Údarás Sábháilteachta Bia NA hÉIREANN
Food Safety AUTHORITY OF IRELAND

FOOD SAFETY MANAGEMENT SYSTEM

GUIDE FOR SMALL MEAT MANUFACTURING PLANTS

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Acronyms

ABP	Animal by-product
ACC	Aerobic colony counts
ATP	Adenosine triphosphate test
CAT 3	Category 3
CP	Control point
CCP	Critical control point
DAFM	Department of Agriculture, Food and the Marine
DoC	Declaration of Compliance
EU	European Union
EFK	Electronic fly killer
FBO	Food business operator
FSAI	Food Safety Authority of Ireland
FSMS	Food Safety Management System
GHP's	Good hygiene practices
GN	Guidance note
HACCP	Hazard analysis and critical control point
INAB	Irish National Accreditation Board
MAP	Modified atmosphere packaging
PPE	Personal protective equipment
PRPs	Prerequisite programmes
SMMP	Small meat manufacturing plant
SOP	Standard operating procedure
SRM	Specified risk material
STEC	Shiga toxin-producing *Escherichia coli*
TVCs	Total viable counts
UV	Ultraviolet
VL	Visual lean

Some key legislation

Regulation (EC) 852/2004 on the hygiene of foodstuffs.

Regulation (EC) 853/2004 laying down specific hygiene rules for food of animal origin.

Regulation (EC) 2073/2005 on microbiological criteria for foodstuffs.

Regulation (EC) 178/2002 laying down the general principles and requirement of food law.

Regulation (EU) 931/2011 on the traceability requirements set by Regulation (EC) No 178/2002 for food of animal origin.

Regulation (EU) 1169/2011 on the provision of food information to consumers.

Regulation (EU) 1337/2013 as regards the indication of the country of origin or place of provenance for fresh, chilled and frozen meat of swine, sheep, goats and poultry.

Regulation (EC) 1760/2000 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products.

Regulation (EC) 1825/2000 laying down detailed rules for the application of Regulation (EC) No 1760/2000 as regards the labelling of beef and beef product.

Regulation (EC) 543/2008 as regards the marketing standards for poultry meat.

Regulation (EC) 1333/2008 on food additives.

Regulation (EU) 231/2012 laying down specifications for food additives.

Regulation (EC) 1924/2006 on nutrition and health claims made on foods.

Regulation (EC) 1935/2004 on materials and articles intended to come into contact with food.

Commission Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food.

Regulation (EU) 2022/1616 on recycled plastic materials and articles intended to come into contact with foods.

Regulation (EU) 2017/625 on official controls and other official activities performed to ensure the application of food law.

Regulation (EC) 1069/2009 laying down health rules as regards animal by-products.

Food Safety Authority of Ireland Act, 1998.

S.I. No. 22/2020 European Union (Food and Feed Hygiene) Regulations 2020.

Legislation is continually changing and being updated.
Food Business Operators (FBO) are responsible for keeping up to date on legislative requirements.

Many of the European Regulations listed above have been amended. Where they are listed and mentioned throughout the guide, the reference is to the amended regulation at the time of the publication (2023). All European legislation is available at EUR-Lex. For ease of reading, the European Commission provides a consolidated version of legislation that has been amended. The most recently consolidated version available should be consulted. All amendments to the legislation published since the most recently consolidated version should be taken into consideration.

All national legislation is available at the Irish Statute Book www.irishstatutebook.ie

How to use this guide

Scope

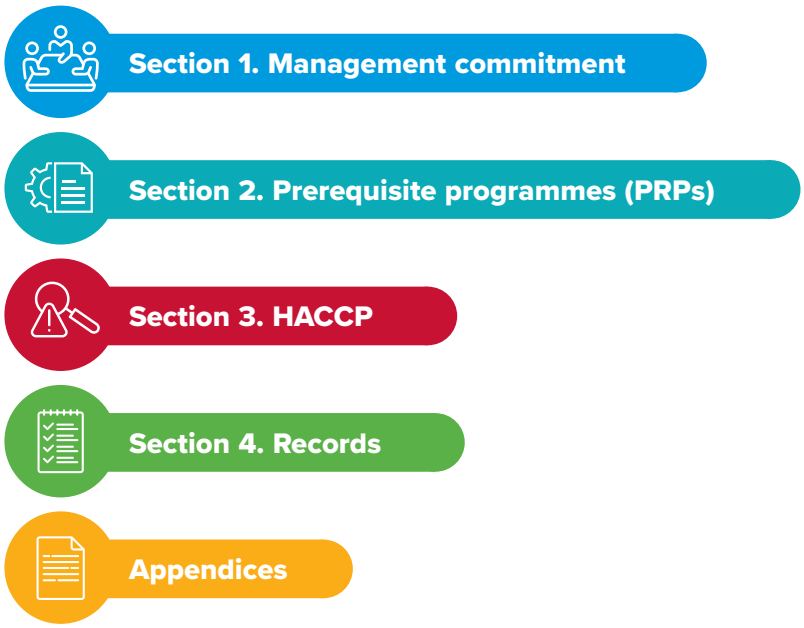
This Food Safety Management System (FSMS) Guide has been produced to help small meat manufacturing plants (SMMPs) comply with food hygiene legislation. Whilst not exclusive of other operators it is specifically intended to assist those producers whose weekly production throughput generally falls below 5 tonnes of minced meat, 20 tonnes of meat products or meat preparations, or 20 tonnes of cut fresh meat.

The guide has been produced by an expert working group that included representatives from the Associated Craft Butchers of Ireland, Local Authority veterinary inspectors, the food industry, and the Food Safety Authority of Ireland (FSAI). This expert working group was the HACCP team that carried out a hazard analysis for the processes included in the guide. Thanks also to this group, Teagasc and the food industry who provided images for this guide. If the FBO follows and complies with this FSMS, this fulfils their legal requirement to implement procedures based on Hazard Analysis & Critical Control Point (HACCP) principles. The FBO must check that all of their activities are covered in the FSMS. If not, they must develop their own procedures, based on the HACCP principles, for the additional activities. For information on how to do this, see Appendix B – Other processes.

Structure

This FSMS guide contains four sections and four appendices as outlined in Figure 1 Structure of the FSMS guide.

Figure 1 Structure of the FSMS guide



Section 1. Management commitment

Section 1 addresses the importance of management commitment and food safety culture. By signing 'The Food Safety Management System Declaration Form', you are confirming that you are taking responsibility for applying the FSMS in your food business. If any other activities outside of the seven processes included in this FSMS are being carried out, you must develop your own procedures based on the HACCP principles. For more information, see Appendix B – Other processes.

Section 2. Prerequisite programmes (PRPs)

Section 2 provides details on the 16 PRPs. These include Good Hygienic Practices (GHPs) that are the basic conditions and activities necessary to maintain a hygienic environment in a food business. These PRPs must be in place before applying procedures based on HACCP principles. Each PRP finishes with the relevant legislation (a direct quote or in some cases the legislation is paraphrased or referenced).

Section 3. HACCP

Section 3 sets out information on the HACCP plan, which is focused on controlling hazards that are reasonably expected to occur during food processing at SMMPs. The HACCP plan is designed to ensure that the food produced is safe and complies with EU legislation. This section includes the HACCP plan (hazard control plan) for seven typical food production processes relevant to SMMPs. In addition, standard operating procedures (SOPs) that are specific to each of the seven food production processes, have been developed by the expert working group (the HACCP team). Each of the seven production processes included within the scope of this guide include the following:

- A process flow diagram
- A documented hazard analysis for each process step
- A hazard control plan for the CP or CCP identified in the relevant production process by the expert group through the process of hazard analysis and risk assessment
- An SOP detailing key tasks to be undertaken for the relevant process.

For any food production processes that are not covered in this guide, the FBO will need to develop their own HACCP plan for those processes to ensure that hazards which are reasonably expected to occur are identified, controlled, risk assessed and managed so that safe food is produced. This can be done by following the hazard analysis and risk assessment methodology for other processes set out in the Appendix B 'Other processes' section of this guide.

Section 4. Records

Section 4 provides records that are associated with the relevant PRPs and the key process and control steps detailed in the relevant HACCP plans. By completing the records, which form an integral part of this FSMS, the FBO is demonstrating that they have operated in accordance with the relevant PRPs and production process SOPs. By completing these records, the FBO is also demonstrating that the food was manufactured in compliance with EU legislation and with their FSMS.

The benefits of effective record keeping include the following:

- Records provided in this guide, when completed as necessary, demonstrate that the food was prepared according to this FSMS, and also demonstrate the effectiveness of controls implemented by the FBO.
- Keeping records accurately will help the FBO to comply with legal requirements and demonstrate their efforts to do so. This may be useful as part of a due diligence defence. In the event of a customer complaint, records can be checked to demonstrate the controls that were in place during the production of the product.
- Managers/supervisors can perform weekly verification checks of completed records to ensure that they are accurate and representative of processing conditions at the time of production. These verification checks can be recorded on each completed record.

The documents and blank records are also available on www.fsai.ie. Each record should be tailored to suit the food business need.

Appendices

The guide contains four appendices covering the following areas:

- The specific detail of the hazard analysis and risk assessment applied to minced meat production in this guide.
- A summarised hazard analysis and risk assessment for all other steps outlined in the other six production processes included in this guide.
- The methodology used by the expert working group (the HACCP team) to complete the hazard analysis and risk assessment for each process.
- Other processes – a step-by-step guide for FBOs conducting their own hazard analysis and risk assessment if they are undertaking a process not included in this FSMS guide.

Generally, in this guide the word "must" indicates that compliance is a legal requirement, or it was considered by the expert working group (the HACCP team) to be necessary for food safety purposes.

Notes

Section 1

Management commitment

Introduction

Under European Union (EU) and national legislation, FBOs are obliged to put in place, implement, and maintain permanent procedures based on hazard analysis and critical control point (HACCP) principles. The application of a combination of prerequisite programmes (PRPs) as control measures and HACCP principles is commonly described as a food safety management system (FSMS).

Food safety culture

It is a legal requirement for all food businesses to have an appropriate food safety culture in place. Having a food safety culture in your food business means that all staff are committed to food safety. They are supported by management and owners to always do the right thing to keep food safe. Food safety culture is 'the way we do things around here'. It is how everyone, including the owner, managers and employees, thinks and acts in their job every day to ensure that the food they produce is safe.

The appropriate food safety culture must be led from the top by ensuring that food safety is a priority in all decisions made. Everyone in the organisation should be committed to, and be accountable for, producing safe food and ensuring that they follow best food safety practices. FBOs must make sufficient resources available to ensure safe and hygienic handling of food.

Management commitment includes:

- Clearly communicating roles and responsibilities to all staff
- Maintaining the integrity of the food safety management system (FSMS) when changes are planned and implemented
- Verifying that controls are being performed timely and efficiently and documentation is up to date
- Ensuring staff are trained and supervised
- Ensuring compliance with relevant regulatory requirements.

Having an appropriate food safety culture in a food business enhances food safety by increasing awareness and improving employees' behaviour. All staff should be encouraged by the FBO and management to learn from and share their knowledge with fellow workers to improve food safety in their workplace.

Approval of small meat manufacturing plants (SMMPs)

Approval under Regulation (EC) 853/2004 must be sought by the FBO before any food products can be placed on the market. The FBO must apply for approval for all activities and species, and make their inspector aware of any changes as this will need to be reflected in the approval certificate. Approved food businesses are issued with a unique approval number which forms part of their identification mark. Approved food businesses are included in the lists of approved food establishments on the Food Safety Authority of Ireland (FSAI) website together with their approval number and the activities that are approved.

The FBO must ensure that the identification mark is applied to products of animal origin before the product leaves the establishment of production. For more information, see PRP 16 Labelling and product information.

Food safety management system

Before implementing procedures based on HACCP principles in any food business, a robust PRP, including good hygiene practices (GHPs) must be in place to ensure food safety. Once the PRPs are in place, a HACCP-based procedure can be applied.

In general terms, operations taking-in raw meat and producing ready-to-eat food such as meat products, have more substantial challenges, and parts of this guide are less relevant for manufacturers who do not produce ready-to-eat food.

As it is not possible to ensure that every possibility for SMMPs is covered in this guide, FBOs need to assess how their food business fits into the examples given. Where their operations are not fully covered by this guide, guidance and advice should be sought to supplement this guide to ensure that the FSMS represents the entire food operation.

The FBO is directly responsible for food safety in the food business.

Complete and sign the **Food Safety Management System Declaration Form** on the following page to confirm that you are taking responsibility for applying this FSMS in your food business.

At the beginning of **Section 3 – HACCP**, there is a **FSMS Activities Form** listing all the processes included in this guide.

Complete the **FSMS Activities Form** for all the activities carried out in your food business.

If a process being carried out by the food business is not included in this guide, then the FBO must develop their own procedures, based on HACCP principles for these activities. Appendix B provides guidance on developing a HACCP plan for any additional activities.

A robust pre-requisite programme, including good hygiene practices (GHPs) must be in place to ensure food safety.

Food safety management system declaration form

I hereby certify that I **(name)** _____

(position) _____

of **(food business name)** _____

will apply this food safety management system in the food business establishment at

(address) _____

The following person(s) is/are responsible for ensuring that the food safety management system is implemented:

(name/position) _____

(name/position) _____

(name/position) _____

(name/position) _____

(name/position) _____

I will review the food safety management system at least once a year to assess its ongoing relevance and adequacy for my food business operations, and also if my food operations change (for example, new product/process, change in structure/layout, new equipment) and train staff accordingly.

If any other activities outside of the seven included in this FSMS are being carried out, I will develop procedures based on HACCP principles for the activity.

FBO signature: _____ Date: _____

Review date	Comment	Signature

Notes

Section 2

Prerequisite Programmes (PRPs)

Introduction

All food businesses must have prerequisite programmes (PRPs) in place. These are good hygiene practices (GHPs) which are the basic conditions and activities necessary to maintain a hygienic environment, often referred to as the foundation of a FSMS.

The following PRPs must be in place before applying procedures based on HACCP principles:

PRP 1	**Premises and structure**
PRP 2	**Layout and zoning**
PRP 3	**Product storage, distribution and transport**
PRP 4	**Product recall and traceability**
PRP 5	**Pest control**
PRP 6	**Waste management**
PRP 7	**Cleaning**
PRP 8	**Utilities and services**
PRP 9	**Maintenance**
PRP 10	**Personal hygiene**
PRP 11	**Training**
PRP 12	**Measures to prevent cross-contamination (food allergens, species and microbial)**
PRP 13	**Purchasing - Supplier control and performance monitoring**
PRP 14	**Rework**
PRP 15	**Food defence**
PRP 16	**Labelling and product information (sampling, shelf-life, and food additives)**

Notes

PRP 1
Premises and structure

PRP 1 Premises and structure

Introduction

The building and equipment must be fit for purpose and designed and constructed in such a way as to minimise contamination of food and ensure compliance with EU legislation. The structural requirements for premises are outlined in Regulation (EC) 852/2004 on the hygiene of foodstuffs and further developed in Regulation (EC) 853/2004 laying down specific hygiene rules for food of animal origin specifying structural requirements for cutting plants, and establishments producing minced meat and meat preparations.

A poorly designed premises with structures that are not adequate, or a premises in an unsuitable location, can create serious food safety hazards for the consumer, which can result in illness, and complaints against the FBO.

These can include:

- **Hazard cross-contamination** – lack of space can lead to cross-contamination between raw and ready-to-eat food, which can cause food poisoning.
- **Species cross-contamination** – inadequate separation in establishments handling meat of different species can result in species cross-contamination.
- **Allergen cross-contamination** – lack of separate storage areas/utensils/production lines can lead to cross-contamination from foods containing allergens.
- **Failure to clean and disinfect properly** – surfaces, rooms and equipment can be difficult to clean properly. This could be because the materials in walls, floors, windows, doors, and ceilings could be damaged, rough, or non-impervious (not waterproof) or hard to reach and clean, thus resulting in dirt traps.
- **Physical contamination** – loose parts of the building structure (for example, broken tiles, wood from a pallet) or unsuitable construction materials can break off and fall into food.
- **Pest infestations** – gaps in foundations, walls, windows, or doors can allow mice, rodents, flies, and birds to enter a premises.
- **Physical injuries** – poorly designed premises can lead to slips, trips and falls and other injuries to personnel.
- **Condensation** – poor ventilation leads to steam build-up and condensation, which can drip onto work tables/product. Moisture facilitates bacterial survival and growth.
- **Pooling of water and other liquids** – poorly designed floors without drains lead to build-up of water/liquids on the production floor. These may act as reservoirs of bacteria, allowing environmental spread from batch to batch despite adequate separation.

Premises and structure

There are requirements which must be met for food processing premises and structures.

- Any change in structure or change to a production process in the current structure, requires re-appraisal of the adequacy of the FSMS and is likely to require a reassessment of the establishment approval under Regulation (EC) 853/2004 from the Competent Authority. The FBO must discuss any proposed changes with their inspector in advance.
- The structure and space provided must be adequate for the throughput both in terms of volume and variety. Variety would include for example sufficient space to produce ready-to-eat food in a safe manner. Also, for example where the premises is approved for cutting meat of different animal species, precautions are taken to avoid cross-contamination, where necessary by separation of the operations on the different species in either space or time.
- Establishments must be designed to facilitate easy cleaning and sanitation.
- Establishments must be designed to facilitate adequate ventilation and steam extraction.

Premises and fixtures

The premises must be close to essential services, including:

- Potable water supply
- Power supply
- Waste and wastewater removal
- Access for transport.

The premises must be adequately separated from possible sources of contamination, such as:

- Farmyards
- Livestock housing
- Slurry pits
- Open drains or ditches
- Areas likely to be flooded.

Roofs and outside extensions must be well constructed, and the premises weatherproof.

Fixtures and fittings (for example ventilation units) must be designed in such a way that they can be maintained, cleaned and kept in a good state of repair.

All equipment should be serviced and maintained regularly.

Flow of product and personnel

Food ingredients/products and personnel should flow in a one-way direction from intake to dispatch, without backtracking or crossover.

Floors

- Floors must be impervious (waterproof) – smooth concrete is acceptable
- Floors must be easy to clean, hard wearing and easy to repair
- Floors must be free of cracks and holes
- Coving is highly recommended at wall/floor junctions
- Any joints present in floors should be level
- Floors must be kept free of pooling water
- Water must be directed towards grated, trapped drains.
- Drains must have the capacity to remove expected flow loads.

Walls

- Walls must be impervious (waterproof) – smooth plastered is acceptable
- Walls must be smooth surfaced and easy to clean
- Walls must be free from flaking paint, damp, cobwebs, and mould growth
- Coving is highly recommended at wall/floor junctions.

Ceilings

- Ceiling (or roof covering) should be easily cleaned
- Openings in ceilings, for vents and piping, should be properly sealed and smooth.

Windows

- Windows must be adequately screened or otherwise constructed to prevent access by pests
- Windowsills should be avoided and, if present, should be sloped, but ideally window reveal should be flush with wall.

Doors

- Doors should be self-closing or automatic
- Doors must be easy to clean and hard wearing
- Doors must be adequately screened or otherwise constructed to prevent access by any pests.

Lighting

- Food premises must have adequate natural or artificial lighting
- Lighting should enable personnel to operate in a hygienic manner and for the safe handling of food
- Light bulbs must have suitable protective covers in all rooms/areas in which food is produced, worked on, or stored
- Light fittings should be designed in such a way that they can be maintained, cleaned and kept in a good state of repair.

Food contact surfaces (such as tables or food processing equipment)

- Food contact surfaces should be smooth, impervious, and hard-wearing
- Food contact surfaces must be easy to clean and disinfect.

Food businesses may require a range of separate rooms/areas and staff facilities some of which are shown in Table 1.

Table 1 Rooms and areas

Rooms and areas			
Office	Hygiene lobby	Dispatch cold room	Chemical store
Staff toilets	Intake cold room	Dry ingredients store	Equipment store
Staff changing room	Cooked and ready-to-eat food area	Wrapping/packaging store	Equipment wash area
Staff canteen	Raw foods area	Packing/dispatch room/ area	Vehicle wash area

- Preparation, cutting and processing areas (including wrapping and packaging) may require active temperature control. See Section 3 – HACCP for relevant requirements on each individual process.
- Cooking areas require:
  - A room/area separate from other processes
  - Adequate steam extraction facilities.
- A hygiene station, with wash hand basins should be positioned at the entrance to food production areas and include the following:
  - Hot and cold running water
  - Liquid soap
  - Paper towels
  - Non-hand-operated wash-hand basin
  - A pedal-operated bin.

- Boot-washing facilities – may be needed in some premises and should be located outside the food-handling rooms/area.
- Production rooms where the main activity is meat cutting, must have facilities for disinfecting tools (knife sterilisers) that heat water to a minimum of 82 °C. Knives must be cleaned prior to placing in the knife steriliser.

  An alternative system that has an equivalent effect to disinfection with water at 82 °C may be used by the FBO but only when authorised by the inspector (Competent Authority). Alternative systems include for example, chemicals / UV disinfection. An alternative method must achieve the same results as a hot water steriliser and this must be validated by the FBO, to the satisfaction of the Competent Authority (for example, microbiological sampling, citation of documents). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement with appropriate documented evidence/validation of the proposed method or activity. The Competent Authority must authorise the flexibility before the FBO can implement it.
- Toilets must not open directly to food-handling rooms/areas.
- Staff changing rooms should have:
  - Separate storage for outdoor and work clothing
  - Boot/shoe racks
  - Bench for putting on and removing protective clothing.

Glass, brittle and hard plastic

Regular monitoring of plant and equipment containing glass or brittle and hard plastic to ensure that parts remain intact and do not pose a threat of physical contamination, including:

- Ensuring glass objects (for example, glass containers, drinking glasses, etc.) are not permitted in food preparation areas.
- All light fittings to be shatterproof or have shatterproof coverings fitted so that they contain the glass in the event of breakage.
- Obtaining evidence from suppliers that light fittings and other glass equipment are shatterproof.
- Ensuring bulbs in food preparation areas are not replaced during active food manufacture.
- Listing glass in food preparation areas in the Glass, brittle and hard plastic record (See Section 4 – Record 1). This assists in identifying any potential risk that may occur (for example, cracked glass, or damaged covers).
- In the event of glass equipment cracking or chipping, the FBO should contact their supplier immediately for replacement glass, and to seek advice.

Breakage procedure

There should be a breakage procedure in place that ensures the following:

- All glass, brittle and hard plastic breakages are reported immediately to the manager/supervisor, to ensure complete clean-up and inspection.
- Where breakages occur, production is stopped and all activities put on hold until the clean-up has been completed.
- Food preparation areas are closed during the clean-up and inspection process.
- Open food and food packaging in close proximity to the breakage must be disposed of immediately.
- A record of disposed products retained.
- Affected areas deep cleaned thoroughly.
- Glass, brittle and hard plastic disposed of in the relevant bin.
- To prevent further contamination, all tools used to clear up the breakage (for example, brushes, mops, dustpans, etc.) cleaned in an area that is separate from the food production/preparation area.
- All breakages documented on the glass, brittle and hard plastic record (See Section 4 – Record 1).

Glass, brittle and hard plastic record

- Implement a glass, brittle and hard plastic inspection programme so that checks are carried out and recorded on all areas and equipment on-site (typically once a month).
- List the areas and equipment that require checks on the glass, brittle and hard plastic record.
- Once glass, brittle and hard plastic checks are completed, fill in the date of completion on the glass, brittle and hard plastic record.
- Depending on the size of the premises, the pre-production checklist may be sufficient to record glass, brittle and hard plastic checks rather than using the glass, brittle and hard plastic record.
- Complete the pre-production checklist as required.

Premises and structures ongoing assessment

To ensure that the premises and the structure are suitable for all food activities, it is recommended that the manager/supervisor takes a walk through the entire premises at least once a day to check that personnel can carry out their duties safely and hygienically, and to check for any defects or damage to tables, floors, walls, doors, lighting, ceilings, wash-hand basins, hygiene stations, chills, etc.

The FBO should take corrective action immediately if any damage to structures/equipment are noted. Table 2 lists several examples of hazards and the relevant corrective action.

Table 2 Hazard and correction action

Hazard	Corrective action
Broken/chipped knife/ damaged blade	• Stop production. • Locate damaged/chipped blade if possible. • If damaged/chipped blade cannot be found identify and assess products since last check. • Review records for the last time the knife was checked. • Examine affected product to locate damaged/chipped blade. • If damaged/chipped blade cannot be located a decision to the designation of the product should be made (destroy or cut/mince the product). • Review the risk assessment/HACCP plan.
Broken tile	• Remove broken material and repair
Increase in temperature due to overcrowded chill	• Move part of stock to another chill. improve product rotation and ensure adequate airflow.
Cross-contamination due to lack of space in food-handling areas	• Increase space/add workstations, review production shifts

Records (see Section 4)

- Glass, brittle and hard plastic record (Record 1)
- Pre-production, metal control and knife register record (Record 2)

Relevant legislation

Regulation (EC) No 852/2004, Annex II, Chapter I requires that:

2. The layout, design, construction, siting and size of food premises are to:
   (a) permit adequate maintenance, cleaning and/or disinfection, avoid or minimise air-borne contamination, and provide adequate working space to allow for the hygienic performance of all operations;
   (b) be such as to protect against the accumulation of dirt, contact with toxic materials, the shedding of particles into food and the formation of condensation or undesirable mould on surfaces;
   (c) permit good food hygiene practices, including protection against contamination and, in particular, pest control;
   and
   (d) where necessary, provide suitable temperature-controlled handling and storage conditions of sufficient capacity for maintaining foodstuffs at appropriate temperatures and designed to allow those temperatures to be monitored and, where necessary, recorded.
3. An adequate number of flush lavatories are to be available and connected to an effective drainage system. Lavatories are not to open directly into rooms in which food is handled.
4. An adequate number of washbasins is to be available, suitably located and designated for cleaning hands. Washbasins for cleaning hands are to be provided with hot and cold running water, materials for cleaning hands and for hygienic drying. Where necessary, the facilities for washing food are to be separate from the hand-washing facility.
5. There is to be suitable and sufficient means of natural or mechanical ventilation. Mechanical airflow from a contaminated area to a clean area is to be avoided. Ventilation systems are to be so constructed as to enable filters and other parts requiring cleaning or replacement to be readily accessible.
6. Sanitary conveniences are to have adequate natural or mechanical ventilation.
7. Food premises are to have adequate natural and/or artificial lighting.
8. Drainage facilities are to be adequate for the purpose intended. They are to be designed and constructed to avoid the risk of contamination. Where drainage channels are fully or partially open, they are to be so designed as to ensure that waste does not flow from a contaminated area towards or into a clean area, in particular an area where foods likely to present a high risk to the final consumer are handled.
9. Where necessary, adequate changing facilities for personnel are to be provided.
10. Cleaning agents and disinfectants are not to be stored in areas where food is handled

Regulation EC No 853/2004 Annex III - Section I Chapter III for meat of domestic ungulates; Section II Chapter III for poultry meat; Section V Chapter I for minced meat, meat preparations requires that:

FBOs must ensure that cutting plants handling meat of domestic ungulates/ poultry/ producing minced meat or meat preparations

1. are constructed so as to avoid contamination of meat, in particular by:
   (a) allowing constant progress of the operations; or
   (b) ensuring separation between the different production batches;
2. have rooms for the separate storage of packaged and exposed meat, unless stored at different times or in such a way that the packaging material and the manner of storage cannot be a source of contamination for the meat;
3. have cutting rooms equipped to ensure compliance with the requirements laid down in Regulation 853/2004 regarding hygiene during cutting and boning (domestic ungulates)/ during and after cutting and boning (poultry)/ during and after production (minced meat and meat preparations).
4. have equipment for washing hands with taps designed to prevent the spread of contamination, for use by staff engaged in handling exposed meat; and
5. have facilities for disinfecting tools with hot water supplied at not less than 82 °C, or an alternative system having an equivalent effect.

PRP 2
Layout and zoning

PRP 2 **Layout and zoning**

Introduction

Zoning is the physical separation of activities, and therefore structure, equipment and product should be zoned correctly to prevent cross-contamination. Zoning divides a premises into defined areas depending on the food safety risks. Good zoning can contribute significantly to preventing food poisoning micro-organisms being accidentally transferred from raw food to ready-to-eat food. Zoning can also be used as part of a food business's allergen controls and meat-species separation. Additional information can be found in PRP 12 Measures to prevent cross-contamination.

All staff working in the food preparation areas must be adequately trained in the safe handling of food and prevention of contamination.

Incorrect zoning can lead to:

1. Contamination of ready-to-eat food with food poisoning bacteria, particularly those frequently present on raw meat, that may be on hands, equipment, utensils or cloths.
2. Cross-contamination of food allergens to products that do not contain allergens.

Movement of staff, equipment, containers or product, from raw food areas to, or through, ready-to-eat food areas and from dirty areas to clean areas can result in contamination of food and food contact surfaces.

Physical separation

Physical separation can manage risk of cross-contamination of raw material operations and processed product operations. If there is no time component to separation, then distance-alone in a shared airspace is not an adequate zoning approach for such operations to take place at the same time.

View from raw meat area, through double-door cooker to cooked meat area.

When working on food, ready-to-eat production zones should be completely segregated from raw food areas by a floor to ceiling barrier. In all cases the following should be put in place:

- Raw meat processing areas segregated from ready-to-eat meat processing areas.
- Processing areas for products/ingredients containing allergens separated from other processing areas (for example, burgers with a cereal content containing wheat).

For storage, zoning should ensure raw and ready-to-eat foods are stored separately.

- Separate dedicated chills and freezers for the storage of raw, and ready-to-eat foods. Where this is not possible store ready-to-eat foods above raw foods, to manage risk arising from drips etc.
- Unpackaged foods should be adequately protected during storage. Ideally, they should be kept covered with a food-grade liner or other suitable food-grade materials.

To prevent cross-contamination between raw and ready-to-eat foods:

- Use colour-coded chopping boards, tools, knives, and cloths, with one colour denoting raw-only and a different colour denoting ready-to-eat.
- Use separate dedicated temperature probes in raw and ready-to-eat areas.
- Change personal protective equipment (PPE) when moving from raw food processing areas to ready-to-eat food processing areas.
- Protective clothing in ready-to-eat areas should be exclusively used in that area and should be visually distinctive from the protective clothing used in raw food areas. For example, the use of different-coloured PPE.
- Visually distinctive cleaning equipment should be used in raw and ready-to-eat production areas respectively.
- Use separate, clearly designated sinks for washing utensils, preparing raw products, preparing ready-to-eat foods, and for handwashing.
- Wash and sanitise hands after handling or preparing raw food and before handling ready-to-eat foods.

Time separation

Time separation of food processing activities may be used if physical separation is not possible. However, this approach requires effective cleaning to minimise cross-contamination.

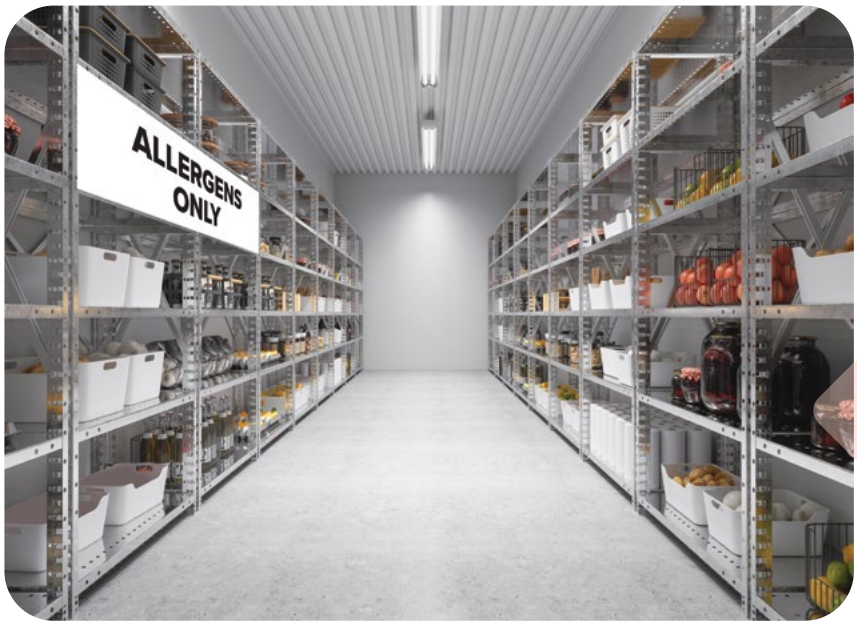
- Prepare raw and ready-to-eat foods at different times and clean and disinfect the area thoroughly between tasks, in addition to changing protective clothing.
- Production scheduling is very important when it comes to minimising the hazard of allergen cross-contamination. To help avoid this problem, start the production day with the processing of meat products that do not contain allergens. Finish the production day by processing meat products that do contain allergens. For example, start the day with the production of beef fillets or minced beef that do not contain allergens. Then move on to beef burgers containing wheat (contains one allergen) and finish with the production of beef burgers containing wheat and mustard (contains two allergens).
- In the case of difficult to clean equipment, time separation is not adequate and dedicated processing equipment (for example mincers, slicers, vacuum packing and wrapping machines) should be used for processing/packing ready-to-eat foods.

To ensure that zoning controls are in place, it is recommended that a manager/supervisor walk through the entire premises at least once a day to check that:

- The flow of product and staff is operating in such a way to ensure that no cross-contamination occurs
- Handling and preparation of foods are correct
- Products/ingredients containing allergens are correctly stored and handled
- Correct colour-coded utensils and equipment are being used
- Work tables, floors, walls, equipment, and utensils are clean
- Correct production scheduling, if applicable, is being followed
- Cleaning equipment is kept in separate areas. For example, brushes, mops, and buckets should be identified by colour coding for the different areas.

The FBO should take corrective action immediately if they notice incorrect zoning, or incorrect staff practices.

Products/ingredients containing allergens should be correctly stored and handled.



Relevant legislation

Regulation (EC) No 852/2004, Annex II, Chapter I requires that:

2. The layout, design, construction, siting and size of food premises are to:
   (a) permit adequate maintenance, cleaning and/or disinfection, avoid or minimise air-borne contamination, and provide adequate working space to allow for the hygienic performance of all operations;
   (b) be such as to protect against the accumulation of dirt, contact with toxic materials, the shedding of particles into food and the formation of condensation or undesirable mould on surfaces;
   (c) permit good food hygiene practices, including protection against contamination and, in particular, pest control;

   and
   (d) where necessary, provide suitable temperature-controlled handling and storage conditions of sufficient capacity for maintaining foodstuffs at appropriate temperatures and designed to allow those temperatures to be monitored and, where necessary, recorded.

Regulation EC No 853/2004 Annex III - Section I Chapter V for meat of domestic ungulates; Section II Chapter V for poultry meat; Section V Chapter III for minced meat, meat preparations requires that:

FBOs ensure that cutting and boning of meat of domestic ungulates/ poultry/ takes place in accordance with the following requirements.

- The work on meat must be organised in such a way as to prevent or minimise contamination. To this end, food business operators must ensure in particular that:
  (a) meat intended for cutting is brought into the workrooms progressively as needed;
  (b) during cutting, boning, trimming, slicing, dicing, wrapping and packaging, the meat is maintained at not more than 4 °C for poultry, 3 °C for offal and 7 °C for other meat by means of an ambient temperature of not more than 12 °C or an alternative system having an equivalent effect;

  and
  (c) where the premises are approved for the cutting of meat of different animal species, precautions are taken to avoid cross-contamination, where necessary by separation of the operations on the different species in either space or time.
- For the production of minced meat and meat preparations the meat must be brought into the preparation room progressively as needed.

Notes

PRP 3

Product storage, distribution and transport

PRP 3 Product storage, distribution and transport

Introduction

This section mainly relates to cold storage, but also includes the storage of non-food items such as food contact packaging, labels and cleaning chemicals.

The cold chain or 'chill chain' refers to controlling the temperature of food products from the point of origin, through the distribution chain, to the final consumer. Lower temperatures slow the growth of bacteria on food, assisting both food safety by inhibiting illness-causing bacteria, and food quality by inhibiting spoilage organisms. Any break in the cold chain along the whole supply chain (including the preparation, storage, distribution, and retail stages) can allow bacteria to grow to problematic levels. FBOs must ensure the cold chain remains unbroken.

The purpose of the cold chain is to ensure:

- Foods are delivered, stored, handled, processed and transported at safe temperatures.
- The time food spends outside refrigerated/frozen temperature (for example during processing) is kept to a minimum.

The FBO must take action if food has not been stored at the correct temperature as bacterial growth may reach harmful levels and cause illness.

To maintain the cold chain, ensure that:

1. All refrigeration equipment is maintained in a good state of repair so that food is stored at the required temperature. Refrigeration equipment should be maintained in accordance with the manufacturer's instructions.
2. Chilled and frozen foods are stored, dispatched and transported at the required temperatures.
3. Frozen food is defrosted under controlled conditions, such as in a chill, to prevent the required temperatures in Table 3 being exceeded.
4. The length of time food spends outside a temperature-controlled environment is minimised (for example during cutting or other preparation work).

Goods inwards/receiving deliveries

On arrival of the incoming product, the relevant manager should check product temperature, product integrity and product packaging. Goods inwards staff should be familiar with the current list of suppliers. This list should be available to them at the goods inwards step.

Where possible, the FBO should obtain a temperature printout from the delivery driver. The FBO should check each delivery to ensure that food arrives at the required temperature. This can be achieved by:

1. Placing the probe in the deep muscle of carcase meat
2. Checking the temperature between packs of food in the delivery
3. For frozen food, checking that the food items are frozen solid and do not show signs of previous defrosting, such as excessive ice crystal build-up.

If there are indications that the food has not been delivered at the correct temperature, a temperature probe should be used to check the core temperature of the food. If this does not comply with the temperatures outlined in Table 3 (below) the product should not be accepted. A record of this rejection should be kept and the supplier notified.

The product temperatures required for meat entering a SMMP are outlined in Table 3. For more information - see Section 3 Goods inwards SOP.

Temperature monitoring

The FBO must demonstrate that the cold chain is operating effectively by monitoring temperatures and reviewing the records that are maintained. For example, the goods inwards record and the chilled/frozen temperature records. There should be active monitoring of cutting room temperatures, and meat product temperatures after cutting.

Table 3 Specific temperature requirements for meat

Product	Maximal temperature
Fresh meat of domestic ungulates including bovine, porcine, ovine, caprine (goat)	Offal: Less than or equal to 3 °C Meat: Less than or equal to 7 °C (surface temperature of meat)
Fresh meat of Poultry and lagomorphs (rabbits and hares)	Meat: Less than or equal to 4 °C
Minced meat	Less than or equal to 2 °C Not higher than -18 °C for frozen minced meat. After defrosting, minced meat must not be refrozen.
Meat preparations	Less than or equal to 4 °C Not higher than -18 °C for frozen meat preparations. After defrosting, meat preparations must not be refrozen.

The FSAI recommends that vacuum-packed meat should be chilled at 0 °C +/- 1 °C.

Regular monitoring of temperatures using a calibrated temperature probe is necessary to ensure that the required air and product temperature are maintained during storage, transport and distribution.

Some equipment will have a digital display to show the temperature. Some may have a temperature monitoring system with data loggers that trigger an alarm if the temperature is out of specification. Delivery vehicles may have data loggers that provide a record. Checks to ensure that the temperature recorded on the digital displays/data loggers is accurate, should be carried out regularly using a calibrated temperature probe.

Hand-held calibrated digital temperature probes can be used when probing foods and for checking air temperatures.

Infrared thermometers or temperature 'guns' should not be used. Infrared thermometers measure surface temperatures, but not the internal temperature of food, and they can be less accurate assessing core temperature than hand-held digital probes.

Digital temperature probes are generally easy to use and are accurate. The probe should be sanitised thoroughly before and after use to prevent cross-contamination. Once the probe has been inserted into the product, the display needs to stabilise before taking a reading.

To ensure that temperature probe readings remain accurate, they should be calibrated according to the manufacturer's instructions. Calibration records should be maintained each time the temperature probe is calibrated. For more information on calibration, see PRP 9 Maintenance.

Monitoring chills and frozen storage

The temperature of each chill and freezer should be checked at least twice a day to ensure that food is being stored at the correct temperature. Ideally, the first check should be carried out before the start of production and information recorded on the pre-production, metal control and knife register record see Section 4 – Record 2 for a copy of the Pre-production, metal control and knife register record. This first check will help to indicate whether the equipment is working properly. The second check should be carried out during a busy period of production, as this will help to indicate whether the equipment maintained the required temperature at busy times when the doors may have been opened frequently.

If the FBO references a digital temperature display of the air temperature of the room, they still need to verify the product temperature using a calibrated hand-held temperature probe to check the following where relevant:

- The deep muscle temperature of carcase meats in the chill or freezer
- The temperature between packs of food in the chill or freezer.

If the digital display shows that the temperature on the surface and between packs of food is not in line with the temperatures specified in Table 3, the core temperature of the food is to be checked.

If a chill or freezer has undergone a defrost cycle, this may affect the air temperature and the temperature between packs of food.

If the core temperature is above the permitted limit, the FBO should investigate why this happened; for example, check whether the food was recently processed at room temperature, and check the temperature of other foods where possible.

When a chill or freezer cannot maintain the required temperature, all products should be checked to see if they are above the required temperature. If they are a decision on their designation should be made. If they are at the required temperature, they should be transferred to a properly functioning unit, and the original chill/freezer taken out of service until it has been repaired with a notice clearly displayed on the door of the unit indicating that it is out of service.

Freezing as an aid to processing

Some FBOs may decide to use freezing or partial freezing to aid processing. For example, decreasing the temperature of meat or fat before mincing to ensure that the temperature of the product remains within acceptable limits during sausage making, or freezing/stiffening bacon backs before slicing into rashers. If such a step is used in a production process, then time and temperature limits should be set out and supported by appropriate checks. Typical limits might be no more than 12 hours in freezer, and a surface temperature no lower than minus 10 °C, but individual operations vary.

Defrosting

Defrosting should be regarded as a process to bring meat from –18 °C to 4 °C. It is essential that the defrosting process is carried out in a temperature-controlled environment between 0 °C and 4 °C. If defrosting of frozen meat is not done properly, it can result in the core of the product remaining frozen and other parts of the meat rising above 4 °C, which can result in bacterial growth on the meat surface and could be dangerous. It may also result in spoilage of the meat prior to the use-by date. To ensure the safety of the meat during defrosting, it is essential that the meat is removed from frozen storage and placed in a temperature-controlled environment between 0 °C and 4 °C. The FBO should ensure that meat is put to defrost in sufficient time to allow it to reach the desired temperature before processing. Products defrost from the outside inwards and a large-sized piece of meat (for example, beef topside or silverside) will take a lot longer to defrost than smaller cuts. Similarly thin parts of a larger cut will defrost more quickly than thick parts. Therefore, the required times may vary, and experience should be used to determine adequate defrosting times. No part of the product, particularly external surfaces should be allowed to exceed 4 °C during or after the defrosting process.

Air temperature of cutting rooms

During cutting, boning, trimming, slicing, dicing, wrapping and packaging, meat must be maintained at a temperature of not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats.

Refrigeration of production rooms should not exceed a maximum of 12 °C. However, in small-scale, low-throughput establishments, an equivalent temperature effect may be achieved through the use of suitable work practices, but only when authorised by the inspector (Competent Authority). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement. The Competent Authority must authorise the flexibility before the FBO can implement it. It should be recognised that without active room cooling, relying on work practices alone may not be adequate in warm weather conditions. In these cases, small batches of product can be worked on in rooms with/without refrigeration, provided that the FBO can demonstrate that the product remains within the required temperature range (not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats).

Immediately after production minced meat must be chilled to not more than 2 °C, and meat preparations must be chilled to not more than 4 °C.

Storage of ambient goods

- All storage areas must be adequately pest proofed.
- Doors to storage areas should be kept closed except when being filled, emptied or cleaned.
- All products must be stored off the floor and away from the walls to allow easy access for cleaning and inspection.
- Keep storage areas clean and dry - clear up any spillages immediately.
- Protect food from all forms of contamination.
- Keep all foods stored in accordance with manufacturer's storage recommendations.

Packaging

- Food contact materials, such as wrapping and packaging materials must be stored off the floor and away from walls.
- Food packaging should have a designated area in the stockroom.
- Protect food packaging from all forms of contamination – keep food packaging covered in the stockroom, to avoid physical contamination of the packaging.

Cleaning chemicals

- A designated area is required for storing cleaning chemicals
- This area should be ventilated
- Cleaning chemicals should not be stored near food.

Stock control

Stock control is the process of ensuring that there is sufficient stock to meet customer demand while keeping the costs of holding stock to a minimum.

- Poor stock control may result in food going beyond its use-by/best-before date. Once the use-by date has passed, the food must be disposed of, as it is deemed to be unsafe in accordance with general food law. This results in the food business ending up with loss of the product and the subsequent cost of disposal.
- Good stock control guarantees that goods are dispatched before they deteriorate in quality, and thus avoids food safety issues.
- Stock control is an important part of a food business's FSMS and it can be carried out in different ways depending on the nature of the products. It is up to the FBO to decide the method of stock control that works best for them, and thus ensure that the food they are producing is safe to eat.

Poor stock control practices can lead to the following food safety issues:

- Microbiological growth of bacteria, which can make food unsafe and/or spoil food
- Stock becoming physically contaminated
- Allergen cross-contamination from products/ingredients containing allergens due to poor stock storage and segregation practices (For example, poor product zoning).

Contamination of food and poor utilisation of stock can be minimised by effective stock rotation:

- Stock with the earliest use-by/best-before dates should be used first.
- The use-by/best-before date of food produced in the premises to be indicated.
- All stored food must be identifiable. When transferring food from its original packaging into containers, it must be possible to identify the ingredients in the product for example retaining the ingredients list and the use-by/best-before date from the original packaging.
- Damaged stock should be removed from storage and disposed of appropriately.
- Food products must not be stored directly on the floor. They should be stored on suitably maintained pallets, racks or shelving.

The FBO should check that their staff are following the correct stock control procedures.

- ☑ Check that food is being stored appropriately.
- ☑ Use-by/best-before dates of food products checked regularly.

Once the use-by date has passed, the food must be disposed of, as it is deemed to be unsafe in accordance with general food law.

Distribution and transport

Transport is a very important step in the food supply chain. Meat and meat products must be transported under hygienic conditions and at the correct temperature (see table 3), free from damage, and protected from contamination (including food allergens). Meat and meat products can spoil, become contaminated or damaged under incorrect transport conditions.

If using a contractor for transporting/delivery the FBO should ensure that all hygiene and temperature requirements are being met.

Vehicle and driver hygiene requirements

- Vehicles should be designed to transport meat hygienically and must be kept clean and maintained in good repair and condition to protect food from contamination.
- When meat and meat products are being transported, the vehicles and containers used must be capable of maintaining the product at the required temperature.
- There should be an artificial light source in the load-carrying area of the vehicle.
- Product must be protected from contamination and should not be stored on the floor of the vehicle.
- In addition, food (especially exposed and packaged meat) should be properly separated.
- Workers transporting exposed meat should wear protective clothing and carry out their work in such a way that it minimises the risk of contamination of the meat.
- All food contact surfaces and food contact materials in the vehicle, including plastic containers for transporting meat, bags containing meat, cardboard boxes containing product, etc., must be food-grade.
- Products/ingredients containing allergens should be appropriately segregated from other food during transport, especially where the integrity of the packaging may be suspect. This is to protect other foods from being contaminated with allergens during transport.
- Chemicals (for example, cleaning products), should not be present in a vehicle transporting unpackaged meat and meat products.

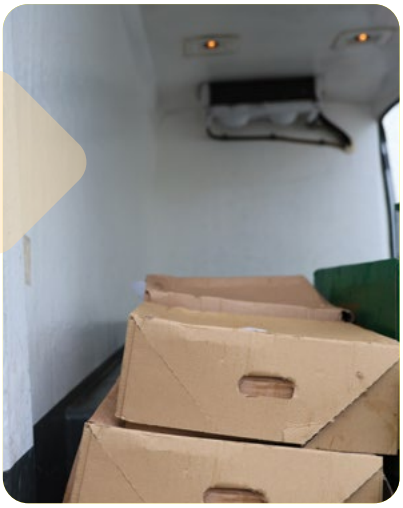
For more information on the transport and disposal of food waste material, including ABPs, see PRP 6 Waste management.

Dispatch

- Prior to loading, the transport vehicle should be inspected for cleanliness and that the refrigeration unit is working. The vehicle must be suitable for transporting meat and meat products.
- The driver should precool the vehicle prior to loading, (for example, the chill compartment should be set to +2 °C and the frozen department set to -20 °C).
- The vehicle should be loaded with the customer orders based on the route plan for the relevant day.
- The vehicle driver should ensure that vehicle door is not left open for long periods of time so that chilled and frozen temperatures are maintained.

Deliveries

- During loading and unloading, the products must be protected from contamination (for example, by fumes, dust, dirt, rain, pests, birds, leaves, and other contaminants). The FBO must have a satisfactory system in place to prevent contamination of exposed meat during loading and unloading between premises and vehicles. This may be achieved, for example, by using a vehicle docking system, a canopy or awning. Where this is not available the FBO must ensure that exposed meat is protected from contamination.
- Where possible the driver should ensure that the customer is present to accept the delivery.
- At the point of delivery, product should be moved to/from the transport vehicle into/out of the chill or warehouse in a hygienic and safe manner.
- The driver should ensure that the temperature of the chilled and frozen product meets legal requirements. A handheld calibrated temperature probe should be used by the driver to check the product on arrival to the customer. If the product is not at the correct temperature upon delivery, the customer should be notified and a decision agreed.
- The driver should ensure that all product traceability information accompanies the product at point of delivery.



Returns

In general terms, product which has left the control of the operator, falls outside of the control of this FSMS, and acceptance of returned product should be an exception arising only when there is clear basis to support it meeting the requirements of this FSMS.

- If the product does not leave the delivery vehicle and is rejected by the customer before unloading (for example, due to order error), it can be placed back into stock. This is not classed as a return, as it has not left the control of the FBO.
- In most cases, and particularly when the product is not in good condition or is missing labels or associated relevant traceability information; or appropriate assurances of temperature maintenance are not forthcoming,
  a. The product should not be accepted as a return
  b. The product should be disposed of appropriately, in all likelihood as Category 3 ABP, at the customer's premises.

The customer should be informed of the decision made.

- In exceptional cases a delivery driver may accept a return from a customer. They must first ensure that the goods being returned are in an acceptable condition as follows:
  - ☑ The product must be unopened, and all traceability information must be intact.
  - ☑ The product must still have the original label and must be in date and in the same condition it was in when delivered to the customer.
  - ☑ The product must be at the required legal temperature, and there should be document checks to demonstrate it had been maintained at that temperature while in the customer's control. If not, the return cannot be accepted.
  - ☑ If there is any doubt about the condition of the product being returned (for example, evidence of temperature abuse, missing label or traceability information), the driver should contact their manager and make them aware of the issue. A decision should then be taken by management as to whether the product in question will be accepted as a return.
- If the return is accepted from the customer, the FBO accepting the return must record the following information:
  - ☑ Reason for the return
  - ☑ The relevant batch number
  - ☑ The quantity and any other information that is relevant to the product being returned
  - ☑ The extent and outcome of check's to verify acceptability of the product.
- If an accepted returned product, is subsequently deemed to be unfit for human consumption, the product must be disposed of appropriately, in all likelihood as Category 3 ABP (See PRP 6 Waste Management.)

Vehicle breakdown

In the event of a vehicle breakdown or if the refrigeration of the vehicle fails, maintaining product temperature is crucial. The following actions should be taken:

- The driver should contact the FBO manager/office immediately and report the breakdown.
- The relevant FBO manager should contact the refrigeration company, if required, and request that it arranges for an appropriate company representative to travel to the breakdown location if possible.
- The relevant FBO manager arrange for a backup vehicle to be sent to the breakdown location if possible.
- Where possible, the driver should keep the refrigeration system running and keep the doors closed until assistance arrives. The vehicle doors should be kept closed to help the food remain at a safe temperature until the breakdown issue is addressed.
- While waiting for assistance, the driver to ensure that the vehicle itself and the load are secured to prevent any potential security threats such as theft or malicious contamination.
- Following repair of the vehicle/refrigeration unit, the driver must take the temperature of the products to ensure they are at the required temperature as outlined in Table 3.
- The breakdown details to be recorded, along with the corrective action taken and the temperature of the product immediately after the vehicle/refrigeration system was repaired.

Records (see Section 4)

- Pre-production, metal control and knife register record (Record 2)
- Chilled/frozen temperature record (Record 3)
- Goods inwards record (Record 4)

Relevant legislation

Regulation (EC) No 852/2004: Annex II, Chapter IX, Provisions applicable to foodstuffs requires that:

5. Raw materials, ingredients, intermediate products and finished products likely to support the reproduction of pathogenic micro-organisms or the formation of toxins are not to be kept at temperatures that might result in a risk to health. The cold chain is not to be interrupted. However, limited periods outside temperature control are permitted, to accommodate the practicalities of handling during preparation, transport, storage, display and service of food, provided that it does not result in a risk to health. Food businesses manufacturing, handling, and wrapping processed foodstuffs are to have suitable rooms, large enough for the separate storage of raw materials from processed material and sufficient separate refrigerated storage.

Regulation EC No 853/2004 Annex III requires the following:

- **Section I, Chapter VII for meat of domestic ungulates:**

  FBOs ensure that the storage and transport of meat takes place in accordance with the following:

  1. (a) Unless other specific provisions provide otherwise, post-mortem inspection must be followed immediately by chilling in the slaughterhouse to ensure a temperature throughout the meat of not more than 3 °C for offal and 7 °C for other meat along a chilling curve that ensures a continuous decrease of the temperature. However, meat may be cut and boned during chilling in accordance with Chapter V, point 4.

  (b) During the chilling operations, there must be adequate ventilation to prevent condensation on the surface of the meat.

  2. Meat must attain the temperature specified in point 1 and remain at that temperature during storage.

- **Section II, Chapter V for poultry meat**

  3. As soon as the meat is cut and, where appropriate, packaged, it must be chilled to a temperature of not more than 4 °C.

  4. Meat must attain a temperature of not more than 4 °C before transport and be maintained at that temperature during transport.

- **Section V, Chapter II for minced meat & meat preparations**

  2. (c) Immediately after production, minced meat and meat preparations must be wrapped or packaged and be:

  (i) chilled to an internal temperature of not more than 2 °C for minced meat and 4 °C for meat preparations;

  or

  (ii) frozen to an internal temperature of not more than -18 °C.

  These temperature conditions must be maintained during storage and transport.

Notes

PRP 4

Product recall and traceability

PRP 4 Product recall and traceability

Introduction

Every FBO regardless of size and operations are required to have a traceability, and recall procedure. The traceability system must be able to trace one step backward to the immediate supplier and one step forward to the immediate customer. Customer traceability is not required for food sold to the final consumer from the premises (for example, customers buying from a retail premises).

An effective traceability system can track and trace food throughout the food chain. In the event of a product recall, without an effective traceability system, a food withdrawal/recall could be more difficult, expensive and time-consuming than otherwise necessary, as products cannot be traced back and forward in a timely manner. This could potentially result in prolonged exposure of consumer to unsafe product, as well as reputational damage to the food business. Therefore, it is important to have an efficient and effective traceability system in place.

Even in the best managed food business, an issue involving the safety of food may occur. This may be the result of, for example, a packaging defect, a product formulation error, a manufacturing or storage problem, or a problem with the food ingredients. It is important that the FBO is aware that food safety issues can arise with their products, and therefore there is a need to plan.

Supplier and customer traceability

The FBO must be able to trace their products one step backward to the immediate supplier and one step forward to the food business they supply. Operators should have Internal traceability system to adequately demonstrate linkage between these within internal processes. Traceability records must be kept and made available to the inspector when requested. See Section 4 – Records for information on the period of time records must be maintained.

In addition, country of origin labelling requires a traceability system at all stages of production and distribution of meat to ensure that there is a link between the labelled meat and the animal or group of animals it came from.

Supplier traceability (one step backward)

The ability to trace raw materials back to a supplier is important if a food safety problem is discovered by a supplier or a customer. The FBO must be able to identify in a timely manner where products, ingredients or packaging have been received from. Accurate traceability records are very important.

The following information must be retained for all foods:

- ☑ Name and address of supplier, for example, wholesaler, importer or manufacturer
- ☑ Date of transaction/delivery
- ☑ Accurate description of the product supplied
- ☑ Use-by/best-before date.

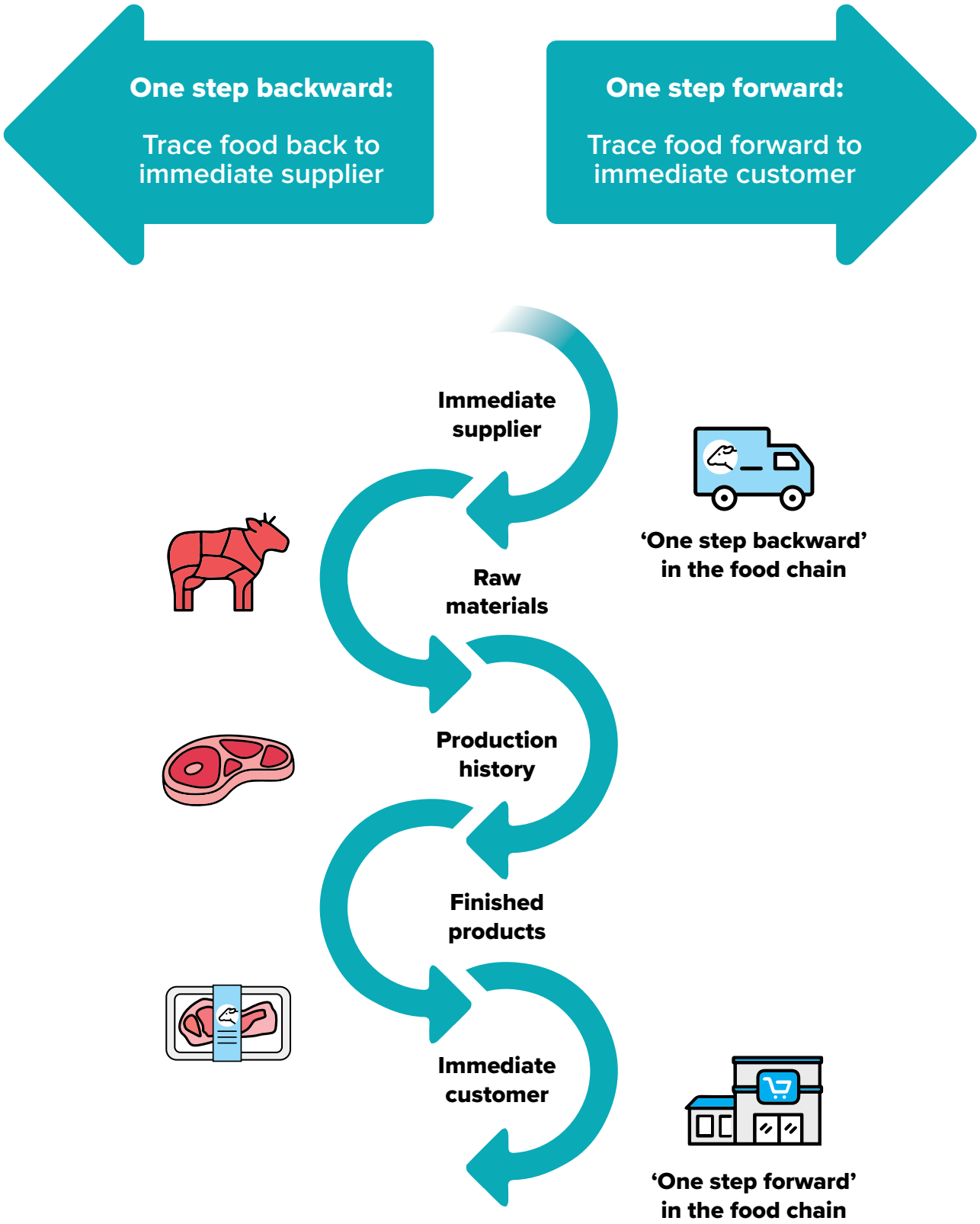
This information may be contained on the invoices, receipts or dockets received from the supplier.

