

**Seasider Scallops Ltd**

**HACCP Plan**

**For**

**Chilled Shucked Scallops**

**Draft**

**(Not for general circulation. This is not an official Seafish publication. This document is provided only as a guide to how a HACCP Plan may be developed for a seafood business)**

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## **How to use this model HACCP Plan**

This model HACCP Plan represents a style of HACCP planning that is a current (circa 2008) and an effective means of documenting all of the risks and issues that must be addressed to ensure safer seafood is available for consumption.

As a UK registered seafood business you are able to use this model as a starting point for developing your own specific HACCP plan. Depending upon the type of business you operate you may need to modify the plan slightly, or considerably. You will not though be able to use the plan without modification as it will not be fit for purpose for your own business.

You may wish to use an external adviser to help you produce your final version of a workable plan.

NB: This model is provided for your information – Seafish will not accept any responsibility for it's fitness for purpose as a HACCP Plan – only you and your local EHO can make that decision.

## **So what should you do?**

- Use someone who understands HACCP and HACCP Planning
- Look at your own situation, operation, processes, issues etc
- Keep it simple – more CCPs do not make for a more effective HACCP Plan
- Get trained – Seafish have a very good Introduction to HACCP Training Course.
- Ensure the HACCP plan says what you do
- Ensure you do what your HACCP Plans says you do.
- Keep it up to date
- Use this as a model and guide, not a straitjacket

## **1. Introduction**

Seasider Scallops Ltd is a small processing operation based on the xxxxxx coast of xxxxxxxx. The Company processes between 50t and 100t of raw material (King scallops in the shell) each year.

The company buys in dredged scallops from local fishing vessels landing in Xxxxxx and Xxxxxx, and will occasionally buy in material from further afield when necessary.

The raw material is shucked, washed and packed (chilled) into catering sized tubs of between 1kg and 5 kgs shucked scallops. The packs are distributed using our own chilled distribution van via Xxxxxx Fish market based wholesalers. Only shucked scallops are despatched from the company. No unshucked, whole or skirt on products are sold for consumption.

The company employs 8 persons full time including 2 office staff and a driver.

The five production staff consist of a supervisor and 4 operatives.

The product is sold to be consumed by the general public after cooking which is sufficient to render the food safe from the vegetative bacteria that might reasonably be expected to be found on the product. Although the product is a low risk chilled product, we operate a full HACCP plan and all staff (including office and driver) have food hygiene certificates.

## **2. Description of Operations**

Our HACCP Plan starts with the reception of whole scallops to our factory and ends with the delivery of chilled shucked scallops to wholesalers in Xxxxxx Fish market.

### Overview of Operations

2.1. Scallops are delivered in woven sacks containing around 50Kgs of in-shell scallops. Delivery times vary but are usually between 0600 and 0800hrs direct from the markets (Xxxxxx or Xxxxxx) on the market lorry. Sacks are placed in the reception chiller as soon as the delivery documentation has been examined and the consignment accepted. Sacks may stay in the chiller for 24hrs if there has been a larger than usual delivery. First in first out applies.

2.2. The first stage of processing is deshelling or shucking the scallop from its shell. Sacks of scallops are removed from the chiller two at a time (this is a convenient load for the trolley) and moved to the shelling bench area. Scallops are tipped onto the bench a sack at a time and the shells removed.

The flat side of the shell is removed by levering open the shell with a strong knife until the adductor muscle snaps off the shell. The curved side of the shell containing the scallop meat is then passed on to the other side of the bench where the meat is removed.

