



Industry Guide to Good Hygiene Practice

Watercress

Regulation (EC) No 852/2004 on the hygiene of foodstuffs

Foreword	ii
Acknowledgements	iii
Introduction.....	1
About this guide	1
How to use this guide.....	1
Legal compliance and due diligence	2
Scope of this guide	2
Relevant legislation.....	2
Primary production of watercress	3
Site risk assessment	4
Protecting the site from contamination.....	6
Water quality.....	7
Growing bed substrate – gravel	8
Natural fertilisers	9
Plant protection products and synthetic fertilisers.....	10
Equipment associated with growing and harvesting	11
Storage, handling and transport.....	14
Cleaning maintenance and disinfection of watercress handling areas	16
Pest control in growing, propagation and handling areas	17
Personnel health and hygiene and sanitary facilities	19
Microbial analysis.....	22
Record keeping.....	26
Recall procedures	27
Food crime	28
Training	29
Growing watercress for seed production	30
Seed storage area	30
Seed traceability	31
Production of seedlings (propagation)	32
Propagation material traceability.....	32
Substrate for propagation	33
Glossary	34
Appendix	38
Legislation.....	38
General guidance.....	39
Open Government Licence.....	41

Foreword

Food Standards Agency and Food Standards Scotland

This industry guide provides watercress producers with practical advice on how to comply with food hygiene legislation and related requirements.

This guide is officially recognised by the **Food Standards Agency (FSA)**, which has responsibility for food safety in England, Wales and Northern Ireland and **Food Standards Scotland (FSS)** with responsibility for food safety in Scotland.

Use of this industry guide is optional and food business operators can choose to comply in other ways. However, where a food business operator is following the guidance in a recognised industry guide, the enforcement authority must take this into account when assessing compliance with legislation.

The information within this guide will help watercress producers meet their legal obligations and ensure food safety. The use of industry guides supports the proportionate, consistent and effective application of food hygiene in the UK, and FSA and FSS fully support their development.

The FSA and FSS would like to thank the Watercress Industry Working Group for developing this guide.



Acknowledgements

The Watercress Industry Working Group are grateful to the Agriculture and Horticulture Development Board (AHDB) for funding the development of this guide.



The working group would like to give particular thanks Dr James Monaghan for his work drafting this guide.

Watercress Industry Working Group Members

 Harper Adams University	Dr James Monaghan	Harper Adams University	Author
	Charles Barter	The Watercress Company	Chairman
	Ollie Bedford	The Watercress Company	Working Group Member
	Dr Steve Rothwell	Vitacress	Working Group Member
	Kim Brown / Helen Brierley	Vitacress	Working Group Member
	Edward Scales	Hairspring Watercress	Working Group Member
 Food Standards Agency	James Ambrose	Food Standards Agency	Project Lead / Working Group Member
 Food Standards Agency	Jide Mirikwe	Food Standards Agency	Project Member
 Dorset County Council	Tim Evans	Dorset County Council	Technical Adviser / WG Member
 Winchester City Council	Kevin Gosling	Winchester City Council	Technical Adviser / WG Member
 AHDB AGRICULTURE & HORTICULTURE DEVELOPMENT BOARD	Grace Choto	Agriculture and Horticulture Development Board	Working Group Member

Introduction

About this guide

This guide provides information on legal obligations for producers of watercress and what they need to do in order to comply with food hygiene law, as well as other aspects such as good practice, which are not legal requirements, but are likely to contribute to the overall achievement of food safety. This guide has been developed by an expert group and is recognised by the Food Standards Agency and Food Standards Scotland in accordance with [Regulation \(EC\) No 852/2004](#), Article 8.

Watercress growers are required to register with the local authority as a food business operator in accordance with [Regulation \(EC\) No 852/2004](#), Article 6. This requirement does not apply to primary production for private domestic use.

You are not legally obliged to follow this guide and may choose other ways to meet the hygiene regulations if you wish. However, you are encouraged to use the guide on a voluntary basis. The guide has no legal force and its use by watercress producers is not obligatory, but local authority enforcement officers are required to take account of its contents when carrying out an inspection of your business. This guide deals only with requirements of [Regulation \(EC\) No 852/2004](#) and the relevant parts of associated UK Food Hygiene Regulations.

This guide refers to watercress grown in gravel beds with flowing water, commonly sourced from underground aquifers. The crop is generally grown outdoors in constructed beds. The risks of contamination are similar to those related to other outdoor grown leafy crops, such as wildlife and pests, but a particular focus is required on managing the risks associated with potential contamination of the water source.

How to use this guide

The guidance is laid out in a format designed to allow producers to consider their processes and whether their current or proposed arrangements comply with hygiene regulations. This guide will also help regulators to reference legal requirements and the relevant legislation. The guidance is laid out in three areas:

‘The law’ – This quotes the relevant specific legal requirement.

‘How to comply with the law’ – This outlines what should be done to comply with the law. Producers may find other ways to comply with the law, however additional validation may be necessary in such cases.

‘Good practice’ – This outlines good practice arrangements that producers may want to implement. There may be further actions necessary to achieve best practice. Where good or best practices are implemented, they should be additional to the arrangements mentioned in ‘how to comply’. These arrangements go beyond the requirements of the law.

The guide has been laid out in a format to allow producers to find advice quickly. As a consequence, legal requirements quoted in ‘The law’ may appear in more than one place, and appropriate additional guidance may be found elsewhere in the document. Other guidance is available from government agencies and other reliable sources. Web addresses for many of these can be found in the [Appendix](#).

A full [glossary](#) of legal definitions and other terms used in this guide has been provide at the end of this guide.

Legal compliance and due diligence

Implementing the requirements of 'How to comply with the law' as set out in this guidance may be sufficient to demonstrate due diligence. In the event of a food safety contravention, businesses may wish to use the due diligence defence. This defence can only be assessed by courts according to the facts of any particular case. Following this guide may assist. Where the guide provides lists of examples that comply with the law, these lists are not exhaustive and other examples may be equally satisfactory.

Scope of this guide

This guide applies to watercress (*Nasturtium officinale*) that is grown commercially in flowing water. This guide covers hygiene standards for the **primary production of fresh and unprocessed watercress** and encompasses the legal obligations and good practice observations for crop production, harvesting and storage with additional guidance on the hygiene requirements for seed production and plant propagation.

This guide does not cover the management of a packing operation or processing practices that substantially change the nature of the product, which commonly include washing, rinsing, dewatering and bagging. Additional legislation applies to these stages. General information regarding the processing of chilled produce is available from various sources including the British Retail Consortium (BRC), Fresh Produce Consortium (FPC), Campden BRI and the Chilled Food Association (CFA).

