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EAST AFRICAN STANDARD

Solid packed crab meat — Specification

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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

Canning of crab meat, solid packed, is important for export as well as for internal consumption. It is hoped that the formulation of this East African Standard on the subject would help in defining the quality of canned crab meat in a better way and would help in processing and canning of good quality crab meat under hygienic conditions.

Crab meat is obtained from fresh crabs. The crabs are washed, cooked and deshelled and crab meat after blanching is solid packed in cans.

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

IS 7582:1975(R2005), *Specification for Crab Meat, Solid Packed*

CAC/RCP 52:2003(Rev. 4:2008), *Code of practice for fish and fishery products*

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

USDA Foreign Agricultural Service website: http://www.mrldatabase.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

Assistance derived from these sources is hereby acknowledged.

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Contents

1 Scope 1

2 Normative references 1

3 Definitions 2

3.1 Product definition 2

3.2 Process definition 2

3.3 Presentation 3

3.4 Raw material 3

3.5 Preparation and processing 3

4 Essential composition and quality factors 3

5 Food additives 4

6 Hygiene and handling 4

7 Packing and marking 5

7.1 Packing 5

7.2 Marking 5

8 Sampling, examination and analyses 6

9 Definition of defects 7

10 Lot acceptance 8

Annex A (normative) Determination of drained weight 10

Annex B (normative) Determination of vacuum of cans 11

Annex C (normative) Determination of sodium chloride 12

Annex D (normative) Determination of acid insoluble ash 13

Annex E (normative) Determination of acidity in brine 14

Annex F (normative) Determination of moisture in meat 15

Annex G (normative) Test for microbiological activity 16

Annex H (normative) Sampling of prawns/shrimp canned in brine 18

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Solid packed crab meat — Specification

1 Scope

This standard prescribes the requirements and method of sampling and test for solid packed crab meat, obtained from the edible species of the genera *scylla* and *protunus.*

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 6887-3, *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*

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

ISO 17239, *Fruits, vegetables and derived products — Determination of arsenic content — Method using hydride generation atomic absorption spectrometry*

ISO 6634, *Fruits, vegetables and derived products — Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method*

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

3.1 Product definition

Canned crab meat is prepared singly or in combination from the leg, claw, body and shoulder meat from which the shell has been removed, of any of the edible species of the sub-order *Brachyura* of the order Decapoda and all species of the family *Lithodidae*.

3.2 Process definition

Canned crab meat is packed in hermetically sealed containers and shall have received a processing treatment sufficient to ensure commercial sterility. This is achieved by blanching — heating the crab

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meat in boiling brine for an adequate period so that it attains the characteristic flavour and firm texture.

3.3 Presentation

3.3.1 Canned crab meat may be presented as:

Chunk pack — In which at least 50% of the contents consists of solid pieces or chunks of crab meat, the remainder being flakes, and is accurately described on the label.

3.3.2 Other presentations

Any other presentation of the product may be permitted provided that it:

a) is sufficiently distinctive from the forms of presentation set out above; and

b) meets all other regulatory requirements; and

c) is adequately described on the label and in accordance with all regulatory labelling requirements.

3.4 Raw material

3.4.1 The raw material used for preparation of canned crab meat shall be fresh crabs without any noticeable injury.

3.4.2 Vacuum dried salt or common salt conforming to EAS 35 shall be used.

3.5 Preparation and processing

3.5.1 The crabs shall be washed in potable water to remove adhering dirt and sand. As the species like *Scylla serrata* live for a considerable time outside water, they shall be paralyzed instantly by putting them in ice water. These crabs shall then be packed in ice for a minimum period of three to four hours.

3.5.1.1 As the species like *Protunus pelagicus* die in a short time when removed from water, there is no necessity to paralyze them. These crabs could be packed in ice straight away.

3.5.1.2 The crabs packed in ice (see 3.5.1) should be dressed by removing the dorsal shell, viscera and gills. The material shall be washed in potable water jets to remove slime and dirt.