- 2.3. The scallop meat is removed from the shell using a curved knife. This operation is skilled as the operator must remove the adductor muscle and roe cleanly from the shell while separating this meat from the viscera, gill and mantle. Two skilled operators carry out this operation and they are able to consistently produce a cleanly separated product.
- 2.4. Preliminary washing is the next stage. After shucking the scallop is usually contaminated with grit from the shells and debris from the viscera. The preliminary washing consists of a quick rinse of batches of scallops (around 2kgs of meat) using a plastic colander to remove all the gross contamination.
- 2.5. Inspection and trimming is a critical part of the operation. The rinsed scallops are carefully examined and if necessary trimmed to ensure that all 'black material' is removed and that no traces of any viscera remain. The batches of scallops once inspected and trimmed are then placed into the washer where they are vigorously washed for 2 mins<sup>1</sup> under flowing water. After this stage they are allowed to drain ready for packing.
- 2.6. Packing of the drained scallops into appropriate catering packs of 1-5kgs wt and labelling is carried out before they are placed in the Finished Product Chill Store. Packing is carried out by hand.  
  
First in first out applies. Maximum duration in the chill store is 12 hours.
- 2.7. Deliveries start at 0500hrs with the loading of the Chilled van by the driver. Consignments are delivered to Xxxxxx Fish market overnight, arriving at the market by 0900hrs.

#### Misc. Production Notes

##### Temperature Control

The scallops are received at ambient temperature<sup>2</sup> as they will still be alive at this point. The Scallop fishing vessels operate as day boats or on 2 day trips and the scallops are easily able to survive the 2 days that they might be out of the water.

Upon arrival at the factory they are placed in the Intake chill which is kept between 6° and 2°C.

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<sup>1</sup> A 2 mins rinse will not reduce Yessotoxin to safe levels where present, a 10 min rinse is required to remove this oil soluble biotoxin. See also footnote page 18

<sup>2</sup> Ambient temperatures vary during the year and will have an impact on chilled storage life as scallops will deteriorate even while alive.

During processing the scallops are kept at ambient temperature which is usually between 10° and 14 °C depending on the season and weather. The factory is chilled to maintain these temperatures.

Water for the initial rinse is at ambient temperature. Measurements have shown that this rarely rises above 12 °C. Water for the final rinse is temperature controlled at 4°C ± 2 °C

The Product Chill is kept between 0° and 4°C.

### Batching and traceability

For the purposes of raw material and end product testing, a full-batch is a whole consignment from a single fishing vessel, for each harvesting area identified on the vessel registration documents. For traceability purposes each pack of scallops is given a code at the point of labelling. The code is based around the time of packing (dates:hours:mins:secs) and is automatically printed on the label for each retail pack. This code is tied in to the fishing vessel data using the batch recording form (appendix 1) . Where a retail pack may contain scallops from more than one batch this is clearly marked on the batch recording form.

We feel it important not to mix batches of scallops and all staff are instructed to process only sacks from the same batch until that batch is used up and to maintain clear 'space' between scallops from different batches. We feel our system is effective in achieving this. The way in which our records are kept allows us to identify a 'spread' of retail packs that might contain scallops from more than one batch.

### Raw Material and End Product Testing

Testing is carried out to detect the presence of Domoic Acid, the causative agent in amnesic shellfish poisoning. Both tests are carried out using a Jellet testing kit. A test is carried out for each full-batch delivered to the factory. Testing is carried out late morning and takes around 1 hour to obtain a result.

### Packaging Materials

Food grade transparent plastic tubs are the main packaging material used. Waxed cardboard outer boxes are used to make up individual consignments. All packaging materials are delivered in a clean well maintained vehicle and materials are securely stored in a dry materials store until required for a day's production.



### 3. Terms of Reference

#### 3.1. HACCP Team

The HACCP Plan is devised by L Cooper of the Sea Fish Industry Authority.

Contributing to the final HACCP Plan are:

M Pyke – Scientific Advisor (Molluscs), Sea Fish Industry Authority  
S Moore – Training Coordinator, Fish Industry Training Association  
Others excluded for reasons of privacy

See appendix 3.1 HACCP Team Details, roles and experience – not included

The HACCP team were unable to meet (as this is a virtual company) but have provided detailed feedback based on their many years experience of scallop processing operations.