In addition, more specific information is required for food of animal origin.

- ☑ Volume or quantity of the food
- ☑ A reference number identifying the lot or batch
- ☑ Name and address of consignor (owner), if different from supplier.

This information must be updated daily. It is best practice to keep this additional information for all products supplied and not just for those of animal origin.

Figure 2 Traceability



Traceability requirements for food packaging

Any material that is intended to come into contact with food, that is already in contact with food, or that can reasonably be expected to come into contact with food, is considered to be a food contact material. This includes wrapping and packaging materials, containers, processing machinery, cutting boards, etc. All food contact materials can potentially contaminate food by transferring substances into it. Therefore, food contact materials must be made and used in such a way that they do not cause unsafe levels of contamination.

Declaration of compliance

A declaration of compliance (DoC) is required for all plastic food contact materials (FCM), including packaging. A DoC should always be provided by a supplier of plastic FCM to FBOs. If the FBO is using recycled FCM plastics those recycled plastics must also comply with the recycling Regulation (EU) 2022/1616 in addition to the FCM framework Regulation (EC) 1935/2004 and Regulation (EU) No 10/2011 on plastic FCM. FBOs should ensure they ask recycled plastic FCM suppliers for a DoC.

It is recommended that FBOs should request from suppliers, a DoC for all other FCMs used by that FBO. All DoCs should be retained on file by the FBO as part of the documentation which helps verify that a particular FCM complies with EU legislation. For further details, see information on food contact materials on www.fsai.ie

The FBO is responsible for the safety and compliance of any product they place on the market, including the food packaging material. The FBO is responsible for ensuring that their food packaging material is:

- Suitable for use with food
- Traceable back to their supplier
- Used in accordance with the manufacturer's instructions
- Used in compliance with EU legislation
- Used safely to ensure that the food is not contaminated.

Traceability information for food packaging material must be retained as part of the product's traceability records. The food and its packaging become one food product and therefore the traceability requirements apply to it as a whole.

Customer traceability (one step forward)

Customer traceability must include all immediate recipient food businesses and the products received. Customer traceability is not required for food sold to the final consumer. There must be a comprehensive customer traceability system in place, including a mechanism whereby the customer is informed if there is any food safety issue.

The FBO must retain the following information:

- ☑ Name and address of customer
- ☑ Contact details (name/mobile number/email) for the contact person in the food business
- ☑ Date of transaction/delivery
- ☑ An accurate description of the product supplied
- ☑ Volume or quantity of the food
- ☑ A reference number identifying the lot or batch
- ☑ Use-by/best-before date
- ☑ Date of dispatch (if different from date of transaction/delivery).

This information must be updated daily.

The FBO must ensure that their identification mark is applied to all products of animal origin produced in that establishment before the product leaves the FBO's premises. For more information, see PRP 16 Labelling and product information.

Process traceability information

One of the key steps in developing any food traceability system is process traceability. A system of internal/ process traceability is required to meet the legal requirements of traceability and maintain traceability through food processing.

The following traceability information is appropriate for process traceability (taken from FSAI **Guidance Note 10: Product Recall and Traceability** - www.fsai.ie

- Identification of a product batch.
- Application of a unique batch code identifier to:
  - Every pack containing the product batch, unless the pack is too small to allow for a code to be applied
  - The outer case, if any
  - Internal process documentation associated with the product batch.
- Generation of an In-process traceability record with all the necessary information relating to ingredients, packaging and process times to allow traceability to the finished product batch. See Section 4 – Record 7 for a copy of the In-process traceability record.

  It is important to record the information without delay.
- Product release procedures should ensure that the traceability system has been maintained.
- Food businesses engaged in rework should ensure that the documentation associated with a product batch contains all the information necessary to allow traceability of any rework incorporated. For more information, see PRP 14 Rework.

An example of an internal traceability tag identifying a product batch.

Process traceability information if rewrapping product

If the FBO is involved in rewrapping products, these products need to be traceable back to the original supplier.

Product recall and withdrawal

When the FBO discovers that a food does not comply with food safety requirements, they must immediately initiate procedures to withdraw the food from the market if the food has left their immediate control. Where the food may have reached the consumer, the FBO must inform consumers of the reason why the food was withdrawn. If necessary, they must recall the affected food from consumers.

The Competent Authority must be notified immediately that a product withdrawal/recall is necessary.

Reasons why a food might be withdrawn or recalled may include the following:

- Incorrect labelling, which may include the omission of allergen information
- Bacterial contamination
- Allergen contamination
- Physical contamination (for example, glass or plastic).

Product recall/withdrawal system

The FBO should establish food recall/withdrawal systems that can effectively and efficiently remove affected food from the market. As part of these systems, the FBO should establish a written food recall/withdrawal policy, and make staff aware of this policy so they know what action to take.

With regard to food product recall, the FBO should implement the following processes:

1. **Planning:** this focuses on the development and documentation of procedures that are necessary for effective food recall/withdrawal. The FBO should undertake a comprehensive planning process well in advance of any food incident. In particular, the FBO should:
   - Develop and document a food recall/withdrawal policy
   - Develop and document a food recall/withdrawal plan
   - Review and test a food recall/withdrawal plan
   - Establish a 'food incident team' or 'product recall team' within the business to make decisions in the event of a food incident and, in particular, to make a decision about whether to withdraw or recall a product (see point 2 'Management' below). This food incident team or product recall team should include personnel from areas such as production, quality/technical, purchasing, sales, etc.
   - Appoint a product recall coordinator who would be responsible for the product recall. The product recall coordinator would also be responsible for contacting their inspector/Competent Authority in relation to the food incident and any decisions that need to be made.
   - Ensure that deputies for each product recall team member are listed on the product recall team and customer contact list. See Section 4 – Record 6 for a copy of the Product recall team and customer contact list.

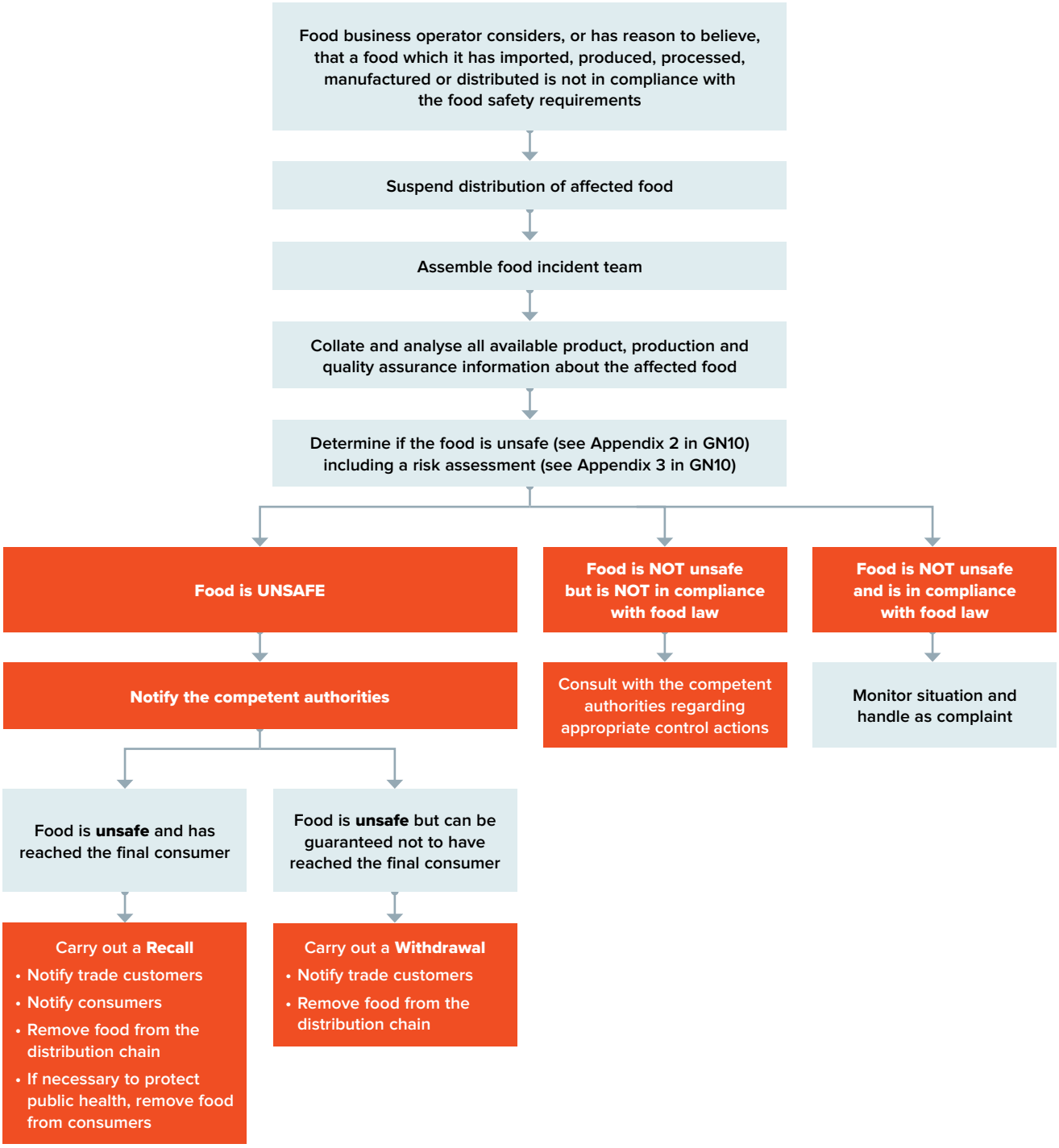
2. **Management:** this focuses on the important considerations for identification of unsafe food and its efficient and effective removal from the market during a food recall/withdrawal process.

   Managing a food recall/withdrawal should follow a clear sequence of steps:
   - Initial information management – product details, nature of the hazard and extent of the issue.
   - Apply the decision tree and identify unsafe or other non-compliant food.
   - Compile information on distribution.
   - Remove unsafe food from the market and any associated communications.
   - Notify the inspector/Competent Authority. They will advise on the best way to proceed based on a risk assessment.
   - Do a mass balance to account for all food of affected batch distributed.
   - Close the product recall/withdrawal.
   - Dispose of unsafe food. For more information, see PRP 6 Waste management.
   - Review the product recall/withdrawal process.

The food recall decision tree should be used as part of the plan to take initial precautionary measures and to identify the legal status of the affected food based on risk assessment

Figure 3 Food recall decision tree

For more information, see FSAI **Guidance Note 10: Product Recall and Traceability**.



Records (see Section 4)

- Goods inwards record (Record 4)
- Product recall team and customer contact list (Record 6)
- In-process traceability record (Record 7)

Relevant legislation

Regulation (EC) No 178/2002, Article 18 Traceability

1. The traceability of food, feed, food-producing animals, and any other substance intended to be, or expected to be, incorporated into a food or feed shall be established at all stages of production, processing, and distribution.
2. Food and feed business operators shall be able to identify any person from whom they have been supplied with a food, a feed, a food producing animal, or any substance intended to be, or expected to be, incorporated into a food or feed. To this end, such operators shall have in place systems and procedures which allow for this information to be made available to the competent authorities on demand.
3. Food and feed business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand.
4. Food or feed which is placed on the market or is likely to be placed on the market in the Community shall be adequately labelled or identified to facilitate its traceability, through relevant documentation or information in accordance with the relevant requirements of more specific provisions.

Regulation (EC) No 931/2011 Article 3 Traceability requirements

1. Food business operators shall ensure that the following information concerning consignments of food of animal origin is made available to the food business operator to whom the food is supplied and, upon request, to the competent authority:
   (a) an accurate description of the food;
   (b) the volume or quantity of the food;
   (c) the name and address of the food business operator from which the food has been dispatched;
   (d) the name and address of the consignor (owner) if different from the food business operator from which the food has been dispatched;
   (e) the name and address of the food business operator to whom the food is dispatched;
   (f) the name and address of the consignee (owner), if different from the food business operator to whom the food is dispatched;
   (g) a reference identifying the lot, batch or consignment, as appropriate; and
   (h) the date of dispatch.

Regulation (EC) No 178/2002, Article 19 Responsibilities for food: food business operators

1. If a food business operator considers or has reason to believe that a food which it has imported, produced, processed, manufactured or distributed is not in compliance with the food safety requirements, it shall immediately initiate procedures to withdraw the food in question from the market where the food has left the immediate control of that initial food business operator and inform the competent authorities thereof. Where the product may have reached the consumer, the operator shall effectively and accurately inform consumers of the reason for its withdrawal, and if necessary, recall from consumers products already supplied to them when other measures are not sufficient to achieve a high level of health protection.
2. A food business operator responsible for retail or distribution activities which do not affect the packaging, labelling, safety or integrity of the food shall, within the limits of its respective activities, initiate procedures to withdraw from the market products not in compliance with the food-safety requirements and shall participate in contributing to the safety of the food by passing on relevant information necessary to trace a food, cooperating in the action taken by producers, processors, manufacturers and/or the competent authorities.
3. A food business operator shall immediately inform the competent authorities if it considers or has reason to believe that a food which it has placed on the market may be injurious to human health. Operators shall inform the competent authorities of the action taken to prevent risks to the final consumer and shall not prevent or discourage any person from cooperating, in accordance with national law and legal practice, with the competent authorities, where this may prevent, reduce or eliminate a risk arising from a food.
4. Food business operator shall collaborate with the competent authorities on action taken to avoid or reduce risks posed by a food which they supply or have supplied.

PRP 5
Pest control

PRP 5 Pest control

Introduction

Pests include rodents, animals, birds or insects that contaminate food either directly or indirectly. Common pests and signs of pests are outlined in Table 4. Pests can carry numerous diseases and may pose a serious risk to food on-site, causing food spoilage or consumer illness. Food poisoning bacteria can be transferred to the food by contact with pests. Pests may also affect the integrity of food packaging as well as structures/equipment in a premises and can create negative publicity for a food business.

The FBO must have procedures in place to control the entry of pests including a pest control programme that has been developed by a competent person such as an approved pest control contractor.

Table 4 Common pests

Pest	Signs
Rodents	Footprints in dust, droppings, holes in walls and doors, gnawed goods or packaging, grease or smear marks, urine stains on food packaging
Flies and flying insects	Bodies of insects, live insects, webbing, nests, droning or buzzing, maggots
Cockroaches	Eggs and egg cases, moulted skins, the insects themselves, droppings
Ants	Small piles of sand or soil, the insects themselves, flying ants on hot days
Birds	Feathers, droppings, nests, noise, the birds themselves
Beetles and weevils	Moving insects, small maggots

Pest proofing

Prevention is the key to pest control.

The FBO must 'pest-proof' the building to keep pests out and prevent potential harbourage and breeding grounds. They must also ensure that the building is in good condition and repair. Pest proofing includes:

- Covering air vents with fine wire mesh
- Sealing holes and fitting drain covers
- Storing food and packaging in sealed containers
- Ensuring that there are no gaps or spaces in floors, walls, roof doors and window openings.

Insect screens should be fitted to any open windows. Similarly, exterior doors that are open for lengthy periods should be fitted with an insect-proof screen door. These screens should be capable of protecting against common flying insects and should be removable for cleaning.

Insect electrocutors

Flying insects can be exterminated by using insect electrocutors. When installed in a food business, such electrocutors should be positioned:

- Not more than 2.4 m from the floor
- In areas free from draughts
- Away from natural light
- Not above an area where food is open or unpackaged
- Not above an area where food contact surfaces are exposed
- Not above exposed food packaging materials.

In addition, insect electrocutors should not be left on permanently. They should be fitted with a catch tray and this should be emptied as frequently as necessary. Ultraviolet (UV) tubes on these units should be changed every 12 months.

Good housekeeping

Ways of preventing food from being contaminated by pests include:

- Checking deliveries thoroughly to make sure there are no visible signs of damage caused by pests.
- Rejecting deliveries that show signs of pests (for example, gnawed packaging).
- Keeping premises and waste areas clean and pest proof.
- Appropriately covering food that is being defrosted or cooled while awaiting preparation.
- Disposing of food waste in appropriate sealed containers.
- Storing food off the floor and away from walls.
- Storing food in sealed containers where possible.
- Ensuring that bins have close-fitting lids and are easy to clean.
- Making sure that external walls are kept tidy and free from weeds.

The grounds around the food premises should be kept clean, uncluttered, and well maintained. Unused or obsolete equipment including pallets and packaging should be removed from the premises. If it is not possible to remove it, then the equipment should be kept clean. Unused rooms are part of the FBO premises and should be kept clean and maintained in good repair and condition.

Pest control

The FBO should employ the services of a competent pest control contractor, or, alternatively, there should be appropriately trained internal FBO staff for the inspection and treatment of the premises to determine and eradicate infestation of pests.

Pest control contractors

Some FBOs may employ a pest control contractor to monitor their premises. Such operators must be registered as a 'Pest Management User Trained Professional' with the Department of Agriculture Food and the Marine (DAFM) Pesticide Registration and Control Divisions (PRCD). There should be a documented contract of services provided where the following issues are considered:

- The pest control contract should include checking for the presence of all pests, monitoring the pest proofing of the premises, and eradicating any infestations.
- The pest control contractor should provide advice on housekeeping and storage arrangements to prevent access by pests.
- The pest control contractor should provide 24-hour emergency cover and a written report after each visit. These reports should be held on file in either hard copy or electronically (soft copy) and made available to the FBO's inspector on request.

Pest control technical manual

The pest control technical manual should include:

- Contract details and confirmation of frequency of routine visits.
- Site-specific map (internal and external area) of bait points and insect electrocutors.
- Material safety data sheets for pesticides used on-site.
- Routine inspection reports.
- Follow-up/call-out reports.

Routine inspection reports

Routine inspection reports should contain:

- A record of opening and checking every bait point and all insect electrocutors.
- A report of any evidence of bait taken or pest activity.
- Application of a label showing the relevant date on each bait box.
- Replenishment of bait where necessary.
- Comment on any inaccessible baits, pest proofing or housekeeping required.
- Action to be taken on any pest activity.

Post-inspection

- The pest control contractor should note all observations and date of completion in the pest control technical manual and reports.
- The FBO should always meet with the pest control contractor for sign-off before they leave the premises to discuss any pest or housekeeping issues on-site.
- If a corrective action has been recommended, the FBO should complete it as soon as possible and a record sheet should be signed/dated, noting the relevant non-compliance issue.

Self-managed pest control

Where internal FBO staff are used to manage pest control, they are categorised as a Pest Management User Trained Professional (for Own Use). The staff member must complete specific training and register with the Department of Agriculture, Food and the Marine as a Pest Management User Trained Professional (for Own Use). Further information on these requirements and on the requirements for use of rodenticides by those other than pest controllers can be found on https://www.pcs.agriculture.gov.ie/biocides/changestouseofanticoagulantrodenticides/.

Pest control records must be maintained by internal FBO staff to demonstrate that the self-managed pest control programme is effective and is being regularly monitored by relevant trained competent staff.

The pest control programme must be followed. Typical plans include the following provisions:

1. The food premises should be checked regularly for signs of pests such as rodent droppings, smear marks, insect egg cases, and either live or dead insects.
2. FBO staff should be aware of actions to take if they discover pests or signs of pests.
3. Management must take immediate and appropriate action to control and remove any infestation of pests identified on their premises.
4. Management must take preventive action to ensure that the problem does not occur in the first place. Staff training must be improved as soon as any sign of pest activity becomes apparent. If the FBO is experiencing a persistent problem with pests, they should consider using the services of an approved pest control contractor.

Records (see Section 4)

- Visitor declaration form (Record 8)
- Pest control record in-house management (Record 9)
- Pest control technical manual and reports (available from pest control contractor) - keep on file.

Relevant legislation

Regulation (EC) No 852/2004, Annex II; Chapter I

2. The layout, design, construction, siting and size of food premises are to:
   (c) permit good food hygiene practices, including protection against contamination and, in particular, pest control.

CHAPTER VI – Food waste

3. Adequate provision is to be made for the storage and disposal of food waste, non-edible by-products and other refuse. Refuse stores are to be designed and managed in such a way as to enable them to be kept clean and, where necessary, free of animals and pests

Chapter IX – Provisions applicable to foodstuffs

4. Adequate procedures are to be in place to control pests

PRP 6
Waste management

PRP 6 Waste management

Introduction

Waste is any unwanted or unusable food, food ingredient, packaging material or other item that is intended to be discarded. Waste must be controlled to avoid the risk of contamination of food, food equipment or work surfaces, and to avoid attracting pests.

Food that is contaminated, has damaged packaging, is out of date or spoiled may contain food poisoning bacteria.

Poor storage or incorrect disposal of waste may cause physical contamination of food and may attract pests.

Animal by-products (ABPs)

Animal by-products (ABPs) are materials of animal origin that are not intended for human consumption. Such by-products include offal, hides or skins. EU legislation categorises ABPs according to risk to either animal or public health, with lowest risk material being Category 3. That category includes material potentially fit for human consumption but unmarketable for commercial reasons, for example, off-cuts trimmings or bones and should generally incorporate all waste generated at an approved SMMP.

In general, ABPs must be sent to an approved ABPs processing plant for appropriate treatment using a transporter registered for ABP transport. Lists of registered ABP transporters and approved ABP processors are maintained by DAFM.

Before collection by a registered ABPs transporter, ABPs must be stored:

- Separately from food or other waste materials
- Kept in a leak-proof container securely closed to avoid contamination of adjacent food when not being filled or emptied, clearly marked ‘Not for human consumption’
- The ABP container may be kept in a designated area of the cold room until collected,
  - Loose ABP may not be stored in cold rooms even in a designated area without a leakproof closed container.

Each consignment of ABPs must be accompanied by a commercial document showing quantity, category, transporter and destination. A copy of this document must be retained by the FBO for 2 years after dispatch of ABPs from the premises.

ABP must be stored separately from food or other waste materials.

There are some potential exemptions from the obligation for disposal through the above ABP channels:

Retail supply to pet owners

- EU legislation allows selling of raw petfood from retail shops where the cutting and storage are performed solely for the purpose of supplying the consumer directly on the spot. There is no limit to the quantity of product nor the number of customers. This may be relevant in scenarios where a SMMP has a retail establishment on-site. It does not apply to cutting in one site, for example, approved SMMP for transport to a different retail establishment. It only applies to Category 3 material which has not undergone a preservation process other than chilling or freezing.

Disposal as normal waste - 20kg per week.

- A different derogation exists for products of animal origin which are no longer intended for human consumption for commercial reasons from which no risk to animal or public health arise. This might include trimmings or out-of-date product from an SMMP. Disposal methods might typically include a licensed waste operator disposing in landfill. Disposal cannot be through burial or burning on-site. The maximum quantity per food establishment is 20kg per week and the derogation only applies for Category 3 material. Records should be available to demonstrate disposal channel.

Internal waste

- All food waste or other waste materials should be regularly removed from food-handling areas.
- Pedal-operated bins should be used so that personnel can avoid touching lids.
- Bins should be kept clean and in good condition and should be easy to clean and disinfect.
- Each food-handling area should have at least one bin, to avoid staff crossing into each food-handling areas to dispose of waste.
- Waste cardboard and plastics should be stored neatly.
- Disposable plastic sacks can be used to dispose of waste other than ABPs and recyclables.
- Food packaging containers should not be used as waste containers.

External waste

- Waste storage areas should be located away from food storage, food-handling and food intake areas.
- Stores and bins should be kept clean so as not to attract pests. Cleaning should be carried out at least daily.
- External waste storage areas should be designed and managed to keep them free from pests (See PRP 5 Pest control).
- Containers used for storing waste should have a fitted lid and be leakproof and durable.

To ensure that waste is disposed of correctly, the FBO must:

- ☑ Check that food is removed from the food-handling area regularly.
- ☑ Ensure that the waste storage area is kept clean.
- ☑ Ensure that spillages are cleaned up immediately.
- ☑ Check that waste is managed appropriately and is regularly collected.
- ☑ Verify that Category 3 (CAT 3) ABP waste is placed in designated Category 3 ABP containers. Confirm that these are leak-proof, securely closed containers clearly marked as Category 3 ABP - not for human consumption and are separated from other waste in designated areas or cold rooms.
- ☑ Ensure that one copy of Category 3 ABP commercial documents is held on file in either hard copy or electronically (soft copy) for 2 years.
- ☑ Ensure that the FBO is using a registered ABP transporter for the removal of this waste to an approved ABP facility.

Records (retain copies of these records)

- Copy of ABP commercial documents
- Copy of alternative waste disposal record

Relevant legislation

Regulation (EC) No 852/2004, Annex II, Chapter VI,

Food waste

1. Food waste, non-edible by-products and other refuse are to be removed from rooms where food is present as quickly as possible, so as to avoid their accumulation.
2. Food waste, non-edible by-products and other refuse are to be deposited in closable containers, unless food business operators can demonstrate to the competent authority that other types of containers or evacuation systems used are appropriate. These containers are to be of an appropriate construction, kept in sound condition, be easy to clean and, where necessary, to disinfect.
3. Adequate provision is to be made for the storage and disposal of food waste, non-edible by-products and other refuse. Refuse stores are to be designed and managed in such a way as to enable them to be kept clean and, where necessary, free of animals and pests.
4. All waste is to be eliminated in a hygienic and environmentally friendly way in accordance with Community legislation applicable to that effect and is not to constitute a direct or indirect source of contamination.

Animal by-products Regulation (EC) No 1069/2009, Article 4

Starting point in the manufacturing chain and obligations

1. As soon as operators generate animal by-products or derived products falling within the scope of this Regulation, they shall identify them and ensure that they are dealt with in accordance with this Regulation (starting point).

Notes

PRP 7
Cleaning

PRP 7 **Cleaning**

Introduction

Unclean equipment, floors, and surfaces are breeding grounds that facilitate survival and growth of bacteria. Dirt and food waste can contaminate food and attract pests and insects, such as flies, that can contaminate food production areas.

Poor cleaning processes, inadequate storage and improper use of chemicals can increase the chances of chemical contamination of food.

Thorough cleaning is essential to remove dirt and debris from food premises and equipment. Effective disinfection of a food premises and equipment is necessary to eliminate bacteria.

Definitions

1. **Cleaning** is the physical removal of food debris and visible dirt from surfaces and equipment and, if necessary, using hot water and detergent. Cleaning should be followed by disinfection.
2. **Detergents** are chemicals such as washing-up liquid and degreaser that are used to dissolve grease and remove dirt and food. Detergents do not reduce bacteria to a safe level and are used for general cleaning only.
3. **Disinfection** eliminates infectious organisms (for example, bacteria). Disinfectant must be applied to a visibly clean surface at a specified concentration and for a specified contact time. Disinfection can be carried out by using steam, hot water (at a temperature of 82 °C or higher), and appropriate chemicals. Disinfectants are chemicals used to reduce numbers of microorganisms on a surface to a safe or acceptable level.
4. **Sanitisers** combine cleaning and disinfection functions on surfaces. They are used to reduce microorganisms such as bacteria to safe levels.

Always refer to manufacturer's guidelines for the use of cleaning chemicals and ensure chemicals are suitable for the surfaces they are used on.

Proper cleaning requires stages of cleaning and disinfection as outlined in Table 5:

Table 5 Stages of cleaning and disinfection

Stage	Description
Pre-clean	Remove any obvious food and dirt by sweeping, wiping, or scraping off loose debris, followed by a pre-rinse.
Main clean	Use a detergent at the correct dilution to remove grease, remaining food, and dirt. Scrub surfaces if necessary. Proper physical cleaning is important.
Intermediate rinse	Rinse with clean water to remove detergent and loosened food and dirt.
Disinfection	Use a disinfectant at the correct dilution, and for the correct contact time, to kill microorganisms.
Final rinse*	Rinse with water to remove disinfectant after a suitable contact time. *This stage is only applicable if rinsing is included in the manufacturer's instructions.

Cleaning chemicals and equipment

Cleaning agents and disinfectants must not be stored in areas where food is handled. There should be a designated area for the storage of cleaning chemicals and equipment. Such an area may be a well-ventilated sluice room, which should be in a secure location away from food and food preparation areas to prevent contamination.

Where it is not practical to keep cleaning chemicals and utensils in a separate room, they may be securely stored in a designated non-food handling area but only when authorised by the inspector (Competent Authority). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement. The Competent Authority must authorise the flexibility before the FBO can implement it. Cleaning chemicals must be clearly labelled or marked. The area used to store cleaning equipment must not pose a risk of contamination to the equipment.

There should be a designated area for the storage of cleaning chemicals and equipment.

Equipment and utensils

- There should be separate cleaning equipment for different areas of the premises, for example, a raw food area, cooked and ready-to-eat food areas, toilets, and staff facilities
- Colour-coded materials and equipment can be used for the different areas. For example:
  - Red for raw food areas
  - Green for cooked and ready-to-eat food areas
  - Blue for toilets
- Cleaning utensils are a potential source of contamination and should be cleaned and disinfected after use.
- Cross-contamination can be prevented by using single-use disposable cloths. If reusable cloths are being used, controls must be in place to prevent possible cross-contamination.
- Production rooms where the main activity is meat cutting, must have facilities for disinfecting tools (knife sterilisers) that heat water to a minimum of 82 °C. Knives must be cleaned prior to placing in the knife steriliser. An alternative system that has an equivalent effect to disinfection with water at 82 °C may be used by the FBO but only when authorised by the inspector (Competent Authority). Alternative systems include for example, chemicals / UV disinfection. An alternative method must achieve the same results as a hot water steriliser and this must be validated by the FBO, to the satisfaction of the Competent Authority (for example, microbiological sampling, citation of documents). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement with appropriate documented evidence/validation of the proposed method or activity. The Competent Authority must authorise the flexibility before the FBO can implement it.

Cleaning chemicals

Cleaning chemicals must be:

- ☑ Sourced from approved, established suppliers
- ☑ In conformance with EN1276 and EN 13697
- ☑ Clearly identified
- ☑ Food-grade
- ☑ Used only in accordance with the manufacturer's instructions.

Most cleaning chemicals are concentrated and need to be diluted with water before they are used. The manufacturer's instructions on dilution and contact times should be followed otherwise the disinfection may not work. Table 6 highlights the factors and definitions that affect cleaning and disinfection.

Table 6 Factors affecting cleaning and disinfection

Term	Definition
Dilution rate	Ratio of concentrate to water. Graduated measuring utensils should be used to obtain accurate measurements. Adding too much or too little water may reduce effectiveness.
Contact time	Length of time a chemical must be in contact with a surface to ensure effective cleaning or disinfection.
Temperature	Very important in order for a cleaning chemical to work effectively.

Vertical surfaces can present problems when aiming to achieve the correct contact time. Foams and gels may be used to extend contact times in these areas.

Suppliers of cleaning chemicals are often willing to provide training on the correct use of their chemicals.

General cleaning

A 'clean as you go' policy must be in place in the food premises. FBOs must clean and disinfect the following areas at least every day (and more frequently if required):

- Surfaces where food is handled
  - All articles, fittings, and equipment (for example, chills, sinks, wash-hand basins, taps).
  - All equipment, surfaces, containers, and utensils, etc. that come into contact with food.
- Complex equipment that is difficult to clean (for example mincer, slicer, vacuum packing, wrapping machines). All serviceable parts of the mincer/bowl chopper, including plates, auger and blades, must be disassembled for cleaning, disinfection and inspection.
- Special attention must be paid to pieces of equipment used with ready-to-eat foods.
- Separate dedicated equipment/cloths must be used for cleaning the following:
  - Waste storage areas
  - Vehicles/containers used to transport food
  - Toilets and staff facilities.

Particular care should be taken with:

- Operational cleaning where exposed food is present. For example, a power washer must not be used where it could cause contamination of food or food contact surfaces.
- Cleaning high-use areas where dirt and food debris can accumulate, such as the undersides of cutting tables and equipment.
- Cleaning areas such as around electrical installations, exterior vents, and rubber door seals.

Deep cleaning

Deep cleaning is when the premises, all equipment, food contact surfaces and non-food contact surfaces such as walls and ceilings are cleaned. It is carried out on a weekly or monthly basis depending on the business type and throughput. A deep cleaning exercise involves:

- Thoroughly cleaning and disinfecting all areas
- Cleaning equipment and fixtures that are difficult to access and that are not in direct contact with food. For example, extractor fans and refrigeration equipment.

Cleaning record

Cleaning must be effective. All areas and equipment should be identified in the cleaning schedule and the FBO should indicate the frequency of cleaning in the different areas. For example, areas in direct contact with food are cleaned continuously, whereas deep cleaning of ceilings might be carried out once a month depending on the business type and throughput.

It is important to remove all food before cleaning and disinfecting. To clean equipment effectively, follow manufacturer's cleaning instructions for the equipment.

Many different chemical cleaning formulations may be used in production, and it is important to understand when and how to use them. Information on all cleaning agents should be made readily available to employees and include the following:

- ☑ A list of all cleaning chemicals
- ☑ What type of chemical to be used (for example, detergent, disinfectant, or sanitiser)
- ☑ Correct dilution rates
- ☑ Correct contact time
- ☑ Correct handling and use of each chemical.

Details of all cleaning procedures carried out should be signed off by the manager/supervisor on the relevant cleaning record to verify the cleaning process, which should include:

- ☑ Area cleaned (listing all items that required cleaning)
- ☑ Date and time of cleaning
- ☑ Cleaning chemicals required (detergents and disinfectants)
- ☑ Person responsible
- ☑ Supervisor of cleaning (verification).

Verification that cleaning is effective:

1. **Visual:** when all visible dirt, soil and residues have been removed
2. **Swabbing:** when the number of microorganisms has been reduced to a level acceptable for human health. This can be verified by doing environmental swabbing according to the Environmental swabbing schedule (See Section 4 – Record 11).

Records (see Section 4)

- Cleaning record (Record 10)
- Environmental swabbing schedule (Record 11)

Relevant legislation

Regulation (EC) No 852/2004, Annex II, Chapter I

General requirements for food premises (other than those specified in chapter iii)

1. Food premises are to be kept clean and maintained in good repair and condition.

Annex II, Chapter V, Equipment requirements

1. All articles, fittings and equipment with which food comes into contact are to:
   (a) be effectively cleaned and, where necessary, disinfected. Cleaning and disinfection are to take place at a frequency sufficient to avoid any risk of contamination.

Notes

PRP 8
Utilities and services

PRP 8 Utilities and services

Introduction

Utilities and services include the supply of water, drainage, ventilation, lighting, and staff facilities. These are required for a safe and hygienic work environment and must be available and working effectively on-site.

Water supply

The FBO is legally required to have a safe water supply. This means the water must not contain bacteria or chemicals at harmful levels. An adequate supply of potable water must always be available. Potable water is treated water that is suitable for drinking and food preparation, i.e. intended for human consumption.

Water, including ice, may be used as an ingredient in food and for washing food. Taps for drinking water purposes must be maintained in a clean and hygienic condition, and identified by signage.

Water is also used for cleaning surfaces, equipment and washing hands. If water becomes contaminated with, for example, harmful bacteria, it can further contaminate food, surfaces, equipment and hands, causing illness. Water may become contaminated with bacteria, parasites or chemicals in several ways, including:

- At its source (for example, if waste or chemicals such as pesticides enter a well)
- From water pipes (for example, lead contamination from lead pipes)
- From uncovered or dirty water storage tanks inside the premises (for example, uncovered tanks may be exposed to contamination by rodents or birds).
- From poor-quality plumbing that allows dirty water to be drawn back into the pipework.

For more information see www.fsai.ie for a factsheet on potable water quality for food businesses.

Public water supply

Water taken directly from a public water supply may be regarded as potable unless there is a warning issued from the water supply authority that the water is not suitable for human consumption.

If a public water supply's integrity is compromised at source, for example contaminated with *Cryptosporidium species*, the water supplier is responsible for restoring compliance with Regulations, however during such an event the FBO is responsible for taking the appropriate corrective action to ensure that there is no impact on food safety. In the case of contamination with *Cryptosporidium species*, this may mean treating the water with ultraviolet light or removing from the market any product that was made using contaminated water.

Public water supplies are controlled, maintained and monitored by the service provider typically a local authority with oversight from Irish Water, these controls may be regarded as an adequate indicator of the safety of the water up to the point where it enters the food premises.

Where non-potable water is available on the premises to be used for specific purposes such as fire control, steam production, and refrigeration, it must circulate in a separate, easily identifiable system.

Group water schemes

Areas where a local authority does not provide a public water supply may have a group water scheme. In such cases, the group is responsible for testing and monitoring, and where necessary treatment of the supply of water.

The results from testing by the group can be used to confirm the quality of the water when it enters the FBO's premises. The FBO will need to ensure access to testing results to ensure adequacy for the purpose of the FSMS.

Private water supply (such as a well)

If a public water supply or group scheme is not available, the FBO may use a private water supply.

In such cases, the FBO is responsible for maintenance and/or treatment of the private water supply to ensure it meets potable standards.

The FBO will need to ensure testing for the appropriate parameter's every 6 months and ensure absence of *E. coli* and Enterococci.

Water storage tanks

Water storage tanks should be:

- Kept clean
- In good repair
- Securely covered with vents
- Properly plumbed
- Cleaned and disinfected every 12 months
- Fitted with secure inspection doors if located externally.

If there are hot water storage tanks in the premises, they should be maintained above 63 °C to control the risk of exposure to legionella.

Ice/ice-making facilities

- Ice that is used in the production of foods must be made with potable water.
- The facilities used to make and store ice must be suitable for preventing contamination. Specifically, they should be:
  - Cleaned
  - Disinfected, and
  - Maintained in accordance with the manufacturer's instructions.
- Ice-making machines should be located in clean areas that are well maintained.
- Lids and doors on ice-making machines should be kept closed.
- The ice scoop should be hygienically stored, so as not to contaminate the ice.
- The ice scoop should not be left in the machine in contact with the ice.

Water safety requirements

The FBO must be able to demonstrate that their water supply is safe and that it complies with microbiological and chemical requirements in EU legislation. Checks and records required depend on the type of water supply, the complexity of the plumbing and the type of water treatment system.

Requirements for all water supplies

1. A simple diagram of the water distribution system. This should show the location of any treatment system, tanks, water heaters and all outlets.
2. Records of annual cleaning and disinfection of water storage tanks.
3. Records demonstrating compliance with directions such as boil water notices.
4. Records of any investigation and corrective action taken in response to non-compliant water testing results.
5. For private water supplies, the records from the laboratory results of microbiological and chemical testing of water to demonstrate compliance with the microbiological and chemical standards in Irish drinking water legislation.
6. For private water supplies, the records relating to any maintenance work, such as replacement of parts (for example, bulb replacement and lifetime monitoring in an ultraviolet disinfection system), as well as records demonstrating proper use, such as residual chlorine measurements for chlorine disinfection systems.
7. For private water supplies, water treatment systems should be fitted with alarms or other alerting system to inform the FBO of issues arising for example, failure of chemical dosing systems or expiration of bulb or filter lifetime.

The water supply testing laboratory should be accredited by the Irish National Accreditation Board (INAB) or other national accreditation body with International Standard ISO 17025, and such accreditation should cover the specific tests required. The FBO should check with the testing laboratory that it has this accreditation.

Table 7 sets out information on water safety requirements for public water supplies and group water schemes with or without a water tank on-site, and for private water supplies such as a private well.

Table 7 Water safety requirements

Key parameter assessed	Public water supplies and group water schemes		Private water supplies
	No water tank	***Water tank***	
Evidence of connection	Yes (for example, invoice from provider)		Written evidence of local authority registration and reference number
Laboratory testing	Microbiological testing Refer to water provider's records	Microbiological testing *E. coli* and *Enterococci* bacteria	
	Chemical testing Not generally required. Refer to water provider's records		
Frequency	Not applicable	Every 12 months	Every 6 months for microbiological testing (and once during wet weather). Chemical testing - when water supply is registered, monitor annually and complete chemical testing on the basis of risk. Frequency of testing is based on risk
Sample site	Tap	Tap supplied by the storage tank	Tap supplied by the storage tank, if present
Records	Use water provider's records if available	Laboratory records Water provider's records for chemical testing	Laboratory results and maintenance

If the results of the laboratory tests confirm the presence of *E. coli*, total coliforms, or *Enterococci* bacteria or an exceedance of chemical safety parameter the following steps must be taken:

1. The FBO must immediately notify their inspector.
2. The FBO must ensure that the water is not used (even if it has been boiled) until permitted by their inspector.
3. The safety of ready-to-eat foods which might have been produced with such water should be assessed with view to potential recall/withdrawal.
4. Steps should be taken to ensure supply of safe water to the operation. These may involve installing treatment systems or changing water supply. If necessary, the FBO should seek expert advice on improving the quality of the water.
5. The FBO must retest the water supply.

If testing detects other non-compliances for indicator parameters, or if an unusual taste, colour or smell is noticed, the FBO must notify their inspector and arrange for laboratory verification of safety parameters, but they may continue to use the water in the interim.

The FBO must carry out their own water safety plan (See Section 4 – Record 21.) They must sign the plan and keep it together with the corresponding records. It must be always available for inspection.

Drainage

- Adequate drainage facilities must be provided for the activity being undertaken.
- The drainage system must be designed and constructed in a way that avoids risk of contamination.
- The size of the drainage system must be adequate to handle all requirements for waste disposal.
- Drainage pipework should not be accessible (except for maintenance).
- Floor drains/gullies, where provided, should be:
  - Fitted with an effective water trap
  - Accessible for cleaning
  - Covered with removable grids
- Where drains are fully or partially open, the water flow must be from clean to dirty areas.
- There must be no direct connection of the floor drainage system to the sewerage system without a trap to prevent gas return.
- All drains must have water seals and must discharge directly into a piped sewer with water seals.
- Manholes and armstrong junctions, if present, must be doubly sealed and secured to prevent overflow of sewage from manholes.
- Vents from drains should be ducted to the exterior of the building.
- Grease traps must be located where they will not cause contamination of food. They must be kept clean and maintained in good condition.

Ventilation

- Ventilation must be at an appropriate level so that product safety and quality are protected.
- Ventilation must be sufficient to prevent condensation on walls, ceilings, and overhead structures during normal production operations.
- For ready-to-eat production areas requiring air control, the implementation of positive air pressure systems and appropriate air filtering systems should be considered.
- A suitable means of ventilation must be provided in staff facilities and toilet areas.
- Toilets must be either naturally or mechanically ventilated with an intervening lobby or space.
- Mechanical ventilation systems (where used) must be installed in such a way that the air flows from clean to dirty areas.
- Mechanical extraction ventilation must be in place over all cooking and steam-emitting equipment.
- Air intake points must be:
  - Positioned in such a way that they prevent intake of contaminated fumes or dust into the premises
  - Located away from air extraction points
  - Screened to prevent entry of pests. Mesh size 16 (1.2 mm) should be used for this screen.

The required air changes and ventilation rates for staff facilities and operational areas are outlined in Table 8 and Table 9.

Table 8 Air changes in staff facilities

Staff facilities	Number of air changes per hour
Changing areas/locker rooms	5
Toilets (air extraction)	3
Toilet lobby (air intake may be by natural means)	2

Table 9 Air changes for operational areas

Operational areas	Number of air changes per hour
Cooking/bakery/ovens	20
Washing up/dishwasher area	10
Toilet lobby (air intake may be by natural means)	2

Lighting

Adequate lighting must be provided to ensure safe and hygienic activities.

The type of light fitting used in food preparation areas must not pose a risk of contamination of food. For example, it must have shatterproof coverings.

Level of lighting that should be provided is outlined in Table 10.

Table 10 Lighting requirements

Area	Lighting required – lux
Food preparation/processing/packaging	540
Other areas (for example, storage)	200

Toilet Facilities

- Toilets must be connected to an adequate drainage system.
- They must not open into, or connect directly into, rooms or areas where food is handled, processed or stored. Toilets must only be accessed via a ventilated lobby or space.
- Both the toilet area and the intervening lobby or space must be separately and independently ventilated by either natural or mechanical ventilation to external air.
- Toilet doors must be self-closing, with the exception of toilet facilities for wheelchair users.
- Non-perfumed liquid soap in appropriate dispensers must be provided at wash-hand basins. Paper towels/ air hand dryer should also be provided.
- There must be an adequate number of toilets available.
- Signage advising staff to wash their hands after using the toilet should be displayed in the toilet areas.
- Separate toilet facilities should ideally be provided for non-food workers and visitors.

Handwashing facilities

- Handwashing facilities should be positioned conveniently between toilets/changing rooms and food-handling areas.
- In food processing and preparation areas, separate handwashing facilities should be:
  - Available for food handlers
  - Designated as such
  - Easily accessible and not likely to be obstructed
  - Suitably located in the working area
- More than one wash-hand basin is required for larger working areas and/or subdivided areas.
- There must be a constant and adequate supply of hot and cold water with a mixer or thermostatic control to ensure that water is at a suitable temperature, i.e. will not burn users.
- Non-perfumed liquid soap must be provided in appropriate dispensers.
- A suitable method of hand drying (for example, single-use paper towels) must be provided at each wash-hand basin. Air hand dryers should not be used in food preparation areas.
- Taps should operate in a manner that will not re-contaminate cleaned hands. Either knee-operated, foot-operated, elbow-operated or electronically operated taps should be provided.
- Bins used for the disposal of paper towels should be emptied regularly.

Records (see Section 4)

- Cleaning record (Record 10)
- Preventive maintenance record (Record 12)
- Water provider records/Irish Water records – retain a copy on file
- Laboratory results – retain a copy on file

Relevant legislation

Regulation (EC) No 852/2004, Annex II, Chapter I:
General requirements for food premises (other than those specified in chapter iii)

3. An adequate number of flush lavatories are to be available and connected to an effective drainage system. Lavatories are not to open directly into rooms in which food is handled.
4. An adequate number of washbasins is to be available, suitably located and designated for cleaning hands. Washbasins for cleaning hands are to be provided with hot and cold running water, materials for cleaning hands and for hygienic drying. Where necessary, the facilities for washing food are to be separate from the hand-washing facility.
5. There is to be suitable and sufficient means of natural or mechanical ventilation. Mechanical airflow from a contaminated area to a clean area is to be avoided. Ventilation systems are to be so constructed as to enable filters and other parts requiring cleaning or replacement to be readily accessible.
6. Sanitary conveniences are to have adequate natural or mechanical ventilation.
7. Food premises are to have adequate natural and/or artificial lighting.
8. Drainage facilities are to be adequate for the purpose intended. They are to be designed and constructed to avoid the risk of contamination. Where drainage channels are fully or partially open, they are to be so designed as to ensure that waste does not flow from a contaminated area towards or into a clean area, in particular an area where foods likely to present a high risk to the final consumer are handled.

Regulation (EC) No 852/2004, Annex II, Chapter VII: Water supply

1. (a) There is to be an adequate supply of potable water, which is to be used whenever necessary to ensure that foodstuffs are not contaminated.

PRP 9
Maintenance

PRP 9 Maintenance

Introduction

Equipment, including fixtures and fittings, must be maintained in such a way that they minimise the risk of product contamination. Maintenance is essential as it allows for the premises to be kept clean and free from pests. It also ensures that equipment is working properly.

A lack of maintenance can result in defective and poorly maintained equipment, causing physical contamination of food. Poorly maintained cooking and chilling equipment can cause bad temperature control, and as a result, the production of unsafe food.

Problems should be dealt with as soon as possible, before they pose a risk to food safety.

Premises

- The fabric of the building must be kept in an appropriate condition for a food production premises.
- Any damage to the premises, such as damp or chipped plaster, broken tiles, damaged walls, floors, or windows, etc. should be repaired as soon as it occurs.
- Floors, walls, roofs, doors, and window openings must be kept in good repair, with no gaps, to prevent pests entering the premises.
- Drains should be kept free of leaks and blockages.

Equipment

- Staff must be trained on how to use equipment properly.
- If the FBO suspects that equipment may not be working properly, they should:
  - Check it immediately.
  - Consult the manufacturer's instructions for troubleshooting guides.
  - Contact the manufacturer or a maintenance contractor.
  - Use alternative equipment until the faulty equipment has been repaired.

In addition, the FBO should:

- Repair any equipment or utensils that are damaged or have loose parts to prevent physical contamination.
- Replace chopping boards that are scratched, pitted, or scored, as dirt and bacteria can gather in any areas where the board is not smooth.
- Replace broken or defective light bulbs, tubes and fittings immediately.
- Regularly check extractor fans and filters to ensure that they are working correctly and are free from grease and dirt.
- Regularly check door seals on refrigeration and cooking equipment.
- Make sure equipment is serviced regularly.

Services

- Maintain water supply systems to ensure that they are in good state of repair.
- Provide adequate ventilation to eliminate the build-up of condensation.
- Keep ventilation systems clean to ensure that they do not become a source of contamination.
- Consider installing positive air pressure systems and appropriate air filtering systems in ready-to-eat food areas.

Preventive maintenance record

- Implement a preventive maintenance record system so that checks are carried out on all equipment and on the structure of the premises. See Section 4 – Record 12 for a copy of the Preventive maintenance record.
- List all the equipment on the preventive maintenance record.
- As the maintenance work is completed on each item, fill in the required information for each piece of equipment listed.
- Records of maintenance, servicing and repairs to equipment (including copies of invoices and receipts) should be retained on-site in the maintenance file in either hard copy or electronically (soft copy).

Reactive maintenance/unplanned maintenance (breakdowns)

There should be documented maintenance procedures in place which ensure that the safety of the product is not jeopardised during planned and unplanned maintenance operations (including breakdowns, any new development work, and construction work).

All maintenance activities must be controlled. Where possible maintenance should take place outside of production hours. If work has to be carried out during production hours, then controls must be put in place to prevent contamination of product.

Prior to any work commencing in a food production area following a breakdown or emergency repairs, appropriate controls must be implemented to ensure that food safety is not put at risk. This should include carrying out a risk assessment, disposing of food exposed at the time of the breakdown/repairs, and thorough cleaning and disinfection before food production recommences.

A mechanical breakdown record should be filled out after the repair work is completed to ensure that production can resume safely. The mechanical breakdown record is part of the preventive maintenance record provided in Section 4 – Record 12.

Maintenance personnel

- Maintenance personnel should report to the FBO/manager prior to carrying out the maintenance work.
- If maintenance work is carried out by contractors, a Visitor Declaration Form is to be completed (See Section 4 – Record 8).
- Maintenance work carried out in-house or by contractors must be conducted in such a way that it ensures product does not become contaminated.
- After maintenance work is completed, the FBO must ensure that the equipment is functioning correctly and is fully cleaned prior to use.

Calibration

Calibration is a process of adjusting and checking the accuracy of monitoring devices such as thermometers, scales, and metal detectors against test equipment that complies with national standards.

Calibration can be done in-house for thermometers by using a calibrated master probe to verify that the probe is working correctly/is creating accurate readings. Where appropriate, external calibration should be carried out for the master probe and probes that are used for monitoring air and product temperature at Cooking and Cooling CCPs.

The manufacturer's recommendations and guidance on calibration should be adhered to for all built-in thermometers, such as those in chills and cooking equipment. If external calibration is recommended by the manufacturer, this recommendation should be adhered to.

Internal calibration checks

The accuracy of thermometers and weighing scales should be checked at least once a month to verify that they are working correctly. Temperature probes should be calibrated internally using water at temperatures of 100 °C and 0 °C. A calibrated test weight is used on weighing scales to ensure that they are weighing accurately. If there are any significant deviations, corrective action must be taken.

To check the accuracy of a thermometer:

- ☑ Immerse the probe in a mixture of crushed ice and water that has previously been held for approximately 10 minutes in a Thermos flask.
- ☑ The thermometer should read 0 °C ± the manufacturer's stated accuracy, i.e. typically ± 0.05 °C to 1 °C.
- ☑ Next, take boiling water and add it to another Thermos flask. Wait for 10 minutes, then immerse the probe.
- ☑ The thermometer should read 100 °C ± the manufacturer's stated accuracy, i.e. typically ± 0.5 °C to 1 °C.

If the results show that the probe is no longer accurate:

- Remove it from use.
- Return the probe to the supplier for repair, recalibration, or replacement.
- If replacing it with a spare probe on-site, ensure that the probe is calibrated before use.
- Record checks on the Internal calibration record (See Section 4 – Record 13).

External calibration

- Calibration of devices must be carried out at least every 12 months, or as required.
- All equipment used to verify temperatures should be purchased from, and calibrated by, a listed supplier.
- The serial number and date of calibration should be clearly visible on the unit, and they should correspond with the calibration certificate.
- Calibration certificates must be held on file in either hard copy or electronically (soft copy).

Calibration is a process of adjusting and checking the accuracy of monitoring devices such as thermometers, scales, and metal detectors.

Records (see Section 4)

- Pre-production, metal control and knife register record (Record 2)
- Visitor Declaration Form (Record 8)
- Preventive maintenance record (Record 12)
- Mechanical breakdown record (Record 12)
- Internal calibration record (Record 13)

Relevant legislation

Regulation (EC) No 852/2004, Annex II, Chapter I

1. Food premises are to be kept clean and maintained in good repair and condition.

Regulation (EC) No 852/2004, Annex II, Chapter V

1. All articles, fittings and equipment with which food comes into contact are to:
   (b) be so constructed, be of such materials and be kept in such good order, repair, and condition as to minimise any risk of contamination.

PRP 10
Personal hygiene

PRP 10 Personal hygiene

Introduction

Personal hygiene is important because it helps staff to prevent bacteria and other contaminants spreading to food. The risk of spreading food poisoning bacteria is especially important when preparing/handling ready-to-eat food. The reason for this is that there is no further 'kill step', such as cooking, to kill the bacteria or other microorganisms.

Microbiological contamination by food poisoning bacteria can be accidentally transferred to food by poor personal hygiene practices such as having dirty hands or clothing. Physical contamination may be caused by items such as hair and jewellery falling into the food. Food can also be contaminated with allergens due to poor personal hygiene practices.

The FBO must ensure that all staff are trained in good hygiene practices that are appropriate with their level of responsibility and they must ensure that all staff behave in a manner that will not contaminate food. In addition, visitors, potential customers and external contractors must wear appropriate protective clothing, provided by the FBO.

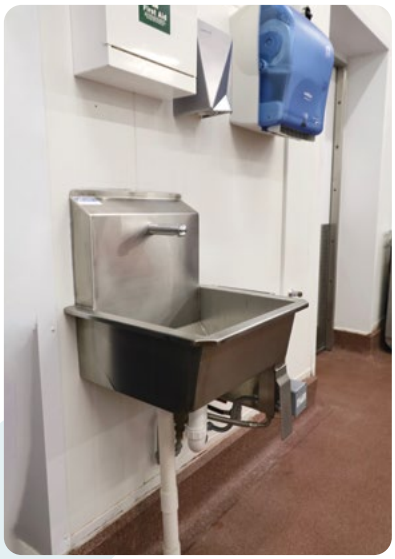
Personal hygiene – general

- Fingernails should be kept clean, short, and free of nail varnish. False nails or eyelashes must not be worn.
- Hair covering should be used where food is exposed to reduce the risk of physical contamination.
- Hair should be clean and tidy; hairnets and, where necessary, beard snoods should be worn in food production areas.
- Staff should not wear piercings or any jewellery other than a plain wedding band.
- Staff should not use their mobile phones in production areas.
- Excessive aftershave, deodorants and/or perfume should not be worn.
- Cuts, sores, burns and grazes must be covered after treatment with a suitable dressing.
- The plasters in the first aid kit should be metal detectable and blue in colour.

Handwashing

Harmful microorganisms such as bacteria, and allergens can be passed from hands to food, work surfaces, and equipment. Effective handwashing helps to prevent this, and therefore all staff should be trained in how to wash their hands correctly, (see Figure 4 Step-by-step guide on how to wash your hands). Hands must be washed thoroughly and regularly using non-perfumed liquid soap. Handwashing is particularly important:

- Before starting work
- Before using disposable gloves
- Before handling unpackaged cooked or ready-to-eat food
- After handling or preparing raw food
- After handling food containing allergens
- After cleaning duties
- After handling refuse
- After eating
- After smoking/vaping
- After using a phone or touch screen
- After using a handkerchief; after blowing or touching the nose, and
- After using the toilet.



Step-by-step guide on how to wash your hands

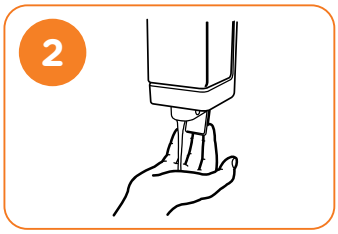
Figure 4 Step-by-step guide on how to wash your hands

How to hand wash

Wash hands when visibly soiled. Otherwise, use handrub with hand sanitiser.

