

HEALTH & FOOD
TECHNOLOGY
HIGHER

FOOD PRODUCT
DEVELOPMENT

BOOK 6

HACCP & THE
PRESERVATION OF
FOOD



Stages of HACCP

Advantages of the HACCP system

The stages of manufacture and HACCP

Hazard analysis critical control point (HACCP)

This is a **FOOD MANAGEMENT SAFETY SYSTEM** which considers the following stages

1. Conduct a hazard analysis
2. Decide on the critical control points
3. Establish a tolerance level
4. Establish a monitoring system
5. Establish what action should be taken to correct the hazard if it occurs
6. Establish procedures to check that the HACCP system works effectively
7. Record keeping and review of procedures

<p><u>1. Conduct a hazard analysis</u></p>	<p>Potential hazards associated with a food, and measures to control those hazards, are identified during hazard analysis. Hazards could be:</p> <p>(a) <i>Contamination of various types</i></p> <ul style="list-style-type: none"> • Biological such as bacteria, moulds, viruses • Chemical such as cleaning chemicals or pesticides • Physical such as foreign bodies like glass, pests, metal. <p>(b) <i>Temperature control during storage</i></p> <p>Bacteria and mould will multiply in foods if they are stored at higher temperatures than recommended or are left in warm conditions for too long.</p> <p>(c) <i>Inadequate cooking</i></p> <p>If food has not had sufficient cooking time or has not reached the correct temperature then bacteria may survive.</p> <p>Personal hygiene, cleaning and disinfecting of equipment, waste disposal and pest control are important at each step of HACCP. By identifying the stages where potential hazards might occur, controls can be put in place which can prevent bacterial growth or contamination.</p>
<p><u>2. Decide on the critical control points</u></p>	<p>These are the points in food production – from its raw state through processing and distribution to the consumer – at which the potential hazard can be controlled or eliminated. At each step of production there are likely to be several hazards. The points at which these hazards must be controlled to ensure food safety should be considered as critical points.</p> <p>If a failure to control any hazard at this point could cause food poisoning or a serious food complaint (e.g. glass in food), then</p>

	<p>this step is called a critical control point and the hazard must be controlled or eliminated. Another example of a critical control point would be temperature control with a high-risk food such as chicken, where food safety would be maintained by keeping temperatures below 5°C.</p> <p>If the hazard does not carry a food-poisoning risk, then good hygiene practice at this step should be sufficient to ensure good food safety – this is called a control point</p>
<p>3. Establish a tolerance level</p>	<p>Controls must be implemented to eliminate the hazard or to reduce it to a safe level. This stage establishes preventative measures with critical limits for each control point. For a cooked food, for example, the control might include setting the minimum cooking temperature and time required to ensure the elimination of food-poisoning bacteria.</p>
<p>4. Establish a monitoring system</p>	<p>Procedures must be established to monitor the steps. Monitoring involves checking to make sure that controls are effective and that they are being implemented throughout food production. Such procedures might include determining how and by whom cooking time and temperature should be monitored. Time and temperature are two very important factors which are precise and relatively easy to monitor.</p> <p>Examples of monitoring include:</p> <ul style="list-style-type: none"> • Checking the temperature of the refrigerator frequently. • Checking that staff wash their hands on entering the food preparation area. • Checking that the core temperature of a joint of meat reaches 75°C. • Checking that all equipment has been thoroughly cleaned and disinfected.
<p>5. Establish what action should be taken to correct the hazard if it occurs</p>	<p>When monitoring has revealed a problem or when a complaint is received, then action to correct the hazard must be taken (corrective action).</p> <p>Some examples of corrective action include:</p> <ul style="list-style-type: none"> • Disposing of food if minimum cooking temperature has not been met. • Rejecting out-of-date stock.

<p>6. Establish procedures to check that the HACCP system works effectively</p>	<p>An example of this could be a testing time and temperature recording device to verify that a cooking unit is working properly</p>
<p>7. Record keeping and review of procedures</p>	<p>This would include records of hazards and their control, the monitoring that has taken place and any action taken to correct potential problems. Documentation of the system is not a legal requirement but detailed and accurate documentation will assist a defence of 'due diligence' in the event of a prosecution.</p> <p>A review of procedures may be required if:</p> <ul style="list-style-type: none"> • The product or the controls are not satisfactory. • The method of preparation changes. • New equipment is introduced.

