Sustainable Agriculture Code - Appendix 2

Risk Assessment, HACCP, QA, and TCO
2.1 Introduction

Many Good Practices require a Risk Assessment to be performed and risk-based management systems put in place. In the “Value Chain” section we ask that all risk assessments be brought together under the general HACCP approach to Quality Assurance (QA).

2.2 Risk Assessment - General Principles

Risk Assessment and Risk Management

Human health and safety, environmental and other social risks must be assessed according to hazard and probability. The basic idea behind risk assessment is to combine assessments of hazards with assessments of probability that the event will occur. See Risk Matrix below.

- The hazard is any source of potential damage, harm or adverse effects. It is assessed in terms of how serious the consequences of any event or behaviour are.
- Probability refers to the likelihood of the event happening at all, or the frequency with which it occurs.

For all risks, the expected exposure routes must be taken into account.

Appropriate measures to mitigate risks are then put in place.

Risk Matrix

A serious hazard, combined with a high likelihood (= highest risk) should be assigned the highest priority for risk management.

Risks should be re-assessed once risk mitigation procedures are put in place, to address the residual risk.

This is a continual process.
For suppliers with little experience of risk assessment, we recommend an excellent general introduction and process guide to risk assessment (focused on Health and Safety) available from the source below:


Once a risk assessment approach has been developed for health and safety, it is relatively easy to see how a similar approach to environmental, reputational, quality and other social risks can be developed.

Other documents which may help are available at: http://www.hse.gov.uk/risk/expert.htm

**Risk assessments** must be based on relevant and up-to-date expertise.

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### 2.3 HACCP

The **HACCP (Hazard Analysis Critical Control Point)** approach to consumer safety and product quality is a **mandatory** form of risk assessment for Unilever third parties, Contract manufacturers and **direct** suppliers to Unilever foods businesses.

Suppliers should contact Unilever directly for “Unilever General Requirements, Third Parties, Contract Manufacturers & Suppliers supplying to Unilever Foods, July 2004. Guideline for the Implementation of HACCP in Unilever (internal to Unilever only)”

For more distant and secondary suppliers, for whom HACCP is advisable but not mandatory, excellent advice on implementing HACCP can be obtained from "Codex Basic Hygiene text + Codex HACCP":

www.codexalimentarius.net/download/standards/23/cxp_001e.pdf


The application of HACCP to agriculture is also described in


Many contamination and quality issues and risks (e.g. CPP contamination, stones, insects, enteric bacteria) arise during agriculture. The HACCP approach should therefore not be confined to factory situations but should extend into the field and agricultural operations. Any HACCP study for food processing must cover inbound raw materials (and therefore agricultural production) to fully understand where Critical Control Points are. Farmers must understand their responsibility.

HACCP is linked to Quality Assurance (QA) and can be used to identify where cost optimisation opportunities may exist through working in partnership with suppliers using the Total Cost of Ownership (TCO) concept.

The TCO is an estimate of the life-cycle costs of owning a product or asset, and therefore includes the purchase price, any additional costs related to sub-optimal performance, and any additional training or maintenance requirements (for example, increased cost of handling out-of specification product; damage to reputation, re-packing or re-cleaning costs incurred by a product recall).

Consideration of TCO results in

- Avoidance of hidden costs
- clearer specifications, and
- by taking a holistic cost calculation along the value chain from raw material purchase to consumer purchase, it becomes easier to eliminate extra/hidden on-costs linked to reputation (product boycotts) or quality (consumer complaints)
HACCP, QA, TCO are not difficult, complicated or bureaucratic, unless an organisation makes them so. What is necessary is a thorough understanding of the value chain, through every step of agricultural production, including those factors that cause concern to customers (internal and external), consumers and key opinion formers.

2.4 HACCP and Agriculture

Stages in a HACCP study extending into agricultural production are:

Planning
1. Define the terms of reference
2. Select the HACCP team (a team might not be required for a small operation)
3. Describe the essential product characteristics
4. Construct a flow diagram of how the raw material is grown, including seed/transplant/clone production, through harvest to delivery to a Unilever factory.

Application
1. List all the hazards associated with each process step, conduct a hazard analysis and consider measures to control the identified hazard (HACCP Principle 1)
2. Determine Critical Control Points (HACCP Principle 2)
3. Establish critical limits for each CCP (HACCP Principle 3)
4. Establish a monitoring system for each CCP (HACCP Principle 4)
5. Establish a corrective action plan (HACCP Principle 5)
6. Establish verification principles (HACCP Principle 6)
7. Establish documentation and record keeping (HACCP Principle 7)
8. Review the HACCP Plan

Critical Control Points
A point beyond which no further hazard elimination, removal or reduction to a safe level can occur. This must not be confused with actions, which can reduce the level of hazards.