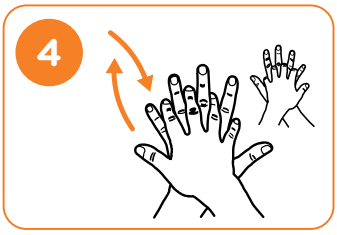
Length of time to spend washing: 40-60 seconds

Wet hands with water

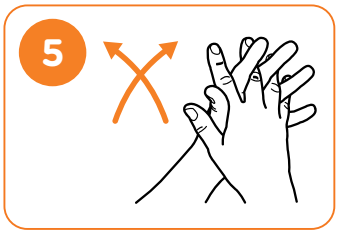


Apply enough soap to cover all hand surfaces

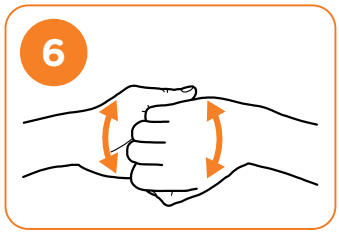
Rub hands palm to palm



Right palm over the back of the left hand with interlaced fingers and do same on other hand



Palm to palm with fingers interlaced



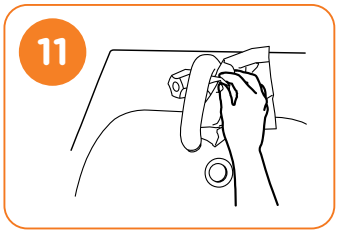
Backs of fingers to opposite palm with fingers interlocked

Rotational rubbing of left thumb clasped in right palm and do same on other hand

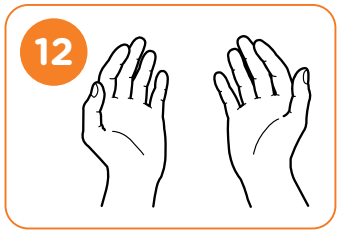
Rub in a circle with clasped fingers of right hand in left palm do same on other hand

Rinse hands with water

Dry hands thoroughly with a clean towel or single use towel



For non-clinical hand wash basins turn off the tap with a tissue



Your hands are now safe

RESIST

www.hse.ie/infectioncontrol

Gloves

If disposable gloves are worn, they must be changed as often as hands would be washed. Hands must be washed before and, after using disposable gloves. Disposable gloves should not replace handwashing and, if used, they should only be worn for short periods and they should be changed frequently. Gloves are a potential cause of food contamination as they can provide the ideal conditions for growth of microorganisms bacteria.

Personal protective equipment (PPE)

- All staff working in a food handling area must wear suitable, clean protective clothing (For example hairnets, beard snoods, and boots).
- Protective clothing must be clean and maintained in good condition and designed so as not to pose a contamination risk to food (For example, without buttons, external pockets).
- It is good practice to have separate colour-coded PPE in ready-to-eat and non ready-to-eat food preparation areas.
- PPE must be cleaned regularly and changed as necessary, including:
  - Before handling ready-to-eat food
  - After raw product manufacture
  - When clothing is visibly soiled
  - When leaving the production area to use the toilet or to take a break.
- Protective clothing must not be worn in toilet areas, in the canteen or outside the food production premises (for example, on the way to work, breaks, etc.)
- Protective clothing must be stored separately from outdoor clothing and there should be a place to hang protective clothing during break times.
- Personal clothing should not be worn over PPE.
- Used (dirty) protective clothing must be stored separately to clean protective clothing.
- Disposable clothing can be a source of physical contamination and should not be used.

All staff must be trained in good hygiene practices in line with their level of responsibility.

Staff facilities

- A suitable area should be provided for staff breaks/food consumption, separate from the production area.
- The staff changing facilities should be clean and tidy, should not be used for food consumption or as a smoking area, and should facilitate separation between normal clothing, as well as clean and used PPE.
- Staff should not use the toilet cubicle as a changing facility.
- Separate storage should be provided for clean and soiled protective clothing.
- Suitable storage should be provided for staff members' personal belongings.

Fitness to Work

Staff should be 'fit to work' at all times. This means that they must not be suffering from, or carrying, an illness or disease that could cause a problem with food safety. People who are not 'fit for work' could spread food poisoning bacteria to food

The FBO must satisfy themselves that no food handlers pose a risk to food safety.

A Fitness to Work Assessment Form (see Section 4 – Record 14) to be completed by all staff, including temporary staff, prior to commencing their employment.

If you are unwell, go and tell.

Reporting illness

- Employees must not handle food or enter a food preparation area while suffering from or being the carrier of a disease or illness likely to be transmitted through food that may compromise the safety of the food.
- Any member of staff who has diarrhoea and/or vomiting must, by law, report it to their manager immediately. Staff should also tell their manager if they have any cuts or sores as food poisoning bacteria on hands/arms could spread to food or equipment.
- No food handler with gastroenteritis should work while they have symptoms. They may be given a different job which does not involve direct contact with food or working in areas where food is stored or handled.
- Staff must be made aware of their legal obligations around reporting illness and absenting themselves from food production during and immediately following illness and the procedure for returning to work after an illness.
- Staff with infected skin lesions on parts of the body that are exposed, particularly hands and forearms, must cover the lesions with a waterproof dressing until the lesions are healed. If it is not possible to cover the lesions, the FBO/manager must consider the exclusion of the worker from food-handling activities.
- A first aid kit must be available and checked regularly to ensure that there is an adequate supply of treatments for cuts, grazes, and burns.
- Plasters in the first aid kit should be metal detectable, waterproof and in a colour to distinguish it from food, (for example, blue).

Returning to work

- Employees must not return to work until they have been free of vomiting or diarrhoea for at least *48 hours.
- Certain diseases require formal exclusion, and then medical clearance before employees can return to food-handling activities.
- A Fitness to Work Assessment Form should be completed by employees returning to work following illness.

Visitors/contractors

If visitors are provided access to the food premises, they should be:

- Required to comply with hygiene requirements
- Accompanied by a member of staff
- Provided with suitable protective clothing.

If contractors are required to carry out work in the premises, they should be:

- Limited to times when there is no processing of product, where possible
- Required to comply with hygiene requirements
- Required to report to a member of staff before work commences and again when it is completed.

Records (see Section 4)

Fitness to Work Assessment Form (Record 14)

Relevant legislation

Regulation (EC) No 852/2004, Annex II, Chapter VIII; Personal hygiene

1. Every person working in a food-handling area is to maintain a high degree of personal cleanliness and is to wear suitable, clean and, where necessary, protective clothing.

2. No person suffering from, or being a carrier of a disease likely to be transmitted through food or afflicted, for example, with infected wounds, skin infections, sores or diarrhoea is to be permitted to handle food or enter any food-handling area in any capacity if there is any likelihood of direct or indirect contamination. Any person so affected and employed in a food business and who is likely to come into contact with food is to report immediately the illness or symptoms, and if possible their causes, to the food business operator.

* This exclusion time may be longer depending on the food poisoning bacteria. Check with your local Department of Public Health.

Notes

PRP 11
Training

PRP 11 Training

Introduction

Food safety awareness is a legal requirement for a food business. Staff must have adequate knowledge to enable them to carry out their duties in a safe and hygienic manner. The FBO must ensure that all food handlers are supervised and instructed and/or trained in food hygiene based on the level of activity they are involved in. All people responsible for the food safety management procedures should also receive training in how to apply them.

Training must include awareness of the responsibility of each person in the food chain for food safety and the potential risk of food fraud/deceptive practices.

General

Staff must be trained to a level corresponding with their level of responsibility. Depending on the staff member's role, suitable training includes the following:

- Personal hygiene
- Cross-contamination
- Food safety hazards
- Temperature control
- Equipment and facilities
- General cleaning/cleaning agents and cleaning programme.
- Products, processes, and packaging
- Work instructions/procedures
- Suppliers/deliveries
- Completion of records.

Additional training and/or instruction should be given if there are changes in the food business, such as changes in the following:

- Work practices
- Equipment
- Products
- Processes
- Cleaning chemicals/methods
- Suppliers
- If a food safety incident occurs in a similar food business.

Work instructions

Work instructions should be clear and simple, visible, or easily accessible by staff, appropriately translated if required, and kept up to date. The following is a non-exhaustive list of work instructions that should be provided:

- Control of suppliers/goods inwards
- Management of storage facilities for raw materials, including packaging
- Management of the storage of finished product
- Handling of intermediate products/rework
- Inspection of incoming and outgoing transport services
- Segregation of raw products from cooked or ready-to-eat foods
- Segregation of goods containing allergens
- Handling of broken glass/damaged goods
- Handling of food returns.

Note: Staff working with complex equipment that is difficult to clean (for example mincer, slicer, vacuum packing, wrapping machines) need to know how to safely disassemble all serviceable parts of the equipment including plates, auger and blades, for cleaning and disinfection. This process should be routinely checked by the FBO/manager.

Management/staff with responsibility for the FSMS

FBO management and/or staff with responsibility for the development and maintenance of the procedures based on HACCP principles must receive adequate training in the application of HACCP principles and the importance of the PRPs in the management of hazards.

Training guides

The FSAI has developed training guides for food businesses that wish to develop their training procedures and make them relevant and applicable to operations carried out by experienced staff. Please see the FSAI Guide to Food Safety Training Level 1 – Induction Skills and Level 2 – Additional Skills for Food and Non-Food Handlers as well as the Guide to Food Safety Training Level 3 – Food Safety Skills for Management: Food Service, Retail and Manufacturing Sectors on www.fsai.ie

- **Guide to Food Safety Training Level 1 – Induction Skills and Level 2 – Additional Skills**

  Level 1 provides information on basic food safety skills that staff should be able to demonstrate within the first month of employment.

  Level 2 provides information on the additional food safety skills that staff should be able to demonstrate within 3 to 12 months of commencing employment in a food business.

- **Guide to Food Safety Training Level 3 – Food Safety Skills for Management: Food Service, Retail and Manufacturing Sectors**

  Level 3 provides information on the food safety skills that should be demonstrated by managers and supervisors in food operations.

Training plan

Training needs to be planned so that all staff and all training topics are covered over a defined period. See Section 4 – Record 15 for a copy of the Employee training record; the scheduled training plan can be included in this record.

Responsibility for food safety is a team effort. Each staff member has responsibility for their own tasks, with management having overall responsibility. FBOs should have a documented training programme in place. Set out below is a list of the essential elements of this programme.

- Documented induction training for new employees completed as soon as possible after they commence working in the business.
- Training covering food safety, hygiene practices, and SOPs, as well as staff mentoring on their role within the business.
- The level of training required depends on the work carried out, the type of food handled, relevant work experience, and the training received in the past. Non-permanent staff or staff covering annual leave must be trained commensurate with their work activity.
- The FBO should ensure that all staff understand the content of the food safety training (i.e. the training takes account of any language or literacy barriers).
- The FSMS should be used as part of the FBO's training plan. Staff must have knowledge of their role within the food safety management system in place. At induction stage, staff operating in ready-to-eat food areas need to have a working knowledge and understanding of the associated hazards, including the controls that need to be applied, and corrective actions to take in case of non-compliances.
- Managers and supervisors need appropriate training and experience in the practical application of the food safety management system, both at induction stage and in ongoing practical application. They should lead and provide positive role models for other staff in good hygiene practices, thus ensuring that food-handling staff understand hazards and controls. Their responsibilities also include checking corrective actions, ensuring that procedures are followed, and that verification is completed.

- Staff performing specific tasks such as cleaning and maintenance should be included in the training programme.
- Training records should be retained for each staff member.

Training record

The training record should contain the following information:

- Name of the trainee (member of staff)
- Position
- Date employment commenced
- Scheduled training plan/date
- Training completed
- Date of training
- Signature of the trainee (member of staff)
- Signature of the trainer.

See Section 4 – Record 15 for a copy of the Employee training record.

Competency testing

The manager should assess the employee's food safety competency or skills on the job following the training course.

- Competency testing involves checking the employee's ability to complete the food safety tasks correctly after receiving the relevant training.
- Retraining is required if an employee displays an inability to understand the food safety skills.

See Section 4 – Record 15 for a copy of the Employee training record. This training record incorporates the competency assessment.

Records (see Section 4)

- Employee training record (Record 15)

Relevant legislation

Regulation (EC) No 852/2004, Annex II, Chapter XII

Training

Food business operators are to ensure:

1. that food handlers are supervised and instructed and/or trained in food hygiene matters commensurate with their work activity;
2. that those responsible for the development and maintenance of the procedure referred to in Article 5(1) of this Regulation or for the operation of relevant guides have received adequate training in the application of the HACCP principles.

   And
3. compliance with any requirements of national law concerning training programmes for persons working in certain food sectors.

Notes

PRP 12

Measures to prevent cross-contamination

PRP 12 Measures to prevent cross-contamination (food allergens, species and microbial)

Introduction

This section includes controls to be put in place to prevent allergen, species, and microbial cross-contamination.

Food allergens

Food law requires that the FBO declares the use of any of the 14 EU priority food allergens (listed in Figure 5 The 14 food allergens) when manufacturing or processing food (See PRP 16 Labelling and product information). In this guide where "food allergen" is used, this is referring to the "14 EU priority food allergens".

While cross-contamination with food allergens can occur at any point in a food business operation, procedures should be in place to limit or eliminate any such opportunities.

If the FBO claims that food produced in the premises is 'free from' food allergens, extreme care is required to ensure that the claim is accurate.

If a consumer with a food allergy eats a food because it is labelled as "allergen free" but actually contains that allergen(s), this can lead to serious health consequences for that person.

FBOs who do not or cannot provide allergen information pose a safety risk to consumers. If a product with an undeclared allergen has left the control of the FBO then recall/withdrawal/relabelling is required – see PRP 4 Product recall and traceability.

Allergen declaration:

Customers need to know if any food products contain any of the 14 EU listed allergens as an ingredient (see Figure 5 for a list of the 14 food allergens). To provide this information, FBOs must identify and record each of the 14 EU listed allergens used (see Record 16 – Raw materials and finished product allergen assessment record). In addition, controls should be in place to minimise cross-contamination of other foods with these allergens.

All food **supplied to the food business** must declare allergen information either on a label or in accompanying commercial documents, for example, product specification. – see PRP 13 Purchasing

All food **supplied by the FBO** to their customers must have allergen information either on a label or in accompanying commercial documents, for example, product specification. – see PRP 16 Labelling and product information.

Ingredients
Pork (74%), Water, Pork Fat, Rusk (**Wheat** Flour, Salt), Seasoning [Salt, Rusk (**Wheat** Flour, salt), Preservative (Sodium **Sulphite**), Spice Extracts, Sugar, Flavour Enhancer (Monosodium Glutamate), Stabiliser (Pentasodium Triphosphates), Antioxidant (Sodium Ascorbate)]. Filled into Natural Beef Casings.

Identifying and recording food allergens

- Identify all of the 14 EU priority food allergens used on the premises including in raw materials, intermediate and finished products.
- Identify food allergens in ingredients including sauces, seasoning mixes and glazes, etc. Look at labels, product specifications etc.
- List the food allergens in Record 16 Raw materials and finished product allergen assessment record.
- Check product ingredients against the labelling to make sure the allergen information provided is accurate. Make sure all food allergens are declared either on the product label or in accompanying commercial documents. For more information, see PRP 16 Labelling and product information.
- Declare the name of the cereal for cereals containing gluten, for example, ‘wheat’ must be declared. ‘Gluten’ may also be displayed in addition but not instead.
- Declare the name of the individual nut for items containing nuts, for example, ‘almond’ must be declared, not simply ‘nuts’.
- Staff must be aware of what to do when ingredients or recipes change so that food allergens are correctly declared on the product.

By knowing what allergens you have in your business and controlling how you handle them, you can keep your customers safe.

Figure 5 The 14 food allergens

Be Food Allergen Aware

Food Safety AUTHORITY OF IRELAND

Five steps to help you comply with **the law** on declaring the use of food allergens in non-prepacked food for your customers:

1 Declare the use of the 14 food allergens in writing

2 Ensure the allergen information is legible and clear

3 Ensure the allergen information is easily accessible to your customers

4 Ensure the allergen information is up-to-date

5 Monitor your suppliers' allergen information

Food allergens that **must be declared**

Cereals

Cereals containing gluten, namely: wheat (such as spelt and khorasan wheat), rye, barley, oats or their hybridised strains, and products thereof, except:

a) Wheat based glucose syrups including dextrose
b) Wheat based maltodextrins
c) Glucose syrups based on barley
d) Cereals used for making alcoholic distillates including ethyl alcohol of agricultural origin

Crustaceans

Crustaceans and products thereof.

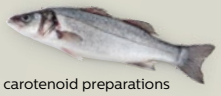
Eggs

Eggs and products thereof.

Fish

Fish and products thereof, except:

a) Fish gelatine used as a carrier for vitamin or carotenoid preparations
b) Fish gelatine or Isinglass used as fining agent in beer and wine



Peanuts

Peanuts and products thereof.

Soybeans

Soybeans and products thereof, except:

a) Fully refined soybean oil and fat
b) Natural mixed tocopherols (E306), natural D-alpha tocopherol, natural D-alpha tocopherol acetate, natural D-alpha tocopherol succinate from soybean sources
c) Vegetable oils derived phytosterols and phytosterol esters from soybean sources
d) Plant stanol ester produced from vegetable oil sterols from soybean sources

Milk

Milk and products thereof (including lactose), except:

a) Whey used for making alcoholic distillates including ethyl alcohol of agricultural origin
b) Lactitol

Nuts

Nuts, (almonds, hazelnuts, walnuts, cashews, pecan nuts, Brazil nuts, pistachio nuts, macadamia/Queensland nuts) and products thereof, except for nuts used for making alcoholic distillates including ethyl alcohol of agricultural origin.

Celery

Celery and products thereof.

Mustard

Mustard and products thereof.

Sesame seeds

Sesame seeds and products thereof.

Sulphur dioxide and sulphites

Sulphur dioxide and sulphites at concentrations of more than 10mg/kg or 10 mg/litre, expressed as SO_2, e.g. found in burgers, sausages and wine.

Lupin

Lupin and products thereof.

Molluscs

Molluscs and products thereof.

For more information on how your food business can comply with these legal requirements, please visit **www.fsai.ie** or contact us at **info@fsai.ie**

IMPORTANT:
Allergen information regarding **"Cereals containing gluten"** must specify the type of cereal, e.g. wheat, and **"Nuts"** must specify the type of nut, e.g. cashew.

Allergen cross-contamination:

Food allergen declaration refers to the legal requirement to declare the 14 EU priority food allergens that are intentionally used as ingredients. Low levels of those allergens can also enter the food as a result of cross-contamination. Controls must be put in place to limit or prevent cross-contamination of foods with any of the 14 EU-listed food allergens that are not used as ingredients. The controls in place for the management of food allergens must be monitored for effectiveness and be amended if necessary.

Cross-contamination with food allergens can occur at any point throughout a food business. Food allergens may unintentionally come into contact with food due to bad practices such as the use of incorrect recipes, last-minute changes of ingredients or suppliers, cross-contamination due to poor equipment design, use of contaminated equipment, poor cleaning standards, poor storage, poor staff practices, inaccurate labelling or insufficient staff training.

If products produced in the premises are sold as 'free from' food allergens, then controls must be in place to ensure that this 'allergen-free' status is maintained, and the claim remains valid until the product is delivered to the customer. Using these voluntary statements means that the allergen is not detectable (except for 'gluten free' declarations) and the product is free from cross-contamination. Only the terms 'gluten free' and 'very low gluten' may be used to voluntarily indicate the absence or low-level presence of gluten in a food. The term 'gluten free' can only be used if there is no more than 20 mg/kg of gluten in the final product, while 'very low gluten' can only be used if the gluten content is no higher than 100 mg/kg. Further details are available on www.fsai.ie.

Control of food allergens

Purchasing/goods inward

- Follow PRP 13 Purchasing to ensure effective food allergen supplier controls are in place.
- Check suppliers are aware of allergens and have an allergen management system in place.
- Check that the food delivered is either clearly labelled or that a list of ingredients is supplied and remains with the food at all times.
- If food delivered may not have all the allergens declared, or where contamination with allergens may have occurred, the supplier needs to make the FBO aware of this in advance or at the time of delivery.
- Obtaining a specification from the supplier for each raw material purchased is essential. The specifications should be reviewed and approved by a competent, trained employee.
- Change control systems are essential for effective allergen management. Where suppliers make changes to the way products are manufactured, or where changes are made to ingredients or to a process, they should notify the FBO of these changes. If the food contains an allergen that has not previously been supplied to the FBO (for example, different brand, new formulation of existing brand), the supplier should notify the FBO of this change in advance or at the time of delivery. Change control requirements can be notified to the FBO's suppliers as part of the supplier assessment process (See PRP 13 Purchasing).
- Where products/ingredients containing food allergens are delivered to the premises, they should be adequately segregated from other materials and handled in a manner that will not cause cross-contamination. Packaging/containers and the condition of food should be checked for signs of damage and/or leakage of allergens. Staff practices should be observed during delivery.

Storage

- Food storage should be regularly checked for signs of damage and/or contamination. Store products/ ingredients containing food allergens that present a higher-risk of cross-contamination, such as powdered ingredients, separately to minimise the risk of cross-contamination.
- Store products/ingredients containing food allergens in dedicated containers which are clearly labelled with the food allergen name. Ensure food allergens and traceability information are clearly identified on the container when decanting products.

Production

- Equipment, conveyors and/or containers used for the transport or storage of one allergen should not be used for the transport or storage of any foods not containing that allergen unless a thorough cleaning and inspection for any visible sign of the allergen has been carried out. Use separate equipment (for example, containers and measures) for handling products/ingredients containing food allergens.
- Where possible, use separate areas for the production of allergen-containing food products and non-allergen-containing food products. If physical separation of products/ingredients containing food allergens is not possible, time separation can be used where this is effectively controlled. This may be achieved by production scheduling and thorough cleaning between production of foods containing/not containing allergens. Production scheduling is very important when it comes to avoiding the hazard of allergen cross-contamination. Production scheduling and planning can be used to start the manufacturing of products that do not contain food allergens in the first half of the day and leaving the manufacturing of allergen-containing products until the end of the day.

Cleaning

Where non-allergen and allergen-containing foods are processed on shared equipment, thorough cleaning is needed to prevent cross-contamination.

- Sites that handle more than one product/ingredient containing allergens must ensure that there are robust controls in place including segregation and thorough cleaning of shared equipment between the processing of different products.
- Staff should be given clear instructions on cleaning procedures as well as instructions on waste handling and spillage controls. Staff should ensure that any spillages of products/ingredients containing allergens that occur during storage, production, etc. are cleaned up immediately to prevent or limit the risk of cross-contamination.
- The effectiveness of the cleaning process should be verified/validated.
- Dedicated equipment should be in place for cleaning up spillages of products/ingredients containing allergens.
- Power washers must not be used where there is a risk of contamination of nearby product.

Training

Staff should be trained in allergen awareness and the controls in place to prevent cross-contamination including:

- Awareness of the grave risk to certain consumers if products are contaminated with food allergens.
- Separating products/ingredients containing food allergens from other products/ingredients.
- Using different production lines, equipment, and storage facilities for products/ingredients containing food allergens.
- Any specific work methods when handling food allergens.
- Complying with hygiene rules before returning to work from breaks/eating.

Verification

The manager/supervisor should take a walk through the intake, storage and production areas regularly to check:

- Allergen controls are in place.
- Staff are following best practice when products/ingredients containing food allergens are being stored and handled.
- Equipment, utensils, and preparation surfaces are being cleaned properly.
- Finished product containing allergens has the correct allergen declaration information either on a label or in accompanying commercial documents.

Integrity of meat species

Sites that work with more than one meat species

Sites that work with more than one meat species must put controls in place to avoid cross-contamination, where necessary by separation of the operation on the different species in either space or time. Shared equipment must be cleaned between species so that product carry-over between species does not occur.

Sites that work with more than one species do not have to test for all species when verifying and validating a clean-down procedure. One meat species can be chosen.

In sites that work with more than one species, the following issues need to be considered:

- Quantity of the different meat species used on-site.
- Severity of a consumer/customer reaction to the cross-contamination, (for example, pork in a non-pork product).
- Likely microbial contamination loads, (for example, skin-on cuts versus skin-off cuts). Cross-contamination in the context of microbiological pathogens should be minimised. Separation of the operations on the different species in either space or time is necessary for poultry and porcine but may not be necessary for other species (for example, beef and lamb).

Control of microbial cross-contamination (between raw and ready-to-eat production areas)

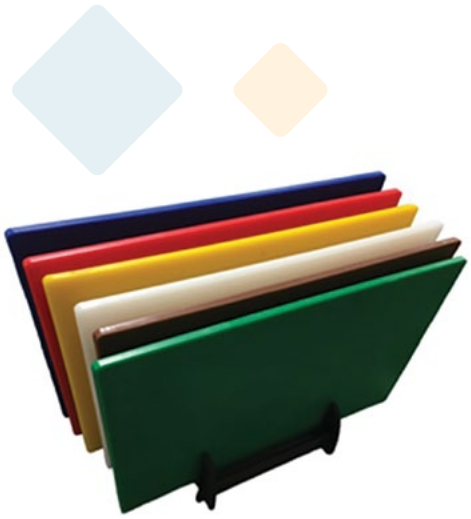
Areas where potential for microbial cross-contamination exists should be identified and a zoning plan/segregation plan should be implemented. Control measures should be put in place to ensure complete segregation of raw foods from ready-to-eat foods as follows:

- Structural segregation/physical barriers, walls or separate buildings between raw and ready-to-eat food production areas.
- Access controls for example, bench cross over system to change into required workwear in ready-to-eat food production areas.
- Visually distinctive protective clothing, including hairnets, aprons, overalls, coats, etc. to clearly identify staff working in raw and ready-to-eat food production areas.

In addition to the above measures:

- Staff traffic patterns should be established to ensure that staff working in raw food production areas do not mix with staff working in ready-to-eat food production areas.
- Positive air pressure systems should be in place for ready-to-eat food production areas.
- Double handwashing procedures should be in place in ready-to-eat food production areas.
- Drains in raw food production areas must not flow into ready-to-eat food production areas.

Artisan food producers



It is recognised that there are food manufacturing sites (for example, artisan food producers) where very low volumes of ready-to-eat foods are produced and that it may not be possible to have physical barriers, walls, etc. between raw and ready-to-eat food production areas. For these sites, the same food production area may be used, provided that the FBO has taken the appropriate measures to prevent biological, chemical, physical and allergen cross-contamination. Time separation can be used in these circumstances to prevent biological, chemical, physical and allergen cross-contamination between raw food and ready-to-eat food.

Time separation requires specific attention to detail and appropriate documentation of steps to minimise cross-contamination:

- A comprehensive deep clean of the processing area must be carried out prior to processing/packing ready-to-eat foods.
- A visual inspection of the cleaned area must be undertaken post-cleaning to ensure that the area is cleaned to the standard required for processing ready-to-eat foods.
- Colour-coded cleaning equipment should be used for cleaning ready-to-eat food production areas to distinguish it from equipment used to clean raw food production areas.
- In the case of difficult to clean equipment, time separation is not adequate and dedicated processing equipment (for example mincers, slicers, vacuum packing and wrapping machines) should be used for processing/packing ready-to-eat foods.
- Colour-coded processing equipment should be used where practical to ensure that this equipment is used for processing/packing ready-to-eat foods only (for example, colour-coded chopping boards/cutting tables and knives, etc.) and to ensure that it is completely distinguishable from equipment used to process raw meat.
- Staff must fully take off all protective clothing and replace with clean protective clothing if they have previously been working with raw foods. Staff must use dedicated protective clothing prior to processing, packing, or handling ready-to-eat foods. At a minimum, this should include different-coloured protective coats/overalls/hairnets.
- Protective clothing, cleaning equipment and utensils used for processing/packing ready-to-eat foods should be stored in a separate designated area away from items such as protective clothing and cleaning equipment that is used in areas where raw meat is processed.
- The highest standards of personal hygiene must be observed at all times when changing from processing raw foods to handling or packing ready-to-eat foods. Hands must be washed and sanitised before, during and after handling or packing ready-to-eat foods.
- A full line/area clearance must be undertaken prior to processing ready-to-eat foods (for example, removal of packaging and labels previously used for raw foods). Ideally, ready-to-eat foods should be processed first, followed by raw foods. Production scheduling and planning are key to achieving this.

Also refer to PRP 2 Layout and zoning.

Records (see Section 4)

- Raw materials and finished product allergen assessment (Record 16)

Relevant legislation

Regulation (EU) No 1169/2011 on the provision of food information to consumers requires the following:

- Allergens – all food supplied by food businesses declares allergen information for the 14 EU-listed allergens.
- Species – name of food is required and general provision that food labelling is not misleading

Regulation (EC) No 852/2004 on the hygiene of foodstuffs requires the identification and control of all hazards, including microbiological, chemical (for example, food additives), physical, and allergen.

Regulation (EC) No 853/2004 requiring precautions to be taken to avoid cross-contamination where the cutting of different animal species occur in the premises.

Regulation (EC) No 2073/2005 on microbiological criteria for foodstuffs

Regulation (EC) No 178/2002 on general food law regarding the requirement to place safe food on the market and that the labelling, and presentation of food shall not mislead consumers.

PRP 13

Purchasing - Supplier control and performance monitoring

PRP 13 Purchasing - Supplier control and performance monitoring

Introduction

A significant consideration in the safety of food produced by any establishment is the safety and quality of raw materials purchased to produce that food. Within this FSMS, FBOs need a suitable method of controlling suppliers for the purpose of ensuring that all food, food ingredients, packaging and other items critical to food safety are only purchased from suitable suppliers.

FBO's must specifically develop and maintain a supplier list, the supplier list should be kept up to date and reviewed at least every 12 months, or reviewed and amended immediately whenever a new supplier is added, or an existing supplier is removed from the list. Addition of new suppliers should only occur after a specific assessment of their ability to meet specification, and retention of suppliers should be considered on an ongoing basis in the context of their supply history. This list should be made available to the Competent Authority on request (See Section 4 – Record 5).

Purchasing from unfamiliar suppliers may result in unsafe, defective or fraudulent food/ingredients being supplied to the FBO. Having an effective purchasing programme in place will help reduce the likelihood of such hazards, while also ensuring that all raw materials purchased and subsequently supplied to the business are safe, authentic, meet legal requirements and the agreed specifications.

The impact of unsafe raw materials entering an FBO's supply chain can be severe, potentially resulting in illness, wasted resources, increased costs, and reputational damage. An adequately managed supplier approval programme reduces these risks and supports the development of strong business relationships. The purpose of an effective purchasing programme is to ensure that only safe, authentic, and legally compliant raw materials are delivered to the premises while also protecting the FBO from supply chain risks.

Responsibility for purchasing

The FBO should have a competent person or persons on their staff who has responsibility for purchasing raw materials and services on behalf of the food business. This person should be aware of the hazards and risks associated with the task and have the relevant skills, knowledge, and experience to perform the task. They should be familiar with the supply chain and the importance of purchasing only from suppliers listed as acceptable. In particular they should be aware of the need for Competent Authority approval of certain food establishment types.

List of Suppliers of raw material or services

All raw materials suppliers and service providers, for example, pest control contractors, laundry services, external consultants, and maintenance contractors should be listed. A choice of any of the following methods for deciding whether to list or not, can be used:

- All food of animal origin (for example, meat) must be sourced from a food business approved under Regulation (EC) 853/2004 and must arrive with the supplier's identification mark applied to it.
- All foods of non-animal origin must be supplied by food businesses registered with the relevant Competent Authority under Regulation (EC) 852/2004.

  Note: As small meat manufacturing plants must be approved by the Competent Authority under Regulation (EC) 853/2004, they can only source raw products of animal origin from other food premises approved under Regulation (EC) 853/2004. However, it is possible for raw products of animal origin to be sourced from a premises that is registered with the relevant Competent Authority if it is box-in-box-out product originating from an approved premises.
- A supplier list must be documented for the site. This should be a live document and should be reviewed at least every 12 months. If a new supplier has been approved or if an existing supplier is delisted it must be reviewed and updated immediately (See Section 4 – Record 5 for a copy of the Supplier list).
- All raw materials and services should only be sourced and purchased from listed suppliers.
- The supplier list should contain the following information as a minimum:
  - Details of the supplier (name, address, contact details, etc.)
  - Raw material(s) supplied/service(s) provided
  - Supplier review date and date of next review.

Assessment of Raw material suppliers for listing

Raw material supplier initial and continued listing should involve an assessment of suitability.

Consideration within such an assessment could include:

- Regulatory good-standing, in particular, approval by a Competent Authority where necessary under Regulation (EC) 853/2004 or registration by a Competent Authority under Regulation (EC) 852/2004.
- Assessment of capacity and infrastructure to support provision materials of the correct standard, quantity, and frequency.
- Approach to product safety, HACCP, traceability, and good manufacturing practice – some FBOs put these types of questions into a supplier self-assessment questionnaire that they send to potential suppliers.
- Evidence of third-party commercial certification to a food/packaging standard.
- Assessment of supplier history.

Listing of Existing Suppliers

In the case of existing long-standing suppliers, history of adequate supply is likely to be a significant factor in assessing suitability for listing. However, evidence of necessary regulatory approval or registration should be sought in all cases and periodically revalidated. In particular, where a longstanding supplier offers a new product, it should be clarified that approval covers such production. A more comprehensive assessment would be appropriate in the absence of reliable supplier history, for example, initial assessment for new suppliers.

Supplier control is one of the first points of control within a business.

Listing of service providers

Service providers are third parties that provide specialised services to a company. These may include:

- pest control contractors
- laundry services
- external consultants
- external maintenance contractors
- transport and distribution providers
- laboratory testing services.

Service provider approval should involve an assessment of suitability (for example a formal contract agreed between both parties). They can be approved for a period of up to 3 years, provided that performance is satisfactory and that there are no changes to the service delivered in that period.

The method of approval for each supplier should be recorded on the supplier list (for example, receipt of signed contract to provide the service outlined). The FBO can use their best judgement in addition to assessing the supplier's past performance.

Listing of subcontractors

- The FBO must be able to demonstrate that where processes are carried out by subcontractors that any risks to food safety, legality, quality, or authenticity are adequately controlled. The FBO is responsible for ensuring the safety of the product while subcontracted work is being carried out.
- Robust traceability systems must be in place in the subcontractor's own business.
- Specific testing, including visual and microbiological testing, may be carried out by the FBO when the products are returned to their premises if they believe it necessary.
- Subcontractors can only be used if they have completed all the required supplier approval documentation, and if formal contracts are in place clearly defining process expectation and product specifications.
- The subcontractor must be registered with or approved by the relevant competent authority.

Listing of new suppliers

Before a new supplier can begin supplying any raw material or service to the business, the supplier assessment considerations listed above should be considered. Effort should be made to validate regulatory approval or registration. Once the relevant supplier information is received, the supplier is then placed on the supplier list.

Review of supplier list

Suppliers may be listed for a period of up to 3 years, provided there are no changes to their business in that period or any issues with product supplied to the FBO. The FBO can determine if the frequency of re-assessment needs to be increased, for example, every year or two years based on supplier performance. That is why it is important to review the supplier list every 12 months so that such decisions can be made.

Records (see Section 4)

- Supplier list (Record 5)

Relevant legislation

Regulation (EC) 852/2004,

Article 1

(a) primary responsibility for food safety rests with the food business operator

Regulation (EC) 852/2004, Annex II Chapter IX - Provisions applicable to foodstuffs

1. A food business operator is not to accept raw materials or ingredients, other than live animals, or any other material used in processing products, if they are known to be, or might reasonably be expected to be, contaminated with parasites, pathogenic microorganisms or toxic, decomposed or foreign substances to such an extent that, even after the food business operator had hygienically applied normal sorting and/or preparatory or processing procedures, the final product would be unfit for human consumption.

PRP 14
Rework

PRP 14 **Rework**

Introduction

Rework is a term used to describe processing of food that has already been processed in that establishment, with consequently more complicated traceability including, for example, multiple batch numbers and process records for one product. Reworked product must be stored, handled, and used in such a way that product safety, quality, traceability, and regulatory compliance are maintained.

Storage, identification, and traceability

- Stored rework must be protected from exposure to microbiological, chemical, physical, allergen or species contamination during storage.
- It is essential that rework is segregated from other products at all stages of the process to avoid exposure to microbiological, chemical, physical, allergen or species contamination.
- Good management of product to be reworked will reduce the risk of contamination, and therefore it is important that the FBO follows best practice in this regard.
- Rework must be clearly identified and/or labelled to enable traceability. Traceability records for rework must be maintained.
- The reason for rework should be recorded along with the product name, production date, shift, production line, and shelf-life of the product being reworked.

Rework usage

- Where rework is incorporated into a product as an 'in-process step', the acceptable, quantity, type and conditions of rework must be specified. The process step and method of addition, including any necessary pre-processing stages, must be defined and documented.
- Where rework activities involve removing a product from filled or wrapped packaging, the FBO must put controls in place to ensure the removal and segregation of packaging materials to prevent physical contamination of the product.
- The impact on shelf-life by including reworked product into a batch must be considered as part of the overall product shelf-life and documented on the In-process traceability record.

Records (see Section 4)

- In-process traceability record (Record 7)

Relevant legislation

Regulation (EC) No 178/2002

Article 18

Traceability

1. The traceability of food, feed, food-producing animals, and any other substance intended to be, or expected to be, incorporated into a food or feed shall be established at all stages of production, processing and distribution.

Notes

PRP 15
Food defence

PRP 15 Food defence

Introduction

The food industry has developed food safety management systems to protect against major outbreaks of food poisoning. These systems typically use HACCP principles that are accepted globally. HACCP has proved to be effective against accidental contamination. However, HACCP principles have not been routinely used to detect or mitigate deliberate attacks on a system or process. Such attacks may include deliberate contamination of food or food fraud.

Deliberate acts may have food safety implications and can harm food businesses in other ways, such as damaging business reputation. The common factor behind all such deliberate acts is people. The people may be working in the food business, they may be employees of a supplier to the food business, or they may be complete outsiders with no connection whatsoever to the food business, the key issue being their motivation. They may aim to cause harm to human health or the reputation of the business, or to make financial gains (i.e. food fraud) at the expense of the FBO.

By adopting simple food defence measures, FBOs can protect their business from attack or reduce the impact of such an attack. The following simple Employees FIRST food defence programme can be used by an FBO to train and educate their staff in the area of food defence. Employees are the first line of food defence.

Employees FIRST food defence programme

The Employees FIRST food defence programme will help to educate employees about the risk of intentional food contamination and the actions they can take to identify and reduce such risk. The Employees FIRST food defence Programme is detailed in Figure 6.

Figure 6 First food defence programme

F **Follow** this food defence programme.

I **Inspect** your work area and surrounding areas.

R **Recognise** anything out of the ordinary.

S **Secure** all ingredients, supplies and finished products.

T **Tell** management if you notice anything out of the ordinary or suspicious.

Access controls

Where feasible, locks, fob access or other systems should be used to physically restrict access to sensitive areas such as raw materials and finished product storage areas and entry points to the FBO premises.

Purchasing

It is essential that the FBO has adequate purchasing procedures in place to ensure that all raw materials are purchased from listed suppliers only to mitigate the threat of food fraud. For more information, see PRP 13 Purchasing.

Relevant legislation

Regulation (EC) No 852/2004, Chapter I

Article 1

(a) primary responsibility for food safety rests with the food business operator;

PRP 16

Labelling and product information (sampling, shelf-life, and food additives)

PRP 16 Labelling and product information (sampling, shelf-life, and food additives)

Introduction

In addition to food hygiene legislation, there is other legislation that the FBO must comply with before placing food on the market. This section includes general information in relation to labelling, shelf-life, sampling, additives, and product specification requirements.

Labelling

Set out below is information on labelling foods of animal origin, including the requirement for an identification mark, mandatory food labelling, and marketing standards that the FBO must comply with before placing food on the market.

Detailed information on labelling is available at www.fsai.ie

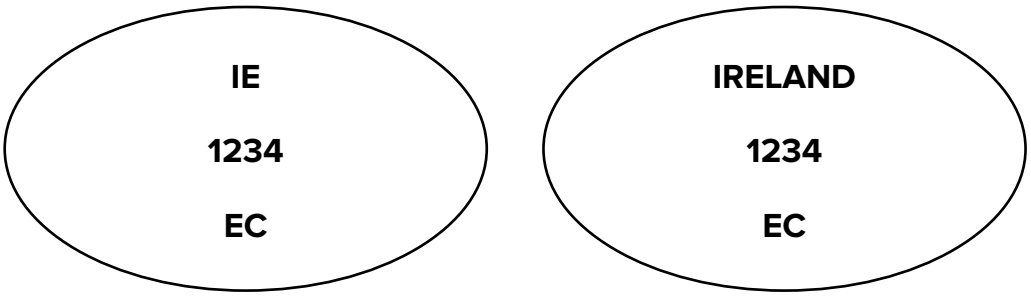
Labelling – identification mark

SMMPs approved under Regulation (EC) 853/2004 are issued with a unique approval number. This forms part of the identification mark that must be applied to all product of animal origin produced in that establishment. FBOs must not place meat or meat products on the market unless they are labelled, as appropriate, with an identification mark in accordance with Regulation (EC) 853/2004. See Figure 7 Example of identification mark.

The identification mark must indicate:

- The name of the country where the establishment is located (IRELAND or IE)
- The approval number of the establishment
- The abbreviation 'EC' (or one of the variations listed in Annex II, Section 1 to Regulation (EC) 853/2004).

Figure 7 Example of identification mark



When the identification mark is applied in an EU establishment, it must be:

- ☑ Oval in shape
- ☑ Legible and indelible
- ☑ Clearly displayed
- ☑ Printed directly onto the wrapping or packaging, or
- ☑ Printed on a label affixed to the product wrapping or packaging.

The identification mark must be applied before the product leaves the premises.

If the packaging/and or wrapping is removed from meat or meat products or if they are further processed then the FBO must apply their identification mark to these product labels.

For cut meat or offal, the identification mark must be applied to a label affixed to the packaging, or it must be printed on the packaging in such a way that it is destroyed when the packaging is opened.

When products of animal origin are placed in consumer packaging, the identification mark can be applied to the outside of the consumer packaging.

Annex II, Section I to Regulation (EC) 853/2004 sets out the requirements for the identification mark and how it must be applied.

Labelling – provision of food information (FIC)

Regulation (EU) 1169/2011 covers the provision of food information on a label, accompanying materials, websites and social media platforms, (for example, Facebook). It applies to food businesses at all stages of the food chain, where their activities concern the provision of food information to consumers. It applies to all foods intended for the final consumer, including foods delivered by caterers, and foods intended for supply to caterers.

Food information must be clear and accurate and must not mislead the consumer. It must be legible and easy to understand.

Prepacked food is defined in the legislation as:

Any single item for presentation as such to the final consumer and to mass caterers, consisting of a food and the packaging into which it was put before being offered for sale, whether such packaging encloses the food completely or only partially, but in any event in such a way that the contents cannot be altered without opening or changing the packaging.

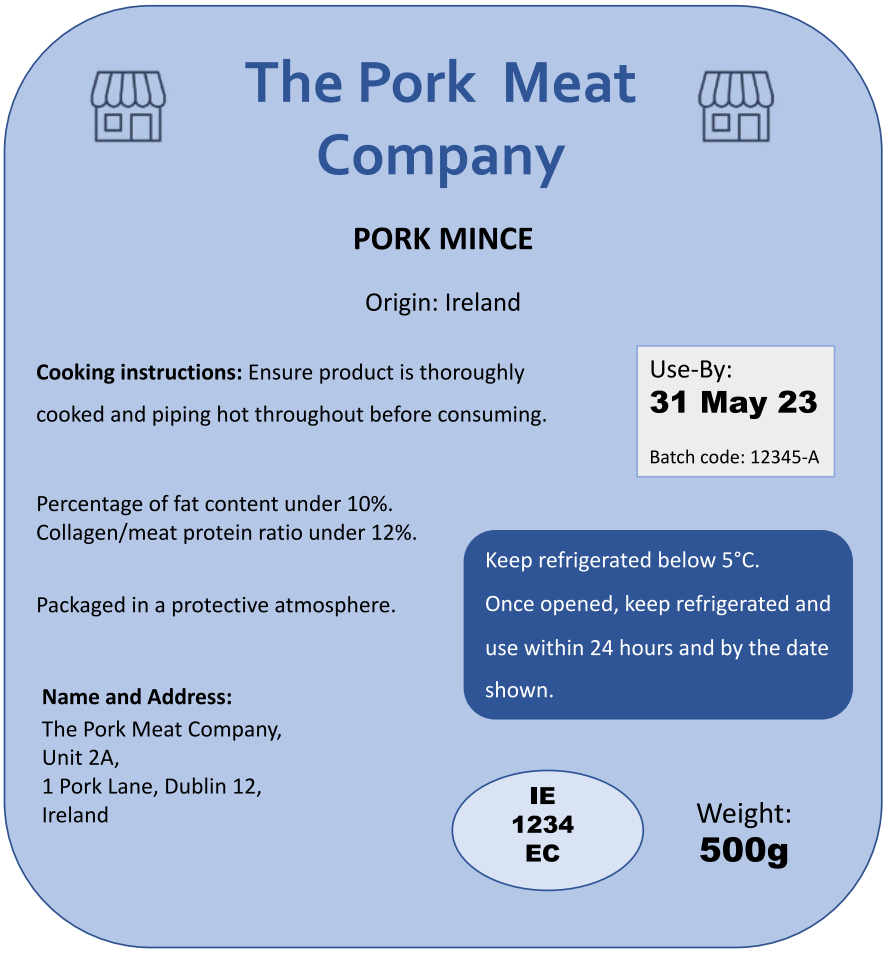
Mandatory food information for prepacked foods:

Where the meat or meat products are prepacked for retail sale to the final consumer, all relevant mandatory food information outlined in the numbered list below should be printed on the label.

1. Name of the food
2. List of ingredients
3. Allergens
4. Quantity of certain ingredients (QUID)
5. Net quantity
6. Best-before date or use-by-date
7. Any special storage conditions and/or conditions of use
8. Name and address of the food business
9. Country or origin (where it is required or where its absence may mislead)
10. Instructions for use
11. For alcoholic beverages – alcoholic strength by volume
12. Nutrition declaration.

There are exemptions from nutrition labelling for producers of small quantities - for further information on these and for details on the other food labelling requirements go to www.fsai.ie

The mandatory information that is relevant depends on the type of product produced. For example, a list of ingredients is not needed for a primal cut of meat as the meat is the only ingredient. But where this meat is used to make sausages, then the sausage would require the list of ingredients to be included on the label.



Prepacked for mass caterers:

For food supplied to mass caterers, the legislation allows for the mandatory information to be printed on the commercial documents relating to the food, where it can be guaranteed that such documents either accompany the food to which they refer or sent before or at the same time as delivery.

The following details must also be printed on the external packaging in which the food is marketed:

- Name of the food
- Best-before date or use-by date
- Any special storage conditions and/or conditions of use
- Name and address of the food business.

Responsibility for labelling

Prepacked food must be labelled in compliance with EU legislation and the responsibilities of food businesses throughout the food chain are set out to ensure that this occurs.

- The responsibility for food information lies with the food business under whose name the food is marketed. This includes ensuring the presence and accuracy of food information.
- If the product is being supplied to other food businesses and is not intended for the final consumer or caterers, then the supplier of the food must ensure that the other FBOs are provided with sufficient information to enable them, where appropriate, to meet their food information obligations.
- FBOs are responsible for any changes they make to food information accompanying a food.
- FBOs must not supply food which they know or presume, on the basis of the information in their possession, to be non-compliant with food information legislation.

The FSAI's **Guidance Note 1: The Labelling of Meat and Meat as an Ingredient** details the legislative requirements for the labelling of meat and the labelling of meat when used as an ingredient. Guidance Note 17 is for FBOs involved in manufacturing, packaging and selling meat and meat products and is available at www.fsai.ie

Labelling – food allergens

Food businesses must declare the presence of the 14 EU priority food allergens (listed in Figure 5) used as ingredients when manufacturing or processing food. In this guide where "allergen" or "food allergen" is used, this is referring to the "14 EU priority food allergens".

To provide this information, the FBO must identify and record the food allergens used as ingredients as follows:

Prepacked food

The allergen must be:

- indicated in the list of ingredients with clear reference to the name of the allergen
- highlighted in a way that makes it stand out from the other ingredients. This could be through, for example, font, style or background colour

The FSAI's '**Food information on prepacked foods**' is available at www.fsai.ie

Non-prepacked food (for example, retail counters, on-line sales)

The allergen must be indicated in writing at the point of:

- Presentation, or
- Sale, or
- Supply

The FSAI's '**Allergen Information for Non-prepacked Foods**' and '**Guidance Note 28: Food Allergen Information for Non-Prepacked Food in Ireland**' are available at www.fsai.ie

- For business to business

All food manufacturers and food suppliers are obliged to pass on allergen information to their customers, regardless of whether those customers are other food businesses (for example, caterers) or the final consumer. The allergen information can be provided on the product label or on associated commercial documentation if supplying another food business.

The FSAI's '**Guidance Note 28: Food Allergen Information for Non-Prepacked Food in Ireland**' is available at www.fsai.ie

In addition to the requirement to declare the allergens intentionally added as ingredients to the product, the FBO must put controls in place to minimise cross-contamination of other foods with allergens. See PRP 12 Measures to prevent cross-contamination.

Allergic reactions can make people very ill and can sometimes lead to death. If a consumer has an allergy and inadvertently eats a food that contains an allergen that is not declared, there can be serious health consequences.

FBOs who do not or cannot provide allergen information pose a safety risk to consumers. If a product with an undeclared allergen has left the control of the FBO then recall/withdrawal is required – see PRP 4 Product recall and traceability.

Labelling – country of origin

Country of origin labelling is required for the following:

- Where failure to indicate origin might mislead the consumer as to the true origin of the food, particularly where the food information could otherwise imply a different origin.
- Fresh, chilled, and frozen meat of swine, sheep, goats, and poultry (Regulation (EU) 1337/2013).
- Beef and beef products (Regulation (EC) 1760/2000).
- For the primary ingredient of a food where the origin of the food is given and is different from the origin of the primary ingredient.

  For example, where the origin of a black pudding is declared as Irish on the label, but the dried blood ingredient is not Irish, then the origin of the blood would also need to be given on the label as blood is an ingredient usually associated with black pudding. This is to ensure the consumer is not misled. Origin can be indicated on a label by statements/words, pictures (for example map, scene), symbols (flags), words/terms or colours/designs that refer to a geographical origin.

In the case of country of origin labelling for fresh or frozen beef, pork, lamb/mutton, goat and poultry, cut or minced, there are different origin indications needed depending on where the animals were born, reared and slaughtered and also different requirements for minced meat and trimmings.

Country of origin labelling requires a traceability system at all stages of production and distribution of meat to ensure that there is a link between the labelled meat and the animal or group of animals it came from. Where meats of different origin are used, accurate origin labelling must be maintained.

The FSAI's Guidance Note 17 provides information on the way origin must be indicated and is available at www.fsai.ie.

Labelling – other requirements

- **Minced meat**

  There are specific requirements in Regulation (EU) 1169/2011 concerning the designation of 'minced meat' relating to its compositional criteria and indication of fat content and collagen/meat protein ratio. The FSAI's Guidance Note 17 provides information on these requirements and is available at www.fsai.ie

- **Additional particulars**

  There are some foods which must include one or more additional particulars for example:

  – foods which have their shelf-life extended by means of packaging gases (MAP) must be labelled "packaged in a protective atmosphere".

  – frozen meat and frozen meat preparations must be labelled with the date of freezing or the date of first freezing in cases where the product has been frozen more than once.

- **Poultry**

  Marketing standards apply to fresh and frozen poultry meat and set out labelling requirements which must also be complied with. The FSAI's Guidance Note 17 provides information on the requirements and is available at www.fsai.ie

- **Cooking instructions**

  Regulation (EC) 2073/2005 on microbiological criteria for food requires that minced meat, meat preparations and meat products intended to be eaten cooked (except for minced meat, meat preparations and meat products made from poultry) supplied in packages intended for supply to the final consumer must be clearly labelled by the manufacturer to inform the consumer of the need for thorough cooking prior to consumption.

  Regulation (EC) 853/2004 laying down specific rules for food of animal origin, requires that retail packages of minced meat containing poultry are required to be labelled with an indication that the product should be cooked before consumption.

- **Labelling – nutrition and health claims**

  Making a nutrition claim (for example, low fat) or a health claim about a product, is covered by Regulation (EC) 1924/2006 which has a list of permitted nutrition claims and their specific conditions of use – only these nutrition claims can be made on a food label.

  A health claim can only be used if the conditions of use and any applicable restrictions are respected. A list of authorised health claims is available on www.fsai.ie

- **Organic**

  Food may only be labelled as organic if it complies with specific requirements. More information on organic labelling is available at www.fsai.ie

- **Lot indication**

  Food may not be marketed unless it is accompanied by an indication of the lot it belongs to. When a best-before or use-by date appears on the label, the lot indication referred to need not appear on the food label, provided that the date consists at least of the uncoded indication of the day and the month, in that order.

Labelling – EU Food Labelling Information System (FLIS)

The European Commission (EC) has developed a food labelling information system. The following link provides access to this system to find the relevant labelling requirements for meat and meat products: Food Labelling Information System (FLIS) (https://food.ec.europa.eu)

Sampling Plan

Sampling is carried out to verify the effectiveness of the food safety management system. The sampling plan must be appropriate to the products being produced in the premises.

The sampling plan should include:

- What is being sampled – list relevant product for product sampling and relevant area/equipment for environment sampling
- What test parameters the sample(s) are being analysed for
- What criteria the test results are being assessed against – criteria limits for each test parameter
- Sampling procedure
- Person responsible for taking samples
- Number of samples required
- Frequency of sampling
- Action to be taken in case of unsatisfactory results
- Information on how to analyse trends in test results and on what action to take if the trends in test results are approaching the limit for unsatisfactory results.

The sampling plan must include the criteria required in Regulation (EC) 2073/2005 (see microbiological sampling of food and environment below) and microbiological and chemical parameters for drinking water (see PRP 8). Periodic sampling to verify the effectiveness of cleaning should be included. Routine sampling should take place to ensure compliance with the legislation on additives and contaminants. Sporadic/random or routine allergen testing should be carried out to verify the process excludes cross-contamination. For cured product periodic testing of finished product for nitrates/nitrites as well as the water used in their production should be included (see Section 3 HACCP for Cured raw meat production).

Microbiological sampling of food

The FBO must make sure that food produced, handled or supplied complies with relevant microbiological criteria set out in Regulation (EC) 2073/2005.

Microbiological criteria are used to assess the acceptability of food and can indicate whether:

- Controls within the FSMS have managed microbial risks
- Food is safe to eat or not
- Food is of acceptable quality
- Hygiene standards in the FBO's premises are satisfactory or unsatisfactory.

Food safety criteria defines the acceptability of a food in terms of its microbiological safety. Process hygiene criteria indicates if the production process is operating in a hygienic manner. The FBO must take measures, as part of their HACCP-based procedures and implementation of PRPs, to ensure that process hygiene criteria are met and that food safety criteria can be met throughout the shelf-life of the product.

Not all foods have a set sampling frequency specified in Regulation (EC) 2073/2005, so it is important to check whether there is a set sampling frequency for the food produced. Of relevance to the processes outlined in this guide there is a set sampling frequency for:

- Minced meat
- Meat preparations (For example, sausages, burgers)
- Fresh poultry meat.

The legislation requires that FBOs producing minced meat, meat preparations, or fresh poultry meat must take samples for microbiological analysis at least once a week, with a different day of sampling each week to ensure that each day of the week is covered.

When justified based on a risk analysis, and consequently authorised by the Competent Authority, establishments producing minced meat, meat preparations and fresh poultry meat in small quantities, may be exempted from weekly sampling. This exemption could either be reduced sampling or no sampling depending on throughput and risk assessment. The FSAI's **Guidance Note 35: Guidance on Establishing Appropriate Microbiological Sampling Frequencies in Low Throughput Slaughterhouses and Meat Processing Plants** sets out the criteria for such exemptions and can be found at www.fsai.ie

When testing against the food safety criteria and process hygiene criteria set out in Regulation (EC) 2073/2005 provides unsatisfactory results, the following action in accordance with Article 7 of Regulation (EC) 2073/2005 must be taken:

- **Food safety criteria non-compliance** - the competent authority must be notified, and the product or batch of food must be withdrawn or recalled in accordance with Article 19 of Regulation (EC) 178/2002 (see PRP 4 Product Recall and Traceability) and the FSAI's Guidance Note 27 (www.fsai.ie) for more information.
- **Process hygiene criteria non-compliance** - improvements in production hygiene and improvements in selection and/or origin of raw materials. See FSAI Guidance Note 27 for more information.

The measures to be taken by the FBO to ensure compliance with criteria defining the acceptability of a process may include, among other things, controls of raw materials, hygiene, temperature and shelf-life of the product.

Ready-to-eat food

There is no sampling frequency specified in Regulation (EC) 2073/2005 for ready-to-eat food. When there is no set sampling frequency specified, the frequency of sampling must be based on risk. The FBO must be able to demonstrate that the risks have been assessed and used to establish the frequency of sampling and this should be documented. Regulation (EC) 2073/2005 requires that FBOs manufacturing ready-to-eat foods, which may pose a *Listeria monocytogenes* risk, sample the processing areas and equipment for *Listeria monocytogenes* as part of their sampling plan.

The FSAI's **Guidance Note 27: Guidance Note on the Enforcement of Regulation (EC) 2073/2005 on Microbiological Criteria for Foodstuffs** provides detailed information on establishing the frequency of sampling ready-to-eat food and relevant environmental sampling.

Shelf-life

Regulation (EC) 2073/2005 requires FBOs to conduct shelf-life studies to investigate compliance with food safety criteria throughout the product's shelf-life. In particular, this applies to ready-to-eat foods which are able to support the growth of *Listeria monocytogenes*, and which may pose a *Listeria monocytogenes* risk for public health.

These shelf-life studies must include:

- Specifications for physicochemical characteristics of the product, such as pH, a_w, salt content, concentration of preservatives and the type of packaging system, taking into account the storage and processing conditions, the possibilities for contamination and the envisaged shelf-life, and
- Consultation of available scientific literature and research data regarding the growth and survival characteristics of the microorganisms of concern.

It may be necessary for FBOs to carry out laboratory-based food shelf-life tests. The FSAI's **Guidance Note 18: Validation of Product Shelf-Life** outlines agreed best practice to be used by FBOs to determine product shelf-life.

Food additives

Food additives are substances added intentionally to foods to perform certain technological functions, for example, to colour or to help preserve foods. Only approved food additives can be used in food production. Food additives may only be used if they fulfil the criteria laid down in Regulation (EC) 1333/2008. They must be safe when used and there must be a technological need for their use. There are also specific conditions regarding which food additives or groups of additives may be used in certain food categories. The provisions for the use of food additives in meat (including meat preparations and meat products) and their conditions of use are provided for in food category 8 and its sub-categories under Annex II, part E to the additives Regulation. Food additives are not permitted in unprocessed foods for example, fresh meat except for a small number of colours used for the purposes of health marking.

