Draft
Jamaican Standard Specification
for
Spices and sauces

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JS CRS 35: 2010
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CERTIFICATION MARKS

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Certification of Agricultural Produce (CAP) Mark

Jamaica-Made Mark
Draft
Jamaican Standard Specification
for
Spices and sauces

Bureau of Standards Jamaica
6 Winchester Road
P.O. Box 113
Kingston 10
Jamaica W. I.
Tel: (876) 926 -3140-5
Fax: (876) 929 -4736
Website: www.bsj.org.jm
E-mail: info@bsj.org.jm

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Jamaican Standards establish requirements in relation to commodities, processes and practices, but do not purport to include all the necessary provisions of a contract.

The attention of those using this standard specification is called to the necessity of complying with any relevant legislation.

### Amendments

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<thead>
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<th>Date of Issue</th>
<th>Remarks</th>
<th>Entered by and date</th>
</tr>
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NOTE
Informative Annex – gives additional information intended to assist in the understanding or use of the document. They do not contain requirements.

Normative Annex – gives provisions additional to those in the body of a document. They contain requirements.
National foreword

This standard is an adoption and is identical to CRS 35: 2010 CARICOM Regional Standard Specification for Spices and sauces. It was developed by the CARICOM Regional Organization for Standards and Quality (CROSQ) in order to outline requirements for spices and sauces offered for sale in CARICOM Member States.

Regional territories are mandated to adopt approved CARICOM Standards.

This standard is intended to be mandatory.

Committee representation

This CARICOM Regional Standard was prepared under the supervision of the Regional Technical Committee for Foods (RTC #3) by Sub-Committee SC-5(d) – Spices and sauces (hosted by CARICOM Member State, Saint Lucia), which at the time comprised the following members:

Mr T Edmund, Chairperson     Private Interest
Mr E Ambrose                  Inter-American Institute for Cooperation on Agriculture
Ms L Francois                 National Consumers’ Association
Mr C Prospere                 Ministry of Health
Dr X Dubuisson                Saint Lucia Bureau of Standards
Mr R Pilgrim                  Caribbean Agriculture Research and Development Institute (CARDI)
Mr C Parsaud                  Barons Foods Ltd.
Mr E Compton                  Ministry of Agriculture
Mrs L Louisy                  Caribbean Agriculture Business Association
Ms N Maynard                  Sir Arthur Lewis Community College
Mrs D Vernor                  Caribbean Environmental Health Institute
Mr M Satney                   Saint Lucia Industrial and Small Business Association
Mr F St. Prix, Technical Secretary     Saint Lucia Bureau of Standards

Comments from stakeholders throughout the CARICOM Member states were also solicited.

Acknowledgment

Acknowledgement is made to the CARICOM Regional Organization for Standards and Quality (CROSQ) for permission to adopt CRS 35: 2010.
Foreword

This CARICOM Regional Standard has been prepared to set levels of quality, purity and acceptability for spices and sauces that are produced or traded within the Caribbean Community.

The Caribbean region is a major source for several spices including ginger, hot peppers or chillis, mace, nutmeg and bay-leaf that are important in international trade which contribute significantly to the region’s agricultural earnings. Other spices imported and processed for retail are important ingredients in Caribbean cuisine. Sauces based on hot peppers (chillis) and soya are widely produced in the region.

This standard is intended to provide guidance and basic information on the identity, purity, wholesomeness and quality of the spices and sauces mentioned, so that they can be traded in regional and international markets.

Some physical and chemical tests are included to assure that the products are fresh and not contaminated.

This standard was approved by the Council for Trade and Economic Development (COTED) on 29 November - 3 December 2010.

In the development of this standard, assistance was derived from the following:

a) Association of Official Analytical Chemists, AOAC Test methods for spices – 18th Edition;
b) British Standard, BS 7087, Herbs and Spices Ready for Food Use;
c) Canadian Food and Drugs Regulations, Division 7.1984;
d) University of the West Indies, Natural Products in Caribbean Folk Medicine, 1988, CE Seafortb;
e) Codex Alimentarius Commission, CAC/GL 50 - 2004 Method of sampling-Volume 13;
f) ISO 676: 1995, Spices and condiments – Botanical nomenclature;

h) ISO 928:1997, Spices and condiments – Determination of total ash;
i) ISO 930: 1997, Spices and condiments – Determination of acid-insoluble ash;
j) ISO 939: 1980, Spices and condiments – Determination of moisture content;
k) ISO 941:1980, Spices and condiments – Determination of cold water-soluble extract;
l) ISO 948: 1980, Spices and condiments – Sampling;
n) ISO 1108: 1992, Spices and condiments – Determination of non-volatile ether extract;
o) ISO 1208: 1982, Spices and condiments – Determination of filth;
p) ISO 2825: 1981, Spices and condiments – Preparation of a ground sample for analysis;
q) ISO 3588: 1977, Spices and condiments – Determination of degree of fineness of grinding – Hand sieving method;
r) ISO 6571: 2008, Spices, condiments and herbs – Determination of volatile oil content;
s) ISO 6577: 2002, Nutmeg, whole or broken, and mace, whole or in pieces – Specification;

1 Scope

This CARICOM Regional Standard provides requirements for the identification, composition, purity, hygiene in processing, labelling, sampling and testing of spices and sauces.

