**Codex Alimentarius – 14 Step Logic Sequence**

The study was carried out following 14 steps, seven preparatory stages and the seven principles outlined below (Campden BRI HACCP: A practical guide (fifth edition) 2015 Guideline 42).

| | |
|---|---|
| Stage 1 | Obtain senior management commitment |
| Stage 2 | Define the terms of reference/scope of the study |
| Stage 3 | Select the team |
| Stage 4 | Describe the product and process |
| Stage 5 | Identify the intended use of the product |
| Stage 6 | Construct a process flow diagram |
| Stage 7 | On-site confirmation of the flow diagram |
| Stage 8 | List all potential hazards associated with each process step, conduct a hazard analysis and determine the measures to control the identified hazards |
| Stage 9 | Determine the CCP's |
| Stage 10 | Establish critical limits for the control measures at each CCP |
| Stage 11 | Establish a monitoring system for each CCP |
| Stage 12 | Establish a corrective plan for each CCP |
| Stage 13 | Perform validation, verification and review activities |
| Stage 14 | Establish documentation and record keeping |

**Management Commitment**

*(Refer to Senior Management Commitment and Continual Improvement Procedure)*

**HACCP Team**

*(refer to HACCP Team)*

**Scope & Terms of Reference**

This modular HACCP plan covers the manufacture of packed frozen ready meals, soups and sauces.

The HACCP team agreed to consider the following food safety hazards of a biological, chemical, physical and allergenic nature throughout the entire process, details of which include:

| | |
|---|---|
| **Physical** | A range of physical hazards would adversely affect product safety, including foreign body hazards e.g. wood, glass, metal etc. |
| **Chemical** | Chemical contaminations were considered from both the environment and raw materials e.g. Pesticide residues, chemical residues associated with the packaging materials, Engineering lubes & oils, cleaning chemicals etc. |
| **Microbiological** | Growth, introduction and survival of pathogenic and non-pathogenic microorganisms capable of causing food poisoning and spoilage such as *Clostridia botulinum*, Cl. Perfringens, *Salmonella spp*, *E. coli*, *Listeria spp*, *Staphylococcus aureus* |
| **Allergens** | All allergens are considered when assessing the suitability of incoming ingredients however, allergens handled on site are detailed in the Allergen Risk Assessment document. |
| **VACCP/TACCP** | All threats to the business are considered, whether from a food defense or malicious contamination. These are all documented in the separate VACCP and TACCP risk assessments. |
| **Radiological** | All raw materials, packaging and utilities have been assessed for risk of radiological contamination. No raw materials, packaging or utilities are radiated therefore no radiological risks identified. |

The main pathogenic microorganisms of concern are *Cl. botulinum*, *Cl. Perfringens*, *Salmonella spp* and *Listeria spp*, however, hygiene indicator organisms such as *Enterobacteriaceae*, *S. aureus*, TVC, Yeasts and Moulds were also considered.

The HACCP team identified that the study will commence at purchasing of raw materials and will conclude when the finished product is dispatched from the factory i.e. transport to Customer (Iceland).

Iceland Manufacturing Ltd has a defined Quality Management System in place which includes a number of established and effective pre-requisites programmes.

As part of the HACCP study the team ensured compliance with all relevant UK and EC legislation and industry guidelines. *(refer to sources of reference)*

**Process & Product Description**

Products are ready to cook ready meals, soups and sauces consisting of a combination of raw and cooked protein with carbs, raw veg and sauce deposits packaged in heat sealed trays/plastic pots or foil trays.

A number of raw material ingredients are used in the manufacture of the ready meals, soups and sauces *(refer to individual product recipes)* but typically include protein, prepared vegetables, such as diced onion and sliced carrot, flour, modified maize starch, sugar, spices and herbs, such as ground white pepper, chilli powder, dried parsley and salt and liquid stocks, such as vegetable, chicken and beef. They are purchased in chilled, frozen and ambient form and are stored appropriately in the factory.

A full raw material list is held on site which details the unique internal ingredient code, supplier and date the specification was approved *(refer to Approved Supplier and Raw Material Database).*

All product recipes for ready meal production which contain raw materials which are classed as allergens or which contain allergenic material e.g. mustard, gluten, milk are controlled through allergen management procedures.

All chillers in the factory are temperature controlled and continuously monitored, average running temperature is 5°C (maximum temperature of 8°C). Sauce holding areas are for temporary storage of sauce in totes prior to transferring to line. Sauce holding areas are also temperature controlled and have an average running temperature of +5°C +/- 2°C.

Ready meals, soups and sauces are assembled on line, protein and where necessary vegetables, are added to the base of the plastic tray or plastic container by a combination of auto-weighers and operatives, a cooked sauce is mechanically deposited on top before being vacuum heat sealed or into a plastic pot and lidded. Sauces are manufactured internally, and heat treated to a minimum temperature of 72°C for 2 minutes, for the sole purpose of starch activation.

Finished products fall into three categories; Noodle bowls, Soups and sauces, and Ready meals. Noodle bowls and soups and sauces are sent for a 24-hour blast freezing cycle followed by chamber freezing. Ready meals are passed through a nitrogen spiral post assembly to achieve a core temperature of between -1°C and -8°C depending on product, and then sent for chamber freezing. All meals in the chamber freezer will achieve -18°C within 72 hours.

