

CODEX ALIMENTARIUS COMMISSION



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Organization of
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Organization

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Agenda Item 8

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(for reference purposes only)

JOINT FAO/WHO FOOD STANDARDS PROGRAMME CODEX COMMITTEE ON FISH AND FISHERY PRODUCTS

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PROPOSED DRAFT CODE OF PRACTICE ON THE PROCESSING OF SCALLOP MEAT (Held at Step 4)

PROPOSED DRAFT CODE OF PRACTICE FOR THE PROCESSING OF FRESH AND QUICK FROZEN RAW SCALLOP MEAT [WITH OR WITHOUT ROE]

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Appendix 'X' Optional Final Product Requirements

¹ this document corresponds to proposed draft COP in document CX/FFP 09/30/9 from the 30th CCFFP

SECTION 2 DEFINITIONS

For the purpose of this Code:

Refrigerated Sea Water is sea water in fixed tanks chilled by mechanical refrigeration.

[Roe on scallop is the scallop adductor muscle meat and the roe sac remaining after the viscera has been completely detached from the scallop shell.]

Scallop Meat is the adductor muscle meat remaining after the viscera and roe have been completely detached from the scallop shell.

Shucking is the process of removing the adductor muscle meat and completely detaching the viscera or viscera and roe from the shell of live scallops.

SECTION X PROCESSING OF FRESH AND QUICK FROZEN RAW SCALLOP MEAT [WITH OR WITHOUT ROE]

In the context of recognising controls at individual processing steps, this section provides examples of potential hazards and defects and describes technological guidelines, which can be used to develop control measures and corrective action. At a particular step only the hazards and defects, which are likely to be introduced or controlled at that step, are listed. It should be recognised that in preparing a HACCP and/or DAP plan it is essential to consult Section 5 which provides guidance for the application of the principles of HACCP and DAP analysis. However, within the scope of this Code of Practice it is not possible to give details of critical limits, monitoring, record keeping and verification for each of the steps since these are specific to particular hazards and defects.

As stressed by this Code, the application of appropriate elements of the pre-requisite program (Section 3) and HACCP principles (Section 5) at these steps will provide the processor with reasonable assurance that the essential quality, composition and labelling provisions of the appropriate Codex standard will be maintained and food safety issues controlled.

The commercial harvest practices of scallops can be quite variable. For instance, shucking can occur either on board fishing vessels equipped for such operations or in processing facilities. For long fishing voyages where scallops are shucked at sea and kept chilled by the application of freshwater ice, the time that the scallop meat is exposed to the melting ice can affect both the product quality and composition. The washing of scallop meat during processing is also a source of freshwater exposure affecting product composition. For the product to meet international and/or regulatory standards aimed to prevent consumer fraud and unfair trade practices, scallop fishers and processors should have proper controls in place with particular attention paid to limit excessive addition of freshwater to the product.

This section covers the preparation and handling of fresh scallop meat on board harvesting vessels prior to offloading and the processing of quick frozen scallop meat at the processing facility. This section will also address the use of freshwater [and polyphosphate treatment] during processing. The example of the flow diagram (Figure X.1) will illustrate some of the common steps involved in the processing of scallop meat.

X.1 GENERAL ADDITION TO PRE-REQUISITE PROGRAMME

Section 3 - Pre-requisite programme gives the minimum requirements for good hygienic practices for a harvesting vessel and processing facility prior to the application of hazard and defect analysis. In addition to the guidelines described in Section 3, the following should also be considered:

- Material used to contain shucked scallop meat on ice aboard harvesting vessels should be clean, sanitary and in good repair
- If scallops are shucked at sea aboard the harvesting vessel they should be thoroughly rinsed with clean sea water to minimize sand, shell, detritus and foreign material in the finished product

X.2 IDENTIFICATION OF HAZARDS AND DEFECTS

Refer also to Section 5.3.3 Conduct Hazard and Defect Analysis.

X.2.1 Hazards

Refer also to Section 5.3.3.1 Identification of Hazards and Defects. When marketing of scallop meat is concerned, this product should meet the contaminants and relevant hygienic provisions outlined in the Codex Standard for Quick Frozen Raw Scallop Adductor Muscle Meat (*under development*). [Where marketing of roe-on scallops is concerned, this product should meet the contaminants and relevant hygienic provisions outlined in the Codex Standard for Live and Raw Bivalve Molluscs (CODEX STAN 292-2008)].

