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Highfield Training Presentation

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3 June 2020

quality, value, service & integrity

Level 4 HACCP

Hazard Analysis and Critical Control Point

INTERACTIVE Version

Ed. 1 February 15

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Ground rules

- Fire escapes
- Toilets
- Smoking
- Confidentiality
- Breaks
- Respect others' point of view
- Timekeeping
- Getting involved
- Homework.

Ground rules

As a courtesy to others please set your mobile phone to SILENT MODE.

NEXT

Key to Highfield Presentations

Class Question	Individual Exercise	Key Point KEY POINT
Law 	Group Exercise	Class Exercise
Definition	Handouts HO	Guidance document Guidance Document

The last point on a slide is denoted by NEXT

NEXT

Please select a module…

Module Guide

NEXT

Module

Course introduction

NEXT

Timetable 5 day course

TIME	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
09:00	Course introductions Module 1: Introductory review	Review of day 1 Module 5: Principles of HACCP Module 6: Step 1: The HACCP team	Review of day 2 Module 10: Critical limits Module 11: Monitoring	Review of day 3 Module 14: Verification, validation and review	Review of day 4 Module 16: Maintaining HACCP
10.30					
10.45	Module 1: Introductory review (continued) Module 2: HACCP and legislation	Module 7: CODEX steps 2-5	Module 12: Corrective action	Module 14: Verification, validation and review (continued)	HACCP case study review Critical analysis of HACCP study
12.45					
13.30	Module 3: Preparing for HACCP Module 4: Prerequisite programmes	Module 8: Hazard analysis	HACCP case study review	HACCP case study review	Examination
15.00					
15.15	Module 4: Prerequisite programmes (continued)	Module 9: Critical control points	Module 13: Implementation	Module 15: HACCP documentation	
17.15	CLOSE	CLOSE	CLOSE	CLOSE	CLOSE.

Aims of the course

To improve the management and food safety skills of candidates

To be interesting, informative and enjoyable.

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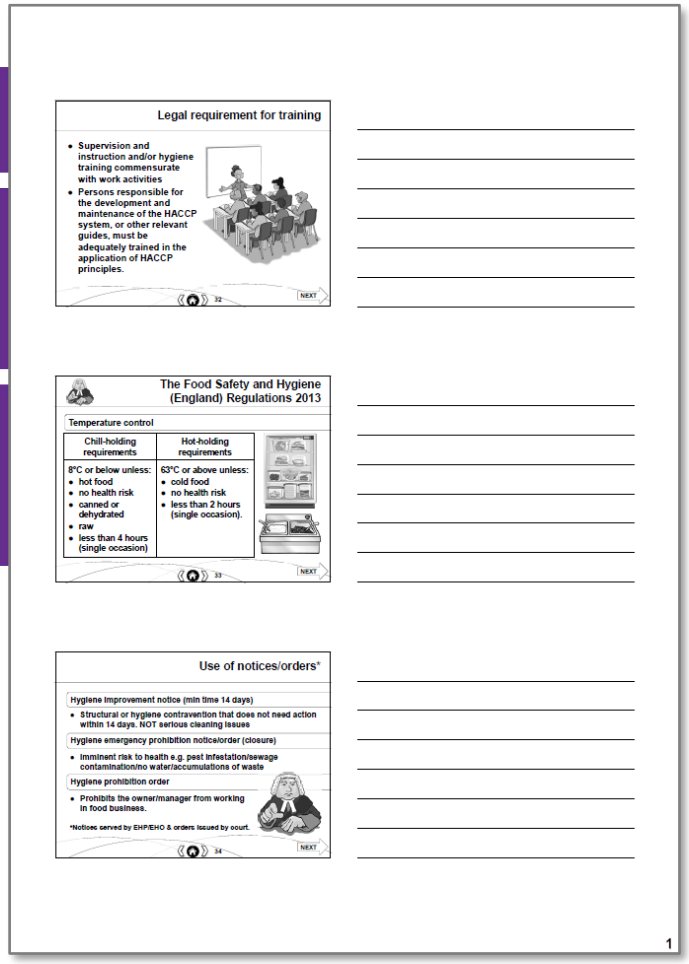
Course learning outcomes

By the end of this course you will be able to:

- Explain the importance of HACCP based food safety procedures
- Manage the implementation of HACCP based food safety management procedures
- Evaluate HACCP based food safety management procedures.

Course materials: PowerPoint ‘Thumbs’

- 3 slides to a page
- Space for you to write additional notes
- Some text removed where there are questions or activities.



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Course materials: PowerPoint

Included activities

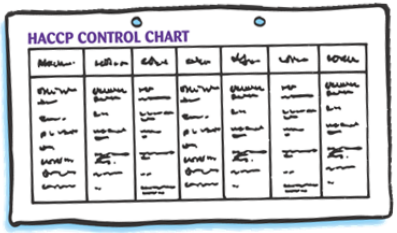
Can be shown in presenter view.

What is a HACCP plan?

Codex

A HACCP plan includes:

- Process flow diagram
- HACCP control charts.



'A document prepared in accordance with the principles of HACCP to ensure control of hazards which are significant for food safety in the segment of the food chain under consideration'

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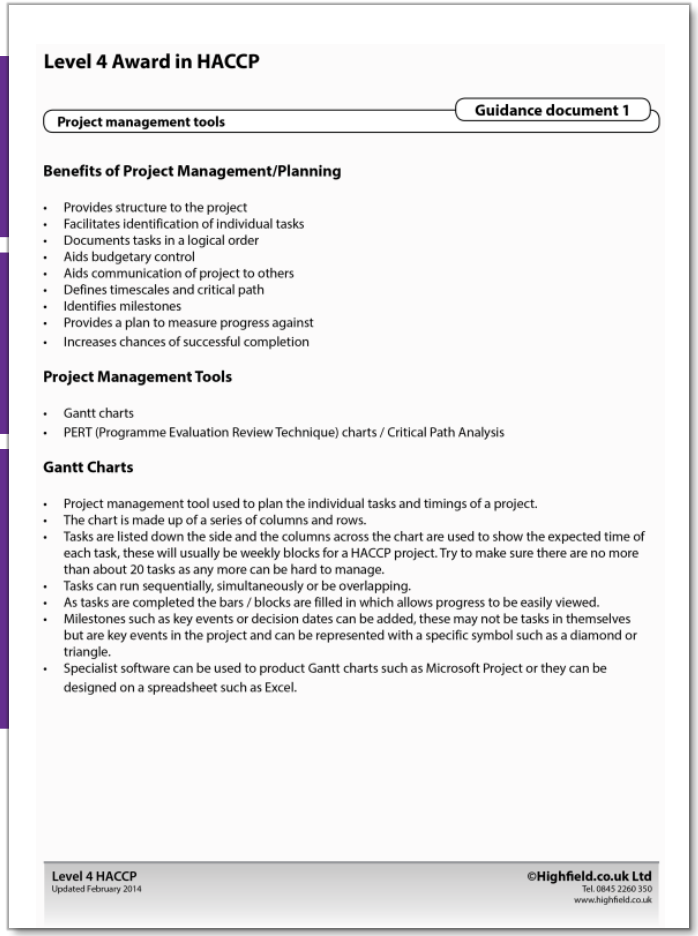
Guidance Document 1

Course materials: additional guidance notes

- Additional notes intended to supplement the text book
- Provide additional supplementary information
- Not required for the examination, but provide underpinning background knowledge



Level 4 Award in HACCP

Project management tools — Guidance document 1

Benefits of Project Management/Planning

- Provides structure to the project
- Facilitates identification of individual tasks
- Documents tasks in a logical order
- Aids budgetary control
- Aids communication of project to others
- Defines timescales and critical path
- Identifies milestones
- Provides a plan to measure progress against
- Increases chances of successful completion

Project Management Tools

- Gantt charts
- PERT (Programme Evaluation Review Technique) charts / Critical Path Analysis

Gantt Charts

- Project management tool used to plan the individual tasks and timings of a project.
- The chart is made up of a series of columns and rows.
- Tasks are listed down the side and the columns across the chart are used to show the expected time of each task, these will usually be weekly blocks for a HACCP project. Try to make sure there are no more than about 20 tasks as any more can be hard to manage.
- Tasks can run sequentially, simultaneously or be overlapping.
- As tasks are completed the bars / blocks are filled in which allows progress to be easily viewed.
- Milestones such as key events or decision dates can be added, these may not be tasks in themselves but are key events in the project and can be represented with a specific symbol such as a diamond or triangle.
- Specialist software can be used to product Gantt charts such as Microsoft Project or they can be designed on a spreadsheet such as Excel.