The authorised additives in the various food categories can only be used in accordance with the provisions outlined in Annexes II and III of Regulation (EC) 1333/2008. In the cases where the use of an additive is permitted, either a numerical maximum permitted level will be specified or in some cases, for certain food additives with low toxicological concern, the additive may be permitted at 'quantum satis'. Quantum satis means that no maximum numerical level is specified and substances must be used in accordance with good manufacturing practice, at a level not higher than is necessary to achieve the intended purpose and provided the consumer is not misled. Food additives used in the production of food must be food-grade and to prevent products from exceeding the maximum

limits, it is important that controls are in place around recipes and the weighing of ingredients. Such controls must include training staff on the use of additives. The FBO should ensure that the appropriate documentation in relation to additives used in the production processes within their business is available. For example, food additive specifications/purity criteria information and material safety data sheets. The packaging or labelling of food additives purchased should include the statement 'for food' or the statement 'restricted use in food' or a more specific reference to its intended food use. It should also contain instructions for use, if the omission thereof would preclude appropriate use of the food additive. The packaging should also contain an indication of the maximum quantity of each component or group of components subject to quantitative limitation in food and/or appropriate information in clear and easily understandable terms enabling the purchaser to comply with the additives Regulation or other relevant legislation. For more information on the labelling requirements for food additives that are being supplied into your business refer to Article 22 of Regulation (EC) 1333/2008.

Only use food additives that have been approved for use for the relevant food category and under the conditions of use specified.

Food additives are a possible source of chemical contamination. Specifications for the presence of certain impurities or contaminants (for example, heavy metals) in food additives are included in Regulation (EU) 231/2012. Manufacturers of food additives are required to abide by the purity criteria in this Regulation. As part of a company's food safety management system, they should be able to verify that the additives they are using are authorised and permitted in accordance with the legislation and comply with the specifications laid down in Regulation (EU) 231/2012. In the case of users of premixes, a certificate of compliance or letter confirming compliance with the specifications Regulation as a pragmatic solution would suffice. Potential areas of contamination must be identified, and controls must be implemented.

In accordance with Article 18 (Annex VII, Part C) of Regulation 1169/2011, all food additives added to foods other than those specified in point (b) of Article 20 must be labelled in the ingredients list by their functional class (e.g. Stabiliser, Emulsifier, Preservative etc.) followed by their specific name or, if appropriate, E number. For example, Preservative: Sodium nitrate or Preservative: E 251. The list of functional classes for food additives can be found in Annex I to Regulation (EC) No. 1333/2008.

Sulphur dioxide (E220) and sulphites (E220–228) are food additives that are also listed as one of the 14 substances or products causing allergies or intolerances in Annex II to Regulation (EU) 1169/2011 on the provision of food information to consumers (FIC) when they are present in food at concentrations of more than 10 mg/kg or 10 mg/litre. The full text of this provision states::

"Sulphur dioxide and sulphites at concentrations of more than 10 mg/kg or 10 mg/litre in terms of the total SO2 which are to be calculated for products as proposed ready for consumption or as reconstituted according to the instructions of the manufacturers".

As a result controls put in place for allergens must also be followed when working with any ingredients containing sulphites. This includes the following:

- Where sulphur dioxide-sulphites are used in the manufacture or preparation of a food (at concentrations of more than 10 mg/kg or 10 mg/L in terms of the total SO2) these additives must be indicated in the list of ingredients in accordance with the provisions specified in Article 21 of Regulation (EU) 1169/2011. Article 21 requires that a clear reference to the name of the substance or product as listed in Annex II be indicated in the list of ingredients and that the name of the substance or product as listed in Annex II must be emphasised through a typeset that clearly distinguishes it from the rest of the list of ingredients, for example by means of the font, style or background colour.
- Furthermore, in accordance with Article 18 (Annex VII, Part C), the additive must be identified with the category name (functional class) followed by the specific name of the additive i.e. in this case "Preservative: Sodium metabisulphite". The additive name cannot be replaced by the E-number as it is considered an allergen when present at concentrations above 10 mg/kg or 10 mg/litre.

FBOs can access the food additives database to identify the additives permitted in meat preparations and meat products and to check their conditions of use. The FSAI website (www.fsai.ie) has eLearning modules on food additives including information explaining the labelling requirements for food additives and this will help food businesses to identify the additives permitted for use in products. See www.fsai.ie for more information.

Product specifications

Raw materials specifications

The FBO should keep specifications for all raw materials and packaging. The specifications should include defined limits for relevant attributes of the raw materials that may affect the quality or safety of the final product (for example, chemical, microbiological or physical standards).

Finished product specifications

Accurate, up-to-date specifications should be available for all finished products. The FBO should develop these specifications either themselves or in conjunction with their customers. See section 4 – Record 20 for the Product description and intended use record.

Each finished product specification should include key information or data to meet customer and legal requirements and also to assist in the safe use of the product.

All specifications should be reviewed at a sufficient frequency to ensure that all information detailed is accurate and remains relevant. If there are any changes required, these should be documented.

Records (see Section 4)

- Product description and intended use (Record 20)

Relevant legislation

Regulation (EC) No 1169/2011 on the provision of food information to consumers:

Applies to food businesses at all stages of the food chain, where their activities concern the provision of food information to consumers. It applies to all foods intended for the final consumer, including foods delivered by caterers, and foods intended for supply to caterers. It sets out the allergen labelling requirements and the correct indication of food additives on food labels.

Regulation (EC) No 1337/2013 regarding the indication of the country of origin for fresh, chilled and frozen meat of swine, sheep, goats and poultry

Regulation (EC) No 1333/2008 on food additives regarding their conditions of use in food, the products they are permitted in and the correct labelling of additives in the ingredient list.

Regulation (EU) No 231/2012 laying down specifications for food additives.

Regulation (EC) No 1760/2000 and **Regulation (EC) No 1825/2000** regarding the labelling of beef and beef products

Regulation (EC) No 543/2008 regarding marketing standards for poultry

Regulation (EC) No 853/2004 laying down specific hygiene rules for food of animal origin regarding the application of an identity mark on products of animal origin

Regulation (EC) No 2073/2005 on microbiological criteria regarding **sampling** and **shelf-life requirements**, as well as the labelling of certain products intended to be eaten cooked where thorough cooking is needed prior to consumption.

Regulation (EC) No 1924/2006 on nutrition and health claims made on food

Directive 2011/91 on indications or marks identifying the lot to which a foodstuff belongs

Section 3

HACCP

FSMS activities form

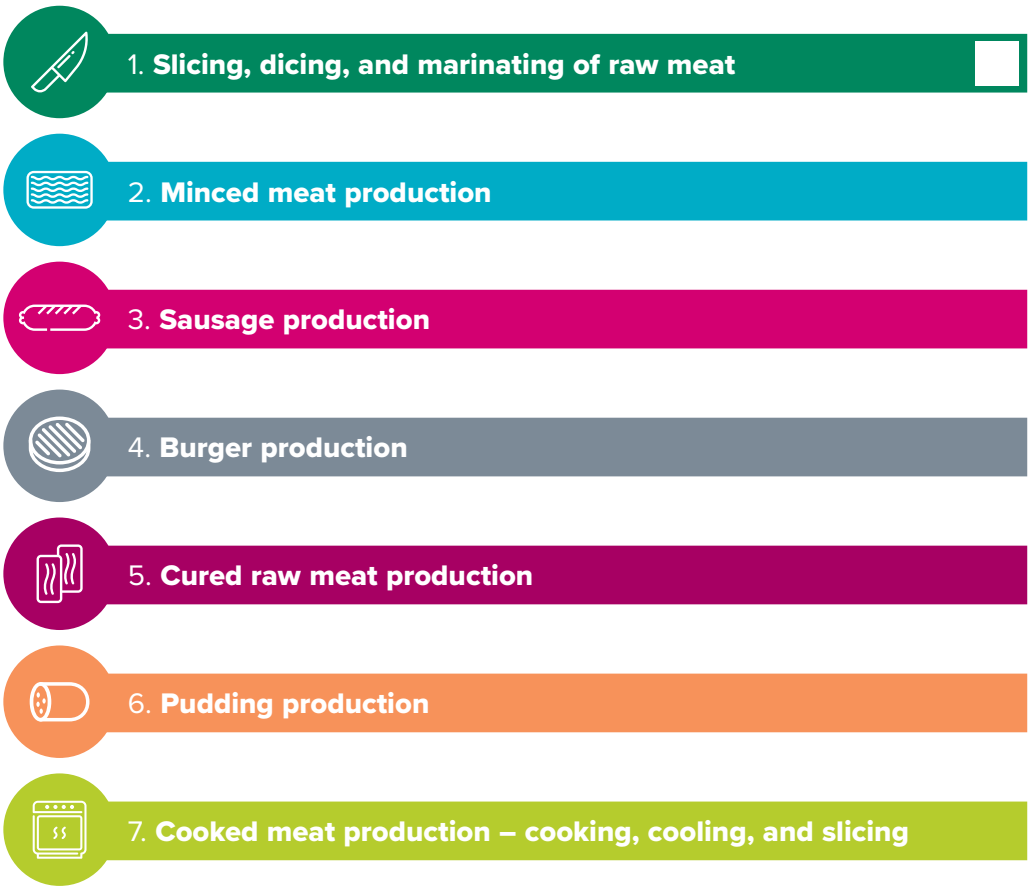
Premises Details

Name:

Approval Number:

Production processes

Tick the boxes for all processes being carried out in the premises above: **Please tick ✓**



List any *other processes being carried out in the premises below:

1.

2.

3.

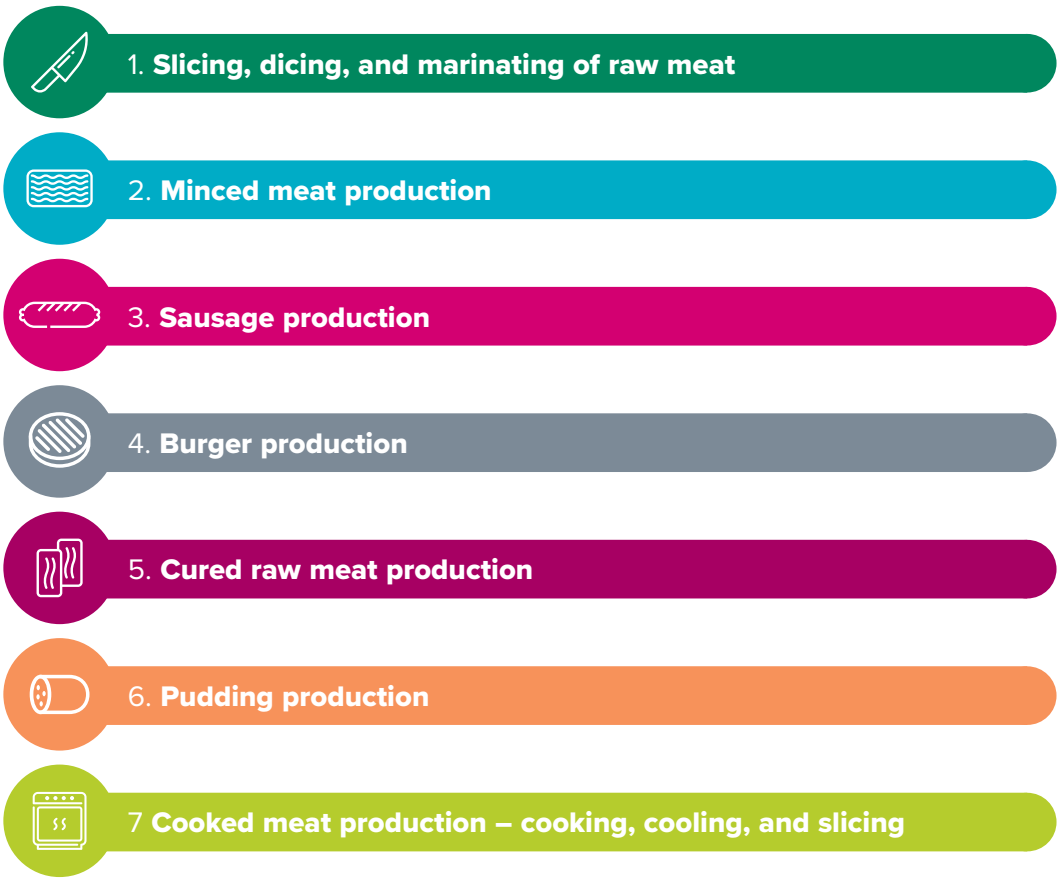
* The FSMS must include all activities carried out by the FBO – if not included in this guide, then the FBO must develop their own procedures, based on HACCP principles for these activities. Appendix B can be used to develop a HACCP plan for any additional activities.

Introduction

Hazard analysis and critical control point (HACCP) is a process control system that is designed to ensure that the food produced is safe. Prerequisite programmes (PRPs) are good hygiene practices (GHPs), the basic conditions and activities necessary to maintain a hygienic environment. HACCP is a legal requirement under Article 5 of Regulation (EC) 852/2004. It is a useful tool to identify and control hazards that may occur in the production of food.

Scope

The seven production processes and standard operating procedures (SOPs) covered in this guide are:



The following process steps are control points that are common to each of the seven production processes above:

A hazard control plan and SOP are also provided for these steps.

HACCP implementation

A comprehensive description of the HACCP principles, and the procedures involved in preparing a HACCP plan are detailed in Appendix B (see the 12 Codex steps). However, due to the limited resources and low staff numbers in SMMPs, it may not be possible or practical for such establishments to prepare their own FSMS based on HACCP principles. Therefore, the expert working group (the HACCP team) has carried out a hazard analysis which covers the various processes detailed in this guide.

While some FBOs may carry out other processes not covered in this guide, they will need to carry out their own hazard analysis and risk assessment for these processes, by referencing the example given for minced meat in Appendix D and using the information provided in Appendix B – Other processes.

If adhering to this guidance, the FBO should complete and sign the Food Safety Management System Declaration Form in Section 1- Management commitment, to confirm they are taking responsibility for applying the FSMS.

Critical control point CCP

A critical control point (CCP) is a step where control can be applied to prevent or eliminate a food safety hazard or reduce it to an acceptable level.

In this FSMS, the expert working group (the HACCP team) used a semi-quantitative risk evaluation method to carry out the hazard analysis, using a risk matrix to guide the evaluation. See Appendix C for a description of the risk methodology used to determine CCPs in conjunction with a two-question decision tree.

The conclusion of this hazard analysis and the subsequent CCP determination was that two steps in the cooked meat production process and one step in the pudding production process were identified as CCPs; these CCPs are cooking and cooling. No other CCPs were identified in any of the other five production processes.

Control point CP

A control point (CP) is a point or step in the production process identified by the hazard analysis as essential to control the likelihood of the introduction, survival and/or proliferation of food safety hazards. A number of steps within each of the seven production processes in this section were identified as being essential for food safety, and these have been categorised as CPs.

Product description and intended use

The product description and intended use is outlined in each of the processes.

Process flow diagrams and verification of process flow diagrams

The expert working group (the HACCP team) has documented a process flow diagram in this FSMS to cover each product, product category or process that is typically applicable to an SMMP. The process flow diagram includes all process steps, including all inputs and outputs, ranging from raw materials selection to processing, storage, and distribution. The process flow diagram shows the link and interaction between each process step and each process where relevant. It includes the following:

- Raw materials as well as utilities and primary packaging
- Sequence and the interaction of all process steps
- Process parameters
- CCPs/CPs
- Intermediate/semi-processed products
- Finished products
- By-products
- Waste
- Raw/ready-to-eat food and clean/dirty area segregation
- Rework/recycling.

Hazard analysis and risk assessment

The biological, physical, chemical, and allergen hazards that are reasonably expected to occur in each process are documented along with the associated control measures. The documented hazard analyses are contained in Appendix A. The methodology used by the expert working group (the HACCP team) to carry out the hazard analysis and risk assessment in this FSMS is contained in Appendix C. A hazard analysis was conducted for every step detailed in this guide.

Classification of hazards

Biological

Bacteria are a common cause of food poisoning. Unlike food spoilage bacteria, food poisoning bacteria do not affect the taste, smell, or look of food. There are many food poisoning bacteria, but some key pathogens include the following: *Salmonella* spp. (pork, poultry, beef); *Campylobacter* spp (poultry); Shiga toxin-producing *Escherichia coli* (STEC) (beef, lamb, goat); *Listeria monocytogenes* (ready-to-eat foods); and *Yersinia enterocolitica* (pork).

Biological hazards can occur in foods as follows:

- Contamination with pathogens: sources of contamination are from poor work practices, poor personal hygiene, poor cleaning procedures, and physical damage causing packaged product to become exposed.
- Growth of pathogens: causes include incorrect chill or frozen storage temperatures, inadequate temperature/time combinations in the blast chill (cooling step), chill or freezer breakdown or poor cooling practice.
- Survival of pathogens: caused by failure of the cooking step. This may be due to equipment failure or poor cooking practices.

Chemical

Sources of chemical hazards include environmental and feed contaminants, veterinary drug residues, pesticide residues, residues of cleaning chemicals, food additives, and migration from food contact materials. Chemical hazards may occur in food due to poor work practices, such as poor cleaning, sourcing raw materials from suppliers who are not on the supplier list, use of non-food-grade additives or contact materials, poor rework, or failure to follow a recipe, for example exceeding the maximum permitted levels for ingredients containing nitrates or nitrites or sulphites among others.

Physical

Physical hazards include metal objects such as a piece of a knife blade, needles from injectors, or pieces of glass or plastic (from the cutting environment) which appear as foreign objects in the meat. Physical hazards also include those intrinsically present in the food (for example, bones, or parts thereof, in meat products) or those that come from people (for example, hair or jewellery). If a robust PRP is in place, there is a low likelihood of physical contamination of the food.

Allergens

If ingested, food allergens may cause severe reaction in susceptible customers. Currently, there are 14 allergens listed in EU legislation that must be declared on a list of ingredients. For more information, see PRP 12 Measures to prevent cross-contamination and PRP 16 Labelling and product information.

In summary

The following documentation has been prepared by the expert working group (the HACCP team) and is available for each of the seven production processes covered in this FSMS:

- ☑ A process flow diagram for each of the seven production processes covered in this document.
- ☑ An SOP for each of the seven production processes, detailing how key tasks should be undertaken for each process.
- ☑ A hazard control plan for each step where there was a CP or CCP identified in the relevant process by the expert working group (the HACCP team) through the hazard analysis process.
- ☑ A documented hazard analysis is provided in Appendix A of the guide for each process step in the relevant production process.

This section includes the following production processes;

1. Slicing, dicing, and marinating of raw meat
2. Minced meat production
3. Sausage production
4. Burger production
5. Cured raw meat production
6. Pudding production
7. Cooked meat production – cooking, cooling, and slicing.

Process steps – control points (CP's) that are common to each of the seven production processes are listed below;

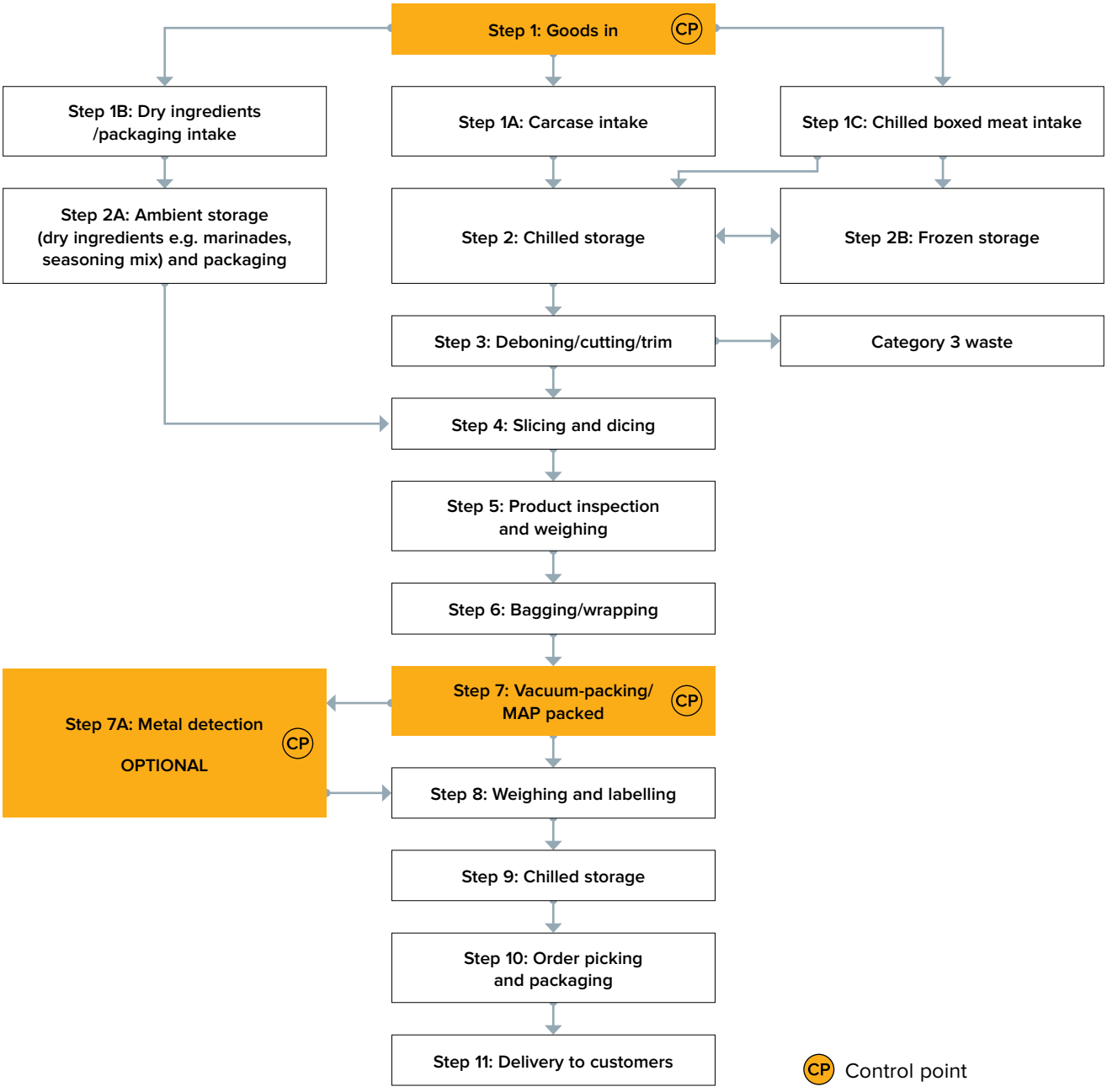
- Goods inwards
- Metal control/metal detection.

A hazard control plan and SOP for these steps are also provided in this section.

1

Slicing, dicing, and marinating of raw meat production

1. Slicing, dicing, and marinating of raw meat production



In the event that the product needs to be reworked, follow **PRP 14 Rework**.

Hazard control plan – slicing, dicing, and marinating of raw meat production

A hazard analysis was conducted on all steps involved in slicing, dicing, marinating of raw meat production. The hazard analysis determined that there are three control points (CPs) and no critical control points (CCPs) in the slicing, dicing, marinating of raw meat production process. The three CPs identified are:

1. Goods in (step 1)
2. Modified atmosphere packaging (MAP) (step 7)
3. Metal detection (step 7A).

The hazard control plan for **Step 7: MAP** is outlined in the table below.
The **Goods in & Metal detection steps** are CPs common to all processes, therefore the hazard control plan for these is outlined towards the end of Section 3.
The hazards associated with the other slicing, dicing, marinating of raw meat production steps are fully controlled by the PRPs. See **Appendix A – Hazard analysis (all other process steps)**.

STEP 7: MODIFIED ATMOSPHERE PACKAGING (CP)
The risk posed by the biological hazards at the MAP step was the reason for identifying this step as a CP

(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Limit/Target	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Biological • Growth of bacteria in product due to poor modified atmosphere packaging (MAP) packing procedure /equipment failure.	**Staff training and compliance with:** • Slicing, dicing, and marinating of raw meat production SOP with regard to MAP procedure to ensure that the product achieves the stated shelf-life on the MAP packed product.	• Gas mixture at required level in sealed pack after MAP packing completed (refer to the MAP packing equipment instructions). • Seals on pack intact after MAP packing.	• Ensure the machine is calibrated and used in accordance with manufacturer's instructions. • Visual – inspect packs under test to ensure that the seals on MAP packed product are intact. • Gently press on packs under test to ensure that seals are intact.	Trained operator	Three trays to be tested at the start, during and after MAP packing has been completed for every batch.	• Review compliance with the Slicing, dicing, and marinating of raw meat production SOP. • Better supervision, training, and/or retraining of staff. • Product not achieving the required gas level mix will need to be repacked. • Adjust the MAP packing equipment/gas flow rates to ensure that the required gas level is achieved in the packs. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved.	**Section 4 – Records** • In-process traceability record (Record 7) • Employee training record (Record 15).	Weekly verification by FBO.

Note: Foods which have their shelf-life extended by means of packaging gases must be labelled "packaged in a protective atmosphere".

STEP 7: MODIFIED ATMOSPHERE PACKAGING (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Chemical **Chemical taint** • Use of incorrect gas mix and taint from MAP packaging.	**Staff training and compliance with:** • Slicing, dicing, and marinating of raw meat production SOP with regard to MAP procedure. • PRP 13 Purchasing – correct gas and food-grade packaging.	No chemical contamination of product.	• Visual inspection of gas cylinders and packaging prior to commencing MAP packing. • Ensure that the correct gas mix is being used prior to commencing MAP packing.	Trained operator	Every batch MAP packed	• Better supervision, training, and/or retraining of staff. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved. • Review suppliers.	**Section 4 – Records** • In-process traceability record (Record 7) • Supplier list (Record 5) • Glass, brittle and hard plastic record (Record 1) • Employee training record (Record 15).	Weekly verification by FBO.
Physical **Physical contamination from:** • Premises • Equipment (for example, condition of MAP packing equipment) • People (for example, hair, jewellery).	**Staff training and compliance with:** • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Visual inspection of building and equipment to ensure that they are fit for purpose, as outlined in PRP 1 Premises and structure. • Ensure that staff are adhering to PRP 7 Cleaning and PRP 10 Personal hygiene. • Maintenance of MAP packing equipment. Ensure that filters are in place on the gas line from gas cylinders to MAP packing equipment.	Trained operator	Every batch MAP packed	• Better supervision, training, and/or retraining of staff. • Dispose of product that may have been contaminated. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Employee training record (Record 15).	Weekly verification by FBO.

STEP 7: MODIFIED ATMOSPHERE PACKAGING (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Allergen **Cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens. • Inadequate cleaning of equipment/utensils that have been used for allergens. • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual – Ensure that staff are adhering to PRP 7 Cleaning. • Ensure that adequate zoning is in place for equipment, utensils, products, ingredients in contact with or containing allergens.	Trained operator	Every batch packed	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

Standard operating procedure for slicing, dicing, and marinating of raw meat production

Introduction

This section covers raw meat for cutting, slicing, dicing as well as the marination of raw meat (for example BBQ sauce).

In Ireland, marinated meat would generally come under the definition of 'meat preparation' (see glossary for definition), which are non ready-to-eat, needing to be cooked before consumption. Immediately after production, meat preparations must be wrapped/packaged and be chilled to an internal temperature of not more than 4 °C, or frozen to an internal temperature of not more than -18 °C. These temperature conditions must be maintained during storage and transport.

Regulation (EC) 2073/2005 sets out sampling requirements for fresh poultry meat and meat preparations. More information on these requirements can be found in PRP 16 Labelling and product information.

Intended use

The meat covered by this process flow is intended to be cooked thoroughly before eating.

Slicing and dicing

- Meat must be fully traceable to the animal or group of animals used in production. For more information, see PRP 4 – Product recall and traceability.
- The raw materials must not have passed their use-by date and will not have passed their use-by date before the end of the shelf-life applied to the label on the steak/diced meat product.
- Meat intended for cutting should be brought into the workrooms only as needed.
- There should be rooms for the separate storage of packaged and exposed meat, unless stored at different times or in such a way that the packaging material and the manner of storage cannot be a source of contamination for the meat. Common intake and dispatch facilities may be permitted provided the FBO can demonstrate to the satisfaction of the Competent Authority that product safety is not compromised. The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement. The Competent Authority must authorise the flexibility before the FBO can implement it. For more information, see PRP 1 Premises and structure and PRP 2 Layout and zoning.
- When sliced and diced products are prepared from frozen meat, make sure the meat used:
  - ☑ Is defrosted in a chill
  - ☑ Has sufficient shelf-life remaining to support the shelf-life being applied to the finished product.
- The In-process traceability record (Section 4 – Record 7) must be completed for each batch of product produced.
- Each operative slicing and dicing primals is responsible for inspection of each steak/diced piece of meat that they cut.
- Prior to cutting a steak or dicing product, the operative should inspect all primals before slicing/dicing and ensure that the primal to be cut is the correct specifications and is suitable for the relevant customer. If they are not (for example, too much fat cover on the primals), they should be trimmed to the correct specifications prior to slicing and dicing.
- The primals should be checked for any dark cutters, scarring, bruising, injection marks or poor-quality cuts.
- Any primal or meat not meeting the required specification should not be used. It can be reworked if practical. For more information on rework, see PRP 14 Rework.
- Production rooms where the main activity is meat cutting, must have facilities for disinfecting tools (knife sterilisers) that heat water to a minimum of 82 °C. Knives must be cleaned prior to placing in the knife steriliser.

  An alternative system that has an equivalent effect to disinfection with water at 82 °C may be used by the FBO but only when authorised by the inspector (Competent Authority). Alternative systems include for example, chemicals / UV disinfection. An alternative method must achieve the same results as a hot water steriliser and this must be validated by the FBO, to the satisfaction of the Competent Authority (for example, microbiological sampling, citation of documents). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement with appropriate documented evidence/validation of the proposed method or activity. The Competent Authority must authorise the flexibility before the FBO can implement it.

Tenderising

- The process of mechanically tenderising meat, by applying equipment with multiple sharp blades or needles penetrating through the meat, has real potential to introduce microbial contamination deep within the meat. The contamination might be present on the needles/blades, or it might be on the external surface of the meat and is transferred to the internal part of the cut of meat during the tenderising process. This equipment is extremely difficult to clean thoroughly and is likely to require dis-assembly to facilitate meaningful hygiene.
- Handheld tenderisers typically have 48 small sharp blades, and thorough cleaning is essential to avoid contaminating product during the tenderising process.
  - Larger hand-operated and automatic tenderisers are also used for tenderising.
  - Before the tenderiser is used, it is essential that it is clean.
  - If a tenderiser is used, it must be thoroughly deep cleaned after use and kept in the chill.
  - If a product is deemed to be tough or of poor quality the best option is not to use it.

Customers should be advised to thoroughly cook pieces of meat that have been tenderised with blades or needles.

- For non-tenderised cuts of meat such as steak, the microbial contamination is usually present on the exposed surface with low risk of there being bacteria in the middle of the piece of meat. Therefore, such cuts may be suitable for consumption following cooking with external surfaces exposed to high temperatures and centre remaining ‘rare’. In-contrast, tenderised cuts have had internal tissues penetrated with needles or blades passing through the external surface so no longer have different risk profiles between surface and centre, and therefore may pose food safety risk if consumed rare. Cuts which have been tenderised should be regarded differently to cuts which have not.
- FSAI recommends that when a piece of meat is tenderised with blades or needles the FBO should advise the customer that the meat must be thoroughly cooked, or put this advice on the label if the product is packaged.

Marinating/dry rubs

- If marinades or dry rubs are used, the date of opening should be recorded on the marinade/dry rub container. The manufacturer’s instructions on storage time and storage conditions must be followed.
- It is essential that excess surplus marinade is not decanted back into the marinade container, as enzymes from the meat that the marinade has been in contact with will cause spoilage and will increase the bacterial count, potentially rendering the marinade unsafe for food use.
- Dry rubs should be kept in a cool dry storage area to avoid caking.
- As in the case of marinades, excess rub must not be put back into its original container. The best advice is to use small quantities and add more as needed.
- Shelf-life considerations and sampling procedures are outlined in PRP 16 Labelling and product information.

- Additives in the marinades or seasonings, under Annex II, part E of Regulation (EC) 1333/2008, should comply with food category 12.6 (sauces) or food category 12.2.2 (seasoning and condiments).
- Allergens listed on the label of the marinade/dry rub/garnish container must be recorded - update the Raw materials and finished product allergen assessment record (Record 16) to ensure it lists all the products allergens. Ensure the ingredients list of the finished, packed marinated/dry rub/garnished product lists all allergens in the product so the customer has accurate information on allergens (see PRP 16 Labelling and product information). **If a product with an undeclared allergen has left the control of the FBO then recall/ withdrawal is required – see PRP 4 Product recall and traceability.**

FBOs who do not provide allergen information pose a safety risk to consumers.

Hygiene and temperature requirements

Cleaning

- All equipment that comes into contact with the product must be cleaned and disinfected frequently, and at least once a day if it has been used that day.
- Equipment must be in good repair and checked for any visible rust or damage (for example, missing pieces of metal).
- All the surfaces that the product will come into contact with must be easy to clean and disinfect.
- Cleaning and disinfection must take place between each batch produced, and if processing meat from different species.

Temperature

- The core temperature of all meat prior to processing should be less than 4 °C to ensure that the meat is as cold as possible prior to slicing and dicing.
- During cutting, boning, trimming, slicing, dicing wrapping and packaging, the meat must be maintained at a temperature of not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meat.
- Refrigeration of production rooms should not exceed a maximum of 12 °C. However, in small-scale, low-throughput establishments, an equivalent temperature effect may be achieved through the use of suitable work practices, but only when authorised by the inspector (Competent Authority). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement. The Competent Authority must authorise the flexibility before the FBO can implement it. It should be recognised that without active room cooling, relying on work practices alone may not be adequate in warm weather conditions. In these cases, small batches of product can be worked on in rooms with/without refrigeration, provided that the FBO can demonstrate that the product remains within the required temperature range (not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats).
- Work-in-progress (WIP) or product carry-over should be avoided or minimised if possible. If WIP or product carry-over is generated at the end of a working day, it must be stored at the required temperature, and the required traceability information for such material should be retained with the product at all times. If a WIP chill is not available and product has been placed in a different chill, such as an intake chill or finished product chill, it should be clearly labelled as WIP to ensure that it is clearly distinguishable from other product being stored in the relevant chill, (for example, other incoming raw materials). The product should be covered, with the appropriate traceability information clearly displayed.

- The product should be wrapped or packaged immediately after production and stored at the required temperature. The maximum storage temperature for fresh meat is not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats.
- Fresh meat with marinades and rubs come under the definition of meat preparations (i.e. fresh meat which has had foodstuffs, seasoning or additives added to it and still has characteristics of fresh meat (see glossary)). Immediately after production, meat preparations must be wrapped/packaged and be chilled to an internal temperature of not more than 4 °C, or frozen to an internal temperature of not more than -18 °C. These temperature conditions must be maintained during storage and transport.

For more information on storage and temperature control requirements, see PRP 3 Product storage, distribution and transport.

Packaging

- Only use food-grade materials for wrapping and packing. Where a Declaration of Compliance is relevant for wrapping/packaging material that comes into contact with food, it must be retained. The wrapping/packaging and the food become one food product and the traceability requirements apply to it as a whole.
- Wrapping and packaging materials must be stored hygienically so that they do not contaminate food.
- Food packaging must be fully traceable back to suppliers. For more information see PRP 4 Product recall and traceability.

Modified Atmosphere Packaging – This is a control point CP

Modified atmosphere packaging (MAP) involves modifying the internal composition of the pack to slow the growth of microorganisms. This helps to prolong the shelf-life of meat, meat products and meat preparations. If done correctly, it maintains the appearance, taste and texture of the product for optimum presentation and longevity. For more information, see FSAI **Guidance Note 18: Validation of Product Shelf-Life** at www.fsai.ie.

All film used for MAP should have an anti-fog top web. This helps to reduce moisture build-up on the inside of the film once sealed in conjunction with the product being stored at the correct chilled temperature after sealing. MAP products should be checked after sealing to ensure that the MAP packing step is effective. The following checks should be performed at production start-up, as well as during and after each production of MAP packed products. It is recommended that three packs at a time be tested for the following:

- **Checks on seal integrity**

  Checks on seal integrity can be done by visual inspection and also by pressing on the packs. If the seal appears to be intact after visual inspection followed by gently pressing on the pack, the seal is deemed to be satisfactory.
- **Changes to gas mixtures**

  If an FBO changes the concentration of any gas in their MAP packaging, for example, carbon dioxide then this is a new product and the shelf-life must be revalidated.
- **Gas analysis**
  - Prior to commencing gas flushing, check the levels of gas (gases used must be food grade) in each tank by examining the display to ensure that there is sufficient gas in the tanks to complete the task at hand.
  - Ensure that the gas tanks are set at the required flow rate.
  - It is recommended that the FBO seeks advice from the gas/MAP packing machine supplier in relation to the required settings needed to achieve target levels of gas in the finished MAP packed products.
  - If using a gas analyser, it is recommended they purchase from a reputable supplier and after MAP packing takes place, packs are tested to ensure they have the required level of gas.

Different types of packaging can be used for MAP packing

- **Thermoformed packs:** a pouch is formed from the base web. The product is placed in the pack, gas is added and the pack is sealed with a top web.
- **Trays:** the product is placed in the tray, gas is added and the pack is sealed with a top web.

It is essential that the FBO follows the gas/MAP packing equipment supplier's recommendations on the correct gas mix to be used for the product being packed.

Make sure you use the correct gas mix for the product being MAP packed.

Metal detection – This is a control point CP

Ideally, all product is passed through a metal detector prior to dispatch. If a metal detector is not available, pre-production checks on equipment and all other items made from metal is sufficient. For more information, see the Metal control/metal detection SOP.

Labelling

Finished product must be labelled correctly - make sure the labels used are accurate and in line with requirements:

- ☑ Name of the food including the species (for example beef sirloin steak, pork chops).
- ☑ List of ingredients.
- ☑ Ensure the ingredients list includes all allergens contained in the product where marinades/rubs/garnishes etc. are added (for example mustard, barley, soya). All allergens must be emphasised through a typeset that clearly distinguishes it from the rest of the ingredients for example by means of font, style or background colour.
- ☑ Products with marinades/rubs/garnishes etc. that contain additives, must comply with the additive labelling requirements in the list of ingredients on prepacked food i.e.:
  - the listing of the functional class of the additive, immediately followed by
  - the specific name or E number of the additive(s) used

  The additive name cannot be replaced by the E number if the additive is an allergen for example, sulphites.

  Note: Food additives are not permitted in fresh (or frozen) raw meat (for example steaks, chops etc.)

  For more information on food additives see PRP 16 Labelling and product information.
- ☑ Meat content (for example, percentage of beef meat in a beef stir fry)
  - See FSAI's **Guidance Note 17: The labelling of Meat and Meat as an Ingredient** for the legislative requirements for the labelling of meat when used as an ingredient.
- ☑ Net quantity.
- ☑ Use-by date (for fresh) – *best-before date for frozen.*
- ☑ Storage conditions are provided.
- ☑ FBO name and address.
- ☑ Country of origin for fresh, chilled and frozen beef, pork, sheep, goats and poultry - see FSAI's **Guidance Note 17: The Labelling of Meat and Meat as an Ingredient** for the legislative requirements for county of origin labelling.
- ☑ Instructions for use where it would be difficult to make appropriate use of the food without instructions. In the case of meat preparations (for example, marinated products), the consumer must be informed that they need to thoroughly cook prior to consumption.
- ☑ Nutrition declaration (see PRP 16 for more information when this is required).
- ☑ Identification mark.
- ☑ The traceability information is correct.
- ☑ The label is clear and legible.

PRP 16 Labelling and product information provides information on food labelling requirements.

Order picking, packing and delivery to customers

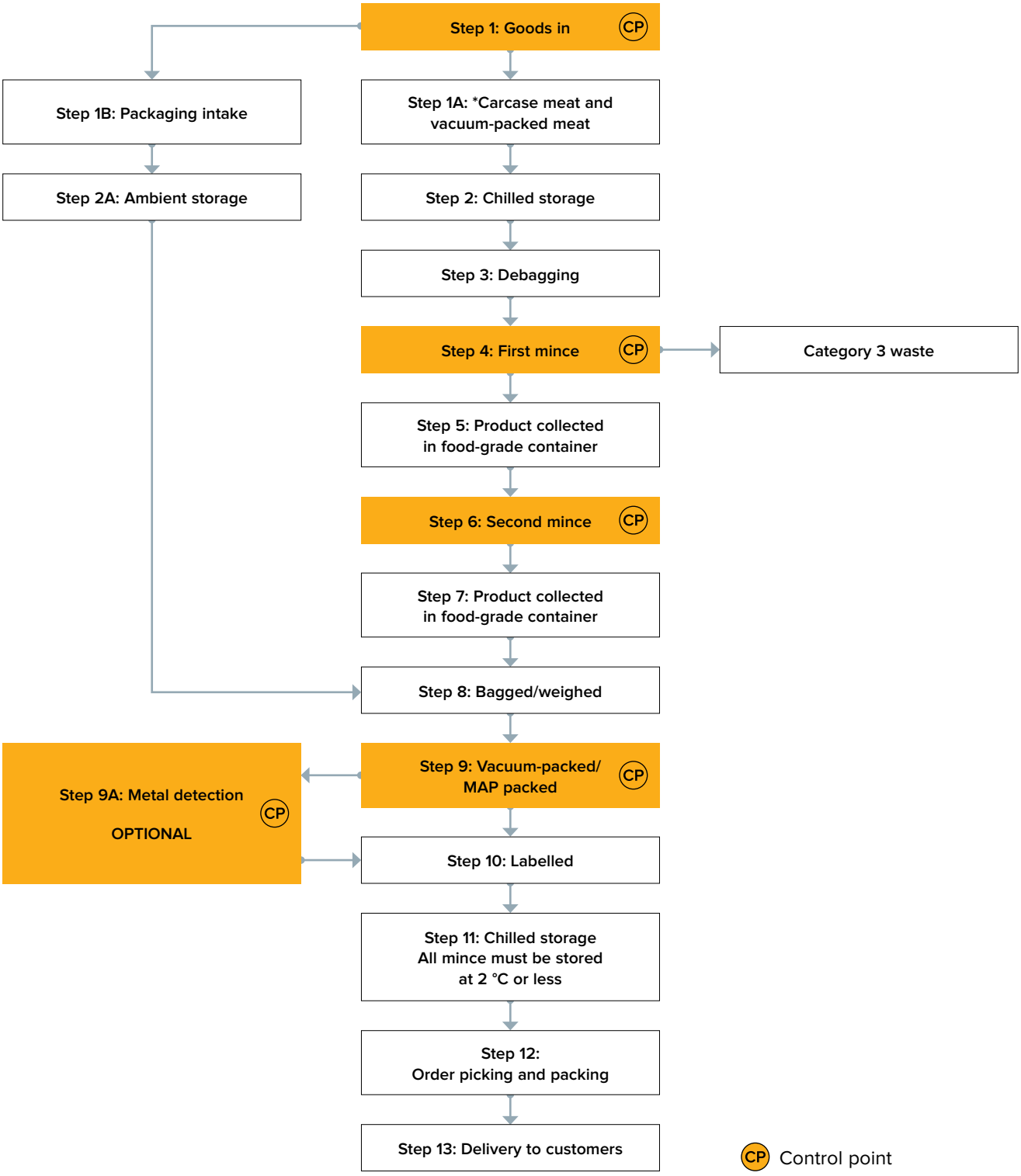
Once an order is received from a customer, the items are picked, packed, and dispatched in line with the relevant temperature requirements – See PRP 3 Product storage, distribution and transport.

Records (see Section 4)

- Glass, brittle and hard plastic record (Record 1)
- Pre-production, metal control and knife register record (Record 2)
- Chilled/frozen temperature record (Record 3)
- Goods inwards record (Record 4)
- Supplier list (Record 5)
- In-process traceability record (Record 7)
- Cleaning record (Record 10)
- Preventative maintenance record (Record 12)
- Employee training record (Record 15)
- Raw materials and finished product allergen assessment record (Record 16).

2 Minced meat production

2. Minced meat production



*When prepared from chilled meat, minced meat must be prepared:

- in the case of poultry, within no more than 3 days of their slaughter
- in the case of animal other than poultry, within no more than 6 days of their slaughter
- in the case of vacuum-packed beef and veal, within no more than 15 days of their slaughter.

In the event that the product needs to be reworked, follow **PRP 14 Rework**.

Hazard control plan – minced meat production

A hazard analysis was conducted on all steps involved in minced meat production. The hazard analysis determined that there are five control points (CPs) and no critical control points (CCPs) in the minced meat production process. The five CPs identified are:

1. Goods in (step 1)
2. First mince (step 4)
3. Second mince (Step 6)
4. MAP packing (step 9)
5. Metal detection (step 9A).

The hazard control plan for **Steps 4 and 6: Mincing** and **Step 9 MAP packing** are outlined in the table below.
The **Goods in & Metal detection steps** are CPs common to all processes, therefore the hazard control plan for these is outlined towards the end of Section 3.
The hazards associated with the other burger production steps are fully controlled by the PRPs. See **Appendix A – Hazard analysis (all other process steps)**.

STEPS 4 AND 6: MINCING (CP) **The risk posed by the biological hazards at the mincing step was the reason for identifying this step as a CP**								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Biological **Bacterial growth** • Increase in product temperature during mincing. • Using meat older than the required number of days from slaughter. **Additional bacterial contamination** • Poor personal hygiene • Unclean equipment/ utensils.	**Staff training and compliance with:** • Minced meat production SOP • PRP 3 Product storage, distribution and transport • PRP 10 Personal hygiene • PRP 7 Cleaning.	• Mince to be at 2 °C or less after mincing • High standards of personal hygiene and equipment /utensil hygiene.	• Visual check that staff are adhering to: – Minced meat production SOP – PRP 7 – PRP 10. • Use a temperature probe to measure the temperature of the mince after mincing (Sanitise the probe before and after use).	Trained operator	Every batch minced	• Review compliance with the Minced meat production SOP. • Better supervision, training, and/or retraining of staff. • Chill mince until temperature of 2 °C or below is achieved. • Dispose of mince that may have been grossly contaminated.	**Section 4 – Records** • In-process traceability record (Record 7) • Chilled/frozen temperature record (Record 3) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.
Chemical **Chemical contamination of food from:** • Incorrect use of cleaning chemicals • Using non-food-grade cleaning chemicals • Using non-food-grade equipment.	**Staff training and compliance with:** • Minced meat production SOP • PRP 7 Cleaning • PRP 13 Purchasing.	No chemical contamination of product.	• Visual inspection of mincer/ equipment prior to mincing. • Ensure that staff are adhering to PRP 7 Cleaning. • Ensure purchase of food-grade cleaning chemicals/ equipment.	Trained operator	Every batch minced	• Better supervision, training, and/or retraining of staff. • Review suppliers. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Supplier list (Record 5) • Employee training record (Record 15).	Weekly verification by FBO.

STEPS 4 AND 6: MINCING (CP)								
(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Limit/Target	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Physical **Physical contamination of food from:** • Premises • Equipment (for example, mincer blades) • Pests • People (for example, hair, jewellery).	**Staff training and compliance with:** • Minced meat production SOP • Metal control/metal detection SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 5 Pest control • PRP 7 Cleaning • PRP 10 Personal hygiene.	• No physical contamination of product	• Visual inspection of premises/equipment to ensure they are fit for purpose, as outlined in PRP 1 and PRP 9. • Ensure that staff are adhering to Metal control/ metal detection SOP. • Ensure that staff are adhering to PRP 7 and PRP 10. • Pest control folder up to date and recommendations actioned.	Trained operator	Before and after every batch minced	• Better supervision, training, and/or retraining of staff. • Maintenance of premises and equipment. • Review pest controls. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Preventative maintenance record (Record 12) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen **Cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils that have been used for allergens • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	• No allergen cross-contamination	Visual – ensure that staff are adhering to PRP 7 Cleaning. Ensure that adequate zoning is in place for equipment, utensils, products, ingredients in contact with or containing allergens.	Trained operator	Every batch minced	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/ utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

STEP 9: MODIFIED ATMOSPHERE PACKAGING (CP) The risk posed by the biological hazards at the MAP step was the reason for identifying this step as a CP								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Biological • Growth of bacteria in product due to poor modified atmosphere packaging (MAP) packing procedure/equipment failure.	**Staff training and compliance with:** • Minced meat production SOP with regard to MAP procedure to ensure that the product achieves the stated shelf-life on the MAP packed product.	• Gas mixture at required level in sealed pack after MAP packing completed (refer to the MAP packing equipment instructions). • Seals on pack intact after MAP packing.	• Ensure the machine is calibrated and used in accordance with manufacturer's instructions. • Visual – inspect packs under test to ensure that the seals on MAP packed product are intact. • Gently press on packs under test to ensure that seals are intact.	Trained operator	Three trays to be tested at the start, during and after MAP packing has been completed for every batch.	• Review compliance with the Minced meat production SOP. • Better supervision, training, and/or retraining of staff. • Product not achieving the required gas level mix will need to be repacked. • Adjust the MAP packing equipment/gas flow rates to ensure that the required gas level is achieved in the packs. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved.	**Section 4 – Records** • In-process traceability record (Record 7) • Employee training record (Record 15).	Weekly verification by FBO.
Chemical **Chemical taint** • Use of incorrect gas mix and taint from MAP packaging.	**Staff training and compliance with:** • Minced meat production SOP with regard to MAP procedure. • PRP 13 Purchasing – correct gas and food-grade packaging.	No chemical contamination of product.	• Visual inspection of gas cylinders and packaging prior to commencing MAP packing. Ensure that the correct gas mix is being used prior to commencing MAP packing.	Trained operator	Every batch MAP packed.	• Better supervision, training, and/or retraining of staff. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved. • Review suppliers.	**Section 4 – Records** • In-process traceability record (Record 7) • Employee training record (Record 15).	Weekly verification by FBO.

STEP 9: MODIFIED ATMOSPHERE PACKAGING (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Physical **Physical contamination from:** • Premises • Equipment (for example, condition of MAP packing equipment) • People (for example, hair, jewellery).	**Staff training and compliance with:** • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Maintenance of MAP packing equipment. Ensure that filters are in place on the gas line from gas cylinders to MAP packing equipment. • Visual inspection of building and equipment to ensure that they are fit for purpose, as outlined in PRP 1 Premises and structure. • Ensure that staff are adhering to PRP 7 Cleaning and PRP 10 Personal hygiene.	Trained operator	Every batch MAP packed	• Better supervision, training, and/or retraining of staff. • Dispose of product that may have been contaminated. • Contact the manufacturer of the MAP packing equipment. • Do not MAP pack until the issue is resolved.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Employee training record (Record 15).	Weekly verification by FBO.
***Allergen** **Cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils that have been used for allergens • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual – Ensure that staff are adhering to PRP 7 Cleaning. • Ensure that adequate zoning is in place for equipment, utensils, products, ingredients in contact with or containing allergens.	Trained operator	Every batch MAP packed	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

Standard operating procedure for minced meat production

Introduction

Minced meat is defined in legislation as boned meat that has been minced into fragments and contains less than 1% salt – see glossary. Different species of meat, including beef, pork, poultry and turkey, can be minced. The desired fat content of the mince will be determined by the type of raw materials selected (for example, 95% visual lean (VL) trims which will give a leaner mince), but this will depend on customer requirements. Minced meat must meet certain limits for fat and collagen/meat protein ratio depending on the species it is from, and the labelling of minced meat must provide certain information in relation to these (see PRP 16 Labelling and product information).

Immediately after production, minced meat must be wrapped/packaged and chilled to an internal temperature of not more than 2 °C, or frozen to an internal temperature of not more than -18 °C. These temperature conditions must be maintained during storage and transport.

Intended use

The minced meat covered by this process flow is intended to be cooked thoroughly before eating.

Minced meat process

The following minced meat production step is outlined in more detail below:

- Mincing CP – First mince/Second mince

Mincing – This is a control point CP

- Before the production of minced meat begins, the label on the raw material should be checked. The approval number of the meat supplier is recorded on the In-process traceability record (Section 4 - Record 7), with the batch number/use-by-date of the meat to be used for mincing. The slaughter date (kill date) must be checked for all meat to be minced and recorded in the In-process traceability record (Section 4 - Record 7). When prepared from chilled meat, vacuum-packed beef or veal must be minced within no more than 15 days from the date of slaughter. It is not common practice to mince product deboned directly from a carcase (non-vacuum-packed meat) but if this does happen, the meat must be minced within no more than 6 days of slaughter, or in the case of poultry within no more than 3 days of slaughter.
- Unless the Competent Authority authorises boning immediately before mincing, frozen or deep-frozen meat used for the preparation of minced meat or meat preparations must be boned before freezing.
- The raw materials to be minced are taken from the goods inwards chill. Minced meat raw materials should be weighed according to the recipe specifications.

First mince

- The raw materials to be minced are debagged and fed through a stainless steel plate (typically 5 mm in size).

Second mince

- A smaller plate is used for the second mince of the same product. This is at the discretion of the FBO. It depends on customer requirements and what the mince will be used for, as to whether a second mince is carried out.
- The mince is collected in a lined crate or stainless steel tote bin.
- The product is then weighed again to ensure that the weight is in accordance with the recipe specifications.
- A unique batch number is assigned to the finished product.

Production of minced meat

- The meat must be fully traceable to the animal or animals used in production as a result of maintaining a comprehensive In-process traceability record (Section 4 – Record 7). For more information on traceability, see PRP 4 Product recall and traceability.
- The raw materials must not have passed their use-by date and will not have passed their use-by date before the end of the shelf-life applied to the minced meat.
- When minced meat is being prepared from chilled meat, ensure that:
  - Poultry meat is minced within 3 days of the date of slaughter.
  - Carcase meat from other species is minced within 6 days of the date of slaughter, or
  - Boned, vacuum-packed beef or veal is minced within 15 days of the date of slaughter.
- When minced meat is prepared from frozen meat, ensure that the meat:
  - Is defrosted in a chill
  - Has sufficient shelf-life remaining to support the shelf-life being applied to the minced meat.
- An In-process traceability record (Section 4 – Record 7) is used to record each batch of minced meat produced.
- Regulation (EC) 2073/2005 sets out sampling requirements for minced meat. More information on these requirements can be found in PRP 16 Labelling and product information.
- Shelf-life considerations and sampling procedures are outlined in PRP 16 Labelling and product information.

Hygiene and temperature requirements

Cleaning

- All equipment that comes into contact with the product must be cleaned and disinfected frequently, and at least once a day if it has been used that day.
- On each occasion when the mincer is about to be cleaned, all serviceable parts of the mincer, including plates and auger, must be disassembled for cleaning, disinfection and inspection.
- Cleaning and disinfection must be repeated between batches of minced meat and between processing minced meat from different species.
- All equipment must be in good repair and checked for any visible rust or damage (for example, missing pieces of metal).
- All the surfaces that the meat will come into contact with must be easy to clean and disinfect.

For more information, see PRP 7 Cleaning.

Temperature maintenance

- The core temperature of all meat prior to processing should be less than 4 °C to ensure that the minced meat does not reach excessive temperatures during the mincing process.
- During cutting, boning, trimming, slicing, dicing, wrapping and packaging, meat must be maintained at a temperature of not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats. Refrigeration of production rooms should not exceed a maximum of 12 °C. However, in small-scale, low-throughput establishments, an equivalent temperature effect may be achieved through the use of suitable work practices, but only when authorised by the inspector (Competent Authority). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement. The Competent Authority must authorise the flexibility before the FBO can implement it. It should be recognised that without active room cooling, relying on work practices alone may not be adequate in warm weather conditions. In these cases, small batches of product can be worked on in rooms with/without refrigeration, provided that the FBO can demonstrate that the product remains within the required temperature range (not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats).

  Immediately after production minced meat must be chilled to no more than 2 °C.
- The raw materials should be brought from refrigerated storage to the mincing machine in small quantities, as needed.
- The minced meat must be wrapped or packaged immediately after production.
- Packs must be chilled and stored at 2 °C or less or frozen to an internal temperature of not more than -18 °C. These temperature conditions must be maintained during storage and transport.
- Work-in-progress (WIP) or product carry-over should be avoided or minimised if possible. If WIP or product carry-over is generated at the end of a working day, it must be stored at the required temperature and the required traceability information for such material should be retained with the product at all times. If a WIP chill is not available and product has been placed in a different chill, such as an intake chill or finished product chill, it should be clearly labelled as WIP to ensure that it is clearly distinguishable from other product (for example, other incoming raw materials) that are being stored in the chill. The product should be covered with the appropriate traceability information clearly displayed.

For more information on temperature control requirements, see PRP 3 Product storage, distribution and transport.

Packaging

- Only use food-grade materials for wrapping and packing. Where a Declaration of Compliance is relevant for wrapping/packaging material that comes into contact with food, it must be retained. The wrapping/packaging and the food become one food product and the traceability requirements apply to it as a whole.
- Wrapping and packaging materials must be stored hygienically so that they do not contaminate food.
- Food packaging must be fully traceable back to suppliers. For more information see PRP 4 Product recall and traceability.

Modified atmosphere packaging (MAP) – This is a control point CP

Modified atmosphere packaging (MAP) involves modifying the internal composition of the pack to slow the growth of microorganisms. This helps to prolong the shelf-life of meat, meat products and meat preparations. If done correctly, it maintains the appearance, taste and texture of the product for optimum presentation and longevity. For more information, see FSAI **Guidance Note 18: Validation of Product Shelf-Life** at www.fsai.ie.

All film used for MAP should have an anti-fog top web. This helps to reduce moisture build-up on the inside of the film once sealed in conjunction with the product being stored at the correct chilled temperature after sealing. MAP products should be checked after sealing to ensure that the MAP packing step is effective. The following checks should be performed at production start-up, as well as during and after each production of MAP packed products. It is recommended that three packs at a time be tested for the following:

- **Checks on seal integrity**

  Checks on seal integrity can be done by visual inspection and also by pressing on the packs. If the seal appears to be intact after visual inspection followed by gently pressing on the pack, the seal is deemed to be satisfactory.
- **Changes to gas mixtures**

  If an FBO changes the concentration of any gas in their MAP packaging, for example, carbon dioxide then this is a new product, and the shelf-life must be revalidated.
- **Gas analysis**
  - Prior to commencing gas flushing, check the levels of gas (gases used must be food grade) in each tank by examining the display to ensure that there is sufficient gas in the tanks to complete the task at hand.
  - Ensure that the gas tanks are set at the required flow rate.
  - It is recommended that the FBO seeks advice from the gas/MAP packing machine supplier in relation to the required settings needed to achieve target levels of gas in the finished MAP packed products.
  - If using a gas analyser, it is recommended the FBO purchase from a reputable supplier and after MAP packing takes place, packs are tested to ensure they have the required level of gas.