Advantages of the HACCP system

- Hazards are identified and controlled before production and at each stage of the process from raw materials through to the sale of the product. This should result in safe food for consumers so that they are not put at risk.
- Many food-poisoning incidents result from poor practices that are only discovered after an outbreak. By identifying hazards, the likelihood of such problems would be reduced.
- It ensures that food companies do not break the law and face prosecution.
- It helps food companies compete more effectively in the world market.
- Record keeping allows investigators to see how well a firm is complying with food safety laws.

Stages of manufacture and HACCP

The stages of manufacture involved in food production will vary according to the final food product. A basic outline of the stages involved in food production is given below and on the following pages.

All these stages have to be closely looked at for potential hazards using the HACCP system.

1. Purchase of ingredients
2. Delivery of ingredients
3. Storage of ingredients
4. Preparation of ingredients
5. Cooking of ingredients
6. Chilled storage
7. Packaging
8. Distribution

Stage	Importance of HACCP to each stage
1. Purchase of ingredients	<ul style="list-style-type: none"> • Raw materials which are purchased may contain harmful foreign bodies, e.g. flour could contain weevils • High-risk foods, such as fish, meat or cream, can present a hazard to health as they could be contaminated by bacteria • Ingredients should be purchased from a reputable supplier to guarantee quality and safety
2. Delivery of ingredients	<p>Checks should be in place to ensure that high-risk foods are delivered at temperatures between 0 and 4°C</p> <ul style="list-style-type: none"> • Check temperature and condition of delivery vehicle • Date marks of dry stores/fats should be checked to ensure that there is sufficient time remaining for them to be used safely

3. Storage of ingredients	<p>Checks should be in place to ensure that high-risk foods such as chicken or cream are stored at temperatures between 0 and 4°C to prevent bacterial growth</p> <ul style="list-style-type: none"> • Dry stores should be stored in a cool place and in sealed containers • Stock rotation system should be used to ensure that the FIFO (First In First Out) system applies • Use foods within the date mark • Containers should be sealed, to prevent the entry of pests, and labelled • Storage areas should be kept clean and free from dust and food debris that could attract pests • Raw and cooked ingredients should be kept separate to prevent cross-contamination
4. Preparation of ingredients	<p>Food handlers should follow strict food hygiene rules to avoid possible contamination of ingredients, by wearing protective clothing.</p> <p>Equipment must be well cleaned and maintained to prevent possible contamination from equipment</p> <ul style="list-style-type: none"> • Work surfaces and areas must be kept clean to avoid possible cross-contamination • Limit handling times during preparation especially of high-risk foods • Check no foreign bodies have entered the food during preparation as these could cause the consumer to choke, e.g. fish bones
5. Cooking of ingredients	<p>Cooking times and temperatures must be ingredients checked</p> <ul style="list-style-type: none"> • Products must be thoroughly cooked to destroy bacteria • Routine temperature checks using food probes to check that core temperatures reach at least 75°C at centre
6. Chilled storage/ cooking	<p>Cooked food must be cooled or chilled cooling rapidly so that the danger zone is quickly passed through to prevent the growth of harmful bacteria</p> <ul style="list-style-type: none"> • High-risk foods such as cream must be refrigerated at between 0 and 4°C immediately after preparation • There should be no contact with raw food, to prevent cross-contamination

<p>7. Packaging</p>	<ul style="list-style-type: none"> • Packaging should be sealed to protect food from contamination or physical contamination • Packaging may have to withstand chilling temperatures without breaking up when refrigerated • Packaging should be labelled to indicate how the product should be stored safely before eating
<p>8. Distribution</p>	<ul style="list-style-type: none"> • High-risk food or cook-chill foods should be distributed to retail outlets in a refrigerated vehicle at between 0 and 4°C • Temperature of vehicle should be checked and recorded before food is loaded into it at the factory and removed from it before unloading to the retailers