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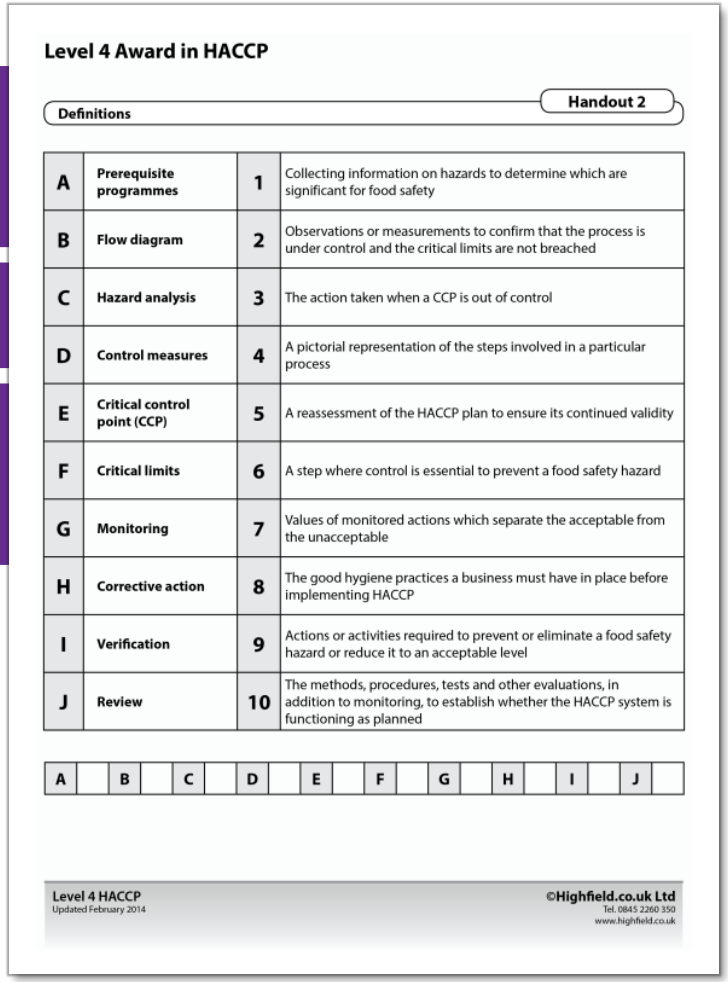
Handouts

- May be group or individual activities
- Allow for practice
- Usually short exercises to establish understanding



Level 4 Award in HACCP

Definitions — **Handout 2**

A	**Prerequisite programmes**	1	Collecting information on hazards to determine which are significant for food safety
B	**Flow diagram**	2	Observations or measurements to confirm that the process is under control and the critical limits are not breached
C	**Hazard analysis**	3	The action taken when a CCP is out of control
D	**Control measures**	4	A pictorial representation of the steps involved in a particular process
E	**Critical control point (CCP)**	5	A reassessment of the HACCP plan to ensure its continued validity
F	**Critical limits**	6	A step where control is essential to prevent a food safety hazard
G	**Monitoring**	7	Values of monitored actions which separate the acceptable from the unacceptable
H	**Corrective action**	8	The good hygiene practices a business must have in place before implementing HACCP
I	**Verification**	9	Actions or activities required to prevent or eliminate a food safety hazard or reduce it to an acceptable level
J	**Review**	10	The methods, procedures, tests and other evaluations, in addition to monitoring, to establish whether the HACCP system is functioning as planned

A		B		C		D		E		F		G		H		I		J	

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Practical exercise: designing a HACCP plan

Stage1

- Nominate a team leader
- Agree HACCP plan terms of reference and scope of study
- Describe product
- Prepare a process flow diagram

Stage 2

- Conduct a hazard analysis
- Identify potential hazards
- Assess the significance of the hazards
- Identify controls for each significant hazard

Stage 3

- Identify CCPs
- Use the CCP decision tree and team judgement to identify CCPs

Stage 4

- Control the CCPs
- Establish critical limits and target levels for each CCP
- Establish monitoring procedures
- Establish appropriate corrective action procedures and responsibilities.

Module

Introductory review

Module 1

NEXT

Why do food businesses need an effective food safety management system?

- Protect health
- Comply with legislation/ due diligence
- Fulfil moral obligations
- Avoid poor media coverage
- Protect brand image
- Meet customer concerns.

Can you add any more reasons?

Does HACCP guarantee food safety?

What are the benefits of HACCP?

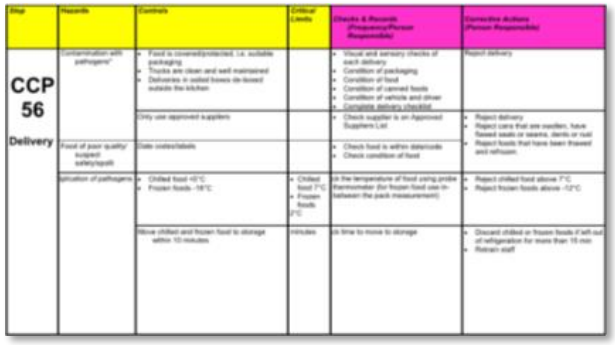
- ✓ Prevents food safety incidents
- ✓ Proactive not reactive
- ✓ Structured and systematic
- ✓ Focuses on the critical food safety areas
- ✓ Recognised internationally (Codex)
- ✓ Shows legal compliance and due diligence
- ✓ Provides training aid involving all food handlers
- ✓ Ensures customer/enforcer/consumer confidence
- ✓ Safety introduced in product development.

What are the limitations of HACCP?

- Management tool that requires correct application
- Requires full and sustained commitment from the management and workforce
- Requires a good understanding of the HACCP methodology and principles
- Needs to be implemented and maintained.

Failure of HACCP

- Poor hygiene practices/inadequate prerequisites
- Lack of management commitment
- Externally imposed
- Lack of resources
- Too complex
- Lack of knowledge/training
- Poor records/too much paperwork
- System sits in manager's office
- Too many critical control points.



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What is the Codex 12 step logic sequence for the application of HACCP?

1. Assemble HACCP team
2. Describe product
3. Identify intended use
4. Construct flow diagram
5. Confirm flow diagram on site
6. List all potential hazards, conduct a hazard analysis, consider control measures
7. Determine CCPs
8. Establish critical limits for each CCP
9. Establish a monitoring system for each CCP
10. Establish corrective actions
11. Establish verification procedures
12. Establish documentation and record keeping.

What are the definitions of…?

Using handout 2, match the term to the definition

What are the definitions of…? Answers

Using handout 2, match the term to the definition

A	8	B	4	C	1	D	9	E	6
F	7	G	2	H	3	I	10	J	5

In summary:

- Designed to control food safety hazards
- Needs to be kept focused and realistic
- Requires commitment and expertise
- Preventive and proactive
- Has limitations and requires effective application.

End of module assessment: module 1

The main reason to develop a food safety management system is to:

A reduce training costs

B prevent prosecutions

C eliminate accidents

D provide safe food.

End of module assessment: module 1

Which of the following is FALSE regarding HACCP?

A It can assist in a due-diligence defence

B It can be applied to both large and small businesses

C It can help to ensure food produced is not contaminated

D It can be used to prevent inspections by enforcement officers.

Module

HACCP and legislation

Module 2

NEXT

Food safety legislation

Acts

Principles of legislation

Regulations

Subordinate legislation to enforce requirements of acts and directives and to facilitate the enforcement of EU regulations

EU directives

Regulations issued by member states

EU regulations

Apply to all member states directly.

Regulation (EC) No 852/2004
Hygiene of Foodstuffs

Food business operators shall put in place, implement and maintain a permanent procedure or procedures *based on* the HACCP principles:

a) identify hazards
b) identify the critical control points (CCPs)
c) establish critical limits
d) establish and implement monitoring at CCPs
e) establish corrective actions
f) establish verification procedures
g) establish documentation and records
h) review after any modification to the product, process, or any step, and make the necessary changes to it.

Regulation (EC) No 852/2004
Hygiene of Foodstuffs

Food business operators shall:

- **provide the competent authority with evidence of compliance taking account of the nature and size of the food business;**
- **ensure that any documents are up-to-date at all times;**
- **retain any other documents and records for an appropriate period.**

Only applies to food business operators carrying out any stage of production, processing and distribution of food after primary production.

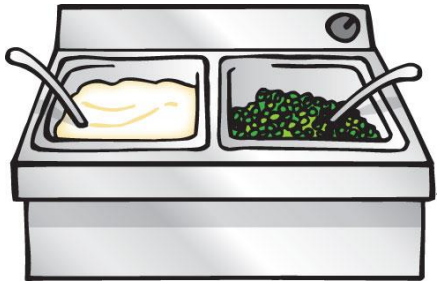
Legal requirement for training

- **Supervision and instruction and/or hygiene training commensurate with work activities**
- **Persons responsible for the development and maintenance of the HACCP system, or other relevant guides, must be adequately trained in the application of HACCP principles.**

The Food Safety and Hygiene (England) Regulations 2013

Temperature control

Chill-holding requirements	Hot-holding requirements
8°C or below unless: • hot food • no health risk • canned or dehydrated • raw • less than 4 hours (single occasion)	63°C or above unless: • cold food • no health risk • less than 2 hours (single occasion).



Use of notices/orders*

Hygiene improvement notice (min time 14 days)

- **Structural or hygiene contravention that does not need action within 14 days. NOT serious cleaning issues**

Hygiene emergency prohibition notice/order (closure)

- **Imminent risk to health e.g. pest infestation/sewage contamination/no water/accumulations of waste**

Hygiene prohibition order

- **Prohibits the owner/manager from working in food business.**

***Notices served by EHP/EHO & orders issued by court.**

Due-diligence defence

Due-diligence defence (The Food Safety and Hygiene (England) Regulations 2013): Prove that all reasonable precautions were taken and all due diligence exercised to avoid the offence

Using HACCP for due diligence:

- **Reasonable precaution**
  - **The presence of a food safety management system based on HACCP principles**
- **Due diligence**
  - **Being able to illustrate the effective implementation of the food safety management system**
- **Importance of accurate records which are signed off.**

Codes of practice

Statutory codes of practice are issued by ministers to assist enforcement authorities with the execution and enforcement of food law

- **Assist in producing a uniform standard of enforcement**
- **Can be used as evidence in a prosecution**
- **Suggest best practice for compliance with regulations**

Examples:
The Food Law Code of Practice – must have regard to
The Food Law Practice Guidance – may have regard to.