Different types of packaging can be used for MAP packing

- **Thermoformed packs:** a pouch is formed from the base web. The product is placed in the pack, gas is added and the pack is sealed with a top web.
- **Trays:** the product is placed in the tray, gas is added and the pack is sealed with a top web.

  It is essential that the FBO follows the gas/MAP packing equipment supplier's recommendations on the correct gas mix to be used for the product being packed.

Make sure you use the correct gas mix for the product being MAP packed.

Metal detection – This is a control point CP

Ideally, all product is passed through a metal detector prior to dispatch. If a metal detector is not available, pre-production checks on equipment and all other items made from metal is sufficient. For more information, see the Metal control/metal detection SOP.

Labelling

Finished product must be labelled correctly - make sure the labels used are accurate and in line with requirements:

- ☑ Name of the food (for example, minced beef, lamb mince, turkey mince).
- ☑ Composition criteria checked based on a daily average.
  - 'percentage of fat content under …'
  - 'collagen/meat protein ratio under …'.
- ☑ List of ingredients.
- ☑ Net quantity.
- ☑ Use-by date (for fresh mince) – *best-before date for frozen mince.*
- ☑ Storage conditions are provided.
- ☑ FBO name and address.
- ☑ Country of origin - see FSAI's **Guidance Note 17: The Labelling of Meat and Meat as an Ingredient** for the legislative requirements for country of origin labelling of minced beef and other species of minced meat.
- ☑ The consumer must be informed that they need to thoroughly cook the mince prior to consumption.
- ☑ Identification mark.
- ☑ The traceability information is correct.
- ☑ The label is clear and legible.

Note: Food additives are not permitted in fresh (or frozen) minced meat.

PRP 16 Labelling and product information provides information on food labelling requirements.

Order picking, packing and delivery to customers

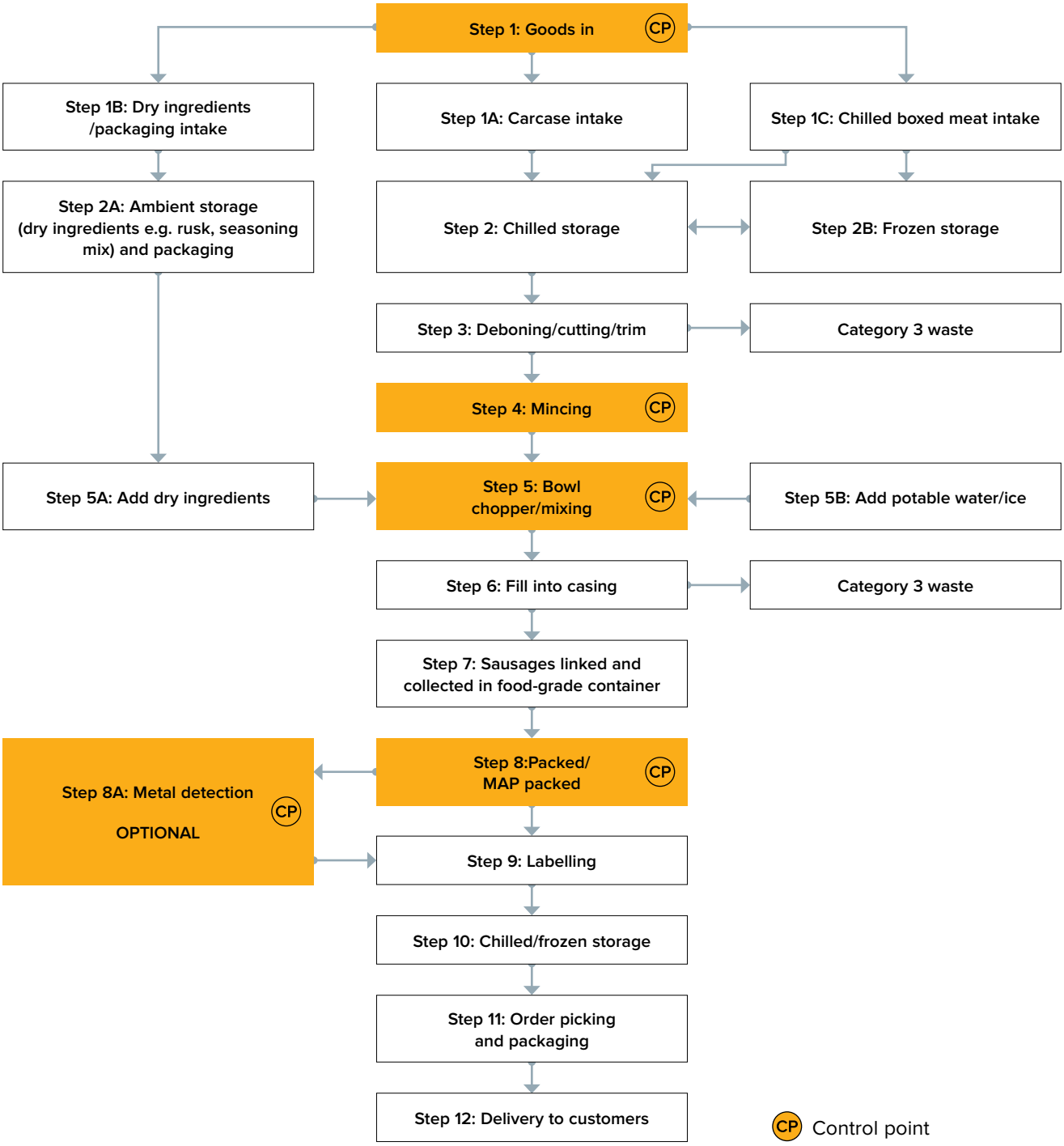
Once an order is received from a customer, the items are picked, packed, and dispatched in line with the relevant temperature requirements – See PRP 3 Product storage, distribution and transport.

Records (see Section 4)

- Glass, brittle and hard plastic record (Record 1)
- Pre-production, metal control and knife register record (Record 2)
- Chilled/frozen temperature record (Record 3)
- Goods inwards record (Record 4)
- Supplier list (Record 5)
- In-process traceability record (Record 7)
- Cleaning record (Record 10)
- Preventative maintenance record (Record 12)
- Employee training record (Record 15)
- Raw materials and finished product allergen assessment record (Record 16).

3 Sausage production

3. Sausage production



In the event that the product needs to be reworked, follow **PRP 14 Rework**.

Hazard control plan – sausage production

A hazard analysis was conducted on all steps involved in sausage production. The hazard analysis determined that there are five control points (CPs) and no critical control points (CCPs) in the sausage production process. The five CPs identified are:

1. Goods in (step 1)
2. Mincing (step 4)
3. Bowl chopper/mixing (step 5)
4. MAP packing (step 8)
5. Metal detection (step 8A).

The hazard control plan for **Step 4: Mincing** & **Step 5: Bowl chopper/mixing** and **Step 8 MAP packing** are outlined in the table below.
The Goods in & Metal detection steps are CPs common to all processes, therefore the hazard control plan for these is outlined towards the end of Section 3.
The hazards associated with the other sausage production steps are fully controlled by the PRPs. See **Appendix A – Hazard analysis (all other process steps**).

STEP 4: MINCING (MEAT FOR SAUSAGE PRODUCTION) (CP)
The risk posed by the biological hazards and allergen (declaration) at this step was the reason for identifying it as a CP

(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Limit/Target	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Biological **Bacterial growth** • Increase in product temperature during bowl chopper/mixing step. **Additional bacterial contamination** • Poor personal hygiene • Unclean equipment/ utensils.	**Staff training and compliance with:** • Sausage production SOP • PRP 3 Product storage, distribution and transport • PRP 10 Personal hygiene • PRP 7 Cleaning.	• Meat to be at 4 °C or less after mincing • High standards of personal hygiene and equipment /utensil hygiene.	• Visual check that staff are adhering to: – Sausage production SOP – PRP 7 – PRP 10. • Use a temperature probe to measure the temperature of the mince after mincing (Sanitise the probe before and after use).	Trained operator	Every batch	• Review compliance with the Sausage production SOP • Better supervision, training, and/or retraining of staff. • Chill mince until temperature of below 4 °C is achieved, if not used immediately. • Dispose of mince that may have been grossly contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • In-process traceability record (Record 7) • Chilled/frozen temperature record (Record 3) • Employee training record (Record 15).	Weekly verification by FBO.
Chemical **Chemical contamination from:** • Incorrect use of cleaning chemicals • Using non-food-grade cleaning chemicals • Using non-food-grade equipment.	**Staff training and compliance with:** • Sausage production SOP • PRP 7 Cleaning • PRP 13 Purchasing.	No chemical contamination of product.	• Visual inspection of mincer prior to mincing. • Ensure that staff are adhering to PRP 7 Cleaning. • Ensure purchase of food-grade cleaning chemicals/ equipment.	Trained operator	Every batch minced	• Better supervision, training, and/or retraining of staff. • Review suppliers. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Supplier list (Record 5) • Employee training record (Record 15).	Weekly verification by FBO.

STEP 4: MINCING (MEAT FOR SAUSAGE PRODUCTION) (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Physical **Physical contamination from** • Premises • Equipment (for example, mincer blades) • Pests • People (for example, hair, jewellery).	**Staff training and compliance with:** • Sausage production SOP • Metal control/metal detection SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 5 Pest control • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Visual inspection of premises/equipment to ensure they are fit for purpose, as outlined in PRP 1 and PRP 9. • Ensure that staff are adhering to Metal control/ metal detection SOP. • Ensure that staff are adhering to PRP 7 and PRP 10. • Pest control folder up to date and recommendations actioned.	Trained operator	Before and after every batch minced	• Better supervision, training, and/or retraining of staff. • Maintenance of premises and equipment. • Review pest controls. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Preventative maintenance record (Record 12) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen **Allergen cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch minced	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

STEP 5: BOWL CHOPPER/MIXING (CP) – this is the step where dry ingredient that could include allergens are added. The risk posed by the biological and allergen (declaration) hazards at the bowl chopper/mixing step was the reason for identifying this step as a CP								
(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Limit/Target	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Biological **Bacterial growth** • Increase in product temperature during bowl chopper/mixing step. **Additional bacterial contamination** • Poor personal hygiene • Unclean equipment/ utensils.	**Staff training and compliance with:** • Sausage production SOP • PRP 3 Product storage, distribution and transport • PRP 10 Personal hygiene • PRP 7 Cleaning.	• Product to be at 4 °C or less immediately after bowl chopper/ mixing. • High standards of personal hygiene and equipment/utensil hygiene.	• Visual check that staff are adhering to: – Sausage production SOP – PRP 7 – PRP 10 • Use a temperature probe to measure the temperature of the mixture after bowl chopper/mixing (Sanitise the probe before and after use).	Trained operator	Every batch	• Review compliance with the Sausage Production SOP. • Better supervision, training, and/or retraining of staff. • Chill mixture until temperature of below 4 °C is achieved, if not used immediately. • Dispose of mixture that may have been grossly contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • In-process traceability record (Record 7) • Chilled/frozen temperature record (Record 3) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen **Allergen as ingredients in the sausage:** • Allergen declaration (ingredients list) does not include all the allergens intentionally added as ingredients to the product.	**Staff training and compliance with:** • Recipe check against label (PRP 16) • PRP 16 Labelling and product information.	All allergens intentionally added to the product are included in the ingredients list.	• Check ingredients used in recipe against the product specification and allergen declaration (label) to make sure that allergen information provided is accurate. • Ensure adherence to allergen labelling requirements in PRP 16.	Trained operator	Every batch	• Update the Raw materials and finished product allergen assessment record (Record 16) to ensure it lists all the products allergens • Ensure the allergen declaration (ingredients list) lists all allergens in the product so customer has accurate information on allergens.	• Sausage label **Section 4- Records** • Raw materials and finished product allergen assessment record (Record 16) • Employee training record (Record 15).	Ongoing verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

STEP 5: BOWL CHOPPER/MIXING (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Allergen **Cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils that have been used for allergens. • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Ongoing verification by FBO.
Chemical **Chemical contamination of food from:** • Incorrect use of food additives • Incorrect use of cleaning chemicals • Using non-food-grade cleaning chemicals • Using non-food-grade equipment.	**Staff training and compliance with:** • Sausage production SOP • PRP 7 Cleaning • Incorrect use of food additives. • PRP 13 Purchasing • PRP 16 Labelling and product information (sampling, shelf-life, and food additives).	No chemical contamination of product.	• Follow instructions for use of food additives. • Visual inspection of bowl chopper/mixer prior to mixing. • Ensure that staff are adhering to PRP 7 Cleaning. • Ensure purchase of food-grade cleaning chemicals/ equipment.	Trained operator	Every batch mixed	• Better supervision, training, and/or retraining of staff. • Review suppliers. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Supplier list (Record 5) • In-process traceability record (Record 7) • Employee training record (Record 15).	Weekly verification by FBO.
Physical **Physical contamination of food from:** • Premises • Equipment (for example, bowl chopper blades) • Pests • People (for example, hair, jewellery).	**Staff training and compliance with:** • Sausage production SOP • Metal control/metal detection SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 5 Pest control • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Visual inspection of premises/equipment to ensure that they are fit for purpose, as outlined in PRP 1 and PRP 9. • Ensure that staff are adhering to Metal control/ metal detection SOP. • Ensure that staff are adhering to PRP 7 and PRP 10. • Pest control folder up to date and recommendations actioned.	Trained operator	Every batch mixed	• Better supervision, training, and/or retraining of staff. • Maintenance of premises and equipment. • Review pest controls. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Preventative maintenance record (Record 12) • Employee training record (Record 15).	Weekly verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

STEP 8: MODIFIED ATMOSPHERE PACKAGING (CP) The risk posed by the biological hazards at the MAP step was the reason for identifying this step as a CP								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Biological • Growth of bacteria in product due to poor modified atmosphere packaging (MAP) packing procedure/equipment failure.	**Staff training and compliance with:** • Sausage production SOP with regard to MAP procedure, to ensure that product achieves the stated shelf-life on the MAP packed product.	• Gas mixture at required level in sealed pack after MAP packing completed (refer to the MAP packing equipment instructions). • Seals on pack intact after MAP packing.	• Ensure the machine is calibrated and used in accordance with manufacturer's instructions. • Visual – inspect packs under test to ensure that the seals on MAP packed product are intact. • Gently press on packs under test to ensure that seals are intact.	Trained operator	Three trays to be tested at the start, during and after MAP packing has been completed for every batch.	• Review compliance with the Sausage production SOP. • Better supervision, training, and/or retraining of staff. • Product not achieving the required gas level mix will need to be repacked. • Adjust the MAP packing equipment/gas flow rates to ensure that the required gas level is achieved in the packs. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved.	**Section 4 – Records** • In-process traceability record (Record 7) • Employee training record (Record 15).	Weekly verification by FBO.
Chemical **Chemical taint** • Use of incorrect gas mix and taint from MAP packaging.	**Staff training and compliance with:** • Sausage production SOP with regard to MAP procedure. • PRP 13 Purchasing – correct gas and food-grade packaging.	No chemical contamination of product.	• Visual inspection of gas cylinders and packaging prior to commencing MAP packing. • Ensure that the correct gas mix is being used prior to commencing MAP packing.	Trained operator	Every batch MAP packed.	• Better supervision, training, and/or retraining of staff. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved. • Review suppliers.	**Section 4 – Records** • In-process traceability record (Record 7) • Employee training record (Record 15) • Supplier list (Record 5).	Weekly verification by FBO.

Note: Foods which have their shelf-life extended by means of packaging gases must be labelled "packaged in a protective atmosphere".

STEP 8: MODIFIED ATMOSPHERE PACKAGING (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Physical **Physical contamination from:** • Premises • Equipment (for example, condition of MAP packing equipment) • People (for example, hair, jewellery).	**Staff training and compliance with:** • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Maintenance of MAP packing equipment. Ensure that filters are in place on the gas line from gas cylinders to MAP packing equipment. • Visual inspection of building and equipment to ensure that they are fit for purpose, as outlined in PRP 1 Premises and structure. • Ensure that staff are adhering to PRP 7 Cleaning and PRP 10 Personal hygiene.	Trained operator	Every batch MAP packed	• Better supervision, training, and/or retraining of staff. • Dispose of product that may have been contaminated. • Contact the manufacturer of the MAP packing equipment. • Do not MAP pack until the issue is resolved.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen **Cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens. • Inadequate cleaning of equipment/utensils that have been used for allergens. • Inadequate zoning • People (for example not washing hands/ changing PPE after handing allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Ongoing verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

Standard operating procedure for sausage production

Introduction

In Ireland sausages are a non ready-to-eat product that need to be cooked before consumption. Under food legislation sausages come under the definition of 'meat preparations' – see glossary. Immediately after production, meat preparations must be wrapped/packaged and chilled to an internal temperature of not more than 4 °C, or frozen to an internal temperature of not more than -18 °C. These temperature conditions must be maintained during storage and transport.

Intended use

The sausages covered by this process flow are intended to be cooked thoroughly before eating.

Sausage production process

The following sausage production steps are outlined in more detail below:

- Mincing CP
- Bowl chopper/mixing CP
- Fill into casing
- Sausage linking

Mincing of meat for sausage production – This is a control point CP

- Before mincing of pork (or other meat) commences to produce sausages, the label on the raw material should be checked. The supplier (slaughterhouse/cutting plant) approval number must be recorded on the In-process traceability record, with the batch number of the meat and its use-by date (Section 4 – Record 7).
- Pork raw materials (sausages can be made from other meats such as poultry or beef but the same method is used) are taken from the raw materials chill. To produce a batch of sausage mix, pork raw materials are weighed according to recipe specifications. The pork raw material, if vacuum-packed, is debagged, placed in the mincer, and fed through stainless steel plate (typically 5 mm in size).
- Once mincing is completed, the mince is collected in a lined crate or stainless steel tote bin. The product is then weighed again to ensure that the weight is in accordance with the recipe specifications. The mince is transferred to a bowl chopper/mixing bowl.

Bowl chopper/mixing bowl – This is a control point CP

- All minced raw materials are added to the bowl chopper/mixing bowl in batches according to the recipe specifications. Seasonings and rusk are pre-weighed, and all relevant dry ingredients are added to the minced raw materials in the bowl chopper/mixing bowl as per the recipe.
- Water (or ice) is pre-weighed, and the required amounts are added to the sausage mix to control the temperature of the batch. The lid of the bowl chopper is pulled down and the relevant programme is selected. Mixing lasts for approximately 5 minutes.
- The temperature of the sausage mix is checked using a temperature probe.
- Product is removed from the bowl chopper and is manually placed in the filler.

Fill into casing

- Sausage mix that has been transferred from the mixing bowl is placed manually into the filler.
- Sausage casings from the dry goods store (plastic casing) or the chill (natural casing) are used and placed on the filling nozzle. If the casing used in a sausage is not edible, this must be indicated on the label.
- The filling machine can be adjusted to select relevant sausage size.
- A unique batch number is assigned to the finished product.

Linking

- Sausages may then be linked by a trained operator if required.

Production of sausages

- Meat used in the production of sausages must be fully traceable to the animal or group of animals from which that meat has been obtained.
- All ingredients must be prepared and used according to manufacturer's specifications.
- The raw materials must not have passed their use-by date and will not have passed their use-by date before the end of the shelf-life applied to the sausages.
- Only certain food additives can be used in sausages according to Part E of Annex II to Regulation (EC) 1333/2008. All food additives must have written assurances concerning their purity and safety and include directions for use – this must be provided by the manufacturer or supplier.
- Allergens listed on the label of ingredients (for example, seasoning mix) must be recorded - update the 'Finished product allergen list' (Record 16) to ensure it lists all the products allergens. The labelling of the sausages must list all allergens added as ingredients.
- When sausages are prepared from thawed meat, the FBO should ensure that the meat:
  - ☑ Has been defrosted in a chill
  - ☑ Has sufficient shelf-life remaining to support the shelf-life being applied to the sausages.

- Water or ice incorporated into the product mix must be potable (drinking quality). For more information, see PRP 8 Utilities and services.
- An In-process traceability record (Section 4 – Record 7) is used to record each batch of sausages produced.
- Regulation (EC) 2073/2005 sets out sampling requirements for meat preparations like sausages. More information on these requirements can be found in PRP 16 Labelling and product information.
- Shelf-life considerations and sampling procedures are outlined in PRP 16 Labelling and product information.

Hygiene and temperature requirements

Cleaning

- All equipment that comes into contact with the product must be cleaned and disinfected frequently, and at least once a day if it has been used that day.
- On each occasion when the mincer/bowl chopper is about to be cleaned, all serviceable parts of the mincer/bowl chopper, including plates, auger and blades, must be disassembled for cleaning, disinfection and inspection.
- Cleaning and disinfection must take place between each batch produced, and when processing meat from different species.
- All equipment must be in good repair and checked for any visible rust or damage (for example, missing pieces of metal).
- All the surfaces that the meat will come into contact with must be easy to clean and disinfect.

For more information, see PRP 7 Cleaning.

Temperature maintenance

- The core temperature of all meat prior to processing should be 4 °C or less to ensure that the sausage meat is as cold as possible prior to filling.
- During cutting, boning, trimming, slicing, dicing, wrapping and packaging, meat must be maintained at a temperature of not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats. Refrigeration of production rooms should not exceed a maximum of 12 °C. However, in small-scale, low-throughput establishments, an equivalent temperature effect may be achieved through the use of suitable work practices, but only when authorised by the inspector (Competent Authority). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement. The Competent Authority must authorise the flexibility before the FBO can implement it. It should be recognised that without active room cooling, relying on work practices alone may not be adequate in warm weather conditions. In these cases, small batches of product can be worked on in rooms with/without refrigeration, provided that the FBO can demonstrate that the product remains within the required temperature range (not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats).

  Immediately after production meat preparations (for example sausages) must be chilled to no more than 4 °C.
- The FBO must control the increase in temperature that arises during mincing. The raw materials should be brought from refrigerated storage to the mincing machine in small quantities, as needed.
- Work-in-progress (WIP) or product carry-over should be avoided or minimised if possible. If WIP or product carry-over is generated at the end of a working day, it must be stored at the required temperature and the required traceability information for such material should be retained with the product at all times. If a WIP chill is not available and product has been placed in a different chill, such as an intake chill or finished product chill, it must be clearly labelled as WIP to ensure that it is clearly distinguishable from other product (for example, other incoming raw materials) that are being stored in the chill. The product should be covered, with the appropriate traceability information clearly displayed.
- Immediately after production, the sausages must be wrapped, packaged, or hung.
- They must then be immediately chilled down and stored at a temperature of 4 °C or less, or frozen to not more than -18 °C.

For more information on storage and temperature control requirements, see PRP 3 Product storage, distribution and transport.

Packaging

- Only use food-grade materials for wrapping and packing. Where a Declaration of Compliance is relevant for wrapping/packaging material that comes into contact with food, it must be retained. The wrapping/packaging and the food become one food product and the traceability requirements apply to it as a whole.
- Wrapping and packaging materials must be stored hygienically so that they do not contaminate food.
- Food packaging must be fully traceable back to suppliers. For more information see PRP 4 Product recall and traceability.

Modified atmosphere packaging (MAP) – This is a control point CP

Modified atmosphere packaging (MAP) involves modifying the internal composition of the pack to slow the growth of microorganisms. This helps to prolong the shelf-life of meat, meat products and meat preparations. If done correctly, it maintains the appearance, taste and texture of the product for optimum presentation and longevity. For more information, see FSAI **Guidance Note 18: Validation of Product Shelf-Life** at www.fsai.ie.

All film used for MAP should have an anti-fog top web. This helps to reduce moisture build-up on the inside of the film once sealed in conjunction with the product being stored at the correct chilled temperature after sealing. MAP products should be checked after sealing to ensure that the MAP packing step is effective. The following checks should be performed at production start-up, as well as during and after each production of MAP packed products. It is recommended that three packs at a time be tested for the following:

1. **Checks on seal integrity**

   Checks on seal integrity can be done by visual inspection and also by pressing on the packs. If the seal appears to be intact after visual inspection followed by gently pressing on the pack, the seal is deemed to be satisfactory.

2. **Changes to gas mixtures**

   If an FBO changes the concentration of any gas in their MAP packaging, for example, carbon dioxide then this is a new product, and the shelf-life must be revalidated.

3. **Gas analysis**
   - Prior to commencing gas flushing, check the levels of gas (gases used must be food grade) in each tank by examining the display to ensure that there is sufficient gas in the tanks to complete the task at hand.
   - Ensure that the gas tanks are set at the required flow rate.
   - It is recommended that the FBO seeks advice from the gas/MAP packing machine supplier in relation to the required settings needed to achieve target levels of gas in the finished MAP packed product.
   - If using a gas analyser, it is recommended the FBO purchase from a reputable supplier and after MAP packing takes place, packs are tested to ensure they have the required level of gas.

Different types of packaging can be used for MAP packing

- **Thermoformed packs:** a pouch is formed from the base web. The product is placed in the pack, gas is added and the pack is sealed with a top web.
- **Trays:** the product is placed in the tray, gas is added and the pack is sealed with a top web.

  It is essential that the FBO follows the gas/MAP packing equipment supplier's recommendations on the correct gas mix to be used for the product being packed.

Make sure you use the correct gas mix for the product being MAP packed.

Metal detection – This is a control point CP

Ideally, all product is passed through a metal detector prior to dispatch. If a metal detector is not available, pre-production checks on equipment and all other items made from metal are sufficient. For more information, see the Metal control/metal detection SOP.

Labelling

Finished product must be labelled correctly - make sure the labels used are accurate and in line with requirements:

- ☑ Name of the food (for example, pork sausages).
- ☑ List of ingredients.
- ☑ Ensure the ingredients list includes all allergens contained in the sausages (for example, wheat, sulphites). All allergens must be emphasised through a typeset that clearly distinguishes it from the rest of the ingredients for example by means of font, style or background colour.
- ☑ Sausages that contain additives, must comply with the additive labelling requirements in the list of ingredients on prepacked food i.e.:
  - the listing of the functional class of the additive, immediately followed by
  - the specific name or E number of the additive(s) used
  Note: The additive name cannot be replaced by the E number if the additive is an allergen for example, sulphites.
- ☑ Meat content (for example, percentage of pork meat in a sausage)
  See FSAI's **Guidance Note 17: The Labelling of Meat and Meat as an Ingredient** for the legislative requirements for the labelling of meat when used as an ingredient.
- ☑ Net quantity.
- ☑ Use-by date (for fresh sausages) / best-before date (for frozen sausages).
- ☑ Storage conditions are provided.
- ☑ If the casing used in the sausage is not edible this must be indicated.
- ☑ FBO name and address.
- ☑ Country of origin where its absence may mislead.
- ☑ The consumer must be informed that they need to thoroughly cook the sausages prior to consumption.
- ☑ Nutrition declaration (see PRP 16 for more information when this is required).
- ☑ Identification mark.
- ☑ The traceability information is correct.
- ☑ The label is clear and legible.

PRP 16 Labelling and product information provides information on food labelling requirements.

Order picking, packing and delivery to customers

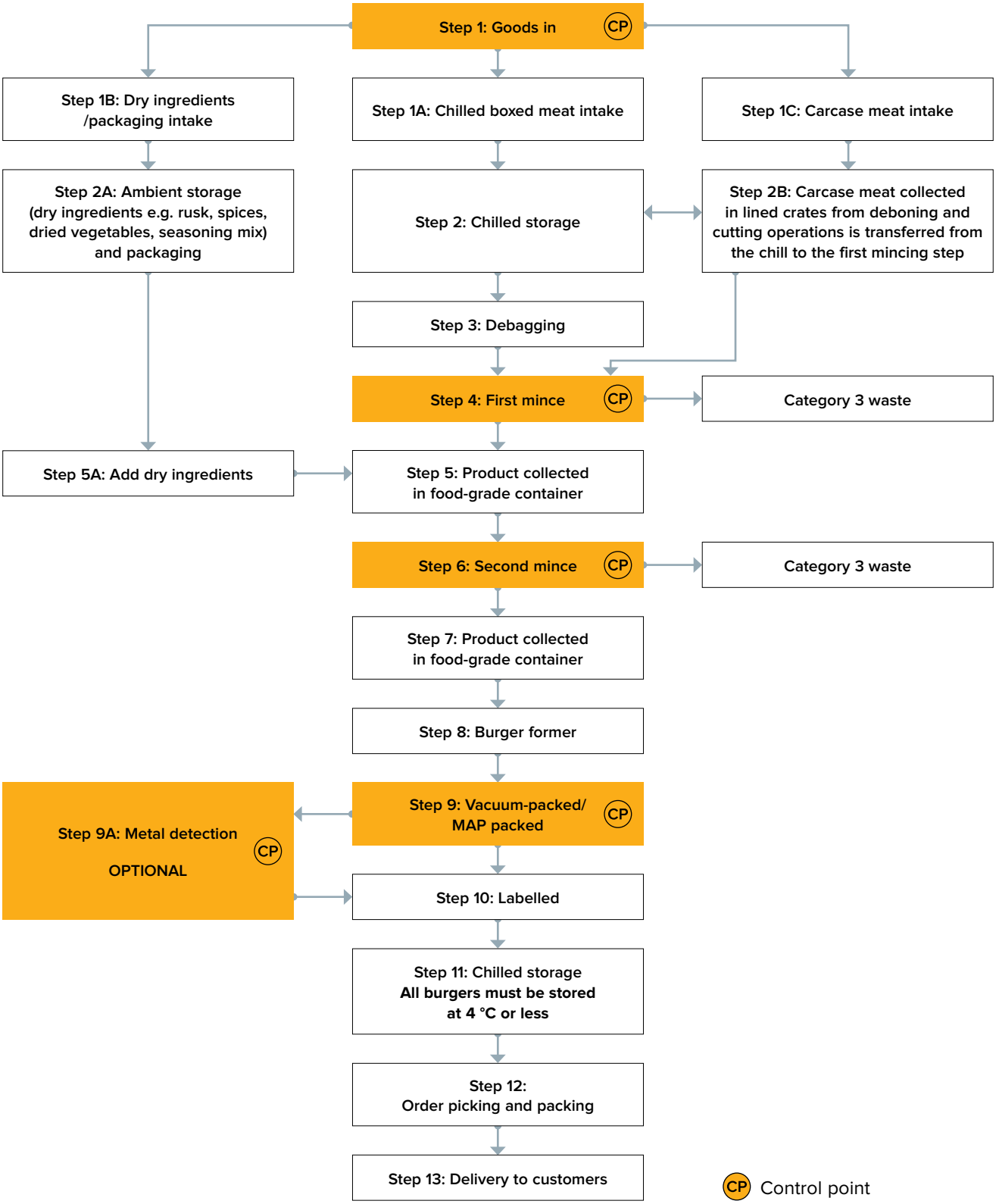
Once an order is received from a customer, the items are picked, packed, and dispatched in line with the relevant temperature requirements – See PRP 3 Product storage, distribution and transport.

Records (see Section 4)

- Glass, brittle and hard plastic record (Record 1)
- Pre-production, metal control and knife register record (Record 2)
- Chilled/frozen temperature record (Record 3)
- Goods inwards record (Record 4)
- Supplier list (Record 5)
- In-process traceability record (Record 7)
- Cleaning record (Record 10)
- Preventative maintenance record (Record 12)
- Employee training record (Record 15)
- Raw materials and finished product allergen assessment record (Record 16).

4 Burger production

4. Burger production



In the event that the product needs to be reworked, follow **PRP 14 Rework**.

Hazard control plan – burger production

A hazard analysis was conducted on all steps involved in burger production. The hazard analysis determined that there are five control points (CPs) and no critical control points (CCPs) in the burger production process. The four CPs identified are:

1. Goods in (step 1)
2. First mince (step 4)
3. Second mince (Step 6)
4. MAP packing (step 9)
5. Metal detection (step 9A).

The hazard control plan for **Steps 4 and 6: Mincing and Step 9 MAP packing** are outlined in the table below.
The **Goods in & Metal detection steps** are CPs common to all processes, therefore the hazard control plan for these is outlined towards the end of Section 3.
The hazards associated with the other burger production steps are fully controlled by the PRPs. See **Appendix A – Hazard analysis (all other process steps)**.

STEPS 4 AND 6: MINCING MEAT FOR BURGER PRODUCTION (CP)
This is the step where dry ingredient that could include allergens are added.
The risk posed by the biological hazards and allergen (declaration) at this step was the reason for identifying it as a CP

(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Limit/Target	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Biological **Bacterial growth** • Increase in product temperature during mincing. **Additional bacterial contamination** • Poor personal hygiene • Unclean equipment/utensils.	**Staff training and compliance with:** • Burger production SOP • PRP 3 Product storage, distribution and transport • PRP 10 Personal hygiene • PRP 7 Cleaning.	• Meat to be at 4 °C or less after mincing • High standards of personal hygiene and equipment /utensil hygiene.	• Visual check that staff are adhering to: – Burger production SOP – PRP 7 – PRP 10. • Use a temperature probe to measure the temperature of the mixture after mincing (Sanitise the probe before and after use).	Trained operator	Every batch	• Review compliance with the Burger production SOP. • Better supervision, training, and/or retraining of staff. • Chill until temperature of below 4 °C is achieved, if not used immediately. • Dispose of mixture that may have been grossly contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • In-process traceability record (Record 7) • Chilled/frozen temperature record (Record 3) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen **Allergen as ingredients in the burger** • Allergen declaration (ingredients list) does not include all the allergens intentionally added as ingredients to the product.	**Staff training and compliance with:** • Recipe check against label (PRP 16) • PRP 16 Labelling and product information.	All allergens intentionally added to the product are included in the ingredients list.	• Check ingredients used in recipe against the product specification and allergen declaration (label) to make sure that allergen information provided is accurate. • Ensure adherence to allergen labelling requirements in PRP 16.	Trained operator	Every batch	• Update the Raw materials and finished product allergen assessment record (Record 16) to ensure it lists all the products allergens. • Ensure the allergen declaration (ingredients list) lists all allergens in the product so customer has accurate information on allergens.	• Burger label **Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Employee training record (Record 15).	Ongoing verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

STEPS 4 AND 6: MINCING MEAT FOR BURGER PRODUCTION (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Allergen **Allergen cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Ongoing verification by the FBO.
Chemical **Chemical contamination of food from:** • Incorrect use of food additives • Incorrect use of cleaning chemicals • Using non-food-grade cleaning chemicals • Using non-food-grade equipment.	**Staff training and compliance with:** • Burger production SOP • PRP 7 Cleaning • PRP 13 Purchasing • PRP 16 Labelling and product information (sampling, shelf-life, and food additives).	No chemical contamination of product.	• Follow instructions for use of food additives. • Visual inspection of mincer/ equipment prior to mincing. • Ensure that staff are adhering to PRP 7 Cleaning. • Ensure purchase of food-grade cleaning chemicals/ equipment.	Trained operator	Every batch minced	• Better supervision, training, and/or retraining of staff. • Review suppliers. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Supplier list (Record 5) • In-process traceability record (Record 7) • Employee training record (Record 15).	Weekly verification by FBO.
Physical **Physical contamination of food from** • Premises • Equipment (for example, mincer blades) • Pests • People (for example, hair, jewellery).	**Staff training and compliance with:** • Burger production SOP • Metal control/metal detection SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 5 Pest control • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Visual inspection of premises/equipment to ensure they are fit for purpose, as outlined in PRP 1 and PRP 9. • Ensure that staff are adhering to Metal control/ metal detection SOP. • Ensure that staff are adhering to PRP 7 and PRP 10. • Pest control folder up to date and recommendations actioned.	Trained operator	Before and after every batch minced	• Better supervision, training, and/or retraining of staff. • Maintenance of premises and equipment. • Review pest controls. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Preventative maintenance record (Record 12) • Employee training record (Record 15).	Weekly verification by FBO.

Note: *If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

STEP 9: MODIFIED ATMOSPHERE PACKAGING (CP) The risk posed by the biological hazards at the MAP step was the reason for identifying this step as a CP								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Biological • Growth of bacteria in product due to poor modified atmosphere packaging (MAP) packing procedure/equipment failure.	**Staff training and compliance with:** • Burger production SOP with regard to MAP procedure to ensure that the product achieves the stated shelf-life on the MAP packed product.	• Gas mixture at required level in sealed pack after MAP packing completed (refer to the MAP packing equipment instructions). • Seals on pack intact after MAP packing.	• Ensure the machine is calibrated and used in accordance with manufacturer's instructions. • Visual – inspect packs under test to ensure that the seals on MAP packed product are intact. • Gently press on packs under test to ensure that seals are intact.	Trained operator	Three trays to be tested at the start, during and after MAP packing has been completed for every batch.	• Review compliance with the Burger production SOP. • Better supervision, training, and/or retraining of staff. • Product not achieving the required gas level mix will need to be repacked. • Adjust the MAP packing equipment/gas flow rates to ensure that the required gas level is achieved in the packs. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved.	**Section 4 – Records** • In-process traceability record (Record 7) • Employee training record (Record 15).	Weekly verification by FBO.
Chemical Chemical taint • Use of incorrect gas mix and taint from MAP packaging.	**Staff training and compliance with:** • Burger production SOP with regard to MAP procedure. • PRP 13 Purchasing – correct gas and food-grade packaging.	No chemical contamination of product.	• Visual inspection of gas cylinders and packaging prior to commencing MAP packing. Ensure that the correct gas mix is being used prior to commencing MAP packing.	Trained operator	Every batch MAP packed.	• Better supervision, training, and/or retraining of staff. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved. • Review suppliers.	**Section 4 – Records** • In-process traceability record (Record 7) • Employee training record (Record 15).	Weekly verification by FBO.

Note: Foods which have their shelf-life extended by means of packaging gases must be labelled "packaged in a protective atmosphere".

STEP 9: MODIFIED ATMOSPHERE PACKAGING (CP)								
(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Limit/Target	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Physical **Physical contamination from:** • Premises • Equipment (for example, condition of MAP packing equipment) • People (for example, hair, jewellery).	**Staff training and compliance with:** • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Maintenance of MAP packing equipment. Ensure that filters are in place on the gas line from gas cylinders to MAP packing equipment. • Visual inspection of building and equipment to ensure that they are fit for purpose, as outlined in PRP 1 Premises and structure. • Ensure that staff are adhering to PRP 7 Cleaning and PRP 10 Personal hygiene.	Trained operator	Every batch MAP packed	• Better supervision, training, and/or retraining of staff. • Dispose of product that may have been contaminated. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2).	Weekly verification by FBO.
Allergen **Allergen cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils • Inadequate zoning. • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Ongoing verification by the FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

Standard operating procedure for burger production

Introduction

The burgers covered by this process flow are produced by combining minced meat with other ingredients (for example dried vegetables, seasoning and cereal). They are a non ready-to-eat product that needs to be cooked before consumption. Under food legislation burgers (minced meat with added seasoning/cereal/vegetables) come under the definition of 'meat preparations' – see glossary. Immediately after production, meat preparations must be wrapped/packaged and be chilled to an internal temperature of not more than 4 °C, or frozen to an internal temperature of not more than -18 °C. These temperature conditions must be maintained during storage and transport.

Different species of meat, including beef, pork, poultry and turkey, can be minced for burger production. Other ingredients like seasonings, cereals and vegetables are added to the burgers depending on the recipe.

Note: Burger patties that are made purely from minced meat (boned meat that has been minced into fragments and contains less than 1 % salt) are not meat preparations. They would come under the definition of 'minced meat' in Regulation (EC) 853/2004 so the relevant process in this guide for these is Process 2 Minced meat production.

Intended use

The burgers covered by this process flow are intended to be cooked thoroughly before eating.

Burger production process

The following burger production steps are outlined in more detail below:

- Mincing CP – First mince/Second mince
- Burger former

Mincing of meat for burger production – This is a control point CP

- Before the mincing of meat for burger production, the label on the raw material should be checked. The supplier (slaughterhouse/cutting plant) approval number must be recorded on the In-process traceability record (Record 7), with the batch number of the meat and its use-by date.
- The raw materials to be minced are taken from the goods inwards chill. Minced meat raw materials should be weighed according to the recipe specifications.

First mince

- The raw materials to be minced are debagged and fed through a stainless steel plate (typically 5 mm in size)
- Dry ingredients may be added at this step.

Second mince

- A smaller plate is used for the second mince of the same product. This is at the discretion of the FBO. It depends on customer requirements, as to whether a second mince is carried out.
- Dry ingredients may be added at this step.
- The mixture is collected in a lined crate or stainless steel tote bin.
- The mixture may be weighed again to ensure that the weight is in accordance with the recipe specifications.

Forming

- After mincing, the burger meat is placed in a burger former, or formed using a handheld former. The burgers are formed to the required shape and size. Burgers may also be made by hand if required.
- A unique batch number is assigned to the finished product.

Production of burgers

- Meat used in the production of burgers must be fully traceable to the animal or group of animals from which that meat has been obtained.
- All ingredients must be prepared and used according to manufacturer's specifications.
- The raw materials must not have passed their use-by date and will not have passed their use-by date before the end of the shelf-life applied to the burgers.
- Only certain food additives are authorised for use in burgers according to Part E of Annex II to Regulation (EC) 1333/2008. Food additives can only be added to burger meat with a minimum vegetable and/or cereal content of 4% mixed within the meat. All food additives must have written assurances concerning their purity and safety and include directions for use – this must be provided by the manufacturer or supplier.
- Allergens listed on the label of ingredients (for example, seasoning mix) must be recorded - update the 'Finished product allergen list' (Record 16) to ensure it lists all the products allergens. The labelling of the sausages must list all allergens added as ingredients.
- When burgers are prepared from frozen meat, the FBO must ensure that the meat:
  - ☑ Is defrosted in a chill
  - ☑ Has sufficient shelf-life remaining to support the shelf-life being applied to the burgers.
- The In-process traceability record (Section 4 - Record 7) must be completed for each batch of burgers produced.
- Regulation (EC) 2073/2005 sets out sampling requirements for meat preparations like burgers. More information on these requirements can be found in PRP 16 Labelling and product information.
- Shelf-life considerations and sampling procedures are outlined in PRP 16 Labelling and product information.

Hygiene and temperature requirements

Cleaning

- All equipment that comes into contact with the product must be cleaned and disinfected frequently, and at least once a day if it has been used that day.
- On each occasion when the mincer/pattie formers are about to be cleaned, all serviceable parts of the mincer/pattie former, including plates and auger, must be disassembled for cleaning, disinfection and inspection.
- Cleaning and disinfection must take place between each batch produced, and if processing meat from different species.
- All equipment must be in good repair and checked for any visible rust or damage (for example, missing pieces of metal).
- All the surfaces that the meat will come into contact with must be easy to clean and disinfect.

For more information, see PRP 7 Cleaning and PRP 9 Maintenance.

Temperature maintenance

- The core temperature of meat prior to processing should be less than 4 °C to ensure that the meat does not reach excessive temperatures during the mincing process.
- During cutting, boning, trimming, slicing, dicing, wrapping and packaging, meat must be maintained at a temperature of not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats. Refrigeration of production rooms should not exceed a maximum of 12 °C. However, in small-scale, low-throughput establishments, an equivalent temperature effect may be achieved through the use of suitable work practices, but only when authorised by the inspector (Competent Authority). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement. The Competent Authority must authorise the flexibility before the FBO can implement it. It should be recognised that without active room cooling, relying on work practices alone may not be adequate in warm weather conditions. In these cases, small batches of product can be worked on in rooms with/without refrigeration, provided that the FBO can demonstrate that the product remains within the required temperature range (not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats).

  Immediately after production meat preparations (for example burgers) must be chilled to no more than 4 °C.
- The FBO must control the increase in temperature that arises during mincing so as to ensure that the temperature of the burger mix does not rise higher than these temperatures.
- The raw materials should be brought from refrigerated storage to the mincing machine in small quantities, as needed.
- Work-in-progress (WIP) or product carry-over should be avoided or minimised if possible. If WIP or product carry-over is generated at the end of a working day, it must be stored at the required temperature and the required traceability information for such material should be retained with the product at all times. If a WIP chill is not available and product has been placed in a different chill, such as an intake chill or finished product chill, it must be clearly labelled as WIP to ensure that it is clearly distinguishable from other product (for example, other incoming raw materials) that are being stored in the chill. The product should be covered, with the appropriate traceability information clearly displayed.
- The burgers must be wrapped or packaged immediately after production.
- They must then be immediately chilled down and stored at a temperature of 4 °C or less, or frozen to not more than -18 °C.

For more information on storage and temperature control requirements, see PRP 3 Product storage, distribution and transport.

Packaging

- Only use food-grade materials for wrapping and packing. Where a Declaration of Compliance is relevant for wrapping/packaging material that comes into contact with food, it must be retained. The wrapping/packaging and the food become one food product and the traceability requirements apply to it as a whole.
- Wrapping and packaging materials must be stored hygienically so that they do not contaminate food.
- Food packaging must be fully traceable back to suppliers. For more information, see PRP 4 Product recall and traceability.

Modified atmosphere packaging (MAP) – This is a control point CP

Modified atmosphere packaging (MAP) involves modifying the internal composition of the pack to slow the growth of microorganisms. This helps to prolong the shelf-life of meat, meat products and meat preparations. If done correctly, it maintains the appearance, taste, and texture of the product for optimum presentation and longevity. For more information, see FSAI **Guidance Note 18: Validation of Product Shelf-Life** at www.fsai.ie.

All film used for MAP should have an anti-fog top web. This helps to reduce moisture build-up on the inside of the film once sealed in conjunction with the product being stored at the correct chilled temperature after sealing. MAP products should be checked after sealing to ensure that the MAP packing step is effective. The following checks should be performed at start-up, during and after each production of MAP packed products. It is recommended that three packs at a time be tested for the following:

- **Checks on seal integrity**

  Checks on seal integrity can be done by visual inspection and also by pressing on the packs. If the seal appears to be intact after visual inspection followed by gently pressing on the pack, the seal is deemed to be satisfactory.

- **Changes to gas mixtures**

  If an FBO changes the concentration of any gas in their MAP packaging, for example, carbon dioxide then this is a new product, and the shelf-life must be revalidated.
- **Gas analysis**
  - Prior to commencing gas flushing, check the levels of gas (gases used must be food grade) in each tank by examining the display to ensure that there is sufficient gas in the tanks to complete the task at hand.
  - Ensure that the gas tanks are set at the required flow rate.
  - It is recommended that the FBO seeks advice from the gas/MAP packing machine supplier in relation to the required settings needed to achieve target levels of gas in the finished MAP packed products.
  - If using a gas analyser, it is recommended the FBO purchase from a reputable supplier and after MAP packing takes place, packs are tested to ensure they have the required level of gas.

Different types of packaging can be used for MAP packing

- **Thermoformed packs:** a pouch is formed from the base web. The product is placed in the pack, gas is added and the pack is sealed with a top web.
- **Trays:** the product is placed in the tray, gas is added and the pack is sealed with a top web.

  It is essential that the FBO follows the gas/MAP packing equipment supplier's recommendations on the correct gas mix to be used for the product being packed.

Make sure you use the correct gas mix for the product being MAP packed.

Metal detection – This is a control point CP

Ideally, all product is passed through a metal detector prior to dispatch. If a metal detector is not available, pre-production checks on equipment and all other items made from metal are sufficient. For more information, see the Metal control/metal detection SOP.

Labelling

Finished product must be labelled correctly - make sure the labels used are accurate and in line with requirements:

- ☑ Name of the food (for example, beef burgers).
- ☑ List of ingredients.
- ☑ Ensure the ingredients list includes all allergens contained in the burgers (for example, wheat, sulphites). All allergens must be emphasised through a typeset that clearly distinguishes it from the rest of the ingredients for example by means of font, style or background colour.
- ☑ Burgers that contain additives, must comply with the additive labelling requirements in the list of ingredients on prepacked food i.e.:
  - the listing of the functional class of the additive, immediately followed by
  - the specific name or E number of the additive(s) used

  Note: The additive name cannot be replaced by the E number if the additive is an allergen for example, sulphites.
- ☑ Meat content (for example, percentage of beef in a burger)
  - See FSAI's **Guidance Note 17: The Labelling of Meat and Meat as an Ingredient** for the legislative requirements for the labelling of meat when used as an ingredient.
- ☑ Net quantity.
- ☑ Use-by date (for fresh burgers) / best-before date for (frozen burgers).
- ☑ Storage conditions are provided.
- ☑ FBO name and address.
- ☑ Country of origin where its absence may mislead.
- ☑ The consumer must be informed that they need to thoroughly cook the burger prior to consumption.
- ☑ Nutrition declaration (see PRP 16 for more information when this is required).
- ☑ Identification mark.
- ☑ The traceability information is correct.
- ☑ The label is clear and legible.

PRP 16 Labelling and product information provides information on food labelling requirements.

Order picking, packing and delivery to customers

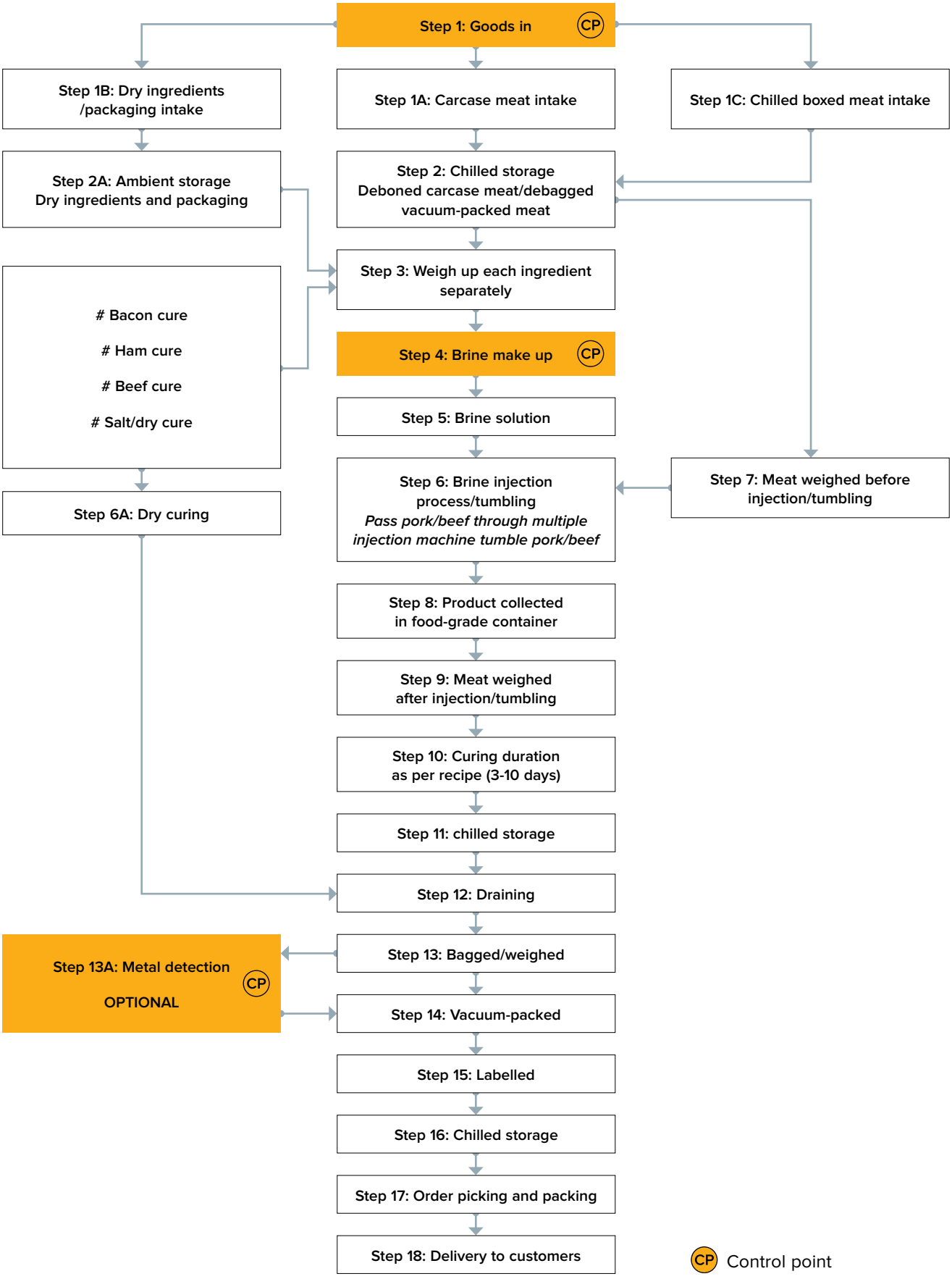
Once an order is received from a customer, the items are picked, packed, and dispatched in line with the relevant temperature requirements – See PRP 3 Product storage, distribution and transport.

Records (see Section 4)

- Glass, brittle and hard plastic record (Record 1)
- Pre-production, metal control and knife register record (Record 2)
- Chilled/frozen temperature record (Record 3)
- Goods inwards record (Record 4)
- Supplier list (Record 5)
- In-process traceability record (Record 7)
- Cleaning record (Record 10)
- Preventative maintenance record (Record 12)
- Employee training record (Record 15)
- Raw materials and finished product allergen assessment record (Record 16).

5
Cured raw meat production

5. Cured raw meat production



In the event that the product needs to be reworked, follow **PRP 14 Rework**.

Hazard control plan – cured raw meat production

A hazard analysis was conducted on all steps involved in cured raw meat production. The hazard analysis determined that there are three control points (CPs) and no critical control points (CCPs) in the cured raw meat production process. The three CPs identified are:

1. Goods in (step 1)
2. Brine make up (step 4)
3. Metal detection (step 13A).

The hazard control plan for **Step 4: Brine make up** is outlined in the table below.
The **Goods in & Metal detection steps** are CPs common to all processes, therefore the hazard control plan for these is outlined towards the end of Section 3.
The hazards associated with the other cured raw meat production steps are fully controlled by the PRPs. See **Appendix A – Hazard analysis (all other process steps)**.

STEP 4: BRINE MAKE UP (CP) **The risk posed by the chemical hazards (nitrate/nitrite) at the brine make up step was the reason for identifying this step as a CP**								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Chemical **Chemical contamination** • Excessive levels of nitrate and nitrite in finished cured product due to incorrect curing practices (for example, failure to follow brine recipe, or incorrect usage rates / curing times or double curing). • Incorrect use of cleaning chemicals. • Using non-food-grade cleaning chemicals. • Using non-food-grade equipment.	**Staff training and compliance with:** • Cured raw meat production SOP • PRP 7 Cleaning • PRP 13 Purchasing.	• Maximum levels for the sodium and potassium salts of nitrate and nitrite (see ** *for an explanation of the maximum levels*).	• Ensure the brine recipe is followed by checking the recipe during brine preparation for every batch. It is also important to take into account the level of nitrate (nitrite) in the water used as this can also contribute to the nitrate (nitrite) levels in the final product. • Visual inspection of equipment prior to using for brine make up. • Ensure that staff are adhering to PRP 7 Cleaning. • Ensure purchase of food-grade cleaning chemicals/ equipment.	Trained operator	Every batch	• Dispose of brine not meeting brine make up recipe requirements. • Review compliance with Cured raw meat production SOP. • Review the brine make up method. • Better supervision, training, and/or retraining of staff.	**Section 4 – Records** • Cleaning record (Record 10) • In-process traceability record (Record 7) • Sampling plan (see PRP 16 Labelling and product information (sampling, shelf-life, and food additives) • Employee training record (Record 15).	• Weekly verification by FBO • Periodic testing of finished product for nitrates/ nitrites as well as the water used in their production.

**Maximum levels for the sodium and potassium salts of nitrate and nitrite are currently set in relevant finished cured product, (for example, non-heat-treated meat products as "added or ingoing" amounts). These additives are commonly used in curing mixtures to develop and fix the colour of meat, to inhibit microbial growth or to develop characteristic flavours of the meat. By way of exception, maximum residual levels are laid down for certain traditionally manufactured meat products (for example, Wiltshire cured bacon / ham and dry cured bacon / ham) for which it is not possible to control the ingoing amount of curing salts absorbed by the meat due to the nature of the manufacturing process associated with these products. These products are known as derogated products (for example, traditional immersion cured meat products and traditional dry cured products) and the maximum residual levels applicable are stipulated in food category 8.3.4 and its sub-categories under Part E of Annex II to Regulation (EC) 1333/2008. For a product to be considered as a derogated product it must meet the criteria outlined in the footnotes associated with such products otherwise the general ingoing amounts specified in food categories 8.2, 8.3.1 and 8.3.2 apply.

STEP 4: BRINE MAKE UP (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Biological **Additional bacterial contamination** • Poor personal hygiene. • Unclean equipment/ utensils • Use of non-potable water when preparing brine solution.	**Staff training and compliance with:** • Cured raw meat production SOP • PRP 10 Personal hygiene • PRP 7 Cleaning • PRP 8 Utilities and services.	• High standards of personal hygiene and equipment /utensil hygiene. • Potable water always used.	• Visual check that staff are adhering to: – Cured raw meat production SOP – PRP 7 – PRP 10 • Check that water used in brine is potable.	Trained operator	Every batch	• Review compliance with the Cured raw meat production SOP. • Better supervision, training, and/or retraining of staff. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • In-process traceability record (Record 7) • Employee training record (Record 15).	• Weekly Verification by FBO. • Water sampling to check it meets potable water requirements.
Physical **Physical contamination of food from:** • Premises • Equipment • Pests • People (for example, hair, jewellery).	**Staff training and compliance with:** • Cured raw meat production SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 7 Cleaning • PRP 5 Pest control • PRP 10 Personal hygiene.	No physical contamination of product.	• Visual inspection of premises/equipment to ensure they are fit for purpose, as outlined in PRP 1 and PRP 9. • Ensure staff are adhering to PRP 7 and PRP 10 • Pest control folder up to date and recommendations actioned.	Trained operator	Every batch	• Better supervision, training, and/or retraining of staff. • Maintenance of premises and equipment. • Review pest controls. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen **Allergen cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils • Inadequate zoning • People (for example, not washing hands/ changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/ utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Ongoing verification by the FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

Standard operating procedure for cured raw meat production

Introduction

Bacon and ham are produced from the treatment of pork with curing salt, which is added as a brine or by rubbing in dry curing salt. Beef is also cured, but less commonly so. The beef cuts principally cured are brisket, silverside and topside. There are specific cures for producing bacon, ham and cured beef.