Ready meals are manufactured in heat sealed plastic trays or containers, or foil trays and then placed into sleeves which is the final product packaging. All our film/plastic lids are inkjet coded with traceability information, Julian date code, time, product name, line name and a best before date; sleeves are coded with a Julian date code, time, product name and a best before date.

Finished products are then packed into labelled cardboard outer cases, stacked onto a wooden pallet and shrink-wrapped.

Frozen finished products are given a shelf life ranging from 9 – 18 months, product specific (refer to unique product specification). Microbiological shelf life validation has confirmed product life when stored at less than <-18°C, validation was undertaken by an independent UKAS accredited laboratory. Organoleptic verification has also been conducted to confirm shelf life. Shelf life is validated by routine end of shelf life microbiological and organoleptic testing.

Finished products are despatched to the Customer in frozen condition. Distribution to and storage at depots and point of sale is frozen. Products are sold in outer cases which clearly identifies the Best Before date and "Store at -18°C" statements.

**Intended Use**

Ready meals and soups are to be fully cooked by the customer/consumer in either a conventional or microwave oven prior to consumption, validated to achieve 72°C for 2 mins. The products must remain frozen (<-18°C) throughout the distribution chain to the consumer and during consumer storage until the Best Before Date. Packaging clearly contains storage and cooking statements. End users intended for consuming the final product are the general population including high risk groups such as children, the elderly, people who suffer from allergies, pregnant women and people who are ill or have an impaired immune system.

Any product that contains an allergen is clearly identified on the packaging.

**Validation, Verification & Review**

CCP auditing forms part of the internal auditing system. All procedures and pre-requisites are audited frequently as part of the scheduled implemented internal audit system.

All CCP's are verified as per a defined schedule by the Quality Auditors and documented. Any deviations from critical limits will result in the non-conforming product procedure being followed and if necessary, the HACCP team to reconvene to review the step.

Third party reviews of the HACCP system are conducted by Certification Bodies and Customers during audits and visits.

Microbiological testing of finished products and raw materials - results are trended and reviewed at a defined frequency.

Customer complaints are investigated and trended.

A documented formal review of the HACCP study will be undertaken annually. This will include verification of the whole process i.e. cook and freeze.

A review of HACCP plan will take place at least annually or prior to any changes which may affect food safety. These include changes in raw material or raw material suppliers; change in recipe/ingredient; change in process conditions, process flow or equipment; change in packaging, storage or distribution conditions; change in consumer use, review following a recall; new developments in scientific information associated with ingredients, products or processes; emergence in new risks.

**Documentation & Records**

A full Quality Management System is in place which includes Procedures, SOP's, Work Instructions and Records, all of which are document controlled. CCP's are clearly identified on the records and within the work instructions.

Paperwork is reviewed on a shift by shift basis by the QA dept to ensure compliance.

Documentation is also reviewed as part of the internal system audit schedule.

# CCP 1 & CCP 2 METAL DETECTION AUDIT

**Process Step:** Metal Detection

| Food safety Hazards and Causes | Control Measures | Rational |
|---|---|---|
| Presence of metal foreign bodies due to defective metal detector | Effective working metal detector in place<br>Foreign Body Control<br>Staff Training<br>Metal Detection Procedure Start-up Controls | Manufacturing limits |

| CCP No. | Critical/ Legal Limits(s) | Monitoring Plan | | | | Corrective Action Plan | | |
|---|---|---|---|---|---|---|---|---|
| | | **Procedures** | **Frequency** | **Responsibility** | **Ref. Work Instruction Forms/Records** | **Procedures** | **Responsibility** | **Ref. Work Instruction Forms/Records** |
| CCP1<br><br>CCP 2 | <u>Metal Detectors</u><br>2.0mm Ferrous<br>2.5mm Non-Ferrous<br>4.0mm Stainless Steel<br><br><u>XRAY</u><br>1.2 mm Ferrous<br>1.2 mm Non-Ferrous<br>1.2 mm Stainless Steel<br><br>20.0mm Ferrous | Metal Detector check to be conducted at the start of run, every 60 minutes thereafter, after breaks, a repair and at the end of run.<br><br>MD fail safes to be checked at start and end of each run. | Start of Run,<br>Every 60 minutes<br>End of Run, after a repair & when metal detector has been left idle for more than 20 mins<br>(breaks)<br><br>MD fail safes to be checked at start and end of each run. | Trained Operative /Line Leaders | QSOP 4.10.3.4 Metal Detection Procedure<br><br>QREC 6.3.24 Metal Detection Log<br><br>QREC 6.3.25 X-Ray Log | In case of failure to detect and reject all test pieces stop the line. Product since last good check to be placed on QA hold and quarantine. Engineers to be informed. Once MD is repaired and working correctly all stock to be resent through the correctly working metal detector.<br>If the machine cannot be repaired, should not be in use. | QA / Team Leader | QSOP 4.10.3.4 Metal Detection Procedure<br><br>QREC 6.3.24 Metal Detection Log<br><br>QREC 6.3.25 X-Ray Log<br><br>SOP PRO10 Use of X-Ray |

