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## EAST AFRICAN STANDARD

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Live aquaculture abalone



EAST AFRICAN COMMUNITY

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## Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

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## Introduction

In the preparation of this East African Standard, the following sources were consulted extensively:

SANS 729:2008, *Live aquaculture abalone*

IS 4303-1:1975, *Code of hygienic conditions for fish industry — Part 1: Pre-processing stage*

IS 4303-2:1975, *Code of hygienic conditions for fish industry — Part 2: Canning stage*

Codex Alimentarius website: [http://www.codexalimentarius.net/mrls/vetdrugs/jsp/vetd\\_q-e.jsp](http://www.codexalimentarius.net/mrls/vetdrugs/jsp/vetd_q-e.jsp)

USDA Foreign Agricultural Service website: <http://www.mrlidatabase.com>

USDA Agricultural Marketing Service website: <http://www.ams.usda.gov/AMSv1.0/Standards>

European Union: [http://ec.europa.eu/enterprise/sectors/pharmaceuticals/veterinary-use/maximum-residue-limits/index\\_en.htm](http://ec.europa.eu/enterprise/sectors/pharmaceuticals/veterinary-use/maximum-residue-limits/index_en.htm)

Assistance derived from these sources is hereby acknowledged.

Draft for comments only — Not to be cited as East African Standard

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## Live aquaculture abalone

### 1 Scope

This standard covers the harvesting, preparation, packing, conveyance and quality of live aquaculture abalone. It also details hygiene requirements for the product and for the packing facility employees.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CAC/GL 21, *Principles for the establishment and application of microbiological criteria for foods*

CAC/RCP 1, *Recommended international code of practice — General principles of food hygiene*

CAC/GL 30, *Principles and guidelines for the conduct of microbiological risk assessment*

CAC/GL 31, *Guidelines for the sensory evaluation of fish and shellfish in laboratories*

CD-K-572-2010, *Fish and fisheries products — Methods of sampling*

CAC/RCP 52[CD/K/521:2010], *Code of practice for fish and fishery products*

EAS 35, *Edible salt — Specification*

EAS 12, *Drinking (potable water) — Specification*

EAS 38, *Labelling of prepackaged foods — Specification*

EAS 41, *Fruits, vegetables and derived products — Sampling and methods of test*

EAS 103, *Schedule for permitted food additives*

EAS 123, *Distilled water — Specification*

ISO 4831, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of coliforms — Most probable number technique*

ISO 4832, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique*

ISO 4833, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of microorganisms — Colony-count technique at 30 degrees C*

ISO 6579, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Salmonella spp.*

ISO 6887-1, *Microbiology of food and animal feeding stuffs — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 1: General rules for the preparation of the initial suspension and decimal dilutions*

ISO 6887-2, *Microbiology of food and animal feeding stuffs — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 2: Specific rules for the preparation of meat and meat products*

ISO 6887-3, *Microbiology of food and animal feeding stuffs — Preparation of test samples, initial suspension and decimal dilutions for microbiological examination — Part 3: Specific rules for the preparation of fish and fishery products*

ISO 6888-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 1: Technique using Baird-Parker agar medium*

ISO 6888-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 2: Technique using rabbit plasma fibrinogen agar medium*

ISO 6888-3, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) — Part 3: Detection and MPN technique for low numbers*

ISO 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique*

ISO 7937, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of Clostridium perfringens — Colony-count technique*

ISO 13720, *Meat and meat products — Enumeration of Pseudomonas spp.*

ISO 16050, *Foodstuffs — Determination of aflatoxin B<sub>1</sub> and the total content of aflatoxin B<sub>1</sub>, B<sub>2</sub>, G<sub>1</sub> and G<sub>2</sub> in cereals, nuts and derived products — High performance liquid chromatographic method*

ISO 16654, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Escherichia coli O157*

ISO 21567, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of Shigella spp.*

ISO/TS 21872-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of potentially enteropathogenic Vibrio spp. — Part 1: Detection of Vibrio parahaemolyticus and Vibrio cholerae*

ISO/TS 21872-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection of potentially enteropathogenic Vibrio spp. — Part 2: Detection of species other than Vibrio parahaemolyticus and Vibrio cholerae*

ISO 11290-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of Listeria monocytogenes — Part 1: Detection method*

ISO 11290-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of Listeria monocytogenes — Part 2: Enumeration method*

### 3 Definitions

For the purpose of this standard the following definitions shall apply:

#### 3.1

##### **acceptable**

acceptable to the authority administering this standard, or to the parties concluding the purchase contract, as relevant

#### 3.2

##### **address**

in the case of a physical address, an address that includes the street or road number (if a number has been allotted), the name of the street or road and the name of the town, village or suburb; in the case of a farm or a smallholding, the name of the farm or small-holding and of the magisterial district in

which it is situated and, in the case of imported foodstuffs, the physical address of the manufacturer or supplier or importer

### 3.3 adequate

#### 3.3.1

<with regard to quality> of such quality as to ensure performance of the projected activity or function

#### 3.3.2

<with regard to quantity (or size)> of such magnitude as will comfortably accommodate the maximum number of persons or operations or size of unit envisaged as being involved

### 3.4

#### appropriate

acceptable to, or required by the authority administering this standard, or to the parties concluding the purchase contract, as relevant

### 3.5

#### "clean area" worker

worker who operates in an area that is required to be maintained in a hygienic condition

### 3.6

#### cleaning

removal of soil, food and fat residues, dirt, grease or other objectionable matter from surfaces

NOTE Food and product are used interchangeably in this standard.

### 3.7

#### code

number(s), letters or markings or any combination of these, indelibly affixed to containers representing the packing facility identity, batch code and sub-code, where applicable

### 3.8

#### competent authority

the authority administering this standard

### 3.9

#### contaminant

biological or chemical agent, foreign matter, or any other substance not intentionally added to food which can compromise food safety or security

### 3.10

#### contamination

introduction or occurrence of a contaminant in food or food environment

### 3.11

#### count

number of units of abalone present in the container

### 3.12

#### "dirty area" worker

worker who operates in an area that cannot be maintained in such a completely hygienic condition as required for the product preparation areas

### 3.13

#### disinfection

reduction, by means of chemical agents or physical methods (or both), of the number of micro-organisms in the environment to a level that does not compromise food safety or suitability

**3.14**

**dispatch establishment number**

official approval number for a growing or harvesting area and packing or processing facility

NOTE The establishment number for packing and processing is obtained from the competent authority.

**3.15**

**extraneous matter**

material readily recognized, without magnification, in the product which has not been derived from abalone or is present at a level determined by any method, including magnification, that indicates non-compliance with good manufacturing practices and sanitation practices

**3.16**

**persistent**

existing without significant change (i.e. not fleeting)

**3.17**

**potable water**

water that complies with the requirements for EAS 12

**3.18**

**process**

course of operations during production of the product

**3.19**

**processing area**

area in which any production of the final product takes place (such as preparation, cleaning, weighing or packing)

**3.20**

**product**

aquaculture abalone in the course of harvesting, handling, preparation, packing or transporting as indicated by the context

**3.21**

**suitable**

complying with the requirements of the intended purpose

**4 Requirements for the harvesting of live abalone from aquaculture facilities**

**4.1 Monitoring**

Harvesting shall only take place from aquaculture facilities that have been monitored in accordance with applicable programs.

**4.2 Harvesting**

**4.2.1** Harvesting techniques shall comply with the applicable requirements.

**4.2.2** Harvesting techniques shall not cause excessive damage to the shells or tissues of live abalone.

**4.2.3** Containers for the transportation or storage of live abalone shall be clean and made from a water-impermeable, easily cleanable material.