3.5.1.3 The cleaned crabs shall be precooked for sufficient time. After cooling, the meat shall be separated. The claw meat and body meat shall be kept separately.

3.5.2 The claw and body meat separated after deshelling shall be properly blanched in boiling brine containing citric acid, if desired. The blanched meat shall be cooled; and filled in clean sulphur resistant lacquered cans, lined with parchment paper, if necessary. The meat shall be packed with claw meat sandwiched between body meat.

3.5.3 The can4 shall be exhausted by heat, steam or mechanical process and sealed in hot condition by double seaming. The sealed cans shall be processed at such temperature and for such length of time to ensure adequate sterilization of the finished product without burning, scorching or overcooking. The heat treated cans shall then be cooled in water containing 1 ppm available chlorine.

4 Essential composition and quality factors

4.1 The can exterior, especially seams shall be free from dents, rust, perforations and distortions. The cans shall not show leaking, panelling or swelling. The interior of the can on opening shall not show any visible black discolouration, rusting or pitting and the inside lacquer shall be in good condition.

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4.2 The contents of the can on opening shall present a characteristic colour and odour of crab meat and shall not have bluish colour and any foreign odour.

4.3 The material shall be free from scorched, bitter or any objectionable flavour.

4.4 The material shall be free from stains, dirt, insect or hair or other extraneous matter. It shall be free from veins, membrane, shell particles and pieces of appendages. It shall also be free from any poisonous and deleterious substances.

4.5 **Preservatives** — The material may contain the preservatives and firming agents permitted under EAS 103.

4.6 **Drained mass of the contents** — The drained mass of the contents in each can shall be not less than 80 percent of the net water capacity of the can as tested by the method given in Annex A.

4.7 The material shall also conform to the requirements given in Tables 1.

Table 1 — Requirements for solid packed crab meat

Characteristic	Requirement	Method of test
(1)	(3)	(4)
i) Vacuum of can in mm, Min	150	Annex B
ii) Bacteriological requirements	Commercially sterile	Annex G
iii) Acid insoluble ash (on moisture free basis), % by mass, max	2.0	Annex D

5 Food additives

The material may contain the preservatives and firming agents permitted in EAS 103.

6 Hygiene and handling

6.1 The product shall be free from any foreign material, that poses a threat to human health.

6.2 When tested by appropriate methods of sampling and examination in accordance with the standards listed in Clause 2, the product:

(i) shall be free from micro-organisms capable of development under normal conditions of storage; and

(ii) shall not contain any other substances including substances derived from micro organisms in amounts which may represent a hazard to health; and

(iii) shall be free from container integrity defects which may compromise the hermetic seal.

6.3 The material shall be prepared, filled and processed under hygienic conditions and only in premises maintained in a thoroughly clean and hygienic manner complying with CAC/RCP 1, CAC/RCP 52 and duly approved or licensed by the authorities concerned.

6.4 The material shall meet the microbiological and heavy metal requirements as given in Table 2.

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Table 2 — Microbiological and heavy metal limits for solid packed crab meat

Type of contaminant		Requirement	Method of test
(i)	Microbiological requirements	Shall be commercially sterile	Annex G
(ii)	Vacuum of the can in mm, min	150	Annex B
(v)	Sodium chloride, % (w/v), max	3.5	Annex C
(vi)	Acidity in brine as citric acid (anhydrous), % (w/v)	0.06 to 0.20	Annex E
(vii)	Arsenic, mg/kg, max	1.0	EAS 41
(viii)	Copper, mg/kg, max	10	EAS 41
(ix)	Tin, mg/kg, max	250.0	EAS 41
(x)	Mercury, mg/kg, max	0.5	EAS 41
(xi)	Lead, mg/kg, max	0.3	EAS 41
(xii)	Cadmium, mg/kg, max	0.3	EAS 41
(xiii)	Zinc, mg/kg, max	50.0	EAS 41

7 Packing and marking

7.1 Packing

7.1.1 The material shall be packed in cans which are sulphur resistant internally and uniformly lacquered. The cans shall be sealed hermetically and may be lined with parchment paper. The lacquer used shall be such that it does not impart any unpleasant taste and smell to the contents of the can and does not peel off during processing and storage.