# CCP 1 & CCP 2 METAL DETECTION AUDIT

| | | | |
|---|---|---|---|
| **Area/Line** | | **Date** | |
| **Auditor Name** | | **Time** | |

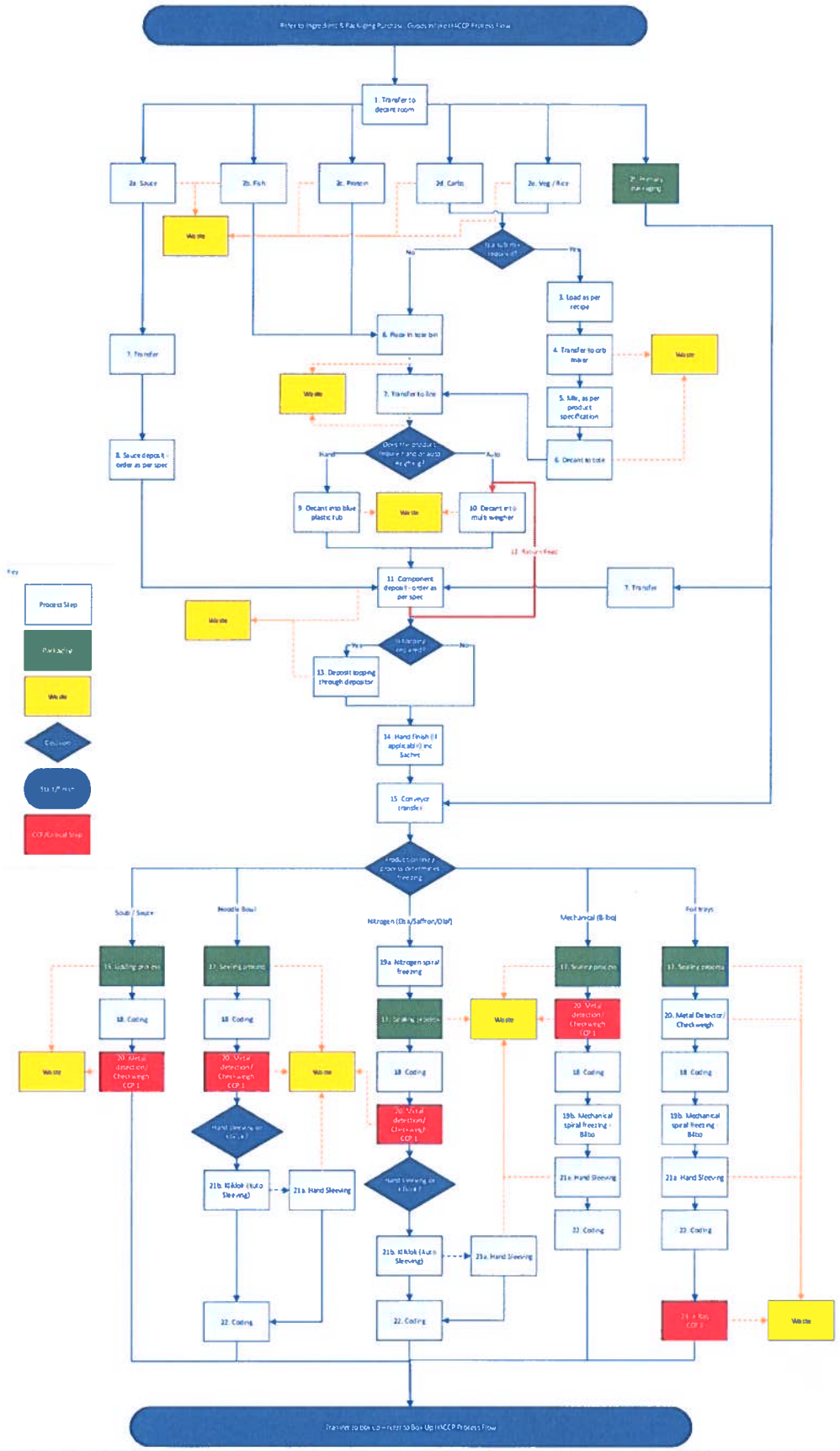
| Audit Point | Observation Points | Yes | No | Comments / Corrective Actions | | |
|---|---|---|---|---|---|---|
| | Is the check sheet correctly referenced, dated and authorised?<br>Check to see if latest version | | | **Issue Number:** | **Doc ref:** | **Issue Date:** |
| Control Measure | Is the metal detector calibrated?<br><br>Are the metal detector sticks being used as per critical limits ref test piece size | | | **Record the serial number and date of calibration**<br><br>**Record test piece sizes being Used** | | |
| Monitoring | Is the operative monitoring the CCP a **full-time** trained employee? | | | **Operative Name (s) Date of Training** | | |
| | Is the Procedure being followed correctly?<br>*audit against procedure | | | | | |
| | Is the frequency of checks being adhered to? | | | | | |
| | Are the records clear, completed and signed? | | | | | |

## CCP 1 & CCP 2 METAL DETECTION AUDIT

| | | | | |
|---|---|---|---|---|
| Corrective Action (when applicable) | If corrective action is required, is it documented clearly and where possible closed out. | | | |

