

1. INTRODUCTION TO HACCP PROGRAM AND HACCP EVALUATION

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The Pillsbury Company in USA, responsible for supplying ready-to-eat food products for the US Space programs, was the pioneer in developing a controlled method to produce safe food products. To begin with, like all food manufacturers, they were also using the end product inspection to recommend ready-to-eat food for the space program. The quality criteria for the space program was so stringent that the system of end product inspection produced only limited number of quality products and the company was unable to meet the supply requirements using the traditional method of production. Then and there, Pillsbury's decided that instead of checking the end product, it was essential to apply controls at each step of production, so that all hazards were kept under check and the end product remained almost free from all hazards. This new technique of controlling hazards at appropriate production steps in order to give hazard free products was termed as **Hazard Analysis and Critical Control Point (HACCP)** system. Later National Academy of Science, National Advisory Committee on Microbial Safety of Foods (NACMSF) and the Food & Drug Administration (FDA) of the USA hailed the HACCP system. In July 1992 the US based National Marine Fisheries Service (NMFS) adopted the principles of HACCP for the seafood industry to facilitate consistent production & sale of safe, wholesome and properly labeled fishery products.

The HACCP system, as it is practiced today, focuses on hazard prevention and hazard control by effective monitoring of all critical production points and record keeping by the industry. One of the advantages of HACCP program is that it permits lesser destructive sampling than the traditional inspection system. Through out the world, HACCP is now being implemented in food industries, and many countries like European Union, Canada, Japan, Thailand etc., have adopted this system. They also made it mandatory for food processing units all over the world, who export their products to these countries.

The Govt. of India is also evolving a strategy through Bureau of Indian Standards (BIS) to implement HACCP program for Indian Food Industry. Based on the mandatory requirements from USA and European Union, the Export Inspection Council of India has also expressly worked out the HACCP procedure for Indian Seafood Industry and in this context, HACCP has become the guiding principle for Indian food industry.

In evolving and implementing a HACCP plan for any food industry, there are certain basic concepts and definitions. A proper understanding of these concepts and definitions are

very essential for a person planning to take part in the development, implementation, and inspection of a HACCP plan. Some of these basic concepts are defined below:

1. **Control Point** : Any step in a manufacturing process (flow chart) of a product at which biological, chemical or physical hazards can be controlled.
2. **Critical Control Point or CCP** : CCP is a step in a manufacturing process, which if not controlled properly may result in the occurrence of a hazard that make the product unsafe, unwholesome or a cause for economic fraud.
3. **Critical Deficiency** : Any hazardous deviation from the HACCP plan requirements that affects safety, wholesomeness and economic integrity.
4. **Critical Limit** : A scientifically established tolerance for a hazard below which the food will be safe for human consumption.
5. **Corrective Actions** : The remedial measures adopted when a critical deficiency is assessed or when a critical limit is exceeded.
6. **Hazard** : A biological, chemical, physical or economic aspect of a food, which can cause illness or injury or mental distress to a consumer.
7. **HACCP Plan** : The document of a food processing unit which spells out the significant hazards, their critical control points, the controls, monitoring, inspection procedures, and record keeping to produce hazard free food products.
8. **Low Risk Products** : Food products that possess no significant risk to public health even if there is a hazard when prepared for distribution. Also see 9 & 16.
9. **High Risk Products** : Food products that possess serious threat to public health in the event of existence of a hazard. All ready to eat food items come under this category.
10. **Major Deficiency** : A major change from the HACCP plan requirements, which hamper safety, wholesomeness and economic integrity.
11. **Minor Deficiency** : A failure on the safety and quality requirements of the food processing unit, which need not affect the overall acceptability of the HACCP system in the unit.

12. **Monitoring Procedure** : The schedule of tests and observations recorded to report the status of a hazard at each critical control point in a production process.
13. **Preventive Measures** : Any action that effectively prevents the introduction of a hazard into a product.
14. **Process** : The series of operations from raw material, preparation, processing, storage and distribution of a product to consumers.
15. **Serious Deficiency** : A severe deviation from HACCP plan requirements, which if allowed to consume can affect the safety, wholesomeness and economic integrity resulting in the production of unsafe products.
16. **Substantial Risk Products** : Food products that may pose a threat to the public health when prepared for human consumption. Eg. Perishable ready to eat food items.
17. **Flow Chart** : The sequential listing of various steps with direction from raw material to finished product in a production process.
18. **Food Safety Hazard** : Food Safety Hazard is something in the food, which can cause, infection or toxicity or injury to the consumer.
19. **Wholesomeness** : It can be defined as freshness of food which is free from decomposition and changes in natural colour, odour, taste and texture.
20. **Economic Fraud** : Any act such as mislabeling, short net weight etc., that can lead to an economic loss to the consumer.
21. **HACCP Worksheet** : A table showing details of the processing steps, likely hazards, significance of the hazard, justification, hazard preventive measures and decision on CCP.
22. **HACCP Plan Form** : A table which lists all critical control points / steps in the process, the significant hazards, critical limits for the hazards, monitoring the hazards (what, how, frequency and who), corrective actions, records and verification procedure.

23. **Verification** : Periodic evaluation and review, of the HACCP plan by the HACCP team of the unit to determine the overall effectiveness of the HACCP plan.
24. **Validation** : The onsite evaluation of HACCP plan with respect to completeness, workability and the capacity to implement the plan by the HACCP team.
25. **Systems Audit** : The onsite evaluation of the unit's effectiveness in implementing the HACCP plan validated by a competent agency.
26. **Verification Audit** : Unannounced onsite verification of the effectiveness of the competent agency by a supervisory team.

Components of HACCP Plan

There are twelve important components for a HACCP plan/ manual. They are:

1. Quality Policy
2. Organizational Chart
3. Organizational narrative
4. HACCP Team, duties and responsibilities of the members
5. Description of products and end use
6. For each similar product group there should be:
 - a. Process flow chart, Hazard analysis worksheet
 - b. HACCP plan forms for each CCP with:
 - i) Processing steps with CCP
 - ii) Hazards to be controlled
 - iii) Preventive measures
 - iv) Critical limits
 - v) Monitoring procedures
 - vi) Corrective actions
 - vii) Records to be maintained
7. Record keeping procedure
8. Good Manufacturing Practices
9. Sanitation Standard Operating Procedure
10. Verification Procedure (HACCP Team)
11. Recall Procedure
12. Labels / Specifications