This standard does not apply to:

a) ketchups;

b) barbeque-flavour sauces;

c) spices derived from plants which are not specified in this standard;

d) sauces made from recipes or formulae which are not specified in this standard;

e) vinegars flavoured with spices or plant material extracts; and

f) essential oils, extracts, or oleo-resins derived from spices that are intended to be used as flavouring or colouring agents in food.

2 Normative references

The following reference documents are indispensable for the application of this document. The latest edition of the referenced documents (including any amendments) applies.

CARICOM Regional Code of Practice, CRCP 5: 2010, General principles of food hygiene

CARICOM Regional Standard, CRS 5, Specification for labelling of pre-packaged foods

ISO 927:1982, Spices and condiments – Determination of extraneous matter content

ISO 948: 1980, Spices and condiments – Sampling

ISO 1208: 1982, Spices and condiments – Determination of filth

3 Terms and definitions

For the purposes of this standard, the following terms and definitions shall apply.

3.1 batch
quantity of product that has been processed within a defined period of time under similar conditions from the same materials

EXAMPLE Period of time includes one day, one shift, etc.

3.2 clove stem
dry fragment of the stalk of the clove

3.3 extraneous matter
part of the named plant that is not defined as the spice, and all other animal, vegetable, or mineral matter
3.4 food additive
any substance, the use of which would result or is likely to result in that substance or any of its by-products becoming a part of, or affecting the characteristics of a food, and includes a preservative and food colour, but does not include:

a) a nutritive article used, recognised or commonly sold as food;

b) vitamins, mineral nutrients or amino acids;

c) residues of pesticides, veterinary drugs used on plants or animals, or their by-products;

d) spices, oils, oleoresins, extracts derived from plants; and

e) packaging materials or substances that may migrate from packaging into a food packed therein

3.5 headless clove
clove consisting of only the receptacle and sepals but has lost the dome-shaped head

3.6 ingredient
any substance used in the preparation of a food and is present in the final product

NOTE Ingredients include food additives.

3.7 khoker clove
clove which has undergone fermentation as a result of incomplete drying

NOTE Identifiable by its pale brown colour, whitish mealy appearance and other wrinkled surface.

3.8 lot
quantity of product included in one shipment, or found in one location

NOTE Where a lot is known to consist of product from different batches, which can be separated, each batch constitutes one lot.

3.9 mixed spices
food prepared from one or more spices, whole or ground, used to flavour or colour other foods

NOTE It may contain other ingredients.

3.10 mother clove
fruit of the clove tree (Eugenia Caryophyllus) which is in the form of an ovoid brown berry surmounted by four incurved sepals

3.11 salt
food grade Sodium Chloride

3.12 sauces
comminuted liquid or semi-liquid food made from combinations of fruits, vegetables, cereals, and other foods, with or without natural colours, flavours, preservatives or food additives, that have been heat treated, and which are intended to be used to flavour other foods during or after cooking
3.13 **spice**
food made from parts of a single species of plant that have been dried or partly dried, and that is used to flavour or colour other foods

**NOTE** It may be ground (powdered), or used as prepared from the plant.

3.14 **spice salt**
food prepared from a named spice mixed with salt

3.15 **whole clove**
floral bud, harvested before blooming, and dried, of *Syzygium aromaticum*. It comprises a receptacle containing, in its upper part, two loculi containing numerous ovules, and crowned by four acute divergent sepals surrounding a dome-shaped head consisting of four paler unexpanded membranous imbricate petals enclosing numerous incurved stamens and a single stiff erect style

3.16 **ground clove**
powder obtained by grinding cloves without any additions

4 Requirements for spices

4.1 General

4.1.1 The spices named in 4.2.1 to 4.2.21 shall be derived only from the spices and varieties of plants mentioned. No other spices or varieties are permitted to be used.

4.1.2 The odour and flavour shall be characteristic of the spice, free from foreign odours and flavours or mustiness and rancidity.

4.1.3 The spice shall be free from living insects and moulds, and shall be free from dead insects, parts of insects, or signs of contamination by rodents that are visible to the naked eye or with magnification. Such contamination shall be determined by the method included in Annex A.

4.1.4 The spice shall not contain extraneous matter in amounts exceeding the limit prescribed, when determined by the method included in Annex A.

