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THE CHALLENGE OF UNIVERSAL FOOD QUALITY AND SAFETY REGIME

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UNIKA
UNIVERSITAS KATOLIK
SOEGIJAPRANATA
Jl. Pawiyatan Luhur IV/1 Bendan Duwur Semarang 50234
Telp. 024-8441555 (hunting) Fax. 024-8445265, 8415429
e-mail : unika@unika.ac.id http : //www.unika.ac.id

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A STUDY OF GMP (Good Manufacturing Practices) IMPLEMENTATION IN COOLING, CUTTING AND PACKAGING PROCESS AT A "LAPIS LEGIT" INDUSTRY IN SEMARANG

Alfonsus Dwianto Wibowo[1)], Fifi Sutanto-Darmadi[2)], Inneke Hantoro[2)]

[1)] Student of the Department of Food Technology, Faculty of Agricultural Technology, Soegijapranata Catholic University

[2)]Lecturer of the Department of Food Technology, Faculty of Agricultural Technology, Soegijapranata Catholic University

ABSTRACT

Nowadays, facing the tight competition of food industries, the fulfillment of food quality must be well considered. To produce a food product with good quality and safety, certain system of quality management, like GMP should be applied. In bakery industries, especially in a "lapis legit" industry at Semarang, serious concern should be given at production process after baking. Processes after baking have high probability of contamination, especially fungi contamination which can recontaminate the product. The purpose of this research is to design an applicable GMP, especially on cooling process, cutting and packaging of the final product. This research was conducted in three ways, which included field observation, data analysis process and GMP development. Field observation supported by a microbiology test to quantify the number of fungi which present in the air, final product and employee's hand. From the field observation process, design of room layout, production process and employee's hygiene give high probability of final product's recontamination, especially by fungi. Although the application of GMP equipment has been done, development should be made to ensure decreasing of recontamination probability of the final product. Design of a clear separating wall between cooling and cutting room, the adding of one new room (employee's and equipment's cleaning room), simplification of employees movement flow are among of GMP applications that should be developed to reduce the spreading of fungi throughout the air. Description of a clear equipment maintenance, alongside with the requirement of several changes and equipments addition, which are used to prevent the contamination of fungi through equipments. At last, contamination prevention which possible to happen from the employees is done with hygiene regulation correction, focuses mainly on hand cleanliness. Finally, GMP application which will be developed must also be followed with the increase of the awareness of all employees.

Keywords: *Food safety, GMP, "lapis legit", fungi.*

INTRODUCTION

Food products that have been submitted to an adequate heat treatment during processing are generally free of vegetative microbial cells and, depending on the intensity of the heat treatment, of spore forming cells. In bakery industries, baking process is the process which automatically destroy most of microbial contamination. In "lapis legit" industry, fungi is the main concern, as the implication of its intermediate food product characteristics. If the manufacturer doesn't put a concern in processes after baking, recontamination can occur easily. Dangerously, there are no specific treatment, i.e. enough heat treatment gived to the product for prevent this recontamination. That's why the processes after baking can be grouped as critical process. In the one of "lapis legit" industry in Semarang, the product handling process after baking is not well

enough, so the product becomes very susceptible from fungi contamination. Finally, decreasing quality of the final products is the impact which already happened.

Aim Of This Research

In order to increase the final product quality, the research is focused to design an applicable GMP, especially on cooling process, cutting and packaging of the final product.

MATERIAL AND METHODS

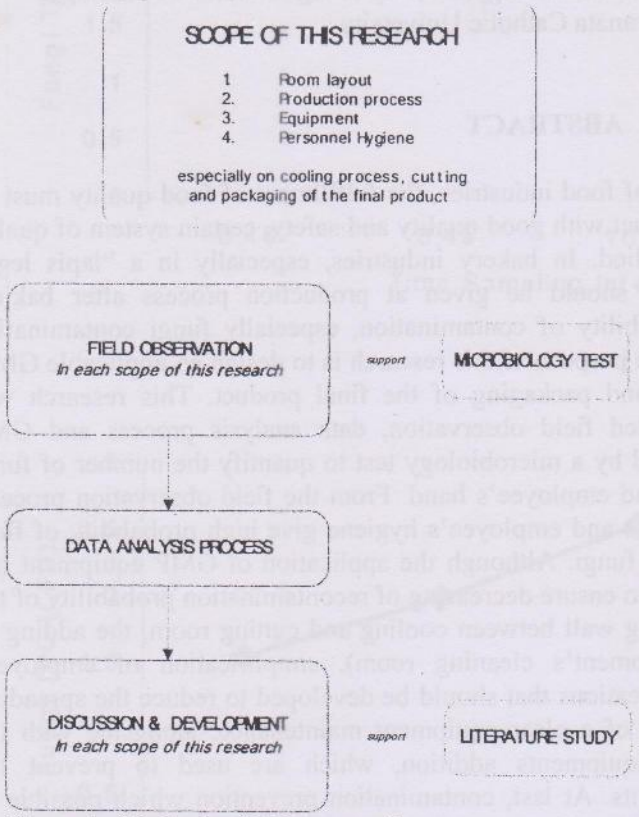


Figure 1. Methods of this research

From the microbiology testing in the final product and also in the surface of personnel's hand (using swab methods), can be said that the final product and personnel's hand relatively clean, especially from fungi contamination.