Relevant legislation

[Council Directive 98/83/EC](#) defines the quality of water intended for human consumption and water used in the food-processing industry. In this guidance document this directive is used to define some aspects of water quality used in the production of watercress.

[Regulation \(EC\) No 178/2002](#) requires that all food placed on the market must be safe to eat and defines requirements for traceability.

[Regulation \(EC\) No 852/2004](#) on the hygiene of foodstuffs and particularly Annex I – Primary Production, Part A: General hygiene provisions for primary production and associated operations. This directly addresses the legal requirements for primary production and is the core of this guide.

[Regulation \(EC\) No 1069/2009](#) laying down health rules as regards animal by-products and derived products not intended for human consumption. This Regulation applies to the use of composted or heat-treated natural fertilizers derived from animal waste.

There are a number of national regulations that are involved in the implementation of these requirements that are also listed in the [Appendix](#).

Primary production of watercress

Primary production encompasses seed production, propagation of seedlings and production of the crop through to harvesting and handling. Microbial contamination of the crop during production, harvest and storage could lead to contaminated watercress crops that have the potential to cause foodborne illness in consumers. Proper consideration of the risks of microbial contamination of watercress during production will minimise the risk of microbial contamination in the harvested crop.

In general, the approach is similar for all stages of production but additional guidance is included for [Seed Production](#) and [Seedling Production](#).

The Law

Reg. 852/2004, Annex I; II.2, II.3(a), II.5(e); III.7

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (e) as far as possible to prevent animals and pests from causing contamination;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

Site risk assessment

Production areas should be managed to minimise the possibility of microbial contamination to the watercress beds from adjacent land. Where seedlings are propagated in substrate, propagation sites (indoor and outdoor) should be located and maintained to minimise the possibility of microbial contamination to the growing plants.

How to comply with the law

The risks of contamination of production areas from the surrounding environment must be assessed in a site risk assessment, recorded and the records available for inspection. The risk assessment must be completed by a competent team or individual.

The risk assessment must include:

- Access by animals (domestic or wild) to the production area.
- Access of animals (domestic or wild) to water sources used in primary production and associated operations.
- Human habitation close to production areas.
- Leaking, leaching or overflowing manure storage and composting areas close to production areas.
- Hazardous waste sites close to production areas (currently and in the past).
- Sewage treatment sites and septic tanks close to production areas (currently and in the past).
- Leaking foul drains and public sewers
- Industrial or mining sites close to production areas (currently and in the past).
- Possibility of runoff from nearby fields and adjacent on-site tracks and roadways.
- Possibility of site being flooded with contaminated water.
- Possibility of contamination of the production area with microbial or other environmental hazards, for example, faecal material, aerosols or organic waste.



Good practice

- The site risk assessment should be reviewed annually.
- Staff training should be included in the site risk assessment.
- The site risk assessment should be reviewed if the situation changes i.e. land use changes on land adjacent to the production area.

The Law

Reg. 852/2004, Annex I; II.2, II. 3(a); III.7

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

Protecting the site from contamination

Watercress production beds are longstanding facilities and the level of risks posed by adjacent land may change over time. It may be necessary for a producer to mitigate environmental risks identified from adjacent land.

Incursion by livestock and wildlife are covered in '[Pest control in growing, propagation and handling areas](#)'.

How to comply with the law

Where the surrounding environment presents a risk to the production site and has been identified in the [site risk assessment](#), measures must be implemented to minimise the contamination of the production area and the growing crop. The measures put in place to control hazards must be recorded and available for inspection.

Good practice

Runoff from adjacent land may be redirected through the landscape by changes such as:

- A ditch, raised bank (e.g. sleeping policeman) or wall to channel water away to a drainage point.
- A drain across a roadway or track.
- Rerouting of traffic access routes from roads and tracks away from the beds.

When there is any evidence that surface water from adjacent land identified in the risk assessment may have entered the crop, or flooding has occurred:

- The crop in the affected bed(s) should be removed and destroyed.
- The bed should be drained, the substrate replaced and / or the bed flushed through with clean water before replanting.
- The outlet water from the bed should be tested for acceptable levels of [pathogens](#).

The Law

Reg. 852/2004, Annex I; II.2, II.3(a), II.5(b),(c),(e); III.7, III.9(c)

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products; (c) to use potable water, or clean water, whenever necessary to prevent contamination; (e) as far as possible to prevent animals and pests from causing contamination;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

Water quality

Watercress is grown in flowing water during production up to harvest and poses a direct risk if the water is contaminated with microbial pathogens.

How to comply with the law

All sources of water used in primary production must be identified (e.g. borehole / well, spring and reservoir) for all uses including production beds, propagation, PPP application, cleaning of equipment etc. The distribution systems and storage of water must be known and mapped. The sources of water must be protected from contamination. The microbial quality of the water sources must be monitored and records kept over time. The water used to produce watercress must not contain micro-organisms or harmful substances in quantities capable of directly or indirectly leading to illness in consumers.

Good practice

- Open water sources with a variable microbial quality e.g. rivers and ponds pose an unacceptable risk and should not be used for watercress production.
- There should be a recorded risk assessment completed by a competent risk assessor where all water sources are identified and potential contamination to the water is considered and preventive action proposed.
- All identified water sources (i.e. individual borehole or spring) should be tested to establish the microbial quality a minimum of four times a year spread equally across the production season.
- Water recycled between production beds (e.g. flow through sequential beds) should be assessed at the original source (i.e. borehole or spring).
- Water should be tested for generic *E. coli* as an indicator species (see [Water Quality](#)).
- Water test results should be trended and kept for five years (see [Water Quality](#)).

The Law

Reg. 852/2004, Annex I; II.2, II.3 (a), II.5 (b); III.9(c)

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

Growing bed substrate – gravel

Watercress is grown in gravel beds with flowing water passing over them. The gravel may be renewed or recycled at times. New gravel is often stored on-site before use.

How to comply with the law

The source of each batch of gravel must be known and recorded. Any treatments (e.g. washing) must be recorded. Storage of gravel must be managed to prevent contamination which could be transferred to the production bed.

Good practice

- Gravel should be free from soil and plant debris before use.

The Law

Reg.1069/2009, Chapter 2, Section 2, Article 32.1(a), (b), (c)

1. Organic fertilisers and soil improvers may be placed on the market and used provided:

(a) they are derived from Category 2 or Category 3 material; (b) they have been produced in accordance with the conditions for pressure sterilisation or with other conditions to prevent risks arising to public and animal health, in accordance with the requirements laid down pursuant to Article 15 and any measures which have been laid down in accordance with paragraph 3 of this Article; (c) they come from approved or registered establishments or plants, as applicable;

Reg. 852/2004, Annex I; II. 3(a); III.7, III.9(c)

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

Natural fertilisers

Natural fertilisers derived from animal manure may be used in some production systems. It is important to manage the risk of introducing microbial hazards through these materials.