NEXT

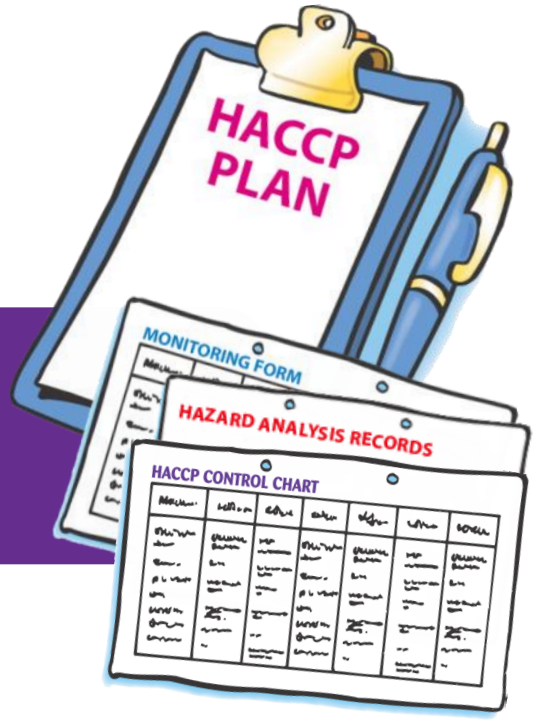
National (Industry) Guides to Good Hygiene Practice

- Practical guides on compliance
- Trade associations offer guidance
- Ensures consistency
- Court will have regard to acceptable alternatives
- EHP/EHO must have regard to guides during inspections.

Enforcement

- Food Standards Agency
- Food authorities (local authorities)
- Authorised officers

Managers should get all records ready for inspection/audit.



Enforcement

Environmental health practitioner (EHP/EHO)

- Have power of entry to inspect food/premises at any reasonable time
- Can take informal action
- Provide advice/training/letters/leaflets
- Serve notices
- Have the power to close
- Have the power to seize/detain food
- Can instigate prosecution
- Have the power to seize records

Trading standards officer (TSO)

- Concerned with composition, labelling, weight/volume and adulteration.

Authorised officers (EHPs/EHOs)

Their duties include dealing with:

- Food premises and inspections
- Food poisoning
- Food complaints
- Food hygiene training
- Food alerts
- Planning applications
- Licensing applications
- ‘Home authority’
- Local business forums etc.

NEXT

Food law code of practice/guidance for inspection

Prior to the inspection

- Premises' history
- Time
- Equipment
- Protective clothing
- Additional expertise.

NEXT

Food law code of practice/ guidance for inspection

Frequency of inspection

- Type of premises
- Nature of food
- Degree of handling
- Size of business
- Type of customer
- Current level of compliance
- Confidence in management
- History of compliance
- Control systems in place.

Flexibility and HACCP

Food safety management system (FSMS) *based on* HACCP principles

Regulation allows flexibility – commensurate with the size and nature of the business

FSMS based on HACCP can range from:

Very simple systems ⟷ **'Full blown' Codex HACCP**

From simple, pre-validated sensory critical limits e.g. takeaway, to extensive trials and automated monitoring e.g. canning.

NEXT

Create a list of the different FSMS you might see in different types of businesses

- Codex HACCP
- ISO 22000
- Process led HACCP
- Specific hazards only
- Generic controls applied
- Good hygiene practice and HACCP, for example ‘CookSafe’
- Sensory observation/supervision, for example ‘Safer food, better business’
- Pre validated HACCP and colour.

HACCP and Safer food better business (SFBB)

SFBB – Small catering businesses

Safe methods – 4Cs + management

Diary + records

- Avoids HACCP jargon
- Uses generic controls
- GHP + HACCP
- Craft skills/sensory tests
- Exception recording.

HACCP and Safer food better business (SFBB)

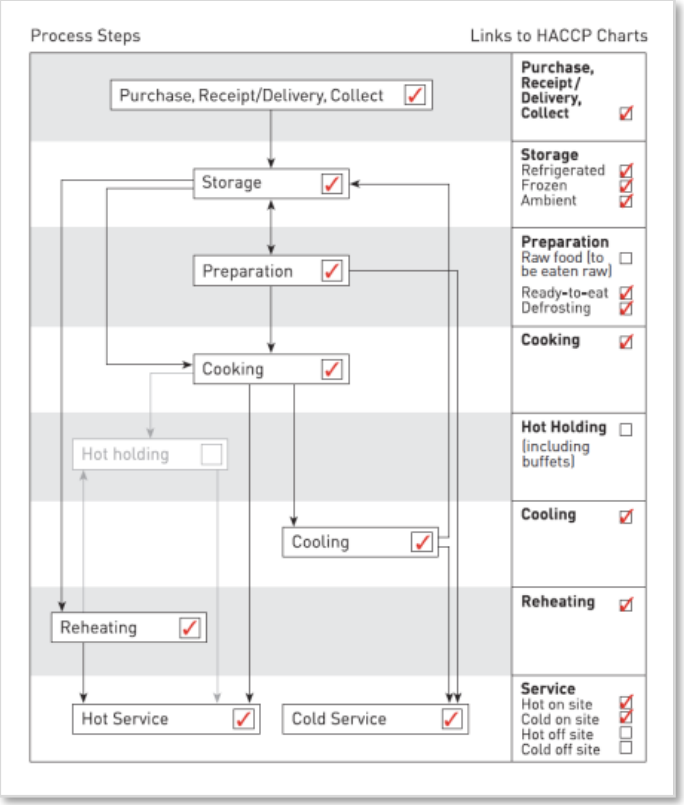
- Some dishes and processes not included
- New safe methods must be developed for these if carried out by the business
- Exceptions and corrective action must be recorded
- Daily use of probe and temperature records not required, but will enhance controls and due-diligence defence
- Probe used for validation of methods which are not standard.

CookSafe food safety assurance system (Scottish model)

Developed for the FSA (Scotland)

Contains:

- **Pre-prepared hazard analysis and CCP management information**
- **HACCP charts**
- **Information on flow diagrams**
- **House rules.**



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Contains

- Colour-coded processes and corresponding charts
- Completed hazard analysis for a variety of catering operations
- Monitoring forms
- Details on prerequisite programmes
- Food safety information
- Advice on controlling hazards.

HACCP certification schemes:

- A quality management system
- Focuses on consistency of the product/process against the original specification
- Initial specification must be correct
- Synergy and benefit in using the approach of ISO 9001:2008 to manage HACCP
- All clauses have relevance to HACCP
- Provides a formalised method of maintaining HACCP.

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HACCP certification schemes: ISO 22000 2005

- Greater focus on prerequisite programmes and operational prerequisite programmes (OPRPs)
- Defines some terms differently from Codex
- Uptake in UK likely to be driven by retailers
- Greater uptake outside EU

Uses 3 categories of control measures:

1. Infrastructure and maintenance prerequisite programmes
2. Operational prerequisite programmes
3. The HACCP plan – showing the CCPs.

HACCP certification schemes: Operational prerequiste programmes

- **New term introduced with ISO 22000**

Identified from hazard analysis as essential to control the likelihood of introducing food safety hazards

ISO22000 (2005)

Activities that are associated with a particular process step and which manage significant hazards identified during hazard analysis

Campden BRI Guideline no.42 (2009).

What are the advantages and disadvantages of HACCP certification schemes?

Advantages

- Independent review
- External benchmarking
- Increases confidence in system and of HACCP team
- Forms part of the operations verification activities
- ‘Expert’ opinion
- Forces internal maintenance of the HACCP system
- Contributes to legal defence
- Possible marketing tool.

What are the advantages and disadvantages of HACCP certification schemes?

Disadvantages

- Can lead to complacency
- Dependent on competence of certificating body and individual auditor
- May compromise confidentiality
- Potential inconsistency between schemes and auditors within same scheme
- Can reduce the accountability felt by operation
- Varying standards
- Significant cost
- Based on a snapshot view
- Requires significant sector expertise.

In summary:

- Legislative pressure for HACCP increased
- Legislation includes much flexibility
- An effective HACCP system will make a significant contribution to a due-diligence defence
- Certification schemes available – pros and cons
- ISO 22000:2005 provides international standard for food safety management.

End of module assessment: module 2

Which of the following is a legal requirement for a food business regarding HACCP?

A Ensure all staff have a formal HACCP qualification

B Identify critical control points

C Review the system on a six monthly basis

D Ensure compatibility with certificate schemes.

End of module assessment: module 2

HACCP systems need to be flexible to suit the diversity in the food industry. Which is the most significant difference of manufacturing from catering?

A Largely consistent processes with long production runs

B Short production runs, variety within each batch

C Low throughput, regular variance of raw products

D Mainly a process of preparation and sensory observation.

Class Exercise

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Module

Preparing for HACCP

Module 3

NEXT

Management commitment

- **Essential to have full commitment of management and workforce before HACCP begins**
- **Food safety policy documents and communicates commitment**
- **HACCP needs to be recognised as *the* most effective way of managing food safety.**

NEXT

Management commitment

Senior management must take food safety seriously and understand:

- **The long-term food safety objectives**
- **What HACCP is and what it does**
- **What's involved**
- **The benefits**
- **Realistic timescale**
- **Resources required.**

NEXT

Gaining senior management commitment

a) Design a brief for senior management to gain their commitment to the HACCP project.

How would you structure it?

What would you emphasise?

- Need for HACCP (moral, legal, economic)
- Brief outline of how it will be carried out (timing, resources, costs)
- Benefits to the business once completed.

Gaining senior management commitment

b) Consider the possible objections. How would you counter these?

- Releasing the required resources to do HACCP properly will pay dividends in the long-term
- Budget – should not require much capital expenditure, but rather people's time
- Training – investing in workforce enables the project to be completed accurately and more effectively
- Time – required to complete correctly; there is no quick fix, which would only be a short-term gain and require correcting at a later stage
- External expertise – makes a more robust system with evidence to show customers/enforcers/accreditation that we are committed to producing safe products.