DISCUSSION AND DEVELOPMENT

Brief Introduction

"Lapis legit" contamination process, especially from fungi usually occurs after baking process. Cooling, cutting and packaging processes are the critical processes which recontamination usually occurs.

There are three main ways of contamination, i.e. air (Cauvain & Young, 2001), equipment (both make a contact and not make contact with the product) (Reij et al., 2005) and the human, who is the personnel (Smith et al., 2003). So, the effort for decreasing the fungi contamination should be focused in all that way.

Although the product, based on the microbiology testing of the product relatively clean, the change in the plant using GMP guidelines should be made. From the field observation process can be said that the contamination risk is still higher. Poor design of cooling area's layout, incorrect cooling process and poor behavior of the personnel (which noted in the field survey) are the reasons.

Room Layout

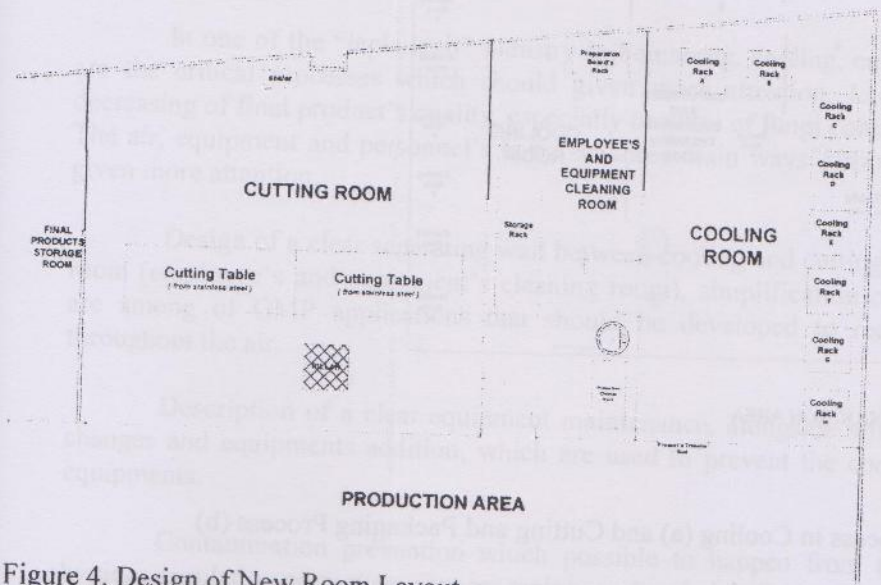


Figure 4. Design of New Room Layout

Design of new room layout (especially cooling, cutting and packaging room) based on the applications of two basic principles:

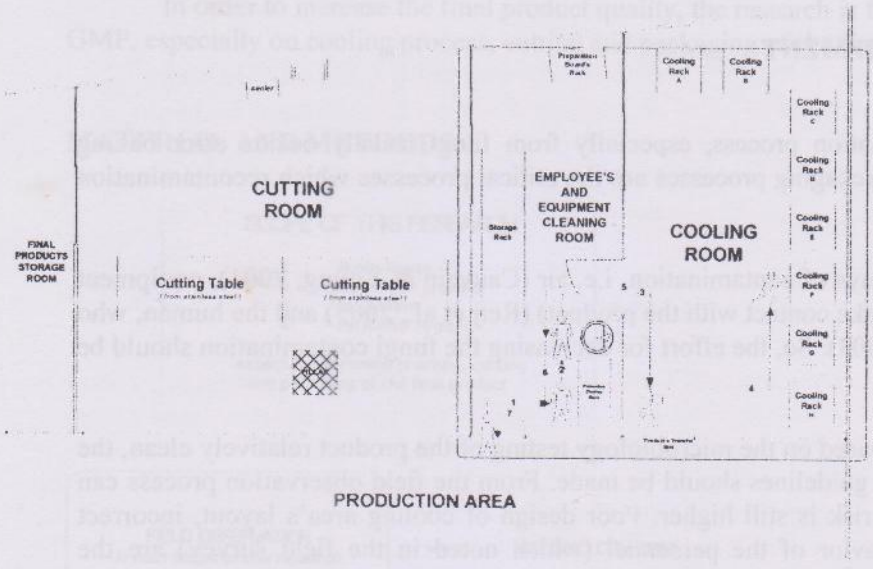
Cooling and cutting room as a high risk areas

These areas must be designed well so can prevent contamination to the product, especially after the product past the baking process.