**4.2.4** On removal from water or during handling and transportation, abalone shall not be subjected to extremes of heat or cold or sudden variations in temperature. Temperature control is critical in handling abalone. Special equipment such as insulated containers and refrigeration equipment should be used if prevailing temperatures and the time involved so require.

**4.2.5** Live abalone shall not be exposed to full sun or surfaces heated by the sun or come into direct contact with ice and other freezing surfaces, nor shall the abalone be held in closed containers with dry ice (frozen carbon dioxide). In most cases storage above 22 °C or below 8 °C shall be avoided.

### **4.3 Wet storage facility**

#### **4.3.1 General requirements**

**4.3.1.1** Wet storage of live abalone refers to the holding of abalone in tanks for temporary storage or conditioning after harvesting and before packing. Wet storage shall comply with the relevant requirements.

**4.3.1.2** No marine species other than abalone may be stored in the same tanks.

**4.3.1.3** The identity of each harvested lot shall be maintained throughout the wet storage process.

**4.3.1.4** Between harvesting and packing, stock may be stored in outside tanks.

#### **4.3.2 Storage tanks**

**4.3.2.1** Storage tanks and related plumbing shall be fabricated of non-toxic materials and shall be easily cleanable. The construction of tanks shall allow for easy access for cleaning and inspection and for self-drainage. The design and installation of plumbing shall allow for regular cleaning and sanitising to prevent contamination of the tanks and water.

**4.3.2.2** Containers (where used) shall have a water-impermeable mesh-type construction that allows adequate flow of water to all live abalone in the containers. They shall be placed in tanks in such a manner that sufficient clearance is provided between the live abalone containers and bottoms and sides of the tanks.

**4.3.2.3** The site, facility and plant shall be evaluated and approved annually by the competent authority, taking into account the records of water officially tested.

#### **4.3.3 Water**

**4.3.3.1** Process water in onshore systems shall not negatively affect the sanitary quality of the stored live abalone or result in physiological stress that could lead to death.

**4.3.3.2** Water of approved production area status may be used in an onshore facility without disinfection provided the system operates on a continuous flow-through basis and the nearshore source water meets the approved area's bacterial criteria at all times that live abalone are held for direct marketing. Where an onshore facility uses recirculated water, then checks shall be made on the water to ensure that it meets the approved area's bacterial criteria at all times that live abalone are held for direct marketing.

**4.3.3.3** Land-based wet storage facilities shall conduct monthly microbiological testing or secure the services of an outside laboratory to provide confirmation of approved water status (see clause 9).

## **5 Requirements for the packing facility and for packing employees**

### **5.1 General**

Management shall implement documented methods and procedures that can testify that an acceptable product safety management system has been incorporated.

### **5.2 Packing facility construction, layout and conditions**

#### **5.2.1 Location, size, hygienic design, conditions and maintenance**

**5.2.1.1** The packing facility shall be situated in an environment deemed by the authority administering this standard to be suitable for the packing of the product.

The location of the packing facility and the designed construction of the packing facility shall be such that it can be kept acceptably free from objectionable odours, smoke, dust and other contamination in order to comply with the relevant requirements for hygiene and sanitation.

**5.2.1.2** The packing facility buildings and structures shall be of suitable size, construction design, and location to facilitate:

- a) maintenance and operation for their intended purpose;
- b) enough space to prevent crowding of equipment and employees;
- c) sufficient space for orderly arrangement of equipment and storage of raw materials and utensils used in any of the operations;
- d) an orderly uninterrupted flow of production without any cross flows that could have an adverse effect on the quality of the product;
- e) adequate cleaning and the maintenance of hygiene;
- f) the preparation of abalone without undue delay;
- g) product quality and safety; and
- h) adequate food safety management procedures.

**5.2.1.3** The packing facility shall have the necessary fittings, equipment, utensils, technical supervision and skilled labour to carry out the production process as required and in accordance with its design.

**5.2.1.4** The packing facility grounds shall be graded to ensure proper drainage and to eliminate stagnant water, and shall not be subject to flooding. There shall be no inadequately drained areas that could contribute to contamination of the product through seepage of food-borne filth and that could provide breeding places for insects or micro-organisms. The packing facility grounds shall be of sound construction and well maintained in a clean and hygienic state and shall be effectively fenced to keep out large animals. Ground surfaces shall be constructed as to prevent the puddling of wastewater.

**5.2.1.5** There shall be no accumulation of unused equipment, litter, waste, refuse, and uncut weeds or grass within the immediate vicinity of the product preparation buildings or structures that could constitute an attraction, breeding place or harbourage for rodents, insects or other pests.

**5.2.1.6** A system of control without risking contamination of the product shall be maintained to keep the packing facility free from birds, rodents, insects and other vermin.

**5.2.1.7** A schedule and routine inspection system of the condition and maintenance of the packing facility construction and facilities shall be implemented and maintained. Procedures for corrective actions in the event of non-compliance shall be instituted. Findings of such inspections and correction of non-conformance or the time limit to correct such non-conformance shall be documented and kept.

## **5.2.2 Roofs and ceilings**

**5.2.2.1** The roofs and valleys shall be weatherproof and well maintained to prevent contamination of the product, ingredients and empty containers, and to keep the walls, floor and other structures from becoming damp. Roofs and valleys shall be kept clear of debris including insects, dead birds and rodents and their droppings.

**5.2.2.2** The roofs and ceilings shall be at least 300 mm above any overhead equipment and in no

case less than 2.5 m from the floor.

**5.2.2.3** Roofs where no ceilings are fitted, and ceilings in other cases, shall be faced with a smooth water-impermeable material that is light in colour and capable of being easily cleaned without damage, and so designed, constructed, installed and finished as to be dust-proof and to minimize condensation, mould development, flaking of paint and the lodgement and accumulation of dirt.

**5.2.2.4** Effective measures shall be taken to avoid contamination of the product and to prevent loose or detachable material and drips from falling on the product from overhead structures in the preparation and storage areas. The structures should be insulated where appropriate.

**5.2.2.5** In areas where the open product is handled, all overhead structures and fittings shall be installed in such a manner as to avoid direct or indirect contamination of the product by condensation, drip or any other falling matter and shall not hamper cleaning operations.

### **5.2.3 Walls, windows and doors**

**5.2.3.1** Outer walls shall be weatherproof and impermeable to water.

**5.2.3.2** All interior wall surfaces shall be faced with a smooth, hard, water-impermeable, light-coloured material to a height of not less than 2 m above floor level. An unplastered brick surface is unacceptable. The walls shall be free from unnecessary projections and ledges. Openings for conveyors, services, vents etc. shall be smooth and shall be sealed.

**5.2.3.3** Fixtures, signboards, switch boxes, or any other fittings shall be avoided on internal wall surfaces in the preparation areas and where necessarily present, shall be adequately sealed to prevent harbourage of pests and accumulation of dirt.

**5.2.3.4** Windowsills shall be sufficiently sloped towards the floor at an angle to ensure that nothing can be stored on them and shall be at least 1 m above floor level.

**5.2.3.5** Windows and other openings shall be so constructed as to avoid accumulation of dirt. Windows shall fit tightly into their frames. Joints on panelled walls and junctions of the panels and floor surface shall be adequately sealed. Where appropriate, walls shall be protected from damage by moving equipment and fork trucks. Corrosion-resistant guardrails or the equivalent shall be used for this purpose.

