Development of a Hazard Analysis Critical Control Point (HACCP) Manual for a Food Processing Plant

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Introduction

Quality and safety in manufacturing food have a greater importance by today more than any other day where, consumers are very much vigilant and educated on the matter, accordingly the industry regulations and standards have been elevated and enforced and more importantly these parameters are being heavily used by the marketers in securing their market share.

Curry Mate (Pvt) Ltd., is a well-established medium scale food processing enterprise which is engaged in the production of many ready to eat food items and curry mixtures packed in bottles, cans and plastic bags for local and export markets. The company has been doing well more than twenty five years gaining the recognition and reputation of the consumers. However, the absence of internationally accepted quality certification has become a bottleneck at present in competing both local and international markets. Therefore, it is important to obtain a food safety certificate which is based on technical and scientific principles such as HACCP. HACCP is a tool to assess hazards and establish control systems that focus on preventive measures rather than relying mainly on end-product testing (Codex Alimentarious, 1995). It is one of the internationally recognized food standard developed by the Codex Alimentarious Commission. And it is necessary to develop a HACCP plan prior to implementing HACCP quality system in the food processing plant. Accordingly, the main objective of this study was to develop a manual to implement HACCP quality system in the food processing plant and the specific objective was to analyze the gaps and feasibility.

Methodology

A gap analysis was undertaken to identify the gaps in between current GMPs and standard levels which should be covered by HACCP prerequisite programs. A check list was used to conduct the gap analysis. All the required GMPs for the food processing plant were identified based on the General Principles of Food Hygiene recommended by the Codex Alimentarious Commission.

Product ingredients and chemical additives in terms of product composition of each product were noted. Packaging information and instructions on the use of the product were recorded. Recommended total shelf-life and conditions required to ensure product safety during storage and distribution of each product were identified and recorded. Customer groups and how they are going to be consumed those products were identified and recorded. All the above information was recorded separately under each product.

Process flow diagrams of each product were drawn showing each step in the operation from receiving raw materials to delivery of the end products. Prepared process flow diagrams were used to identify all potential biological, chemical and physical hazards. Then

preventive measures for all identified hazards were noted. The hazards which can be controlled or eliminated by GMPs were noted as non-significant hazards and others were noted as significant hazards.

HACCP decision tree was applied to each process step which combined with a significant hazard in order to identify whether that step is a CCP or not. CCP determination was done for all products separately. Critical limits such as maximum or minimum time and temperature controls and required standards in purchasing raw materials for each CCP were determined and recorded in the HACCP plan. A documented monitoring system for required parameters at each CCP was established to observe whether the CCP is under control. Corrective actions which should be under taken if monitoring indicates a loss of control at CCPs were defined and recorded in the HACCP plan. A procedure for periodical review of HACCP plan was established to ensure that monitoring procedures and corrective actions are properly maintained. It was planned to do through auditing and review of records of each CCP.

Record keeping documents for all established monitoring procedures, corrective action plans and verification procedures were designed and prepared.

Results and Discussion

Determined Critical Control Points of each production process are summarized in the Table 1.

Table 1: Summary of CCPs in all Production Processes

Product	Receiving Raw Materials	Cooking	Washing Sterilizing Packaging Materials	Autoclaving	Hot Filling
Katta Sambal	CCP			CCP	
Seeni Sambal	CCP	CCP	CCP		CCP
Buriyani Mix	CCP	CCP	CCP		CCP
Chicken Curry Mix	CCP	CCP	CCP		CCP
Kadala	CCP			CCP	

Table 2: Critical Limits

CCP	Critical Limit
Receiving Ingredients	Purchasing raw materials from approved and reputable suppliers
Cooking	Exceed the core temperature of cooked food 74^0C
Washing Sterilizing Packaging Materials	Keep glass bottles above 20 min in boiling water
Autoclaving	Autoclave 30 min at 120^0C
Hot Filling	Pre heat glass bottles up to 60^0C Maintain cooked food temperature above 74^0C

Table 2 shows the critical limits of each identified CCP. HACCP plans which includes all the information about monitoring systems, corrective actions and verifications were prepared as shown in Table 3.

Table 3: Format of HACCP Plan

CCP	Significant Hazard	Critical Limit	Monitoring	Corrective Actions	Verification	Records
			What:			
			How:			
			Frequency:			
			Who:			

Conclusions

The current situation of GMPs in that food processing plant needs to be improved more in order to align with Codex recommendations.

The identified CCPs in all five production processes are quite similar and therefore HACCP plans of each CCP such as raw material receiving, cooking, autoclaving, hot filling and sterilizing packaging materials are similar for every product due to the similarities in those production procedures.

HACCP manual was prepared gathering all documents about Company Information, Required GMPs, Product Descriptions, Process Flow Diagrams, Hazard Analysis, CCP Determination, HACCP Plans and Record Keeping Documents.

Record keeping documents designed will be helpful for effective monitoring of GMPs and CCPs as well as performance of corrective action procedures and verification procedures.

Company will be able to follow this manual and successfully implement HACCP quality system without many difficulties.

References

Codex Alimentarius Commission, 1995. General Requirements: Food Hygiene, 2nd Edition, Volume 1B.