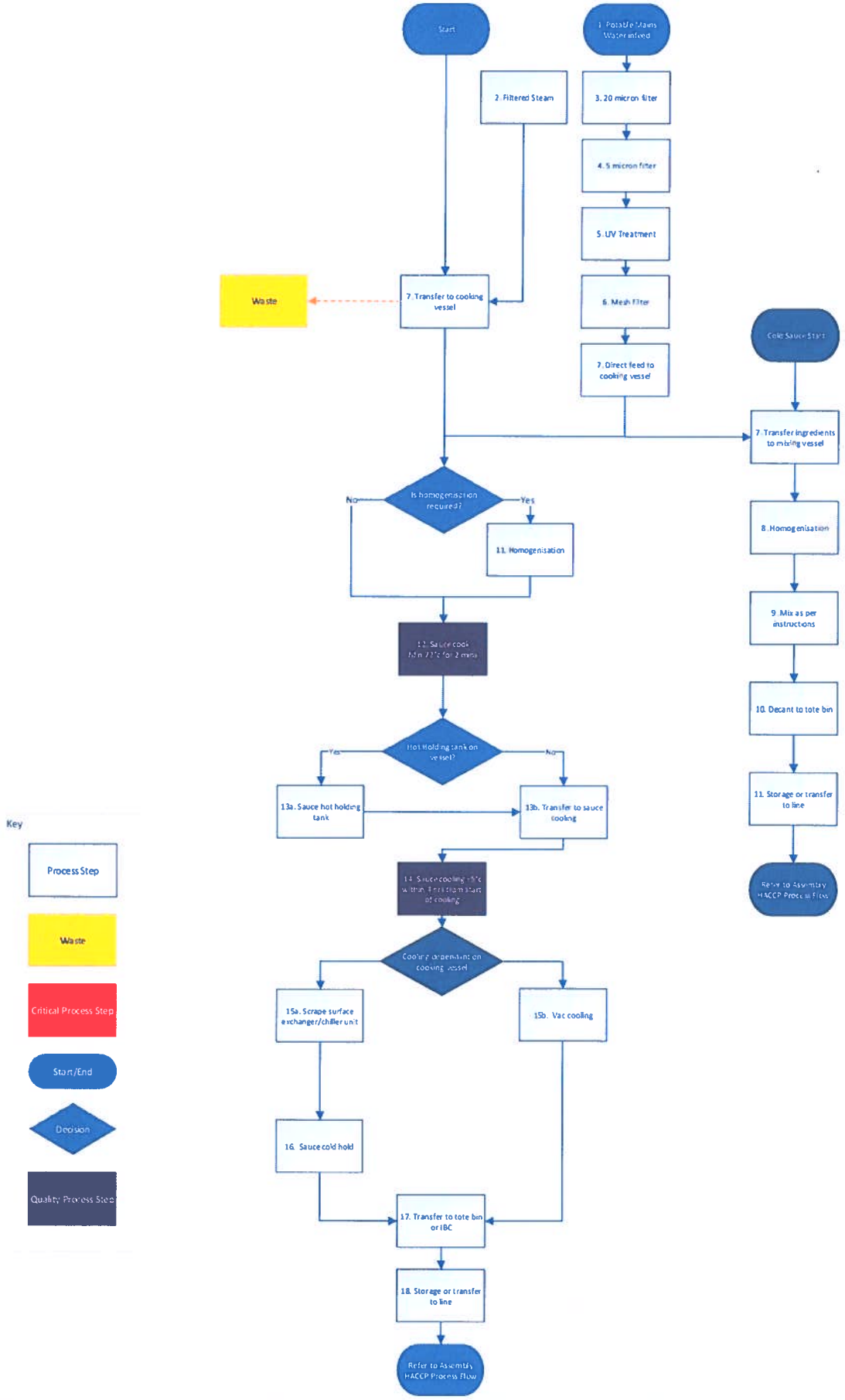
| | | | | |
|---|---|---|---|---|
| Competency of Operatives | 1) Does the operative understand what HACCP stands for? | | | |
| | 2) Does the operative understand the hazard(s) associated with CCP1 & CCP2? | | | |
| | 3) Does the operative understand why the metal detection system is used? | | | |
| | 4) Does the operative know what rod sizes should be used? | | | |
| | 5) In the event of the critical limits for the CCP not being achieved what action would the operative take? | | | |
| ***QA Print Sign:*** | | | | |