4.1.5 Spices shall conform to the physical and chemical requirements prescribed in this standard.

4.1.6 Where spices and mixed spices are sampled and analysed by the methods mentioned in Annex A, the metal content shall be in accordance with the limits specified in Table 1, unless specified by national regulations.

<table>
<thead>
<tr>
<th>Heavy metal</th>
<th>Recommended limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic As</td>
<td>Not more than 2 mg/kg</td>
</tr>
<tr>
<td>Copper Cu</td>
<td>Not more than 50 mg/kg</td>
</tr>
<tr>
<td>Lead Pb</td>
<td>Not more than 10 mg/kg</td>
</tr>
<tr>
<td>Zinc Zn</td>
<td>Not more than 50 mg/kg</td>
</tr>
</tbody>
</table>

**NOTE** The above shall also apply to mixed spices.
4.2 Specific requirements

4.2.1 Pimento (Allspice)

4.2.1.1 Pimento shall be prepared from the dried, mature but unripe whole berries of the pimento plant *Pimento dioica* (L) Merrill. It may be whole or ground.

NOTE Whole pimento berries are nearly spherical, between 3.5 mm to 9.5 mm in diameter, with a rough surface, bearing a small annulus form by the sepals, and dark brown in colour.

4.2.1.2 Pimento shall be free from foreign taste or odour, including rancidity or mustiness.

NOTE Pimento has a mixed flavour of four spices, with a preponderant clove flavour blended with cinnamon, nutmeg and pepper.

4.2.1.3 Whole dried pimento or allspice shall contain no more than 1 % by weight of extraneous matter, when determined by the method described in ISO 927.

NOTE Broken berries are not considered as extraneous matter.

4.2.1.4 Pimento shall be free from moulds, living insects, practically free from dead insects, insect’s fragments and rodent contamination visible to naked eye. Contamination of ground pimento shall be determined by the method specified in ISO 1208 and shall be according to the requirements indicated in Table 2.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Whole berries</th>
<th>Ground Tested Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %</td>
<td>12.0 max</td>
<td>12.0 max</td>
</tr>
<tr>
<td>Total ash, % on dry basis</td>
<td>4.5 max</td>
<td>4.5 max</td>
</tr>
<tr>
<td>Acid in soluble ash, % on dry basis</td>
<td>0.4 max</td>
<td>0.4 max</td>
</tr>
<tr>
<td>Crude fibre, % on dry basis</td>
<td>-</td>
<td>27.5 max</td>
</tr>
<tr>
<td>Non volatile ether extract, % (by mass) on dry basis</td>
<td>-</td>
<td>8.5 max</td>
</tr>
</tbody>
</table>

NOTE Pimento samples are ground so that all particles pass through a sieve with 1 mm apertures before analysis.

4.2.1.5 Pimento shall be classified into two groups, A and B, according to the volatile oil content as outlined in Table 3.

<table>
<thead>
<tr>
<th>Volatile oil, ml/100g on dry basis</th>
<th>Whole</th>
<th>Ground</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>&gt; 3</td>
<td>&gt; 2</td>
<td>A.11</td>
</tr>
<tr>
<td>Group B</td>
<td>≥ 2</td>
<td>≥ 1</td>
<td>A.11</td>
</tr>
</tbody>
</table>

4.2.2 Chillis (bird peppers, cayenne peppers, hot peppers, Tabasco peppers)

4.2.2.1 Chillis shall be prepared from the dried whole fruits of cultivated varieties of the chilli plant *Capsicum frutescens*, *Capsicum annuum*, *Capsicum chinense*, *Capsicum pubescens* and *Capsicum baccatum* which may be whole or ground.

NOTE The whole chillis are usually less than 25 mm in length, dark red to orange-yellow in colour, varying in shape, with smooth surface, containing seeds and a fibrous core.
4.2.2.2 The odour and flavour of chillis shall be characteristic, initially pleasant, fruity, followed by an acrid, very pungent, sensation.

4.2.2.3 Chillis shall contain no more than 1 % of extraneous matter including leaves, stalks, roots or flavours of the chilli plant.

4.2.2.4 Whole chillis shall contain no more than 2 % of unripe, broken or disfigured fruits.

4.2.2.5 When sampled, and tested, whole or ground chillis shall conform to the requirements specified in Table 4.

Table 4 — Chemical requirements for Chillis

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Requirement</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, % by weight</td>
<td>10.0 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash, % by weight</td>
<td>10.0 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble ash, % by weight</td>
<td>1.6 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Crude fibre, % day basis</td>
<td>28.0 max</td>
<td>A.12</td>
</tr>
<tr>
<td>% starch</td>
<td>1.5 max</td>
<td>A.19</td>
</tr>
</tbody>
</table>

NOTE Chilli samples are ground so that all particles pass through a sieve with 1 mm apertures before analysis.

4.2.3 Black pepper

4.2.3.1 Whole black pepper shall consist of the whole dried berries of *Piper nigrum* L., picked before complete ripening.