**5.2.3.6** Wall-to-wall and wall-to-floor junctions in production areas shall be closed and coved. The minimum radius of the coving shall be 25 mm and 40 mm, respectively. Junctions between walls and ceilings shall be closed and coved. Wall surfaces shall be easy to clean and disinfect.

**5.2.3.7** Doors through which the product is moved between preparation areas shall be of adequate width. Doors and door frames shall be made from corrosion-resistant material that has high impact resistance. Doors and door frames shall have a smooth, seamless, water-impermeable, light-coloured, readily cleanable surface. Doors that open directly from the outside into the preparation and packing areas shall be tight-fitting and shall be of a self-closing type.

### **5.2.4 Floors and drainage in preparation and product handling areas**

**5.2.4.1** Floors in preparation and product handling areas shall be constructed of concrete or any other suitable material that is water-impermeable, non-toxic, resistant to wear and to corrosion, easy to clean and maintain, and laid to an even surface that is smooth but not slippery, and free from cracks, crevices and open joints.

**5.2.4.2** Floor surfaces shall be resistant to attack by product spillages, cleaning agents and cleaning solutions used at normal strengths. In the case of floor tiles, the grouting between the tiles shall be non-absorbent and of a durable material that is resistant to erosion and corrosion.

**5.2.4.3** Floors and drainage channels shall be evenly sloped to have a fall of at least 1 in 60 and shall be drained to internal drainage channels connected to accessible gullies, sumps and external sewers.

**5.2.4.4** Outlets shall have a suitable drain trap to prevent vermin entering the packing facility from the sewer system via the drain trap. Floors and drainage channels shall be in good condition and repair, and gully traps shall have strainers in place. Internal drainage channels shall be of the open type with, where necessary, removable covers.

**5.2.4.5** Installations that obstruct flow and cleaning shall not be present in drainage channels. The capacity of drainage channels shall be sufficient to cope with the maximum flow of liquid during peak demand without overflowing and causing flooding.

**5.2.4.6** Where necessary, stands or duckboards made from material that is easy to clean and water-impermeable shall be provided for workers.

### **5.2.5 Lift cages and staircases**

**5.2.5.1** Lift cages shall have a corrosion-resistant inside surface that is smooth, easy to clean, and water-impermeable, and the floor shall be properly drained.

**5.2.5.2** Staircases in rooms where the product is processed or handled shall have solid risers, and shall be provided with closed balustrades of a height that will prevent contamination of any product underneath the stairs.

**5.2.5.3** Stairs, lift cages and auxiliary structures such as platforms, ladders, chutes and catwalks shall be so situated and constructed so as to not cause contamination of the product.

**5.2.5.4** Walkways, catwalks, bridges and mezzanine floors over the open product, product contact surfaces, empty containers, conveyors for empty containers, or the open product or hand-wash facilities shall be completely sealed underneath and shall have side walls.

**5.2.5.5** Chutes shall be constructed, where appropriate, with inspection and cleaning hatches.

### **5.2.6 Cables and pipes**

**5.2.6.1** Cables and pipes shall be

- a) fixed above ceilings,
- b) chased into walls,
- c) carried under floors, or
- d) fixed away from walls or ceilings and above the floor, and spaced in such a manner that the ceilings, walls, floor, cables and pipes can be easily cleaned and maintained in a hygienic condition.

**5.2.6.2** Overhead cables, cable connections, pipework, girders and other structures shall be kept to a minimum to aid cleaning and, if present, shall be free from dust, rust, mould, flaking of paint, cobwebs and other extraneous material.

### **5.2.7 Illumination**

**5.2.7.1** General illumination shall be such as to permit efficient operation during the preparation and packing of the product. An illuminance of at least 220 lux is required for general operations, while at least 540 lux is required at points where close examination of the product or containers is carried out.

**5.2.7.2** Artificial illumination, if used, shall be such that the colour of the product is not significantly altered.

**5.2.7.3** Luminaires suspended over production areas, container storage areas and ingredient storage areas, shall be of the safety type or otherwise so protected as to prevent contamination of the product

in case of breakage. Suspended luminaires shall be so constructed and so situated as to facilitate easy cleaning and maintenance.

### 5.2.8 Ventilation

**5.2.8.1** The ventilation shall keep the air fresh, prevent the build-up of excessive heat, remove excess steam, and shall prevent the formation of condensate and growth of mould. Natural ventilation shall be augmented, if necessary, by mechanical means.

**5.2.8.2** Airflow shall be from the more hygienic to the less hygienic areas of the packing facility.

**5.2.8.3** Windows that open for ventilation purposes or ventilation openings shall be fitted with insect screens made of corrosion-resistant material and kept in good repair. The screens shall be easily removable for cleaning and shall be regularly cleaned.

**5.2.8.4** Fork truck or other vehicles emitting exhaust gasses shall not be operated in the preparation and processing areas. The air shall be free from noxious fumes, smoke, vapour, dust, chemicals and contaminating aerosols.

**5.2.8.5** Mechanical air intake points for ventilation shall be fitted with dust filters and shall be located so as to avoid the intake of air contaminated by micro-organisms and other contaminants.

### 5.2.9 Hand-washing facilities

**5.2.9.1** The following shall be provided at the entrances to the preparation and processing areas of the packing facility used by the employees, and at other strategic and convenient places wherever the process demands it:

- a) an adequate number of wash-hand basins, with an abundant supply of hot and cold potable running water or warm potable running water in the temperature range of 40°C to 50 °C under adequate pressure from taps operated by means other than hands or elbows;
- b) sufficient supply of unscented liquid soap or suitable hand cleaning detergent, nail brushes and, where required to dry hands, single use disposable towels; and
- c) where required, receptacles for any used disposable towels.

**5.2.9.2** Hand-washing facilities at the entrance to the preparation and product handling areas shall be protected against environmental contamination inside the building and shall be preferably located in a lobby or entrance hall. They shall be placed in such a position that employees are forced to pass them upon entering (for example, guided by a rail).

**5.2.9.3** The hand-washing facilities at the entrances to and inside the preparation area shall be located in such a position that employee practices can be supervised.

**5.2.9.4** Access to hand-washing facilities shall, at all times, be unobstructed by equipment and operating activities. Wash-hand basins shall be of a suitable corrosion-resistant impermeable material, shall have a smooth finish, be easy to clean and shall drain directly into the wastewater system.

**5.2.9.5** Hand-washing facilities shall not be used for other purposes other than the washing of hands. Disinfectant hand dips, where provided, shall be of such design that they can be adequately cleaned. Hand dips shall not be allowed to become a source of contamination. Disinfectant solutions shall be monitored and replaced regularly.

### 5.2.10 Footbaths and boot-wash basins

**5.2.10.1** Unless their absence in particular circumstances is acceptable, or unless alternative acceptable cleaning and disinfecting facilities are provided, footbaths or boot-wash basins that contain a suitable active disinfectant solution shall be provided at each entrance to the preparation,

processing and packing area that is used by employees, and shall be so located that employees cannot obtain access to such areas without disinfecting their footwear.

**5.2.10.2** There shall be adequate provision for the drainage and cleaning of footbaths. Boot-wash basins shall be positioned before the hand-washing facility upon entering the preparation area and shall be located inside the packing facility, protected against environmental contamination.

**5.2.10.3** When present, boot-wash basins shall be provided with suitable brushes that consist of a non-absorbent material of hygienic design, water sprays under suitable pressure, boot scrubbing powder and a disinfectant dip.