# HACCP PROCESS FLOW - ASSEMBLY



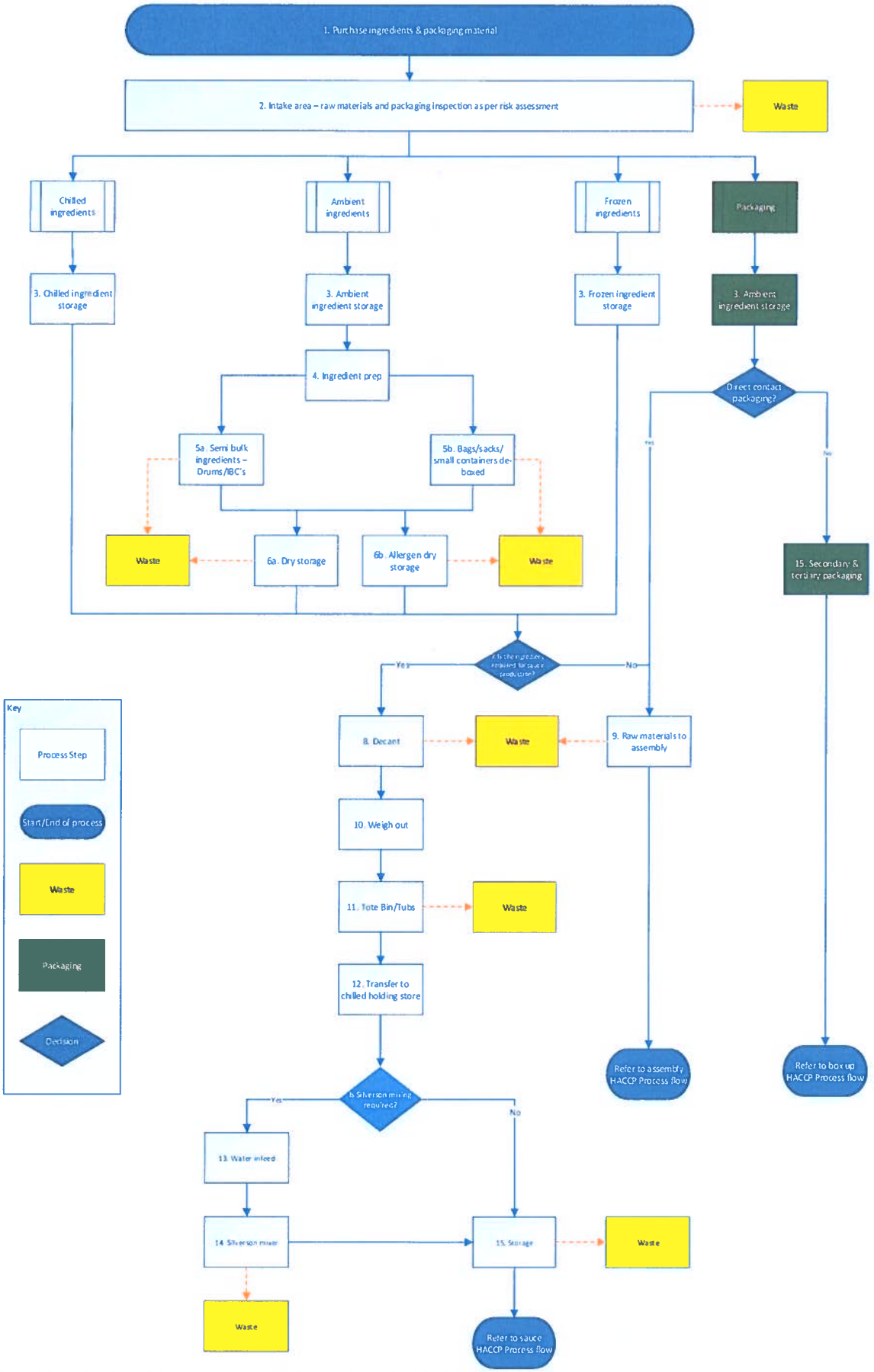

| Document ref: | Version No. | Prepared by: | Approved by | Issue Date: |
|---|---|---|---|---|
| REC HAC01 | 5 | M Warr | N Spreadbury | 29/01/19 |