NOTE 1 Black pepper is a dried berry of *Piper nigrum* L., having an unbroken pericarp.

NOTE 2 Whole black pepper berries are nearly spherical, between 3 mm to 6 mm in diameter, black to brownish-grey in colour, with a wrinkled pericarp.

4.2.3.2 Ground black pepper shall be prepared from whole black pepper by comminution or grinding with no added material.

4.2.3.3 Processed whole black pepper shall be cleaned, dried, and graded. Non-processed whole black pepper is not required to be cleaned, graded or otherwise prepared by the producing country before being exported.

NOTE Semi-processed pepper is pepper that has been processed by the producing country before being exported.

4.2.3.4 The odour of black pepper, when freshly ground, shall be very aromatic, strong and sharp in characteristic. The product shall be free from foreign odours and flavour.

4.2.3.5 Whole black pepper shall contain no more than 1.5 % by weight of extraneous matter if processed and no more than 2.5 % if unprocessed.

NOTE Light berries, pin heads or broken berries are not considered as extraneous matter.

4.2.3.6 Whole black pepper shall contain no more than 5 % by weight of light berries, if processed, and no more than 10 % if unprocessed.

NOTE Light berries are berries that have reached an apparently normal stage of development but do not contain a kernel and float when suspended in a mixture of ethanol and water with relative density between 0.80 and 0.82 at 20 °C.
4.2.3.7 Whole black peppers shall contain no more than 4 % by weight of pinhead or broken berries if processed, or more than 7 % if unprocessed.

NOTE 1 Pin-head berries are very small berries that have not developed and are less than 2 mm in diameter.

NOTE 2 Broken berry is a berry that has been separated into two or more pieces.

4.2.3.8 Ground black pepper shall be examined microscopically to detect extraneous matter.

NOTE Light berries, pin heads or broken berries are not considered as extraneous matter

4.2.3.9 Black pepper, whole or ground, shall conform to the requirements of specified in Tables 5 and 6.

### Table 5 — Chemical requirements for black pepper

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Whole non-processed or semi-processed</th>
<th>Whole processed</th>
<th>Ground tested</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture %</td>
<td>13 max</td>
<td>13 max</td>
<td>13 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash, % dry basis</td>
<td>7.0 max</td>
<td>6.0 max</td>
<td>6.0 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble ash, % dry basis</td>
<td>-</td>
<td>-</td>
<td>1.2 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Non-volatile either extract, % dry basis</td>
<td>6.0 min</td>
<td>6.0 min</td>
<td>6.0 min</td>
<td>A.10</td>
</tr>
<tr>
<td>Volatile Oils ml/100g, dry basis</td>
<td>2.0 min</td>
<td>2.0 min</td>
<td>1.0 min*</td>
<td>A.11</td>
</tr>
<tr>
<td>Piperine content %, dry basis</td>
<td>4.0 min</td>
<td>4.0 min</td>
<td>4.0 min</td>
<td>A.17</td>
</tr>
<tr>
<td>Crude fibre, %</td>
<td>-</td>
<td>-</td>
<td>17.5 max</td>
<td>A.12</td>
</tr>
</tbody>
</table>

* To be measured as soon as possible after grinding.

NOTE Whole black pepper is ground so that all particles pass through a sieve with 1 mm apertures before analysis.

### Table 6 — Physical characteristics of whole black pepper

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Non processed</th>
<th>Processed</th>
<th>Reference test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraneous matter, % (m/m)</td>
<td>2.5 max</td>
<td>1.5 max</td>
<td>A.2</td>
</tr>
<tr>
<td>Light berries, % (m/m)</td>
<td>10 max</td>
<td>5.0 max</td>
<td>-</td>
</tr>
<tr>
<td>Pinheads or broken berries, % (m/m)</td>
<td>7.0 max</td>
<td>4.0 max</td>
<td>Physical separation and weighing</td>
</tr>
<tr>
<td>Bulk density, g/l</td>
<td>450 min</td>
<td>490 min</td>
<td>-</td>
</tr>
</tbody>
</table>

4.2.4 White pepper

4.2.4.1 White pepper shall be the berries of the black pepper plant. *Piper nigrum* L., from which the outer pericarp has been removed.

4.2.4.2 Whole white pepper shall be obtained in one of two ways, as follows:

a) from black pepper using the whole dry berry of *Piper nigrum* L., generally picked before complete ripening, and removing the outer pericarp, with or without preliminary soaking in water; and

NOTE If necessary, drying is carried out afterwards.
b) from the whole ripe berry of *Piper nigrum L.*, removing the outer pericarp by the same procedure as described in 4.2.4.2 a).

NOTE Whole white peppers are almost spherical berries between 3 mm and 6 mm in diameter, smooth surface, one end slightly depressed, the other protruding generally uniform in colour, grey-brown to ivory, showing a few dark streaks between the ends.