7.1.2 The cans may also be lacquered externally subject to agreement between the purchaser and the vendor.

7.1.3 Unless agreed otherwise between the purchaser and the vendor, the cans shall be packed in cases, strong enough to withstand rough handling by rail, road or sea-transport without damage to the contents. The number of cans in each case shall be as agreed to between the purchaser and the vendor.

7.2 Marking

The labelling of the cans shall be done by printing or lithographing on the cans themselves or by attaching labels printed on paper, subject to agreement between the purchaser and the vendor.

7.2.1 The cans and label together shall give the following information:

a) Name of the material with the brand name, if any;

b) Name and address of the manufacturer (optional for export purposes);

c) Minimum net mass or the drained mass of the contents of the can in grams (optional for export purposes);

d) Batch of lot number and the date of manufacture in code to be embossed on the can; and

e) List of additives added.

7.2.2 The warranty period may also be mentioned on the label subject to agreement between the purchaser and the vendor.

7.2.3 Each container may also be marked with a Certification Mark.

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8 Sampling, examination and analyses

8.1 Sampling

8.1.1 The sampling and tolerance plans in CD-K-572:2010 shall be used to determine the acceptability of the lot. The sampling plans dictate the minimum sample size to be taken. If necessary, in the opinion of the inspector, more than the minimum sample size specified may be taken.

8.1.2 Sampling of lots for the sensory examination of the product shall be in accordance with CD-K-572:2010 except that a lower acceptance number for decomposition shall be used as indicated in the sampling tables.

The tables specify the minimum number of sample units to be used for the following types of inspections:

a) Level I — Sensory examinations of all products subject to inspection other than lots which are subject to reinspection.

b) Level II — Sensory examinations of all products which are under reinspection.

8.1.3 The sample unit shall consist of a can of crab meat and the entire contents thereof.

8.2 Sensory and physical examination

Samples taken for sensoric and physical examination shall be assessed by persons trained in such examination and in accordance with Annex A and CAC/GL 31.

8.3 Determination of net weight

Net weight of all sample units shall be determined by the following procedures:

(i) Weigh the unopened container.

(ii) Open the container and remove the contents.

(iii) Weigh the empty container, including the end and any wrapping material, after removing excess liquid and adhering meat.

(iv) Subtract the weight of the empty container and any wrapping material from the weight of the unopened container. The resultant figure is the net content.

8.4 Determination of drained weight

The drained weight of all sample units shall be determined by the following procedures:

(i) Maintain the container at a temperature of between 20 ℃ and 30 ℃ for a minimum of 12 hours prior to examination.

(ii) Open the container and distribute the contents on a pre-weighed circular sieve having a wire mesh with square openings of 2.8 mm x 2.8 mm.

(iii) Remove all wrapping material and incline the sieve at an angle of approximately 17-20° and allow the meat to drain two minutes, measured from the time the product is poured onto the sieve.

(iv) Weigh the sieve containing the drained crab meat.

(v) Determine the weight of drained crab meat by subtracting the mass of the sieve from the mass of the sieve with drained product.

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8.5 Examination

8.5.1 Complete external can examination.

8.5.2 Open can and complete drained weight determination, according to defined procedures. A drained weight determination should only be conducted on samples which have equilibrated at room temperature for several hours. This will ensure that any gelled brine has liquified. Where parchment paper has been wrapped around the product, care should be taken to ensure product is free to drain properly.

8.5.3 Carefully remove product, and parchment paper where necessary, from can. Examine can interior for presence of foreign material, sulphide blackening, struvite, and corrosion or other can interior defects.