How to comply with the law

Where fertilisers derived from animal products are applied to a crop they must only be used if they have undergone suitable treatment to achieve a high level of potential pathogen reduction. The method of treatment must be recorded. Composting must be verified by testing for faecal pathogens before use, either by the composted material supplier or by the primary producer. Storage of faecal derived material must be managed to prevent contamination of the growing crop. Compost analysis and treatment records must be available for inspection.

Good practice

- The processes applied to the animal products to produce the natural fertiliser should be recorded, and, if necessary, risk assessed.
- A microbiological analysis or a Certificate of Compliance from any natural fertiliser supplier should be available for each batch of material brought on to the primary production site.
- Test results should be available for the batch of natural fertiliser before it is applied to the growing bed.

	Target / g
Generic <i>E. coli</i>	<100 cfu
Salmonella	absent
<i>Listeria monocytogenes</i>	absent
<i>E. coli</i> O157	absent

- If the target levels are exceeded and / or a pathogen is detected prior to use, the fertiliser should not be used and an investigation should be carried out with the supplier to understand the source of contamination.

The Law

Reg. 852/2004, Annex I; III.7, III.9(a)

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (a) any use of plant protection products and biocides;

Plant protection products and synthetic fertilisers

Although this production guide is focussed on microbial hazards, the use of plant protection products (PPP) and synthetic fertilisers may pose a risk to consumers if not approved for use on human food crops.

How to comply with the law

PPP and synthetic fertilisers must be acceptable for human food crops. [Records](#) must be kept of any applications applied and be available for inspection.

The Law

Reg. 852/2004, Annex I; II.5(a),(b); III.7, III.9(c)

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (a) to keep clean and, where necessary after cleaning, to disinfect, in an appropriate manner, facilities, equipment, containers, crates, vehicles and vessels; (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

Equipment associated with growing and harvesting

Inadequate maintenance and cleaning of watercress growing and harvesting equipment could lead to an accumulation of pathogens which can cross contaminate the harvested crop. Equipment includes knives, boxes / crates and machinery that come into contact with the crop during growing or harvesting.

How to comply with the law

Equipment must be cleared of debris before use, cleaned and where necessary disinfected. The cleaning and disinfecting procedure must be defined and recorded, and records must be available for inspection. Field boxes / crates and product containers must be suitable for contact with food, only be used to hold the product and be routinely cleaned and where necessary disinfected. Equipment must be stored in a manner that minimises contamination.

Good practice

There should be a defined written cleaning and disinfecting procedure for all growing and harvesting equipment. This should cover:

- All cleaning / disinfection procedures including daily cleaning and weekly deep cleaning, where equipment can partially be dismantled and belts removed to facilitate effective cleaning.
- The identification of appropriate cleaning / disinfection chemicals and dilutions for effective use and used as directed by the manufacturer i.e. contact times and rinsing.
- Training records should be available for all staff who undertake cleaning and disinfection.
- The effectiveness of cleaning and disinfection should be verified through records of environmental swabbing on equipment surfaces that come into contact with the harvested crop.
- Cleaning of equipment must be carried out in designated area outside the production area to prevent contamination of the growing crop or pollution of associated watercourses.

Where watercress is harvested into boxes / crates using knives:

- Knives used for harvesting should be cleaned and disinfected after use and stored away from contamination risks.
- Damaged crates should be removed from use.
- Harvest crates should be cleaned and disinfected prior to daily use. Crates should be swabbed for Enterobacteriaceae after cleaning every month.

Enterobacteriaceae	
Target	<100 cfu / swab
Investigate	100-1000 cfu / swab
Unacceptable	> 1000 cfu / swab

- Where test results >100 cfu / swab, the crates should be re-cleaned and swabbed again.
- Corrective actions should include a review of cleaning practices and retraining of responsible personnel.

Where watercress is harvested into boxes / crates using a mechanical harvester:

- Harvest machinery should be designed to make it as easy to clean as possible.
- Harvest machinery should be deep cleaned and disinfected daily by trained staff following a detailed written cleaning procedure.
- Weekly swabs should be taken from the main product contact surface (the main belt and blade) after cleaning and analysed for total Enterobacteriaceae to verify the efficacy of cleaning.

Enterobacteriaceae	
Target	<100 cfu / swab
Investigate	100-1000 cfu / swab
Unacceptable	> 1000 cfu / swab

- Where test results >100 cfu / swab, the equipment should be re-cleaned and swabbed again. Corrective actions should include a review of cleaning practices and retraining of responsible personnel.

- Harvest machinery should be swabbed for *Listeria monocytogenes* after cleaning every month (from the blade and belt after it has been run for 10 minutes).

<i>L. monocytogenes</i>	
Target	<10 cfu / swab
Investigate	10-100 cfu / swab
Unacceptable	> 100 cfu / swab

- Where test results >10 cfu / swab, the equipment should be re-cleaned and swabbed again. Corrective actions should include a review of cleaning practices and retraining of responsible personnel.
- Harvest crates should be cleaned and disinfected prior to daily use.
- Damaged crates should be removed from use.
- Crates should be swabbed for total Enterobacteriaceae after cleaning every month.

Enterobacteriaceae	
Target	<100 cfu / swab
Investigate	100-1000 cfu / swab
Unacceptable	> 1000 cfu / swab

- Where test results >100 cfu / swab, the crates should be re-cleaned and swabbed again. Corrective actions should include a review of cleaning practices and retraining of responsible personnel.
- Crates should be swabbed for *Listeria monocytogenes* after cleaning every month.

<i>L. monocytogenes</i>	
Target	<10 cfu / swab
Investigate	10-100 cfu / swab
Unacceptable	> 100 cfu / swab

- Where test results >10 cfu / swab, the crates should be re-cleaned and swabbed again. Corrective actions should include a review of cleaning practices and retraining of responsible personnel.

The Law

Reg. 852/2004, Annex I; II.5(a),(b)

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (a) to keep clean and, where necessary after cleaning, to disinfect, in an appropriate manner, facilities, equipment, containers, crates, vehicles and vessels; (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

Storage, handling and transport

Watercress is commonly hand or machine harvested into field crates. The harvested material may then be taken to a separate area for removal of field heat, prior to distribution.

Storage

Harvested material may be stored for a period of time in a refrigerated store.

How to comply with the law

Harvested watercress must be stored away from chemicals, animals and other sources of contamination.

Good practice

The harvested watercress should be held in an area designated for crop storage.

Post-harvest temperature controls

Reduced temperatures minimise the growth of microbial contaminants on fresh produce and robust chill / cool chain procedures are an important preventive action and if correctly followed can help to ensure hygienic production, transport and storage conditions.

