Dried and dry-salted fish — Specification
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Foreword

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(a) a member of International Organisation for Standardisation (ISO) and

(b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and

(c) the National Enquiry Point on TBT/SPS Agreements of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of representatives of consumers, traders, academicians, manufacturers, government and other stakeholders.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

This Draft Uganda Standard, DUS 920:2012, was developed by the subcommittee on Fish and Fishery products (SC 10) under supervision of technical committee on Food and Agriculture standards (UNBS/TC 2).

This Draft Uganda Standard has been developed as a result of a need to provide guidance to industry in production and regulation of dried and dry-salted fish.
Dried and dry-salted fish — Specification

1 Scope
This standard specifies the requirements and the methods of sampling and test for various types of dried and dry-salted fish intended for human consumption.

This standard does not apply to dried smoked fish.

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.

US 7, General standard for the labelling of pre-packaged foods
US 28, Code of practice for hygiene in the food and drink manufacturing industry
US 45, General standard for food additives
US 201, Drinking (potable) water — Specification
US 203, Edible salts — Specification
US 500, Guidelines for nutritional labelling of foods
US 508, Guidelines for nutritional and health claims for food
US 566, Use of Nutrition claims — Requirements
US 738, General standard for contaminants and toxins in food and feed
FDUS EAS 217-2, Microbiology of foods and animal feeding stuffs — Horizontal method for the enumeration of microorganisms — Part 2: Colony count technique at 30 °C
FDUS EAS 217-4, Microbiology of foods and animal feeding stuffs — Horizontal method for the detection and enumeration of coliforms — Part 4: Most probable number technique
FDUS EAS 217-8, Microbiology of foods and animal feeding stuffs — General guidance for enumeration of yeasts and moulds — Part 8: Colony count technique at 25 °C
US 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
US ISO 7251, Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive Escherichia coli — Most probable number technique
US 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 Description and definitions

3.1 Description

Dried salted fish is the product obtained from fish which has been gutted, with or without beheading, splitting or filleting, and subsequently washed, salted and dried. All parts of the fish shall have reached salt/water equilibrium prior to drying.

3.2 Process definition

3.2.1 The product, its skin and flesh shall have characteristics colour should be firm.

3.2.2 The material shall be free from visible fungal, insect or mite infestation.

3.2.3 Fish for salting and drying shall be subjected to one of the salting processes defined in 3.2.3.1 and one or both of the drying processes defined in 3.2.3.2. When the fish is split, a cut is made in a straight line close to one side of the backbone from the neck to the caudal fin.

3.2.3.1 Salting

(a) Dry salting (kench curing) — Is the process of mixing fish with suitable food grade salt and stacking the fish in such a manner that the excess of the resulting brine drains away.

(b) Wet salting (pickling) — Is the process whereby fish is mixed with suitable food grade salt and stored in water-tight containers under the resultant brine (pickle) which forms by solution of salt in the water extracted from the fish tissue. The fish is subsequently removed from the container and stacked so that the brine drains away.

3.2.3.2 Drying

3.2.3.2.1 The fish shall be dried either in the sun or in artificial driers.

3.2.3.2.2 The fish, while drying and during storage, shall be protected against contamination from dirt, sand, birds, vermins, flies and insects.

3.3 Presentation

Dried and dry-salted fish shall be presented, with or without the black membrane (belly lining), scaled or un-scaled in one of the following ways:

3.3.1 Split fish — Split and with approximately the anterior two-thirds of the backbone removed.

3.3.2 Split fish with entire backbone — Split with the whole of the backbone intact.

3.3.3 Fillets — Split and divided longitudinally into two parts and with fins, fin bones, tail and the whole of the backbone removed.

3.3.4 Cuts — Split fish or fillets cut up transversely into fairly regular pieces.

3.3.5 Any other presentation of the product shall be permitted provided that it:
4 Essential composition and quality factors

4.1 Raw material

Dried and dry-salted fish shall be prepared from sound fish of the designated species which are of a quality such as is fit to be sold fresh for human consumption.

4.2 Salt

Salt used to produce dried and dry-salted fish shall be clean and not previously used; free from foreign matter and foreign crystals, show no visible signs of contamination with dirt, oil, bilge or other extraneous materials.

The salt used shall comply with the requirements of US 203.

4.3 Final product

4.3.1 The flesh and the skin shall have the characteristic colour and shall not show any evidence of halophilic mould (dun) nor visible evidence of red, halophilic bacteria (pink).

4.3.2 The product shall have the characteristic dried salted fish odour. It shall be free from any off-odour indicative of spoilage.