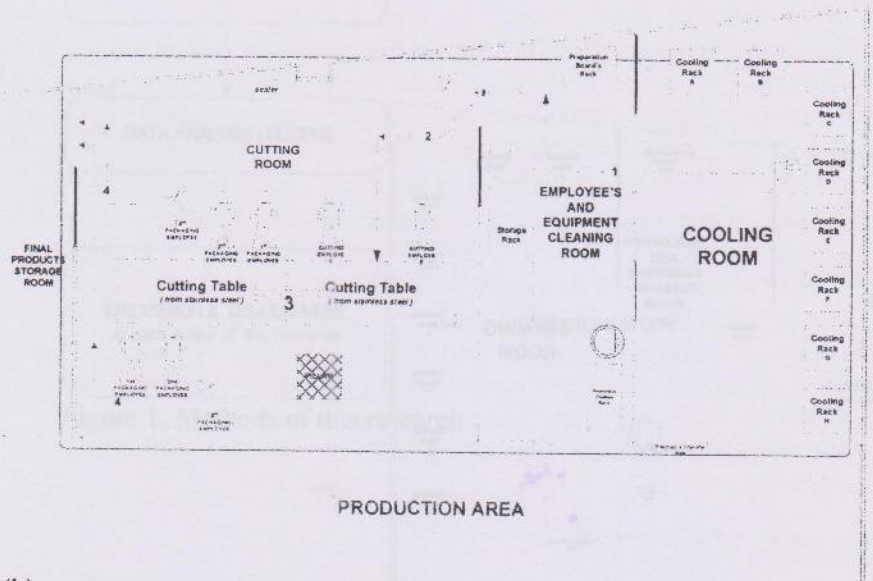
Limitation of personnel flow movement

Limitation of personnel flow movement, should be described to prevent contamination from human (personnel) body, included protective shoes, transportation equipment (in this case-trolley) (Codex Alimentarius Comission, 1999), and from dirty protective clothes (Marriott, 1997).

Production process



(a)



(b)

Figure 5. New Mechanisms Process in Cooling (a) and Cutting and Packaging Process (b)

Modification of process mechanism hopefully can bring these changes:
Establishment of environmental conditions which can prevent growth of the fungi.
Increase of air quality, especially from numbers of fungi present.

Equipment

Some suggestion, which should be made to more decrease the contamination risk, especially from the equipment to the products are:
Improvement Cleaning Manager's role as a guarantor of all cleaning processes. In this case, this personnel should be completed with suitable checklist, to ensure all cleaning processes.

Describing of the maintenance processes. The industry have been conducted the cleaning processes very well, but forget of the importance of the maintenance processes, especially to maintain good conditions of the equipment.
General Cleaning processes, which clean all the high risk areas comprehensive is needed to be done routinely.

Personnel Hygiene

Generally, the industry has been designing the personnel hygienic standards well. These standards surely designed to decrease the contamination risk, especially from the personnel. Some important matters, which should give more attention are:
Describing of the good hand-cleaning methods
Describing of the good hand-cleaning time
Describing of the disposable glove's wearing mechanisms.

Additional suggestion to the management

All of these changes above will be very useless when the personnel didn't conduct the regulation well, which apparently found in the field awareness survey. In the fact, the industry has been establishing the regulation well, completed with suitable punishment and signs (i.e. hand-cleaning signs which can be found in the plant) but the personnel still do not obey the regulations. That's why the training activities should be made routinely. Training activities, especially in sanitation matter, should be planned and done well (UNIDO, 2005). This matter also should be added in the personnel's working regulations.

CONCLUSIONS

In one of the "lapis legit" industry in Semarang, cooling, cutting and packaging processes are the critical processes which should given more attention. Lack of attention can result to decreasing of final product's quality, especially because of fungi contamination.
The air, equipment and personnel's body are three main ways of fungi's spreading, which should given more attention.

Design of a clear separating wall between cooling and cutting room, the adding of one new room (employee's and equipment's cleaning room), simplification of employees movement flow are among of GMP applications that should be developed to reduce the spreading of fungi throughout the air.

Description of a clear equipment maintenance, alongside with the requirement of several changes and equipments addition, which are used to prevent the contamination of fungi through equipments.

Contamination prevention which possible to happen from the employees is done with hygiene regulation correction, focuses mainly on hand cleanliness.

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