8.5.4 Examine liquid and surface of crab for presence of struvite crystals, sulphide blackening, foreign material or undesirable parts.

8.5.5 Examine each unit for style of presentation as required:

Where percentage of leg meat is declared, collect leg meat separately and determine compliance using the following formula:

$$\frac{\text{Weight of leg meat in unit}}{\text{Declared drained weight of unit}} \times 100 = \%\ \text{leg meat}$$

For packs labelled as "chunk", collect chunks (pieces not less than 10 mm in each direction) separately and determine compliance as follows:

$$\frac{\text{Weight of chunks in unit}}{\text{Declared drained weight of unit}} \times 100 = \%\ \text{chunk}$$

8.5.6 Assess odour. Assess flavour and texture as required.

8.5.7 Record any defect for that unit on the appropriate worksheet.

9 Definition of defects

A sample unit will be considered defective when it exhibits any of the properties defined below.

9.1 Taint
A unit will be considered tainted when any of the following conditions are found:

a) **Rancid** — Odour characterized by the distinct or persistent odour of oxidized oil; or

Flavour characterized by that of oxidized oil which leaves a distinct bitter aftertaste.

b) **Abnormal** — Distinct and persistent uncharacteristic odours or flavours such as iodine, burnt, acrid or metallic and not defined as rancid or decomposed; or

Flavour or odour resulting from the improper addition or mixing of ingredients e.g. salt or citric acid.

9.2 Decomposition

A unit will be considered decomposed when any of the following conditions are found:

a) **Odour or flavour** — A sample unit affected by persistent and distinct objectionable odours or flavours indicative of decomposition or rancidity. Persistent, distinct and uncharacteristic odour

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or flavour including but not limited to the following: sickly-sweet, fruity, vegetable, musty, sour, faecal, ammonia, hydrogen sulphide, putrid.

b) **Discolouration** — Distinct discolouration characterized by a blue, black, orange or yellow colour to the meat.

c) **Texture** — Breakdown of muscle structure characterized by:

1) muscle structure which is very soft or mushy; and/or

2) muscle fibres, particularly in the legs, which are short and very shredded; and/or

3) muscle structure which is very tough or dry.

9.3 Unwholesome

a) **Critical foreign material** — A lot will be considered defective when any of the following conditions are found:

— the presence of any material which has not been derived from crab (and packing media) and which poses a threat to human health (such as glass, etc.); or

— distinct and persistent odour or flavour of any material which has not been derived from crab (and packing media) and which poses a threat to human health (such as solvents, fuel oil, etc.).

b) **Foreign material** — A unit will be considered defective when the following condition is found:

— the presence in the sample unit of any matter, which has not been derived from crab (and packing media) but does not pose a threat to human health (such as insect pieces, sand, etc.), and is readily recognized without magnification or is present at a level determined by any method including magnification that indicates non-compliance with good manufacturing or sanitation practices.

c) **Other defects** — A unit will be considered defective when any of the following conditions are found:

1) **Struvite crystals** (magnesium ammonium phosphate crystals) Any struvite crystal greater than 5 mm in length.

2) **Sulphide blackening** (smut) — Staining of the meat in excess of 5% of the drained contents.

3) **Undesirable parts** — Shell, gills, viscera or cartilage in excess of 2% of the drained contents.

9.4 Style of presentation

A unit will be considered defective for style of presentation if any of the following conditions occur:

a) it fails to meet the declared percentage of leg meat when examined according to the method outlined in Clause 8; or

b) in the case of chunk pack, greater than 50% of the contents is flaked, when examined by the method outlined in Clause 8.

10 Lot acceptance

A lot shall be considered as meeting the requirements of this standard when:

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(i) not any single instance of critical foreign matter occurs; or

(ii) the total number of sample units found defective for taint, decomposition or unwholesomeness, individually or in combination, does not exceed the acceptance number for the sample size designated in the sampling plans in CD-K-572:2010; or

(iii) the total number of sample units found defective for decomposition does not exceed the acceptance number (c) shown in parentheses for the sample size designated in the sampling plans in CD-K-572:2010; or

(iv) the average net weight and the average drained weight of all sample units examined is not less than the declared weight and provided there is no unreasonable shortage in any individual container;

(v) the Food Additives, Hygiene and Labelling requirements of Sections 5, 6, and 7 are met.