4.3.3 The material shall be free from artificial colouring matter and firming agents except common salt.

4.3.5 Dried and dry-salted fish shall also conform to the requirements given in Table 1 and Table 2 respectively.
**Table 1 — Physical requirements for dry-salted fish and fish products**

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Characteristic</th>
<th>Dry-salted mackerel</th>
<th>Dry-salted seer fish</th>
<th>Dry-salted leather jacket</th>
<th>Dry-salted Surai (Tuna)</th>
<th>Dry-salted shark</th>
<th>Dry-salted catfish</th>
<th>Dry-salted threadfin (Dara)</th>
<th>Dry-salted Jew fish (Ghol)</th>
<th>Dry-salted horse mackerel</th>
<th>Dry-salted Dhoma</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moisture content, % by mass, max.</td>
<td>30.0</td>
<td>35.0</td>
<td>35.0</td>
<td>35.0</td>
<td>35.0</td>
<td>35.0</td>
<td>40.0</td>
<td>40.0</td>
<td>35.0</td>
<td>35.0</td>
<td>Annex A</td>
</tr>
<tr>
<td>2</td>
<td>Sodium chloride, per cent by weight on moisture free basis, max.</td>
<td>25.0 – 30.0</td>
<td>25.0 – 30.0</td>
<td>25.0 – 30.0</td>
<td>25.0 – 30.0</td>
<td>25.0 – 30.0</td>
<td>25.0 – 30.0</td>
<td>25.0</td>
<td>25.0</td>
<td>25.0 – 30.0</td>
<td>10.0 – 15.0</td>
<td>Annex B</td>
</tr>
<tr>
<td>3</td>
<td>Acid insoluble ash, per cent by weight on moisture free basis, max.</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>2.0</td>
<td>Annex C</td>
</tr>
</tbody>
</table>

**Table 2 — Requirements for dried fish**

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Characteristic</th>
<th>Dried Bombay duck</th>
<th>Laminated Bombay duck</th>
<th>Dried white baits</th>
<th>Dried prawns</th>
<th>Dried shark fins</th>
<th>Dried fish maws</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moisture content, % by mass, max.</td>
<td>15.0</td>
<td>15.0</td>
<td>15.0</td>
<td>20.0</td>
<td>10.0</td>
<td>8.0</td>
<td>Annex A</td>
</tr>
<tr>
<td>2</td>
<td>Sodium chloride, per cent by weight on moisture free basis, max.</td>
<td>7.5</td>
<td>6.0</td>
<td>2.5</td>
<td>5.0</td>
<td>—</td>
<td>—</td>
<td>Annex B</td>
</tr>
<tr>
<td>3</td>
<td>Acid insoluble ash, per cent by weight on moisture free basis, max.</td>
<td>1.0</td>
<td>1.0</td>
<td>1.5</td>
<td>1.0</td>
<td>1.5</td>
<td>1.5</td>
<td>Annex C</td>
</tr>
</tbody>
</table>
5 Food Additives

Dried and salt-dried fish may contain only permitted additives in accordance with US 45.

6 Hygiene

Dried and salt-dried fish shall be produced and handled in a hygienic manner in accordance with US 28.

Dried and salt-dried fish shall comply with the microbiological limits given in Table 3.

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Microorganism</th>
<th>Maximum limit</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Pseudomonas</em> species/g, max.</td>
<td>Absent</td>
<td>ISO 13720</td>
</tr>
<tr>
<td>2</td>
<td><em>Salmonella</em> in 30 g, max.</td>
<td>Absent</td>
<td>ISO 6579</td>
</tr>
<tr>
<td>3</td>
<td><em>E. coli</em>/g, max.</td>
<td>Absent</td>
<td>ISO 7251</td>
</tr>
<tr>
<td>4</td>
<td>Coliforms/100 g, max.</td>
<td>Absent</td>
<td>ISO 4832</td>
</tr>
<tr>
<td>5</td>
<td><em>Staphylococcus</em> aureus/10 g, max.</td>
<td>$2 \times 10^5$</td>
<td>ISO 6888</td>
</tr>
<tr>
<td>6</td>
<td>Total viable count/g, max.</td>
<td>$10^4$</td>
<td>ISO 4833</td>
</tr>
<tr>
<td>7</td>
<td><em>Clostridium perfrigens</em>/g, max.</td>
<td>Absent</td>
<td>ISO 7937</td>
</tr>
<tr>
<td>8</td>
<td><em>Listeria monocytogenes</em>/25g, max.</td>
<td>Negative</td>
<td>ISO 11290-2</td>
</tr>
</tbody>
</table>

7 Contaminants

7.1 Pesticides and veterinary drug residues

Dried and salt-dried fish shall comply with those maximum pesticide and veterinary drug residue limits established by the Codex Alimentarius Commission for this product.

7.2 Heavy metals and other contaminants

Dried and salt-dried fish shall comply with those maximum levels for heavy metals and other contaminants established specified stipulated in US 738.

9 Packaging

Dried and salt-dried fish shall be packaged in food grade containers which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product.

The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They shall not impart any toxic substance or undesirable odour or flavour to the product.