The HACCP team have been able to consider and validate:

- Raw Material, Process and Product Description (4.1 to 4.3)
- Process Flow Chart
- Food Safety Hazards and level of risk presented by each hazard (6.1);
- Evaluation of CCPs using the CCP standard decision tree (6.2)
- The resulting HACCP Plan.

#### 3.2. Purpose and Scope of the HACCP Plan

Although the HACCP Plan is based around the virtual scallop processor Seaside Scallops Ltd, it is intended that the HACCP Plan be realistic and applicable to the operations typical of such small scallop processing operations.

The Plan is also intended to provide a model for such small processor operations to use to compare with their existing HACCP Plans and documentation.

The HACCP Plan for Seaside Scallops Ltd covers all operations from the delivery of whole scallops in sacks to the 'factory gate' through to the delivery of the finished product to Wholesale merchants at Xxxxxx market.

### 3.3 Process Specific Terms

Term	Definition
Shucking	Removal of shell and viscera from a scallop, leaving only the adductor muscle and gonad.
Domoic Acid	The causative agent in ASP.
Jellet Test	A low cost rapid indicative test for the presence of domoic acid.

## 4 Raw material, process and product descriptions

### 4.1 Raw Material

Raw materials are whole King Scallops (*Pecten maximus*) that are dredged in the waters of West Scotland and landed at Xxxxxx and Xxxxxx.

Scallops are delivered live in woven sacks by open lorry from the local harbours/markets under contract with local boats. The scallop sacks are covered by tarpaulin to avoid contamination by rain and seagulls.

Raw material testing is carried out but has very limited impact on operations as it is our working policy to consider the raw material to be contaminated with domoic acid.

### 4.2 Process

Scallops are processed by removing the meat from the shell, separating the edible parts (adductor muscle and roe) from the inedible parts (viscera) and thoroughly washing the meat to remove or reduce all physical, biological and chemical contamination. Scallops are subject to biotoxin contamination and correct shucking and thorough washing is the only effective means of significantly reducing Biotoxins to safe levels.

End product testing is carried out but it has a limited impact on operations because of issues over batch size and variability of biotoxin in samples.

Effective shucking and thorough washing have been shown (through independent research) to have a significant impact on biotoxin levels.

#### 4.3 Finished Product

The finished product is a chilled scallop (adductor muscle and roe) containing less than 20 mg domoic acid/100g finished product. Target levels for domoic acid are 2mg/100g.

The finished product is sold in catering sized packs, primarily for restaurant and hotel use.

#### 4.4 Domoic Acid, Amnesic Shellfish Poisoning

Domoic acid contamination of King Scallops is considered endemic in Scottish scallops. Although occasionally present in levels above the safe level (20mg/100g flesh), effective shucking and thorough washing has been shown to reduce toxin levels dramatically. The presence or absence of the toxin can be assessed using the Jellet test, while the level of toxin can only be assessed using more costly and less rapid testing methods.

