Hazard Analysis and Critical Control Points (HACCP)

These resources provide a comprehensive learning module to understand the reasons of practical food safety procedures. They are ideally suited to a wide range of learners, as they more than fulfill the requirements of Basic Food Hygiene (NVQ Level 2) and so provide the resources to meet the mandatory requirement for all FE and HE hospitality students to obtain this qualification.

Through an understanding of the scientific reasons for a food safety the student achieves the knowledge of how to manage food safety in an operational unit and also from the large company's perspective for the implementation of HACCP, making the resource suitable for HE students to enter management roles in industry.

Contents

This resource discusses an explanation of the Hazard Awareness and Critical Control Points theory, as well as how to implement HACCP processes.

Section 1. Learning Outcomes

By the end of this section you will have learnt;

1. What is HACCP and how it provides safe food ,
2. How to perform a risk analysis,
3. How to form a HACCP team and how to form a HACCP plan,
4. How to apply the 7 principles of HACCP in your work.

Section 2. Hazard Analysis and Critical Control Points

What is HACCP?

Quality systems are needed in the food service industry to protect the safety of food and drink

service.

HACCP is a quality system that focuses on food safety.

HACCP is a process to identify how the chance of contamination with a foreign matter, toxic substance or pathogenic microorganism such as bacteria or viruses can be minimized or eliminated.

The HACCP process leads to the use of routine preventative measures designed to keep food and drink service safe.

The principle of HACCP was recommended by the EC directive of June 14, 1993, on the hygiene of foodstuffs. This directive has been implemented by national legislation of the European countries. The most recognized and accepted document of the HACCP concept has been provided by the FOA/WHO Codex Alimentarius Commission, Alinorm 97/13A, Codex Guidelines for the Application of Hazard Analysis and Critical Control Point System, June 1997.

From the 1st January 2006, UK legislation required that *all* food businesses, including caterers, apply food safety procedures based on the principles of Hazard Analysis and Critical Control Point (HACCP) to their business.

This means that HACCP became part of the daily work for all members of your team, and is required by legislation.

Section 3. The 7 HACCP Principles

1. Identify all the hazards (physical/chemical and microbiological) and list the preventive measures for each hazard). A food safety hazard is anything that affects the safety and quality of food and could endanger the health of a consumer. They can originate in the ingredients, the production process, or the final product itself.

2. Identify the critical control points (CCP) There will be various points in the process where hazards exist, but not all of them can or need to be controlled. E.g.: food may contain bacteria when delivered, but as long as the food is heated thoroughly and sufficiently to kill all bacteria later on in the process, controlling the microbiological hazard on delivery is not critical, but carrying out the heating step correctly is vital. Those points in the process, which could, if left uncontrolled, lead to a food safety risk, are called critical control points.

3. Determine the critical limits of CCP Once the critical control points have been identified, then control actions are written so that corrective actions can be rapidly executed if a hazards situation occurs. Precise and clear measures and targets should be defined and documented, for every critical point. E.g.: the minimum time and temperature for cooking the food in order to kill all bacteria. The actions taken will obviously on the situation.

4. Establish the monitoring methods for each CCP The control measures are then monitored at an interval that ensures daily control of critical processes. Monitoring in food service relies on various temperature measurements. Daily audits to ensure equipment is set-up and functioning correctly, hygiene was completed satisfactorily, and that food safety policies have been followed, e.g. proper food storage and labeling, are also examples of how critical control points are monitored. The frequency of monitoring depends on the level of risk. It is recommended that the monitoring results are recorded.

5. Establish a registration and documentation system. Keeping records of all monitoring results and procedures is helpful to ensure and to show that you have taken all reasonable precautions to minimise risks. Good documentation endorses the quality of your work.

6. Establish the corrective actions for each CCP For all critical control points, pre-planned corrective measures should be defined if the control criteria are not met. Action should be taken to correct the situation. E.g. if the food was not cooked well enough it should be cooked again, or thrown out. The procedures to regularly measure the control points as well as the responsible person for each task need to be defined.

7. Describe the routines for verification of the HACCAP and the CCP systems Things can change and a food safety system needs to be kept up-to-date. Audits, microbial testing, review of documents, evaluating employee training are all methods that can be used to verify that the HACCP system is working and comprehensive. You should regularly review whether your procedures are still being followed, are working properly, and are stringent enough to ensure safety.