2.5 Safety and Quality hazards

Typical Crop Safety and Quality Hazards include:

Biological
- Variety
- Pathogenic bacteria, e.g. E.coli, Salmonella
- Fungal toxins
- Plant toxins, (e.g. glycoalkaloids from solanaceous weeds)
- Fungal bodies or plant berries (e.g. ergot, nightshade)
- Genetically modified materials (derived from GMOs)
- Fungal moulds and bacterial rots (spoilage)
- Plant diseases
- Insects
- Animal or human matter, e.g. faeces
Chemical
- CPP residues, (e.g. exceeding MRLs (Maximum Residue Limits) or using CPPs not permitted in destination country).
- Nitrate levels – certain leafy crops such as spinach
- Heavy metal levels, (e.g. Lead (Pb), cadmium (Cd))
- Mineral oils – lubricants, hydraulic oil, diesel
- Composition, (e.g. protein, sugars, oil)
- Dry matter content

Physical
- Glass
- Metal
- Stones
- Wood
- Extraneous vegetable matter (EVM) – contamination with other plant parts
- Foreign EVM – contamination with plant parts not from the crop
- Physical damage and blemishes
- Size/shape
- Colour
- Soil contamination

2.6 Other risk assessments

Typical Scope of Risk Assessments
The general risk assessments (i.e. those not specifically linked to quality or contamination where HACCP is the required methodology) must cover all areas of risk:
- People (e.g. operators, neighbours and bystanders)
- Environment (e.g. soil, water, air and biodiversity)
- Economic (e.g. profitability)

and consider
- Normal (routine use and management),
- Non-routine or abnormal (e.g. when handling CPPs ‘abnormal’ means extraordinary but planned situations, such as refilling fuel tanks or change of oil filters) and
- Emergency (e.g. during fire or flooding) circumstances.

For example, properly constructing, bunding and using a tank of diesel will help manage risks during routine activities. Non-routine situations, like replacing a valve, and emergency circumstances, like a fire, may introduce additional risks (spillage, explosion), which are not effectively managed by the above measures.

Non-routine situations can be regularly arising (e.g. maintenance of equipment; staff exiting a building by a secondary exit instead of the normal exit); or they may never have happened to date, but are theoretically possible (e.g. power cut; livestock epidemic). Non-routine situations can increase the significance of a risk or introduce additional risks, compared to routine activities.
2.7 Risk management

Any identified control or mitigation measures must be hierarchical in approach. For risks associated with Nutrients, for example, we ask:

1. **Fertiliser choice** Can a formulation be used that reduces the identified risk (e.g. pellets rather than liquid fertilisers, organic fertilisers rather than synthetic inorganic ones, ammonium nitrate rather than urea)?
2. Can the identified risks for the selected fertilisers be controlled through engineering approaches to prevent or reduce exposure e.g. bunded storage systems, riparian strips, enclosed tractor cabs?
3. What are the best handling procedures to reduce or minimise exposure? e.g. ensuring competent/trained operators, proper calibration of equipment, mixing practices, hygiene practices etc.
4. Finally and only after all other approaches have been assessed, what Personal Protective Equipment (PPE) is necessary to control any residual risk?

For risks associated with Pest Management, for example, we ask:

1. **Substitution** – can another pest control method be used not involving the application of chemicals?
2. Can a safer CPP or formulation be used? The use of Manufacturers Safety Data Sheets or public domain risk assessment tools should be encouraged - for example Unilever’s PROMPt system.
3. Can the identified risks for the selected CPP be controlled through engineering approaches to prevent or reduce exposure? e.g. improved store security, closed transfer systems, enclosed tractor cabs, CPP formulations in water soluble bags.
4. What are the best handling procedures to reduce or minimise exposure? e.g. ensuring competent/trained operators, appropriate nozzle height, mixing practices, hygiene practices etc.
5. Finally and only after all other approaches have been assessed, what PPE is necessary to control any residual risk?
6. The exposure risks for individuals who spray CPPs must be considered, particularly to determine whether health checks are necessary.


The management of Health and Safety at Work in agriculture must be based on a risk assessment approach, and be accompanied by

- Input from workers representatives & agreement on priority setting
- Provision of Health and safety awareness training
- Provision of first aid training and first aid kits in the workplace

There are risks to people, the environment, our products and our reputation arising FROM agricultural practices, and also risks arising from outside farms and the supply chains TO agricultural operations. This inevitably results in some risks appearing more than once in the Unilever Sustainable Agriculture Code.