10 Weights and Measures

Dried and salt-dried fish shall be packaged in accordance with the Weights and Measures legislation of the destination country.
10 Labelling

10.1 In addition to the requirements in US 7, the following specific labelling requirements shall apply and shall be legibly and indelibly marked:

   a) common name of the product as “dried and salt-dried fish” with the specific name of the fish in close proximity;
   b) complete list of ingredients shall be declared on the label in descending order of proportion;
   c) net weight in metric units;
   d) name and physical address of the manufacturer/packer/distributor of the product shall be declared on the label;
   e) date of manufacture;
   f) list of ingredients;
   g) lot identification;
   h) expiry date;
   i) country of origin;
   j) the net weight in metric units;
   k) storage instructions; and
   l) instructions on disposal of used package.

10.2 When labelling non-retail packages, information for non-retail packages shall either be given on the packages or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the packages.

10.3 Nutrition labelling and claims

Nutritional labelling, nutrition and health claims may be made in accordance with US 500, US 508, US 566.

11 Methods of sampling and test

Dried and salt-dried fish shall be sampled in accordance with the appropriate methods of sampling. Tests shall be conducted in accordance with appropriate methods where indicated in an appropriate clause or other international standard methods.
Annex A  
(normative)

Determination of moisture content

A.1 Principle

The determination should be carried out in duplicate and a reagent blank should be carried out.

A.2 Preparation of the sample

Cut the large portions of fish into small pieces and mix. Comminute the pieces as finely as possible to obtain a homogenous sample, care being taken that no moisture is lost during the process. Keep the product in an air-tight container in order to prevent changes in moisture content during subsequent handling. Use this product for testing.

A.3 Procedure

A.3.1 Place a steel dish containing about 20 g of acid washed sand and a glass rod in an air oven and dry to constant weight at 103 ± 2 °C (1 hour should be sufficient). Cool in a desiccator for 30 minutes and weigh the dish with sand and glass rod (4-place balance).

A.3.2 Add about 5 g of the sample and reweigh.

A.3.3 Add about 5 cm³ of industrial ethanol and stir with the glass rod to give a homogenous paste.

A.3.4 Place on a water bath (temperature 60 °C to 80 °C) and stir occasionally until all the ethanol has evaporated.

A.3.5 Place the dish and content (including the glass rod) in an air oven and dry to constant weight at 103 ± 2 °C. Cool in a desiccator for 30 minutes and weigh. Retain the product for the determination of sodium chloride (see B.2.1) and acid insoluble ash (see C.2.1).

A.3.6 Calculation

Moisture, per cent by mass = \( \frac{M_2 \times 100}{M_1} \)

where,

- \( M_2 \) = loss of mass, in g, of the sample, and
- \( M_1 \) = mass, in g, of the sample taken.
Annex B
(normative)

Determination of sodium chloride

B.1 Reagents

B.1.1 Standard Silver Solution — 0.1 N, standardized against 0.1 N sodium chloride solution.

B.1.2 Dilute Nitric Acid — 1:4.

B.1.3 Ferric Ammonium Indicator Solution — A saturated solution of ferric alum Fe\((NH_4)\)\((SO_4)\)\(_2\)\(\cdot\)12H\(_2\)O.

B.1.4 Standard potassium thiocyanate solution — 0.1N

B.2 Procedure

B.2.1 Take 0.3 g to 0.5 g of the dried products (see D.3.5) 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.

B.3 Calculation

B.3.1 Sodium chloride, per cent by weight

\[
= 5.85 \frac{(V_1N_1 - V_2N_2)}{W}
\]

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.
Annex C
(normative)

Determination of acid insoluble ash

C.1 Reagent
C.1.1 Dilute Hydrochloric Acid — 1:1, prepared from concentrated hydrochloric acid.

C.2 Procedure
C.2.1 Weigh accurately about 2 g of the dried material (see D.3.5) in a tared porcelain, silica or platinum dish. Ignite with a meker burner for about 1 hour. Complete the Ignition by keeping in a muffle furnace at 500 °C to 570 °C until grey ash results.

Cool and filter through whatman filter paper No. 42 or its equivalent. Wash the residue with hot water until the washings are free from chlorides as tested with silver nitrate solution and return the filter paper and residue to the dish. Keep it in an electric air oven maintained at 135 ± 2 °C for about 3 hrs. Ignore the dish again for about 30 minutes, cool and weigh. Repeat this process till the difference between two successive weighings is less than 1 mg. Note the lowest weight.

C.3 CALCULATION
C.3.1 Acid insoluble ash, per cent by weight

\[
\text{Acid insoluble ash} = \frac{100(M_2 - M)}{M_1 - M}
\]

where,

- \(M_2\) = the lowest weight, in g, of the dish with the acid insoluble ash;
- \(M\) = weight, in g, of the empty dish; and
- \(M_1\) = weight, in g, of the dish with the dried product taken for the test.
Certification marking

Products that conform to Uganda standards may be marked with Uganda National Bureau of Standards (UNBS) Certification Mark shown in the figure below.

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