Section 4. HACCP Plan

How to Setup a HACCP Plan

The steps of setting up a HACCP Plan

1. compose a HACCP team
2. Define the scope of study
3. Define the hazards
4. Describe the product composition
5. Describe the target consumer and the use of the product
6. Design process flowcharts
7. Verify the process flowcharts
8. Identify all hazards (physical/chemical/microbiological)
9. List the preventive measures for each hazard
10. Identify the critical control points (CCP)
11. Determine the critical limits
12. Establish the monitoring methods for each CCP
13. Establish the corrective action routines
14. Training of operators in food hygiene and HACCP
15. Describe the routines of verification
16. Establish a registration and documentation system
17. Describe the routines of verifying the HACCP system

Section 5. HACCP Team

How to compose a HACCP Team

Step 1 Compose a HACCP team

The team should be multi-disciplinary and comprise the following:

- Process technology
- Product development
- Technical service/maintenance
- Quality control
- Microbiology

The team has to be composed by individuals of the correct level, i.e. in close contact with the production. The team will promote a more rapid collection of knowledge and decision-making, and ensure that commitment will be provided by all parties involved. A chairman and secretary should be chosen to ensure documentation from all meetings. The team should be trained in HACCP methodology.

Step 2 How to define the scope of the study.

Determine which products and processing activities will be covered by the HACCP plan.
Avoid taking more than one for the first study.

Determine the responsibility of the company and make an overview of the chosen process with regard to its position in the food chain.

Section 6. Hazards

Step 3 Identify and define the Hazards

Define all the potential hazard categories and determine if there are any indications which will point out special hazards. These can be new hazards, not traditionally considered, or a company policy that a particular hazard should be restricted in the products. This will then affect the level of hazard determination in the study. A food safety hazard is anything that affects the safety and quality of food and could endanger the health of a consumer. A hazard can originate in the ingredients, the production process or the final product itself.

Every business will have different hazards depending upon the foods produced, prepared, or sold, and every operator will have to identify their particular hazards and assess the risk they present. It is useful to create a diagram of the various stages and steps in the flow of products in your operation this will help you to carry out a systematic analysis.

If you are uncertain of the hazards and risks associated with your business, you are strongly advised to take specialist advice.

Section 7. Product composition

Step 4 Describe the product composition

This will include:

- Composition
- Process conditions
- Packaging
- Physical /chemical/ microbiological characteristics of raw material finished products
- Storage conditions

- Shelf-life
- Distribution
- Common complaints

Section 8. The consumer and product use and flowchart, and the Target consumer and product use and flowchart

Step 5 Identify target consumer and the product's use.

How will the product be prepared/eaten/used normally?

Who are the target consumers?

What kinds of abuse can be performed?

Are there any potential hazardous treatments which are beyond the producers control?

Step 6 Design the process flowcharts.

The flowcharts shall describe the process and the raw material handling.

A detailed flowchart shall be designed for all the details in each process step and other important parameters, such as temperatures in environment and product, and process flow times.

Step 7 Verify the process flowchart.

Inspect all the steps on site during production.

Investigate all the different aspects of production deviations. Try to cover the starting up and closing down conditions and also the cleaning regimes. If possible, use video documentation.

Section 9. Hazards identify and prevent

Step 8 List all the hazards for each step in the process, avoid hypothetical hazards. There are three main groups of (contamination) hazards that may arise in connection with food:

- Micro-biological hazards micro-organisms that can cause food poisoning
- **Chemical hazards** chemicals such as cleaning materials and pest baits
- **Physical hazards** foreign matter such as glass, metal, plastic etc.

Hazardous situations will mostly occur where:

- food can become contaminated by bacteria, chemicals or foreign matter
- bacteria can grow (e.g. if food is kept too long under wrong conditions)
- bacteria survive a process which should normally remove or kill them (e.g. cooking at too low temperature, or inadequate cleaning and disinfection)

Step 9 List the preventive measures for each hazard.

Remember that the preventive measures are aimed against the development of hazards. This is the normal system used for control.

Avoid final control thinking!

Section 10. Managing Critical Control Points

Step 10 Identify the critical control points (CCP)

Use a decision tree to identify the critical control points. Make sure of other instruments for sorting hazards (leveling of severity and probability)

Step 11 Determine the critical limits.

Determine the critical limits with possible tolerances of each CCP. Be prepared to introduce new investigations in order to determine what is acceptable or unacceptable.

Step 12 Establish the monitoring methods for each CCP Determine the types of methods to monitor the development of hazardous conditions in the process. Decide the frequency of monitoring. The operators will need training to make correct observations and recordings.

Section 11. Corrective Action and training

Step 13 Corrective Action

Who shall act?

When to act?

How to act?

There is often a need for different levels of the corrective actions.

Short term actions to save the process and long term actions to avoid repetitions of deviations must be implemented.

Step 14 Training of operators in food hygiene and HACCP.

Training is vital for the implementation of the HACCP.

Section 12. Routine Verification and Documentation

Step 15 Describe verification routines Verification routines must be established, regularly checking the CCP monitoring system and all the preventive measures. This can be done by internal audits, final control testing, and validations of critical limits.

In addition the HACCP plan should also verified by an external party.

Step 16 Establish a registration and documentation system

It is obligatory to register the deviations found during the CCP monitoring and it is also worthwhile documenting the corrective actions and correct monitoring result.

Step 17 Describe the routines of verifying the HACCP system
These will ensure that the plan and system will function after any changes.

Credits

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