How to comply with the law

The method used to remove the field heat from the harvested batches must not pose a risk to the crop and any water used in the cooling process must be of acceptable [microbial quality](#).

Good practice

- A system of monitoring the temperature of the storage environment and the watercress should be in place.
- The harvested batches should be < 5 °C within four hours of harvest.
- Watercress should be maintained at <5 °C during storage.
- Bulk-stored watercress can generate heat even in a refrigerated store and must be monitored and re-cooled as necessary.

Transport requirements

Some watercress will be transported from the production site to the next stage in the supply chain in vehicles that are not managed by the producer. However, in some cases businesses may have responsibility for transporting watercress to the next stage of the supply chain e.g. delivering watercress in a business-managed vehicle to a customer.

How to comply with the law

Loading and transportation must be carried out in a manner to minimise damage and contamination of the watercress. Transport equipment / containers and vehicles must be kept clean. Harvested watercress must be protected against contamination during transport.

Good practice

- Watercress should be transported in refrigerated vehicles.
- The refrigeration units on the trucks should be serviced regularly.
- The interior of the trucks should be kept clean.
- Where appropriate, trucks should be cleaned according to a written procedure and the cleaning recorded.
- The vehicles should be checked for cleanliness and temperature (target <5 °C) prior to loading.

The Law

Reg. 852/2004, Annex I, Chapter 5
(a), (b)

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (a) to keep clean and, where necessary after cleaning, to disinfect, in an appropriate manner, facilities, equipment, containers, crates, vehicles and vessels; (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products.

Cleaning maintenance and disinfection of watercress handling areas

Watercress may be handled following harvesting and before distribution; this may include cooling and storing.

How to comply with the law

Premises and re-usable equipment must be kept in a good state of repair and in a condition to facilitate cleaning and where appropriate disinfection.

Programmes must be in place to ensure that any necessary cleaning and maintenance is carried out effectively and appropriately. Cleaning and disinfection of handling areas must be carried out in a manner that will not cause the harvested crop or production areas to be contaminated.

Good practice

- There should be a schedule for cleaning and disinfection of all relevant equipment and areas.
- The schedule should cover both daily cleaning and weekly deep cleaning, where equipment can be partially dismantled to facilitate effective cleaning.
- Cleaning should include removing debris, detergent, rinse with clean water and if appropriate disinfect following manufacturers' instructions (dilution rates, contact times and rinsing).
- There should be clear identification of appropriate cleaning chemicals and dilutions for effective use.
- All cleaning procedures should be recorded including daily cleaning and weekly deep cleaning.
- Training records of all staff who undertake the cleaning and disinfection should be available for inspection.
- The effectiveness of the cleaning and disinfection should be verified through records of environmental swabbing on equipment surfaces that come into contact with the harvested crop.

Pest control in growing, propagation and handling areas

Livestock, wildlife and domestic animal activity pose a risk to watercress beds and adjacent land through faecal contamination if potential microbial contaminants are present in the faeces. The challenge for producers is similar to that of other field-grown leafy crops. Watercress has a particular challenge in that the flowing water in the beds may spread contamination more widely through the growing crop.

Watercress can be contaminated by liver fluke, a parasite which is potentially dangerous to humans. The crop becomes contaminated through the presence of mud snails (*Lymnaea truncatula* / *Galba truncatula*) within the crop. These snails act as a carrier of liver fluke from infected animal faeces to humans.

Different strategies may be required for animals (including pests and livestock), birds and mud snails.

How to comply with the law

The producer must assess the risk of faecal contamination through access to the production area from livestock, domestic or wild animals in the [site risk assessment](#). If the assessment highlights an unacceptable risk, preventive actions must be put in place and pest control measures must be recorded.

Incursion into the crop by livestock or wildlife including water fowl that requires remedial action, such as non-harvesting of crops, must be recorded, and the records be made available for inspection. Staff involved in production must be trained to report the presence of significant incursion.

Good practice

Animals

- Where a risk is identified there should be barriers, such as amphibian, rabbit and deer proof fencing to prevent domestic and wild animals entering production area.
- Cattle grids should be at all access points to the site adjacent to livestock areas.
- Where public footpaths are adjacent to the production area, there should be clear signage marking the area as a food production site.
- Where possible potential entry into the crop by the public and / or pets should be prevented.
- Managed pest control through shooting can reduce the pest pressure in some circumstances.
- If there is evidence that domestic or wild animals have accessed the crop (i.e. the barriers have failed) the

affected area of crop and the crop downstream in that bed should be removed and destroyed.

- The barriers should be improved or repaired.
- The bed should be drained, the substrate replaced and / or the bed flushed through with clean water before replanting.

Birds

- Bird scarers should be used to minimise bird activity in the production area. This may include the use of hawks to fly over the site.
- Managed pest control through shooting can reduce the pest pressure in some circumstances.
- If gross faecal contamination is observed following bird activity in the crop, or a dead bird is found in the crop, the affected area of crop and the crop downstream in that bed should be removed and destroyed.
- The bed should be drained, the substrate replaced and / or the bed flushed through with clean water before replanting.

Mud snails

- Production beds should be bounded by either a three metre well drained gravel (or similar material) track or minimum one meter wide water course not bridged by vegetation, to prevent ingress of mud snails which may be present on neighbouring land.
- If mud snails are present in a bed the crop in the affected bed(s) should be removed and destroyed.
- The route of mud snail ingress should be traced and actions taken to prevent any further incursion.
- The bed should be drained, the substrate replaced and / or the bed flushed through with clean water before replanting.

The Law

Reg. 852/2004, Annex I; II.5 (b),(c),(d)

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products; (c) to use potable water, or clean water, whenever necessary to prevent contamination; (d) to ensure that staff handling foodstuffs are in good health and undergo training on health risks;

Personnel health and hygiene and sanitary facilities

Watercress may be handled by workers during production, harvesting and post-harvest procedures.

Worker hygiene

It is important the hazards posed by poor personal hygiene are managed in a way that reduces the contamination risk to the watercress. A significant risk is posed by workers handling the crop.

How to comply with the law

All workers must be trained in general hygiene procedures and understand the importance of following hygiene procedures. Non-essential persons and casual visitors must be prevented from accessing the harvest area and other crop production areas, e.g. watercress beds, without authorisation. Appropriate hand washing procedures for workers must be implemented, with workers washing their hands before starting work if handling the growing or harvested crop and after using the toilet or handling any contaminated material.

Appropriate protective equipment must be worn by all staff involved in watercress production and harvesting. When protective equipment is used within the crop production area it must be in an acceptable condition and clean.

Fixed or mobile toilet and hand wash facilities must be available in a location that can be accessed by workers but does not pose a contamination risk to the production area. The facilities must be in an acceptable condition and be routinely cleaned. There must be sufficient provision of toilet and hand wash stations for the numbers of staff involved in crop production and harvesting. Areas must be provided away from the crop production and handling areas for workers to take breaks and to eat.