Planning the HACCP project

Stages of HACCP development:

1. **Planning and preparation**
2. **HACCP study and plan development**
3. **Implementation**
4. **Verification and maintenance**

Consider:

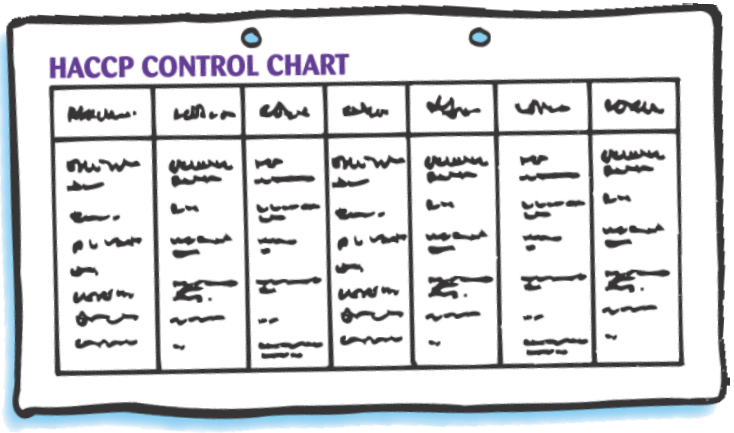
- **starting point**
- **size of task**
- **resources**
- **prioritising activities**
- **completion.**

What is a HACCP plan?

Codex

A HACCP plan includes:

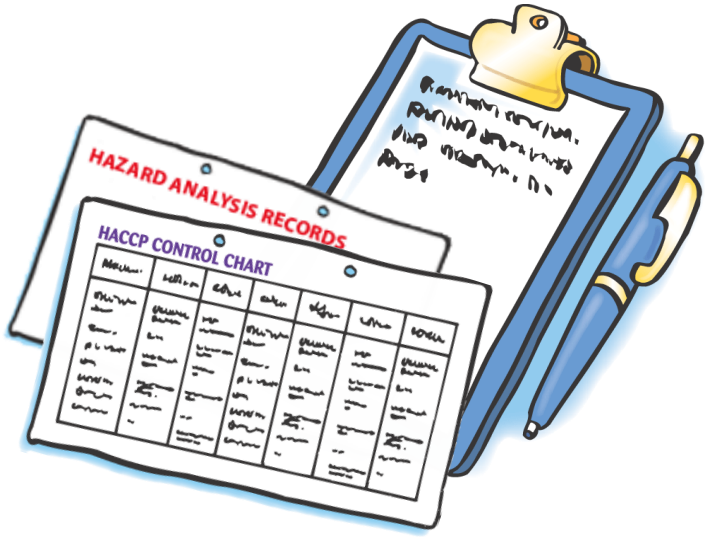
- **Process flow diagram**
- **HACCP control charts.**



'A document prepared in accordance with the principles of HACCP to ensure control of hazards which are significant for food safety in the segment of the food chain under consideration'

Other documents within HACCP

- Scope and terms of reference
- Details of team members
- Product description
- Process description
- Details of supporting PRPs
- Hazard analysis records
- CCP decision tree records/justifications
- Minutes from HACCP team meetings
- HACCP amendment forms
- Evidence for decisions
- Validation and verification plans and records.



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In summary:

- HACCP requires initial and on-going management commitment
- Planning the HACCP project is a valuable investment of time
- There are distinct stages to a HACCP project
- The HACCP plan is the document that contains the output of the HACCP study.

End of module assessment: module 3

Which of the following is part of the HACCP plan?

A Reports from supplier approval audits

B Validation records

C Process flow diagrams

D CCP monitoring records.

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End of module assessment: module 3

A commercial benefit of having a HACCP system in place is that it:

A is the simplest type of food safety management system

B significantly reduces the training required

C increases confidence of customers

D ensures the quality of all food produced.

Module

Prerequisite programmes

Module 4

NEXT

Prerequisite programmes

What are they?

- Programmes which control site wide, lower risk hazard and underpin the HACCP system

Why are they important?

- Allow HACCP to focus on significant hazards
- Create the correct operational and environmental conditions for production of safe food

What are the common problems?

- Assumed to be in place and effective
- Large quantity of controls to manage.

Prerequisite definitions

Prerequisite (Campden BRI 2009)
The measures that provide the basic environmental and operating conditions in a food operation that are necessary for the production of safe and wholesome food

Prerequisite (WHO 1999)
Practices and conditions needed prior to and during the implementation of HACCP and which are essential for food safety.

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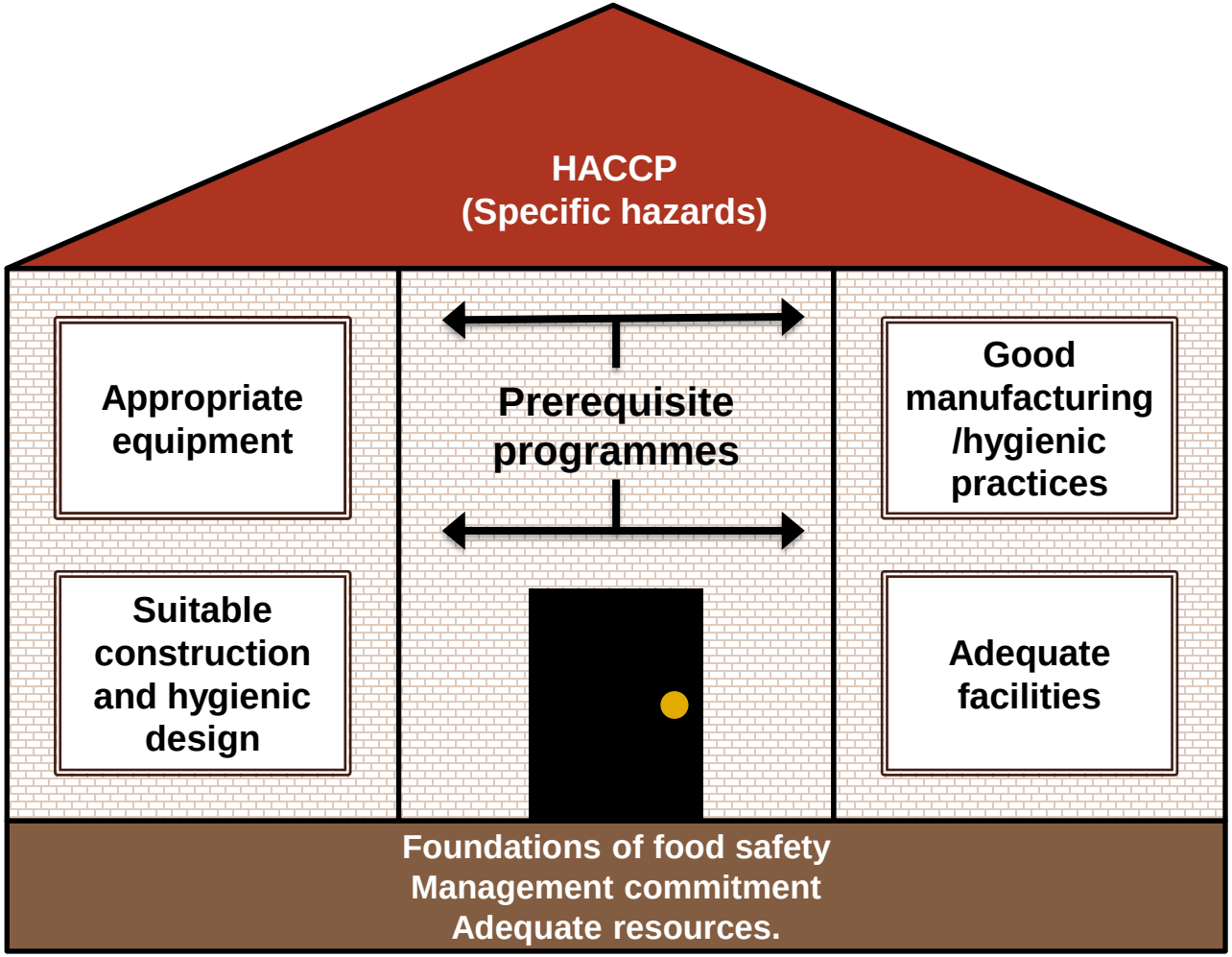
The basis for effective food safety management



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The role of PRPs

- Provide basic operating conditions necessary for the production of safe, wholesome food
- Control the general/site wide, lower risk hazards which may affect all/many areas, products and processes
- Provide a solid foundation for HACCP
- Manage the general/lower risk hazards and allow HACCP to focus on the product/process specific significant hazards
- Reduce the amount of repetition within HACCP
- Enable a simpler, more focused HACCP system.

PRPs

Hazard analysis may identify need for improved PRPs therefore during hazard analysis consider all hazards independent of PRPs in place

May be occasions where hazards normally controlled by PRPs need to be included in HACCP at a specific step

Can be controlled, monitored, recorded and documented separately

PRPs and OPRPs – ISO 22,000.

NEXT

Make a list of prerequisites relating to PREMISES

- Building – location, design, construction, layout (flows) and maintenance
- Equipment – design, construction and installation
- Planned preventative maintenance
- Calibration
- Cleaning and disinfection
- Pest control and management
- Services (e.g. water, air, steam) – provision and maintenance
- Control of chemicals
- Glass and hard plastics control
- Temperature controlled storage
- Waste management.

Make a list of prerequisites relating to PEOPLE

- **Personal hygiene**
- **Medical screening (staff and visitors)**
- **Training and competency**
- **Staff hygiene facilities.**

Make a list of prerequisites relating to PRODUCT

- Supplier approval and management
- Specifications – raw materials and finished products
- Appropriate storage facilities and conditions
- Allergen controls (BRC)
- Traceability and recall
- Incident management
- Good laboratory practice
- Control of non-conforming product
- Product information and usage instructions
- Monitoring of customer/consumer complaints
- Transport supervision.

Supplier approval

- Raw material specifications
- Supplier questionnaires
- List of approved suppliers
- Audit programme
- Codes of practice
- Third party audits
- Audit standards and accreditation
- Performance monitoring
- Relationship building.

Assessing PRPs

Conduct a gap analysis to determine what is in place/required

- Confirm the current situation
- Identify the gaps – utilise a third party standard or industry guide
- Decide how to fill the gaps – prioritise, consider resources and external assistance

PRPs must be validated, enforced, verified, reviewed and available for reference

Verification to test the effectiveness of the systems

- Must be effective to support the HACCP system
- Can be achieved by auditing.

