Scottish Seaweed Industry Association

CODE OF GOOD PRACTICE

CHAPTER 4: PROCESSING

CODE OF GOOD PRACTICE IN SCOTTISH SEAWEED OPERATIONS

Contents

Standard Version History 2
1. Documents and Training 3
1.1 Traceability 3
1.2 Record- Keeping and Documentation 3
1.3 Training 4
1.4 Health and Safety 4
1.5 Third Party Audits 4
2. Biosecurity 4
2.1 Biosecurity Planning 5
2.2 Site Hygiene 5
2.3 Personal Hygiene 5
2.4 High Risk Situations 6
3. Handling 6
3.1 Handling at Sea and on Site 6
3.2 Equipment and Surface Handling 6
3.3 Personal Conduct 6
3.4 Transfer Points 6
3.5 Operating Systems 7
4. Environmental Responsibility 7
4.1 Waste and Materials Management 7
4.2 Noise 7
4.3 Sustainable Resource Use 7
4.4 Fuel Oil Handling and Storage 8
5. Product Quality 8
5.1 Visual and Physical Inspection 8
5.2 Drying and Moisture Control 8
5.3 Storage and Shelf Life 9
5.4 Responding to Feedback 9
6. Food Safety 9
6.1 Food Safety Plans Based on HACCP Principles 9
6.2 Testing 10
6.3 Health Claims and Labelling 10
7. Social Responsibility 10
7.1 Claims 11

Standard Version History

Version	Date	Reason for Change	Primary Author(s)
WD1.0	February 2025	Working Draft – Version 1.0	RR
WD2.0	May 2025	Working Draft – Version 2.0 application of comments from steering group	RR
FD1.0	November 2025	Final Draft – version 1.0	RR

Code of Good Practice for the Scottish Seaweed Sector

Processing

The processing of seaweed requires strict adherence to protocols that ensure product safety and quality. This chapter outlines best practices for seaweed processing, focusing on the critical areas of documentation and training, customer assurance, and biosecurity.

1. Documents and Training

Traceability is crucial for ensuring product safety, quality, and compliance with regulatory standards. It allows for the identification of product origins, enabling effective response to any issues that may arise during production or distribution.

1.1 Traceability

1.1.1 Implement a unique identifier system when harvesting and processing seaweed including date, time, and location of harvest.

1.1.2 Implement a batch numbering system to track seaweed from harvest to processing, using consistent batch identifiers suitable to your product type and processing stage.

1.1.3 Traceability should be maintained throughout production processes.

1.1.4 Businesses to which products have been supplied should be identified.

1.1.5 Traceability records should be maintained and such information made available to the competent authorities on demand.

1.2 Record- Keeping and Documentation

1.2.1 Documents, records and other information relevant to the management of operations should be held and effectively controlled.

1.2.2 All documents should be the current version and be properly authorised.

1.2.3 All documents should be clearly written, contain sufficient detail for the purpose and be readily accessible to the relevant personnel.

1.2.4 Reasons for amendments to, and replacement of, documents should be recorded.

1.2.5 Other documents should be retained for an appropriate time and be available for inspection.

1.2.6 Risk assessments should be conducted by trained personnel.

1.2.7 The outcome of risk assessments should be communicated to the relevant production personnel and other members of personnel responsible for implementation of the outcomes.

1.2.8 Prepare and maintain documented Safe Systems of Work (SSW) and site/activity specific Risk Assessments (RA)s to identify and mitigate risks.

1.2.9 Documentation and training should be accessible and understandable to all staff, considering language and literacy needs.

1.3 Training

1.3.1 Documented evidence of training of individuals in activities relevant to the farming, harvesting, and processing of seaweed should be maintained.

1.3.2 Staff should only undertake activities once they have been signed off as competent to perform the task safely and effectively.

1.4 Health and Safety

1.4.1 Companies should remain up to date with, and collaborate in, new initiatives that arise in relation to health and safety.

1.5 Third Party Audits

1.5.1 Harvesters should seek verification of traceability and quality systems through recognised third-party audits. Refer to Appendix … for a list of recommended auditing and certification schemes.

2. Biosecurity

Biosecurity is critical in maintaining a safe and clean environment, preventing contamination, disease spread, and the introduction of non-native species. A robust, up-to-date, live biosecurity plan must be established to address these concerns.

2.1 Biosecurity Planning

2.1.1 A biosecurity plan should outline how contamination is avoided and managed. It should reflect a site's activities, scale, and location.