Good practice

- Clear signage instructing employees to wash their hands should be posted visibly in appropriate areas.
- One hand-washing station should be available for every 10 people working.
- One toilet should be available for every 10 people working.
- Toilets should be located within 500 metres or five minutes' travel from the production area.
- Sanitising gel should be available following handwashing.
- Drinking water should be available separately from hand washing or toilet facilities.
- Waste containers should be emptied regularly.
- Boots should be free of visual soiling before entering the crop production beds. This can be achieved through washing and rinsing with clean water ensuring any run off does not enter the beds.
- Workers in close contact with the crop should wear hair nets or caps.

The Law

Reg. 852/2004, Annex I; II.5 (d); III.7

Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (d) to ensure that staff handling foodstuffs are in good health and undergo training on health risks;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

Health status

Workers who have a gastrointestinal illness or skin complaint risk contaminating the production area or harvested watercress.

How to comply with the law

There must be a defined policy in place for handling workers with gastrointestinal diseases. Workers must be aware that they should not work in contact with watercress if they feel sick or have had diarrhoea or been sick within the previous 48 hours. Illnesses must be reported to management in line with reporting procedures.

When a worker is suffering from a disease likely to be transmitted through food, they must be excluded from working with or around the crop. The length of the exclusion depends on the illness: comprehensive guidance can be found in the document Food Handlers: Fitness to Work from the Food Standards Agency (see [Appendix](#)).

If infected wounds can be effectively covered, exclusion should not be necessary.

Good practice

- All visitors on site should be made aware of and follow hygiene guidelines.
- Training records covering declaration of illness and return to work procedures should be available for all staff.
- Defined and managed return to work procedures should be in place for staff who have been ill.
- Boils or septic skin lesions, cuts and wounds should be covered in brightly coloured, food grade adhesive dressings.
- Where necessary, plasters should be metal detectable.

The Law

Reg. 852/2004, Annex I; II.2, II.5(c), (g); III.7, III.9(c)

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (c) to use potable water, or clean water, whenever necessary to prevent contamination; (g) to take account of the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

Microbial analysis

There are currently no legal critical values for microbial contamination of agricultural water or harvested product but testing is an essential component of food safety management in the production of watercress.

Water

Managing microbial safety of water is covered in the section on [Water Quality](#).

How to comply with the law

The water used in production of the crop must not contain levels of micro-organisms or harmful substances in quantities that will pose a food safety risk to consumers. Records must be available for inspection.

Good practice

- A schedule of testing should be in place for all water sources, which defines frequency of testing and organisms to be tested.
- Testing should be carried out by independently accredited laboratories (e.g. ISO / IEC 17025:2005).
- Water test results should be trended to monitor water quality over time and records should be kept for five years.
- Water should be in specification for indicator organisms:

Generic <i>E. coli</i>	
Target	<10 cfu / 100 ml
Investigate	10-100 cfu / 100 ml
Unacceptable	> 100 cfu / 100 ml

- If the water test results are >10 cfu / 100ml Generic *E. coli* an investigation into the source of the potential contamination should be completed and recorded.
- Where water test results >100 cfu / 100 ml, crop production using that water source should stop, water should be tested for pathogens and corrective actions should be agreed with a competent person (e.g. Technical Manager or relevant local authority regulator) and all actions should be recorded.
- Generally accepted standards for pathogen testing in water are:

Target / 100 ml	
Salmonella	absent
<i>E. coli</i> O157	absent

The Law

Reg. 178/2002. Chapter 2, Section 4, Article 14. 1, 2(a)

1. Food shall not be placed on the market if it is unsafe. 2. Food shall be deemed to be unsafe if it is considered to be: (a) injurious to health;

Reg. 852/2004, Annex I; II.5(g); III.7, III.9(c)

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (g) to take account of the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

Harvested watercress

Watercress shall not be placed on the market if it is unsafe i.e. is considered to be injurious to health. Whilst testing does not guarantee the safety of a crop, testing can verify that the agricultural practices involved in the crop production are managing hazards adequately. It should be noted that the criteria for ready-to-eat watercress following processing ([Regulation \(EC\) No 2073/2005](#)) are more stringent than those expected for primary production.

How to comply with the law

Watercress placed on the market must not be injurious to health. Records must be available for inspection.

Good practice

- A schedule of testing should be in place for harvested watercress, which defines frequency of testing, organisms to be tested.
- Harvested watercress should be routinely sampled, at least four times a year throughout the growing season.
- Testing should be carried out by independently accredited laboratories (e.g. ISO / IEC 17025:2005).
- Watercress test results should be trended to monitor microbial quality over time and records should be kept for five years.
- Data may be plotted on a map of the production areas to show visual spread of detections to assist in identifying any potential problem areas.
- If the product test results are not satisfactory, corrective actions should be recorded.
- Harvested watercress should be in specification for indicator organisms:

	Generic <i>E. coli</i>	<i>L. monocytogenes</i>
Target	<100 cfu / g	<10 cfu / g
Investigate	100-1000 cfu / g	10-100 cfu / g
Unacceptable	> 1000 cfu / g	> 100 cfu / g

- If any results are out of specification, the raw material should be re-tested for:

Target / g	
Salmonella	absent
<i>E. coli</i> O157	Absent

- If either are detected appropriate measures should be taken to trace and withdraw any implicated material from the supply chain whilst isolating and further investigating the source of the contaminated crop.
- Where any implicated material may have reached consumers then a recall should be initiated and the competent authority should be notified as described in [Recall Procedures](#).

The Law

Reg. 178/2002 Chapter 2, Section 4, Article 18. 1-4.

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

2. Food [...] business operators shall be able to identify any person from whom they have been supplied with a food, [...] or any substance intended to be, or expected to be, incorporated into a food [...]. 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 [...] 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 [...] 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.

Traceability

The ability to trace batches of crop through the supply chain enables products associated with food safety issues to be swiftly removed from the food chain and the source of issues to be identified.

How to comply with the law

Traceability records must be in place which enable the tracing of watercress one step back and one step forward in the supply chain. Records must be available for inspection.

Good practice

- Producers should have an identity reference for each cropping bed.
- Records should be available for each batch of watercress and should include:
 - Growing location / bed.
 - Date of harvest.
 - Agronomic inputs (e.g. PPP).
 - The recipient (e.g. processor or retailer).

The Law

Reg. 852/2004, Annex I; III.7, III.9(a-c), III.10.