Example PRP gap identification

Process step/area/PRP	Hazard	Control measure	In place YES/NO
Storage of raw material	Microbiological/ chemical or physical contamination from pests	Effective pest management programme	Yes.

NEXT

Example PRP gap identification

Process step/area/ PRP	Hazard	Control measure	In place YES/NO
Personal hygiene	Microbiological or physical contamination from food handlers	Food hygiene training programme	Some, not all, food handlers have attended Level 2 food hygiene courses. Some certificates more than 5 years old. This shows that although some food handlers have attended training it has lapsed and not covered all employees. There is no mention of a competency check. Food handlers should be competent, but they do not need to be certificated. Training and competency checks should be ongoing.

NEXT

In summary:

- Effective PRPs are essential to support the HACCP system
- They enable the HACCP system to focus on significant hazards at specific steps
- PRPs must be documented, validated, monitored, verified and maintained
- Ineffective PRPs can compromise food safety.

End of module assessment: module 4

Which of the following is NOT an example of a prerequisite?

A Pest control measures

B Taking temperatures of chilled products

C Using approved suppliers

D Routine cleaning programmes.

Class Exercise

NEXT

End of module assessment: module 4

If a business has designed and implemented suitable prerequisite programmes it will enable them to:

A concentrate on significant hazards

B maximise the number of critical control points

C reduce the amount of supervision required

D identify corrective actions more effectively.

Class Exercise

NEXT

Module

Principles of HACCP

Module 5

NEXT

The 7 Codex HACCP principles

1. Conduct a hazard analysis

2. Determine the critical control points

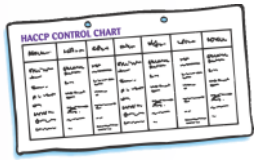
3. Establish critical limit(s)

4. Establish a system to monitor control of the CCP

5. Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control

6. Establish procedures for verification to confirm that the HACCP system is working effectively

7. Establish documentation concerning all procedures and records appropriate to these principles and their application.



NEXT

The Codex 12 step logic sequence for the application of HACCP

1. Assemble HACCP team
2. Describe product
3. Identify intended use
4. Construct flow diagram
5. Confirm flow diagram on site
6. List all potential hazards, conduct a hazard analysis, consider control measures (principle 1)

And then…

The Codex 12 step logic sequence for the application of HACCP

7. Determine CCPs (principle 2)
8. Establish critical limits for each CCP (principle 3)
9. Establish a monitoring system for each CCP (principle 4)
10. Establish corrective actions (principle 5)
11. Establish verification procedures (principle 6)
12. Establish documentation and record keeping (principle 7).

HACCP the big picture

Management commitment

1. Terms of ref/scope
2. Assemble HACCP team
3. Describe product
4. Identify intended use
5. Construct flow diagram
6. Confirm flow diagram on site
7. List all potential hazards, conduct a hazard analysis and consider control measures
8. Determine CCPs
9. Establish critical limits for each CCP
10. Establish a monitoring system for each CCP
11. Establish corrective actions
12. Establish verification procedures *(plus validation & review)*
13. Establish documentation and record keeping
14. Implement.

NEXT

In summary:

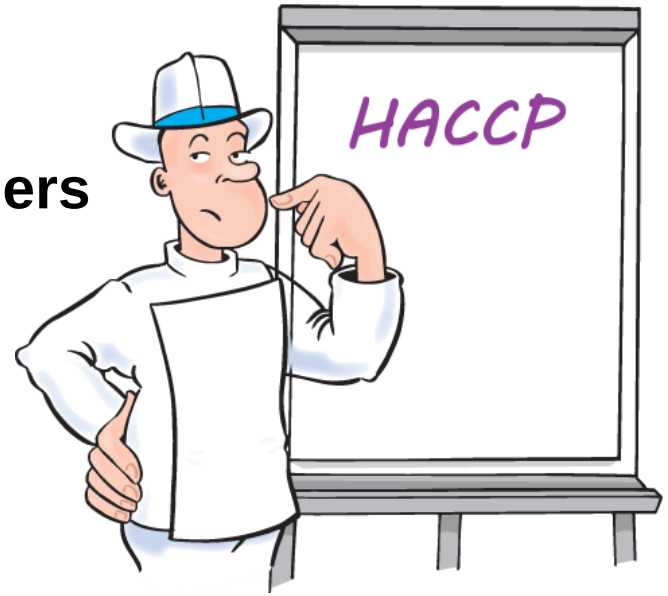
- Principles and steps must be applied correctly and thoroughly for robust HACCP
- Codex principles and steps provide internationally accepted methodology
- Some texts include additional steps/stages
- Other activities such as implementation and maintenance are also required.

NEXT

Planning for HACCP development and implementation

Benefits of project management:

- Provides structure
- Identifies individual tasks
- Documents tasks in a logical order
- Aids budgetary control
- Aids communication of project to others
- Defines timescales and critical path
- Identifies milestones
- Provides plan to measure against
- Increases chances of successful completion.



Planning for HACCP development and implementation

Potential problems with using project management:

- Can be overcomplicated and difficult to follow
- Too much time spent on the plan as opposed to completing the project
- Requires frequent updating to remain accurate
- Requires adequate IT skills
- May select inappropriate tool.

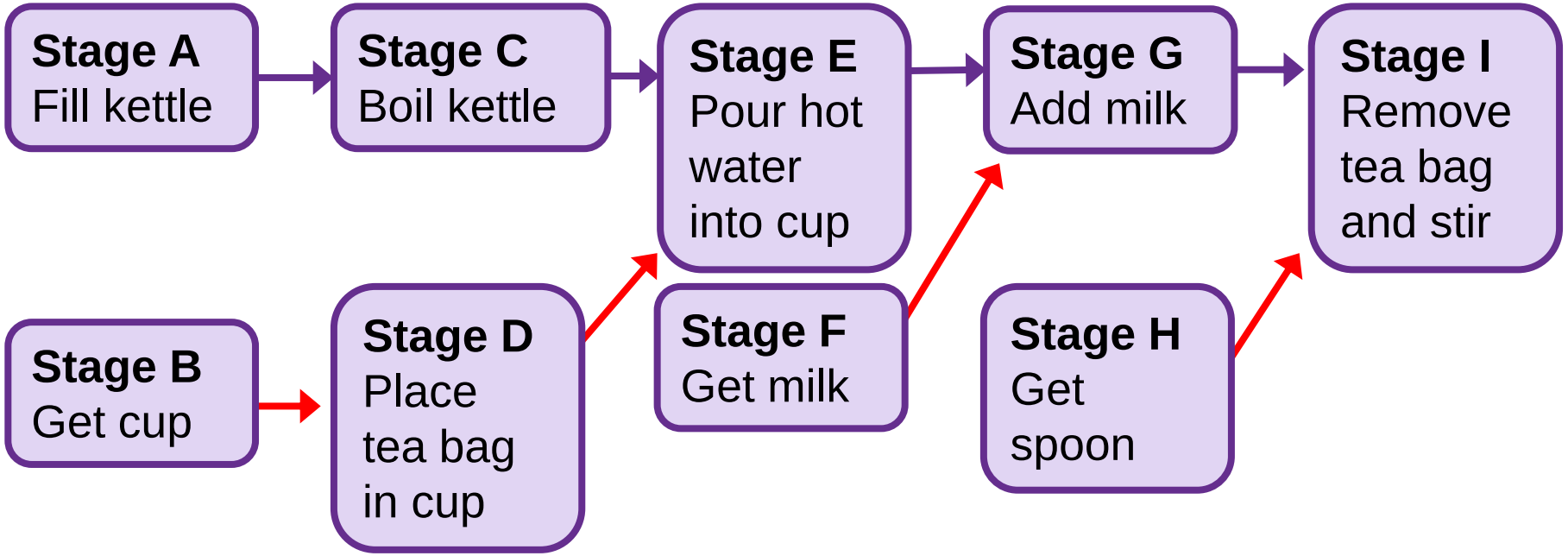
NEXT

Gantt chart

Task	Weeks	Responsibility	January				February				March					April				May				June				July			
			5	12	19	26	2	9	16	23	1	8	15	22	29	5	12	19	26	3	10	17	24	7	14	21	28	5	12	19	
Project start date	0																														
Confirm management commitment	1	HACCP Champion																													
Identify and assemble team	1	HACCP Champion																													
Train team	1	External																													
Gap analysis of prerequisite programmes	2	HACCP Team																													
Decide structure of HACCP system	1	HACCP Team																													
Write scope, product description & intended use	1	HACCP Team																													
Draw process flow diagram	2	HACCP Team																													
Carry out hazard analysis	3	HACCP Team																													
Identify CCPs	2	HACCP Team																													
Establish critical limits	2	HACCP Team																													
Establish monitoring procedures	1	HACCP Team																													
Establish corrective action procedures	1	HACCP Team																													
Complete control charts	3	HACCP Team																													
Validate before implementation	1	HACCP Team																													
Train workforce	2	HACCP Team/External																													
Implement	4	HACCP Team/Production																													
Establish verification systems	2	HACCP Champion																													26
Verify	1	Audit Team																													

Guidance Document 1

PERT Chart (critical path) for making a cup of tea



Red arrows show the critical path, that is the shortest time in which the cup of tea can be made. Other tasks can be carried out alongside the critical path, but must be completed by specific stages

C must follow **A, D** must be completed by **E, D** must follow **B, F** must be completed by **G, E** must follow **C, H** must be completed by **I, G** must follow **E, I** must follow **G.**

Tasty Bake Ltd.

- A supermarket is interested in buying some products from Tasty Bake
- The supermarket requires all suppliers to have a HACCP plan in place
- The supermarket plan to conduct a supplier approval audit in 2 months time

Read the information provided and, working as a group:

A. Identify which issues you would want to address first

B. Outline an appropriate action plan.

End of module assessment: module 5

A new food business has trained their HACCP team and together they have identified the scope of their HACCP, drawn process flows and confirmed these. What other steps should have been addressed prior to hazard analysis?