4.2.4.4 Processed white pepper shall be pepper that has been cleaned and dried.

NOTE Semi processed pepper has undergone a partial treatment by the producing country before being exported.

4.2.4.5 Ground white pepper shall be prepared from whole white pepper by comminution or grinding with no added material.

4.2.4.6 The odour and flavour of white pepper, when freshly ground, shall be characteristic, aromatic, and slightly sharp. The product shall be free from foreign odours and flavours.

4.2.4.7 Whole white pepper shall contain no more than 0.8 % by weight of extraneous matter if processed and no more than 1 % if semi-processed.

4.2.4.8 Whole white pepper shall contain no more than 10 % by weight of black berries, when processed and no more than 15 % if semi-processed.

NOTE Black berries are dark-coloured berries from which the pericarp had not been completely removed.

4.2.4.9 Whole white pepper shall contain no more than 3 % by weight of broken berries when processed and no more than 4 % when unprocessed. Bulk density shall be at least 600 g/l when semi-processed or processed.

4.2.4.10 Ground white pepper shall be examined microscopically when necessary, to detect extraneous matter.

4.2.4.11 White pepper, whole or ground, shall conform to the requirements specified in Table 7.

Table 7 — Chemical requirements for white pepper

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Whole, Processed or Semi-processed</th>
<th>Ground</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture %</td>
<td>14.0 max</td>
<td>14.0 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash, % Dry basis</td>
<td>3.5 max</td>
<td>3.5 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble ash, % Dry basis</td>
<td>-</td>
<td>0.3 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Non-volatile methylene chloride Extract, % Dry basis</td>
<td>6.5 min</td>
<td>6.5 min</td>
<td>A.10</td>
</tr>
<tr>
<td>Volatile oils, ml/100g, Dry basis</td>
<td>1.0 min</td>
<td>0.7 min†</td>
<td>A.11</td>
</tr>
<tr>
<td>Piperine content, % Dry basis</td>
<td>4.0 min</td>
<td>4.0 min</td>
<td>A.17</td>
</tr>
<tr>
<td>Crude fibre, % Dry basis</td>
<td>-</td>
<td>6.5 max</td>
<td>A.12</td>
</tr>
</tbody>
</table>

†To be measured as soon as possible after grinding.

NOTE Whole white pepper is ground so that all particles pass through a sieve with 1 mm apertures before analysis.

4.2.5 Nutmeg (whole, broken or unshelled)

4.2.5.1 Nutmeg shall consist of the kernel of the dried ripe fruit of the nutmeg tree, *Myristica fragrans Houtt*, which may be whole or broken.
NOTE Whole nutmegs are ovoid or spherical, between 15 mm to 25 mm wide and 20 mm to 30 mm in length, with a surface, grey-brown in colour, bearing furrows and a shallow groove on the least convex side.

4.2.5.2 Unshelled nutmeg shall consist of the dried kernel of the nutmeg fruit and shall be cleaned and free from the pericarp and aril (mace).

NOTE 1 The shell is hard, dark-brown, glossy bearing markings derived from the aril.

NOTE 2 The aril is a fleshy or membranous tissue surrounding certain seeds and attached to the seeds at one point only, i.e. the hilum.

NOTE 3 The mace is the dried aril of the ripe fruit of the nutmeg tree (*Myristica fragrans* Houtt)

4.2.5.3 The odour of nutmeg shall be characteristic and aromatic, and the flavour shall be bitter, acid and hot.

4.2.5.4 Nutmeg shall contain no more than 0.5 % by weight of extraneous matter, including pieces of shell, but may contain up to 3 % of mace.

4.2.5.5 Nutmeg shall be free from moulds, living insects, practically free from dead insects, insect’s fragments and rodent contamination visible to the naked eye.

4.2.5.6 Nutmeg shall conform to the requirements specified in Table 8.

4.2.5.7 Unshelled nutmeg is required to be shelled before grinding and analysing. The kernels shall conform to the requirements of Table 8.

Table 8 — Chemical requirements for nutmeg, whole, ground or broken, unshelled

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Requirements</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture %</td>
<td>10 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash, % dry basis (heat to 600 ± 25°C)</td>
<td>3 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble ash, % dry basis</td>
<td>0.5 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Volatile oils, ml/100g, dry basis</td>
<td>6.5 min</td>
<td>A.11</td>
</tr>
<tr>
<td>Calcium, as CaO, % dry basis</td>
<td>0.35 max</td>
<td>A.20</td>
</tr>
</tbody>
</table>

NOTE Whole or broken nutmeg are ground as that all particles pass through a sieve with 1 mm apertures before analysis. It is recommended that samples be cooled before grinding. The total ash is to be determined by heating at 600 °C.