2.1.2 The plan should be kept live, reviewed when operations change or new risks arise.

2.1.3 All staff engaged in the production of seaweed should be familiar with the relevant aspects of the biosecurity plan.

2.1.4 All staff should have a level of understanding of the key risks that reside in the area of operation and the control measures in place, including, but not limited to, activities that prevent the spread of disease and invasive non-natives.

2.2 Site Hygiene

2.2.1 Movements of people, vessels, and equipment between sites should follow protocols that prevent cross-site contamination, including the check, clean, dry protocol.

2.2.2 Surfaces, tools, and gear should be cleaned regularly and when moving between locations.

2.2.3 Facilities should have a clear separation between 'wet' and 'dry' or 'dirty' and 'clean' areas.

2.2.4 Dedicated equipment for each site or system reduces the risk of cross-contamination.

2.2.5 Disinfection should be conducted to a level to inactivate pathogens considered to pose significant risk.

2.3 Personal Hygiene

Good hygiene practice includes within its scope the conduct and hygiene of persons concerned, their personal clothing, personal protective equipment and other equipment used by them on site.

2.3.1 Good hygiene plans should be in place, these include clean PPE, appropriate handwashing, and safe workwear.

2.3.2 Visitors and contractors should be made aware of local hygiene protocols before entering operational areas.

2.3.3 Outdoor PPE should be thoroughly washed and air dried. Boots should be disinfected.

2.3.4 Disposable protective clothing should be disposed of in an appropriate manner.

2.4 High Risk Situations

2.4.1 If handling multiple species or stock from different sources, use extra precautions (e.g. isolation, separate gear).

3. Handling

3.1 Handling at Sea and on Site

3.1.1 During deployment, harvest and handling, operators should use clean containers, bags, and equipment. Where appropriate void placing seaweed directly on the ground or deck without a protective barrier.

3.1.2 Harvested seaweed should be moved promptly to the next stage of processing or storage to prevent spoilage.

3.1.3 Where appropriate avoid unnecessary foot traffic or equipment contact in areas where fresh product is stored or handled.

3.2 Equipment and Surface Handling

3.2.1 Surfaces that come into contact with seaweed should be regularly cleaned using appropriate methods for the product type.

3.2.2 Equipment used in contact with seaweed should be cleaned between batches or after contamination.

3.2.3 Keep dedicated cleaning tools for seaweed-contact surfaces to avoid cross-use with non-food or dirty areas.

3.3 Personal Conduct

3.3.1 Eating, smoking, and other personal activities should be restricted from handling areas.

3.4 Transfer Points

3.4.1 Seaweed should be protected from physical, chemical, and biological contamination during transfer and landing.

3.4.2 All crates, bins, or transfer containers should be cleaned and dried before reuse.

3.4.3 Operators should have a clear separation between 'wet' and 'dry' or 'dirty' and 'clean' areas.

3.5 Operating Systems

3.5.1 Consideration should be given to cleaning systems (manual or automated) to remove debris and fouling organisms during harvesting including microplastics.

4. Environmental Responsibility

Seaweed operations should demonstrate care for the marine environment by actively minimising disturbance, reducing waste, and protecting wildlife. These actions support the long-term viability of the sector and help preserve Scotland's natural heritage.

4.1 Waste and Materials Management

4.1.1 All waste materials such as twine, ropes etc. should be carefully collected, properly segregated, stored and recycled or disposed of by an approved means within a defined timescale.

4.1.2 Gear should be correctly labelled (e.g. buoys, ropes, crates) with unique identifying marks and were possible company name and contact details should be used to aid in case of loss.

4.1.3 Procedures should be in place for the retrieval of lost or damaged equipment.

4.1.4 Alternatives to single-use plastics should be sought where feasible.

4.1.5 The disposal or composting of organic seaweed waste should be considered.

4.2 Noise

4.2.1 Operators should ensure that equipment that creates significant noise is suitably muffled in order to prevent unacceptable disturbance to wildlife or humans. Advice on suitable measures may be obtained from local Environmental Health departments.

4.3 Sustainable Resource Use

4.3.1 Adopt energy-efficient practices in equipment and facility operation where possible.

4.3.2 Reuse and repurpose materials (e.g., ropes, bins) wherever possible.

4.3.3 Consider the environmental impacts of material selection, choosing lower-impact or recyclable options where available.