In Ireland cured bacon, ham and beef are considered to be 'meat products' (see glossary for definition). They are non ready-to-eat and therefore need to be cooked before consumption.

Intended use

The cured raw meat products covered by this process flow are intended to be cooked thoroughly before eating.

Production of bacon, ham and cured beef

Different production methods are used to produce cured meat (bacon, ham, and cured beef). These are:

1. **Wet curing (pickling)** involves injecting meat with chilled curing brine followed by immersing the meat in a chilled curing brine, (I) with or (II) without mechanical assistance.
   I. The meat cuts are packed in tanks and chilled brine is added until they are covered completely. For equal penetration of the meat, the meat is cured in chilled conditions for periods ranging from several days to 2 weeks depending on the size of the cuts.
   II. Alternatively, under chilled temperatures, the meat cuts are tumbled in a tumbler under vacuum or are massaged in a massager, which accelerates the penetration of the curing salts into the meat.

1a. Curing may take place in bags instead of undergoing an immersion stage. Here, boneless pieces of meat are injected with chilled brine, drained for a short period, placed in vacuum-packed bags, and stored under chilled conditions for a minimum of 2 days for equilibration and cured colour development.

2. **Dry curing** involves rubbing the dry curing ingredients into the surface of exposed lean tissue. This is vacuum-packed and stored under chilled conditions for 10–14 days, after which time it is ready to slice.

Controls on nitrate and nitrite in cured meat products are based on the in-going amount of the additives unless there is a specific derogation contained in the legislation for a particular product which permits levels to be based on residual amounts in the product (for example, Wiltshire cured bacon and ham).

Meat products which are injection cured only or injection cured followed by a short period of immersion curing (i.e. less than three days) must comply with the general relevant provisions for nitrites/nitrates outlined under food categories 8.3.1 "non-heat treated meat products" or 8.3.2 "heat treated meat products".

Products for which derogations exist are listed in italics in the legislation and these are produced by 'traditional' curing processes and fall in under food category 8.3.4 and its sub-categories. In such products, the maximum limits for both nitrates and nitrites generally relate to the maximum residual levels permitted in the finished product at the end of the production process. Typically, the product is cured by injection with curing solution followed by immersion in brine, or by immersion only, for three days or more. Starter cultures are also used in the case of Wiltshire cured bacon and hams. Typically, higher maximum levels for nitrates and nitrites are permitted for use in the traditionally cured meat products. However, to avail of such higher maximum levels the products concerned must comply with the description in the general heading of the food category 8.3.4.1 for traditional immersion cured meat products, i.e. would need to be immersed in a curing solution containing nitrites and/or nitrates, salt and other components as well as adhering to the manufacturing process outlined for the particular product which is provided for in the Restrictions/ Exceptions column (last column) to the legislation. So, for example for Wiltshire bacon and similar products falling in under food category 8.3.4.1 this would mean that the "meat is injected with curing solution followed by immersion curing for 3 to 10 days. The immersion brine solution also includes microbiological starter cultures.

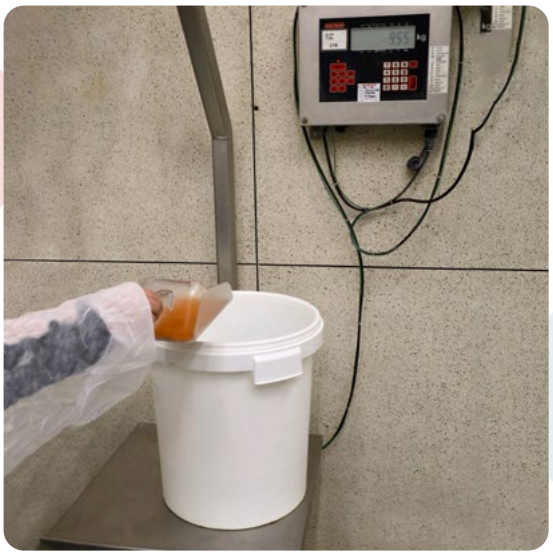
Relevant considerations regardless of curing method:

- The manufacturer's instructions for making up the brine mix must be followed when mixing ingredients, with particular attention paid to nitrites/nitrates concentration.
- The use of sodium and potassium nitrates and nitrites in cured meat products must comply with the provisions set out in Regulation (EC) 1333/2008 on food additives.
- Consideration should be given to the amount of nitrate present in the water used in the makeup of the brine as if the brine mix contains the maximum permitted level for nitrate then any additional nitrate added via other ingredients such as water may result in exceedance of the maximum level.
- The level of nitrate or nitrite in the product must not exceed the maximum permitted levels, but it must be high enough to prevent the growth of *Clostridium botulinum* and other microorganisms. For more information on the requirements in relation to the use of nitrate or nitrite in food, please read the FAQs and Guidance Document for Nitrate/Nitrite Sampling of Meat Products on www.fsai.ie.
- The meat used in the production of cured meats must be fully traceable to the animal or animals used in production by maintaining a comprehensive in-process traceability record (Section 4 – Record 7). For more information, see PRP 4 Product recall and traceability.
- An In-process traceability record (Section 4 – Record 7) is used to record each batch of cured raw meat produced.
- Water used in the brine makeup must be potable (drinking quality). For more information, see PRP 8 Utilities and services.
- It is good practice to chill the water used in brine overnight in a chill.
- Shelf-life considerations and sampling procedures are outlined in PRP 16 Labelling and product information.

Process

Brine make up – This is a control point CP

- Different brine recipes are used when producing different products such as bacon, ham or cured beef. Curing brines can be injected into the meat, absorbed during immersion curing or, alternatively, they can be used in a tumbler. A cover brine can also be made; this is used to cover the meat after injection or tumbling. A cover brine is used after the cured meat is collected in food-grade containers. The brine or cure recipe used, and its ratio to cured meat must ensure that nitrite and nitrate levels do not exceed legal requirements. For more information on the requirements in relation to the use of nitrate or nitrite in food, please read information on nitrates and nitrites at www.fsai.ie. The product should be tested periodically to verify compliance with requirements.



- All brine ingredients are weighed using a calibrated weighing scales. Brines must be made up as per the 'cure' recipe relevant to the meat being cured and the approach to curing, including cut-size and immersion-time. The relevant cure recipe must always be accessible to staff. Staff involved in curing must be trained in the process and controls in place.
- The required amount of potable water is added into the food-grade tanks, along with the relevant dried cure ingredients, and mixed thoroughly. All brines must be made up as per the relevant cure recipe. In the event of an error being noted after weigh up, or if there is any doubt about the brine made, it must be discarded immediately and a new brine made. If the brine is not made properly and is subsequently used, it can result in poorly cured product that could potentially be unsafe and of poor quality.
- All details about the brine make up must be recorded on the In-process traceability record along with the batch number of the product being cured via injection, immersion and/or tumbling (See section 4 – Record 7.)

Injection of meat with cure

The following is some additional information on the injection process:

- Once the brine is made it is transferred in the tank to the injector, and the injection fitting from the injection machine is then placed into it. The product is now ready to be cured.
- Before injection/curing begins, the needles on the injector should be checked to ensure that they are in good condition and not damaged or broken. It is good practice to count them and record the check (Section 4 – Record 2). After deboning pork or beef, carcase meat or debagged vacuum-packed pork or beef cuts are passed by the injector and are then placed in a food-grade tank/container.
- Once the curing process is finished, the needles on the injector are counted again (Section 4 – Record 2) and the food-grade tank containing the cured pork or beef is then moved to a chill. Here, the stainless steel tank is filled with cover brine. The product typically remains in the tank for a number of days before being further processed/packed.
- Once the product is cured, it is then ready for further processing.

Tumbling

The following is some additional information on the tumbling process:

- Meat cuts can be tumbled in a tumbler under vacuum or can be massaged in a massager, which accelerates the penetration of curing salts into the meat.
- After deboning pork or beef, carcase meat or debagged vacuum-packed pork or beef cuts are weighed. The weight is taken to ensure that the required amount of brine is added, based on the recipe, thus ensuring the correct weight to volume ratio of the brine.
- Once the meat is weighed, it is then placed directly into the tumbler.
- Brine is then added into the tumbler in the required quantities; in other words, the brine added must constitute the required percentage of the total weight of the raw meat added to the tumbler.
- Once the correct amount of brine is added, the door on the tumbler is closed.
- The relevant programme is selected. Typically, tumbling will last for several hours.
- Once the programme is finished, the meat is emptied from the tumbler into a food-grade bin.
- It may then be covered with brine.
- Once the product is cured, it is ready for further processing.

Hygiene and temperature requirements

Cleaning

- All equipment that comes into contact with the product must be cleaned and disinfected frequently, and at least once a day if it has been used that day.
- Cleaning and disinfection must take place between each batch produced, and if processing meat from different species.
- All the surfaces that the product will come into contact with must be easy to clean and disinfect.
- Equipment must be in good repair and checked for any visible rust or damage (for example, missing pieces of metal).

For more information, see PRP 7 Cleaning.

Temperature maintenance

- The core temperature of all meat prior to processing should be less than 4 °C to ensure that the meat is as cold as possible prior to curing.
- During cutting, boning, trimming, slicing, dicing, wrapping and packaging, meat must be maintained at a temperature of not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats. Refrigeration of production rooms should not exceed a maximum of 12 °C. However, in small-scale, low-throughput establishments, an equivalent temperature effect may be achieved through the use of suitable work practices, but only when authorised by the inspector (Competent Authority). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement. The Competent Authority must authorise the flexibility before the FBO can implement it. It should be recognised that without active room cooling, relying on work practices alone may not be adequate in warm weather conditions. In these cases, small batches of product can be worked on in rooms with/without refrigeration, provided that the FBO can demonstrate that the product remains within the required temperature range (not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats).
- The cured products should be wrapped or packaged immediately after production.
- They should be immediately chilled down and stored at a temperature of 4 °C or less.
- Work-in-progress (WIP) or product carry-over should be avoided or minimised if possible. If WIP or product carry-over is generated at the end of a working day, it must be stored at the required temperature and the required traceability information for such material should be retained with the product at all times. If a WIP chill is not available and product has been placed in a different chill, such as an intake chill or finished product chill, it should be clearly labelled as WIP to ensure that it is clearly distinguishable from other product (for example, other incoming raw materials) that are being stored in the chill. The product should be covered, with the appropriate traceability information clearly displayed.

For more information on storage and temperature control requirements, see PRP 3 Product storage, distribution and transport.

Packaging

- Cured product is bagged, weighed, vacuum-packed and then labelled. Only use food-grade materials for wrapping and packing. Where a Declaration of Compliance is relevant for wrapping/packaging material that comes into contact with food, it must be retained. The wrapping/packaging and the food become one food product and the traceability requirements apply to it as a whole.
- Wrapping and packaging materials must be stored hygienically so that they do not contaminate food.
- Food packaging must be fully traceable back to suppliers. For more information, see PRP 4 Product recall and traceability.

Metal detection – This is a control point 

Ideally, all product is passed through a metal detector prior to dispatch. If a metal detector is not available, pre-production checks on equipment and all other items made from metal are sufficient. For more information, see the Metal control/metal detection SOP.

Labelling

Finished product must be labelled correctly - make sure the labels used are accurate and in line with requirements:

- ☑ Name of the food (for example, bacon, corned beef).
- ☑ List of ingredients.
- ☑ Products containing nitrites/nitrates (or any other additive) must comply with the additive labelling requirements in the list of ingredients on prepacked food i.e.:
  - The listing of the functional class of the additive, immediately followed by
  - The specific name or E number of the additive(s) used
    For example, Preservative (sodium nitrite) or Preservative (E250)
- ☑ Meat content. See FSAI's **Guidance Note 17: The labelling of Meat and Meat as an Ingredient**.
- ☑ Net quantity.
- ☑ Use-by date/best-before date.
- ☑ Storage conditions are provided.
- ☑ FBO name and address.
- ☑ Country of origin where its absence may mislead.
- ☑ The consumer should be informed that they need to thoroughly cook the product prior to consumption.
- ☑ Nutrition declaration (see PRP 16 for more information when this is required).
- ☑ Identification mark.
- ☑ The traceability information is correct.
- ☑ The label is clear and legible.

PRP 16 Labelling and product information provides information on food labelling requirements.

Order picking, packing and delivery to customers

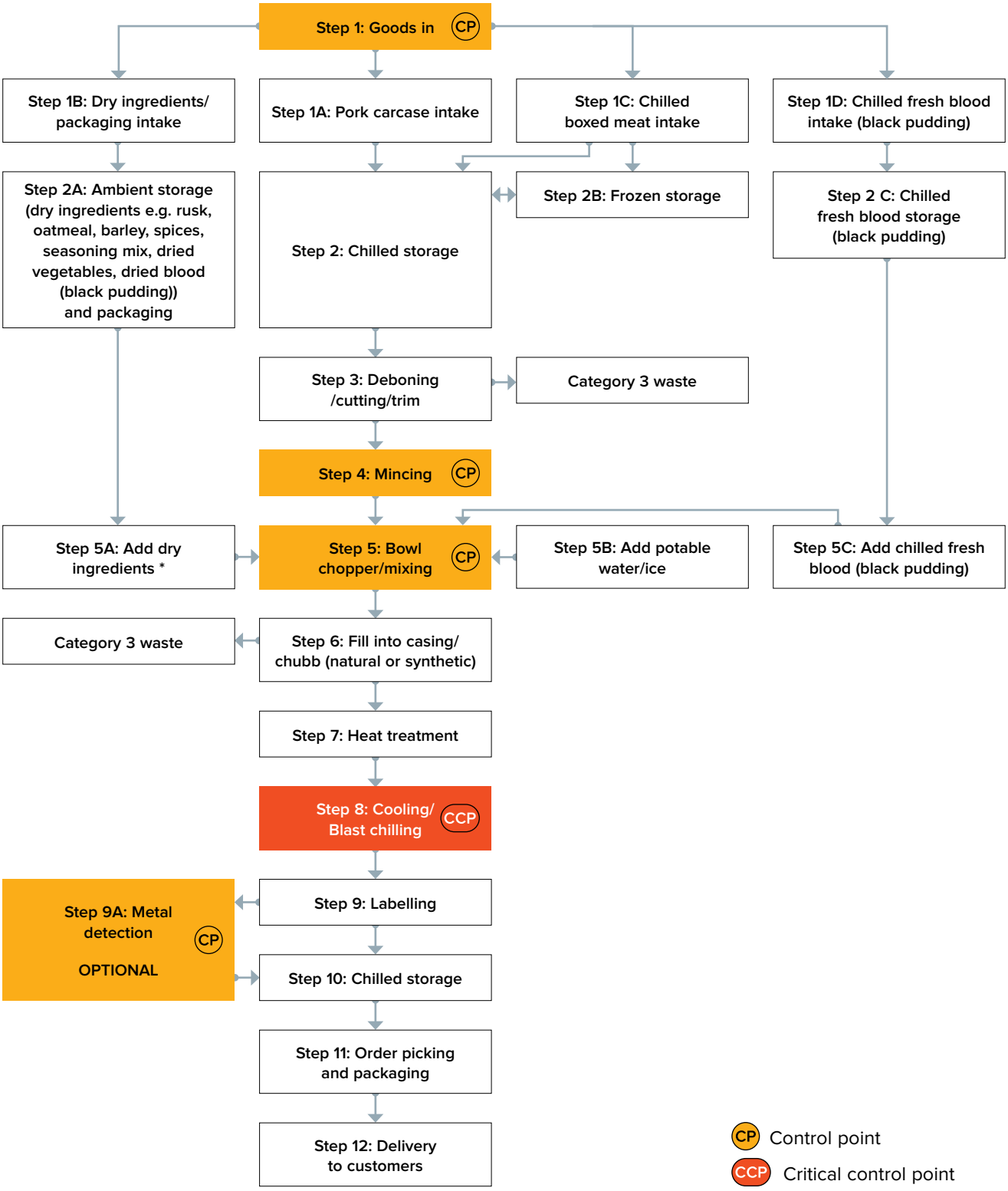
Once an order is received from a customer, the items are picked, packed, and dispatched in line with the relevant temperature requirements – See PRP 3 Product storage, distribution and transport.

Records (see Section 4)

- Glass, brittle and hard plastic record (Record 1)
- Pre-production, metal control and knife register record (Record 2)
- Chilled/frozen temperature record (Record 3)
- Goods inwards record (Record 4)
- Supplier list (Record 5)
- In-process traceability record (Record 7)
- Cleaning record (Record 10)
- Preventative maintenance record (Record 12)
- Employee training record (Record 15)
- Raw materials and finished product allergen assessment record (Record 16).

6 Pudding production

6. Pudding production



* Pearl barley may be heat treated prior to addition to bowl chopper, depending on recipe used.

In the event that the product needs to be reworked, follow **PRP 14 Rework**.

Hazard control plan – pudding production

A hazard analysis was conducted on all steps involved in pudding production. The hazard analysis determined that there is **one critical control point (CCP)** and **four control points (CPs)** in the pudding production process. The one **CCP** identified is **Cooling/Blast chilling (step 8)**. The four CPs identified are:

1. Goods in (step 1)
2. Mincing (step 4)
3. Bowl chopper/mixing (step 5)
4. Metal detection (step 9A).

The hazard control plan for **Step 4: Mincing** & **Step 5: Bowl chopper/mixing** are outlined in the table below.
The **Goods in & Metal detection steps** are CPs common to all processes, therefore the hazard control plan for these is outlined towards the end of Section 3.
The hazards associated with the other pudding production steps are fully controlled by the PRPs. See **Appendix A – Hazard analysis (all other process steps)**.

STEP 4: MINCING (MEAT FOR PUDDING PRODUCTION) (CP)
The risk posed by the biological hazards at the mincing step in pudding production was the reason for identifying this step as a CP

(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Limit/Target	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Biological **Bacterial growth** • Increase in product temperature during mincing. **Additional bacterial contamination** • Poor personal hygiene • Unclean equipment/ utensils.	**Staff training and compliance with:** • Pudding production SOP • PRP 3 Product storage, distribution and transport • PRP 10 Personal hygiene • PRP 7 Cleaning.	• Meat to be at 4 °C or less after mincing. • High standards of personal hygiene and equipment/utensil hygiene.	• Visual check that staff are adhering to: – Pudding production SOP – PRP 7 – PRP 10. • Use a temperature probe to measure the temperature of the mince after mincing (Sanitise the probe before and after use).	Trained operator	Every batch	• Review compliance with the Pudding production SOP. • Better supervision, training, and/or retraining of staff. • Chill mince until temperature of below 4 °C is achieved, if not used immediately. • Dispose of mince that may have been grossly contaminated.	**Section 4 – Records** • Cleaning record (Record 10). • In-process traceability record (Record 7) • Chilled/frozen temperature record (Record 3) • Employee training record (Record 15).	Weekly verification by FBO.
Chemical **Chemical contamination of food from:** • Incorrect use of cleaning chemicals • Using non-food-grade cleaning chemicals • Using non-food-grade equipment.	**Staff training and compliance with:** • Pudding production SOP • PRP 7 Cleaning • PRP 13 Purchasing.	No chemical contamination of product.	• Visual inspection of mincer/ equipment prior to mincing • Ensure that staff are adhering to PRP 7 Cleaning. • Ensure purchase of food-grade cleaning chemicals/ equipment.	Trained operator	Every batch minced	• Better supervision, training, and/or retraining of staff. • Review suppliers. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Supplier list (Record 5) • Employee training record (Record 15).	Weekly verification by FBO.

STEP 4: MINCING (MEAT FOR PUDDING PRODUCTION) (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Physical Physical contamination of food from • Premises • Equipment (for example, mincer blades) • Pests • People (for example, hair, jewellery).	**Staff training and compliance with:** • Pudding production SOP • Metal control/metal detection SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 5 Pest control • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Visual inspection of premises/equipment to ensure they are fit for purpose, as outlined in PRP 1 and PRP 9. • Ensure that staff are adhering to Metal control/ metal detection SOP. • Ensure that staff are adhering to PRP 7 and PRP 10. • Pest control folder up to date and recommendations actioned.	Trained operator	Before and after every batch minced	• Better supervision, training, and/or retraining of staff. • Maintenance of premises and equipment. • Review pest controls. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Preventative maintenance record (Record 12) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen Allergen cross-contamination from: • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Ongoing verification by the FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

STEP 5: BOWL CHOPPER/MIXING (CP)

This is the step where dry ingredient that could include allergens are added.

The risk posed by the biological hazards and allergen (declaration) at the bowl chopper/mixing step was the reason for identifying this step as a Control Point (CP)

(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Limit/Target	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Biological **Bacterial growth** • Increase in product temperature during bowl chopper/mixing step. **Additional bacterial contamination** • Poor personal hygiene • Unclean equipment/ utensils.	**Staff training and compliance with:** • Pudding production SOP • PRP 3 Product storage, distribution and transport • PRP 10 Personal hygiene • PRP 7 Cleaning.	• Product to be at 4 °C or less immediately after bowl chopper/ mixing. • High standards of personal hygiene and equipment/utensil hygiene.	• Visual check that staff are adhering to: – Pudding production SOP – PRP 7 – PRP 10. • Use a temperature probe to measure the temperature of the mixture after bowl chopper/mixing (Sanitise the probe before and after use).	Trained operator	Every batch	• Review compliance with the Pudding Production SOP. • Better supervision, training, and/or retraining of staff. • Chill mixture until temperature of below 4 °C is achieved, if not used immediately. • Dispose of mixture that may have been grossly contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • In-process traceability record (Record 7) • Chilled/frozen temperature record (Record 3) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen **Ingredient in the pudding** • Allergen declaration (ingredients list) does not include all the allergens intentionally added as ingredients to the product.	**Staff training and compliance with:** • Recipe check against label (PRP 16) • PRP 16 Labelling and product information.	All allergens intentionally added to the product are included in the ingredients list.	• Check ingredients used in recipe against the product specification and allergen declaration (label) to make sure that allergen information provided is accurate. • Ensure adherence to allergen labelling requirements in PRP 16.	Trained operator	Every batch	• Update the Raw materials and finished product allergen assessment record (Record 16) to ensure it lists all the products allergens. • Ensure the allergen declaration (ingredients list) lists all allergens in the product so customer has accurate information on allergens.	• Pudding label **Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Employee training record (Record 15).	Ongoing verification by FBO.
Allergen **Cross-contamination** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils that have been used for allergens • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Ongoing verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

STEP 5: BOWL CHOPPER/MIXING (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Chemical **Chemical contamination of food from:** • Incorrect use of food additives • Incorrect use of cleaning chemicals • Using non-food-grade cleaning chemicals • Using non-food-grade equipment.	**Staff training and compliance with:** • Pudding production SOP • PRP 7 Cleaning • PRP 13 Purchasing • PRP 16 Labelling and product information (sampling, shelf-life, and food additives).	No chemical contamination of product.	• Follow instructions for use of food additives. • Visual inspection of bowl chopper/mixer prior to mixing. • Ensure that staff are adhering to PRP 7 Cleaning. • Ensure purchase of food-grade cleaning chemicals/ equipment.	Trained operator	Every batch	• Better supervision, training, and/or retraining of staff. • Dispose of product that may have been contaminated. • Review suppliers.	**Section 4 – Records** • Cleaning record (Record 10) • Supplier list (Record 5) • In-process traceability record (Record 7) • Employee training record (Record 15).	Weekly verification by FBO.
Physical **Physical contamination of food from:** • Premises • Equipment (for example, bowl chopper blades) • Pests • People (for example, hair, jewellery).	**Staff training and compliance with:** • Pudding production SOP • Metal control/metal detection SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 5 Pest control • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Visual inspection of premises/equipment to ensure that they are fit for purpose, as outlined in PRP 1 and PRP 9. • Ensure that staff are adhering to Metal control/ metal detection SOP. • Ensure that staff are adhering to PRP 7 and PRP 10. • Pest control folder up to date and recommendations actioned.	Trained operator	Every batch	• Better supervision, training, and/or retraining of staff. • Maintenance of premises and equipment. • Review pest controls. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Preventative maintenance record (Record 12) • Employee training record (Record 15).	Weekly verification by FBO.

STEP 8: COOLING/BLAST CHILLING (CRITICAL CONTROL POINT) The risk posed by the biological hazards at the cooling step was the reason for identifying this step as a CCP								
(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Critical limit	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Biological **Growth of pathogens** • The growth of bacterial spores due to product not brought to a cold enough temperature sufficiently quickly. **Additional bacterial contamination** • Poor personal hygiene • Unclean equipment/ utensils.	**Staff training and compliance with:** • Pudding production SOP • PRP 3 Product storage, distribution and transport • PRP 10 Personal hygiene • PRP 7 Cleaning.	• ≤5 °C (at the core) within 270 minutes (4.5 hours) for heat-processed foods • High standards of personal hygiene and equipment /utensil hygiene.	• Use a calibrated temperature probe to measure the core temperature of the product in the warm spot in accordance with the Pudding production SOP (Sanitise the probe before and after use.) • Visual check that staff are adhering to: – Pudding production SOP – PRP 7 – PRP 10.	Trained operator	Every batch cooled/ blast chilled.	• Corrective action to be taken based on risk assessment: The action taken should be proportional to the risk. Based on risk assessment, there are three possible methods of dealing with non-conforming product: 1. Accept the non-conforming product following further inspection and testing 2. Rework the non-conforming product to meet specified requirements 3. Dispose of the non-conforming product. • Discuss with your inspector. • Review the cooling procedure including chill loading. • Better supervision, training, and/or retraining of staff. • Dispose of product that may have been grossly contaminated.	**Section 4 – Records** • Cooking and cooling record (Record 17) • Chilled/frozen temperature record (Record 3) • In-process traceability record (Record 7) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.
Chemical **Chemical contamination of food from:** • Incorrect use of cleaning chemicals • Using non-food-grade cleaning chemicals • Using non-food-grade equipment.	**Staff training and compliance with:** • Pudding production SOP • PRP 7 Cleaning • PRP 13 Purchasing.	No chemical contamination of product.	• Visual inspection of equipment prior to cooling/ blast chilling. • Ensure that staff are adhering to PRP 7 Cleaning. • Ensure purchase of food-grade cleaning chemicals/ equipment.	Trained operator	Every batch cooled/ blast chilled.	• Better supervision, training, and/or retraining of staff. • Review suppliers. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Supplier list (Record 5) • Employee training record (Record 15).	Weekly verification by FBO.

STEP 8: COOLING/BLAST CHILLING (CCP)								
(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Critical limit	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Physical Physical contamination of food from: • Premises • Equipment • Pests • People (for example, hair, jewellery).	**Staff training and compliance with:** • Pudding production SOP • Metal control/metal detection SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 5 Pest control • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Visual inspection of premises/equipment to ensure they are fit for purpose, as outlined in PRP 1 and PRP 9. • Ensure that staff are adhering to PRP 7 and PRP 10. • Pest control folder up to date and recommendations actioned.	Trained operator	Every batch cooled/ blast chilled.	• Better supervision, training, and/or retraining of staff. • Maintenance of premises and equipment. • Dispose of product that may have been contaminated. • Review pest control contractor.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Preventative maintenance record (Record 12) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen **Allergen cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 2 Layout and zoning • PRP 7 Cleaning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch cooled/ blast chilled.	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Ongoing verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

Standard operating procedure for pudding production

Introduction

Under food legislation black and white pudding come under the definition of 'meat products' – see glossary. In Ireland, pudding is a non ready-to-eat product that needs to be cooked before consumption. Black and white pudding has been a traditional part of Irish and European cuisine for generations.

Black puddings (or blood sausages) are made by cooking blood with a filler until it thickens when cooled. Production may use either fresh liquid blood or freeze-dried blood powder, and in either case the blood needs to come from an establishment approved for such production and bear an Identification Mark. Food-grade dried blood, is now widely used because it is more convenient, easily handled and stored. Fresh blood requires more attention to food safety management to minimise microbial contamination and growth during its limited shelf-life. For more information, see the *Harvesting Blood for Making Black Pudding* factsheet on www.fsai.ie.

Intended use

The black and white pudding covered by this process flow are intended to be cooked thoroughly before eating.

Pudding production process

The following pudding production steps are outlined in more detail below:

- Mincing CP
- Bowl chopper/mixing CP
- Fill into the casing/chubb (natural or synthetic)
- Heat treatment
- Cooling/blast chilling CCP

Mincing of meat for pudding production – This is a control point CP

- Before mincing meat to produce puddings, the label on the raw material should be checked. The supplier (slaughterhouse/cutting plant) approval number should be recorded on the In-process traceability record, with the batch code of the meat and its use-by date (Section 4 – Record 7).
- Pork and beef raw materials (for example, pork jowl and beef fat) are taken from the raw materials chill. To produce a batch of pudding mix, pork and beef raw materials are weighed according to the recipe specifications. The pork and beef raw materials are debagged, placed in the mincer and fed through a stainless steel plate (typically 5 mm in size). The mince is collected in a lined crate or stainless steel tote bin. The product is then weighed again to ensure that the weight is in accordance with the recipe specifications.
- The mince is then transferred to a bowl chopper/mixing bowl.

Bowl chopper/mixing – This is a control point CP

- All minced raw materials are added to the bowl chopper/mixing bowl in batches according to the recipe specifications. All relevant dry ingredients are pre-weighed and added to the minced raw materials in the bowl chopper/mixing bowl as per the recipe.
- Water (or ice) is pre-weighed, and the required amounts are added to the pudding mix to control the temperature of the batch. The lid of the bowl chopper is pulled down and the relevant programme is selected. Mixing lasts for approximately 5 minutes.
- The temperature of the pudding mix is checked using a temperature probe.
- Product is removed from the bowl chopper and is manually placed in the filler.

Fill into the casing/chubb

- Pudding mix is transferred from the bowl chopper/mixing bowl and placed manually into the filler.
- Pudding casings (plastic casing or natural casing) are used and placed on the filling nozzle. Plastic casing is typically stored in the dry ingredients store. Natural casing is stored in the chill.
- When pudding is made from plastic casing, a clipping machine is used to clip the pudding. This involves putting a metal clip on either end of the pudding to seal it. The clipping machine places the clips on the pudding at the required distance. The filling machine can be adjusted to select the relevant pudding size.
- A unique batch number is assigned to the finished product.

Heat treatment

The puddings are then heated using the relevant heat treatment process selected by the FBO for the appropriate time/temperature duration. The pudding is heat treated for quality reasons. It will undergo a full cooking process prior to consumption.

Cooling/blast chilling – This is a critical control point CCP

- After heat treatment, the puddings must be cooled as quickly as possible.
- To prevent the risk of microbial growth following cooking, puddings must be cooled in accordance with recognised industry guidelines using a blast chiller or equivalent method (for example, cooling them in a water bath, showering them with water or using ambient temperature to cool them initially, followed by placing them in a chill. Table 11 provides the best practice for chilling heat-processed foods in FSAI **Guidance Note 20: Industrial Processing of Heat-Chill Foods**.

Table 11 Best practice for chilling heat-processed foods including pudding

Chilling stage	Requirement	Best practice
Commencement of chilling	Begin chilling as quickly as possible after completion of heat processing.	Recommend a period of ≤ 90 minutes after the completion of heat processing
Initial chilling process	Reduce the temperature of the food (at the geometric core/thickest point) from 55 °C to ≤ 10 °C as quickly as possible.	Recommend a period of not greater than 120 minutes after beginning the process of chilling from 55 °C to ≤ 10 °C
Final chilling process	Continue chilling as quickly as possible from 10 °C to ≤ 5 °C	Recommend a period of not greater than 60 minutes from 10 °C to ≤ 3 °C
Final storage	Following completion of chilling, the food should be immediately placed in controlled refrigerated storage which ensures a final product temperature (at its geometric core/thickest point) of ≤ 5 °C throughout the chill chain.	Recommended temperature of ≤ 3 °C throughout the chill chain

- All temperatures refer to readings taken at the core of the product.
- Cooling process temperature records are required (Section 4 – Record 17) to demonstrate that each batch of puddings has reached the required core temperature in the required period of time.
- By the end of the chilling process, puddings should have reached a core temperature of 5 °C or less (FSAI Guidance Note 20 recommends 3 °C or less).
- Following chilling, the product should be immediately placed in controlled refrigerated storage which ensures a final product temperature (at its core) of 5 °C or less (FSAI Guidance Note 20 recommends 3 °C or less) throughout the chill chain.
- If cooling is too slow, heat-resistant spores may germinate and grow. Some of these can produce heat-resistant toxins (for example, *Bacillus cereus*) that would survive subsequent cooking.

Production of puddings

- Meat used in the production of puddings must be fully traceable to the animal or group of animals from which that meat has been obtained.
- All ingredients must be prepared and used according to manufacturer's specifications.
- The raw materials must not have passed their use-by-date.
- When puddings are prepared from thawed meat, the FBO should ensure that the meat:
  - ☑ Has been defrosted in a chill
  - ☑ Has sufficient shelf-life remaining to support the shelf-life being applied to the puddings.
- An In-process traceability record (Section 4 – Record 7) is used to record each batch of puddings produced.
- Shelf-life considerations and sampling procedures are outlined in PRP 16 Labelling and product information.

Hygiene and temperature requirements

Cleaning

- All equipment that comes into contact with the product must be cleaned and disinfected frequently, and at least once a day if it has been used that day.
- On each occasion when the mincer/bowl chopper/mixing bowl is about to be cleaned, all serviceable parts of the mincer/bowl chopper/mixing bowl, including plates, auger and blades, must be disassembled for cleaning, disinfection and inspection.
- Cleaning and disinfection must take place between production of each batch of puddings.
- All equipment must be in good repair and checked for any visible rust or damage (for example, missing pieces of metal).
- All surfaces that the product will come into contact with must be easy to clean and disinfect.

For more information, see PRP 7 Cleaning.

Temperature maintenance

- Fresh blood has a limited shelf-life and should be stored hygienically at 3 °C or less.
- The core temperature of meat prior to processing should be less than 4 °C to ensure that the pudding meat is as cold as possible prior to filling.
- During cutting, boning, trimming, slicing, dicing, wrapping and packaging, meat must be maintained at a temperature of not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats. Refrigeration of production rooms should not exceed a maximum of 12 °C. However, in small-scale, low-throughput establishments, an equivalent temperature effect may be achieved through the use of suitable work practices, but only when authorised by the inspector (Competent Authority). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement. The Competent Authority must authorise the flexibility before the FBO can implement it. It should be recognised that without active room cooling, relying on work practices alone may not be adequate in warm weather conditions. In these cases, small batches of product can be worked on in rooms with/without refrigeration, provided that the FBO can demonstrate that the product remains within the required temperature range (not more than 3 °C for offal, 4 °C for poultry and 7 °C for other meats).
- The FBO's heat treatment process temperatures should be achieved for the appropriate time/temperature duration and documented.
- Work-in-progress (WIP) or product carry-over should be avoided or minimised if possible. If WIP or product carry-over is generated at the end of a working day, it must be stored at the required temperature and the required traceability information for such material must be retained with the product at all times. If a WIP chill is not available and product has been placed in a different chill, such as an intake chill or finished product chill, it should be clearly labelled as WIP to ensure that it is clearly distinguishable from other product (for example incoming raw materials) that are being stored in the chill. The product should be covered, with the appropriate traceability information clearly displayed.
- The puddings should be wrapped or packaged immediately after production. Following chilling, the product should be immediately placed in controlled refrigerated storage which ensures a final product temperature (at its core) of 5 °C or less (FSAI Guidance Note 20 recommends 3 °C or less) throughout the chill chain.
- Dry ingredients must be stored in cool, dry, dark conditions.

For more information see PRP 3 Product storage, distribution and transport.

Packaging

- Only use food-grade materials for wrapping and packing. Where a Declaration of Compliance is relevant for wrapping/packaging material that comes into contact with food, it must be retained. The wrapping/packaging and the food become one food product and the traceability requirements apply to it as a whole.
- Wrapping and packaging materials must be stored hygienically so that they do not contaminate food.
- Food packaging must be fully traceable back to suppliers. For more information, see PRP 4 Product recall and traceability.

Metal detection – This is a control point CP

- Ideally, all product is passed through a metal detector prior to dispatch. If a metal detector is not available, pre-production checks on equipment and all other items made from metal are sufficient. For more information, see the Metal control/metal detection SOP.

Labelling

Finished product must be labelled correctly - make sure the labels used are accurate and in line with requirements:

- ☑ Name of the food (for example, black pudding, white pudding).
- ☑ List of ingredients.
- ☑ Ensure the ingredients list includes all allergens contained in the puddings (for example, oats, barley, wheat (flour)). All allergens must be emphasised through a typeset that clearly distinguishes it from the rest of the ingredients for example by means of font, style or background colour.
- ☑ Puddings that contain additives, must comply with the additive labelling requirements in the list of ingredients on prepacked food i.e.:
  - the listing of the functional class of the additive, immediately followed by
  - the specific name or E number of the additive(s) used
- ☑ Meat content. See FSAI's **Guidance Note 17: The labelling of Meat and Meat as an Ingredient** for the legislative requirements for the labelling of meat when used as an ingredient.
- ☑ Net quantity.
- ☑ Use-by date (for fresh puddings) – *best-before date for frozen puddings*.
- ☑ Storage conditions are provided.
- ☑ The consumer should be informed that they need to thoroughly cook the puddings prior to consumption.
- ☑ FBO name and address.
- ☑ Country of origin where its absence may mislead.
- ☑ Nutrition declaration (see PRP 16 for more information when this is required).
- ☑ Identification mark.
- ☑ The traceability information is correct.
- ☑ The label is clear and legible.

Additional information on labelling requirements is available in PRP 16 Labelling and product information.

Order picking, packing and delivery to customers

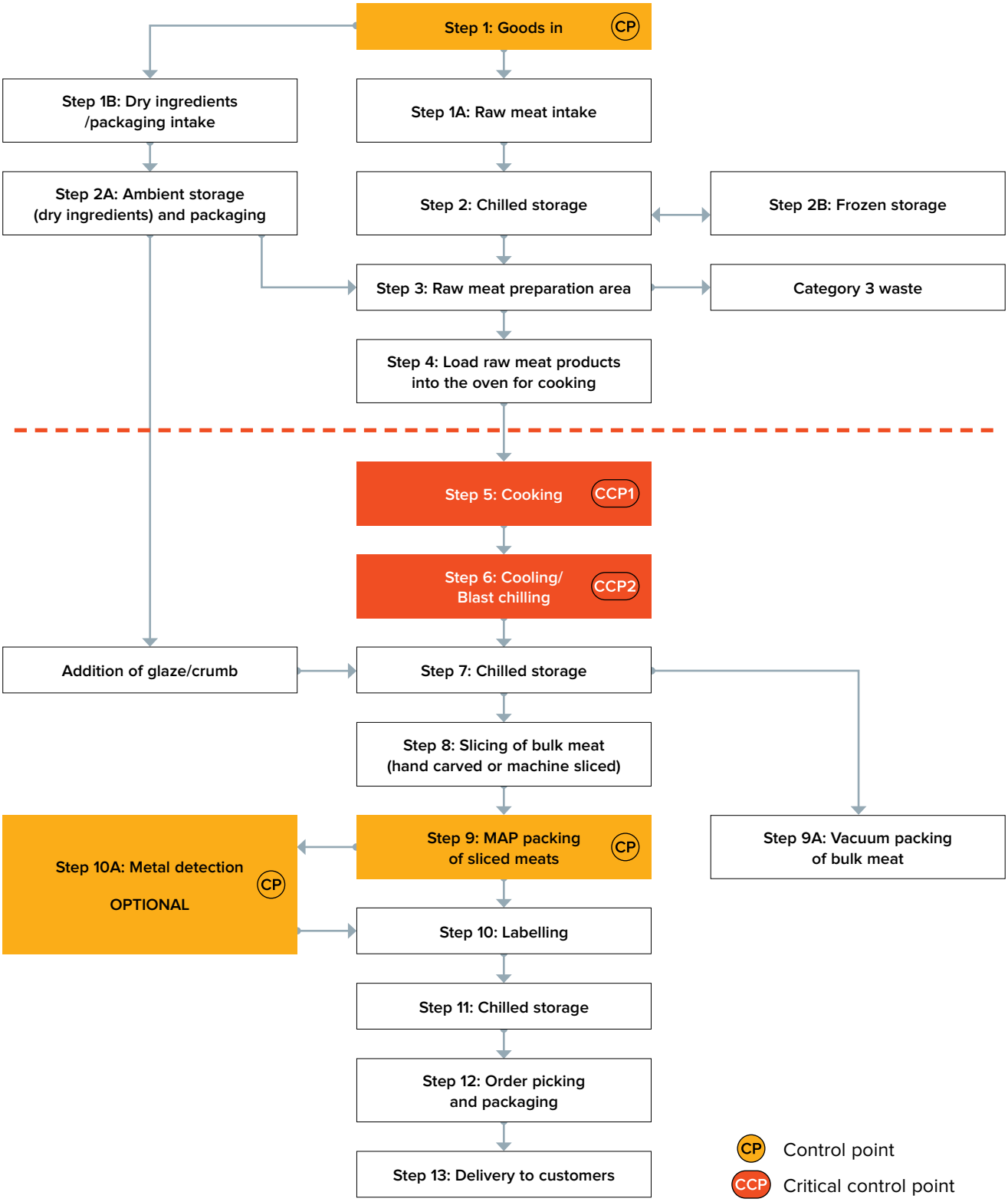
Once an order is received from a customer, the items are picked, packed, and dispatched in line with the relevant temperature requirements – See PRP 3 Product storage, distribution and transport.

Records (see Section 4)

- Glass, brittle and hard plastic record (Record 1)
- Pre-production, metal control and knife register record (Record 2)
- Chilled/frozen temperature record (Record 3)
- Goods inwards record (Record 4)
- Supplier list (Record 5)
- In-process traceability record (Record 7)
- Cleaning record (Record 10)
- Preventative maintenance record (Record 12)
- Employee training record (Record 15)
- Raw materials and finished product allergen assessment record (Record 16)
- Cooking and cooling record (Record 17).

7 Cooked meat production

7. Cooked meat production



In the event that the product needs to be reworked, follow **PRP 14 Rework**.

HACCP plan for cooked meat production – cooking, cooling, and slicing

A hazard analysis was conducted on all steps involved in cooked meat production. The hazard analysis determined that there are two critical control points (CCPs) and three control points (CPs) in the cooked meat production process. The two CCPs identified are:

1. CCP1 – Cooking (Step 5)
2. CCP2 – Cooling/Blast chilling (step 6).

The three CPs identified are:

1. Goods in (step 1)
2. MAP (step 9)
3. Metal detection (step 10A).

The hazard control plan for **Step 5: Cooking, Step 6: Cooling/Blast chilling** and **Step 9: MAP** are outlined in the table below.
The Goods in & Metal detection steps are CPs common to all processes, therefore the hazard control plan for these is outlined towards the end of Section 3.
The hazards associated with the other cooked meat production steps are fully controlled by the PRPs. See **Appendix A – Hazard analysis (all other process steps)**.

STEP 5: COOKING (CRITICAL CONTROL POINT – CCP 1) **The risk posed by the biological hazards at the cooking step was the reason for identifying this step as a CCP**								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Critical limit**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Biological **Survival of pathogens** • The survival of bacteria due to product not cooked to a high enough temperature. **Additional bacterial contamination** • Poor personal hygiene • Unclean equipment/ utensils.	**Staff training and compliance with:** • Cooked meat production SOP • PRP 7 Cleaning • PRP 10 Personal hygiene.	• ≥75 °C or equivalent time/temperature combination at the core • High standards of personal hygiene and equipment /utensil hygiene.	• Use a calibrated temperature probe to measure the core temperature of the product in the cold spot as per the Cooked meat production SOP (Sanitise the probe before and after use). • Visual check that staff are adhering to: – Cooked meat production SOP – PRP 7 – PRP 10.	Trained operator	Every batch cooked	• Continue cooking until the required temperature as per the Cooked meat production SOP is achieved. • Review the cooking procedure. • Better supervision, training, and/or retraining of staff. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cooking and cooling record (Record 17) • Chilled/frozen temperature record (Record 3) • In-process traceability record (Record 7) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.

STEP 5: COOKING (CCP 1)								
(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Critical limit	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Chemical **Chemical contamination of food:** • Incorrect use of cleaning chemicals • Using non-food-grade cleaning chemicals • Using non-food-grade equipment.	**Staff training and compliance with:** • Cooked meat production – Cooking SOP • PRP 7 Cleaning • PRP 13 Purchasing.	No chemical contamination of product.	• Visual inspection of equipment • Ensure that staff are adhering to PRP 7 Cleaning. • Ensure purchase of food-grade cleaning chemicals/ equipment.	Trained operator	Every batch cooked	• Better supervision, training, and/or retraining of staff. • Dispose of product that may have been contaminated. • Review suppliers.	**Section 4 – Records** • Cleaning record (Record 10) • Supplier list (Record 5) • Employee training record (Record 15).	Weekly verification by FBO.
Physical **Physical contamination of food from:** • Premises • Equipment • Pests • People (for example, hair, jewellery).	**Staff training and compliance with:** • Cooked meat production SOP • Metal control/metal detection SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 5 Pest control • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Visual inspection of premises/ equipment to ensure they are fit for purpose, as outlined in PRP 1 and PRP 9. • Ensure that staff are adhering to Metal control/metal detection SOP. • Ensure that staff are adhering to PRP 7 and PRP 10. • Pest control folder up to date and recommendations actioned.	Trained operator	Every batch cooked	• Better supervision, training, and/or retraining of staff. • Maintenance of premises and equipment. • Review pest controls. • Dispose of product that may have been contaminated.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Preventative maintenance record (Record 12) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen **Allergen cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 2 Layout and zoning • PRP 7 Cleaning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch cooked	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Ongoing verification by the FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

STEP 6: COOLING/BLAST CHILLING (CCP 2) The risk posed by the biological hazards at the cooling/blast chilling step was a key factor in identifying this step as a CCP								
(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Critical limit	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Biological **Growth of pathogens** • The growth of bacterial spores due to product not brought to a cold enough temperature sufficiently quickly. **Additional bacterial contamination** • Poor personal hygiene • Unclean equipment/ utensils.	**Staff training and compliance with:** • Cooked meat production SOP • PRP 3 Product storage, distribution and transport • PRP 10 Personal hygiene. • PRP 7 Cleaning.	• <5 °C (at the core) within 270 minutes (4.5 hours) for heat-processed foods. • <5 °C (at the core) within 600 minutes (10 hours) for large uncured meats. • < 5 °C (at the core) within 750 minutes (12.5 hours) for large, cured meats • High standards of personal hygiene and equipment /utensil hygiene.	• Use a calibrated temperature probe to measure the core temperature of the product in the warm spot as per the Cooked meat production SOP (Sanitise the probe before and after use) • Visual check that staff are adhering to: – Cooked meat production SOP – PRP 7 – PRP 10.	Trained operator	Every batch cooled/ blast chilled.	• Corrective action to be taken based on risk assessment: The action taken should be proportional to the risk. Based on risk assessment, there are three possible methods of dealing with non-conforming product: 1. Accept the non-conforming product following further inspection and testing 2. Rework the non-conforming product to meet specified requirements 3. Dispose of the non-conforming product. • Discuss with your inspector. • Review the cooling procedure including chill loading. • Better supervision, training, and/or retraining of staff. • Dispose of product that may have been grossly contaminated.	**Section 4 – Records** • Cooking and cooling record (Record 17) • Chilled/frozen temperature record (Record 3) • In-process traceability record (Record 7) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.
Chemical **Chemical contamination of food:** • Incorrect use of cleaning chemicals • Using non-food-grade cleaning chemicals • Using non-food-grade equipment.	**Staff training and compliance with:** • Cooked meat production - Cooling SOP • PRP 7 Cleaning • PRP 13 Purchasing.	No chemical contamination of product.	• Visual inspection of equipment prior to cooling/ blast chilling • Ensure that staff are adhering to PRP 7 Cleaning. • Ensure purchase of food-grade cleaning chemicals/ equipment.	Trained operator	Every batch cooled/ blast chilled.	• Better supervision, training, and/or retraining of staff. • Dispose of product that may have been contaminated. • Review suppliers.	**Section 4 – Records** • Cleaning record (Record 10) • Supplier list (Record 5) • Employee training record (Record 15).	Weekly verification by FBO.

STEP 6: COOLING/BLAST CHILLING (CCP 2)								
(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Critical limit	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Physical **Physical contamination of food from:** • Premises • Equipment • Pests • People (for example, hair, jewellery).	**Staff training and compliance with:** • Cooked meat production SOP • Metal control/metal detection SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 5 Pest control • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Visual inspection of premises/equipment to ensure they are fit for purpose, as outlined in PRP 1 and PRP 9. • Ensure that staff are adhering to PRP 7 and PRP 10. • Pest control folder up to date and recommendations actioned.	Trained operator	Every batch cooled/ blast chilled.	• Better supervision, training, and/or retraining of staff. • Maintenance of premises and equipment. • Dispose of product that may have been contaminated. • Review pest control contractor.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2) • Glass, brittle and hard plastic record (Record 1) • Preventative maintenance record (Record 12) • Employee training record (Record 15).	Weekly verification by FBO.
Allergen **Allergen cross-contamination from:** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 2 Layout and zoning • PRP 7 Cleaning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual check that staff are adhering to control measures outlined in PRP 12, PRP 7, PRP 2 and PRP 10. • Ensure adequate zoning is in place for equipment, utensils, products, and ingredients that are in contact with, or contain allergens.	Trained operator	Every batch cooled/ blast chilled.	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process. • Separate equipment/utensils/ ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability.

STEP 9: MODIFIED ATMOSPHERE PACKAGING (CP) The risk posed by the biological hazards at the MAP step was the reason for identifying this step as a CP								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Biological • Growth of bacteria in product due to poor modified atmosphere packaging (MAP) packing procedure /equipment failure.	**Staff training and compliance with:** • Cooked meat production SOP with regard to modified atmosphere packaging procedure in order to ensure that the product achieves the stated shelf-life on the MAP packed product.	• Gas mixture at required level in sealed pack after MAP packing completed (refer to the MAP packing equipment instructions). • Seals on pack intact after MAP packing.	• Ensure the machine is calibrated and used in accordance with manufacturer's instructions. • Visual – Inspect packs under test to ensure that the seals on MAP packed product are intact. • Gently press on packs under test to ensure that seals are intact.	Trained operator	Three trays to be tested at the start, during and after MAP packing has been completed for every batch.	• Review compliance with the Cooked meat production SOP. • Better supervision, training, and/or retraining of staff. • Product not achieving the required gas level mix will need to be repacked. • Adjust the MAP packing equipment/gas flow rates to ensure that the required gas level is achieved in the packs. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved.	**Section 4 – Records** • In-process traceability record (Record 7).	Weekly verification by FBO.
Chemical **Chemical taint** • Use of incorrect gas mix and taint from MAP packaging.	**Staff training and compliance with:** • Cooked meat production SOP with regard to modified atmosphere packaging procedure in order to ensure that the product achieves the stated shelf-life on the MAP packed product. • PRP 13 Purchasing – correct gas and use of food-grade packaging.	No chemical contamination of product.	• Visual inspection of gas cylinders and packaging prior to commencing MAP packing. Ensure that the correct gas mix is being used prior to commencing MAP packing.	Trained operator	Every batch MAP packed.	• Better supervision, training, and/or retraining of staff. • Review suppliers. • Contact the manufacturer of the MAP packing equipment. Do not MAP pack until the issue is resolved.	**Section 4 – Records** • In-process traceability record (Record 7).	Weekly verification by FBO.

Note: Foods which have their shelf-life extended by means of packaging gases must be labelled "packaged in a protective atmosphere".

STEP 9: MODIFIED ATMOSPHERE PACKAGING (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Physical **Physical contamination of food from:** • Premises • Equipment (for example, condition of MAP packing equipment) • People (for example, hair, jewellery).	**Staff training and compliance with:** • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 7 Cleaning • PRP 10 Personal hygiene.	No physical contamination of product.	• Maintenance of MAP packing equipment. Ensure that filters are in place on the gas line from gas cylinders to MAP packing equipment. • Visual inspection of building and equipment to ensure that they are fit for purpose, as outlined in PRP 1 Premises and structure. • Ensure that staff are adhering to PRP 7 Cleaning and PRP 10 Personal hygiene.	Trained operator	Every batch MAP packed.	• Better supervision, training, and/or retraining of staff. • Dispose of product that may have been contaminated. • Contact the manufacturer of the MAP packing equipment. • Do not MAP pack until the issue is resolved.	**Section 4 – Records** • Cleaning record (Record 10) • Pre-production, metal control and knife register record (Record 2).	Weekly verification by FBO.
***Allergen** **(cross-contamination)** • Using equipment and utensils that have been used for product containing allergens • Inadequate cleaning of equipment/utensils that have been used for allergens • Inadequate zoning • People (for example, not washing hands/changing PPE after handling allergens).	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning • PRP 2 Layout and zoning • PRP 10 Personal hygiene.	No allergen cross-contamination.	• Visual – Ensure that staff are adhering to PRP 7 Cleaning. • Ensure that adequate zoning is in place for equipment, utensils, products, ingredients in contact with or containing allergens.	Trained operator	Every batch minced.	• Where the food has been contaminated with an allergen: – If this is a recipe and label change, make customers aware of this so they have accurate information on the allergens in the product. **OR** – Rework/Redesignate/ Dispose of product that has been contaminated. • Better supervision, training, and/or retraining of staff. • Review cleaning process • Separate equipment/ utensils/ingredients in contact with or containing allergens.	**Section 4 – Records** • Raw materials and finished product allergen assessment record (Record 16) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.

Note: If a product with an undeclared allergen has left the immediate control of the FBO then recall/withdrawal/relabel is required – see PRP 4 Product recall and traceability

Standard operating procedure for cooked meat production – cooking, cooling, and slicing

Introduction

This section applies to the production of cooked meat, such as ham, turkey, chicken, lamb, beef, and ready meals.

Thoroughly cooking food, so that its core reaches a temperature of 75 ˚C (or equivalent time/temperature combination), is considered effective for non-spore forming pathogens (for example *Listeria monocytogenes*). Thoroughly reheating foods that have already been cooked, to achieve a core temperature of ≥70 ˚C is also considered effective to eliminate microorganisms of concern or reduce them to an acceptable level.

Intended use

Cooked meat is intended to be eaten without any further cooking. It is a ready-to-eat product.

Cooked meat – hazards

- Harmful bacteria that are found in raw meat may survive cooking if meat is not cooked properly.
- Heat-resistant bacteria that survive cooking may grow during cooling and refrigerated storage.
- Cooked meat may become contaminated with harmful bacteria after cooking due to one or more of the following:
  - Cross-contamination from raw meat.
  - Poor personal hygiene (for example, dirty hands) leading to the transfer of bacteria from a person to food.
  - Presence of harmful bacteria on food contact surfaces or equipment, (for example, as a result of inadequate cleaning and disinfection).
- Cooked meat may become physically contaminated (for example, with pieces of metal or plastic).
- Food may become contaminated with chemicals (for example if cleaning chemicals are used close to exposed food).
- Allergens intentionally added to the product must be declared in the correct manner in the products ingredients list, and stringent allergen controls must be in place to prevent cross-contamination with allergens. Allergens listed on the label of any ingredients must be recorded - update the 'Finished product allergen list' (Record 16) to ensure it lists all the product allergens. Ensure the ingredients list of the finished product lists all allergens in the product so the customer has accurate information on allergens (see PRP 16 Labelling and product information).

Ready-to-eat meat products

It is essential that all microbiological food safety hazards are effectively controlled during the production of ready-to-eat meat products as they will not undergo a subsequent cooking process by the final consumer.

Ready-to-heat meat products

Clear and valid cooking instructions are particularly important for food which, because of its appearance, a consumer or another food business may think is ready-to-eat. Non ready-to-eat meat products are intended to be reheated before they are eaten and require thorough reheating (to reach a core temperature of 70 °C) by the final consumer. While it is important that all microbiological food safety hazards are fully controlled during production, there is a further food pathogen elimination process available, i.e. reheating by the final consumer.

It is essential that the requirement to thoroughly heat before consumption and clear, reheating instructions are displayed on the label. These instructions must be validated by the FBO to ensure that following the reheating instructions will raise the core temperature of the food to at least 70 °C.

Note: Foods which are intended to be reheated for palatability purposes but will not reach a core temperature of 70˚C are considered ready-to-eat.

Microbiological sampling of meat products

The FBO must carry out microbiological sampling and analysis of finished products to ensure compliance with the microbiological criteria laid down in Regulation (EC) 2073/2005. These criteria define the acceptability of a food in terms of its microbiological safety. Food safety criteria are established for ready-to-eat food, including ready-to-eat meat products.

Ready-to-eat-meat products are subject to the microbiological criteria in relation to *Listeria monocytogenes* contained in Regulation (EC) 2073/2005, Annex I, Chapter I, Category 1.2 or 1.3. The food category (Category 1.2 or 1.3) depends on the pH, water activity (aw), shelf-life, location of sampling and other criteria relating to that food. Information on microbiological criteria for ready-to-eat meat products can be found on www.fsai.ie

It is important to consider what laboratory is selected to conduct micro testing on behalf of the FBO. It is recommended that the laboratory chosen to perform micro testing is accredited for the relevant test methods used. For more information, see the FSAI factsheet 'Best Practice for Testing Foods when Assessing Compliance with the Microbiological Criteria specified in Regulation (EC) 2073 of 2005' available at www.fsai.ie.

Cooking CCP1

Before introducing a cooking process, it is recommended to repeat temperature mapping and heat penetration tests in accordance with the FSAI **Guidance Note 20: Industrial Processing of Heat-Chill Foods**. In particular, the FBO should ensure that they use:

- Ingredients from listed suppliers
- Ovens with in-process temperature monitoring. This requires specialist advice.
- Cooking process temperature records (Section 4 – Record 17) to demonstrate that every batch of the product has reached the required core cooking time/temperature combination.

The FBO must ensure that foods are cooked to a core temperature of 75 °C instantaneously, or held at 70 °C for 2 minutes or an equivalent time/core temperature combination in the slowest-heating product (i.e. the geometric core/thickest point, in the cold spot) as outlined in Table 12.

Table 12 Example of equivalent time/temperature combinations for thorough cooking

Temperature (°C)	Time	Temperature (°C)	Time
64	12 minutes 37 seconds	**70**	2 minutes
65	9 minutes 17 seconds	**71**	1 minute 28 seconds
66	6 minutes 50 seconds	**72**	1 minute 5 seconds
67	5 minutes	**73**	48 seconds
68	3 minutes 42 seconds	**74**	35 seconds
69	2 minutes 43 seconds	**75**	26 seconds

Cooling/blast chilling CCP2

After cooking, foods must be cooled as quickly as possible.