4.2.5.8 Nutmeg type shall be classified according to the producing region.

4.2.5.8.1 Siauw type or Banda type

Siauw type nutmeg shall be classified as nutmeg produced in the South-East Asian region.

NOTE Siauw type nutmeg is a greyish-brown colour, but it may be white (if it has been subjected to liming for the purpose of protecting it from insects and as an aid to conservation). It is spherical or slightly ovoid in shape, its length generally varying from 20mm to 30mm and its width from 15mm to 25mm. Its surface is hard to the touch, marked with numerous braided furrows and with a narrow groove which extends from the hilum to the chalaza on the least-convex side.

4.2.5.8.2 Grenada type

Grenada type nutmeg shall be classified as nutmeg produced in Grenada, West Indies. It has the same colours and characteristics as the Siauw type or Banda type. It is never limed and is of various shapes and sizes.
4.2.5.9 Commercial categories of Grenada type nutmeg

Nutmegs shall be classified according to the following categories:

a) Sound Unassorted Nutmegs (SUNS);

NOTE This includes sound nutmegs which have not been attacked by insects and are not sorted according to size.

b) Sound Selected Nutmegs;

NOTE This includes sound nutmegs which have not been attacked by insects and which are classified as a function of size.

c) Grenada Unassorted Nutmeg (GUNS);

NOTE This includes whole nutmegs which have been slightly bruised, as well as nutmegs with no more than three pin holes, hairline cracks or breaks (pieces) and nutmeg which float after an immersion test.

d) Dry Nutmeg in Shell;

NOTE This includes dry nutmegs which shell has not been removed.

e) Distillation Nutmeg; and

NOTE These include insect infested nutmeg which is used for the production of nutmeg oil.

f) Grenada Broken and Clean (GBC) Nutmeg.

NOTE These are nutmeg which have been dried, cracked, broken and cleaned of extraneous matter.

4.2.6 Mace

4.2.6.1 Mace shall be prepared from the aril of the ripe fruit of nutmeg tree, *Myristica fragrans* Houttyn, by removing it from the seed, flattening and frying.

NOTE Mace has a horny texture, length 30 mm to 40 mm, 1 mm thick, generally yellow to orange in colour.

4.2.6.2 Mace shall have an aromatic odour, more pronounced than nutmeg and an acid, hot, bitter flavour.

4.2.6.3 Mace shall contain no more than 0.5 % by weight of extraneous matter including pieces of shell, but is required to contain up to 3 % of broken nutmeg.

4.2.6.3.1 It shall be free from moulds, living insects, practically free from dead insects, insect’s fragments and rodent contamination visible to naked eye.

4.2.6.3.2 Mace shall be classified according to the producing region:

a) Siauw type or Banda type; and

NOTE Siauw type is a flattened, dried, quite wide aril with a horny texture, reddish-yellow to brownish-red in colour and generally 30mm to 40mm long and 1mm thick.

b) Grenada type.

NOTE Grenada type is a flattened, dried, quite wide aril with a horny texture, generally 30mm to 40mm long and 1mm thick. Its colour varies according to the category.

4.2.6.4 Mace can be graded as follows:
a) whole red mace;

NOTE This includes mace red in colour without blemishes containing not more than 5 % of broken pieces.

b) No.1 – whole pale mace;

NOTE This includes whole mace, pale yellow in colour containing not more than 5% of broken pieces.

c) No. 2 – Broken mace;

NOTE This includes pieces ranging from yellow to dark red in colour but, overall, yellow.

d) No. 3 – broken pieces and pickings; and

NOTE This includes discoloured pieces of mace with an overall yellow colour; it should not include mildew or black pieces and lumps.

e) mace powder.

NOTE This is residue coming from No. 1 mace which can pass through a sieve with 1 mm apertures.

4.2.6.5 Mace shall conform to the requirements as specified in Table 9.

<table>
<thead>
<tr>
<th>Table 9 - Chemical requirements for mace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic</td>
</tr>
<tr>
<td>Moisture %</td>
</tr>
<tr>
<td>Total ash, % dry basis (heat to 600 ± 25°C)</td>
</tr>
<tr>
<td>Acid-insoluble ash, % dry basis</td>
</tr>
<tr>
<td>Volatile oils, ml/100g dry basis and broken), Grades 1 &amp; 2: 7.5 min; Grade 3: Picking 5 min</td>
</tr>
</tbody>
</table>

NOTE Before analysis, mace is ground so that all particles pass through a sieve with 1 mm apertures. It is recommended that mace be cooled before grinding. The total ash content is to be determined by heating to 600 °C.

4.2.7 Ginger

4.2.7.1 Ginger shall be prepared from the rhizome of the ginger plant. Zingiber officinal Roscoe, which may be peeled or unpeeled.

NOTE Ginger is in irregular shapes, generally more than 20 mm in length, fibrous, pale-brown to buff in colour after being washed coated or scraped, and sun-dried. Ginger may be bleached with lime, and may be garbled by removing small pieces.