7. Food business growers are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business growers are to make relevant information contained in these records available to the competent authority and receiving food business growers on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on:

(a) any use of plant protection products and biocides;

(b) any occurrence of pests or diseases that may affect the safety of products of plant origin; and

(c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

10. The food business operators may be assisted by other persons, such as veterinarians, agronomists and farm technicians, with the keeping of records.

Record keeping

How to comply with the law

In addition to [Traceability](#) requirements, growers must keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the size and nature of the business.

This information must be made available to the competent authorities on request, as well as the food business operators taking delivery of the harvested products.

Good practice

- Relevant records should be kept for at least three years.

Relevant records should be documented for all measures put in place to control hazards in watercress production including:

- Inspection / audit records.
- Measures to manage water used for irrigation, application of plant protection products and fertilisers, washing of equipment and personal hygiene.
- Use of natural fertilisers.
- Equipment monitoring and maintenance records.
- Results of microbiological tests carried out to verify the effectiveness of cleaning and disinfection of food contact surfaces and equipment.
- Cleaning and disinfection reports for buildings / structures and equipment.
- Personnel training records and return to work after illness procedures.
- Results of microbiological tests of water used in crop production.
- Results of microbiological tests of harvested watercress.

The Law

Reg. 178/2002, Section 4, Article 19

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 [...].

Recall procedures

How to comply with the law

Formal withdrawal and recall procedures must be in place. Businesses must inform their local authority and the Food Standards Agency if there is reason to believe that food is not compliant with food safety requirements.

Good practice

- Customers should be aware of the withdrawal and recall procedures employed by the primary producer.
- If businesses have reason to believe watercress is unsafe, it should immediately be withdrawn or, if it has reached consumers, recalled.

Food crime

Food crime is dishonesty in food production or supply, which can be complex and may result in serious harm to consumers, businesses or the overall public interest.

If there is a suspicion or concern that food crime is taking place in the watercress supply chain, this should be reported to either The National Food Crime Unit (NFCU), covering England, Wales and Northern Ireland, or the Scottish Food Crime and Incidents Unit (SFCIU). These units can be accessed through the following websites:

Reporting food fraud in **England, Wales and Northern Ireland**:

<https://www.food.gov.uk/enforcement/the-national-food-crime-unit>

Reporting food fraud in **Scotland**:

<http://www.foodstandards.gov.scot/consumers/food-crime/food-crime>

The Law

Reg. 852/2004, Annex I; III.5(d)

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (d) to ensure that staff handling foodstuffs are in good health and undergo training on health risks;

Training

Staff training in safe food handling is important for those workers involved in all aspects of watercress production. Training does not always have to be by a formally recognised course; training may be delivered in-house.

How to comply with the law

All staff handling the crop must have been trained in personal hygiene and safe food handling practices, this must include temporary or contract staff.

Good practice

- Staff training should be relevant to the level of work.
- All crop-handling personnel must undertake some form of basic food hygiene training and be suitably supervised or instructed.
- Staff must undergo refresher training at appropriate intervals.

The Law

Reg. 852/2004, Annex I, Chapter II.3 (a), II.5 (e); III.7, III.9(b)

3. [...] food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (e) as far as possible to prevent animals and pests from causing contamination;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (b) any occurrence of pests or diseases that may affect the safety of products of plant origin;

Growing watercress for seed production

If seeds have been contaminated during production or storage of the seed crop, they may introduce microbial hazards to the harvested crop. The hygiene requirements for the production of seed crops are the same as for the [stages of primary production](#). In addition, the following specific areas need to be considered.

Seed storage area

Insects and mammalian pests such as rodents can transfer pathogens to seeds whilst in storage. They also damage the seeds and can make them more susceptible to contamination.

How to comply with the law

Buildings must be kept in good repair to limit access to pests and eliminate potential breeding sites. Stored seeds must be inspected to ensure seeds damaged or contaminated by insects / rodents are not used. Buildings should be regularly checked for infestation and records kept of inspections. Records must be available for inspection.

Good practice

- Infestations should be controlled immediately.
- Methods used to control pests should not affect the safety of the seeds.
- Holes, drains and other places where pests are likely to gain access should be kept sealed.
- Wire mesh screens should be used on open windows, doors and ventilators.
- Seeds should be kept in a secured and designated storage area.

The Law

Reg. 178/2002 Chapter 2, Section 4, Article 18, 1-3

1. The traceability of food, [...] 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 [...] business operators shall be able to identify any person from whom they have been supplied with a food, [...] or any substance intended to be, or expected to be, incorporated into a food or feed.

3. Food [...] 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.

Seed traceability

If seeds have been contaminated during production or storage, they may introduce microbial hazards to the harvested crop.

How to comply with the law

Traceability records that enable the tracing of watercress seeds one step forward and one step back in the supply chain must be in place. Seed suppliers must be able to identify the businesses they have supplied with seeds. Records must be kept and be available for inspection to enable traceability to a single batch. The system must enable batches to be retrieved i.e. to recall batches that have been supplied to other producers, and a system must be in place to properly dispose of recalled seeds.

Good practice

If producing seed, producers should have an identity reference for each seed crop and be able to trace the seed lot used.

The Law

Reg. 178/2002 Chapter 2, Section 4, Article 18, 1-3.

1. The traceability of food, [...] 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 [...] business operators shall be able to identify any person from whom they have been supplied with a food, [...] or any substance intended to be, or expected to be, incorporated into a food [...].

3. Food [...] 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.

Reg. 852/2004, Annex I; II.2; III.7

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

Production of seedlings (propagation)

Watercress crops may be grown from seeds placed directly into the bed or grown from seedlings or cuttings. The hygiene requirements for the production of seedlings and cuttings are the same as for the [stages of primary production](#). In addition, the following specific areas need to be considered.

Propagation material traceability

Some foodborne illness outbreaks in fresh produce have been linked to seed contamination. Isolating bacteria from contaminated seeds is inconsistent with available technologies and microbial testing of seeds cannot be relied on to ensure that seeds are free of contamination. As such, it is important to know that seeds, seedlings or cuttings have been produced to the same standards as a crop for consumption.

How to comply with the law

The source of watercress seeds, seedlings and cuttings must be known and the material must have been produced following the same standards as a commercial crop for consumption that reduces the risk of microbial contamination during production.

Good practice

- Records should be available that identify each batch of propagation material (i.e. seeds, seedlings or cuttings), whether they are bought-in or produced within the business.
- Seed should be sourced from an approved, known, traceable supply chain.
- Seed production practices should be demonstrated as being compatible with the [primary production guidelines](#).

The Law

Reg. 852/2004, Annex I; II.2, II.3(a), II.5(c), (g); III.7, III.9(c)

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (c) to use potable water, or clean water, whenever necessary to prevent contamination; (g) to take account of the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

Substrate for propagation

Some businesses may produce seedlings in peat or coir plugs before transplanting them into the production bed. This propagation substrate can be a potential source of microbial contamination by human pathogens. Peat particularly can have variable levels of *E. coli* present.