This Section describes the main hazards and defects specific to scallop meat.

X.2.1.1 Marine Biotoxins

Marine biotoxins such as DSP, PSP or ASP are generally not a food safety concern in scallop adductor muscle meat alone and therefore do not pose a human health risk. Scientific data regarding the contamination of scallop meat with biotoxins are limited. Never the less, some scientific and monitoring data have shown ASP and DSP contamination in scallops, although mainly concentrated in the viscera and roe, may accumulate in the adductor muscle. While scientific information regarding biotoxin contamination in scallop meat is limited, the hazard analysis will need to consider marine biotoxins as a potential hazard. This hazard will be excluded or included based upon the species and the available country specific scientific evidence data for toxins in that species.

X.2.2 Defects

The potential defects below are outlined in Sections 3. and 9. of the Proposed Draft Codex Standard for Quick Frozen Raw Scallop Adductor Muscle Meat (*under development*).

End product specifications outlined in Appendix 'X' describe optional requirements specific to scallop meat.

X.2.2.1 Parasites

Parasites are known to affect the respiratory system, organs and the connective tissue of organs (i.e. *Perkinsus* spp.) in bivalve molluscs. *Sulcascaaris sulcata*, a nematode, has been known to parasitize the adductor muscle of scallops; however, this species matures in cold blooded marine turtles and is not considered a hazard to humans. Never the less, the infestation of parasites in scallops or the presence of cysts can be aesthetically offensive to consumers.

X.2.2.2 Excessive Viscera, Sand, Detritus and Foreign Matter

During the shucking of scallops, incomplete removal of the viscera and other parts of the intestine from the scallop meat could occur. Sand, fine gravel, detritus and foreign matter may accompany harvested scallops from the natural environment to shipboard. If not properly rinsed away, sand and fine gravel may become embedded between the fibres of the adductor muscle. Excessive amounts of viscera and foreign matter could result in undesirable physical attributes in the final product that would be objectionable to consumers. In addition, incomplete removal of viscera may result in health hazards from biotoxins and pathogens.

X.2.2.3 “Added water”

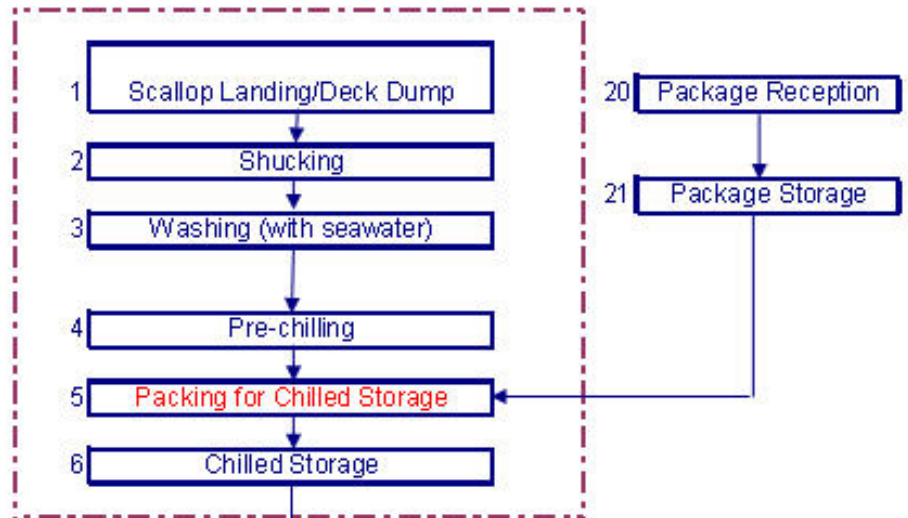
It has been shown that freshwater in contact with scallop adductor muscle meat will increase its moisture content over time. This is because the adductor muscle of a scallop is made up of parallel strands of fibers that can absorb water through capillary action. If scallop adductor muscle meat has been in contact with fresh water, including melting fresh water ice, for an amount of time greater than that required for preparation and processing under good manufacturing practices, the product will absorb excess water, which may be construed as an unfair trade practice or consumer fraud. [The use of polyphosphates in scallops during processing will bind added water and if used improperly, can potentially lead to consumer fraud and unfair trade practices.]

