AN INTRODUCTION TO RISK ASSESSMENTS FOR FRESH PRODUCE

The Codex Alimentarius International Food Standards, 'General Principles of Food Hygiene' (CXC 1-1969, 2020 revision) sets out the following principle:

*'Food safety and suitability should be controlled using a science-based **preventive** approach'*

This applies to food businesses at all stages of the supply chain, from primary production to point of sale.

The Codex Alimentarius Commission was established in the 1960s by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO). Codex Alimentarius texts inform national legislation and are also an international reference point for dispute resolution by the World Trade Organization.

In recognition of this principle and domestic legal obligations to ensure that unsafe food is not placed on the market, Red Tractor expects fresh produce members to **proactively** identify potential risks (hazards) within the production process, and to implement good hygiene practices or other suitable controls to eliminate or reduce risk to an acceptable level.

This appendix explains how to identify and implement effective controls within the production process. This is intended as a guidance resource. If business have pre-existing Risk Assessment systems that follow an equivalent methodology and deliver an equally robust outcome, that is entirely acceptable and there is no expectation that members will modify their systems to follow this precise approach.

IMPLEMENTATION OF A RISK ASSESSMENT FOR FRESH PRODUCE

This system is suitable for small, medium or large crop production operations. It is a flexible management tool which can be applied to a wide range of simple or complex operations including arable crops, field vegetables, protected crops/controlled environment agriculture, soft fruit and top fruit production.

There are some generic areas of possible risk such as pest control, while others, such as neighbouring livestock operations and irrigation water will be specific to context and crop.

A risk in terms of food safety is anything that may cause harm to the consumer. Risks may be microbiological, physical (e.g. stones), allergenic or chemical (e.g. pesticide residues).

The risk assessment begins by breaking the crop production process down into steps. Many crop production operations follow a similar, linear flow, consisting of all or at least some of the following stages:

- selection of site and crop inputs
- crop production
- harvest
- post-harvest operations
- storage
- dispatch to customer

Some process flows will also include additional stages, relevant just to particular circumstances (e.g. steam sterilization of mushroom growing rooms between crop production cycles),

AN INTRODUCTION TO RISK ASSESSMENTS FOR FRESH PRODUCE

Stage 1. Developing a Risk Assessment

Initially you will need to identify the 'scope' (e.g. the crop commodities and process stages) you will be risk assessing.

Secondly, clearly identify potentials risks that are relevant to your scope that you will be looking to identify during the risk assessment (see Table RA.1 below for examples).

Thirdly, get together a team of staff within the business (and a consultant where used) who have the knowledge of the operation and necessary skills to complete the Risk Assessment.

Table RA.1 Potential Risks to Be Reviewed During the Risk Assessment	
Physical	■ Foreign bodies from farming operations (e.g. plastic, metal, harvesting knives, etc.) ■ Risks related to production site location and history (e.g. previous site use, historic livestock grazing, etc.) ■ Proximity of other activities that present a risk (e.g. waste sites, waste treatment facilities, abattoirs, golf courses, public rights of way, etc.) ■ Hydrological features (e.g. flood risk, groundwater, surface water flow, infiltration, soil moisture etc.) ■ Wildlife and/or domestic animals (e.g. presence of animal faeces, bird's nests, feathers, etc.) ■ Other specific risks (e.g. trees shedding leaves)
Chemical	■ Heavy metals ■ Cleaning chemicals ■ Plant Protection Products (PPPs) ■ Lubricants ■ Fertilisers ■ Intrinsic chemical contaminants (e.g. nitrate) ■ Bio-stimulants ■ Oil ■ Rodenticides
Microbiological	■ Environmental contamination (e.g. soil borne Listeria monocytogenes) ■ Human-borne contamination (e.g. Norovirus spread by infected food handlers) ■ Contamination of water sources ■ Contamination of manure or other soil inputs ■ Neighbouring activities (e.g. livestock operations) ■ Contamination from pests/vermin (e.g. bird faeces) ■ Contamination from environmental events (e.g. flooding) ■ Toxic weeds (e.g. groundsel) ■ Pathogen growth due to inadequate temperature control post-harvest
Allergenic	■ Cross contamination by allergenic crops (e.g. neighbouring crops or volunteer crops due to historic land use) ■ Contamination with allergens from surrounding environment (e.g. nut trees) ■ Human-borne contamination due to inadequate personal hygiene Customer Expectations ■ Product specification requirements
Customer Expectations	■ Products meet customer specific expectations
Food Fraud	■ Counterfeit PPPs ■ Non-food grade packaging material