**5.2.11 Preparation and processing areas**

Preparation and processing areas shall not be used for any other purposes than that for which they have been designed. These areas shall be designed, constructed, and staffed, and the equipment shall be arranged in such a manner as to permit

- a) control of access,
- b) proper supervision,
- c) adequate working space to allow free movement of workers for the performance of all operations,
- d) functions such as quality and process control on the packing, materials, handling and preparation from the arrival of the abalone to the packed product,
- e) easy and adequate cleaning and proper maintenance of hygiene and hygienic operations, and the facilitation of free movement and cleaning of movable equipment,
- f) physical separation of the preparation and processing areas from any storage and designated cleaning areas, i.e. workshops and comfort areas shall be completely separated from preparation and storage areas,
- g) rapid and efficient handling and preparation without mechanical or other damage to the product,
- h) an orderly and undelayed flow,
- i) prevention of cross flows of operations that might have an adverse effect or reduction in the quality of the product, or separation of those operations that might cause cross contamination, and
- j) minimization of the risk of contamination of the product.

**5.2.12 storage facilities for live abalone in the packing area**

**5.2.12.1** Storage tanks for live abalone shall be constructed of material that is durable, water-impermeable, resistant to flaking or pulverising, and capable of withstanding repeated cleaning and disinfection.

**5.2.12.2** Water or ice water used for storage of the raw product shall not be re-circulated for the purpose of repeated use without adequate treatment to maintain its purity. Provision shall be made for drainage of the tanks without contaminating the product.

**5.2.13 Storage facilities for items not used in contact with the product**

Materials capable of contaminating the product and spare parts for machinery shall be stored separately from the processing areas.

**5.2.14 Storage facilities for packing and packaging materials**

Cartons shall be stored in clean, dustproof, vermin-proof, dry storerooms reserved for the purpose. Precautions shall be exercised that containers and closures are not exposed to dust and other environmental elements or excessive steam or moisture during storage. Packing and packaging materials shall be stored at a height of at least 150 mm above floor level and away from the walls.

#### **5.2.15 Storage facilities for poisonous and harmful materials**

##### **5.2.15.1 Storage facilities for pesticides and other poisonous materials**

Pesticides and other poisonous or harmful materials, and equipment for their application, shall be stored in an enclosed room or cupboard in which no foodstuff or food-handling equipment or packing material or containers or lids are stored and shall be kept locked. These poisonous or harmful substances shall at all times be segregated from edible materials. All these materials shall be prominently and distinctly labelled with the warning about their toxicity and use, and shall be registered for the purpose of use. Their containers shall be kept closed during storage.

##### **5.2.15.2 Storage facilities for cleaning and disinfecting materials**

Cleaning and disinfecting materials, and equipment for their application, shall be stored in a lockable room or cupboard where no foodstuff or food-handling equipment or packing materials or containers or lids are stored and shall at no time come into contact with containers, raw materials or the product. All materials shall be prominently and distinctly labelled.

##### **5.2.15.3 Storage facilities for lubricants**

Lubricants shall be stored away from the production areas in such a manner that they shall not be a cause of contamination to the product.

#### **5.2.16 Storage facilities for utensils and spare parts**

Utensils and equipment parts that come in contact with the product, shall, when not in use, be kept in a disinfectant solution or be stored in a hygienic manner in an area that is dry, free from dust and any other source of contamination by vermin. Suitable stands or shelves (or both) shall be provided for the storage of loose equipment and utensils. Spare parts for equipment and tools that can contaminate the product shall not be stored with operational utensils and equipment parts used in contact with the product.

#### **5.2.17 Refuse**

A separate refuse room or other equally adequate refuse facility shall be provided on the premises. The design and construction shall be such as to prevent harbourage of pests and contamination of the product, the equipment or the buildings used for the production of the product.

#### **5.2.18 Effluent sewage and waste disposal**

**5.2.18.1** Establishments shall have an efficient effluent sewage and waste disposal system that shall, at all times, be maintained in good order and repair. All effluent lines (including sewer systems) shall be large enough to carry peak loads, shall be so constructed as to avoid contamination of potable water supplies or the environment, shall not constitute a source of contamination to the product, product contact surfaces or ingredients, and shall not create an unsanitary condition or nuisance. Drainage and sewer pipes shall not be installed directly over the preparation or packing areas, the product or product contact surfaces, empty container storage areas, or in any manner that accidental leakages could contaminate the product. Sewer pipes shall have an inside diameter of at least 100 mm and shall be properly vented to the outside atmosphere.

**5.2.18.2** Effluent sewage and wastewater lines shall be identified as such and the disposal shall be made into a public sewerage system or, in the absence thereof, into an adequate private sewerage system as per requirements of local authorities but in such a manner that health risks are eliminated.

**5.2.18.3** Offal and rubbish shall be so conveyed, disposed, or stored as to minimize the development of bad odours, to prevent the harbouring and breeding of vermin, and to prevent contamination of the product or product contact surfaces, ground surfaces or water supplies. Manholes shall not be present in the preparation and processing areas.

**5.2.19 Comfort facilities**

**5.2.19.1** An adequate number of suitable dining rooms, change rooms, wash-hand basins with taps (see 5.2.9.1(a)), toilet facilities (separate for each sex) and, where appropriate, urinals, shall be provided. The design, layout, construction and location of the comfort facilities shall be such as not to create a health hazard. Comfort facilities shall be separated and shall not open directly into the preparation, processing, packing or storage areas, but shall be connected to these areas by means of a vestibule or lobby. The location of the change rooms shall be such as to enable workers to dress in the required protective clothes before entering the preparation and processing areas. Change rooms shall not open directly into the packing facility, but shall be connected to preparation areas in such a manner that protective clothing can be exchanged before leaving the packing facility or before visiting the toilets.

**5.2.19.2** Toilets shall be conveniently located and be provided at a suitable distance from the production areas, shall not open directly into production areas and shall be completely separated from change rooms. If toilets do not open into a vestibule or a lobby, they shall be fitted with closefitting self-closing doors. Doors of toilet facilities shall not open directly into areas where the product could be exposed to airborne contamination. An adequate supply of toilet paper shall be provided at the toilets.

**5.2.19.3** The comfort facilities shall be kept neat and clean and maintained in a sanitary condition and in good repair and free from bad odours. The layout and equipment shall be such as to permit proper cleaning, maintenance and enable proper vermin control. The comfort facilities shall be designed to ensure hygienic removal of waste matter.

**5.2.19.4** Proper facilities such as clothes baskets or well ventilated lockers shall be provided for the storage of the daily change of clothes at or near change room facilities. Where lock-up facilities are required for personal effects of workers, such facilities shall be provided in a separate room (for example, rest rooms or dining rooms). Personal effects of workers shall not be allowed to accumulate in the lockers or clothes baskets. The lockers or clothes baskets shall not be used for the storage of food or personal items that could attract vermin. The lockers or clothes baskets shall be maintained in a clean and good condition, and shall be repaired or be replaced when necessary.

**5.2.19.5** The comfort facilities shall be adequately ventilated and illuminated. Toilets shall be ventilated to external air and in such a way as not to contaminate the air in the preparation areas.

**5.2.19.6** Change rooms and dressing rooms shall not be used as living quarters or for the preparation of food or as dining rooms. Staff dining rooms shall be separate from the change rooms or dressing rooms. "Clean area" workers shall not use the same facilities at the same time as "dirty area" workers and where the same comfort facilities are used by both at different times they shall be cleaned during the interim period. Where "clean area" workers and "dirty area" workers have to use the same facilities, all the hygienic rules of facilities for "clean area" workers shall be observed and no dirty clothes or boots shall be kept or stored in "clean area" facilities.