How to comply with the law

Each batch of material must be verified as free from pathogens.

Good practice

- A record of a microbiological analysis from the substrate producer should be available for each batch of material or a Certificate of Compliance should be provided by the supplier.
- The batch should be tested for:

	Target / g
Generic <i>E. coli</i>	<100 cfu
Salmonella	absent

Glossary

BS EN: British Standard, European Norm. Disinfectants that comply with BS EN 1276 and / or BS EN 13697 published standards or alternative standards that meet the same conditions have been shown to kill bacteria including *E. coli* O157 if applied as directed by manufacturers.

Clean water: is defined in [Regulation \(EC\) No 852/2004](#) as clean seawater or fresh water of a similar quality. Clean seawater means natural, artificial or purified water that does not contain micro-organisms, harmful substances or toxic marine plankton in quantities capable of directly or indirectly affecting the health quality of food.

Cool chain (also referred to as cold or chill chain): the process used to maintain acceptable temperatures for the transport, storage, and handling of food. This process is used to slow or inhibit the growth of pathogens. The temperatures of this process will need to be validated.

Consumer: means the ultimate consumer of a foodstuff who will not use the food as part of any food business operation or activity.

Contact time: the period of time that the disinfectant needs to be left on the surface to work effectively.

Contamination: the presence or introduction of a hazard into food, including undesirable materials, micro-organisms or any taint that may affect the safety or wholesomeness of food.

Competent Authority (CA) (also referred to as enforcement authority): usually the local authority where the FBO establishment is located. The Central Competent Authority is the Food Standards Agency for establishments located in England, Wales or Northern Ireland and Food Standards Scotland establishments located in Scotland. The CA /CCA ensures compliance with the requirements of the Law.

Corrective action: actions to be taken when a deviation occurs from the critical limits.

Detergent: product used for general cleaning (to dissolve grease and remove dirt). Detergents do not have disinfectant properties (i.e. if used on their own they are not able to kill bacteria such as *E. coli* O157).

Disinfection: the application, following general cleaning, of a biocidal disinfecting agent or heat treatment to facilitate the reduction of micro-organisms from surfaces or equipment to a safe level. Disinfectants should comply with BS EN 1276 and / or BS EN 13697 published standards or alternative standards.

E. coli: *Escherichia coli* is a bacterium frequently found in the intestines of humans and animals. There are many different types of *E. coli*, and while some live in the intestine quite harmlessly, others may cause a variety of diseases. The bacterium is found in faeces and can survive in the environment. One of the main sources of *E. coli* in this context would be either livestock or pest faeces or from human contact (for example not washing hands after using the toilet or touching something contaminated with *E. coli*).

E. coli* O157:** is a strain of *Escherichia coli* (see ***E. coli). *E. coli* O157 is most frequently reported strain to cause illness in England and Wales.

Foodborne: describes microorganisms, such as bacteria, which use food as a vehicle to move onto humans where they can multiply.

Food business: is defined in [Regulation \(EC\) No 178/2002](#); means any undertaking, whether for profit or not and whether public or private, carrying out any of the activities related to any stage of production, processing and distribution of food.

Food business operator (FBO): is defined in [Regulation \(EC\) No 178/2002](#); means the natural or legal persons responsible for ensuring that the requirements of food law are met within the food business under their control.

Food handler: anyone who handles or prepares food. This can include both staff and visitors.

Food hygiene: or generally referred to as 'hygiene' is defined in [Regulation \(EC\) No 853/2004](#); means the measures and conditions necessary to control hazards and to ensure fitness for human consumption of a foodstuff taking into account its intended use.

Hand sanitising gels: hand sanitising products, such as alcohol-based gels / bactericidal (capable of killing bacteria) hand gels and wipes.

Hazard: is defined in [Regulation \(EC\) No 178/2002](#); means a biological, chemical or physical agent in, or condition of, food or feed with the potential to cause an adverse health effect.

L. monocytogenes: *Listeria monocytogenes* is the name of a bacteria found in soil and water and some animals, including poultry and cattle. *Listeria* is unlike many other germs because it can grow even in the cold temperatures (such as refrigerator or cold store). *Listeria* is widespread in the environment and can contaminate a wide range of foods. It is most commonly associated with chilled ready-to-eat foods. *Listeria* can cause serious illness and death in vulnerable groups of the population.

Micro-organisms: any organism, such as a bacterium, viruses, yeasts, moulds, algae, parasitic protozoa, microscopic parasitic helminths, and their toxins and metabolites, of microscopic size. Those which can cause harm to humans are often referred to as pathogens.

Monitoring: a pre-arranged programme of checks (observations or measurements) of critical and/or 'legal' limits to check whether control measures are in danger of failing and which determine the need to take corrective actions.

Pathogen: is a micro-organism which causes harm to humans. (See **Micro-organisms**).

Plant protection products: (PPP) are 'pesticides' that protect crops or desirable or useful plants and include herbicides and rodenticides. The most common use of pesticides is in the form of PPPs. They are primarily used in the agricultural sector but also in forestry, horticulture, amenity areas and in home gardens. The term 'pesticide' is often used interchangeably with 'plant protection product'.

Post-harvest: is the stage of watercress production after harvest and includes cooling, cleaning, sorting and packing.

Potable water: means water meeting the minimum requirements laid down in [Council Directive 98/83/EC](#) on the quality of water intended for human consumption.

Pre-harvest: incorporates all activities on the farm that occur before watercress is harvested.

Primary Production: means the production or growing of primary products including harvesting as defined in [Regulation \(EC\) No 178/2002](#) and associated operations defined in [Regulation \(EC\) No 852/2004](#), including the transport, storage and handling of primary products at the place of production, provided that this does not substantially alter their nature; and transport operations to deliver primary products, the nature of which has not been substantially altered, from the place of production to an establishment.

Private water supplies: private drinking water supplies are water supplies that are not provided by the statutory water undertaker, which may come from a variety of sources, including wells, springs, boreholes and streams; they are regulated under [The Private Water Supplies Regulations 2016](#).

Processing: is defined in [Regulation \(EC\) No 852/2004](#); means any action that substantially alters the initial product, including heating, smoking, curing, maturing, drying, marinating, extraction, extrusion or a combination of those processes;

Production area: the cropping area and associated land including service tracks, bounded by a delineating barrier.

Raw: in this context includes any food product which has not been cooked or processed, including fruit and vegetables.