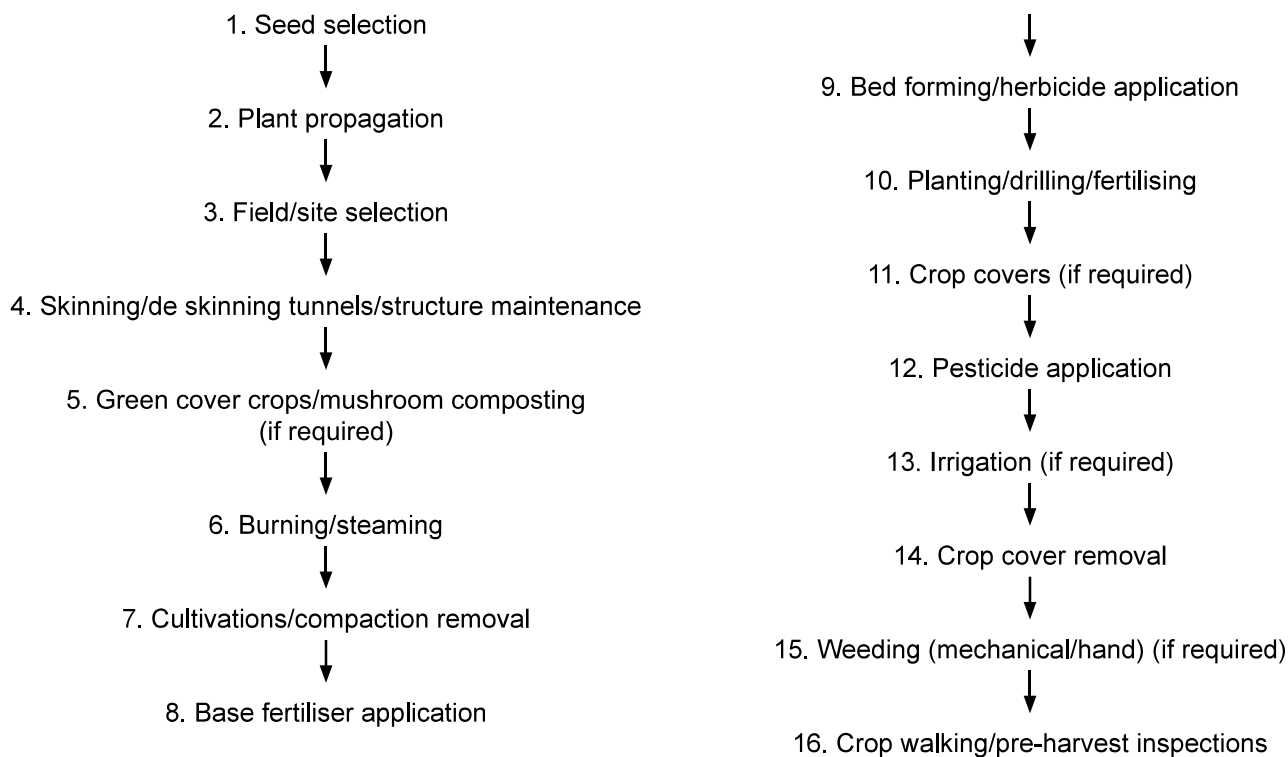## AN INTRODUCTION TO RISK ASSESSMENTS FOR FRESH PRODUCE

Stage 2: Developing a "process flow"

Using both your own and your team's knowledge of the operations develop a simple "map" of the crop production process in the sequential order in which steps occurs. This ideally should be in the form of a simple flow diagram:

Example 1 – Simplistic flow diagram for baby leaf

Bed-forming ► Planting of Seed ► Irrigation ► Pesticide Application ► Foliar Feeds ► Crop Assessment ► Harvest ► Cooling ► Inspection ► Packing ►Distribution

Example 2 – Simplistic Flow diagram for field/tunnel selection and the growing of field crops

1. Seed selection

2. Plant propagation

3. Field/site selection

4. Skinning/de skinning tunnels/structure maintenance

5. Green cover crops/mushroom composting (if required)

6. Burning/steaming

7. Cultivations/compaction removal

8. Base fertiliser application

9. Bed forming/herbicide application

10. Planting/drilling/fertilising

11. Crop covers (if required)

12. Pesticide application

13. Irrigation (if required)

14. Crop cover removal

15. Weeding (mechanical/hand) (if required)

16. Crop walking/pre-harvest inspections

Stage 3: Identifying Risks

The next stage is to critically look at the risks throughout the growing operation.

Use each process step identified in stage 2 and identify what risks (examples outlined in Table RA.1) could affect the crop and at what point in the process flow of production. The examples provided are for guidance – there may well be other, specific food safety risks associated with your crop, production system or location.

Food Standards Scotland's **Fresh Produce Tool** is a useful resource that may help you with this process (see links at the end of this appendix).

AN INTRODUCTION TO RISK ASSESSMENTS FOR FRESH PRODUCE

Stage 4: Managing Risk

For each risk identified a suitable control should be put in place. This can sound complex but most of these will already exist within your business and this process only gives an ordered way of managing and seeing the importance of these controls.