**5.2.20 Living quarters**

Living quarters shall not be located in the same building that accommodates the areas where the product is prepared, processed, packed or stored.

**5.2.21 Facilities for washing and laundering of protective clothing**

Plastics brushes on corrosion-resistant chains, disinfecting soap or powder such as hypochlorite, and spray nozzles shall be provided near the hand-washing facilities for the cleaning of waterproof protective clothing and gloves. The washing or laundering of other types of protective clothing shall be performed by the packing facility or a firm contracted by the packing facility. Workers shall not be

allowed to remove work clothing from the premises in order to launder this clothing. Laundering facilities at the packing facility shall not be connected to preparation or storage areas.

#### **5.2.22 Facilities for cleaning and disinfecting portable equipment**

**5.2.22.1** The washing and disinfecting of portable or movable equipment such as trolleys, bins and other utensils shall be conducted in allocated areas furnished with proper floor drainage and necessary water points. Such facilities shall either be located in a separate room or in a designated area that may be partitioned off from the preparation and packing areas where there is a possibility of contamination of the product or product contact surfaces.

**5.2.22.2** Suitable drying stands or shelves shall be provided to keep equipment and utensils off the floor. An ample supply of cold potable water, and hot water if required, or saturated steam at adequate pressure that complies with the requirements for potable water, shall be provided. High-pressure or high-frequency oscillating water or detergent equipment shall be available where possible. The drainage shall be in a direction away from the product handling areas.

#### **5.2.23 Chiller rooms and ice-making facilities**

Chiller rooms and ice-making facilities shall comply with the current compulsory standard for frozen fish and frozen fish products as published in Notice number R 1076 of Government Gazette 25245 of 2003-08-01 (as amended from time to time).

#### **5.2.24 Ice-making plant and ice storage and transportation**

Suitable and adequate facilities shall be provided for the production, storage and transportation of ice. All surfaces of ice-making equipment that come into contact with ice shall be of suitable non-absorbent, corrosion-resistant material that shall not peel or flake. The ice-making plant shall be of such a design and construction as to protect the ice against contamination and undue exposure to heat, and to facilitate cleaning and the drainage of melted water. Ice shall be effectively protected against contamination and heat when transferred or transported.

### **5.3 Equipment**

#### **5.3.1 Layout, installation, design, construction and usage**

##### **5.3.1.1 Layout**

Preparation areas shall be so designed, equipped and staffed as to allow free movement of employees to facilitate easy cleaning and maintenance of hygiene, and product quality. Equipment such as tables shall be installed or placed away from the walls. Aisles and working spaces between equipment and between equipment and walls shall be unobstructed and shall be of a sufficient width to permit employees to perform their duties without contamination of the product or product contact surfaces with clothing or through personal contact. The position of stationary equipment shall not impede drainage of water towards the drainage canals.

##### **5.3.1.2 Installation**

**5.3.1.2.1** Equipment shall be so constructed and installed as to prevent hygienic hazards and to minimize the build-up of contamination with organic material and dirt, and to facilitate their cleaning and disinfection.

**5.3.1.2.2** All permanently mounted or readily movable equipment shall be installed away from the walls or ceiling and shall be either installed high enough above the floor at distances sufficient to provide access for cleaning and inspection, or completely sealed to the floor.

**5.3.1.2.3** Equipment shall preferably not be sunk into the floor but if this is unavoidable, the equipment shall be installed in an acceptable manner. Sunken areas shall be well drained.

##### **5.3.1.3 Design**

**5.3.1.3.1** Equipment, implements and utensils shall be designed and shall be of a workmanship that is suitable for their intended purpose and to facilitate rapid and efficient handling of the product.

**5.3.1.3.2** The design of equipment and, where applicable, utensils shall be such as to prevent hygienic hazards and shall preclude contamination of the product with lubricants, fuel, steel fragments, soiling, contaminated water or any other contaminants.

**5.3.1.3.3** All equipment used in the production of the product shall be in a well-maintained and sound condition, durable and easy to maintain, inspect or monitor, movable or easy to dismantle or shall be able to be disassembled or to be opened for cleaning. They shall be of hygienic design with no open joints or pits or crevices or dirt traps. All parts that come into contact with the product shall be easily accessible for cleaning and disinfecting. Where necessary, equipment that cannot be cleaned *in situ* shall be easy to dismantle in order to expose the product contact surfaces for effective cleaning and disinfection.

**5.3.1.3.4** Surfaces with which the product comes into contact shall not be painted and shall be so constructed as to reduce projections, sharp comers or other features that could cause damage to the product.

**5.3.1.3.5** Bearings in equipment within reach of the product contact surfaces shall be of a sealed type and shall not cause any soiling of the product through seepages.

#### **5.3.1.4 Construction**

**5.3.1.4.1** All plant equipment, implements and utensils or surfaces that come into contact with the product shall be smooth and of a suitable corrosion-resistant, non-absorbent material that does not transmit toxic substances, odour, taste, staining or cause colour changes and soiling of the product and shall be inert to the product, detergents and disinfectants under normal operating conditions.

**5.3.1.4.2** The equipment, implements and utensils may have an acceptable plastics-coated surface capable of withstanding repeated cleaning and disinfection or shall preferably be made of stainless steel suitable for use with the product.

**5.3.1.4.3** Dissimilar steel material shall not be used where electrolytic corrosion can occur. Wooden equipment or utensils are unacceptable.

**5.3.1.4.4** Copper, lead and their alloys (other than solder), and other steels or materials detrimental to health, shall not be used in the construction of equipment that comes into contact with raw materials or with the unprotected product at any stage of its preparation. The use of solder in equipment shall be minimized.

#### **5.3.1.5 Usage**

**5.3.1.5.1** Equipment and utensils shall not be removed from the preparation areas except for repairs.

**5.3.1.5.2** Equipment and utensils used for inedible materials or waste shall be identified as such and shall not be used for edible products. Equipment and utensils not for use in product processing or product contact areas (for example, in the ablution facilities) shall not be used in the product handling, processing, packing and storage areas.

#### **5.3.2 Tables**

**5.3.2.1** Wooden tables shall not be used in the preparation and packing areas. Tables shall be of a design and construction that will not allow the development of unhygienic conditions and microbial build-up. Frames shall be made of suitable smooth, corrosion-resistant steel or steel with no openings in the construction.

**5.3.2.2** The tops of preparation and packing tables shall be of a suitable water-impermeable, smooth, seamless, corrosion-resistant steel (preferably stainless steel or other material with similar surface

characteristics). The tops shall either be removable for cleaning or so secured to their frames as to allow easy cleaning and disinfection.

**5.3.2.3** Tables shall, as far as possible, allow rapid and effective draining and shall be easy to clean and shall be free from cracks, crevices or openings.

**5.3.2.4** Where steel table tops are folded at the edges, the fold shall be so effectively soldered, welded or sealed with an acceptable mastic sealant as to prevent organic matter and dirt from entering the folded section. All joints shall be watertight.

### **5.3.3 Utensils and implements**

Knives, shovels, brooms and other utensils or implements used in the processing or packing areas shall not have handles of wood or other absorbent or porous material.

### **5.3.4 Conveyors, elevators, runways and flumes**

Conveyors, elevators, runways and flumes for transferring the product shall be so designed as to allow effective cleaning and, when necessary, disinfection and to prevent damage to the product such as by sharp comers, projections, long drops, crushing or contamination of the product. Electrical motors and transmissions driving the conveyors shall not be installed above the open product or in such a position that the product is exposed to soiling. Conveyor systems and runways to transport empty containers shall be so designed and constructed as to prevent contamination and damage to the containers.