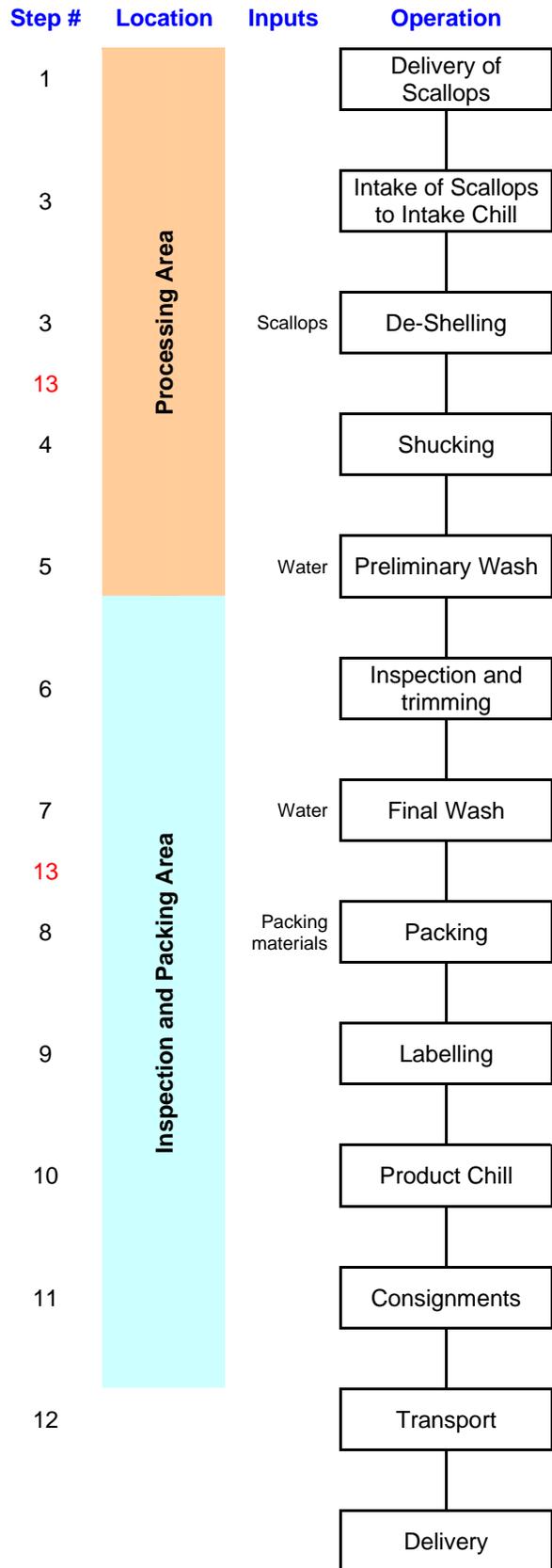
### Specifications

Product name	Chilled King Scallop meat
Source of raw material	West of Scotland coastal waters
Key characteristics of product	A chilled product that must be temperature controlled, consumed within 3 days of production and cooked before consumption.
Ingredients	King Scallops and water <sup>2</sup>
Packaging	Poly Tubs of 1Kg or 5 KG
End use instructions	Keep Chilled, Cook before consumption
Storage and shelf life	Store in a refrigerator, not suitable for freezing, consume within use by date.
Distribution/ purchasers	Catering establishments
Labelling specifics	Producer, wt, batch, use by date, contents etc
Special Instructions	none

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<sup>2</sup> Water is only used for washing but there will be some absorption by the Scallop during processing.

# Process Flow Chart



## **Factory Floor Plan and Product Flow**

### **Product Flow**

The factory is divided into 3 areas.

