient for tracing back to other records when problems are found. For instance, if a problem is found in the product from packing line PA4, it is necessary to use the packing record to find which finished product storage tank the product came from. Therefore, we will find out that lot of product from that tank will be traced, hold and recalled. However, this procedure must relate to the other two procedures, which are Hold/release Procedure and Recall Procedure.

VIII. HOLD/RELEASE PROCEDURE

Hold and Release procedure is a procedure used in the situation that a problem is found in a product. Therefore, after we identify all products in that lot, we must have the procedure to manage the affected products. This procedure presents the way to do with the affected products after the product identification procedure. Not only affected products will be hold, but also products that are possibly contaminated. This procedure should identify the methods of separating the hold product from normal product such as labeling. Moreover, it should include the area where the hold product should be placed. When products seem to be contaminated with hazards, they must be separated and hold for analysis the problem. If there is no contamination, the products will be released to the finished products. On the other hand, if the hold products are contaminated, it is necessary to have a procedure to handle the affected product, which may be different depending on the type of hazard contamination.

IX. RECALL PROCEDURE

Recall procedure will be used when the problem is found after customers receive the product. Although the company may lose a lot of time and money due to the result of recall procedure, this procedure must be proceeded if consumers will have a serious effect from the contamination of the products. Recall procedure should describe the methods of recall starting from the problem is found to the elimination of the affected product. This procedure relates to the product identification. The better the system of product identification, the smaller the damages the company takes. However, it needs a lot of investment to achieve the good system of product identification.

In the case study, the recall procedure of the case company is not quite good because when the company has a problem in the product, it has to recall the product in a very high quantity. For example, a problem is found at CCP4, which is the plate magnet, during conveying the finished product to the packing tank. Therefore, the company has to recall the entire product from that finished product storage tank, which may contain approximately 100 tons of rice. Nevertheless, the probability of recalling product is pretty low since the rice is sold as uncooked and low-risk product. The strictness of this procedure depends largely on the chance of the occurrence of the hazard contamination.