(vi) the total number of sample units found defective for standards of identity (style of presentation) and size designation or count range (if a size designation or count range is declared), does not exceed the acceptance number for the sample size designated in the sampling plans.

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Annex A
(normative)

Determination of drained weight

A.1 Apparatus

A.1.1 Test sieve 200 (Aperture 2.00 mm) — BS Sieve 8 or Tyler Sieve 9 or ASA Sieve 10 (same as ASTM Test Sieve), may also be used.

A.2 Procedure

A.2.1 Carefully weigh the clean and dry sieve and transfer the contents of the can to the sieve. Allow to drain for five minutes and weigh the sieve with the contents. The difference between the two weights gives the drained weight. Calculate the drained weight as percentage of the water capacity of the can. Retain the residue on the sieve as well as the drained liquid.

A.2.2 Determine the water capacity of the can by the procedure given in A.2.2.1 to A.2.2.4.

A.2.2.1 Cut out the lid without removing or altering the height of the double seam.

A.2.2.2 wash, dry and weigh the empty can.

A.2.2.3 Fill the container with distilled water at 20 ℃ to 4 mm vertical distance below the top level of the container and weigh.

A.2.2.4 Subtract the weight in A.2.2.2 from the weight in A.2.2.3. The difference shall be considered to be the weight of water required to fill the container.

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Annex B
(normative)

Determination of vacuum of cans

The vacuum in the cans may be determined with a vacuum gauge of the piercing type or of an electric recording type.

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Annex C
(normative)

Determination of sodium chloride

C.1 Reagents

C.1.1 Standard Silver Solution

0.1 N, standardized against 0.1 N sodium chloride solution.

C.1.2 Dilute Nitric Acid — 1:4.

C.1.3 Ferric Ammonium Indicator Solution

A saturated solution of ferric alum Fe (NH_4) $(SO_4)_2.12H_2O$.

C.1.4 Standard potassium thiocyanate solution

0.1N

C.2 Procedure

C.2.1 Take 0.3 g to 0.5 g of the dried products in a 250-ml Erlenmeyer flask. Add a known volume of the standard silver nitrate solution in quantity more than sufficient to precipitate all the chloride as silver chloride and then add 20 ml of dilute nitric acid. Boil on a hot plate or sand bath until the solids, except silver chloride, dissolve. Cool and add 50 ml of water and 5 ml of the ferric ammonium indicator solution and titrate against the standard potassium thiocyanate solution until a permanent light brown colour appears.

C.3 Calculation

C.3.1 Sodium chloride, per cent by weight

$$= 5.85 \frac{(V_1 N_1 - V_2 N_2)}{W}$$

where,

V_1 = volume of the standard silver nitrate solution;

V_2 = volume of the standard potassium thiocyanate;

N_1 = normality of the standard silver nitrate solution;

N_2 = normality of the standard potassium thiocyanate; and

W = weight, in g, of the dried product taken for the test.

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Annex D
(normative)

Determination of acid insoluble ash

D.1 Reagents

D.1.1 Dilute hydrochloric acid

D-2 Procedure

D.2.1 Weigh accurately 5 g of dried material (see A.2) in a tared porcelain silica or platinum dish. Ignite with a burner for about one hour. Complete the ignition by keeping in a muffle furnace at 600 ± 20 ℃ until grey ash results. Cool and add 35 ml hy drochloric acid, cover with a watch glass and heat on a water bath for 10 min. Cool and filter through Whatman filter paper No. 42 or its equivalent. Wash the residue with hot water and test the filtrate with silver nitrate solution to ensure complete removal of chlorides. Return the filter paper with the residues to the dish. Keep it in an electric air oven maintained at 135 ± 2 ℃ for about 3 h. Cool i t in a desiccator and weigh. Ignite the dish again for 30 min, cool and weigh. Repeat the process till the difference between two successive weighings is less than one milligram.