# HACCP PROCESS FLOW – SAUCE COOK



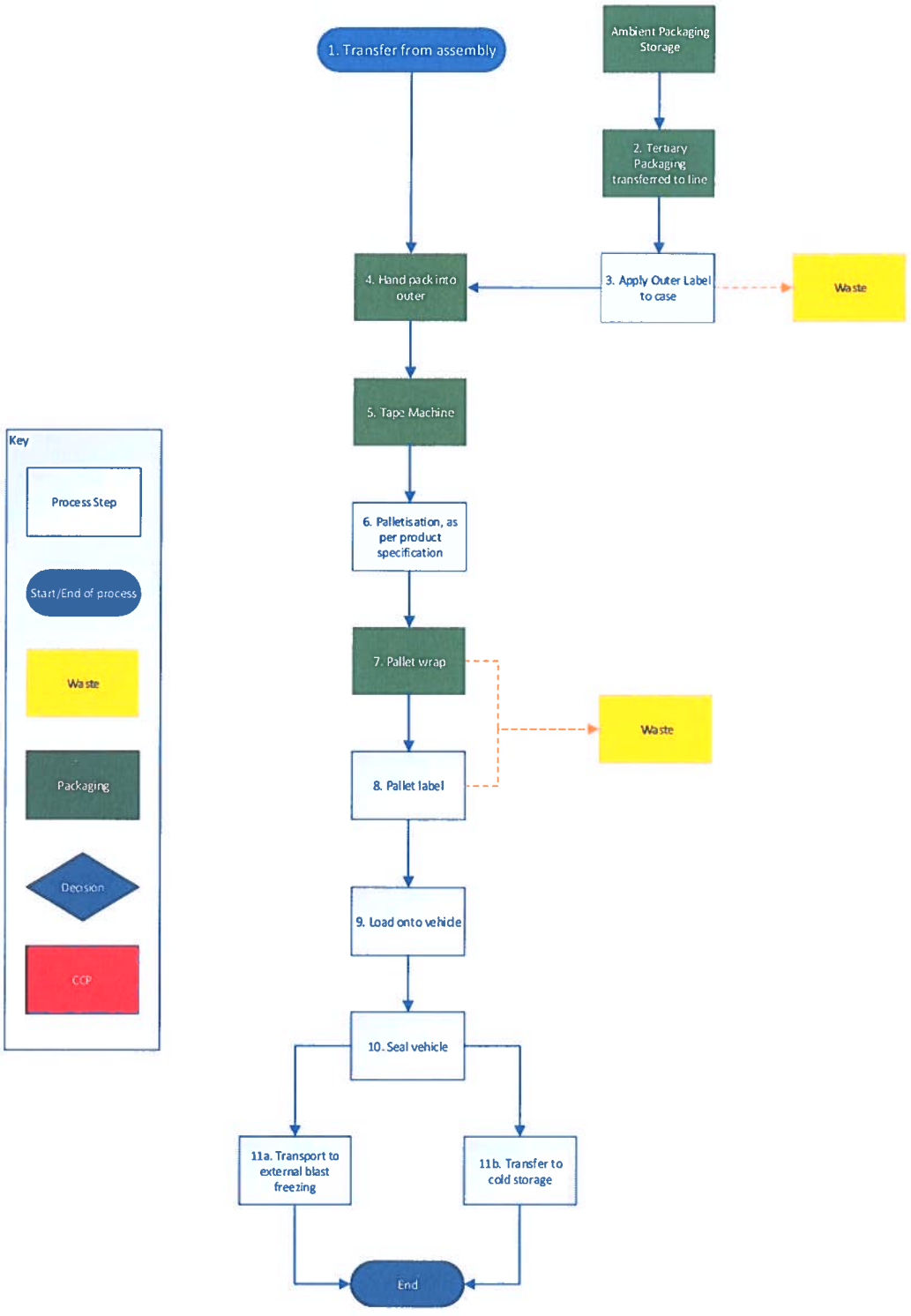

| Document ref: | Version No. | Prepared by: | Approved by | Issue Date: |
|---|---|---|---|---|
| REC HAC02 | 1 | M Warr | N Spreadbury | 28/01/19 |

# HACCP PROCESS FLOW – INGREDIENT INTAKE AND WEIGHING




| Document ref: | Version No. | Prepared by: | Approved by | Issue Date: |
|---|---|---|---|---|
| REC HAC03 | 2 | M Warr | N Spreadbury | 29/01/19 |

# HACCP PROCESS FLOW – BOX UP



# HACCP RISK ASSESSMENT SCORING SYSTEM

When assessing the risk of each identified hazard the HACCP team used a scoring system to assess the significance of each hazard identified. A score of 1 to 3 was given to both severity and likelihood based on the criteria detailed below. These individual scores are then multiplied together to determine the significance of the hazard. Any hazard with a score of 3 or greater was considered significant and was put through the CCP decision tree.