## **5.4 Water (other than sea water)**

### **5.4.1 Potable water**

**5.4.1.1** The water used shall comply with the requirements of EAS 12.

**5.4.1.2** Every packing facility shall have an adequate supply of clean potable water under adequate pressure and capable of coping with peak demand. The water supply shall be free from suspended matter and substances that are deleterious to the product or hazardous to health.

**5.4.1.3** All water coming in to contact with the product, product contact surfaces or that is used in the preparation areas at the packing facility shall have been so treated by flocculation, filtration, chlorination or other acceptable process as to ensure compliance with the requirements for drinking water in terms of EAS 12.

### **5.4.2 Ice**

The purity of ice shall be such that the water derived from it (by melting the ice under aseptic conditions at a temperature not higher than 10 °C) immediately after the ice has been manufactured, complies with the requirements of 5.4.1.

### **5.4.3 Non-potable water other than sea water**

Non-potable water shall be carried in completely separate lines from potable water with no cross-connection with, or back-siphonage into, the system carrying potable water in order to prevent contamination. Non-potable water lines shall be identified as such and the water shall be considered unsafe and shall not be used for drinking or for use in product or in product handling areas or for hand washing purposes.

### **5.4.4 Water for cleaning**

Water used for cleaning the plant and equipment shall comply with the requirements of 5.4.1. Chlorinated water that could have any deleterious effect on the product shall be dechlorinated immediately before use and the maximum chlorine level for water in contact with abalone shall be not higher than 0.5 mg/l.

## **5.5 Sea water**

Clean, uncontaminated freshly pumped treated or untreated sea water may be used in the packing facility provided that it complies with the microbiological requirements of SANS 241 and with the following physical and chemical requirements in terms of SANS 241.

- a) Physical: Colour and turbidity.
- b) Chemical:
  - 1) Macro-determinands: Ammonia as N, nitrate and nitrite as N and zinc as Zn.
  - 2) Micro and organic determinands: To comply with class EAS 12.

## **5.6 Hygienic operating requirements**

### **5.6.1 General**

The packing facility shall implement procedures that will ensure good operation and sanitation practices.

### **5.6.2 Cleaning and disinfecting**

#### **5.6.2.1 Cleaning and disinfecting system**

A permanent cleaning and disinfection system shall be established to ensure that the preparation area, equipment and material, including vessels used for transportation, are cleaned and disinfected appropriately and regularly.

#### **5.6.2.2 Cleaning and disinfecting materials**

An adequate supply of cleaning materials, hot and cold water, that complies with 5.4, hosepipes, brushes and other requisites for proper cleaning shall be available. Brooms and brushes shall be made of impermeable material, shall have nylon bristles, and shall be maintained in a clean and good condition. Bristles shall be conspicuously coloured to enable easy detection in case of detached bristles. Brooms and brushes used on floors shall not be used on product contact surfaces. Wire wool or steel scouring wool shall not be used for cleaning surfaces that come into contact with the product. Cleaning equipment and utensils shall be identified to their areas of use and equipment used to clean toilets, ablution facilities or other uncleaned areas shall not be used in preparation areas.

#### **5.6.2.3 Cleaning of facilities**

**5.6.2.3.1** Buildings, premises, plant, equipment, utensils and all other physical facilities of the packing facility shall be kept clean and in good repair and shall be maintained in an orderly, clean and hygienic condition. As frequently as necessary and whenever circumstances demand, the plant shall be cleaned or disinfected (or both) and rinsed during production stoppages when there is no product on lines that can be contaminated by the cleaning procedures.

**5.6.2.3.2** The entire plant, equipment and utensils shall be thoroughly cleaned with a detergent or other cleaning agent and disinfected at the end of each operation. Immediately before the commencement of operations, equipment shall be thoroughly rinsed with potable water to remove any residues from the cleaning process and dust. Cleaning of the facility shall commence immediately after processes have stopped and machinery and the product have been protected and safeguarded against contamination. Dirt, waste and organic materials such as blood and mucous shall be removed to facilitate thorough cleaning.

**5.6.2.3.3** Ceilings shall be regularly cleaned and accumulation of dust above ceilings shall not be allowed. During periods of operation, the floors and the drainage channels in the preparation, processing and packing areas shall be kept as clean as possible and soils shall be removed

hygienically without contaminating the product or the product lines. Refuse shall not be permitted to accumulate in drainage channels. Thorough cleaning of floors and drainage channels shall take place as often as is necessary and at the end of each day's operations in order to maintain hygienic conditions.

**5.6.2.3.4** Foot-baths shall be drained and cleaned regularly and the disinfectant kept in active condition.

**5.6.2.3.5** The inside surfaces of walls of preparation, processing and packing areas shall be thoroughly washed immediately after operations, as required, and not during operations as this can lead to cross-contamination. The rooms shall be kept as free from dust as possible.

### **5.6.3 Control of vermin**

**5.6.3.1** All buildings in which abalone is prepared and packed shall be kept free from insects, rodents, birds and other vermin. The packing facility and its premises shall be regularly inspected by trained personnel for the evidence of infestation by insects or rodents, and for the presence of birds and wild or domestic animals.

**5.6.3.2** An effective and continuous programme for pest control shall be established, implemented and maintained.

**5.6.3.3** A site drawing and register of all bait stations shall be kept up-to-date and open baits shall not be present in preparation areas or in the ingredients, the product, empty containers and lid stores.

NOTE Also see SANS 10133.

### **5.6.4 Exclusion of animals**

Animals, including birds, shall not be allowed in any part of the packing facility. Security dogs shall not be allowed in or come into contact with the product, product handling areas or product contact surfaces.

## **5.7 Requirements for employees engaged in the handling, packing and storage of the product**

### **5.7.1 Production planning**

The production planning shall be such that workers will not be subjected to such exhausting long working hours that could result in a lack of their concentration with the risk of adversely affecting the product quality and safety.

### **5.7.2 Health**

**5.7.2.1** All the public health requirements shall be complied with.

**5.7.2.2** Before being engaged, employees shall pass an appropriate medical examination to ensure that they are free from communicable diseases, and shall thereafter pass an annual medical examination in accordance with the relevant legislation (see 5.7.2.1).

**5.7.2.3** No person who is a carrier of, or is suffering from, any communicable disease, especially a carrier of *Salmonella*, *Shigella* and A-type haemolytic *Streptococcae*, or parasites such as any vegetative or cystic amoeba, tape-worm or any type of helminthiasis, or shows symptoms of, or is suffering from gastro-enteritis or an enterobacterial infection or a disorder or condition causing discharge of fluid from any part of the skin or body shall be allowed to come into contact with the product, containers or product contact surfaces. Any such person or worker in the packing facility, in a capacity where there is a possibility of the product or ingredients becoming contaminated or the disease being transmitted to other individuals, shall immediately report to the packing facility management.

**5.7.2.4** The management shall ensure that no employee who is known or suspected to be affected with a disease capable of being transmitted through food shall be permitted to work in any part of the packing facility in a capacity in which there is a possibility of the employees contaminating the product with pathogenic organisms.

**5.7.2.5** In the case of any absence of more than one day due to illness, the employee shall, before resuming duty, report the nature of the illness that necessitated the absence to the packing facility hygiene officer, who shall, should he deem it necessary, take the appropriate steps to obtain a medical opinion on the employee's fitness for work.

**5.7.2.6** An appropriate medical record of each employee shall be kept. Medical records and any medical certificate submitted by a packing facility employee shall be available for inspection by the authority administering this standard.