Note the lowest mass.

D.3 Calculation

Acid insoluble ash, on moisture free basis, percent by mass = $\frac{100 \times (M_1 - M)}{M_1 - M}$

where

M_2 = lowest mass, in g, of the dish with the acid insoluble ash;

M = mass, in g, of the empty dish; and

M_1 = mass, in g, of the dish with the dried material taken for the test.

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Annex E
(normative)

Determination of acidity in brine

E.1 Reagents

E.1.1 Standard sodium hydroxide solution — 0.1N.

E.1.2 Phenolphthalein indicator solution

Dissolve one gram of phenolphthalein in 100 ml of 95 percent (w/v) alcohol.

E.2 Procedure

E.2.1 Take a suitable aliquot of the brine solution (see C.2.1), add about 200 ml of water and titrate against the standard sodium hydroxide solution using phenolphthalein indicator solution. Calculate the percentage acidity of the brine in terms of citric acid from the relationship: 1ml of 0.1 N sodium hydroxide solution is equivalent to 0.0064 g of citric acid (anhydrous).

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Annex F
(normative)

Determination of moisture in meat

F.1 Drying in vacuo at 95–100℃

Dry test portion containing ca 2 g dry material to constant weight at 95°–100℃ under pressure ≤100 mm Hg (ca 5 h). For feeds with high molasses content, use temperature ≤70℃ and pressure ≤50 mm Hg. Use covered Al dish ≥50 mm diameter and 40 mm deep.

F.2 Air drying

F.2.1 With lids removed, dry test sample containing ca 2 g dry material 16–18 h at 100–102℃ in air oven (mechanical convection preferred). Use covered Al dish ≥50 mm diameter and ≤40 mm deep. Cool in desiccator and weigh. Report loss in weight as moisture, g.

F.2.2 With lids removed, dry test sample containing ca 2 g dry material to constant weight (2–4 h depending on product) in mechanical convection oven or in gravity oven with single shelf at ca 125℃. Use covered Al dish ≥50 mm diameter and ≤40 mm deep. Avoid excessive drying. Cover, cool in desiccator, and weigh. Report loss in weight as moisture, g. (Dried test sample is not satisfactory for subsequent fat determination.)

Report loss on drying (LOD) as estimate of moisture content.

F.3 Calculations

$$\% \text{ (w/w) LOD} = \% \text{ (w/w) moisture} = 100 \times \frac{\text{wt loss on drying, g}}{\text{wt test portion, g}}$$

$$\% \text{ Dry matter} = 100 - \% \text{ LOD}$$

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Annex G
(normative)

Test for microbiological activity

G.1 General

G.1.1 Incubation at 37℃ — Half of the cans selected in the sampling shall be incubated at 37℃ for not less than 14 days and subjected to bacteriological examination.

G.1.2 Incubation at 55℃ — The remaining half of the cans shall be incubated at 55℃ for not less than 4 days and subjected to bacteriological examination.

G.2 Apparatus

G.2.1 Glassware — All the glass apparatus used in the microbiological examination shall be sterile,

G.2.2 Accessories — Can opener of the piercing type, sampling petri-dishes, pipettes, scissors, cotton wool — all sterile. Suitable detergent for washing the cans, and rectified spirit.

G.3 Media

G.3.1 Sodium Thioglycollate broth — It has the following composition:

Dextrose	5 g
Yeast extract	5 g
Peptone	15 g
Sodium chloride	2.5 g
1 Cystine	0.75 g
Sodium thioglycollate	0.4 g
Agar-agar	0.75 g
Resazurin	0.001 g
Distilled water	1 000 ml

G.3.1.1 Preparation — Dissolve all the ingredients except resazurin in the distilled water by heating on water-bath, adjust pH to 7.3 filter, add the resazurin, distribute in 10 ml quantities in test tubes and sterilize at 1 kg/cm^3 steam pressure for 30 minutes. Warm the tubes to 80℃ for 30 minutes and immediately cool them prior to use.