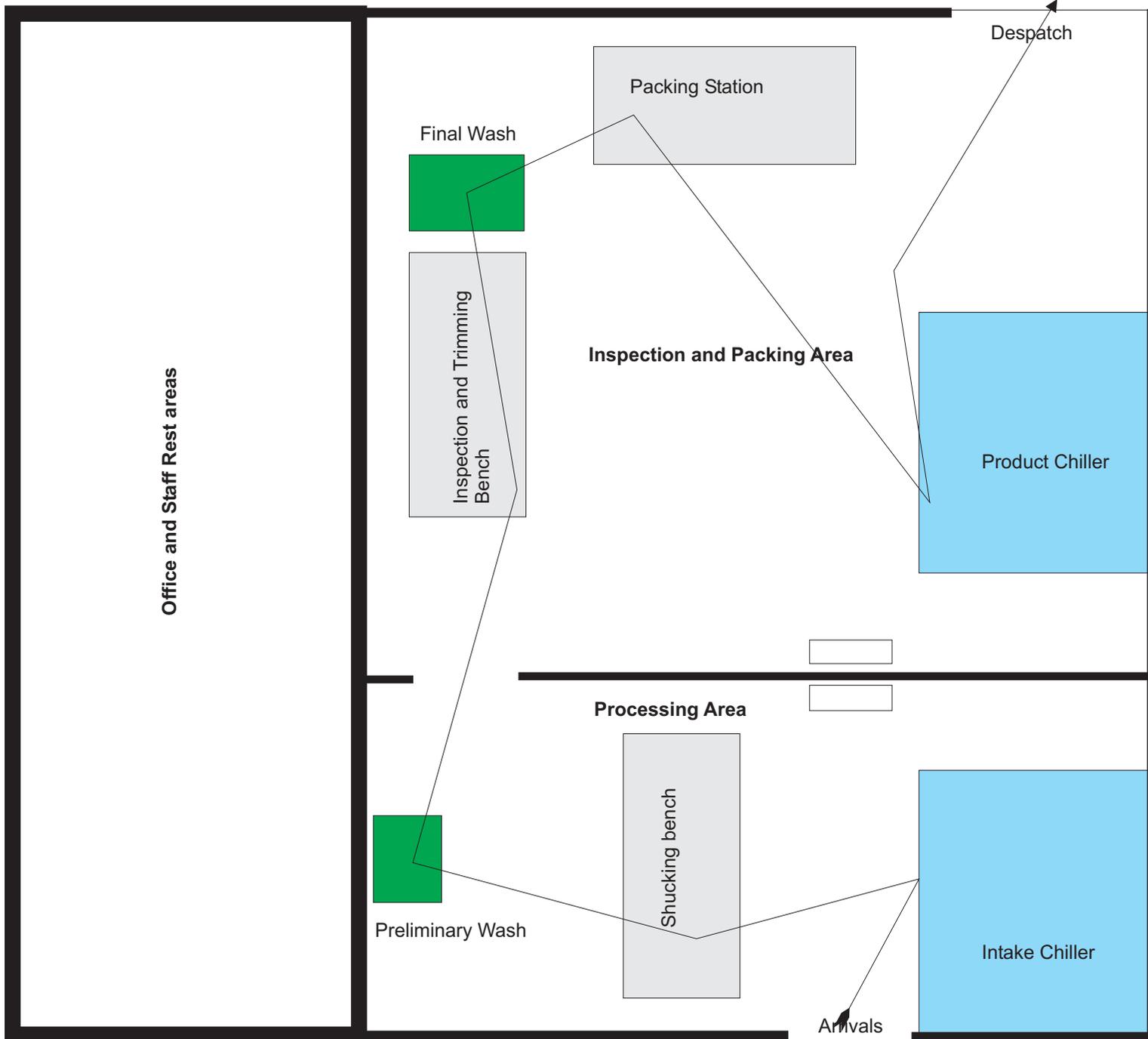
An office and rest/staff area outwith the food handling sections of the factory.

A processing or shucking area which contains the intake chiller, shucking table and pre-wash sink. This area deals with the live animal.

An inspection, and packing area which contains the inspection and trimming table, the final wash sink, packing station and product chiller. This area is temperature controlled and is a higher care area than the shucking area.

Product flow is

- Into the intake chiller;
- Onto the shucking table;
- Into the preliminary wash
- Into the Inspection and Packing Area
- Onto the inspection table;
- Through the final wash;
- Onto the packing station (incs metal detection)
- Into the product chiller
- Onward for despatch.



## 5 Pre-requisite programmes

The following pre-requisites are assumed to be in place

- 5.1 GMP – See Seafish Guide to Scallop Handling and Shucking Practices
- 5.2 Standard Operating Procedures (SOPs)

At all times the requirements of the following SOPs are met or followed as appropriate.