- To prevent the risk of microbial growth following cooking, food must be cooled in accordance with recognised industry guidelines using a blast chiller or equivalent method. See **FSAI Guidance Note 20: Industrial Processing of Heat-Chill Foods**. Table 13 outlines the best practice for chilling heat-processed foods and Tables 14 and 15 outline the best practice for chilling large uncured and cured meat products.
- Cooling process temperature records are required to demonstrate that each batch of product reached the required core temperature of the slowest-cooling product (i.e. the warm spot) in the required cooling time/core temperature combination (Section 4 – Record 17).
- After cooling is completed, store foods at 5 °C or less.

Table 13 Best practice for chilling heat-processed foods

Chilling stage	Requirement	Best practice
Commencement of chilling	Begin chilling as quickly as possible after completion of heat processing.	**Recommend a period of ≤ 90 minutes after the completion of heat processing**
Initial chilling process	Reduce the temperature of the food (at the geometric core/thickest point) from 55 °C to ≤ 10 °C as quickly as possible.	**Recommend a period of not greater than 120 minutes after the beginning of chilling from 55 °C to ≤10 °C**
Final chilling process	Continue chilling as quickly as possible from 10 °C to ≤ 5 °C.	**Recommend a period of not greater than 60 minutes from 10 °C to ≤ 3 °C**
Final storage	Following completion of chilling, the food should be immediately placed in controlled refrigerated storage which ensures a final product temperature (at its geometric core/thickest point) of ≤ 5 °C throughout the chill chain.	**Recommend a temperature of ≤ 3 °C throughout the chill chain**

Table 14 Best practice for chilling large uncured meat products

Temperature range	Uncured meats	
	Good practice	Maximum
	Time (minutes)	
Final cooking temperature to 55 °C	60	150
55 °C to 12 °C	360	360
12 °C to 5 °C	60	90
Total cooling time (minutes)	**480**	**600**

Table 15 Best practice for chilling large cured meat products

Temperature range	Cured meats	
	Good practice	Maximum
	Time (minutes)	
Final cooking temperature to 55 °C	75	195
55 °C to 12 °C	450	450
12 °C to 5 °C	75	105
Total cooling time (minutes)	**600**	**750**

- All temperatures refer to readings taken at the core of the product.
- Following chilling, the product must be immediately placed in controlled refrigerated storage which ensures a final product temperature (at its core) of below 5 °C (recommended below 3 °C) throughout the chill chain.

Baking/roasting/glazing

- If a baking/roasting/glazing step is carried out after cooling has been completed, the product must be further cooled to ensure that the core and the surface temperature is brought back to 5 °C or less within 2 hours. The total cooling time for the product is calculated by detailing the time the core temperature of the product remains higher than 5 °C. The total chilling time should not exceed the times specified in Table 15.

Slicing of cooked meats

Slicing of cooked meat products must be carried out in a manner that prevents cross-contamination and maintains product temperature at less than 5 °C at all times.

Slicing of cooked meats involves the following;

- Removal of cooked meat from chill
- Unwrapping of cooked meat
- Slicing of cooked meat
- Repacking of cooked meat
- Chill storage

Procedure

Where feasible, all cooked meat process steps, including slicing, should be carried out in a temperature-controlled environment. Where this is not feasible, a risk assessment must be carried out, and the procedure documented and agreed with the regulatory authority. The risk assessment must include the volume of product being sliced, the amount of time it is at ambient temperature, the structural fabric of the premises, seasonal factors, external air temperature and internal ambient temperatures. The agreed procedure may differ according to external air temperatures and internal ambient temperatures. The procedure may include limiting the time the product is removed from the cold store, monitoring the temperature of the meat product, and taking account of external factors such as weather. The temperature of the cooked meat after slicing and rewrapping should not exceed 5 °C when returned to chill storage.

Cleaning

- All equipment and surfaces that come into contact with ready-to-eat and ready-to-heat foods must be cleaned and disinfected frequently.
- Use separate (or appropriately cleaned and disinfected) surfaces and equipment for handling ready-to-eat foods. Always use separate complex equipment (for example mincers, slicers, vacuum packing and wrapping machines) for processing ready-to-eat food. Such equipment must only be used for ready-to-eat food, and never for raw food.

  For more information, see PRP 2 Layout and zoning.
- Cleaning and disinfection must take place between each batch produced and if processing meat from different species.
- All equipment must be in good repair and checked for any visible rust or damage (for example, missing pieces of metal).

Cleaning of knives and equipment

All equipment, including knives, chopping boards and food contact surfaces must be thoroughly cleaned and disinfectant regularly and at least once a day if it has been used that day.

Production rooms where the main activity is meat cutting, must have facilities for disinfecting tools (knife sterilisers) that heat water to a minimum of 82 °C. Knives must be cleaned prior to placing in the knife steriliser. An alternative system that has an equivalent effect to disinfection with water at 82 °C may be used by the FBO but only when authorised by the inspector (Competent Authority). Alternative systems include for example, chemicals / UV disinfection. An alternative method must achieve the same results as a hot water steriliser and this must be validated by the FBO, to the satisfaction of the Competent Authority (for example, microbiological sampling, citation of documents). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement with appropriate documented evidence/validation of the proposed method or activity. The Competent Authority must authorise the flexibility before the FBO can implement it.

Cleaning of cooked meat slicers

The effective cleaning of the cooked meats slicer is essential. If the cooked meat slicer is not cleaned properly it could result in contamination of the cooked meat. This in turn could make the consumer ill. The cooked meat slicer should be dismantled daily, and the slicer body and all components should be washed and disinfected in hot water.

Always follow manufacturers instructions when cleaning cooked meat slicers, taking into account:

- Disconnect the machine by removing the plug or turning off the isolator switch.
- Set the thickness guide to zero.
- Remove any food debris from underneath the machine.
- Dismantle the machine and wash in the equipment sink, dry with a disposable towel.
- Remove the collection tray; wash with sanitiser in the equipment sink. Dry with disposable paper towel.
- Dry off thoroughly and reassemble.
- Wash the machine table with sanitiser.
- Wash any adjacent areas with sanitiser.
- Check that all parts are in proper position and tightly fitted before turning power back on.

Due to the dangerous nature of this machine, it is vital to ensure that the manufacturer's Health and Safety instructions are always adhered to.

There must be ongoing verification of the cleanliness of the cooked meats slicer.

Environmental monitoring

Under Article 5.2 of Regulation (EC) 2073/2005, FBO's manufacturing ready-to-eat foods such as sliced deli meat, which may pose a *Listeria monocytogenes* risk for public health, must sample the processing areas and equipment for *L. monocytogenes* as part of their sampling scheme. FBO's are recommended to follow the European Union Reference Laboratory for *Listeria monocytogenes* (EURL Lm) guidelines on sampling the food processing area and equipment for the detection of *Listeria monocytogenes*.

What areas should be sampled?

FBO's should determine what sites to sample throughout their establishment (from raw material intake to final dispatch) considering sites where contamination is most likely to occur – including both food contact and non-food contact surfaces (for example, slicers, knives (blade/handle junction), equipment for wrapping (for example, vacuum packer) and non-food contact surfaces (for example, drains, floors, wellies). These include hard to reach places such as holes or crevices in fibrous, porous, rusting and hollow materials and poorly cleanable equipment.

How often to sample?

Regulation (EC) 2073/2005 does not state how often an FBO should take samples from processing areas and equipment used in food production. Sampling should be done frequently in areas where the food product is exposed to contamination, but it may be useful to also sample, less frequently, in areas where it is not (storage areas). A generic sampling frequency cannot be specified due to the variability of processing facilities and their practices. FBO's should determine how often to conduct environmental monitoring based on a risk assessment (see FSAI Guidance Note 27, on www.fsai.ie).

Sampling results

The detection of *L. monocytogenes* in an environmental monitoring swab is unsatisfactory for surfaces in contact with ready-to-eat food and immediate corrective actions under the FBO's food safety management system should be carried out. Detection of *Listeria* spp. (for example, *L. innocua*) in the food processing environment, particularly on food contact surfaces, should be viewed as an indicator of an increased risk of *L. monocytogenes* contamination and corrective actions should be taken as appropriate. For information on actions should *Listeria* spp. (including *L. monocytogenes*) be detected on food contact surfaces or non-food contact surfaces, see **The Control and Management of *Listeria monocytogenes* Contamination of Food** on www.fsai.ie.

Assessing effectiveness of cleaning

Additionally, environmental monitoring swabs can be taken to assess the effectiveness of the cleaning and sanitation programme. These swabs should be analysed for Aerobic Colony Counts (ACC), also known as Total Viable Counts (TVCs), and Enterobacteriaceae, or by using a rapid Adenosine triphosphate (ATP) test. ATP is a molecule found in all living cells. This is a rapid method which can be used by FBO's to assess the effectiveness of its cleaning and sanitation programme on-site in real-time. The ATP testing machine (a luminometer) counts the ATP from a swab sample taken from the tested surface and the result is measured in RLU (Relative Light Units). The higher the RLU score, the greater the level of microbial contamination and the less effective cleaning and sanitation has been. The main advantage of measuring ATP is that it is carried out on the spot meaning that action can be taken immediately to reclean and sanitise if a surface fails the ATP limit set by the FBO.

There are no legal or guideline criteria published to determine an acceptable level of contamination with the microbiological parameters of ACC and Enterobacteriaceae, or ATP on food contact surfaces. The initial level of microorganisms on a surface prior to cleaning, the presence of biofilms, the availability of nutrients and an environmental temperature to enable microbial growth, the hygienic design of equipment (for example, the cooked meat slicer), the ease of cleaning, and the efficacy of the sanitiser used to disinfect the surface will all contribute to whether a cleaning and sanitation programme performs effectively. As these factors will vary among FBO's and the types of equipment they operate, it is difficult to set standard microbiological criteria for the environmental monitoring of ACC and Enterobacteriaceae, or ATP on surfaces after cleaning and sanitation has been carried out. It is recommended that FBO's set their own internal standards for ACC and Enterobacteriaceae, or ATP to assess whether the levels remaining on a surface after cleaning and sanitation are satisfactory. To do this, the FBO should assess the level of ACC and Enterobacteriaceae, or ATP present on a surface after 10 carefully controlled cleaning and sanitation sessions (i.e. sanitation schedule is followed exactly, sanitiser and detergent are correctly diluted and used according to manufacturer's instructions, contact times are strictly adhered to etc.). The mean result will provide an achievable standard which can be immediately implemented by the FBO.

If the results of ACC, Enterobacteriaceae or ATP testing breach the internal standard criteria the FBO has set to assess the effectiveness of the cleaning and sanitation programme, this should trigger corrective actions as set out under the FBO's food safety management system, for example, reclean the surface and retest after cleaning and sanitation, investigate the cause of the unsatisfactory result, review cleaning and sanitising procedures to ensure they are effective, review staff training to ensure that staff are appropriately trained etc.

Analysing trends in test results

FBO's should also analyse the trends in test results of any environmental sampling carried out to gauge how their cleaning and sanitising programme is working. This can be simply undertaken by producing a graphical representation of the test results per parameter tested over time. The outputs from these graphs can be used as a visual aid to help operatives responsible for cleaning and sanitation judge how they are performing. The FBO's own cleaning standard limits can be reviewed and altered as necessary as subsequent data points are obtained from future testing and trend analysis. A review of the internal standards set by the FBO would be required if either the food product, the process or the cleaning and sanitation programme were changed. For more information, see PRP 7 Cleaning.

Packaging

- Only use food-grade materials for wrapping and packing. Where a Declaration of Compliance is relevant for wrapping/packaging material that comes into contact with food, it must be retained. The wrapping/packaging and the food become one food product and the traceability requirements apply to it as a whole.
- Wrapping and packaging materials must be stored hygienically so that they do not contaminate food.
- Food packaging must be fully traceable back to suppliers. For more information, see PRP 4 Product recall and traceability.

Modified Atmosphere Packaging – This is a control point CP

Modified atmosphere packaging (MAP) involves modifying the internal composition of the pack to slow the growth of microorganisms. This helps to prolong the shelf-life of meat, meat products and meat preparations. If done correctly, it maintains the appearance, taste and texture of the product for optimum presentation and longevity. For more information, see FSAI **Guidance Note 18: Validation of Product Shelf-Life** at www.fsai.ie.

All film used for MAP should have an anti-fog top web. This helps to reduce moisture build-up on the inside of the film once sealed in conjunction with the product being stored at the correct chilled temperature after sealing. MAP products should be checked after sealing to ensure that the MAP packing step is effective. The following checks should be performed at production start-up, as well as during and after each production of MAP packed products. It is recommended that three packs at a time be tested for the following:

- **Checks on seal integrity**
  Checks on seal integrity can be done by visual inspection and also by pressing on the packs. If the seal appears to be intact after visual inspection followed by gently pressing on the pack, the seal is deemed to be satisfactory.
- **Changes to gas mixtures**
  If an FBO changes the concentration of any gas in their MAP packaging, for example, carbon dioxide then this is a new product and the shelf-life must be revalidated.
- **Gas analysis**
  - Prior to commencing gas flushing, check the levels of gas (gases used must be food grade) in each tank by examining the display to ensure that there is sufficient gas in the tanks to complete the task at hand.
  - Ensure that the gas tanks are set at the required flow rate.
  - It is recommended that the FBO seeks advice from the gas/MAP packing machine supplier in relation to the required settings needed to achieve target levels of gas in the finished MAP packed products.
  - If using a gas analyser, it is recommended they purchase from a reputable supplier and after MAP packing takes place, packs are tested to ensure they have the required level of gas.

Different types of packaging can be used for MAP packing

- **Thermoformed packs:** a pouch is formed from the base web. The product is placed in the pack, gas is added and the pack is sealed with a top web.
- **Trays:** the product is placed in the tray, gas is added and the pack is sealed with a top web.

  It is essential that the FBO follows the gas/MAP packing equipment supplier's recommendations on the correct gas mix to be used for the product being packed.

Make sure you use the correct gas mix for the product being MAP packed.

Metal detection – This is a control point CP

Ideally, all product is passed through a metal detector prior to dispatch. If a metal detector is not available, pre-production checks on equipment and all other items made from metal are sufficient. For more information, see the Metal control/metal detection SOP.

Labelling

Finished product must be labelled correctly - make sure the labels used are accurate and in line with requirements:

- ☑ Name of the food
- ☑ List of ingredients
- ☑ Ensure the ingredients list includes all allergens contained in the product. All allergens must be emphasised through a typeset that clearly distinguishes it from the rest of the ingredients for example by means of font, style or background colour.
- ☑ Products that contain additives, must comply with the additive labelling requirements in the list of ingredients on prepacked food i.e.:
  - the listing of the functional class of the additive, immediately followed by
  - the specific name or E number of the additive(s) used.
- ☑ Meat content
  - See FSAI's **Guidance Note 17: The labelling of Meat and Meat as an Ingredient** for the legislative requirements for the labelling of meat when used as an ingredient.
- ☑ Net quantity
- ☑ Use-by date
- ☑ Storage conditions are provided
- ☑ FBO name and address
- ☑ Country of origin where its absence may mislead
- ☑ Nutrition declaration (see PRP 16 for more information when this is required)
- ☑ Identification mark
- ☑ The traceability information is correct
- ☑ The label is clear and legible.

PRP 16 Labelling and product information provides information on food labelling requirements.

Order picking, packing and delivery to customers

Once an order is received from a customer, the items are picked, packed, and dispatched in line with the relevant temperature requirements – See PRP 3 Product storage, distribution and transport.

Records (see Section 4)

- Pre-production, metal control and knife register Glass, brittle and hard plastic record (Record 1)
- Pre-production, metal control and knife register record (Record 2)
- Chilled/frozen temperature record (Record 3)
- Goods inwards record (Record 4)
- Supplier list (Record 5)
- In-process traceability record (Record 7)
- Cleaning record (Record 10)
- Preventative maintenance record (Record 12)
- Employee training record (Record 15)
- Raw materials and finished product allergen assessment record (Record 16)
- Cooking and cooling record (Record 17).

Goods inwards

Goods inwards

Goods inwards – hazard control plan for all production processes

Note: A hazard analysis conducted on all production processes has determined that the goods inwards step is a control point (CP) in each process. The hazard control plan for the goods inwards step is outlined in the table below. The Goods inwards step is applicable to all production processes covered in this guide.

STEP 1: GOODS INWARDS (CP) **The risk posed by the biological hazards at the goods inwards step was the reason for identifying this step as a CP**								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Biological **Bacterial growth** • Poor temperature control: – At supplier's site – During delivery/goods inwards. **Bacterial contamination** • Presence of pathogens due to poor slaughter/deboning practices in supplier's site • Poor supplier control • Poor vehicle hygiene • Poor personal hygiene.	**Staff training and compliance with:** • Goods inwards SOP • PRP 3 Product storage, distribution and transport • PRP 13 Purchasing • PRP 10 Personal hygiene • PRP 7 Cleaning.	• Zero visible contamination • Carcases <7 °C in deep muscle • Poultry and lagomorph carcases <4 °C • Chilled boxed/vacuum-packed meat <4 °C • Frozen product <-18 °C • High standards of personal hygiene and vehicle hygiene.	• Visual check for contamination of incoming bone-in and boneless meat at intake. • Check delivery vehicle is clean, and personnel are maintaining good hygiene practices. • Use a temperature probe to measure the temperature of the meat delivered (Sanitise the probe before and after use).	Trained operator	Every delivery	• If the temperature is higher than required temperature accept/reject the delivery (based on risk). • Remove contamination from incoming carcases using a clean and sterile knife as per the Goods inwards SOP. • If contamination is deemed excessive, reject the delivery. • Review compliance with Goods inwards SOP and PRP 13 Purchasing. • Better supervision, training, and/or retraining of goods inwards staff. • Issue supplier non-conformance where required. • Review suppliers.	**Section 4 – Records** • Goods inwards record (Record 4) • Chilled/frozen temperature record (Record 3) • Supplier list (Record 5) • Cleaning record (Record 10) • Employee training record (Record 15).	Weekly verification by FBO.
Chemical **Chemical contamination** • Food and non-food on same vehicle • Packaging contamination.	**Staff training and compliance with:** • Goods inwards SOP • PRP 3 Product storage, distribution and transport • PRP 13 Purchasing.	No chemical contamination of product.	• Visual check of delivery vehicle to ensure no chemical contamination of product as per Goods inwards SOP.	Trained operator	Every delivery	• Better supervision, training, and/or retraining of Goods inwards staff. • Reject product, if necessary. • Review suppliers.	**Section 4 – Records** • Goods inwards record (Record 4) • Supplier list (Record 5) • Employee training record (Record 15).	Weekly verification by FBO.

STEP 1: GOODS INWARDS (CP)								
(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Limit/Target	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (How)	By	Frequency			
Physical **Physical contamination** • Personnel - poor hygiene of delivery van/driver • Foreign body - open/torn packaging • Pests – doors open – pest ingress.	**Staff training and compliance with:** • PRP 3 Product storage, distribution and transport • PRP 13 Purchasing • PRP 5 Pest control.	No physical contamination of product.	• Check delivery vehicle is clean, and personnel are maintaining good hygiene practices. • Check for any signs of pest infestation.	Trained operator	Every delivery	• Better supervision, training, and/or retraining of Goods inwards staff. • Reject product, if necessary. • Review PRP 13 Purchasing.	**Section 4 – Records** • Goods inwards record (Record 4) • Supplier list (Record 5) • Employee training record (Record 15).	Weekly verification by FBO.
Allergens • Food product containing allergens where the product is not labelled appropriately. **Allergen contamination** • Damaged packaging due to poor/incorrect storage in transit.	**Staff training and compliance with:** • PRP 12 Measures to prevent cross-contamination • PRP 13 Purchasing.	All allergens in the product declared No allergen cross-contamination.	• Visual – ensure that staff are adhering to PRP 12 Measures to prevent cross-contamination. • Ensure that adequate zoning is in place on delivery vehicle in order to prevent cross-contamination with allergens.	Trained operator	Every delivery	Better supervision, training, and/or retraining of Goods inwards staff. Unlabelled products to be refused at Goods inwards. Reject product, if necessary.	**Section 4 – Records** • Goods inwards record (Record 4) • Supplier list (Record 5) • Employee training record (Record 15).	Ongoing verification by FBO.

Standard operating procedure for Goods inwards CP

Introduction

When chilled, frozen, ambient food products and food packaging materials are delivered to the FBO premises, they should be checked to ensure that they meet specified requirements with regard to integrity, shelf-life, and temperature.

The following should be checked on delivery:

- ☑ The personal hygiene of the delivery personnel is satisfactory.
- ☑ The interior of the vehicle is clean and does not contain items such as cleaning materials that could contaminate the food.
- ☑ Food containing allergens stored separately and containers adequately sealed to prevent cross-contamination.
- ☑ Containers adequately sealed to prevent entry of rain, pests, or exhaust fumes.
- ☑ Meats and their packaging are not in direct contact with the floor of the vehicle.
- ☑ Crates, trays and boxes containing products are clean.
- ☑ Outer packaging is free from damage.
- ☑ No evidence of pest activity in or near any products checked.

The FBO must have a satisfactory system in place to prevent contamination of exposed meat from, e.g. diesel fumes, dust, flies, birds, leaves, poor weather conditions, during loading and unloading between premises and vehicles. This may be achieved, for example, by using a vehicle docking system, a canopy or awning. Where this is not available the FBO must ensure that exposed meat is protected from contamination. Common intake and dispatch facilities may be permitted provided the FBO can demonstrate to the satisfaction of the Competent Authority that product safety is not compromised. The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement. The Competent Authority must authorise the flexibility before the FBO can implement it. For more information, see PRP 2 Layout and zoning.

Product temperatures

Food deliveries must not be left exposed to contamination and should be transferred to a suitable area as soon as possible to carry out appropriate checks. Temperature checks should be carried out first and must be completed by a trained member of staff, using a calibrated probe. For more information on calibration and training, see PRP 9 Maintenance and PRP 11 Training. The required temperatures for good inwards are outlined in Table 16.

Temperature monitoring frozen products

Take a ‘between packs test’ by placing the probe between two packs of frozen product, hold the two packs together, wait for 5 minutes, or for the temperature to stabilise. Check and record the reading.

Table 16 Goods inwards temperature requirements

Product	Temperature requirement
Chilled: bone-in-meat of ungulates	Less than or equal to 3 °C (offal) Less than or equal to 7 °C (surface temperature of meat)
Chilled: bone-in-meat of poultry	Less than or equal to 4 °C
Chilled: boneless meat	Less than or equal to 4 °C (meat)
Chilled: minced meat	Less than or equal to 2 °C (minced meat)
Frozen foods	Temperature -18 °C

Actions:

- ☑ If the results indicate that the food has not been delivered at the correct temperature, use a temperature probe to check the core temperature of the food. If this does not comply with the permitted temperature limits at the time of delivery, a decision must be made based on risk as to whether the meat can be accepted or whether it must be returned to the supplier.
- ☑ All corrective actions should be recorded on the goods inwards record.

Carcase inspection

The goods inwards operative must check the temperature of bone-in meat (lamb carcases, beef quarters, pig sides, etc.) at intake.

- If the temperature of the carcase meat is not 7 °C or less, it must be rejected and returned to the supplier.
- Carcases, sides, quarters, etc. should be probed at the front, middle and back of the container.
- Ensure probes are sanitised before and after the temperature check.
- If a small delivery is received, a sample of carcases, sides or quarters are probed.
- The probe is placed in the muscle of the deep round.
- One temperature is recorded to denote the check.
- Temperatures are noted in the goods inwards record.
- Full commercial delivery documentation must be collected and held on file in either hard copy or electronically (soft copy). This documentation is important for both commercial and traceability purposes.

The goods inwards operative must visually inspect each carcase, side, or quarter for contamination such as faeces, hair, grease, rail dust, specified risk material (SRM) etc.

- Any contamination found should be trimmed off using a clean and sterile knife and disposed of as ABP (See PRP 6 Waste management).
- A second clean and sterile knife is used for further trimming if required.
- A two-knife technique must be always used at this step.
- A contaminated knife must not be reused.
- Production rooms where the main activity is meat cutting, must have facilities for disinfecting tools (knife sterilisers) that heat water to a minimum of 82 °C. Knives must be cleaned prior to placing in the knife steriliser.

  An alternative system that has an equivalent effect to disinfection with water at 82 °C may be used by the FBO but only when authorised by the inspector (Competent Authority). Alternative systems include for example, chemicals / UV disinfection. An alternative method must achieve the same results as a hot water steriliser and this must be validated by the FBO, to the satisfaction of the Competent Authority (for example, microbiological sampling, citation of documents). The onus is on the FBO to apply to the Competent Authority for any flexibility they wish to implement with appropriate documented evidence/validation of the proposed method or activity. The Competent Authority must authorise the flexibility before the FBO can implement it.
- If contamination of the bone-in-meat (carcase meat) supplied is excessive, the FBO/manager should be informed, and the delivery should be rejected.
- The supplier should be immediately informed.

A full check for spinal cord/specified risk material (SRM) must be carried out at intake. The spinal cavity of all beef quarters and sheep carcases greater than 12 months old must be inspected for spinal cord. If found, the supplier should be immediately informed. Non-conformances and corrective actions should be recorded in the goods inwards record.

Boneless meat/vacuum-packed meat and visual lean (VL)

The goods inwards operative checks the temperature of all incoming boneless meat at intake, using a calibrated probe. For more information on calibration, see PRP 9 Maintenance.

- If the temperature of the meat is not 4 °C or less, a decision must be made based on risk as to whether the meat can be accepted or returned to the supplier.
- This is recorded in the goods inwards record.
- Full commercial delivery documentation must be collected and held on file in either hard copy or electronically (soft copy). This documentation is important for both commercial and traceability purposes.

Most of the boneless meat is vacuum-packed. Some boneless meat may be received in lined crates or a plastic box. It is difficult to check for contamination in vacuum-packed meat, however, the goods inwards operator should visually inspect incoming boneless meat for obvious signs of contamination.

- ☑ Any damaged or badly sealed packaging should be rejected.
- ☑ If the product is received in an acceptable condition and the meat temperature is <4 °C, the product may be accepted into the site.
- ☑ All relevant traceability information must be recorded. An internal FBO-issued batch number may also be used.

Allergen controls at intake

- ☑ If the ingredients delivered are not the same as those agreed with the supplier, the FBO must ascertain what food allergens are in the ingredient's and ensure all are identified (and labelled correctly) in the related FBO food product labelling and customer information. Update the 'Raw materials and finished product allergen list' (Record 16) to ensure it lists all the products allergens.
- ☑ The FBO should check that products/ingredients containing food allergens are delivered in a way that prevents cross-contamination.
- ☑ The FBO should check packaging, containers and the condition of food for signs of damage that could lead to a leakage of food allergens.
- ☑ If there are any spillages of products/ingredients containing allergens, these should be cleaned up immediately using dedicated cleaning equipment.

For more information on allergens, see PRP 12 Measures to prevent cross-contamination and PRP 16 Labelling and product information.

Storage

After deliveries have been accepted, the chilled and frozen foods should be transferred to refrigerated storage without delay. Ambient goods, including wrapping and packaging, should be stored at ambient temperatures, and protected from contamination. The FBO should ensure that stock rotation takes place when storing foods. For more information on storage, see PRP 3 Product storage, distribution and transport.

Traceability

All food supplied to the premises must be traceable to the supplier. The legal requirement is to be able to trace one step backward to the immediate supplier and one step forward to the immediate customer. For more information, see PRP 4 Product recall and traceability.

Records (see Section 4)

- Chilled/frozen temperature record (Record 3)
- Goods inwards record (Record 4)
- Supplier list (Record 5)
- Cleaning record (Record 10)
- Preventative maintenance record (Record 12)
- Employee training record (Record 15)
- Raw materials and finished product allergen assessment record (Record 16)

Notes

Metal control/ metal detection

Metal control/metal detection

Metal detection – hazard control plan (optional for all production processes)

Note: A hazard analysis conducted on all production processes has determined that the metal detection step is a control point (CP) if applicable to the site. The hazard control plan for the metal detection step is outlined here.

STEP 1: METAL DETECTION (CP)								
(What can go wrong?) Hazard	**(What can I do about it?) Control measure**	**(What do I need to achieve?) Limit/Target**	**(How can I check it?) Monitoring**			**(What if it is not right?) Corrective action**	**(Where do I record my check?) Documentation reference**	**(How do I check the checker?) Verification**
			Procedure (How)	**By**	**Frequency**			
Physical • Metal in product passing through metal detector undetected.	**Staff training and compliance with:** • Metal control/metal detection SOP • PRP 9 Maintenance – calibration of metal detector.	• Relevant ferrous, non-ferrous and stainless steel test wands.	• Monitoring of metal detection step to be carried out as per Metal control/metal detection SOP.	Trained operator	• Start of production • Every hour • End of batch • End of day.	• Remove suspect product from reject bin or the metal detector conveyor belt and recheck immediately. • If metal is found in product, stop production. Quarantine affected product and re-check all product since last successful test, as per Metal control/metal detection SOP.	**Section 4 – Records** • Metal detector record (Record 23).	Weekly verification by FBO.

Standard operating procedure for metal control/metal detection

Introduction

It is recognised that having a metal detector on-site may not be feasible for some businesses. Nevertheless, it is essential that there is adequate control of metal in the food production area. An FBO who does not have a metal detector on-site should inspect the production area for damaged metal daily. This check should take place before production begins to ensure that all equipment containing metal is intact, and that all metal in direct contact with meat will not pose a physical contamination hazard to the product.

Conducting the pre-production inspection for metal

Before production begins, the relevant staff member should ensure that all equipment is fully checked so that there is no broken or damaged metal which could potentially contaminate the product. This involves a full check on all equipment, with a focus on equipment that comes into direct contact with the product (food contact surfaces). Every component should be checked at the start of each production session. The person responsible for ensuring that metal is controlled in the production area should check the following equipment if relevant:

- ☑ The mincer/mincer blades
- ☑ The burger former
- ☑ The injector/pickle pump/injector needles
- ☑ The bandsaw, bandsaw blade and other machine components
- ☑ All knives in use in the FBO premises, including a full check on all knife blades
- ☑ The tenderiser
- ☑ Any other equipment containing metal that may pose a contamination hazard to the product.

In the event of a problem with any equipment or parts of the equipment listed above, it should be repaired or removed before production begins. Defective equipment should not be used. The daily metal checks should be recorded in the pre-production, metal control and knife register record by the person who performed the checks.

Metal detection CP – optional

The use of a metal detector is optional. However, for some customers, having a metal detector in place for finished product may be a specific requirement for commercial reasons. Therefore, the expert working group (the HACCP team) has developed the metal detection procedure described below to assist SMMPs with metal detection protocols.

Metal detector

1. The sensitivity of the metal detector in place should be specified and be appropriate to the nature of the products being examined, as well as the contamination characteristics and the location and size of the detector.
2. All metal detectors should be capable of detecting ferrous, non-ferrous and stainless steel test wands. The only exception to this is where products are packaged in foil or other metal packaging, and in this case, only ferrous test wands are used to test the detector.
3. Metal detectors should be located as close as possible to the finished product packaging point.
4. Only authorised staff should have access to and be capable of altering settings on the metal detector. Metal detectors should be password protected to ensure the security of the detector and prevent settings being altered by staff who are not trained to do so.
5. The metal detector should have an effective automatic rejection device that diverts contaminated product to a secure unit accessible only to authorised personnel; for example, a locked box with nominated key holders that diverts it out of product flow.
6. The metal detector should incorporate either an audible or visual alarm system.
7. The belt stop system should have a visual or audible alarm. Belt stop metal detectors should only be used where automatic rejection is not possible or practical due to the nature of the product or process; for example, bulk or sensitive material. It is likely that this type of metal detector would be used for boxed meat or large vacuum-packed meat primals or cuts.

Calibration and servicing

The metal detector should be serviced at regular intervals. The frequency of servicing should be based on the manufacturer's instructions, but it should be carried out at least every 12 months. Servicing should include external calibration to recognised national standards and should be conducted by either the equipment manufacturer or trained contractors.

Testing the metal detector

The metal detector should be routinely tested. Typically, this means:

- Hourly
- Whenever there is a changeover in product
- Whenever there is a change in machine setting
- Following downtime.

Monitoring should be carried out by trained staff only and the test results recorded on the metal detector record at the start and at the end of food production (See section 4 – Record 23 for a copy of the Metal detector record).

The testing procedure ensures that the detector detects the test pieces, and that the reject system is correctly synchronised.

Test procedures

At a minimum, test procedures should incorporate the following:

- ☑ A test pack is successfully passed through the detector prior to being used for the check.
- ☑ The test pieces are passed through the detector in the centre of the aperture with the test pack.
- ☑ Include a test using consecutive test packs to test the recovery time of the detector if using a reject system as opposed to a belt stop system.
- ☑ It should be representative of how products would normally travel through the detector during the normal production process.

Procedure to follow if metal detector fails

In the event that there is a failure to detect a test piece or failure to reject product, the following checks should be carried out:

- ☑ Ensure that all product which was checked since the previous successful check is isolated, quarantined and retested after the metal detector has been repaired.
- ☑ If metal is found, ensure that a full investigation takes place to determine the source of the contamination.
- ☑ Ensure that a risk assessment is carried out to determine whether other products are contaminated or whether there is any potential for product contamination with metal of a size below that which the detector is capable of identifying.
- ☑ All affected or potentially affected product is isolated and quarantined.
- ☑ All corrective and preventive actions are implemented and documented.
- ☑ All details of incidents, investigations and disposal of product are recorded by trained staff.
- ☑ The course of action to be taken in the event of false positive readings (product that was rejected but does not contain contaminated material) should be documented.

Records (see Section 4)

- Pre-production, metal control and knife register record (Record 2)
- Employee training record (Record 15)
- Metal detector record (Record 23).

Notes

Section 4
Records

Introduction

This section provides the list of records that are associated with the relevant prerequisite programmes (PRPs), critical control points (CCPs), control points (CPs), and standard operating procedures (SOPs) in this guide. By completing the records that form an integral part of this FSMS, the FBO is demonstrating that the food was manufactured in compliance with EU legislation and with the requirements set out in this guide confirming that they have operated in accordance with the relevant PRPs, CCPs, CPs and production process SOPs. Records must be maintained for a period of not less than 3 years. Where a record relates to food of animal origin and the shelf-life of the food is greater than 3 years, the record must be maintained for the period of the shelf-life of the food.

All records can be tailored to suit the food business and are also available on www.fsai.ie

1. Glass, brittle and hard plastic record
2. Pre-production, metal control and knife register record
3. Chilled/frozen temperature record
4. Goods inwards record
5. Supplier list
6. Product recall team and customer contact list
7. In-process traceability record
8. Visitor declaration form
9. Pest control record (In-house management)
10. Cleaning record
11. Environmental swabbing schedule
12. Preventive maintenance record
13. Internal calibration record (temperature probes and scales)
14. Fitness to work assessment form
15. Employee training record
16. Raw materials and finished product allergen assessment record
17. Cooking and cooling record
18. Hazard control plan – template
19. Process hazard analysis and risk assessment
20. Product description and intended use
21. Water safety plan
22. Process flow diagram
23. Metal detector record

1. Glass, brittle and hard plastic record

Month:_____ Year:_____ Completed by:_____

Location	Item - glass / brittle plastic / hard plastic	Condition: A = Acceptable U = Unacceptable	Action (if unacceptable)
Manager/supervisor signature:			Date:

Glass breakage record. Fill in details as required.

Date/Time	Area where the breakage occurred	Item broken	Products or packaging affected	Area inspected satisfactory to resume work	Inspected by	Manager signature

2. Pre-production, metal control and knife register record

Week beginning: _____ Year: _____ Checked by: _____

	Pre-production check for warm water/soap/paper towels at wash-hand basin	Pre-production check for staff PPE and no jewellery	Pre-production check for foreign bodies (for example plastic, wood)	Pre-production check for broken or damaged glass, brittle or hard plastic in food production area.	Metal control - injector needles/ mincer blades/ tenderiser are intact and in good condition (if applicable).	Metal control - loose metal (for example damaged knife blades/ mincer blades)	*Knife register - record number of knives in food production area AM/PM
Monday							AM ____ PM ____
Tuesday							AM ____ PM ____
Wednesday							AM ____ PM ____
Thursday							AM ____ PM ____
Friday							AM ____ PM ____
Saturday							AM ____ PM ____
Sunday							AM ____ PM ____
Corrective action taken							AM ____ PM ____

A = Acceptable
U = Unacceptable
*If a knife is noted as missing, production cannot continue until the knife is accounted for.

3. Chilled/frozen temperature record

Month: _____ Year: _____

Unit (Insert Name Or Number Of Units In Shaded Boxes Below)													Comments/Action	Sign
Unit														
Date	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM		
1st														
2nd														
3rd														
4th														
5th														
6th														
7th														
8th														
9th														
10th														
11th														
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25th														
26th														
27th														
28th														
29th														
30th														
31st														

Product storage temperature requirements are outlined in Table 3 of PRP 3 Product storage, distribution and transport. It is recommended that chill/freezer/production room temperatures are checked at least twice per day. Some FBOs may wish to check more frequently.

Manager/Supervisor check on	/ /	/ /	/ /	/ /	/ /	/ /
Sign						

4. Goods inwards record

Week commencing: _____

Goods inwards record (boxed meat and ambient goods)

Date	Supplier name	Product delivered	Quantity delivered	Product temperature ˚C	Batch code	Use-by/ best-before date	Condition of goods Acceptable/unacceptable (including labelling/ID mark)	Corrective action	Signature

Goods inwards record (carcase meat)

Date	Supplier name	Product delivered	Quantity delivered	Product temperature ˚C	Record carcase/flock/ herd/batch numbers	If contamination found, state type (faeces, hair, SRM, rail dust, grease etc.)	Corrective action	Signature

Manager/supervisor signature: _____ Date: _____

Procedure: All deliveries of food and packaging should be checked and recorded. Conduct a temperature check using a clean, calibrated temperature probe. Record the temperature on the probe display once it has stabilised. (Required temperatures: chilled bone-in-meat 7˚C; offal 3˚C; chilled boneless meat 4˚C; minced meat 2˚C; frozen foods -18 °C.)

5. Supplier list

Supplier name	Supplier approval/ registration number	Address	Contact person	Contact details (phone/email)	Product supplied/ service provided	Method used to list supplier	Date of listing/ review

This requirement to maintain supplier details is in addition to the traceability requirements of PRP 4 Product recall and traceability.

6. Product recall team and customer contact list

List each member of the product recall team	
(1)	(5)
(2)	(6)
(3)	(7)
(4)	(8)

Unique customer code (if applicable)	Customer name	Address	Contact person	Contact number	Out-of-hours mobile number	Email address

Record customer contact details and update as required.

7. In-process traceability record

Process:			
Production date:	**Product:**		**Quantity:**
Kill date (if relevant, for example *minced meat):	**Finished product Use-by/Best-before date:**		**Finished product batch number:**
MAP product: **Time of check:** **Gas level reading:** **1. ____ 2. ____ 3. ____**	Record original batch number and use-by date or best-before date of any reworked product. **Rework product name:** **Batch No:** **Use-by date/Best-before date:**		
Finished product temperature:			**Weight of meat used in recipe:**
Ingredients used (Including brine, cure etc.) and packaging	**Supplier/approval number**	**Use-by date/Best-before date**	**Batch number**
Comment/Action:			
Signature:			

***Note:** For production of minced meat:

- Poultry meat cannot be older than 3 days from the kill date
- Other meat cannot be older than 6 days from the kill date
- Vacuum-packed beef or veal meat cannot be older than 15 days from the kill date

Manager/supervisor signature: _____ Date: _____

8. Visitor declaration form

Guideline for visitors when visiting the premises:

- All visitors should report to the FBO/manager in charge.
- Visitors should have a clean appearance and conduct themselves in a professional manner.
- Visitors should comply with any requests or guidelines provided by the FBO/manager or staff.
- Visitors should not enter the premises if they have had any infectious disease within the last 14 days.
- For maintenance contractors, equipment used should be clean and must not contaminate any food. If any parts are removed from equipment, maintenance contractors must ensure that all parts are accounted for and removed from the production area. If any part is mislaid, the FBO/manager in charge must be contacted.
- All jewellery other than a plain wedding band should be removed.
- Visitors cannot enter the production area without wearing clean protective clothing.
- Hands must be washed before entering a food production area.
- Eating, drinking, and chewing gum is not permitted in the production area.
- Cuts, sores, burns and grazes must be covered with a suitable visible waterproof dressing (for example blue waterproof plaster) that will not pose a risk of contamination to food.

Name: _____

Job title and company: _____

Date: _____

Reason for visit / contact point: _____

9. Pest control record (in-house management)

Date: _____ Year: _____ Checked by: _____

Internal/external bait box number	Location	Checked by	*Bait takes (0 or 1)	**Corrective action

*0 = No bait taken
*1 = Bait taken. If bait has been taken, replenish the bait and record the action taken.
**In the event of internal infestation, external expertise must be sought immediately.

Document your bait map (monitoring point locations) on this blank page for internal and external bait points

10. Cleaning record

Week commencing: _____ Year: _____

Areas and equipment to be cleaned	Frequency	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Corrective action
Weekly deep cleaning: initial relevant box on day of cleaning once cleaning has been completed.									
Manager/supervisor signature:									

Procedure: Cleaning must be carried out appropriately and according to a cleaning schedule. All areas and equipment identified in the FBO's business to be listed in Column 1. Indicate frequency of cleaning in Column 2. Initial the relevant box once cleaning has been completed. If cleaning is unsatisfactory, place an "X" in the relevant box and record the corrective action taken.

Note: It is important to remove all food before cleaning and disinfecting. To clean equipment effectively, follow the manufacturer's cleaning instructions for the relevant piece of equipment.

11. Environmental swabbing schedule

Sampling frequency: _____ (for example, once per week/month/quarter)

Area	Date of test	Tested for [1]	Results	Satisfactory/Unsatisfactory [2]	Corrective action [3]

1 FBO's producing cooked meat must test food and non-food contact surfaces for Listeria spp. (including *L. monocytogenes*). Swabs should also be tested for Aerobic Colony Counts (ACC) and Enterobacteriaceae, or ATP.

2 *Listeria* spp. (including *L. monocytogenes*): Satisfactory - Not detected per swab; Unsatisfactory – Detected per swab. FBO's are recommended to set their own internal standard limits for ACC and Enterobacteriaceae, or ATP scores. For more information see 'Environmental monitoring' in the SOP for cooked meat production.

3 If the results of environmental monitoring are unsatisfactory, corrective actions should be carried out (for example, reclean the surface and retest, investigate the cause of the unsatisfactory result, review cleaning and sanitising procedures to ensure they are effective, review staff training to ensure that staff are appropriately trained etc. For information on actions should Listeria spp. (including *L. monocytogenes*) be detected on food contact surfaces or non-food contact surfaces, see The Control and Management of Listeria monocytogenes Contamination of Food (FSAI 2005).

12. Preventative maintenance record

Year commencing: _____

Item of equipment	Frequency (for example, every 3 months, 6 months, 12 months)	Service provider name and contact details. Also record if work was carried out in-house	Scheduled maintenance date	Date work completed	Service engineer's or employee's signature	Manager/supervisor signature (indicating that the area has been cleared to resume production)

Procedure: Implement a preventive maintenance record system so that checks are carried out on all equipment and on the structure of the premises.

Mechanical breakdown record

Repair work carried out by: _____ Date: _____ Time: _____

Record the time production stopped to enable the repair work to be carried out.	Time:
Tools were accounted for before entering the area concerned.	Yes/No:
Please state where the repair work is being carried out.	
What is in need of repair?	
Have you ensured that all necessary steps have been taken so that product safety is not compromised while carrying out the repair work?	Yes/No:
Account for all your tools before leaving the production area. You should have the same number of tools when leaving the area concerned as you did when entering it. Is this the case?	Yes/No:
Corrective action:	

Signature of maintenance technician: _____

Date and time production restarted: _____

Signature of the person who has ensured that the area is clear for production to resume: _____

13. Internal calibration record (temperature probes and scales)

Year:_____

Month	Type (probe/ scales)	Date	Serial number	Location of probes/scales	Temperature Cold °C	Temperature Hot °C	Record weight of test weight used	Actual weight recorded by scales	Comments	Sign

The accuracy of thermometers and weighing scales should be checked at least once a month to verify that they are working correctly. Temperature probes are calibrated internally using water at 100 °C and 0 °C. A calibrated test weight is used on weighing scales to ensure that they are weighing accurately. If there are any significant deviations, take corrective action. See PRP 9 Maintenance – internal calibration for the correct procedure. Note: The FBO should tailor the record to suit their food business depending on the number of probes/scales on-site.

14. Fitness to work assessment form

Name of employee: _____ Date of assessment: _____

This form may be used for existing food handlers, for new food handlers who have just been recruited, and for food handlers who are returning to work after illness.

Reason for assessment: (Tick box)

☐ Existing food handler

☐ Pre-employment assessment

☐ Return to work after illness

1. Have you suffered from diarrhoea and/or vomiting within the last 48 hours? _____ **YES / NO**
   If **no**, in the last 48 hours have you taken any medication to control diarrhoea and/or vomiting? _____ **YES / NO**

2. At present are you suffering from:
   i. Infected wounds, skin infections or sores? _____ **YES / NO**
   ii. Boils, styes or septic fingers? _____ **YES / NO**
   iii. Discharge from the eyes, ears, or gums/mouth? _____ **YES / NO**
   iv. Jaundice _____ **YES / NO**

3. Have you ever had, or are you known to be a carrier of, typhoid or paratyphoid? _____ **YES / NO**

4. In the last 21 days have you been in contact with anyone, at home or abroad, who may have been suffering from typhoid or paratyphoid? _____ **YES / NO**

If the answer to any question is 'yes', the individual must not be permitted to handle food or enter food production areas if there is any likelihood of direct or indirect contamination. Further advice should be sought (for example, from a doctor).

Action taken: _____

_____

_____

_____

FBO signature: _____ **Date:** _____

I hereby declare that the information I have given is correct and I will notify my employer if I suffer from any of the above illnesses/conditions.

Employee: _____ **Date:** _____

15. Employee training record

Employee name: _____ Position: _____ Date of employment: _____

Training information					Competency assessment		
Scheduled training plan/date	**Training completed**	**Date**	**Trainee (signature)**	**Trained by (signature)**	**Manager/supervisor (signature)**	**Date**	**Outcome of assessment** S = Satisfactory RT = Retraining required
							S / RT
							S / RT
							S / RT
							S / RT
							S / RT
							S / RT
							S / RT
							S / RT
							S / RT

Competency assessments should take place 'on the job' following training. Circle S (Satisfactory) or RT (Retraining required). Competency checklists are available from FSAI Level 1, 2 and 3 training guides.

16. Raw materials and finished product allergen assessment record

Raw material allergen list

Note: Specify the *cereals containing gluten (for example, wheat) and specify the type of *nut (for example, walnut). X = Allergen present

Raw material name	*Cereals	Crustaceans	Eggs	Fish	Peanuts	Soybeans	Milk	*Nuts	Celery	Mustard	Sesame seeds	Sulphur dioxide and sulphites	Lupin	Molluscs

Finished product allergen list

Note: Specify the *cereals containing gluten (for example, wheat) and specify the type of *nut (for example, walnut).								X = Allergen present						
Finished product	***Cereals**	**Crustaceans**	**Eggs**	**Fish**	**Peanuts**	**Soybeans**	**Milk**	***Nuts**	**Celery**	**Mustard**	**Sesame seeds**	**Sulphur dioxide and sulphites**	**Lupin**	**Molluscs**

17. Cooking and cooling record

Week commencing: _____

Product Information		Cooking*			Cooling**				Corrective action (see Cooked meat production – Cooking, cooling, and slicing SOP)
Date	Product description	Time cooking finished	Core temperature °C	Sign	Time into blast chiller	Time cooling finished	Core Temperature °C	Sign	

***Cooking:** core temperature of 70 °C for 2 minutes or equivalent time/temperature combination.

****Cooling:** cool food to below 5 °C in the required time based on product being cooled.

The time when the cooking process finished must be recorded if food is being cooled.
See SOP for cooked meat production and SOP for pudding production.

Manager/supervisor signature					
Date					

18. Hazard control plan – template

STEP:								
(What can go wrong?) Hazard	(What can I do about it?) Control measure	(What do I need to achieve?) Limit/Target	(How can I check it?) Monitoring			(What if it is not right?) Corrective action	(Where do I record my check?) Documentation reference	(How do I check the checker?) Verification
			Procedure (how)	By	Frequency			
Biological								
Chemical								
Physical								
Allergen								

19. Process hazard analysis and risk assessment

Process:									
Step:			Risk assessment			*Decision tree			
Hazard	Cause	Control measure	Likelihood	Severity	Risk	Q 1	Q 2	CCP Yes/No	Nature of the control measure
Biological hazards									
Chemical hazards									
Physical hazards									
Allergen hazards									

***Hazards that are fully controlled by the PRPs are not put through the two-question decision tree.**
Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).
Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)
Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)
Risk = Risk rating ranging between 1 and 9

20. Product description and intended use

Product description and intended use for _____ (insert product name) Scope:	
Product name	
Product composition (raw materials, ingredients, recipe)	
Origin of meat	
Physical or chemical properties (for example, water activity)	
Treatment and processing (curing, freezing, etc.)	
Preservation factors	
Type of packaging used	
Labelling requirements relating to food safety	
Storage and distribution conditions	
Shelf-life under stated conditions	
Vulnerable Groups	
Intended use of the product	

21. Water safety plan

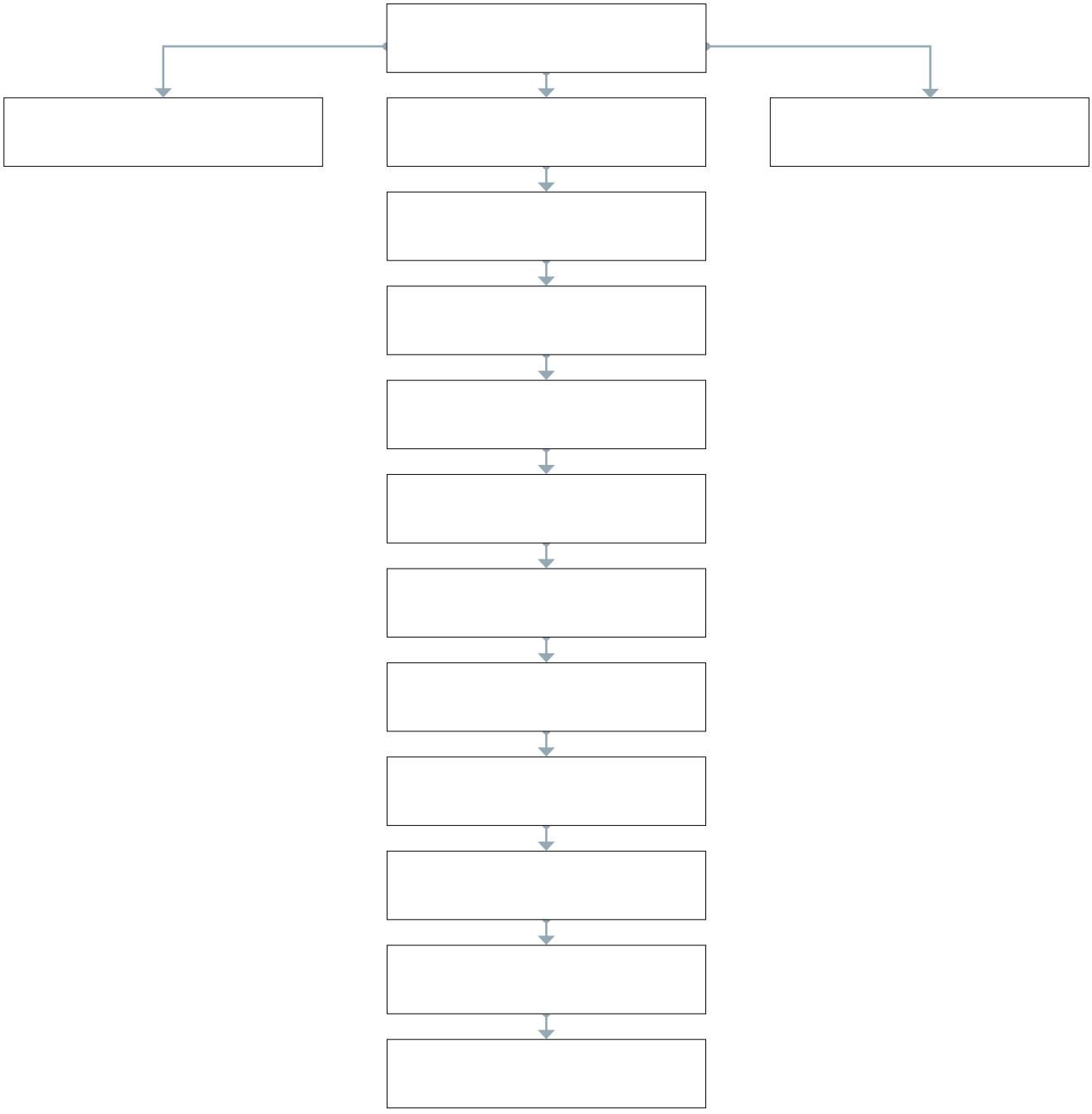
What type of water supply is used?	Public supply/Irish Water group scheme/ private supply [delete as appropriate]
Is the water that is used as an ingredient in food or for cleaning or washing hands stored in a tank before use?	
For private supply: Is the private supply registered with the local authority department responsible for private water supplies, and do you have a record of this?	Yes/No If you answer 'no' to this question, you will need to register the supply and/or ask for a record of such registration.
For private supply: what type of private supply is used? (For example, household well, borehole.)	
Is a water treatment system used? (For example, a UV filter or chlorination system). Please provide a description of the system.	
What is the water supply name or reference number? *For example, for an Irish Water supply, this will be the name of the Water Supply Zone. For a private supply, this will be the supply reference number from the local authority.*	

I understand that having a safe water supply is a legal requirement. I agree to follow this water supply safety guidance in PRP 8 Utilities and Services and maintain the required records.

FBO Signature: _____ Position: _____ Date: _____

22. Process flow diagram

_____ **(insert product name)**



Note: Tailor this blank process flow diagram to include the sequence of all steps involved in the process, ranging from receiving the raw materials to dispatch of finished product. The accuracy of the process flow diagram must be verified.

23. Metal detector record

Week beginning: _____

Time	Ferrous Achieved Yes/No	Non-ferrous Achieved Yes/No	Stainless steel Achieved Yes/No	State batch/box/ case number to denote check	Corrective action	Checked by
Monday						
Prestart						
10.00						
12.00						
15.00						
Tuesday						
Prestart						
10.00						
12.00						
15.00						
Wednesday						
Prestart						
10.00						
12.00						
15.00						
Thursday						
Prestart						
10.00						
12.00						
15.00						
Friday						
Prestart						
10.00						
12.00						
15.00						
Saturday						
Prestart						
10.00						
12.00						
15.00						
Sunday						
Prestart						
10.00						
12.00						
15.00						

Notes

Appendices

Appendix A – Hazard analysis and risk assessment

A hazard analysis was conducted on all steps in the 7 processes included in Section 3. These processes were considered to be the ones most typically carried out in a small meat manufacturing plant. For the purposes of this FSMS guide, the expert working group (the HACCP team) used a semi-quantitative risk evaluation method to carry out the hazard analysis, using a risk matrix to guide the evaluation (See Appendix C).

The hazard analysis determined the **critical control points (CCPs)** and **control points (CPs)** in the 7 processes. All **CPs** and **CCPs** are outlined in each of the processes (see Section 3). The **Goods in** & **Metal detection steps** are control points (CPs) common to all processes, so these are outlined separately in Section 3. The hazards associated with the other process steps are fully controlled by the PRPs - these are all listed below in addition to a summary of the CCP and CP steps.

