

DEVELOPMENT OF HACCP SYSTEM
IN
A FRUIT COCKTAIL
MANUFACTURING PLANT

By

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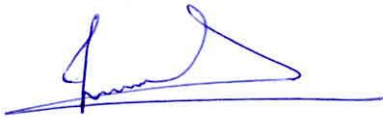
By

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Declaration:

The work described in this thesis was carried out by me under the supervision of Dr. Yasmina Sulthanbawa (Senior Research Officer , Agro & Food Technology Division, Industrial Technology Institute) and Prof. A. Bamunuarachchi. A report on this has not been submitted in whole or in part to any University or any other institution for another degree/diploma.



W.A.I. Tharangani

We certify that the above statement made by the candidate is true and that this thesis is suitable for submission to the University for the purpose of evaluation.

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Title : Development of HACCP System in a Fruit Cocktail manufacturing plant

By W. A. I. Tharangani

ABSTRACT

The consumption of fresh fruits is increasing as consumers strive to eat healthy diets. These products include pre-washed pre-cut salads items, prepared fruit salads, or fruit combinations.

This mix fruit cocktail is an innovative product for the local market and has the potential to go to the international markets. Quality problems encountered with the spoilage of cups during the shelf life period had to be addressed. In order to improve consumer safety, a safety assurance system was developed for the fruit cocktail process.

Complete study of process flow and employee interactions were done .Audits were done in order to identify non conformities of the production process, factory layout and personal hygiene. Since the existing factory layout was not specifically designed to avoid cross contamination, new factory layout that allow direct flow of process with minimum cross contamination possibilities was developed. Initial microbiological testing helped to understand the existing sanitary level of the plant and personnel hygiene. These results verified that plant sanitation and personal hygiene were not up to the standard.

GMP and GHP trainings were conducted to improve the employee awareness on food safety and hygiene aspects. 5S training program gave a good initiation to food safety

training and to reorganize the factory. Final microbiological analysis verified that there is an improvement of sanitary level and personal hygiene of the plant after the training programs.

During this study proximate analysis, physical and microbiological parameters of the final product were studied to get an idea of the product. Record keeping system was also implemented.

An emphasis was given to the machine cleaning procedure as this product was produced using an automated machine which is a novel experience to the food industry of our country. HACCP studies on fruit salads or cocktails are not available in literature. Four CCPs were determined with critical limits, monitoring procedures, corrective and verification procedures. The CCPs identified were fruit sanitizing, syrup formulation, pasteurization and refrigeration.

CHAPTER 1 : INTRODUCTION

1.1 Introduction to the Project

The market demand for convenient foods has increased. Due to the busy lifestyle people do not have much time to waste on food preparation. Consumers also want healthy food, taste and value. Across convenient meal solutions, there is a movement towards fresh foods. As a result, refrigerated foods are significantly outpacing sales of both frozen and shelf-stable meal solutions. Therefore there is a great market demand for pre cut fruit salads.

Fresh pre cut products are very popular in developed countries. Yet in the Sri Lankan market, fresh pre cut products has not developed to the desired extent. Mango and mixed fruit 'Achcharu' are the most popular fresh pre-cut products in Sri Lanka observed in many roadside outlets.

According to a recent research and markets report, consumers believe that refrigerated prepared meals use fresh ingredients and contain fewer additives and are therefore healthier.

Fruits are an important component in a healthy diet. An increasing body of literature is accumulating that highlights the role of fresh produce in providing anti-oxidants and other compounds that may lower the risk of cancer and other chronic diseases such as heart disease.

This cocktail is an innovative product to the local market. It has the potential to thrive in the market successfully. Not only are the pre-cut fruits time saving, they are also rich in

nutrients. According to recent market research studies it is apparent this tropical fruit cocktail will explore both the local and export market successfully. Further this type of precut products will be more popular in airline food services. To enter and to face the competition in the international market, assurance of safety of this product is essential.

1.2 Introduction to HACCP:

HACCP is a food safety assurance management tool. It involves the systematic assessment of all the steps that are critical to the safety of the product. Measures are adopted to control these identified hazards and safety of the food is ensured. HACCP is a preventive based, systematic approach, rather than relying on end product testing. HACCP system supports to make the product safely and be able to demonstrate that the product has been made safe.

Certain countries such as the European Union and USA have made it obligatory to implement and maintain HACCP to enter the export market. During the last ten years HACCP implementation has taken place in industrialized countries. In many newly industrialized countries HACCP implementation has taken place particularly in the fish processing industries due to EU requirements and import regulations of the USA.

The EU and other developed countries have included HACCP principles in their legislation. This has contributed to a high level of HACCP implementation in developed countries.

1.3 Justification for the project:

Processed food products from developing countries cannot compete well in the international food market due to the lack of safety and quality assurance and the product have usually been relegated to lower end market or abandoned in some cases.

The fruit cocktail factory wanted to develop the HACCP study because this product was experiencing customer complains for spoiled cups and undesirable flavor in the cups (swelling of the lid) within the shelf life period of the product .There were market returns within the shelf life period due to spoiled cups. Though in number these complains are few. When compared with other competitive products in the local market such as ice cream cups, yoghurt products the number of complains are fairly high. As this is a ready to eat product, and only pasteurized, the need for a safety assurance system was identified. An in depth study to the problem revealed that the factory sanitation, personal hygiene and non adherence to GMP was the cause. Therefore, establishment of GMP and GHP in the plant prior to HACCP development would give a positive impact for this problem.



Plate 1 : Fruit cocktail cups