SOP Title	Type
Delivery Vehicle Inspection	Raw Material Intake
Raw Material Inspection - General Condition	Raw Material Intake
Raw Material Inspection - Labelling (Traceability)	Raw Material Intake
Chill/Cold Storage Temperature control	Storage
Chill/Cold Storage Segregation	Storage
Handling - Packing	Handling
Hand washing	Personal Hygiene
Dress code	Personal Hygiene
Jewellery controls	Personal Hygiene
Metal Detection	Food Safety
Waste Removal & Control	Waste
Chemical control	Cleaning
Cleaning Schedules	Cleaning
Hygiene Monitoring	Cleaning
Packaging condition	Dispatch Controls
Product temperature	Dispatch Controls
Despatch Vehicle control	Dispatch Controls
HACCP	Food Safety
Pre-employment	HR
Maintenance (Equipment)	Production
Return to Work (Sickness Absence)	HR
Glass and hard plastics Control	Food Safety
Foreign Body Control	Food Safety
Weighing Control	Production
Product Recall and Crisis Management	Food Safety
Pest Control	Food Safety
New Product Development Procedures	General
Quarantine Stock Control	Food Safety
Supplier Approval	Production
Bacteriological and Chemical Analysis Procedures	Food Safety
Management Review	General
Cleaning Schedules	Cleaning
Production Temperature Controls	Production
Dilution rates (Cleaning Chemicals)	Cleaning

Illness Reporting	HR
Cooling and Chilling Procedures	Food Safety
Visitors / Contractors Questionnaire	HR
Scallop processing	Production

### 5.3 Other prerequisites include:

- Buildings and equipment are fit for purpose – constructed from appropriate materials are well maintained, and meet or exceed current food standards.
- Seaside Seafood holds the Seafish Quality Award (higher standard). A copy of the audit specification is available from the Sea Fish Industry Authority ([www.seafish.org](http://www.seafish.org)).
- All staff are appropriately trained in food safety (Level 1 or 2), food handling and H&S as standard. New starters complete an incompany induction programme developed by the local Group Training Association.

## 6 HACCP

### 6.1 Hazard Analysis

Using the process flow chart, we have identified 12 process steps and an additional (13<sup>th</sup>) process of raw material and end product testing. For each of these steps we apply the decision tree method (appendix 6.1) of identifying and analysing hazards

When carrying out the analysis, key issues to take into account are:

- All scallops should be considered as contaminated with the marine biotoxin domoic acid;
- The fishing vessels we contract with operate an effective care of the catch policy and land scallops that are alive and uncontaminated by cleaning chemicals, fuel oil or other vessel-based contaminants;
- All scallop shells will suffer damage from the dredging operation and will contain grit;
- During shucking there is a degree of contamination from shell, debris and viscera.
- The preliminary wash effectively removes contamination by grit and other physical material including 'clinging' viscera;
- Small amounts of viscera and other black material may remain on the scallop after shucking;
- Testing of raw material and end product only indicates the presence or absence of biotoxin from one scallop in each full batch of several hundred scallops;
- The scallops are contaminated with low levels of vegetative bacteria upon arrival.
- The scallops are kept chilled and are handled hygienically and levels of food poisoning bacterial contamination and multiplication are negligible;
- Hygiene standards in the factory are high and are effectively monitored using ATP testing for bacteria and protein testing as an indication of cleaning effectiveness.

## 6.2 CCP Assessments

Step #	Operation	Potential Hazards	Significant Hazard?	Q2 <sup>3</sup>	Q3 <sup>4</sup>	Q4 <sup>5</sup>	Q5 <sup>6</sup>	CCP
1	Delivery of Scallops	diesel contamination	No					
	Intake of Scallops to Intake	Rain or seagulls	No					
3	Chill	Mixed consignments	No					
3	De-Shelling	physical contamination by grit,	Physical	Yes	No	Yes	Yes. Step 5	
4	Shucking	chemical contamination by viscera	Chemical	Yes	No	Yes	Yes, step 5	
		poor shucking, 'black' material remains.	Chemical	Yes	No	Yes	Yes, step 6	
5	Preliminary Wash	ineffective rinsing	No					
6	Inspection and trimming	Black material remains	Chemical	Yes	Yes	Yes	No	CCP
7	Final Wash	Ineffective flushing of material from ducts	Chemical	Yes	Yes	Yes	No	CCP
8	Packing	Cross contamination	No					
9	Labelling	Mis-labelling of batches	No					
10	Product Chill	Temperature control	No					
11	Consignments	Temperature control	No					
12	Transport	Temperature control	No					
	Delivery	Temperature control	No					