**5.7.2.7** The management shall ensure that no employee who is suffering from any cut, injury, infected wound, or infected skin irritation shall be allowed to come into contact with the product, ingredients, containers, or product contact surfaces unless the cut or injury has been so treated or dressed that the discharge of body fluid has been prevented, and the wound and its dressing have been so covered as to ensure that infection or contamination of the product is no longer possible. Such dressing and its covering shall be conspicuous in colour.

**5.7.2.8** Employees performing close-up inspections shall undergo an eyesight test at least annually.

### **5.7.3 Protective clothing**

**5.7.3.1** All employees engaged in the handling and preparation of the product shall wear clean, light-coloured protective clothing that covers personal clothes down to the knee. They shall, in addition, wear washable or disposable headgear that completely covers their hair (including beards) and, if necessary, wear helmets. Employees handling the exposed product or other wet materials shall wear light-coloured waterproof aprons.

**5.7.3.2** Overalls shall completely cover the personal clothing of the employees. At the end of each working day, soiled overalls and headgear shall be handed in for laundering. Employees shall not remove protective clothing from the packing facility premises (see 5.2.21).

**5.7.3.3** Gloves, if used, shall be made from impermeable material and shall either be washable or be of the disposable type. The wearing of gloves shall not exempt workers from washing their hands.

**5.7.3.4** Sleeves that may become wet or soiled during packing shall not extend below the elbows, except when covered by plastics sleevelets.

**5.7.3.5** Protective clothing, other than waterproof aprons, sleevelets and gloves, shall not be stored in work areas. When not in use, protective clothing shall be kept in change rooms (see 5.2.19.4) and shall not be removed from the premises except for laundering under hygienic conditions. The homes of employees shall not be regarded as acceptable for laundry purposes (see 5.2.21).

**5.7.3.6** Waterproof protective clothing shall be made of plastics, rubber or other similar acceptable material. All protective clothing shall be of hygienic design, shall not have external pockets above the waistline, shall be in good repair and shall not constitute a source of contamination to the product.

**5.7.3.7** Employees shall not visit the toilets and cloakrooms with their protective clothing, waterproof aprons, gloves or plastics sleevelets on. Hooks and pegs for hanging waterproof aprons and gloves shall be provided at the exit before the hand-washing facilities. Pegs for gloves shall not be located above other protective clothing in such a way that contamination by means of dripping water can occur. Hooks for aprons shall be adequately spaced apart to prevent contact between aprons and a consequent build-up of contaminants.

**5.7.3.8** Waterproof aprons, sleevelets and gloves shall be cleaned and disinfected immediately at the end of each shift and at the end of each days' operations, at each time of undress and as frequently

as necessary, and shall be hung on hooks or pegs at exits from work areas during intervals between work and during visits to the toilet. Waterproof protective clothing such as aprons shall not be washed on the floors (see 5.2.21). Waterproof aprons, sleevelets and gloves, as well as equipment used in the preparation and packing of the product shall not be removed from the work areas except for repairs and for cleaning under hygienic conditions.

#### **5.7.4 Personal hygiene and personal effects**

**5.7.4.1** Workers shall, at all times, maintain a high degree of personal cleanliness and conform to hygienic practices while on duty. Workers shall be trained and educated in personal cleanliness and hygienic practices. Adequate control shall be exercised to ensure that employees are in compliance with the hygienic requirements such as supervision at the hand-washing facilities before commencing work at the beginning of a work shift and after breaks.

**5.7.4.2** Before commencing work, and after each absence from the preparation or packing area, employees shall wash their hands. Fingernails shall be kept short and clean and free from varnish or lacquer. Jewellery and wristwatches shall not be worn by employees who handle raw materials or the unprotected product.

**5.7.4.3** The necessary precautions and control shall be exercised to prevent contamination of the product with micro-organisms and foreign substances including but not limited to, perspiration, hair, cosmetics, chemicals and medicants or any behaviour that could result in the contamination of the product by the workers. Workers handling the unprotected product shall keep their hands away from their noses, eyes, ears, hair and mouth, and shall avoid licking their fingers when handling the unprotected product. Workers shall not cough, sneeze or blow their noses over the unprotected product.

**5.7.4.4** Containers used in the preparation or packing of the product shall not be used for any other purpose.

**5.7.4.5** The use of chewing gum and tobacco in any form shall not be allowed within the areas where the product and its ingredients and packing materials are handled or stored. Spitting shall not be allowed anywhere within the packing facility premises.

**5.7.4.6** Neither workers' personal effects nor their food shall be present in the preparation or packing areas, nor where the product, its ingredients or packing materials are handled or stored. Employees' personal effects including their personal clothes shall be kept in lockers or hangers provided for this purpose in the change rooms (see 5.2.19).

#### **5.7.5 Notice boards and supervision**

**5.7.5.1** Notices that prohibit eating, spitting and the use of chewing gum and tobacco in any form shall be posted in each production area and in each area for the storage of ingredients. Notices that request employees or, where applicable, visitors to wash their hands on entering the production areas shall be posted at each entrance used by employees or visitors to gain access to those areas. Notices that direct employees to wash their hands after using the toilet shall be posted at toilet facilities (see 5.2.9).

**5.7.5.2** Adequate supervision shall at all times be practised to ensure compliance with 5.7.5.1.

**5.7.5.3** The responsibility of ensuring observance of all personal practices, operations and requirements of this clause by all persons shall be given to competent staff members.

#### **5.7.6 Visitors**

**5.7.6.1** Strict control of visitors entering the packing facility shall be exercised.

**5.7.6.2** Any person who visits or enters the preparation, processing or packing areas during the hours of operation shall, when in those areas, observe and adhere to all relevant hygiene requirements and shall wear clean protective clothing that shall be provided by the packing facility.

## 6 Requirements for abalone used for the product

- 6.1 Good hygiene and good manufacturing practices shall be adhered to during the harvesting, transport, handling, and preparation of the product.
- 6.2 Abalone shall be obtained from sources that are officially approved by the authority having jurisdiction.
- 6.3 Abalone shall not contain any chemical, microbiological contaminants or marine biotoxins at levels that could be detrimental to the health of the consumer (see Clause 9).
- 6.4 Abalone shall be kept alive during all preparation processes up to and including transportation and receipt by the buyer.
- 6.5 Abalone shall have been harvested and transported in accordance with the requirements of the most recent relevant regulations.
- 6.6 In any sorting or storage area, live abalone shall be kept at a temperature that does not adversely affect their quality and viability. Live abalone shall be stored and transported at a temperature that ensures continued viability of the animals.
- 6.7 Abalone from different aquaculture facilities shall be kept sorted and packed separately so as not to lose identity.
- 6.8 Before packing live abalone, the shells shall have been rinsed in clean seawater.
- 6.9 No feeding of abalone shall take place during wet storage and transportation and, in general, abalone shall not be fed 24 h before being transported.

## 7 Preparing and packing

- 7.1 Abalone shall be rinsed with clean seawater and culled of dead or damaged animals before wet storage.
- 7.2 Abalone shall be taken from wet storage and shall be well drained before packing.
- 7.3 The packing technique and equipment used shall be suitable to ensure that
- the animals have sufficient moisture and oxygen to survive transportation,
  - the animals are maintained at a suitable temperature, and
  - waste products from the live abalone are allowed to drain away from the other abalone.

## 8 Requirements for the final product

### 8.1 Packing appearance and colour

- 8.1.1 The final product in its container shall comprise live abalone including the shell of an appearance and colour characteristic of the genus or genera processed and packed in the manner indicated in clause 7.
- 8.1.2 The final product shall have a normal texture characteristic of the species.
- 8.1.3 The abalone may be packed by weight, count per unit of weight, volume or count per package or a combination of these as is required by the country of destination.