4.2.7.2 Ground ginger shall be prepared by comminuting whole ginger or pieces, without adding any other matter.

4.2.7.3 The odour and taste shall be characteristic of ginger, slightly sharp, pungent, fresh and lemony. The ginger shall be free from musty odours or rancid or bitter taste.

4.2.7.4 Ginger shall contain no more than 1 % by weight of extraneous matter and no more than 0.5% by weight of foreign matter.

4.2.7.5 Ginger shall be free from living insects and shall be practically free from visible dead insects or insect’s fragments.
4.2.7.6 Ground ginger shall be free from coarse particles and fibres. The fineness shall be agreed between the buyer and the seller.

4.2.7.7 Ginger, whole or in pieces, shall conform to the requirements as specified in Table 10.

**Table 10 - Chemical requirements for ginger**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Requirements</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %</td>
<td>12 max(whole or pieces)</td>
<td>A.4</td>
</tr>
<tr>
<td></td>
<td>11.0 max(ground)</td>
<td></td>
</tr>
<tr>
<td>Total ash, % dry basis</td>
<td>8.0 max (unbleached)</td>
<td>A.5</td>
</tr>
<tr>
<td></td>
<td>8.0 max (bleached)</td>
<td></td>
</tr>
<tr>
<td>Volatile oils, ml/100g, dry basis</td>
<td>1.5 min(whole or pieces)</td>
<td>A.11</td>
</tr>
<tr>
<td></td>
<td>1.0 min(ground)</td>
<td></td>
</tr>
<tr>
<td>Calcium, as CaO, % dry basis</td>
<td>1.1 max (unbleached)</td>
<td>A.20</td>
</tr>
<tr>
<td></td>
<td>2.5 max (bleached)</td>
<td></td>
</tr>
<tr>
<td>Acid-insoluble ash, % dry basis</td>
<td>1.5 max</td>
<td>A.6</td>
</tr>
</tbody>
</table>

**NOTE** Before analysis, ginger is ground so that all particles pass through a sieve with 1 mm apertures.

4.2.8 Cloves

4.2.8.1 Whole cloves shall be prepared from the dried, unopened floral bud of the tree *Eugenia caryophyllus* (*C. Sprenge bullock and harrison*), which has been picked before opening and dried in the sun.

**NOTE** Whole cloves are narrow, with a dome at one end formed by the four unopened petals of the flower, surrounded by four divergent sepals and dark reddish-brown in colour.

4.2.8.2 Ground cloves are required to be prepared by grinding whole cloves with no added material.

4.2.8.3 The odour of whole or ground cloves shall be spicy, strongly aromatic with an initial warming characteristic flavour, quickly followed by a numbing sensation. They shall be free from off-flavours, including mustiness.

4.2.8.4 Whole cloves shall be of a reddish-brown to blackish-brown colour. Ground cloves shall be of a brown colour with a violet tinge.

4.2.8.5 Cloves may be classified as follows;

a) grades 1 special (hand-picked);

b) grades 2; and

c) grades 3.

4.2.8.6 Cloves shall be free from living insects and shall be practically free from visible dead insects or insect’s fragments.

4.2.8.7 Whole cloves shall contain no foreign matter or defective cloves in excess of the limits specified in Table 11.
Table 11 - Extraneous matter in whole cloves

<table>
<thead>
<tr>
<th>Defect</th>
<th>Grade 1 % (m/m) max</th>
<th>Grade 2 % (m/m) max</th>
<th>Grade 3 % (m/m) max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraneous matter</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Headless cloves</td>
<td>2</td>
<td>5</td>
<td>(not specified)</td>
</tr>
<tr>
<td>'Mother' cloves</td>
<td>0.5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>'Khoker' cloves</td>
<td>0.5</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

4.2.8.8 Whole cloves and ground cloves shall conform to the requirements specified in Table 12.

Table 12 - Chemical requirements for whole and ground cloves

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Whole cloves</th>
<th>Ground cloves</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>12.0 max</td>
<td>10 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash % on dry basis</td>
<td>6.0 max</td>
<td>7.0 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble Ash % on day basis</td>
<td>0.5 max</td>
<td>0.5 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Crude fibre</td>
<td>10.0 max</td>
<td>130.0 max</td>
<td>A.12</td>
</tr>
<tr>
<td>Volatile oil, ml/100g</td>
<td>Grades 1 and 2: 17 min&lt;br&gt;Grades 3: 15 min</td>
<td>Grades 1 and 2: 16 min&lt;br&gt;Grades 3: 14 min</td>
<td>A.11</td>
</tr>
</tbody>
</table>

NOTE Whole cloves are ground before analysis so that all particles pass a sieve with 1 mm apertures.