<sup>3</sup> Do control or preventative measures exist? NO >> Not a CCP, Yes >> to Q 3

<sup>4</sup> Is the step specifically designed to eliminate or reduce the likely occurrence of the hazard to an acceptable level? No >> to Q4, Yes >> CCP

<sup>5</sup> Could contamination occur or increase to unacceptable levels? No >> Not a CCP, Yes >> to Q 5

<sup>6</sup> Will a subsequent step render safe an identified hazard? No >> CCP, Yes >> Not a CCP

### 6.3 HACCP Plan Overview

HACCP Plan				Monitoring					Corrective Action	Records	Verification
CCP	Significant Hazard?	Control Measure(s)	Critical Limits	What	How	Frequency	Who	Records			
Inspection and trimming	Chemical	See Seafish Guidelines <sup>7</sup>	No black material	colour	visual inspection	continuous	trimmer & packer	no, SOP	re-trim, report consistent failures	Yes	Post packing inspection (sub sample) and end product testing
Final Wash	Chemical	See Seafish Guidelines	2 or 10 mins wash <sup>8</sup>	duration and turbulence	timer and flow rate	continuous	packer	no, SOP	re-wash report consistent failures	Yes	

The view of the HACCP Team is that effective shucking practices and thorough washing of the scallop to flush out material from the duct is an efficient and reliable means of reducing any biotoxin present in the scallops to an acceptable level. The actions of the shucking, washing and packing staff are critical to the success of this operation. The inspection of a sample of post packing product and the use of end product testing is an appropriate means of verifying that proper procedures are being followed and cannot in themselves be relied on as a CCP.

<sup>7</sup> Scallop Handling and Shucking Practices, 2005

<sup>8</sup> Guidance from Seafish:

The 10 mins wash was only intended as guidance to those businesses that did not have the ability to test and release their scallops, or have other evidence that their scallops were safe enough.

The 10 min wash is targeted at yessotoxin in scallops. This toxin binds more to fats and so is harder to wash out. This recent report may be of help - <https://www.efsa.europa.eu/en/efsajournal/pub/6422>

The FBO is able to adopt any regime that will adequately control the risks to public safety posed by their businesses. They should ask themselves how they have gone about establishing the levels of biotoxins in their scallops with particular reference to yessotoxins over a suitable period of time and how they monitor potential future risks.

Conclusions of the HACCP team are:

- Microbiological contamination and multiplication by food spoilage and food poisoning bacteria do not present significant risks to human health due to:
  - Effective temperature control;
  - High standards of staff, equipment and plant hygiene;
  - Scallops are processed quickly and consumed within a short timescale;
  - Scallops are cooked before consumption.
  
- Physical contamination by grit, broken shell, glass, hard plastics and metal do not present significant risks due to:
  - Effective washing prior to packing;
  - Effective application of the glass, hard plastic and foreign body SOPs;
  - Metal detection prior to packing.
  
- Chemical contamination by:
  - Diesel, cleaning chemicals, oils and grease do not present a significant risk due to:
    - Fishing vessel approval and application of Care of the Catch procedures;
  - Biotoxins from marine algae
    - May present a significant risk to human health. These should be controlled through:
      - Effective and consistent trimming of scallops to remove all black material – viscera;
      - Effective, prolonged, vigorous and thorough washing of trimmed scallops to flush out any potential material in the ducts;
      - Visual inspection during packing to check for black material and end product testing are useful means to verifying the two critical controls of proper trimming and effective washing.

A detailed analysis of the hazards, significant risks and appropriate preventative measures would normally be attached to a working HACCP Plan.

#### 6.4 Other Food, Health and Environmental Safety Issues

The disposal of shucking waste (viscera) presents a significant hazard to human health and the waste must be treated as a high level hazard and disposed of appropriately.

Waste disposal is carried out by a licensed contractor and all scallop viscera are incinerated and the ash sent to land fill.

The level of flesh adhering to scallop shell is sufficiently low that this material can be treated as low level waste and sent directly to land fill.