Proper processing controls should be in place by the processor to ensure that water is not added to the extent that it is technologically avoidable [and that polyphosphate] and water use meets international and regulatory standards. (i.e. GMP's must be properly followed by the processor). The processor should ensure that labelling is not misleading for the consumer.

This flow chart is for illustrative purposes only. For in-factory HACCP implementation a complete and comprehensive flow chart has to be drawn up for each process.

References correspond to relevant Sections of the Code

Long Haul Harvesting Vessel Operations



Processing Facility Operations

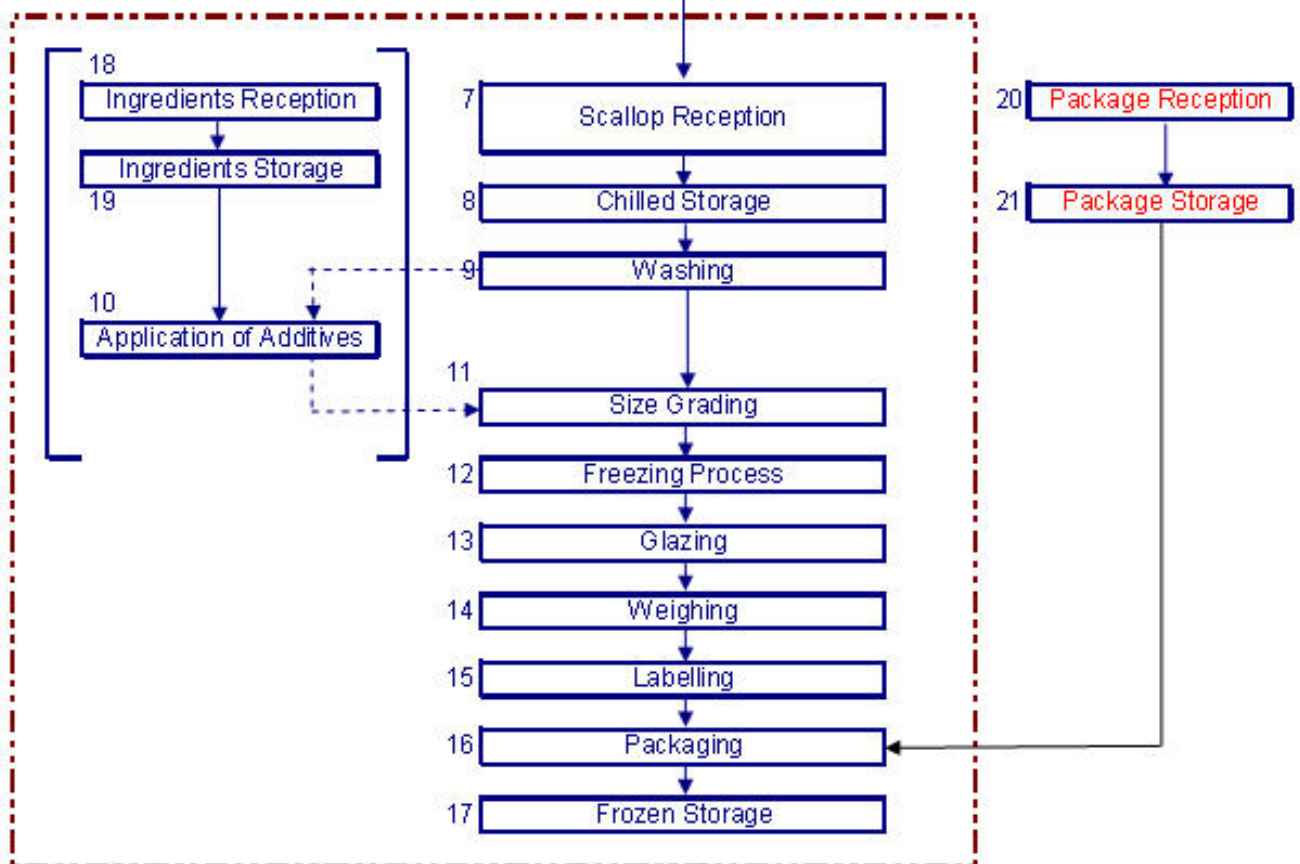


Figure X.1 Example of flow chart of processing of scallop meat

X.3 PROCESSING OPERATIONS

X.3.1 Processing Of Fresh Scallop Meat On Board a Long Haul Harvesting Vessel Prior To Offloading