Key: B = Biological (for example, *Salmonella, Listeria monocytogenes,* STEC); C = Chemical (for example, chemical residue, pesticides); P = Physical (for example, foreign bodies); A = Allergen (for example, wheat, mustard)

Step	Hazards				Cause of the hazard	Control measures	Risk rating	CCP/CP
	B	C	P	A				
Cooking *(Process: cooked meat)* The risk posed by the biological hazards at the cooking step was the reason for identifying this step as a critical control point. (CCP).	**Y**	Y	Y	Y	Survival of pathogens due to inadequate time/ temperature combination/oven breakdown Contamination with biological, chemical, physical and allergen hazards due to poor cleaning, inappropriate production scheduling, and poor personal hygiene.	**Staff training and compliance with:** • Cooked meat production – cooking, cooling, and slicing SOP • PRP 1 Premises and structure • PRP 2 Layout and zoning • PRP 4 Product recall and traceability • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**High risk** **(Likelihood pathogens will survive if the control fails = 3)** **(Severity if the hazard is ingested by a vulnerable group = 3)** **(3 x 3 = 9)**	**CCP**
Cooling *(Process: cooked meat, puddings)* The risk posed by the biological hazards at the cooling step was the reason for identifying this step as a critical control point. (CCP).	**Y**	Y	Y	Y	The growth of bacterial spores due to product not brought to a cold enough temperature sufficiently quickly/chill breakdown Contamination with biological, chemical, physical and allergen hazards due to poor cleaning, inappropriate production scheduling, and poor personal hygiene.	**Staff training and compliance with:** • Cooked meat production – cooking, cooling, and slicing SOP • Pudding production SOP • PRP 1 Premises and structure • PRP 2 Layout and zoning • PRP 4 Product recall and traceability • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**High risk** **(Likelihood pathogens will grow if the control fails = 3)** **(Severity if the hazard is ingested by a vulnerable group = 3)** **(P (3) x S (3) = 9)**	**CCP**

Appendix A – Hazard analysis and risk assessment

Key: B = Biological (for example, *Salmonella, Listeria monocytogenes*, STEC); C = Chemical (for example, chemical residue, pesticides); P = Physical (for example, foreign bodies); A = Allergen (for example, wheat, mustard)

Step	Hazards				Cause of the hazard	Control measures	Risk rating	CCP/CP
	B	C	P	A				
Goods inwards *(All processes)* The risk posed by the biological hazards at the goods inwards step was the reason for identifying this step as a control point (CP).	**Y**	Y	Y	Y	Contamination and growth of pathogens of incoming meat (bone-in and boneless) due to poor supplier control/poor intake procedure Presence of chemical, physical and allergen hazards due to poor supplier control.	**Staff training and compliance with:** • Goods inwards SOP • PRP 3 Product storage, distribution and transport • PRP 5 Pest control • PRP 12 Measures to prevent cross-contamination • PRP 13 Purchasing.	**Medium risk**	**CP**
Mincing *(Processes: minced meat, burgers, puddings, sausages)* The risk posed by the biological hazards at the mincing step was the reason for identifying this step as a control point (CP). Note: For burgers it is the mincing step (First mince/Second mince) where dry ingredients that could contain allergens are added (see step in row below for relevant details).	**Y**	Y	Y	Y	Contamination and growth of pathogens due to poor mincing procedure. Contamination with chemical, physical and allergen hazards due to poor cleaning, inappropriate production scheduling, and poor personal hygiene.	**Staff training and compliance with:** • Minced meat production SOP • PRP 1 Premises and structure • PRP 5 Pest control • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**Medium risk**	**CP**
Bowl chopper/Mixing *(Processes: puddings and sausages)* The risk posed by the biological and allergen hazards at the bowl chopper/mixing step was the reason for identifying this step as a control point (CP). Note: For puddings and sausages it is the Bowl chopper/ Mixing step where dry ingredients that could include allergens are added.	**Y**	Y	Y	**Y**	Contamination and growth of pathogens due to poor mixing/bowl chopping procedure. Ingredients list does not include all the allergens intentionally added to the product. Contamination with chemical, physical and allergen hazards due to poor cleaning, inappropriate production scheduling, incorrect use of food additives, and poor personal hygiene.	**Staff training and compliance with:** • Pudding production SOP and Sausage production SOP • PRP 1 Premises and structure • PRP 5 Pest control • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**Medium risk**	**CP**

Appendix A – Hazard analysis and risk assessment

Key: B = Biological (for example, *Salmonella, Listeria monocytogenes*, STEC); C = Chemical (for example, chemical residue, pesticides); P = Physical (for example, foreign bodies); A = Allergen (for example, wheat, mustard)

Step	Hazards				Cause of the hazard	Control measures	Risk rating	CCP/CP
	B	C	P	A				
Brine make up *(Process: cured raw meat)* The risk posed by the chemical hazards at the brine make-up step was the reason for identifying this step as a control point (CP).	Y	**Y**	Y	Y	Chemical contamination caused by excess nitrate and nitrite in finished brine and potentially ending up in finished product due to incorrect weigh up/failure to follow brine make up recipe. Contamination with biological, physical, and allergen hazards due to poor cleaning and poor personal hygiene.	**Staff training and compliance with:** • Cured raw meat production SOP • PRP 1 Premises and structure • PRP 2 Layout and zoning • PRP 7 Cleaning • PRP 8 Utilities and services • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**Medium risk**	**CP**
MAP packing *(Processes: burgers, sausages, minced meat, sliced cooked meat)* The risk posed by the biological hazards at the MAP packing step was the reason for identifying this step as a control point (CP).	**Y**	Y	Y	N	Growth of aerobic bacteria due to poor MAP packing procedure/failure of MAP packing equipment. Contamination with physical and chemical hazards due to poor cleaning, use of incorrect gas mix, poor personal hygiene, and poor maintenance of equipment.	**Staff training and compliance with:** • Cooked meat, burgers, sausages, minced meat SOPs • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination • PRP 13 Purchasing.	**Medium risk**	**CP**
Metal detection *(Optional for all processes)* The risk posed by the physical hazards was the reason for identifying this step as a control point (CP), if it is applicable to the site.	N	N	**Y**	N	Failure or malfunction of the metal detector.	**Staff training and compliance with:** • Metal control/metal detection SOP • PRP 9 Maintenance.	**Medium risk**	**CP**

Appendix A – Hazard analysis (all other process steps)

All hazards identified in the other process steps are controlled by production process SOP training and PRP controls.

Key: B = Biological (for example, *Salmonella, Listeria monocytogenes*, STEC); C = Chemical (for example, chemical residue, pesticides); P = Physical (for example, foreign bodies); A = Allergen (for example, wheat, mustard)

Step	Hazards				Cause of the hazard	Control measures	CCP/CP
	B	C	P	A			
Deboning/cutting/trimming *(Processes: sausages, puddings and slicing, dicing, and marinating of raw meat)*	Y	Y	Y	Y	Contamination of pathogens due to poor deboning/ cutting/trimming procedure. Contamination with biological, physical, and allergen hazards due to poor cleaning and poor personal hygiene .	**Staff training and compliance with:** • Sausage production SOP, Pudding production SOP; Slicing, dicing, and marinating of raw meat production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Slicing and dicing *(Processes: slicing, dicing, and marinating of raw meat)*	Y	Y	Y	Y	Contamination of pathogens due to poor slicing and dicing procedure/poor personal hygiene Contamination with biological, physical, and allergen hazards due to poor cleaning and poor personal hygiene.	**Staff training and compliance with:** • Slicing, dicing, and marinating of raw meat production SOP • PRP 1 Premises and structure • PRP 2 Layout and zoning • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Adding potable water/ice *(Processes: sausages and puddings)*	Y	Y	Y	Y	Contamination of pathogens due to use of non-potable water. Contamination with chemical, physical and allergen hazards due to poor cleaning and poor personal hygiene.	**Staff training and compliance with:** • Sausage production SOP; Pudding production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 8 Utilities and services • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Filling into casings/chubbs *(Processes: sausages and puddings)*	Y	Y	Y	Y	Contamination with biological, chemical, physical and allergen hazards due to poor cleaning, poor personal hygiene, and use of non-food-grade primary packaging (for example, casings/chubbs).	**Staff training and compliance with:** • Sausage production SOP; Pudding production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination • PRP 13 Purchasing.	**No**
Heat treatment *(Process: pudding)* (Pudding is heat treated for quality reasons. It will undergo a full cooking process prior to consumption.)	N	N	Y	N	Packaging may rupture during the heat treatment process.	**Staff training and compliance with:** • Pudding production SOP • PRP 1 Premises and structure.	**No**
Sausage linking *(Process: sausage)*	Y	Y	Y	Y	Contamination of pathogens due to poor sausage linking process/poor personal hygiene. Contamination with chemical, physical and allergen hazards due to poor cleaning, inappropriate production scheduling, and poor personal hygiene.	**Staff training and compliance with:** • Sausage production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**

Appendix A – Hazard analysis (all other process steps)

All hazards identified in the other process steps are controlled by production process SOP training and PRP controls.

Key: B = Biological (for example, *Salmonella, Listeria monocytogenes*, STEC); C = Chemical (for example, chemical residue, pesticides); P = Physical (for example, foreign bodies); A = Allergen (for example, wheat, mustard)

Step	Hazards				Cause of the hazard	Control measures	CCP/CP
	B	C	P	A			
Debagging *(Processes: minced meat and burgers)*	Y	N	Y	N	Contamination of pathogens due to poor debagging procedure/poor personal hygiene. Contamination with physical hazards due to poor personal hygiene.	**Staff training and compliance with:** • Minced meat production SOP; Burger production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 10 Personal hygiene.	**No**
Product collected in food-grade container *(Processes: burgers, sausages, minced meat, and cured raw meat)*	**Y**	Y	Y	Y	Contamination with biological, chemical, physical and allergen hazards due to poor cleaning, poor personal hygiene, use of contaminated liners/containers and use of non-food-grade liners/containers.	**Staff training and compliance with:** • Burger production SOP; Sausage production SOP; Minced meat production SOP; Cured raw meat production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination • PRP 13 Purchasing.	**No**
Bagged/weighed *(Processes: minced meat, and cured raw meat)*	Y	Y	**Y**	Y	Contamination with biological, chemical, physical, and allergen hazards due to poor cleaning, use of non-food-grade bags, poor personal hygiene, and poor bagging/weighing procedure.	**Staff training and compliance with:** • Minced meat production SOP; Cured raw meat production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination • PRP 13 Purchasing.	**No**
Slicing of bulk cooked meat (hand carved or machine sliced) *(Process: cooked meat)*	Y	Y	Y	Y	Contamination of pathogens due to poor slicing procedure/poor personal hygiene Contamination with biological, physical, and allergen hazards due to poor cleaning, poor personal hygiene, and inappropriate production scheduling.	**Staff training and compliance with:** • Cooked meat production – cooking, cooling, and slicing SOP • PRP 1 Premises and structure • PRP 2 Layout and zoning • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Vacuum packing *(Processes: burgers, minced meat, slicing, dicing, and marinating of raw meat, cooked meat, and cured raw meat)*	Y	Y	Y	Y	Contamination of pathogens due to poor vacuum packing procedure/poor personal hygiene. Contamination with physical, chemical, and allergen hazards due to poor cleaning, use of non-food-grade packaging, poor personal hygiene, and inappropriate production scheduling.	**Staff training and compliance with:** • Burger production SOP; Minced meat production SOP; Slicing, dicing, and marinating of raw meat production SOP; Cooked meat production – cooking, cooling, and slicing SOP; Cured raw meat production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination • PRP 13 Purchasing.	**No**

Appendix A – Hazard analysis (all other process steps)

Key: B = Biological (for example, *Salmonella, Listeria monocytogenes*, STEC); C = Chemical (for example, chemical residue, pesticides); P = Physical (for example, foreign bodies); A = Allergen (for example, wheat, mustard)

Step	Hazards				Cause of the hazard	Control measures	CCP/CP
	B	C	P	A			
Weigh up each ingredient *(Process: Cured raw meat)*	Y	Y	Y	Y	Contamination of pathogens due to poor weighing procedure/poor personal hygiene. Contamination with physical, chemical, and allergen hazards due to poor cleaning and poor personal hygiene.	**Staff training and compliance with:** • Cured raw meat production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Dry Curing *(Process: Cured raw meat)*	Y	Y	Y	Y	Contamination with biological, physical, chemical, and allergen hazards due to poor dry curing procedure/poor personal hygiene and poor cleaning.	**Staff training and compliance with:** • Cured raw meat production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Injection/Tumbling *(Process: Cured raw meat)*	Y	Y	Y	Y	Chemical contamination caused by excess nitrate and nitrite due to poor injection/tumbling procedure. Growth of pathogens and spoilage bacteria in meat due to poor injection/tumbling procedure. Contamination with physical, and allergen hazards due to damaged equipment, poor cleaning, and poor personal hygiene.	**Staff training and compliance with:** • Cured raw meat production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 8 Utilities and services • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Meat weighed before and after injection/ tumbling *(Process: Cured raw meat)*	Y	N	Y	N	Contamination of pathogens due to poor weighing procedure/poor personal hygiene. Contamination with physical hazards due to poor cleaning and poor personal hygiene.	**Staff training and compliance with:** • Cured raw meat production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Curing for the required period *(Process: cured raw meat)*	Y	Y	Y	N	Growth of pathogens and spoilage bacteria in meat due to incorrect storage time in brine. Contamination with physical, hazards due to poor maintenance of equipment. Chemical contamination caused by excess nitrate and nitrite in brine.	**Staff training and compliance with:** • Cured raw meat production SOP • PRP 1 Premises and structure • PRP 3 Product storage, distribution and transport • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Draining *(Process: cured raw meat)*	Y	N	Y	N	Contamination with biological and physical hazards due to poor personal hygiene/poor maintenance.	**Staff training and compliance with:** • Cured raw meat production SOP • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 10 Personal hygiene.	**No**

Appendix A – Hazard analysis (all other process steps)

Key: B = Biological (for example, *Salmonella, Listeria monocytogenes*, STEC); C = Chemical (for example, chemical residue, pesticides); P = Physical (for example, foreign bodies); A = Allergen (for example, wheat, mustard)

Step	Hazards				Cause of the hazard	Control measures	CCP/CP
	B	C	P	A			
Burger former *(Process: burgers)*	Y	Y	Y	Y	Contamination of pathogens due to poor burger forming procedure/poor personal hygiene. Contamination with chemical, physical and allergen hazards due to poor cleaning, inappropriate production scheduling, and poor personal hygiene.	**Staff training and compliance with:** • Burger production SOP • PRP 1 Premises and structure • PRP 7 Cleaning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Raw meat preparation *(Process: cooked meat)*	Y	Y	Y	Y	Contamination with biological, physical, chemical, and allergen hazards due to poor cleaning, poor segregation, poor maintenance, poor personal hygiene, and inappropriate production scheduling.	**Staff training and compliance with:** • Cooked meat production – cooking, cooling, and slicing SOP • PRP 1 Premises and structure • PRP 2 Layout and zoning • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Load raw meat products into the oven *(Process: cooked meat)*	N	N	Y	N	Contamination with physical hazards due to poor maintenance of plant and equipment.	**Staff training and compliance with:** • Cooked meat production – cooking, cooling, and slicing SOP • PRP 1 Premises and structure • PRP 9 Maintenance.	**No**
Product inspection and weighing *(Processes: slicing, dicing, and marinating of raw meat)*	Y	Y	Y	Y	Contamination with biological, physical, chemical, and allergen hazards due to poor cleaning, poor segregation, and poor personal hygiene.	**Staff training and compliance with:** • Slicing, dicing, and marinating production SOP • PRP 1 Premises and structure • PRP 2 Layout and zoning • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Addition of marinades/glaze/crumb *(Processes: slicing, dicing, and marinating of raw meat, cooked meat)*	Y	Y	Y	Y	Contamination with biological, physical, chemical, and allergen hazards due to poor marinating procedure and poor personal hygiene.	Staff training and compliance with: • Slicing, dicing, and marinating of raw meat production SOP; Cooked meat production – cooking, cooling, and slicing SOP • PRP 1 Premises and structure • PRP 2 Layout and zoning • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**

Appendix A – Hazard analysis (all other process steps)

Key: B = Biological (for example, *Salmonella, Listeria monocytogenes*, STEC); C = Chemical (for example, chemical residue, pesticides); P = Physical (for example, foreign bodies); A = Allergen (for example, wheat, mustard)

Step	Hazards				Cause of the hazard	Control measures	CCP/CP
	B	C	P	A			
Chilled storage *(All processes)*	Y	Y	Y	Y	Growth of pathogens and chemical contamination (refrigerant gas) due to chill/refrigeration breakdown. Contamination of physical hazards from equipment due to poor preventive maintenance management. Contamination of allergen hazards due to poor zoning, poor storage control and spillages.	**Staff training and compliance with:** • All production process SOPs • PRP 1 Premises and structure • PRP 2 Layout and zoning • PRP 3 Product storage, distribution and transport • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Frozen storage *(Processes: slicing, dicing, and marinating of raw meat, cooked meat, sausages, puddings)*	Y	Y	Y	N	Growth of pathogens and chemical contamination (refrigerant gas) due to chill/refrigeration breakdown Contamination of physical hazards from equipment due to poor preventive maintenance management.	**Staff training and compliance with:** • Slicing, dicing, and marinating of raw meat production SOP; Cooked meat production – cooking, cooling, and slicing SOP; Sausage production SOP; Pudding production SOP; and Cured raw meat production SOP • PRP 1 Premises and structure • PRP 3 Product storage, distribution and transport • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene.	**No**
Ambient storage *(All processes)*	N	Y	Y	Y	Contamination with physical, chemical, and allergen hazards due to poor pest control, poor cleaning, poor segregation, and poor personal hygiene.	**Staff training and compliance with:** • All production process SOPs • PRP 1 Premises and structure • PRP 2 Layout and zoning • PRP 3 Product storage, distribution and transport • PRP 5 Pest control • PRP 7 Cleaning • PRP 9 Maintenance • PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.	**No**
Labelling *(All processes)*	N	N	N	Y	Allergen cross-contamination due to poor labelling procedure. Selection of incorrect labels prior to label application.	**Staff training and compliance with:** • All production process SOPs • PRP 16 Labelling and product information.	**No**
Order picking and packing *(All processes)*	N	N	Y	N	Physical contamination due to poor order picking and packing procedure.	**Staff training and compliance with:** • All process SOPs • PRP 10 Personal hygiene.	**No**
Delivery to the customer *(All processes)*	Y	Y	Y	N	Growth of pathogens due to the vehicle refrigeration unit not being set to the required temperature setting at dispatch, and vehicle breakdown. Chemical contamination (refrigerant gas) due to vehicle breakdown Contamination of physical hazards from equipment due to poor vehicle management.	**Staff training and compliance with:** • All production process SOPs • PRP 3 Product storage, distribution and transport.	**No**

Appendix B – Other processes

Introduction

This section provides information for the FBO to develop a HACCP plan for any additional processes carried out, i.e. products other than those described in Section 3 of this FSMS guide. Examples of processes where the FBO would need to develop their own HACCP plan include smoked meats and fermented meat products. Examples of documentation that can be used to develop a HACCP plan for these processes are in this appendix and blank record templates are provided in Section 4 – Records.

It is important that the FBO identifies all of the hazards associated with the other processes to ensure control of these hazards and the production of safe food.

Implementation of the HACCP plan

The 12 Codex steps and 7 HACCP principles listed in Table 17 should be followed when developing a HACCP plan (see Section 3 of this guide). The risk methodology used, including the use of a decision tree, is detailed in Appendix C. This appendix details how the expert working group (the HACCP team) developed the HACCP plan for the seven production processes covered in this FSMS. Following the information set out in Section 3 and Appendix C in this guide will assist with the development of a HACCP plan for any other process not covered in this guide.

The FSAI website (www.fsai.ie) has additional information/guidance on processes that can be used when the FBO is developing a HACCP plan for a process not included in this guide. For example, the FSAI's **Guidance Note 33: Good Manufacturing Practices for the Production of Ready-to-eat Raw Fermented Meat Products**.

Table 17 The 12 Codex steps and the 7 HACCP principles

	Step sequence	Codex step/HACCP principle
1	Assemble a food safety (HACCP) team	Codex step 1
2	Describe the products	Codex step 2
3	State their intended use	Codex step 3
4	Create a flow diagram	Codex step 4
5	Verify the accuracy of the flow diagram	Codex step 5
6	Carry out a **hazard analysis** by identifying and listing all potential hazards and measures to control these.	**Principle 1** Codex step 6
7	Identify the **critical control points (CCPs)**	**Principle 2** Codex step 7
8	Establish the **critical limits** for each CCP	**Principle 3** Codex step 8
9	Establish a procedure for **monitoring** each CCP	**Principle 4** Codex step 9
10	Establish procedures for **corrective action**	**Principle 5** Codex step 10
11	Identify procedures for **verification** that the HACCP plan is being complied with.	**Principle 6** Codex step 11
12	Establish **documentation** and a system for keeping food safety management records.	**Principle 7** Codex step 12

HACCP team

As stated in Section 1 - Management commitment, the FBO is directly responsible for food safety in the food business and must complete and sign the Food Safety Management System Declaration Form. This confirms that the FBO is applying the guide in the food business and if any other food manufacturing-related activity other than the activities described in this FSMS guide are being carried out, the FBO must develop procedures based on HACCP principles for that activity. This means that a HACCP team should be in place who are responsible for ensuring that the HACCP system is effectively implemented and verified within the business. Those responsible for the development and maintenance of the HACCP system must have received adequate training in the application of HACCP principles.

Sample – HACCP team record

HACCP team record for: _____ (insert food business name)

Date: _____

Name of team member	Job role	Experience/Training

Product description

There should be a documented product description in place for each product or group of products with similar biological, chemical, physical and allergen characteristics. The description should include the products within the process, their distribution, their intended use, and potential customers. This step helps to ensure that all areas of concern are addressed.

Intended use of the product

The intended use of the product should be documented and consider the following.

- The end user or consumer
- The suitability of the product for vulnerable groups (for example, people who are ill, the elderly, allergy sufferers).
- Handling and preparation (i.e. further cooking required.)
- Storage requirements (i.e. frozen, chill, ambient, etc.)
- Product shelf-life once opened.

The information set out in Table 18 can be used to complete the product description and intended use of the product/group of products. See Section 4 – Record 20 for a copy of the product description and intended use template.

Table 18 Product description and intended use

Product description and intended use for _____(insert product name) **Scope:**	
Product name	
Product composition (raw materials, ingredients, recipe)	
Origin of meat	
Physical or chemical properties (for example, water activity)	
Treatment and processing (curing, freezing, etc.)	
Preservation factors	
Type of packaging used	
Labelling requirements relating to food safety	
Storage and distribution conditions	
Shelf-life under stated conditions	
Vulnerable groups	
Intended use of the product	

Process flow diagram and verification

All steps involved in the process, ranging from receiving the raw materials to dispatch of finished product, should be studied in sequence and presented in a detailed process flow diagram. See Section 3 – HACCP for more information on details that should be included in the process flow diagram. The accuracy of the process flow diagram must be verified. This is typically done by going through the process step by step on the premises floor and signing and dating the process flow diagram to confirm its accuracy. See Section 4 – Record 22 for a copy of the Process flow diagram template.

Hazard analysis and risk assessment

Conduct a hazard analysis and risk assessment on the process by identifying and listing all potential hazards and measures put in place to control the hazards identified. See Appendix C for more information on the methodology used.

Hazard control plan

The Hazard control plan details the 7 HACCP principles to be applied to key process steps. See Section 4 – Record 18 for a copy of the Hazard control plan template.

Appendix C – Methodology

Hazard analysis including risk assessment

The expert working group (the HACCP team) has carried out an FSMS hazard analysis which covers the various processes detailed in this guide.

Hazard analysis

The expert working group (the HACCP team) has identified and documented the food safety hazards that are reasonably expected to occur in relation to the type of product, type of process, and process environment.

All significant potential biological, chemical, physical and allergen hazards that may be reasonably expected to occur at each process step (including purchasing, production, storage, transport and distribution, handling of raw materials and ingredients, as well as delays during production) are identified and listed.

In conducting a hazard analysis, the expert working group (the HACCP team) considered the following:

1. The likelihood of occurrence of the hazards assuming the failure of controls in place at the step and the severity of their adverse health effects (See Table 19 and Table 20.)
2. The quantitative risk rating of the presence of hazards. See Table 21 for the risk matrix that was used to conduct a risk assessment for each hazard identified.
3. The survival or multiplication of microorganisms and unacceptable generation of chemicals in intermediate products, end products or production lines.
4. The production or persistence in foods of toxins or other undesirable products of microbial metabolism, chemicals, or physical agents or allergens.
5. The contamination (or recontamination) of a biological nature (for example, microorganisms, parasites) or of a chemical, physical or allergen nature, of raw materials, intermediate products or end products.

Hazards were considered in sufficient detail to enable hazard assessment and the selection of appropriate control measures at each step.

Control measures

The expert working group (the HACCP team) considered and described what control measures, if any, could be applied for each hazard. Control measures are the actions and activities that can be used to prevent hazards, eliminate them, or reduce their impact or likelihood of occurrence to acceptable levels. Many preventive control measures are part of the PRPs and are intended to prevent contamination from the production environment (for example, personal hygiene, pest control, and maintenance). Other control measures aimed at reduction or elimination of hazards are more specifically linked to particular processes (for example, cooking or cooling) and may result in the establishment of CCPs (Critical Control Points) or CPs (Control Points).

Risk assessment

The expert working group (the HACCP team) has carried out the risk assessments for every hazard identified per process step in each of the seven production processes covered in this FSMS. The risk assessment on the relevant hazard identified at each step in the relevant process was conducted assuming the failure of the controls in place. When carrying out the risk assessments the following were considered:

- The likelihood of the hazard occurring in the end product, assuming the failure of the controls in place, after the controls have been applied to manage the relevant hazard identified at each step.
- The severity of its adverse health effects in relation to the intended use of the product and assuming that the hazard is ingested by a vulnerable group (assuming the controls fail).

Risk assessment methodology

A quantitative analysis approach to risk assessment was used by the expert working group (the HACCP team) and applied to hazards identified at every process step. A 'likelihood x severity' risk matrix was used in Tables 19 to 21 to describe the likelihood and severity of the risk associated with each hazard.

Scoring system

With this approach, a rating is assigned that best represents the likelihood of the hazard identified occurring assuming control failure at the relevant process step. A rating is also assigned that best represents the severity of the relevant hazard identified if it is ingested by a vulnerable group; the ratings are multiplied together to denote the significance of the hazard. This risk assessment is the worst-case scenario. All decisions taken in relation to whether a step is a CCP or not must be based on risk.

Table 19 and Table 20 show the quantitative likelihood and severity of the risks associated with the hazards.

Table 19: Defining the three levels of likelihood of hazard occurrence in the final product.

Likelihood rating	Definition
High: 3	Due to the failure of a specific control measure, there is a high likelihood of this hazard occurring in the end product (i.e. frequent).
Medium: 2	Due to the failure of a specific control measure, this hazard can be present in a certain percentage of the end product (i.e. not frequent).
Low: 1	There is a very limited likelihood of this hazard occurring in the end product (i.e. rare).

Level of likelihood of the hazard occurring assuming control failure.

Table 20: Defining the three levels of hazard severity if ingested.

Severity rating	Definition
High: 3	The consumer group belongs to a risk category and the hazard can result in serious symptoms, including permanent injury and mortality.
Medium: 2	The hazard can result in short-term or long-term effects, which rarely result in mortality.
Low: 1	The hazard does not cause serious injuries and/or symptoms. The effects on health are negligible to mild.

Level of severity if the hazard is ingested by a vulnerable group.

Table 21: Calculation of the risk rating using a 3 × 3 risk matrix (likelihood x severity) model to determine the level of risk associated with hazards.

Level of likelihood	Level of severity		
	Negligible (1)	**Moderate (2)**	**Significant (3)**
High: 3	Medium risk (3)	High risk (6)	High risk (9)
Medium: 2	Low risk (2)	Medium risk (4)	High risk (6)
Low: 1	Low risk (1)	Low risk (2)	Medium risk (3)

Risk Rating: Low risk = ≤2 (Green); Medium risk = 3-4 (Orange); High risk = ≥5 (Red).

Identification of a Critical Control Point (CCP) or a Control point (CP)

The key steps identified for each manufacturing process are categorised into two categories based on risk (CCP or CP).

A CCP is defined as a step at which control can be applied. It is essential in order to prevent or eliminate a food safety hazard or reduce it to an acceptable level. At this step, there must be a measurable critical limit.

A CP is defined as a point or step in the production process identified by the hazard analysis as essential in order to control the likelihood of the introduction, survival and/or proliferation of food safety hazards.

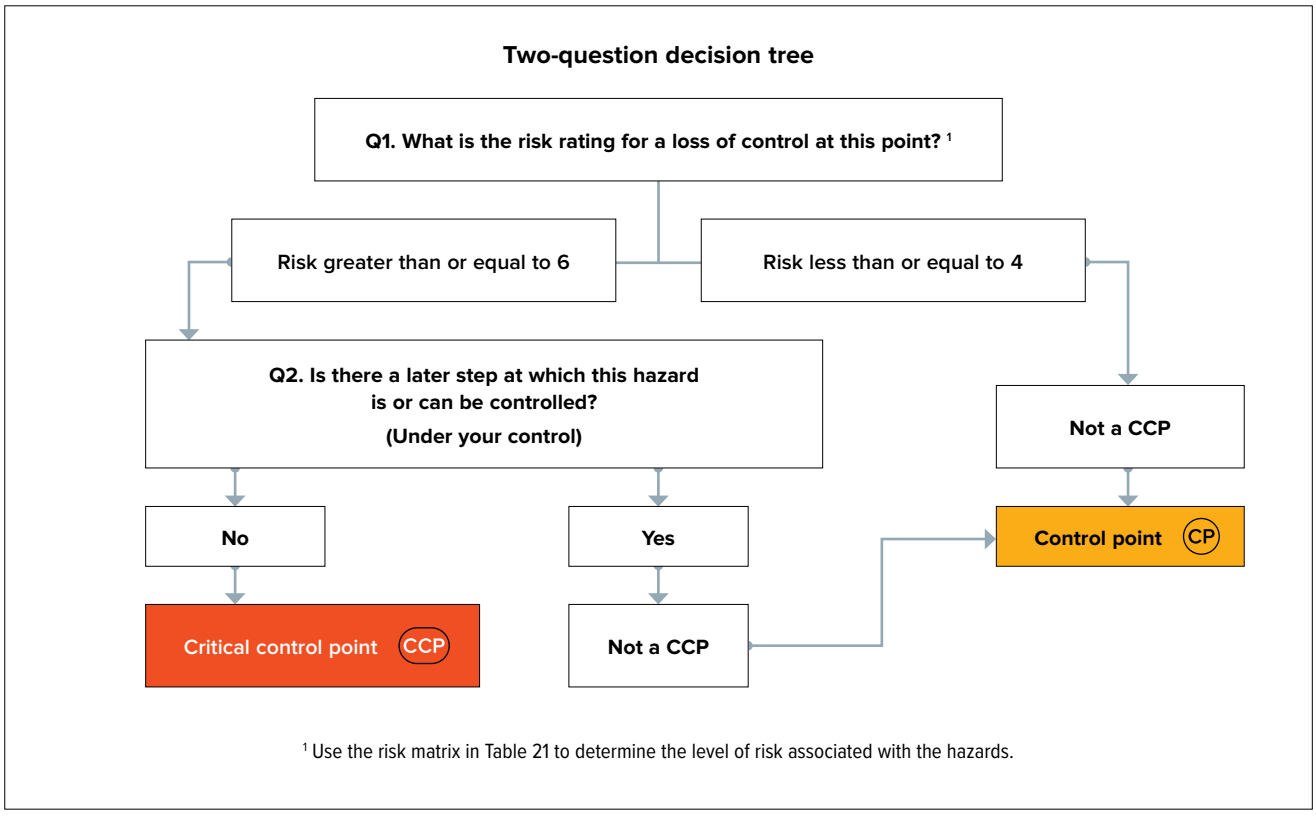
If one or more hazards have been identified at a step where control is necessary for safety, then this step may be a CCP. The identification of a CCP requires a logical approach. Such an approach can be facilitated using a decision tree (see Figure 8) and a risk matrix (see Table 21) according to the expertise of the HACCP team.

If one or more hazards have been identified at a step where control is necessary for safety, but this step is not identified as a CCP, it may be identified as a CP. Again, a logical approach is used to identify a CP.

The risk rating calculated using the 3 x 3 risk matrix detailed in Table 21 is used to determine whether one or more hazards identified at a step where control is necessary for safety should be a CCP or a CP by using the decision tree shown in Figure 8 to facilitate this process. Hazards not fully controlled by the PRP are appropriate to be put through the two-question decision tree. Hazards that are fully controlled by the PRP are not suitable to be put through the two-question decision tree.

Hazards achieving a risk rating of ≤4 are not deemed to pose a realistic risk of illness or injury when put through Question 1 in the two-question decision tree shown in Figure 8. Hazards achieving a risk rating of ≥5 or higher are deemed to pose a more realistic risk of illness or injury at Question 1. You can then proceed to Question 2 to determine whether the hazard at the step will result in the step becoming a CCP or a CP.

Figure 8 Two-question decision tree
To determine whether one or more hazards identified at a step where control is necessary for safety should be a CCP or a CP.



[1] Use the risk matrix in Table 21 to determine the level of risk associated with the hazards.

Hazard control plan

A hazard control plan has been developed within the scope of this FSMS guide for each manufacturing process assessed in the guide (see Appendix A and Appendix D for the mincing process). The hazard control plan details how the 7 HACCP principles have been applied to each CCP or CP. The decision tree shown in Figure 8 was used by the expert working group (the HACCP team) to determine the CCPs and CPs provided. The hazard control plan also documents each manufacturing process assessed in the guide (See Section 3 – HACCP for more information). Each hazard control plan was developed based on the 12 Codex steps and the 7 HACCP principles.

Appendix D – Minced meat hazard analysis and risk assessment

Process hazard analysis

Process: Production of minced meat									
Step 1: Goods inwards			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • Contamination of pathogens • Growth of pathogens.	• Poor intake procedure • Poor supplier control.	• Management of purchased materials • All chilled and frozen product is inspected as per the Goods inwards SOP.	Med 2 Med 2	Mod 2 Mod 2	**Med** **4** **Med** **4**	– No	– –	– No	• PRP 13 Purchasing • Control point (CP) Goods inwards.
Chemical hazards Chemical contamination.	• Poor supplier control • Spillage in transit.	• Purchase from listed suppliers only • Delivery vehicle is inspected to ensure no chemical contamination of product as per Goods inwards SOP.	Med 2 Med 2	Mod 2 Mod 2	**Med** **4** **Med** **4**	– –	– –	– –	• Goods inwards SOP • PRP 3 Product storage, distribution and transport • PRP 13 Purchasing.
Physical hazards • People • Pests.	• Poor personal hygiene • Poor supplier control.	• Personal hygiene training • Purchase from listed suppliers only.	Med 2 Med 2	Mod 2 Mod 2	**Med** **4** **Med** **4**	– –	– –	– –	• PRP 10 Personal hygiene • PRP 5 Pest control.
Allergen hazard • Allergen cross-contamination.	• Poor supplier control • Spillage in transit.	• Personal hygiene/allergen awareness training • Purchase from listed suppliers only.	Med 2	Sig 2	**High** **4**	– –	– –		• PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination • PRP 13 Purchasing.

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Step 2 and 11: Chill storage			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • Growth of pathogens.	• Chill/refrigeration breakdown.	• Preventive maintenance • All chilled product is stored as per PRP 3 Product storage, distribution and transport.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 9 Maintenance • PRP 3 Product storage, distribution and transport.
Chemical hazards • Refrigerant gas.	• Chill/refrigeration breakdown.	• Preventive maintenance • Management of purchased materials.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 9 Maintenance • PRP 13 Purchasing.
Physical hazards • Equipment.	• Poor preventive maintenance management.	• Preventive maintenance.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 9 Maintenance.
Allergen hazards • Allergen cross-contamination.	• Poor storage control • Spillage in storage/ burst bags • Poor zoning.	• Personal hygiene/allergen awareness training • Zoning procedure followed in storage.	Med 2	Sig 3	**High** **6**	–	–	–	• PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Step 2A: ambient storage			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • None identified.									
Chemical hazards Chemical contamination.	• Spillage of chemicals • Poor segregation of chemicals and food.	• All ambient product is stored as per PRP 3 Product storage, distribution and transport.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 3 Product storage, distribution and transport.
Physical hazards • People • Pests.	• Poor personal hygiene • Poor pest control.	• Personal hygiene training • Pest control programme • All ambient product is stored appropriately.	Med 2 Med 2	Mod 2 Mod 2	**Med** **4** **Med** **4**	–	–	–	• PRP 10 Personal hygiene • PRP 5 Pest control • PRP 3 Product storage, distribution and transport.
Allergen hazards • Allergen cross-contamination.	• Poor storage control • Spillage in storage/ burst bags • Poor zoning.	• Personal hygiene/allergen awareness training • Zoning procedure followed in storage.	Med 2	Sig 3	**High** **6**	–	–	–	• PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination.

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Step 3: debagging			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • Contamination of pathogens.	• Poor debagging.	• Training of the operator in the Minced meat production SOP.	Med 2	Mod 2	**Med** **4**	N	–	–	• Minced meat production SOP.
Chemical hazards • None identified.									
Physical hazards • People.	• Poor personal hygiene.	• Personal hygiene training.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 10 Personal hygiene.
Allergen hazards • None identified.									

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Steps 4 and 6: mincing (first and/or second mince)			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • Contamination of pathogens • Growth of pathogens.	• Poor personal hygiene • Poor mincing procedure.	• Personal hygiene training • All product is minced as per the Minced meat production SOP.	Med 2 Med 2	Mod 2 Mod 2	**Med** **4** **Med** **4**	– N	– –	– N	• PRP 10 Personal hygiene • Control point (CP) First mince/ Second mince.
Chemical hazards • Chemical contamination.	• Incorrect use of cleaning chemicals • Using non-food-grade cleaning chemicals • Using non-food-grade equipment.	• Cleaning as per PRP • Purchase from listed suppliers only • Minced meat production SOP training.	Med 2 Med 2	Mod 2 Mod 2	**Med** **4** **Med** **4**	– –	– –	– –	• Minced meat production SOP • PRP 7 Cleaning • PRP 13 Purchasing.
Physical hazards • People • Foreign bodies.	• Poor personal hygiene.	• Personal hygiene training • Purchase from listed suppliers only.	Med 2 Med 2	Mod 2 Mod 2	**Med** **4** **Med** **4**	– –	– –	– –	• PRP 10 Personal hygiene • PRP 13 Purchasing.
Allergen hazards • Allergen cross-contamination.	• Poor cleaning control.	• Personal hygiene/allergen awareness training • Cleaning as per PRP.	Med 2	Sig 2	**High** **6**	–	–	–	• PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning.

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Steps 5 and 7: product collected and placed in food-grade container			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • Contamination of pathogens.	• Use of contaminated liners/ crates.	• Training of the operator in the Minced meat production SOP.	Med 2	Mod 2	**Med** **4**	N	–	N	• Minced meat production SOP.
Chemical hazards • Migration/taint from liner.	• Use of non-food-grade liners.	• Purchase food-grade packaging from listed suppliers only.	Med 2	Mod 1	**Low** **2**	–	–	–	• PRP 13 Purchasing.
Physical hazards • People.	• Poor personal hygiene.	• Personal hygiene training.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 10 Personal hygiene.
Allergen hazards • None identified.									

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Step 8: bagging/weighing			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • Contamination of pathogens.	• Poor packing or labelling procedure.	• Training of the operator in the Minced meat production SOP.	Med 2	Mod 2	**Med** **4**	N	–	N	• Minced meat production SOP.
Chemical hazards • None identified.									
Physical hazards • People	• Poor personal hygiene.	• Personal hygiene training.	Med 2	Mod 2	**Med** **4**	– –	– –	– –	• PRP 10 Personal hygiene.
Allergen hazards • Allergen cross-contamination.	• Poor bagging/weighing control procedure • Poor cleaning practice • Poor zoning.	• Personal hygiene/allergen awareness training • Cleaning as per PRP • Production scheduling and zoning procedure followed in production to prevent cross-contamination.	Med 2	Sig 3	**High** **6**	–	–	–	• PRP 10 Personal hygiene • PRP 12 Measures to prevent cross-contamination • PRP 7 Cleaning.

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Step 9: vacuum packing			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • Contamination of pathogens.	• Poor vacuum packing procedure.	• Training of the operator in the Minced meat production SOP.	Med 2	Mod 2	**Med** **4**	N	–	N	• Minced meat production SOP.
Chemical hazards • Migration/taint from vacuum-pack bag.	• Use of non-food-grade bags.	• Purchase food-grade packaging from listed suppliers only.	Med 2	Mod 1	**Low** **2**	–	–	–	• PRP 13 Purchasing.
Physical hazards • People.	• Poor personal hygiene.	• Personal hygiene training.	Med 2	Mod 2	**Med** **4**	– –	– –	– –	• PRP 10 Personal hygiene.
Allergen hazards • None identified.									

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Step 9: MAP packing			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • Contamination of pathogens.	• Growth of aerobic bacteria in product due to poor MAP packing procedure.	• Training of the operator in the Minced meat production SOP, with regard to modified atmosphere packaging procedure in order to ensure that the product achieves the stated shelf-life on the MAP packed product.	Med 2	Mod 2	**Med** **4**	N	–	N	• Minced meat production SOP • Control point (CP) MAP packing.
Chemical hazards • Chemical taint.	• Use of incorrect gas mix and taint from MAP packaging.	• Minced meat production SOP with regard to modified atmosphere packaging procedure in order to ensure that the product achieves the stated shelf-life on the MAP packed product • Purchasing of correct gas and use of food-grade packaging.	Med 2	Mod 2	**Med** **4**	N	–	N	• Minced meat production SOP • PRP 13 Purchasing.
Physical hazards • Physical contamination.	• Poor personal hygiene • Equipment (for example, condition of MAP packing equipment).	• Personal hygiene training • Cleaning and maintenance of equipment as per PRPs.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 10 Personal hygiene • PRP 1 Premises and structure • PRP 9 Maintenance • PRP 7 Cleaning.
Allergen hazards • None identified.									

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Step 9A: metal detection			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • None identified.									
Chemical hazards • None identified.									
Physical hazards • Metal passing through undetected.	• Malfunction of the metal detector.	• Maintenance • Calibration • Supply of utilities • Design • Training of the operator in the Metal control/metal detection SOP.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 9 Maintenance • PRP 8 Utilities and services • PRP 13 Purchasing • Control point (CP) Metal detection • Metal control/metal detection SOP.
Allergen hazards • None identified.									

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Step 10: labelling			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • None identified.									
Chemical hazards • None identified.									
Physical hazards • None identified.									
Allergen hazards • Label does not include all the allergens in the product • Allergen cross-contamination.	• Poor labelling procedure • Selection of incorrect labels prior to label application.	• All packaged product is labelled as per PRP 16 Labelling and product information.	Med 2	Sig 3	**High** **6**	–	–	N	• PRP 16 Labelling and product information.

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Steps 12: order picking and packing			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • Growth of pathogens.	• Poor order picking and packing procedure • Poor stock rotation.	• Training of the operator in the Minced meat production SOP.	Med 2	Mod 2	**Med** **4**	N	–	N	• Minced meat production SOP.
Chemical hazards • None identified.									
Physical hazards • People.	• Poor personal hygiene.	• Personal hygiene training.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 10 Personal hygiene.
Allergen hazards • None identified.									

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Process hazard analysis

Process: Production of minced meat									
Step 13: dispatch and delivery			**Risk assessment**			***Decision tree**			
Hazard	**Cause**	**Control measure**	**Likelihood**	**Severity**	**Risk**	**Q 1**	**Q 2**	**CCP Yes/No**	**Nature of the control measure**
Biological hazards • Growth of pathogens.	• Vehicle breakdown • Vehicle refrigeration is not set to the required temperature setting at dispatch.	• Follow vehicle breakdown procedure PRPs • All chilled product is dispatched and delivered as per PRP 3 Product, storage, distribution and transport.	Med 2	Mod 2	**Med** **4**	–	–	N	• PRP 3 Product, storage, distribution and transport.
Chemical hazards • Refrigerant gas.	• Chill/refrigeration breakdown.	• Maintenance of vehicle as per PRP 3 Product storage, distribution and transport.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 3 Product, storage, distribution and transport
Physical hazards • Equipment.	• Poor vehicle management.	• Maintenance of vehicle as per PRP 3 Product, storage, distribution and transport.	Med 2	Mod 2	**Med** **4**	–	–	–	• PRP 3 Product, storage, distribution and transport.
Allergen hazards • None identified.									

***Hazards that are fully controlled by the prerequisites (PRPs) were not put through the two-question decision tree.**

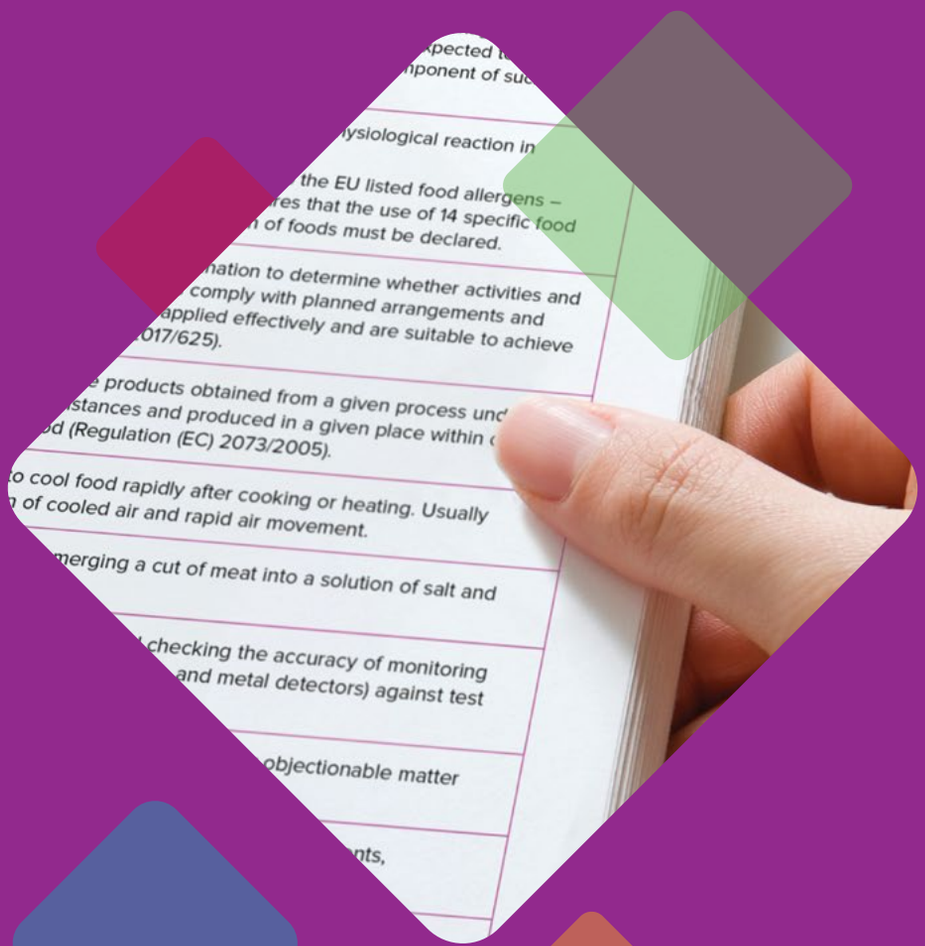
Key: Risk assessment (see 3x3 matrix). Risk (Low, Medium, High).

Likelihood = Likelihood of the hazard occurring if the control fails (1 = Low; 2 = Medium; 3 = High)

Severity = Severity of the hazard if ingested by the consumer (1 = Negligible; 2 = Moderate; 3 = Significant)

Risk = Risk rating ranging between 1 and 9

Glossary


ysiological reaction in
the EU listed food allergens –
of foods must be declared.
products obtained from a given process und
(Regulation (EC) 2073/2005).
of cooled air and rapid air movement.
checking the accuracy of monitoring
and metal detectors) against test
objectionable matter

Glossary

Term	Definition
Acceptable level	A level of hazard in a food at or below which the food is considered to be safe according to its intended use (Commission Notice 2022/C 355/01).
Additive	Any substance not normally consumed as a food in itself and not normally used as a characteristic ingredient of food, whether or not it has nutritive value, the intentional addition of which to food for a technological purpose in the manufacture, processing, preparation, treatment, packaging, transport or storage of such food results, or may be reasonably expected to result, in it or its by-products becoming directly or indirectly a component of such foods (Regulation (EC) 1333/2008).
Allergens	A substance present in food that may cause a physiological reaction in consumers who are hypersensitive to it. Reference to allergens in this guide refers to the EU listed food allergens – see www.fsai.ie. Regulation 1169/2011 requires that the use of 14 specific food allergens in the production or preparation of foods must be declared.
Audit	A systematic and independent examination to determine whether activities and the related results of such activities comply with planned arrangements and whether these arrangements are applied effectively and are suitable to achieve the objectives (Regulation (EU)2017/625).
Batch	A group or set of identifiable products obtained from a given process under practically identical circumstances and produced in a given place within one defined production period (Regulation (EC) 2073/2005).
Blast chiller	Equipment designed to cool food rapidly after cooking or heating. Usually employs a combination of cooled air and rapid air movement.
Brining	Brining is the process of submerging a cut of meat into a solution of salt and water.
Calibration	Calibration is a process of adjusting and checking the accuracy of monitoring devices (for example, thermometers, scales, and metal detectors) against test equipment traceable to national standards.
Cleaning	The removal of soil, food residues, dirt, grease or other objectionable matter (Codex CXC 1-1969).
Cleaning Agents	Chemicals used to aid the cleaning process. These can be detergents, disinfectants, and sanitisers.
Codex	The Codex Alimentarius is a collection of standards, guidelines and codes of practice adopted by the Codex Alimentarius Commission under the Joint FAO/WHO Food Standards Programme. The Codex document referred to in this guide is 'General Principles of Food Hygiene CXC 1-1969' Adopted in 1969. Amended in 1999. Revised in 1997, 2003, 2020. Editorial corrections in 2011.

Term	Definition
Cold chain	A cold chain is a temperature-controlled supply chain. An unbroken cold chain is an uninterrupted series of storage and distribution activities that maintain a given temperature range. Refrigerators, freezers, blast chillers, cold rooms, and refrigerated transport are used to help maintain the cold chain to ensure food safety and food quality.
Competent authority	The central authorities of a Member State responsible for the organisation of official controls and of other official activities, or any other authority to which that responsibility has been conferred; and where appropriate the corresponding authorities of a third country (Regulation (EC) 852/2004).
Contamination	The presence or introduction of a hazard (Regulation (EU) 852/2004).
Control measures	Any action or activity that can be used to prevent or eliminate a hazard or reduce it to an acceptable level (Commission Notice 2022/C 355/01).
Corrective action	Any action taken when a deviation occurs in order to re-establish control, segregate and determine the disposition of the affected product if any and prevent or minimise reoccurrence of the deviation (Commission Notice 2022/C 355/01).
Country of origin	The origin or the source of food or raw material.
Control point (CP)	A point or step in the production process identified by the hazard analysis as essential in order to control the likelihood of the introduction, survival and/or proliferation of food safety hazards. A control point can also be referred to as OPRP (operational pre-requisite programme).
Critical control point (CCP)	A step at which a control measure or control measures, essential to control a significant hazard, is/are applied in a HACCP system (Commission Notice 2022/C 355/01).
Critical limit	A criterion, observable or measurable, relating to a control measure at a CCP which separates acceptability from unacceptability of the food (Commission Notice 2022/C 355/01).
Cross-contamination	The four types of hazards can be accidentally transferred from items, people, food and surfaces onto other items, food, and surfaces. For example, harmful bacteria are accidentally transferred from raw food to ready-to-eat food, or a food allergen gets into another food accidentally during manufacturing or food preparation.
Cutting plant	Establishment used for boning and/or cutting up meat (Regulation (EC) 853/2004).
Declaration of compliance (DoC)	A written declaration required for certain food contact materials like plastics, stating that they comply with the rules applicable to them. A DoC must contain the information laid down in legislation and must permit an easy identification of the materials, articles or products for which it is issued.
Detergents	Chemicals that remove dirt (They do not kill bacteria).
Disinfectants	Chemical agents that destroy bacteria and sometimes bacterial spores. Removing the contamination that cannot be seen.

Term	Definition
Domestic ungulates	Domestic bovine (including Bubalus and Bison species), porcine, ovine and caprine animals, and domestic solipeds (Regulation (EC) 853/2004).
Electronic fly killer (EFK)	Equipment to control flies and other flying insects.
End product	Product that will not undergo any further food processing by the food business.
Equivalent	In respect of different systems, capable of meeting the same objectives (Regulation (EC) 852/2004).
Flow diagram	A systematic representation of the sequence of steps used in the production or manufacture of food (Codex CXC 1-1969).
FBO (Food business operator)	The natural or legal person(s) responsible for ensuring that the requirements of food law are met within the food business under their control (Regulation (EC) 178/2002).
Final consumer	The ultimate consumer of a foodstuff who will not use the food as part of any food business operation or activity (Regulation (EC) 178/2002).
Food handler	Anyone who handles or prepares food, whether open (unwrapped) or packaged. Any person who directly handles packaged or unpackaged food, equipment and utensils used for food, or surfaces that come into contact with food and that is expected, therefore, to comply with food hygiene requirements (Codex CXC 1-1969).
Food hygiene	The measures and conditions necessary to control hazards and to ensure fitness for human consumption of a foodstuff taking into account its intended use (Regulation (EC) 852/2004).
Food poisoning	An unpleasant illness that usually occurs within between 1 and 72 hours after eating contaminated or poisonous food.
Food safety	The steps taken to avoid risks to public health arising from food intended for human consumption.
Fresh meat	Meat that has not undergone any preserving process other than chilling, freezing or quick-freezing, including meat that is vacuum-wrapped or wrapped in a controlled atmosphere (Regulation (EC) 853/2004).
Food safety management system (FSMS)	Prerequisite programmes, supplemented with control measures at CCP, as appropriate, that when taken as a whole, ensure that food is safe and suitable for its intended use. The FSMS is also the combination of control measures and assurance activities. The latter aims at providing evidence that control measures are working properly such as validation and verification, documentation and record keeping (Commission Notice 2022/C 355/01).
Good Hygiene Practices (GHP)	Fundamental measures and conditions applied at any step within the food chain to provide safe and suitable food. GHP include also good manufacturing practice(s) (GMP, stressing correct work Methodologies, for example, correct dosage of ingredients, appropriate processing temperature, checking that packages are clean and non-damaged (Commission Notice 2022/C 355/01).

Term	Definition
HACCP	Procedures based on the hazard analysis and critical control points (HACCP) principles i.e. an own-check system which identifies, evaluates and controls hazards which are significant for food safety consistent with the HACCP principles (Commission Notice 2022/C 355/01).
HACCP plan	Documentation or set of documents, prepared in accordance with the principles of HACCP to ensure control of significant hazards in the food business, available in any format. The initial HACCP plan shall be updated if there are changes in the production and must be supplemented with records from outcomes of monitoring and verification, and from corrective actions taken (Commission Notice 2022/C 355/01).
Hazard	A biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect (Regulation (EC) 178/2002).
Hazard analysis	The process of collecting and evaluating information on hazards identified in raw materials and other ingredients, the environment, in the process or in the food, and conditions leading to their presence to decide whether or not these are significant hazards (Commission Notice 2022/C 355/01).
MAP	Modified atmosphere packaging (MAP) is a way of extending the shelf-life of fresh food products. Normal air inside a package is replaced with a protective gas mix that helps the food to last longer. Foods which have their shelf-life extended by means of packaging gases must be labelled “packaged in a protective atmosphere”.
Meat	Edible parts of the animal (domestic ungulates/ poultry/ lagomorphs/ game) including blood (Regulation (EC) 853/2004).
Meat preparations	Fresh meat, including meat that has been reduced to fragments, which has had foodstuffs, seasonings or additives added to it or which has undergone processes insufficient to modify the internal muscle fibre structure of the meat and thus to eliminate the characteristics of fresh meat (Regulation (EC) 853/2004). Specific requirements to produce ‘meat preparations’ are laid down in Annex III; Section V to Regulation 853/2004.
Meat products	Processed products resulting from the processing of meat or from the further processing of such processed products, so that the cut surface shows that the product no longer has the characteristics of fresh meat (Regulation (EC) 853/2004). Specific requirements to produce ‘meat products’ are laid down in Annex III; Section VI to Regulation 853/2004.
Minced meat	Boned meat that has been minced into fragments and contains less than 1 % salt (Regulation (EC) 853/2004). Specific requirements to produce ‘minced meat’ are laid down in Annex III; Section V to Regulation 853/2004.
Monitor	The act of conducting a planned sequence of observations or measurements of control parameters to assess whether a control measure is under control (Commission Notice 2022/C 355/01).

Term	Definition
Offal	Fresh meat other than that of the carcase, including viscera and blood (Regulation (EC) 853/2004).
Pathogen	Harmful microorganisms that can cause disease.
Packaging	The placing of one or more wrapped foodstuffs in a second container, and the latter container itself (Regulation (EC) 852/2004).
Placed on the market	The holding of food for the purpose of sale, including offering for sale or any other form of transfer, whether free of charge or not, and the sale, distribution, and other forms of transfer themselves (Regulation (EC) 178/2002).
Potable water	Treated water that is suitable for drinking and food preparation, i.e. intended for human consumption.
Primals or primal cuts	The first pieces of meat to be separated from the carcase of an animal during the butchering process.
Prerequisite programmes (PRPs)	Preventive practices and conditions including all GHP, as well as other practices and procedures such as training and traceability, that establish the basic environmental and operating conditions that set the foundation for implementation of HACCP-based procedures (Commission Notice 2022/C 355/01).
Processing	Any action that substantially alters the initial product, including heating, smoking, curing, maturing, drying, marinating, extraction, extrusion or a combination of those processes (Regulation (EC) 852/2004).
Product recall	The action taken to remove a foodstuff from customers or consumers in the event of a potential or actual risk to public health: Any measures aimed at achieving the return of an unfit product from customers and final consumers.
Product withdrawal	The action taken to remove a foodstuff from the market that has not yet reached the consumer.
Raw material	Material forming part of a product (for example, primary products, additives and processing aids), as well as packaging and similar materials.
Ready-to-eat	Food intended by the producer or the manufacturer for direct human consumption without the need for cooking or other processing to eliminate or reduce to an acceptable level micro-organisms of concern (Regulation (EC) 2073/2005). Ready-to-eat food poses a microbiological risk because it is consumed without any further microbiocidal treatment, such as cooking.
Record	Evidence, in written or electronic form, which demonstrates that the food safety management system is being, and has been, complied with.
Risk	A function of the probability of an adverse health effect and the severity of that effect, consequential to a hazard (Regulation (EC) 178/2002).
Risk assessment	A scientifically based process consisting of four steps: hazard identification, hazard characterisation, exposure assessment and risk characterisation (Regulation (EC) 178/2002).

Term	Definition
Sanitiser	The separation of items or articles in order to prevent contamination of one by the other.
Shelf-life	Either the period corresponding to the period preceding the 'use-by' or the minimum durability date ('best-before') (Regulation (EC) 2073/2005). The period of time over which a food maintains its safety and/or quality under reasonably foreseeable conditions of distribution, storage and use.
Significant hazard	A hazard identified by a hazard analysis, as reasonably likely to occur at an unacceptable level in the absence of control, and for which control is essential given the intended use of the food (Commission Notice 2022/C 355/01).
Small meat manufacturing plant (SMMP)	Whilst not exclusive of other operators this guide is specifically intended to assist those producers whose weekly production throughput generally falls below 5 tonnes of minced meat, 20 tonnes of meat products or meat preparations, or 20 tonnes of cut fresh meat.
Standard operating procedure (SOP)	Document which defines actions that must be followed to ensure that an activity is carried out in a controlled manner.
Traceability	The ability to trace and follow a food, or substance intended to be, or expected to be incorporated into a food, through all stages of production, processing and distribution (Regulation (EC) 178/2002).
Validation	Obtaining evidence that a control measure or combination of control measures, if properly implemented in the HACCP-based procedures and by the OPRP, is capable of controlling the hazard to a specified outcome. Revalidation may be required in case of changes (Commission Notice 2022/C 355/01). OPRPs in this SMMP guide are referred to as control points.
Verification	The application of methods, procedures, tests and other evaluations, in addition to monitoring, to determine whether a control measure is or has been operating as intended. Verification is conducted periodically to demonstrate that the HACCP system and the management of the OPRP are working as planned (Commission Notice 2022/C 355/01). OPRPs in this SMMP guide are referred to as control points.
Wrapping	The placing of a foodstuff in a wrapper or container in direct contact with the foodstuff concerned, and the wrapper or container itself (Regulation (EC) 852/2004).
Zoning	The separation of the premises, by physical barriers or otherwise, into areas for the preparation of different product groups.

Notes

Notes

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