A A description of the product and its intended use

B Assessment of the significance of the hazards

C Identification of monitoring procedures

D Establishment of corrective action procedures.

End of module assessment: module 5

Which one of the following is included in the seven principles of HACCP?

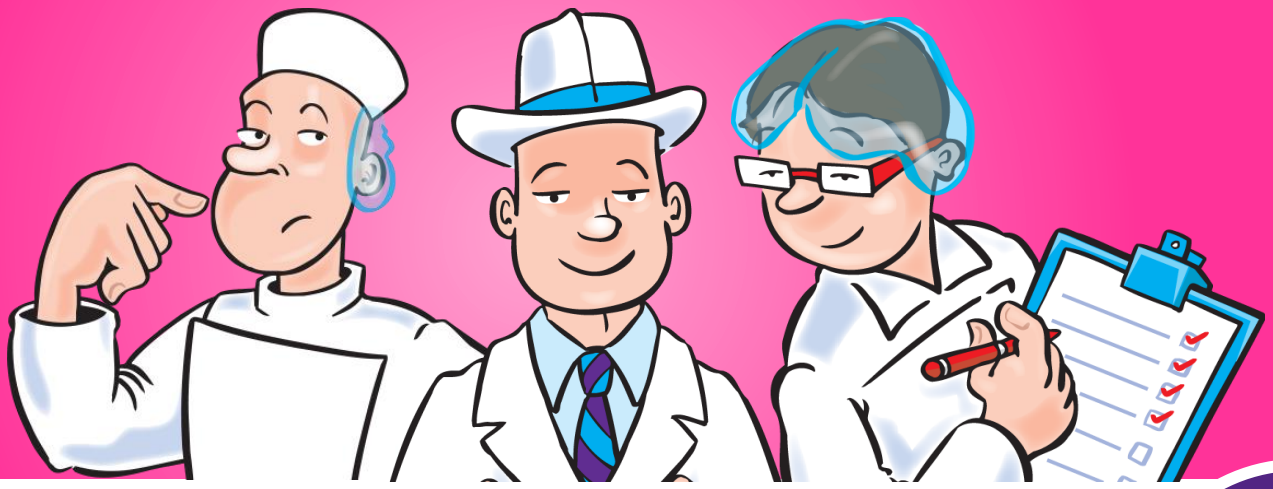
A Provide effective cleaning schedules

B Construct a flow diagram

C Establish verification procedures

D Establish bacteriological testing.

Module



Step 1: The HACCP team

Module 6

NEXT

The HACCP team

- Multi-disciplinary
- Inter-hierarchical
- Workable size
- Expertise needed
  - Technical/microbiological
  - Production/operations
  - Maintenance/engineering
  - Purchasing/SQA
  - Development
  - Distribution
- Use of external experts and consultants.

Identify potential barriers to using the team approach to HACCP and suggest possible solutions to these

Barrier	Solution
Time limitations	Negotiate in advance, plan for less busy times, arrange cover, share workload
Lack of expertise	Training, purchase expertise via consultancy, research
Lack of resources	Negotiate rooms, equipment, finances in advance
Conflict within the group	Set ground rules, allocate workload evenly, have respect, negotiate
Lack of commitment from the group	Motivate, encourage enthusiasm, project plan, train, make benefits visible
Lack of organisation	Appoint a team leader, allocate roles, inform, feedback, project plan.

Benefits of using a team

- ✓ Includes input from all disciplines
- ✓ Exceeds the capability of one person
- ✓ Challenging environment leads to discussion
- ✓ Can lead to a more cohesive workforce
- ✓ Offers training opportunity
- ✓ Motivational.

Responsibilities of the team

- Plan the HACCP project
- Conduct the study and write the HACCP plan
- Validate the plan
- Oversee implementation of the HACCP plan
- Communicate and train
- Review deviations at CCPs Verify the plan
- Maintain and review the plan.

What skills do the HACCP team need?

- Management and planning
- Hazard analysis and risk assessment
- Validation techniques
- Process control assessments
- Data/trend analysis
- Auditing
- Training
- Communication.

HACCP team leader

- Selects appropriate team members
- Ensures all contribute
- Maintains the unity of the team
- Keeps track of progress
- Updates management
- Assigns tasks
- Resolves conflict

Training the HACCP team

- **Require a thorough understanding of the HACCP principles and their practical application before beginning the study**
- **Advisable for team leader to have a higher level of HACCP knowledge**

Team leader may also require training in:

- **project management techniques**
- **technical aspects of product/process**
- **teamwork.**

NEXT

HACCP team meetings

Practical aspects to consider include:

- minutes
- agenda
- length of meetings
- frequency of meetings
- attendance.

In summary:

- Effective HACCP requires a team approach
- Teamwork can be difficult to achieve in practice
- The role of the HACCP is more than just designing the plan
- The team leader has an essential role
- Team members and the team leader require a wide range of skills.

NEXT

End of module assessment: module 6

Why is it a good idea to have a HACCP team?

A It is a legal requirement for every business to have a HACCP team

B It ensures a good team spirit

C It can help reduce the risk of accidents in the workplace

D A team can bring a range of experience and expertise to analysing hazards.

Class Exercise

NEXT

End of module assessment: module 6

Before a HACCP plan is developed, the team needs to have knowledge of:

A suitable corrective actions

B food safety controls

C monitoring systems that are in place

D critical control points through the process.

Class Exercise

NEXT

Module

Codex steps 2 to 5

Module 7

Terms of reference/scope

What is it?

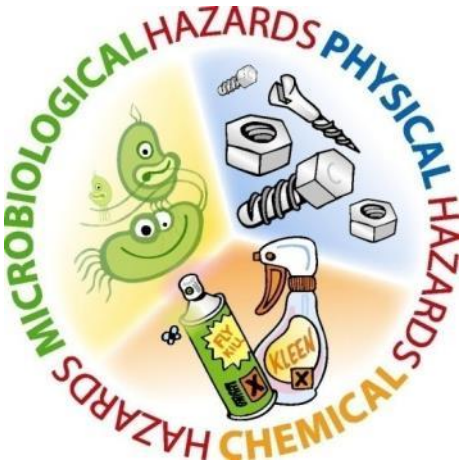
- Defines approach and what's covered
- Not included as one of 12 Codex steps
- Terms often interchangeable

Why is this important?

- Helps team focus on key issues
- Sets out boundaries
- Defines what is to be considered.

Terms of reference and scope

- Objectives – food safety, quality, spoilage
- Point of food safety
- Type of hazard categories included
- Which product(s)/process(es)
- Whole process or process module
- How HACCP system structured
- Start and end points
- Which part of food chain covered
- Prerequisite programmes – supporting information
- Reference documents – legislation, HACCP guidance, industry guides.



NEXT

Structuring the HACCP system

Linear

- applied to a number of similar processes/industry sector

Modular

- applied to each product/process individually

Generic

- applied to distinct parts of a process

NEXT

Product description

What is it?

- A description of the nature and characteristics of the product

Why is this important?

Ensures team members:

- understand the product
- understand what makes it safe
- appreciate the factors that could compromise product safety
- know it is essential for accurate hazard analysis.

Product description

- Product name and type
- Method/type of packaging – e.g. MAP, aseptic
- Processing details
- Preservation methods – e.g. heating, freezing
- Potential to support pathogenic growth
- Intrinsic control factors – e.g. pH, a_w
- Shelf life – e.g. 'use-by' or 'best-before'
- Composition – e.g. recipe, ingredients/raw materials and origin
- Labelling and usage instructions
- Allergen information
- Storage and distribution conditions – chilled/ambient
- Abuse potential – e.g. during storage
- Legal requirements.

Intended use

What is it?

- A consideration of how the customer and/or consumer should/could use/abuse the product and who it is/ is not suitable for

Why is this important?

- Affects level of concern at hazard analysis
- Considers possible unintended use
- May highlight hazards specific to vulnerable groups
- Can be done as part of product description.

Intended use

- Expected uses by the customer/consumer
  - usage instructions: cooking, storage etc.
- Potential misuses by customer/consumer
- Suitability for vulnerable groups
- Whether the product is targeted at a vulnerable group.

NEXT

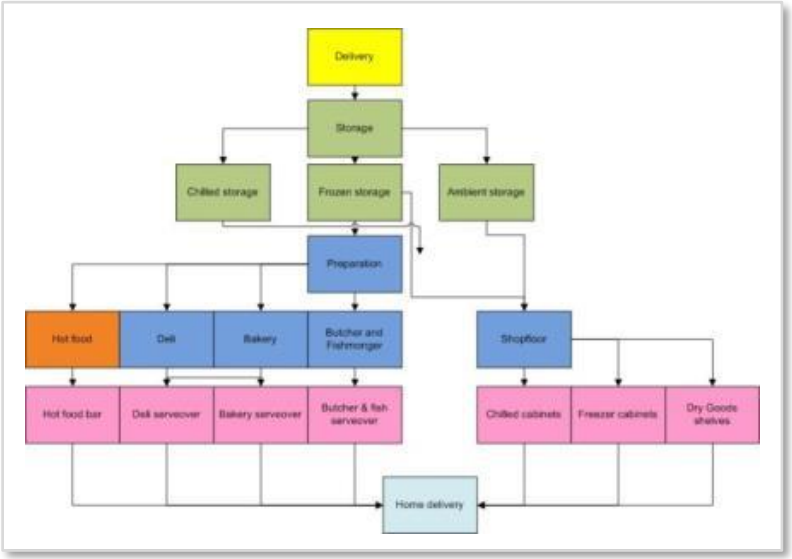
Process flow diagram

What is it?

- A stepwise illustration of the process under consideration

Why is this important?

- To ensure process carefully examined
- Provide flow for basis of rest of the study
- To ensure all inputs/outputs and steps considered.