G.3.2 Tryptone glucose agar with 0.5 percent sodium chloride — It has the following composition:

Beef extract	3 g
Tryptone	5 g
Dextrose	1 g
Agar-agar	15 g
Sodium chloride	5 g
Distilled water	1 000 ml

G.3.2.1 Preparation — Melt the agar with the other ingredients by steaming, Adjust pH to 7.3, filter through cotton wool, distribute in convenient quantities and sterilize at 1 kg/cm^2 steam pressure for 30 minutes. The medium is melted by heating on water-bath and cooled to 40 ℃ just before use.

G.3.3 Sulphite polymyxin sulphadiazine agar (SPS Agar) — It has the following composition:

Bacto tryptone	15 g
Bacto yeast extract	10 g
Bacto agar	15 g
Ferric citrate	0.5 g
Distilled water	1 000 ml

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G.3.3.1 Preparation — Dissolve the ingredients by steaming. Adjust the pH to 7.0 ± 0.1, filter and distribute in flasks in convenient quantities. Sterilize at 121 °C for 15 minutes. The medium is melte d and cooled to 40 °C just before use. To each litre of the cooled medium add:

a) 5.0 ml of freshly prepared 10 percent solution of sodium sulphite ($Na_2SO_3.7H_2O$)

b) 10.0 ml of 0.1 percent solution of polymyxin B sulphate, only sterile distilled water to be used for making solutions.

G.3.4 Normal saline — 0.9 percent (*w*/*v*) of sodium chloride (analytical reagent). Distribute in 90 ml quantities and sterilize at 1 kg/cm^3 steam pressure.

G.4 Procedure

G.4.1 Preparation of the cans for test — Allow the incubated cans to cool down to room temperature. Olean the top surface of the cans with a detergent like soap water, wash them well and dry with cotton wool. Sterilize the dried surface by sprinkling rectified spirit and flaming.

G.4.2 Opening of the cans

G.4.2.1 Unswelled cans — Cut open the sterilized side of the can with a sterile can opener.

G.4.2.2 Swelled cans — Place a sterilized glass funnel over the sterilized side of the can. Introduce a sharp and sterilized metal rod through the tail end of the funnel and pierce the can. After the pressure is released cut open the can with a sterile can opener.

G.5 Procedure

G.5.1 Commercial sterility test — With a sterile pipette, transfer aseptically 1 ml of the liquid portion from the can to the thioglycollate broth and incubate the tube at 37 °C for 48 hours. If there is growth in the tubes after 48 hours, the cans are not commercially sterile. In doubtful cases the contents of the tube may be reinoculated and tested for a period of 48 hours. No cans shall show non-sterile conditions.

G.5.2 Total aerobic plate count — Transfer aseptically 10 g of the solid portion from the centre of the can into a sterile petri dish. Prepare a homogenate of the material with 90 ml of the normal saline under asceptic conditions. Transfer 1 ml each of the homogenate to two sterile petri dishes. Add nearly 10 ml of the melted and cooled agar, mix well and incubate the dishes at 37 °C for 48 hours, after the agar has solidified. Count the number of colonies and compute the number of organisms per gram. Not less than 90 percent of the samples shall be sterile, no sample shall have bacterial count above 100/g.

G.5.3 Examination for *Clostridia* — One millilitre of the liquid portion (G.5.1) is transferred to sodium thioglycollate broth (G.3.1) using sterile pipette and incubated at room temperature for 2 days. Positive tubes may be tested for clostridia using SPS Agar (G.3.3) as given in G.5.3.1.