Severity of hazard

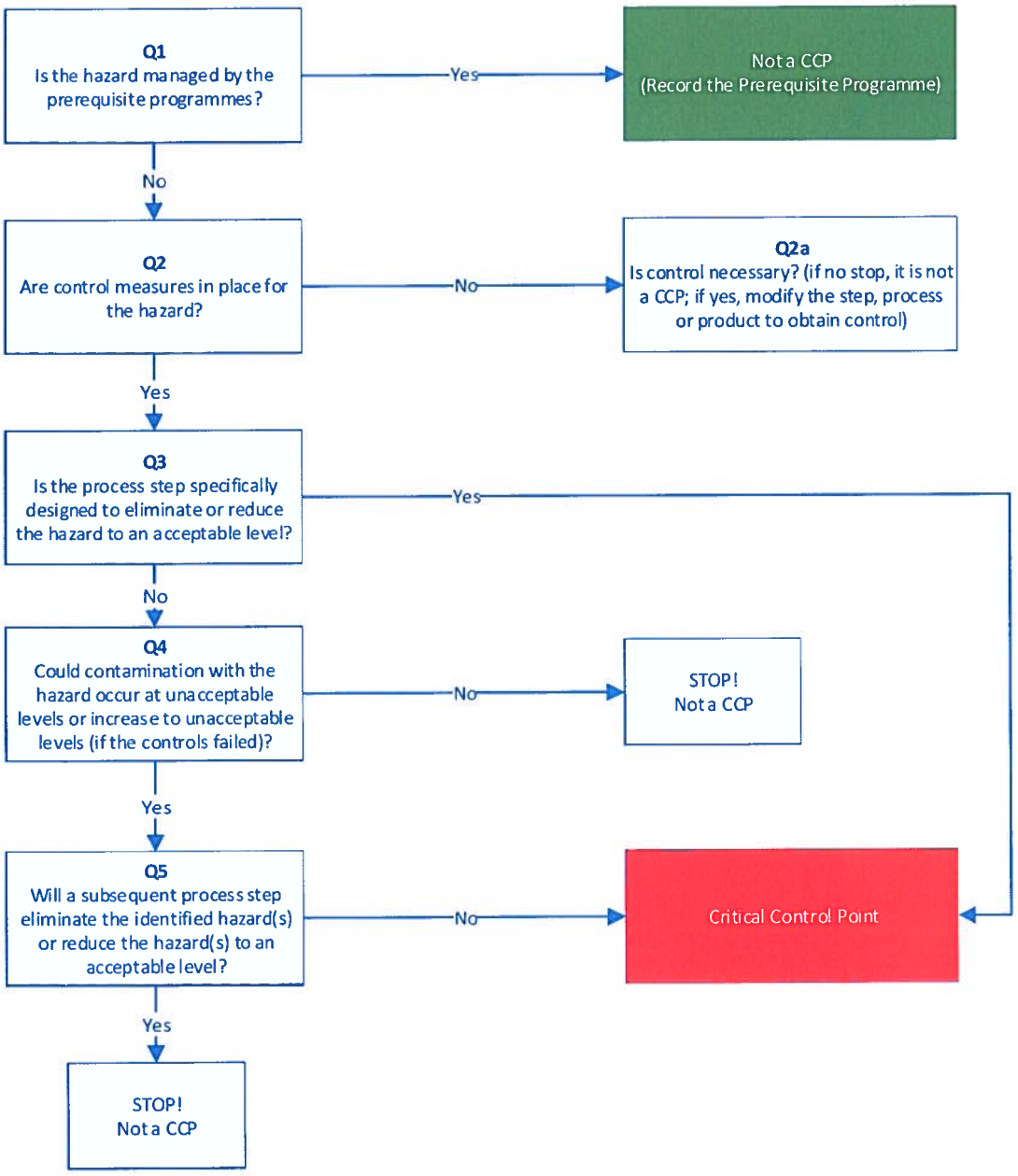
1. Minor injury to consumer
2. Consumer in hospital or, serious short-term injury
3. Death of consumer/ Long-term illness leading to death

Likelihood of hazard

1. Possibly could occur (unlikely to occur, but might)
2. Probably could occur (likely to occur at some time but no history of it occurring)
3. Definitely will occur (at some time it is going to happen or, has occurred in the past)

| | | Likelihood | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Severity | 1 | 1 | 2 | 3 |
| | 2 | 2 | 4 | 6 |
| | 3 | 3 | 6 | 9 |

## CCP Decision Tree



| FOOD SAFETY & QUALITY MANAGEMENT SYSTEM | Iceland MANUFACTURING LTD |
|---|---|

# HACCP TEAM

In order to carry out the HACCP study we have established a team with experience from as wide range and multifunctional knowledge.

The team consists of:

| Team member | Role in Team | Qualification | Experience | Role |
|---|---|---|---|---|
| Matt Warr<br>Technical Services Manager | Team Leader<br>Technical | HACCP Level 4 for Food Manufacturing – 29/01/19 | Previously a team member for two different manufacturers, across ambient production – powder blending and cereal manufacturing.<br>Implementation of new process flows in powder blending, implementation of validation and verification processes. | Maintenance of study<br>Maintenance of paperwork/minutes<br>HACCP Review<br>Pre-requisites<br>Changes to Legislation<br>Microbiological Requirements<br>Changes to Products<br>Changes to Packaging |
| James Hunter<br>Factory Technical Manager | Deputy Team Leader<br>Team Member<br>Technical | HACCP Level 4 for Food Manufacturing – 07/06/18 | Previously a team leader for two different manufacturers, across chilled and frozen production – ready meals and salad manufacturing.<br>Implementation of new process flows in salad washing, implementation of validation and verification processes. | Deputy Team Leader<br>Maintenance of study<br>Maintenance of paperwork/minutes<br>HACCP Review<br>Pre-requisites<br>Changes to Legislation<br>Microbiological Requirements<br>Changes to Products<br>Changes to Packaging |
| Neil Spreadbury<br>Head of Technical | Exec Member<br>Technical | Level 3 Award for Managing HACCP in Manufacturing & Retail – 08/05/14 | | Escalation of issues to Executive team<br>Overall HACCP review |
| Perry Moss<br>QA Technician | Team Member<br>QA | HACCP Level 3 for Food Manufacturing – 25 May 18 | New to HACCP team | HACCP Review<br>Process Flow Validation<br>Pre-requisites<br>Hazard Analysis |
| Josh Burrage<br>CI Manager | Team Member<br>CI | HACCP Level 3 for Food Manufacturing – 19 Dec 18 | New to HACCP team | HACCP Review<br>Process Flow Validation<br>Pre-requisites<br>Hazard Analysis |