The process flow diagram

A step-by-step representation of the process. Consider:

- raw materials
- process steps
- packaging
- water/air
- rework
- transfer stages
- storage conditions
- waste handling
- distribution

Supporting information for process flow diagram

Supporting information

- Site plan/layout
- Ingredients/recipe
- Potential for process delays
- Correct sequence of complex steps
- Information on utility inputs e.g. steam, compressed air
- Information on processing aids
- Personnel routes
- Waste removal routes.

NEXT

The process flow diagram

Do:

- include all the steps
- number the steps
- use arrows
- include process detail
- list the activity not the equipment
- produce an overview if using modular approach
- mark on CCPS (once identified)

Don’t:

- be limited by the software you are using
- include tests/checks.

NEXT

On-site confirmation of the process flow diagram

- Accuracy essential as the process flow diagram forms the basis of the HACCP plan
- ‘Walk’ the process to confirm detail
- Ensure it is carried out by someone not involved in the design
- Test it out at different times/shifts
- Check for seasonal variations
- Amend where necessary and record changes
- Retain amended version
- Sign off and date amended version.

NEXT

Practical exercise: Designing a HACCP plan stage 1

Stage1

- Nominate a team leader
- Agree HACCP plan terms of reference and scope of study
- Describe product
- Prepare a process flow diagram

Stage1

- **Nominate a team leader**
- **Agree HACCP plan terms of reference and scope of study**
- **Describe product**
- **Prepare a process flow diagram**

Stage 4

- Control the CCPs
- Establish critical limits and target levels for each CCP
- Establish monitoring procedures
- Establish appropriate corrective action procedures and responsibilities.

In summary:

- The scope/terms of reference must be decided and documented
- A detailed product description is essential for effective hazard analysis
- The intended use must be clearly identified
- The flow diagram must be detailed and accurate
- The flow diagram must be confirmed and evidence retained.

End of module assessment: module 7

It is important to confirm that a flow diagram is correct in practice to:

A help to identify critical control points accurately

B outline potential areas of concern

C demonstrate staffing levels are suitable at each step

D ensure that all steps and processes have been included.

Class Exercise

End of module assessment: module 7

The main reason it is important that you identify the likely consumer of your product when developing a HACCP plan is because it may:

A affect your decision with regard to the severity of a hazard

B assist you to determine your marketing plan

C speed up the time spent developing the HACCP system

D help to reduce the number of complaints regarding product quality.

Class Exercise

Module

Hazard analysis

Module 8

NEXT

Hazard analysis

Why is this important?

- Fundamental part of HACCP
- Identifies significant hazards and controls

Common problems:

- superficial and/or poor rationale for decisions
- overlooking hazards could compromise food safety
- including too many leads to an over-complex HACCP system.

Hazard analysis

‘The process of collecting and evaluating information on hazards and conditions leading to their presence to decide which are significant for food safety and therefore should be addressed in the HACCP plan’

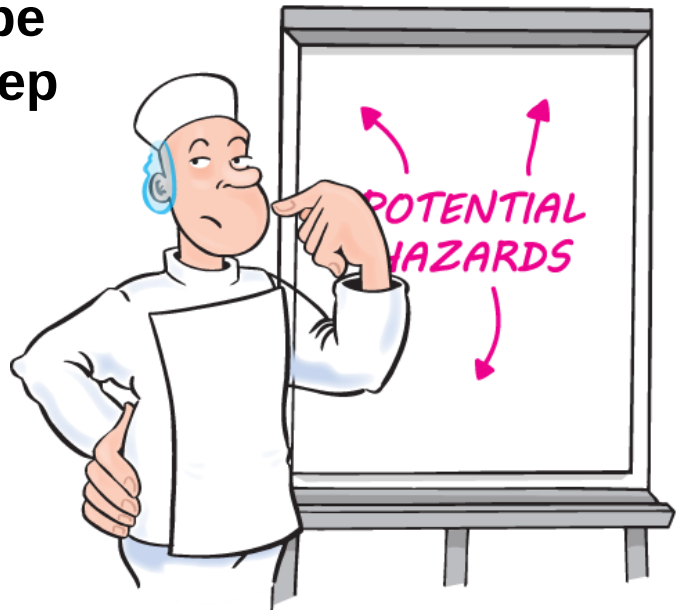
Codex 2001.

The Codex 3 stages of hazard analysis

1. List all potential hazards
2. Conduct a hazard analysis (assess significance)
3. Consider the control measures.

Stage 1: List all potential hazards

- List all the potential hazards that could be reasonably expected to occur at each step
- Include hazards:
  - in raw materials
  - introduced during the process
  - which increase or survive at a process step
  - such as process delays, temporary storage, intrinsic factors



- Hazard categories: microbiological, chemical, physical and allergenic
- Use brainstorming or mind mapping
- Go and look at the process
- Use the process flow diagram as a guide.

Identifying hazards

Hazard

- **A biological, chemical, physical or allergenic agent in, or a condition of food with the potential to cause an adverse health effect**

Include detail of the 3 elements:

1. **what the hazard is**
2. **how it manifests itself – presence, introduction, multiplication or survival**
3. **what its source/cause is – what has allowed/led to the hazard being present, introduced, multiplying or surviving.**

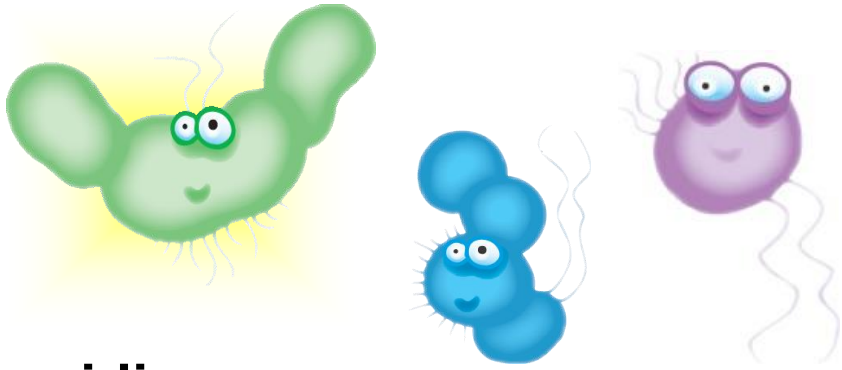
Examples of hazards

Step	Hazard	Manifestation	Source or cause
Intake	Salmonella	Presence	Cross-contamination at evisceration
Chill storage	Salmonella	Growth	Due to increased storage temperature
Cooking	Salmonella	Survival	Due to inadequate time and temperature
Carving	Salmonella	Introduction	Contaminated equipment.

NEXT

Microbiological hazards

- Pathogenic bacteria
- Viruses
- Moulds – mycotoxins
- Parasites
- Parasitic protozoa – Cryptosporidium
- Need to understand the characteristics of the hazard:



Toxin producers

Spore formers

Infective dose

Growth temperatures.

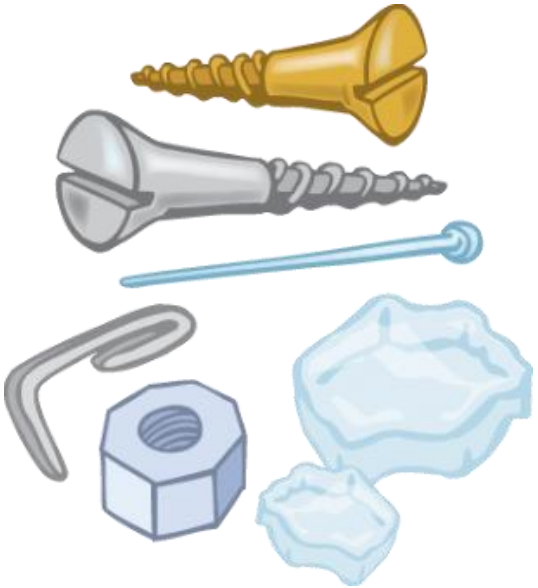
NEXT

Identify common chemical hazards under each heading

Raw materials	Process	Packaging
Pesticides/herbicides Heavy metals Natural toxins Antibiotics Hormone residues	Cleaning agents Lubricants Refrigerants Pest chemicals Fumes Additives Preservatives	Plasticisers Ink Adhesive Metals.

Physical hazards

- Items which are sharp and may cause injury
- Items which are hard and may cause dental damage
- Items which could block airways and cause choking.



NEXT

Allergenic hazards

- **Increasing problem**
- **Immune system reacts**
- **Symptoms range from rashes to anaphylactic shock and death.**

Most important allergenic foods

- Peanuts/groundnuts
- Tree nuts
  - walnuts
  - hazelnuts
  - brazil nuts
- Milk/lactose
- Eggs
- Fish
- Shellfish (molluscs)
- Sesame seeds
- Soya (tofu and bean curd)
- Cereals containing gluten
- Mustard, celery and celeriac
- Lupin.

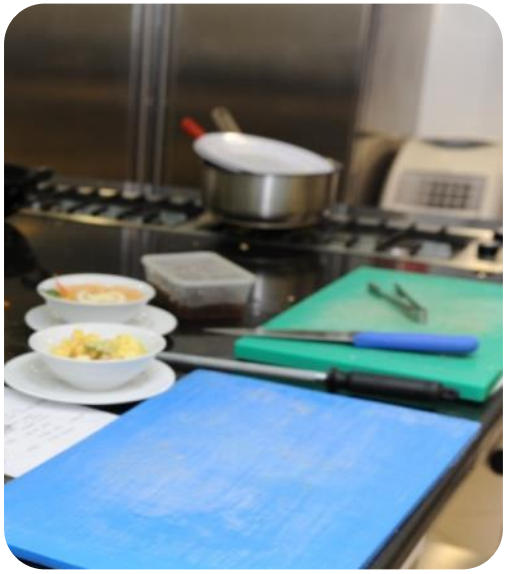
NEXT

Allergen risk assessment

Manage allergens using HACCP approach

Carry out detailed risk assessment

- **Allergens in ingredients**
- **Potential presence in ingredients**
- **Allergens declared in finished products**
- **Potential cross-contamination**
- **Nature of allergen - powder or liquid**
- **Consider each step in the process**



Allergens generally managed by PRPs.