Scallop fishing may be either short haul or long haul and is differentiated by the time at sea and the distance of the fish ground from the land based processing facility. “Short haul voyages” are typically 1 - 2 days in the case of inshore wild caught fisheries and daily as in the case of aquaculture-controlled harvest. “Long haul voyages” are typically offshore fishing voyages. On long haul voyages, shucking of scallops is carried out on board fishing vessels. Products are kept chilled by the application of freshwater ice and placed in appropriate refrigerated storage.

X.3.1.1 Scallop Landing/Deck Dump (Processing Step 1)

Potential Hazards: Not likely
Potential Defects: Dead animals

Technical Guidance:

- Live scallops should be collected and placed in clean storage containers without undue delay and with care to avoid contamination.
- Rough handling of live scallops should be avoided to minimize stress and injury to the animal.

X.3.1.2 Shucking (Processing Step 2)

Potential Hazards: Presence of marine biotoxin
Potential Defects: Remaining viscera

Technical Guidance:

- Live scallops should be eviscerated as soon as possible. If biotoxins are present in the viscera, this may help prevent toxin migration into the adductor muscle.
- Care should be taken when shucking to avoid damage to the viscera and/or roe that could result in transfer of marine biotoxins, if present, to the adductor muscle
- Care should be taken to ensure that the viscera, connective tissue and roe [(if applicable)] are completely removed from the scallop meat.
- Scallop meat shucked at sea should be unloaded without undue delay and placed in chilled storage until processing occurs.

X.3.1.3 Washing with Sea Water (Processing Step 3)

Potential Hazards: Shell fragments, presence of marine biotoxin
Potential Defects: Remaining viscera, physical contamination (sand, debris), excess added water

Technical Guidance:

- An adequate supply of clean seawater should be available for washing of scallop meat after shucking to remove any shell fragments, viscera, connective tissue, sand, detritus and foreign matter.
- Care should be taken during washing to minimize the contact time between water and the scallop meat in order to limit any uptake to that which is technologically unavoidable.

X.3.1.4 Pre-chilling (Processing Step 4)

Potential Hazards: *Microbiological growth and/or recontamination*

Potential Defects: *Moisture (added water) - applies to pre-chilling using freshwater*

Technical Guidance:

- Pre-chilling of the scallop meat should be employed to reduce the core temperature of the scallop meat prior to being placed in chilled storage. This step can minimize the amount of ice melt and consequently freshwater contact with the scallop meat during chilled storage. Rapid chilling will also minimize subsequent drip loss.
- Pre-chilling involves the immersion of the scallop meat in refrigerated sea water for a specified period of time.
- If freshwater ice is used in conjunction with sea water, the contact time for each batch should be kept as short as practical.
- Water used for pre-chilling should be periodically replaced to minimise the bacterial load and ensure functional water temperature.

X.3.1.5 Packing for Chilled Storage (Processing Steps 5, 20, 21)

Potential Hazards: *Not likely*

Potential Defects: *Not likely*

Also refer to Section 8.5.1 - Reception – Packaging, Labels & Ingredients; Section 8.5.2 – Storage - Packaging, Labels & Ingredients and Section 8.4.4 - Wrapping and Packing,

Technical Guidance:

- After the scallop meats are packed in clean containers made of a suitable material appropriate to be in contact with food, a tag or other appropriate identification should be attached to each container to determine the date of harvest and other relevant product information.
- The container should not be too large, appropriately filled and not over-stacked in order to facilitate thermal exchanges and to prevent scallops' damage.
- The scallop meats should be kept in a clean condition.
- [Containers should be impermeable or designed to minimize water uptake in scallop meat to the extent possible provided it does not result in quality loss in the product]