4.3.4 The principles of Refuse, Reduce, Reuse, Repurpose, Recycle should be incorporated into the company's environmental management plan.

4.4 Fuel Oil Handling and Storage

4.4.1 Contractors and third parties working on the site should have a contract which specifies the requirement to work within the conditions of this CoGP.

4.4.2 Operators should have an appropriate Spillage Plan in place and equipment (e.g. oil mats) to clean up any spills and limit the risk to the environment.

5. Product Quality

Maintaining consistent, high-quality seaweed is essential for building customer confidence and unlocking new markets. Quality begins at harvest and extends through handling, grading, drying, and packaging. Operators should have systems in place to assess and manage product characteristics at each stage.

5.1 Visual and Physical Inspection

5.1.1 Visual inspection of seaweed should be conducted to maintain quality and avoid contamination. This might include checking for fouling, removing foreign materials, and identifying any signs of decay or damage.

5.2 Drying and Moisture Control

5.2.1 For operations involving drying, airflow, cleanliness, and protection from contaminants should be managed to reduce mould and ensure stability.

5.2.2 Operators should monitor drying using visual and tactile cues. For food-grade or export products, moisture meters or lab testing should be used.

5.3 Storage and Shelf Life

5.3.1 Seaweed should be stored in a way that protects its quality. Dried products should be kept in clean, dry, pest-free conditions; fresh or blanched seaweed should be chilled or frozen.

5.3.2 Operators should use systems like ‘first-in, first-out’ to rotate stock and label batches for traceability and recall purposes.

5.4 Responding to Feedback

5.4.1 Feedback from customers and end users should be reviewed to support ongoing improvements in quality. This may include feedback on appearance, texture, or shelf life.

5.4.2 Producers should be able to act on both formal (e.g. complaints or returns) and informal (e.g. chef comments or buyer preferences) sources of feedback.

5.4.3 Regular communication with buyers, processors, or end users should be encouraged to understand expectations and adjust practices if needed.

6. Food Safety

The production and handling of seaweed for human consumption requires strict adherence to food hygiene, safety, and standards to protect public health and maintain consumer confidence.

For more information on HACCP protocols, including examples of possible biological, chemical, and physical hazards that could be found within the seaweed value chain, please see Annex 1.

6.1 Food Safety Plans Based on HACCP Principles

Many aspects of food safety, including recall procedures, legal registration, novel food compliance, and labelling compliance, are regulated under European, UK and Scottish law. The undernoted provisions are additional to legal requirements.

6.1.1 Food safety plans should comply with Codex Alimentarius HACCP principles.

6.1.2 It should be possible to demonstrate that the team members have specific knowledge of HACCP principles and relevant knowledge of the production process.

6.1.3 HACCP plans should consider all potential food safety hazards, including chemical, microbiological, physical, and allergenic hazards not controlled by existing provisions (see annex 1 for examples).

6.1.4 All records of monitoring, deviations, and corrective actions should be dated, signed, and securely stored for a minimum period as required by regulatory authorities.

6.1.5 The HACCP plan should be a live document, reviewed periodically and updated as new risks are identified or processing methods change.

6.2 Testing

6.2.1 Developers must Suggested industry thresholds for some elements of concern (all amounts given mg/kg DW):

Cadmium	Mercury	Inorganic Arsenic	Lead	Nickel
3	0.2	3	3	30

6.2.2 Routine testing should be developed with heavy metals (such as cadmium, lead, mercury, inorganic arsenic, nickel), iodine, and microbiological contaminants (such as salmonella, E. coli, and listeria) in mind.

6.2.3 Testing frequencies should be determined based on the level of risk and regulatory requirements, determined in agreement with relevant EHO.

6.2.4 Results should be documented, and corrective action should be taken for any product that exceeds acceptable levels.

6.2.5 Testing should be carried out using validated laboratory methods and in accordance with regulatory guidelines.

6.3 Health Claims and Labelling

6.3.1 Health claims should be reviewed and approved by legal or regulatory experts before publication.

6.3.2 Documentation supporting health claims should be stored for reference in the event of a dispute or audit.

6.3.3 Labels should meet all national and international regulatory requirements.

7. Social Responsibility

7.1 Claims

7.1.1 Any company making claims about their carbon footprint should ensure these are supported by a Life Cycle Assessment (LCA) or equivalent, independently verifiable evidence. This helps maintain credibility, supports transparency, and avoids misleading stakeholders or consumers.