Designing hazards out

Can any of the identified hazards be designed out of the process?

- **Process/equipment change**
- **Product change.**

NEXT

Stage 2: Conduct a hazard analysis (assess significance/risk)

Consider the significance of each hazard

Risk

- The probability of an adverse health effect and the consequential severity of the hazard in food

Likelihood

- The likelihood of the hazard occurring

Severity

- The seriousness of the adverse health effect

Significant hazard

- Hazards that must be prevented, eliminated or reduced in order to produce safe food.

Analysing hazards – points to consider

- Likely occurrence of the hazard – previous data
- The severity of the hazard – life threatening/mild
- Vulnerability of those exposed – vulnerable groups
- Numbers potentially affected – batch size
- Survival and growth of micros of concern
- Presence or production of toxins, foreign bodies or chemicals
- Conditions leading to the above.

Tools for hazard analysis

Various tools/methods include:

- **scoring systems**
- **quadrant graph**
- **logic table**

Make sure:

- **tools are used consistently**
- **methodology is documented**
- **there is a clear rationale for non-significant hazards.**

Make hazard analysis more structured and logical, whilst still relying on judgment and experience of team – qualitative. Provide documentary evidence of hazard analysis

Risk assessment

Quantitative	Qualitative
• Requires very detailed studies • Usually only carried out at national/ international level • Published outcomes can be used within HACCP	• Preferred method within HACCP • Based on judgement and expertise • Evaluates information to reach a balanced judgement.

Risk assessment matrix

Low > LIKELIHOOD > High			
	High Likelihood Low Severity	High Likelihood Med. Severity	High Likelihood High Severity
	Med. Likelihood Low Severity	Med. Likelihood Med. Severity	Med. Likelihood High Severity
	Low Likelihood Low Severity	Low Likelihood Med. Severity	Low Likelihood High Severity

Low > SEVERITY > High

'Used to assess the relative significance of hazards'

- Cardboard in cooked chicken meal
- Mouse in product
- Razor blade in loaf of bread
- Salmonella in undercooked chicken
- Botulism in home canned low acid food
- E.*coli* 0157 in undercooked beefburger
- Pin in cooked chicken
- Stone in jam
- Bone in fish.

Risk assessment matrix – suggested answers

Low > LIKELIHOOD > High	Low > SEVERITY > High		
	High Likelihood (1,000) Low Severity (10) RxS = 10,000 Bone in fish	High Likelihood (1,000) Med. Severity (100) RxS = 100,000 Salmonella in undercooked chicken	High Likelihood (1,000) High Severity (1,000) RxS = 1,000,000 *E. coli* O157 in under cooked beefburger
	Med. Likelihood (100) Low Severity (10) RxS = 1,000 Stone in jam	Med. Likelihood (100) Med. Severity (100) RxS = 10,000 Mouse in product	Med. Likelihood (100) High Severity (1,000) RxS = 100,000 Botulism in home canned low-acid food
	Low Likelihood (10) Low Severity (10) RxS = 100 Cardboard in cooked chicken meal	Low Likelihood(10) Med. Severity (100) RxS = 1,000 Pin in cooked chicken	Low Likelihood (10) High Severity (1,000) RxS = 10,000 Razor blade in loaf of bread

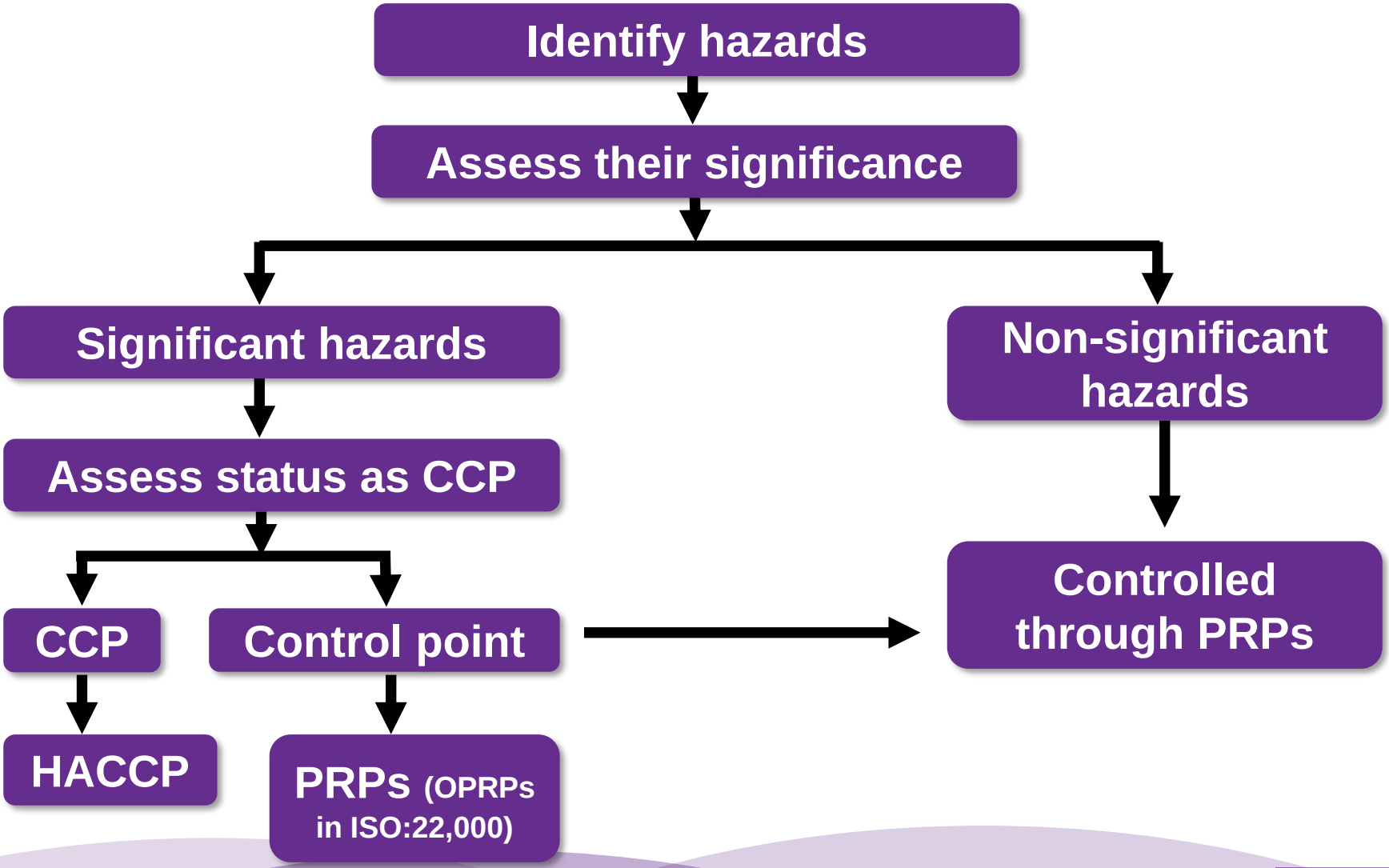
'Used to assess the relative significance of hazards.'

Sources of information

- HACCP team members
- Consultants and laboratories
- Research organisations (universities)
- Public analysts
- National food poisoning statistics
- Seminars
- Codes of practice
- Enforcement officers
- Food Standards Agency
- Health Protection Agency
- Trade associations
- In-house experts
- Mathematical modelling
- Customers/suppliers
- Customer complaints
- Television/radio
- Textbooks
- Magazines
- Libraries
- Internet.

NEXT

The hazard analysis process



PRPs and HACCP

The hazard analysis should be done independently of the PRPs – identify the hazard *then* decide under which system it will be controlled

Caution:

- **Controlling hazards by PRPs can be seen by some teams as an easy option**
- **If a hazard is to be controlled by a PRP the team must be sure the relevant PRP is actually capable of doing so**
- **Be careful not to 'lose' hazards between the two systems**
- **Hazards usually covered by PRPs may be included in HACCP at certain steps and become CCPs.**

Stage 3: Identify control measures

‘Any action and activity that can be used to prevent or eliminate a food safety hazard or reduce it to an acceptable level’

Codex 2001

Remember:

- **More than one hazard may be controlled by a particular control measure**
- **An individual hazard may require more than one control measure.**

Control measures

Control measures:

- must relate back to the hazard and the source/cause
- are simple statements e.g. thorough cooking
- are often confused with monitoring
- are often part of prerequisite programmes

HACCP provides a good opportunity to challenge existing controls.

Examples of control measures

- Thorough cooking
- Effective metal detection
- Effective sieving/filtration
- Use of approved suppliers
- Chill temperature maintenance
- Adherence to a procedure
- Segregation of raw and ready-to-eat foods.

In summary:

- Hazard analysis comprises 3 stages: hazard identification, assessing significance and identifying control measures
- Each hazard must have a manifestation and source/cause
- Assessing significance can be complex
- Product specific significant hazards are controlled by HACCP; general significant hazards are controlled by PRPs
- Control measures must relate to the hazard and are simple statements.

Practical exercise: designing a HACCP plan stage 2

Stage1

- Nominate a team leader
- Agree HACCP plan terms of reference and scope of study
- Describe product
- Prepare a process flow diagram

Stage 2

- **Conduct a hazard analysis**
- **Identify potential hazards**
- **Assess the significance of the hazards**

Stage 3

- **Identify controls for each significant hazard**

Stage 4

- Control the CCPs
- Establish critical limits and target levels for each CCP
- Establish monitoring procedures
- Establish appropriate corrective action procedures and responsibilities.

End of module assessment: module 8

When conducting a hazard analysis which of the following is included?

A Establishing records

B Identifying corrective actions

C Identifying the controls

D Identifying critical limits.