OR

- [If the container is not impermeable, it should be necessary to put an impervious film between the ice and the container to avoid water uptake]

X.3.1.6 Chilled Storage (Processing Step 6)

Potential Hazards: *Microbiological growth and/or recontamination*

Potential Defects: *Decomposition, Moisture (added water)*

Also refer to Section 8.1.2 – Chilled Storage

Technical Guidance:

- The containers of scallop meat should be surrounded by sufficient finely divided ice.
- The chilled storage or storage containers should be adequately drained. Freshwater from the melted ice should not come in contact with the product near the bottom layer.
- Where ice is used, stored scallops should be examined regularly to ensure sufficient ice cover of the product
- Temperatures should be taken to ensure that the stored scallop meat remains at temperature of melting ice.

- Prior to offloading, product and storage information (e.g. dates of harvest in relation to onboard chilled storage locations, etc.) should be considered to facilitate proper utilisation of the scallops.

X.3.2 Processing of Quick Frozen Scallop Meat

This section is designed to augment the Processing of Fresh Scallop Meat On Board a Long Haul Harvesting Vessel section with additional operation steps pertaining specifically to the processing of quick frozen scallop meat.

X.3.2.1 Scallop Reception (Processing Step 7)

Potential Hazards: Marine Biotoxin, chemical contamination

Potential Defects: Decomposition, Moisture (added water), parasites, foreign matter

Technical Guidance:

- Live scallops requiring shucking on arrival at the processing facility or scallop meats should be adequately chilled, handled without undue delay and with care to avoid contamination.
- Rough handling of live scallops should be avoided to minimize stress and injury to the animal.
- Product specifications could include the following characteristics:
 - organoleptic characteristics such as appearance, odour, texture, etc;
 - species specification
 - acceptable upper limit moisture content; (*DN: possible methods of analysis (i.e. % moisture and M/P ratio could be appended as an annex for reference purposes)*);
 - workmanship (excessive viscera/roe (in the case of adductor muscle meat only));
 - chemical contamination such as heavy metals, pesticide residues, etc.
 - presence of parasites;
 - foreign matter.
- [For the marketing of roe-on scallops, a processor should have a process in place to ensure that the toxicity content meets the regulatory requirements of the official agency having jurisdiction. For example, this could be accomplished by, but not limited to, adherence to monitoring programs or end product testing.]
- Skills should be acquired by scallop handlers and appropriate personnel in sensory evaluation techniques to ensure incoming lot meet essential quality provisions of the Codex Standard for Quick Frozen Scallop Adductor Muscle Meat.
- Appropriate procedures should be in place for scallop handlers and appropriate personnel to verify that species specifications are met. This could include but not limited to reviewing product information in commercial documentation, etc.
- Scallops or scallop meats should be rejected if known to contain harmful, decomposed or extraneous substances, which will not be eliminated or reduced to an acceptable level by normal procedures of sorting or preparation. An appropriate assessment should be carried out to determine the reason(s) for loss of control and the HACCP or DAP plan should be modified where necessary.

X.3.2.2 Chilled Storage (Processing Step 8)

Potential Hazards: *Microbiological pathogen growth*

Potential Defects: *Decomposition*

Also refer to Section 8.1.2 – Chilled Storage

Technical Guidance:

- For scallop meat packed in containers, their identification tag facilitates the determination of the harvest date and the number of days the product has been kept in contact with freshwater ice. Stock rotation schemes should be used to ensure proper utilisation of the scallops.
- Products should be stored at the adequate temperature approaching that of melting ice. The temperature should be monitored during chilled storage.
- Product should be stacked in a manner that would facilitate adequate and uniform temperature distribution to all parts of the stored product.

X.3.2.3 Washing (Processing Step 9)

Potential Hazards: *Shell fragments*

Potential Defects: *Excessive water, physical contamination (sand, debris)*

Technical Guidance:

- Scallop meat should be gently agitated to allow separation from each other and to ensure the removal of foreign matter.
- Chilled salt water (3%) should be used for the washing of scallop meat to minimize the uptake of moisture.
- Chilled salt water should be prepared from potable water and food grade salt. The salinity of chilled salt water should be monitored
- The use of freshwater should be avoided. If used, a washing/showering method should be clearly defined and should address the contact time.
- The washing schedule (contact time parameters) should be carefully monitored.
- The washed scallop meats should be adequately drained.
- After washing, the scallop meat should be immediately processed or refrigerated and kept at the adequate temperature (temperature of melting ice).