### 8.2 Absence of foreign matter and contaminants

The final product shall be free from any foreign material that poses a threat to human health, for example:

- a) contaminants such as, but not limited to, pesticide residue, fuel, mineral oil and lubricants or hazardous chemicals; or
- b) dangerous material such as, but not limited to, glass, steel, stones, or sharp and hard bones.

### 8.3 Objectionable extraneous matter

The final product shall be free from any objectionable extraneous material such as, but not limited to insects, sand, dirt, soiling, hair, steel soiling or other foreign matter that indicates non-compliance with good manufacturing and sanitation practises.

## 9 Sampling and test methods

### 9.1 Sampling of abalone and water

As required by the CD/K/572:2010.

### 9.2 Test methods before transportation

9.2.1 Microbiological and biotoxin requirements and recommended test methods

9.2.1.1 Test methods for the analyses of biotoxins and microbial contaminants in abalone meat

As required by the CD/K/572:2010.

9.2.1.2 Test method for microbiological spoilage

Use standards listed in Clause 2 to check for microbiological spoilage.

9.2.1.3 Test methods for pathogenic organisms

Use the following test methods, in accordance with the specified standard, to check for:

- a) *Escherichia coli* (see ISO 16649-3);
- b) *Salmonella* (see ISO 6579), and
- c) Viable pathogenic vibrio organisms (see ISO 8914).

### 9.3 Methods of physical examination post transportation

9.3.1 The sensory and physical examination of the contents of the container shall be as follows:

- a) Open container and carefully remove the contents out of the container onto a white coloured tray for physical examination.
- b) Assess and record the number of dead or damaged units.

NOTE Dead abalone is characterized by lack of muscle movement when touched or complete muscle stiffness due to the rigor mortis process setting in after death of the animal.

9.3.2 Animals damaged to the extent that they can no longer function biologically are considered to be defective.

9.3.3 The product shall be rejected if more than 5% of the units in the sample are dead or damaged.

**9.3.4** Physical checks on the product can be carried out by the customer on receipt.

## **10 Requirements for containers used for transportation**

### **10.1 General requirements**

Containers, including lids, sheets, dividers and bags shall:

- a) be capable of maintaining the preservation of their contents in a sound wholesome condition;
- b) be made of a suitable material and so constructed as to be easily closed and sealed;
- c) be sufficiently durable to withstand mechanical and thermal stresses during distribution, and to resist physical damage while maintaining their normal appearance during normal distribution and storage;
- d) protect the contents from contamination by micro-organisms or any other substance;
- e) be suitable for the type of final product and the conditions of storage and transportation; and
- f) shall not react with the contents in any way that would adversely affect the final product.

### **10.2 Condition of containers and closures**

Containers or lids with signs of poor or doubtful container integrity shall not be used. The inner surfaces of all containers, lids, sheets, dividers and bags shall, at the time of use, be clean.

### **10.3 Transportation and storage of empty containers**

**10.3.1** Containers, lids, sheets, dividers and bags from manufacturers shall be protected against contamination and covered by wrapping material or contained in covers, and shall be transported and stored under protection against risk of contamination, damage and extreme weather.

**10.3.2** Containers, lids, sheets, dividers and bags shall be stored in a dry storage area, protected against vapour from the sea and away from steam, humidity, condensation or sudden temperature variations.

**10.3.3** The storage area shall be kept clean and shall be insect-, bird- and rodent-proof.

**10.3.4** The storage area shall be used solely for the storage of empty containers and lids.

### **10.4 Inspection on receipt of packing material**

**10.4.1** The packing facility shall, on receipt of the consignments, conduct a routine inspection system that includes a visual examination of the packing material to determine the freedom of integrity defects and other defects.

**10.4.2** Inspection results and corrective procedures, where applicable, shall be documented and kept on file. Consignments not in compliance with the standards set by the container manufacturer shall not be used.

## **11 Labelling and marking**

### **11.1 Labelling operations**

#### **11.1.1 Labelling area**

The labelling area shall be maintained in a clean, tidy and orderly condition.

### 11.1.2 Condition and handling of containers during labelling

The handling of containers during the labelling process shall be done in such a manner as to avoid container abuse.

### 11.1.3 Label requirements

**11.1.3.1** Labels, printing on containers, pictorial presentation and colouring shall be in accordance with the marking requirements of 11.2.

**11.1.3.2** The size of the label shall be suitable to the container size without being oversized. Printing shall be correct, proper and neat.

**11.1.3.3** Labels shall be clean, unspoiled and undamaged.

**11.1.3.4** Labels shall be durable, waterproof and the information presented shall be legible and indelible.

### 11.1.4 Attachment of labels

**11.1.4.1** Labels shall not be attached or applied to containers by any person other than the packer or by his authorized agent.

**11.1.4.2** Labels shall be securely attached at the time of despatch from the packing facility.

**11.1.4.3** Misaligned labels, excess glue or lack of glue, or loose or pleated label wrappers shall not be present. Labels shall not be superimposed over other labels or over outer wrappers that have been affixed on to containers.

**11.1.4.4** Materials such as adhesives or glues used for attaching or applying labels, outer wrappers or outer cartons or closing of packages shall not be hygroscopic, or liable to deteriorate during storage after being applied.

## 11.2 Marking of labels

The following information shall appear on each container or label, clearly visible in legible and indelible markings not affected by pictorial or other matter, printed or otherwise, in type of such size and presentation as prescribed by regulation promulgated under the said Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972) and the Trade Metrology Act, 1973 (Act No. 77 of 1973):

- a) dispatch establishment number, name and address;
- b) date packed (day, month, year) and batch code reflecting the origin of product;
- c) date of harvest (day, month year) (if different from 11.2(b);  
NOTE This may be in an encoded form.
- d) production method, and commercial designation or species name (or both) (i.e. Cultivated abalone or Cultivated *Haliotis midae*, or both);
- e) the words "Product of the Republic of \_\_\_\_\_";
- f) the words "live animals — handle with care" or similar wording to indicate the presence of live animals in the container; and
- g) arrows showing which way up the container is to be transported.

## 12 Transportation and export

## 12.1 Transportation

**12.1.1** Consignments of live abalone intended for human consumption shall be transported wrapped in sealed parcels.

**12.1.2** Live abalone shall be transported and distributed using closed vehicles or containers which will maintain the product at a temperature that does not adversely affect quality and viability.

**12.1.3** Packages containing live abalone shall not be transported with other products that might contaminate them.

**12.1.4** Ice used for temperature control shall have been made from potable water or clean seawater (see 5.4.2).

## 12.2 Export

**12.2.1** Health guarantees, where required, shall be issued in accordance with the requirements of the country of destination. As required, finally prepared and packed live abalone shall be monitored on the basis of a random testing and surveillance programme, in addition to the sampling of live product before dispatch.

**12.2.2** Exporters shall copy their request for health documents sent to the issuing office to their area inspector of the competent authority (for sampling purposes), as might be required.

**12.2.3** For the issue of health guarantees, it is required that:

- a) the product originate from farms and be packed in facilities approved in terms of this standard;
- b) the farms comply with the requirements of the relevant regulations; and
- c) the farms and the product be monitored as required by the programme (see 12.2.3(b) by official inspectors.



**Mature abalone**



Mature abalone in a holding tank, ready for market



Abalone foot — A prized delicacy

Draft for comment

American Standard

Standard



Prepared abalone



Draft for comment

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