G.5.3.1 One millilitre of the inoculam from sodium thioglycollate broth is mixed with approximately 10 ml of SPS agar, allowed to solidify in the petri dish and the plate is incubated at room temperature for 2 to 4 days, under anaeorbic conditions using spray's dish or keeping the plate in an enclosed atmosphere consisting of 80 percent nitrogen and 20 percent carbon dioxide. Black colonies show the presence of *clostridium* spp.

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Annex H
(normative)

Sampling of prawns/shrimp canned in brine

H.1 General requirements for sampling

H.1.1 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

H.1.2 Samples may be tested at a laboratory agreed to between the purchaser and the vendor.

H.2 Scale of sampling

H.2.1 **Lot** — In any consignment, all the cases containing cans of the same size and from the same batch of manufacture shall be grouped together to constitute a lot.

H.2.1.1 Samples shall be tested for each lot for ascertaining conformity of the material to the requirements of this standard.

H.2.2 The number of cases to be selected from each lot shall be in accordance with col 1 and 2 of Table H.1.

Table H.1 — Selection of packing cases

Number of cases in the lot	No. of cases to be selected
(1)	(2)
Up to 8	2
9 to 25	4
26 to 40	5
41 to 65	6
66 to 110	7
111 to 180	8
181 to 300	9
301 to 500	10

H.2.3 The cases shall be selected at random. In order to ensure randomness of selection, random number tables shall be used. In case such tables are not available, the following procedure may be adopted:

> Starting from any case count them as 1, 2, *3, ... r* and so on in a systematic manner. Every *r*th case thus counted shall be withdrawn, r being the integral part of *N/n,* where *N* is the total number of cases in the lot, and *n* the number of cases to be selected, till the requisite number is obtained.

H.2.4 From each of the cases selected as in H.2.2, draw at random one can for testing the physical and chemical requirements.

H.2.5 In addition to the cans selected as in H.2.4, 8 cans shall be selected at random as far as possible from all the cases chosen (see H.2.2), for testing for microbiological activity.

H.3 Number of tests

H.3.1 Each of the cans selected as in H.2.4 for testing the physical and chemical requirements shall

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be tested individually for vacuum and head space.

H.3.2 After testing for vacuum and head space, half of the cans shall be tested individually for drained weight, sodium chloride content in brine and acidity of brine, while the contents of all the remaining cans shall be mixed to form a composite sample and the composite sample so formed shall be tested for arsenic, lead, copper, zinc and tin.

H.3.3 Tests for microbiological activity

H.3.3.1 Incubation at 37 °C — Half of the cans selected as in H.2.5 shall be incubated at 37 °C for not less than 14 days and subjected to bacteriological examination.

H.3.3.2 Incubation at 55 °C — The remaining half of the cans shall be incubated at 55 °C for not less than 14 days and subjected to bacteriological examination.

H.4 Criteria for conformity

H.4.1 Vacuum and head space requirements — The lot shall be declared as conforming to the requirements for vacuum and head space when each of the cans tested individually (see H.3.1) satisfies the requirements specified in Table 1.

H.4.2 Drained weight, sodium chloride in brine and acidity of brine — The test results for these characteristics for each of the cans tested (see H.3.2) shall satisfy the requirements prescribed in Table H.1.

H.4.3 Metallic impurities — The test results for metallic impurities on the composite sample (see H.3.2) shall satisfy the requirements prescribed for arsenic, lead, copper, zinc and tin in Table H.1.

H.4.4 Microbiological requirements — For declaring the conformity of the lot to the microbiological requirements, the test results (see H.3.3.1 and H.3.3.2) shall satisfy the requirements prescribed in Table H.1.

H.5 Commercial sterility test

With a sterile pipette, transfer aseptically 1 ml of the liquid portion from the can to the thioglycollate broth and incubate the tube at 37 °C for 48 hours. If there is growth in the tubes after 48 hours, the cans are not commercially sterile. In doubtful cases the contents of the tube may be reinoculated and tested for a period of 48 hours. No cans shall show non-sterile conditions.

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