[X.3.2.4 Application of Additives to Scallop Meat (Processing Steps 10, 18, 19)

Potential Hazards: *Not likely*

Potential Defects: *Excess water, off-flavours*

Also refer to Section 8.5.1 Reception – Packaging, Labels & Ingredients and Section 8.5.2 Storage - Packaging, Labels & Ingredients.

Technical Guidance:

- Soaking scallop meat in a phosphate solution is the most common method of polyphosphate application. Polyphosphates can also be applied by dipping, spraying or tumbling in phosphate solution.
- The application of phosphates should not result in more than a small increase in moisture that can occur under good manufacturing practices without the use of phosphates. If polyphosphates are used, a processor should develop a process for its application in order to consistently achieve its beneficial functional goals.
- Polyphosphates should be blended in the proper proportions and should adhere to the appropriately validated contact time. The amount of water absorbed by the scallop meat will increase with soaking time.
- Additives should comply with the requirements of the Codex General Standard for Food Additives and the Proposed Draft Standard for Quick Frozen Raw Scallop Adductor Muscle Meat.]

X.3.2.5 Size Grading (Processing Step 11)

Potential Hazards: Not likely
Potential Defects: Decomposition

Technical Guidance:

- Size grading of scallop meat is typically undertaken through mechanical graders of various degrees of sophistication. There is a possibility of scallop meat becoming trapped in the bars of the graders so that regular inspection and cleaning is required to prevent “carry-over” of old scallop meat.
- After grading, the scallop meat should be immediately processed or refrigerated and kept at the adequate temperature (temperature of melting ice).

X.3.2.6 Freezing Process (Processing Step 12)

Potential Hazards: Not likely
Potential Defects: Texture deterioration

Refer to Section 8.3.1 Freezing Process

X.3.2.7 Glazing (Processing Step 13)

Potential Hazards: Not likely
Potential Defects: Subsequent dehydration, incorrect net weight

Refer to Section 8.3.2 Glazing

Technical Guidance:

- Care should be taken to ensure that the entire surface of the frozen scallop meat is covered with a suitable protective coating of ice and should be free of exposed areas where dehydration (freezer burn) can occur.

X.3.2.8 Weighing (Processing Step 14)

Potential Hazards: Unlikely
Potential Defects: Incorrect net weight

Refer to Section 8.2.1 Weighing and Section 8.3.2 Glazing

X.3.2.9 Labelling (Processing Steps 15)

Potential Hazards: Unlikely
Potential Defects: Incorrect labelling, undeclared additive, undeclared added water

Also refer to Section 8.2.3 Labelling

Technical Guidance:

- Labeling must accurately describe the nature of the product so that consumers are not misled and can make an informed choice.
- [Where polyphosphate was used in the process, a system should be in place to ensure that this additive is properly declared on the label.]
- Where moisture content prescribed by national legislation has been exceeded, the label must indicate that water was added in accordance with national legislation of the country where the product is sold.

X.3.2.10 Packaging (Processing Steps 18, 19, 20, 21)

Potential Hazards: Not likely

Potential Defects: *Not likely*

Refer to Section 8.5.1 Reception – Packaging, Labels & Ingredients; Section 8.5.2 Storage - Packaging, Labels & Ingredients and Section 8.4.4 Wrapping and Packing

X.3.2.11 Frozen Storage (Processing Step 17)

Potential Hazards: *Unlikely*

Potential Defects: *Dehydration, decomposition, development of rancid odours, loss of nutritional quality*

Refer to Section 8.1.3 Frozen Storage

APPENDIX ‘X

OPTIONAL FINAL PRODUCT REQUIREMENTS – SCALLOP MEAT [TO BE COMPLETED]

- **Varying colour (i.e. light orange verses milk white):** In the spring, sea scallops have orange-colored roe that can bleed into the adductor muscle. This cosmetically different product known as "pumpkins" in the scallop industry may not be preferred in some markets.