## HACCP TEAM

| | | | | |
|---|---|---|---|---|
| Matthew Stott | Team Member<br>H&S/Environmental | HACCP Level 3 for Food Manufacturing – 12 Dec 18 | New to HACCP team | HACCP Review<br>Process Flow Validation<br>Pre-requisites<br>Hazard Analysis |
| Steeve Tamatave<br>NPD Process Development Manager | Team Member<br>NPD | RSPH Level 3 Award in HACCP for Food Manufacturing 10.03.11.<br>HACCP Level 3 for Food Manufacturing – 30 Nov 17 | Previous member of HACCP team.<br>Review of process flows | HACCP Review<br>Process Flow Validation<br>Pre-requisites<br>Hazard Analysis<br>Changes to Products |
| Gbadebo Ojoyin<br>Hygiene Team Leader | Team Member<br>Hygiene | HACCP Level 3 for Food Manufacturing – 12 Dec 17 | New to HACCP team | HACCP Review<br>Process Flow Validation<br>Pre-requisites<br>Hazard Analysis |
| Simon Walker<br>Training Manager | Team Member<br>Training | HACCP Level 3 for Food Manufacturing – 29 Nov 17 | New to HACCP team | HACCP Review<br>Process Flow Validation<br>Pre-requisites<br>Hazard Analysis |
| Rachel Haddow<br>Assistant Production Manager | Team Member<br>Production | HACCP Level 3 for Food Manufacturing – 12 Dec 18 | New to HACCP team | HACCP Review<br>Process Flow Validation<br>Pre-requisites<br>Hazard Analysis |
| Sam Cooke<br>Engineering | Team Member<br>Engineering | HACCP Level 3 for Food Manufacturing – 12 Dec 18 | New to HACCP team | HACCP Review<br>Process Flow Validation<br>Pre-requisites<br>Hazard Analysis<br>Changes to Maintenance/Production |
| Mike Stewart<br>Warehouse Manager | Team Member<br>Warehouse | HACCP Level 3 for Food Manufacturing – 12 Dec 18 | New to HACCP team | HACCP Review<br>Process Flow Validation<br>Pre-requisites<br>Hazard Analysis |
| Andy Whittaker<br>Assistant Production Manager | Team Member<br>Production | HACCP Level 3 for Food Manufacturing – 12 Dec 18 | New to HACCP team | HACCP Review<br>Process Flow Validation<br>Pre-requisites<br>Hazard Analysis |

**Deputy list – HACCP L3 or above trained staff.**

Stuart Ogden – Engineering – 15/10/13
Darren Kelly – Production – 18/05/18
Martins Berzins – Production – 24/04/18
Stephanie Banks – QA – 12/12/18
Samantha Tyrell – QA – 25/05/18
Adrian Bailey – NPD – 12/12/18

# FOOD SAFETY & QUALITY MANAGEMENT SYSTEM

Iceland MANUFACTURING LTD

## CCP Site Summary

| Process Step: Metal Detection | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Food Safety Hazards and Causes** | | **Control Measures** | | | **Rational** | | |
| **Presence of foreign bodies & metal due to defective metal detector** | | Effective working metal detector in place<br>Foreign Body Control<br>Staff Training<br>Metal Detection Procedure<br>Start-up Controls | | | Manufacturing Limits | | |
| **CCP No** | **Critical Limit** | **Monitoring Plan** | | | **Corrective Action Plan** | | |
| | | **Procedures** | **Frequency** | **Responsibility** | **Procedures** | **Responsibility** | **Verification** |
| **CCP 1**<br>**Metal Detection** | Test pieces must be rejected<br><br>2.0mm Ferrous<br>2.5mm Non Ferrous<br>4.0mm Stainless Steel | Metal Detector check to be conducted at start of run, every 60 minutes and end of run, using claibrated test pieces.<br><br>MD fail safes to be checked at start of run | Start of Run<br><br>Every 60 Mins<br><br>End of Run | Trained operative / Team Leaders | In case of failure to detect and reject all test pieces or foreign bodies are found in the product, stop production. Product since last good check to be placed on QA HOLD and required to be inspected, investigated, raise disposal note | Line Leaders to inform QA and APM. QA to place stock on Hold | Internal system and GMP audits (specific CCP audit), review of complaints, planned HACCP review, record sign off by team leader at start of each batch |

## CCP Site Summary

| Process Step: X-Ray | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Food Safety Hazards and Causes** | | **Control Measures** | | | **Rational** | | |
| **Presence of foreign bodies & metal due to defective x-ray** | | Effective working x-ray in place<br>Foreign Body Control<br>Staff Training<br>X-Ray Procedure<br>Start-up Controls | | | Manufacturing Limits | | |
| **CCP No** | **Critical Limit** | **Monitoring Plan** | | | **Corrective Action Plan** | | |
| | | **Procedures** | **Frequency** | **Responsibility** | **Procedures** | **Responsibility** | **Verification** |
| CCP 2<br>X-Ray | Test pieces must be rejected<br><br>1.2mm Ferrous<br>1.2mm Non Ferrous<br>1.2mm Stainless Steel | X-Ray check to be conducted at start of run, every 60 minutes and end of run, using calibrated test pieces. | Start of Run<br><br>Every 60 Mins<br><br>End of Run | Trained operative / Team Leaders | In case of failure to detect and reject all test pieces or foreign bodies are found in the product, stop production. Product since last good check to be placed on QA HOLD and required to be inspected, investigated, raise disposal note | Line Leaders to inform QA and APM. QA to place stock on Hold | Internal system and GMP audits (specific CCP audit), review of complaints, planned HACCP review, record sign off by team leader at start of each batch |