For example:

Example 1:

Risk Identified: Non-approved pesticide residues or MRL exceedance

Control: Only use pesticides that are approved for specific crop, advice from BASIS consultant, spray operator trained, sprayer annually checked

Example 2:

Risk Identified: Soft fruit pickers not washing their hands

Control: Business has hygiene policy clearly defined, all pickers are trained before they start work, hand washing compliance checked by supervisor

There will be others risk that are identified through this process that are not controlled or managed by your current management processes. These could represent considerable food safety risk to the crops you are producing and need to be managed:

Example 3:

Risk Identified: Potential nut contamination of crops from nut trees in hedgerows.

Control: A control should be developed that works for your business (cutting the tree down might seem the easiest but not the most environmentally friendly approach). Some controls could include:

- Arranging rotation so there is no cropping in field with nut trees when the nuts are ripe
- Having an X meter exclusion zone around the tree that's not harvested

At the end of the process you should have:

- Clear idea of what risks and crop production processes are in scope
- A simple flow diagram of the process
- A list of the food safety risks associated with each process step that affect your specific crop production process/ location
- And most importantly a document that details the controls and management process, you have implemented/ identified that control the food safety risks within your business

Stage 5: Review

The risk assessment needs to be reviewed at least annually or more frequently if changes to the production process occur or new knowledge emerges that could affect the evaluation of risk.

OPTIONS AND USEFUL RESOURCES

It can be appropriate to get help for professional organisation or consultants to aid you in developing a risk assessment, but you know your own business better than anyone and are very often the best person to carry out the assessment.

AN INTRODUCTION TO RISK ASSESSMENTS FOR FRESH PRODUCE

Hazard Analysis and Critical Control Point (HACCP) Food Plans

The example system set out in this appendix is informed by HACCP principles – although it does not follow all aspects of HACCP methodology. HACCP was first developed in the 1950s and 1960s by a team of food scientists and engineers from Pillsbury, Natick Research Laboratories, and NASA. The original goal was to produce safe food for space travel – as medical attention and alternative food sources would not be available.

HACCP principles have since been applied far more broadly to the management of food safety. They were enshrined within the Codex Alimentarius International Food Standards, *General Principles of Food Hygiene, CXC 1-1969 (Revised 2020)* and a Food Safety Management System, based on HACCP principles is a legal requirement for UK food businesses, through implementation of EU Regulation (EC) 852/2004 and related, domestic legislation – which continues to apply after the UK's exit from the European Union.

The text of (EC) 852/2004 does however allow for a different approach at primary production:

'The application of hazard analysis and critical control point (HACCP) principles to primary production is not yet generally feasible. However, guides to good practice should encourage the use of appropriate hygiene practices at farm level. Where necessary, specific hygiene rules for primary production should supplement these guides. It is appropriate for the hygiene requirements applicable to primary production and associated operations to differ from those for other operations.'

Regulation (EC) No 852/2004 of the European Parliament

While UK growers are not obliged by law to adopt a food safety management system that fully complies with HACCP principles, since the implementation of (EC) 852/2004, we can observe the following developments:

- More growers have adopted food safety management systems based on HACCP principles

- Alternative approaches (such as the one set out in this appendix) are increasingly informed by the systematic and preventative approach of HACCP

- Food Safety issues and food poisoning outbreaks associated with Fresh Produce have led to the increased integration of HACCP principles into global farm assurance schemes

- The Global Food Safety Initiative (GFSI) benchmarking requirements for Farming of Plants (Scope BI) states that benchmarked farm assurance schemes must require a Hazard and Risk Management System that:

    '*…may be a HACCP based system or another hazard and risk management system that covers the Annex of Codex Alimentarius General Principles of Food Hygiene.'*

In summary, while HACCP principles are not currently a legal requirement for UK fresh produce growers, the application of HACCP principles to primary production is now much more feasible. Many Red Tractor Fresh Produce farms already adopt a food safety management system based on HACCP principles and those who do not may wish to consider this option to adopt industry best practice in food safety management and future-proof their businesses. Where growers wish to adopt a HACCP based system, certified HACCP training is recommended.

Useful Links

- AHDB Microbials: Keeping Fresh Produce Free of Pathogens:
  https://ahdb.org.uk/knowledge-library/microbials-keeping-fresh-produce-free-of-pathogens

- Codex Alimentarius Codes of Practice: **www.fao.org/fao-who-codexalimentarius/codex-texts/codes-of-practice/pt/**

  Includes: CXC 1-1969 | General Principles of Food Hygiene, CXC 53-2003 Code of Hygienic Practice for Fresh Fruits and Vegetables

- Food Standards Agency: Hazard Analysis and Critical Control Point (HACCP):
  https://www.food.gov.uk/business-guidance/hazard-analysis-and-critical-control-point-haccp#.UH1ku-1OE20

- Food Standards Scotland: Fresh Produce Tool: **https://freshproducetool.foodstandards.gov.scot**