Ready-to-eat: is defined in [Regulation \(EC\) No 2073/2005](#); means food intended by the producer or the manufacturer for direct human consumption without the need for cooking or other processing effective to eliminate or reduce to an acceptable level micro-organisms of concern;

Retail: is defined in [Regulation \(EC\) No 178/2002](#); Means the handling and / or processing of food and its storage at the point of sale or delivery to the final consumer, and includes distribution terminals, catering operations, factory canteens, institutional catering, restaurants and other similar food service operations, shops, supermarket distribution centres and wholesale outlets.

Recall: when customers are asked to return / dispose of a food product.

Salmonella: is a bacterium commonly found in the digestive system of farm animals. Food poisoning from Salmonella has also been associated with consumption of contaminated ready to eat fruit and vegetables. Cross-contamination can also occur where Salmonella is transferred onto work hands, surfaces, equipment or, clothing.

Sample: is defined in [Regulation \(EC\) No 2073/2005](#); means a set composed of one or several units or a portion of matter selected by different means in a population or in an important quantity of matter, which is intended to provide information on a given characteristic of the studied population or matter and to provide a basis for a decision concerning the population or matter in question or concerning the process which has produced it.

Sanitisers: products that combine a disinfectant and a detergent in a single product. For effective disinfection they must be used twice: first to clean and then again to disinfect.

Traceability: is defined in [Regulation \(EC\) No 178/2002](#); 'means the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be

incorporated into a food or feed, through all stages of production, processing and distribution.

Trending (of microbial test results): this is the process of collecting and comparing microbial test results over time to identify a general level of microbial quality. This is commonly used with indicator species and is useful for identifying inconsistencies and / or upward trends where investigation and corrective actions may be required. Further information can be found in the 'Monitoring microbial food safety of fresh produce' Factsheet (See [Appendix](#)).

Appendix

Legislation

[Council Directive 98/83/EC](#) defines the quality of water intended for human consumption and water used in the food-processing industry.

<http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:01998L0083-20151027&from=EN>

[Regulation \(EC\) No 178/2002](#) requires that all food placed on the market must be safe to eat and defines requirements for traceability.

<http://www.food.gov.uk/multimedia/pdfs/1782002ecregulation.pdf>

[Regulation \(EC\) No 852/2004](#) on the hygiene of foodstuffs and particularly Annex I – Primary Production, Part A: General hygiene provisions for primary production and associated operations.

[http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R0852R\(01\)&from=en](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R0852R(01)&from=en)

[Regulation \(EC\) No 1069/2009](#) laying down health rules as regards animal by-products and derived products not intended for human consumption.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:300:0001:0033:EN:PDF>

National legislation

The Food Safety and Hygiene (England) Regulations 2013 (SI2013/2996).

<http://www.legislation.gov.uk/ukxi/2013/2996/made/data.pdf>

The Food Hygiene (Wales) Regulations 2006 No 31 (W5).

<http://www.legislation.gov.uk/wsi/2006/31/contents/made>

The Food Hygiene (Scotland) Regulations 2006.

<http://www.legislation.gov.uk/ssi/2006/3/contents/made>

The Food Hygiene Regulations (Northern Ireland) 2006 (SR 2006 No 3).

<http://www.legislation.gov.uk/nisr/2006/3/contents/made>

The Private Water Supplies (England) Regulations 2016 (SI2016/618).

<http://www.legislation.gov.uk/ukxi/2016/618/regulation/1/made>

The Private Water Supplies (Wales) Regulations 2010.

<http://www.legislation.gov.uk/wsi/2010/66/contents/made>

The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017.

<http://www.legislation.gov.uk/ssi/2017/282/contents/made>

The Private Water Supplies (Northern Ireland) Regulations 2009.

<http://www.legislation.gov.uk/nisr/2009/413/contents/made>

General guidance

EC guidance document on addressing microbiological risks in fresh fruits and vegetables at primary production through good hygiene related to [Regulation \(EC\) No 852/2004](#), Annex I.

http://ec.europa.eu/food/sites/food/files/safety/docs/biosafety_fh_legis_guidance_sante-10470-2016_en.pdf

Guidance on the general approach to microbial food safety in fresh produce.

<https://www.food.gov.uk/sites/default/files/multimedia/pdfs/microbial.pdf>

Managing Farm Manures for Food Safety – Guidelines for growers to reduce the risks of microbiological contamination of ready-to-eat crops.

<https://www.food.gov.uk/sites/default/files/multimedia/pdfs/manuresguidance.pdf>

Staff training guidance and videos.

<https://www.food.gov.uk/business-industry/food-hygiene/training>

Food Handlers: Fitness to Work from the Food Standards Agency – Regulatory Guidance and Best Practice Advice for Food Business Operators (FSA).

<https://www.food.gov.uk/sites/default/files/multimedia/pdfs/publication/fitnesstoworkguide09v3.pdf>

[Food Handlers: Fitness to work - Best Practice Advice for Food Businesses \(FSS\)](#)

<http://www.foodstandards.gov.scot/food-handlers-fitness-work-best-practice-advice-food-businesses>

Workplace safety and welfare guidance from the Health and Safety Executive (HSE). This includes guidance on worker toilet and welfare facilities.

<http://www.hse.gov.uk/agriculture/topics/welfare.htm>

[Risk assessment tool to aid growers in developing on-farm water and worker hygiene risk assessments](#)

<http://www.foodstandards.gov.scot/food-safety-standards/fresh-produce-tool>

Guidance for Enforcement Authorities on the Use of Private Water Supplies in Primary Production in relation to [Regulation \(EC\) No 852/2004](#).

<https://www.food.gov.uk/sites/default/files/private-water-supply-guidance.pdf>

Guidance Notes for Food Business Operators on Food Safety, Traceability, Product Withdrawal and Recall.

<https://www.food.gov.uk/sites/default/files/multimedia/pdfs/fsa1782002guidance.pdf>

Guidance Notes for Food Business Operators on food incidents (i.e. where concerns about actual or suspected threats to the safety or quality of food require intervention to protect consumers).

<https://www.food.gov.uk/business-industry/food-incidents>

Quick guide for farmers and growers on compliance with [Regulation \(EC\) No 852/2004](#).

<https://www.businesscompanion.info/en/quick-guides/food-and-drink/food-hygiene-for-farmers-and-growers>

Open Government Licence

© Crown copyright 2017

This publication (not including logos) is licensed under the terms of the [Open Government Licence v3.0](#) except where otherwise stated. Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

All logos and pictures within this document are copyright to their respective owners. The copyright holders reserve all rights. Reproduction or use outside the context of this guide will require prior authority.

To view this licence:

Visit: www.nationalarchives.gov.uk

Email: psi@nationalarchives.gsi.gov.uk

Write to: Information Policy Team, The National Archives, Kew, London, TW9 4DU

About this publication:

Enquiries: <https://www.food.gov.uk/about-us/contact-us>

NOTES



Industry Guide to Good Hygiene Practice

Watercress

2017

© Crown Copyright 2017