4.2.8.9 Plastic materials used in packaging whole or ground cloves shall be resistant to clove oil.

4.2.9 Cardamom (Elaichi Elychi)

4.2.9.1 Cardamom or Elaichim Elychi shall be prepared from the nearly ripe fruits of the plant Elettaria cardamomum (L) Maton var. Minuscula Burkill, by drying.

NOTE Cardamom consist of capsules (which may have been clipped, may have pedicels removed), coloured green or white, cream, light brown, 12 mm to 16 mm in length, 6 mm to 9 mm in thickness, containing well-formed seeds.

4.2.9.2 Cardamom shall have their characteristic fresh odour and flavour, free from foreign taints, including rancidity and mustiness.

4.2.9.3 Grading

The Cardamom capsules may be graded on the basis of colour, clipping, size and whether they are bleached or unbleached and as a function of the proportion of extraneous matter, of their place of origin.

4.2.9.4 Cardamom shall not contain foreign matter or defective capsules in excess of the limits specified in Table 13.
Table 13 - Extraneous matter in cardamom

<table>
<thead>
<tr>
<th>Defect</th>
<th>Maximum % (m/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dirt, dust, pieces of stem or stalks</td>
<td>5.0</td>
</tr>
<tr>
<td>Empty or mal-formed capsules</td>
<td>5.0</td>
</tr>
<tr>
<td>Immature, shrivelled capsules</td>
<td>7.0</td>
</tr>
</tbody>
</table>

NOTE Empty capsules are those which contain no seeds; the percentage is determined by taking 100 capsules at random, opening them, and examining the contents.

4.2.9.5 Cardamom shall be free from living insects and shall be practically free from visible dead insects or insect’s fragments.

4.2.9.6 Cardamom shall conform to the requirements specified in Table 14.

Table 14 - Chemical requirements for cardamom

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Requirement</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %, m/m</td>
<td>13.0 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash, %, m/m on dry basis</td>
<td>9.5 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Volatile oils, ml/100g, on dry basis</td>
<td>3.5 min</td>
<td>A.11</td>
</tr>
</tbody>
</table>

NOTE Before analysis, cardamom is ground so that all particles pass through a sieve with 1 mm apertures.

4.2.10 Cinnamon

4.2.10.1 Whole cinnamon shall be prepared from the bark of the cinnamon tree, *Cinnamomum zeylanicum Blume* (synonym *C. Verum Presl*) wild or cultivated.

NOTE The bark may be scraped so that the inner peel is used to prepare cinnamon, or may be left unscraped. The bark or inner peel is dried in rolled form (quills) or flat pieces, which may vary in shape and size, coloured between reddish-brown and yellow.

4.2.10.2 Ground cinnamon shall be prepared by grinding whole cinnamon, with no added material.

4.2.10.3 Whole cinnamon shall be graded in several ways, depending on the country of origin, the importing country, and the form in which it is prepared. Grades shall be based on size, shape, colour defects, whether the bark is scraped, peeled or unpeeled.

4.2.10.4 The flavour and odour of cinnamon shall be fresh and characteristic of cinnamon of the origin concerned and free from foreign flavours, including mustiness.

4.2.10.5 Whole cinnamon shall contain no more than 1 % m/m of leaves, stems, and other vegetable matter, together with sand, earth or dust. Ground cinnamon shall be examined microscopically for traces of extraneous matter, where applicable.

4.2.10.6 Cinnamon shall be free from living insects and shall be practically free from visible dead insects or insect’s fragments.

4.2.10.7 Whole cinnamon and ground cinnamon shall conform to the requirements specified in Table 15.
Table 15 - Chemical requirements for whole and ground cinnamon

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Whole cinnamon</th>
<th>Ground cinnamon</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, % m/m</td>
<td>12.0 max</td>
<td>12.0 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total Ash, % m/m, on dry basis</td>
<td>6.0 max</td>
<td>6.0 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble ash, % on dry basis</td>
<td>2.0 max</td>
<td>2.0 max</td>
<td>A.1</td>
</tr>
<tr>
<td>Volatile Oil, ml/100g, on dry basis</td>
<td>1.2 min</td>
<td>1.2 min</td>
<td>A.6</td>
</tr>
</tbody>
</table>

NOTE Before analysis, whole cinnamon is ground so that all particles pass through a sieve with 0.5 mm apertures.

4.2.11 Coriander

4.2.11.1 Whole coriander shall be prepared from the fruits of the plant Coriandrum sativum L. which have been dried, spherical in shape, yellow-brown to light brown in colour, about 2 mm to 6 mm in diameter.

4.2.11.2 Ground coriander shall be prepared from whole coriander with no added material by grinding so that all particles pass a sieve with 0.5 mm apertures.

4.2.11.3 Whole and ground coriander shall have a characteristic typical aroma and fragrant odour and aromatic flavour, free from foreign taints and musty odour.

4.2.11.4 Coriander shall be free from living insects and shall be practically free from visible dead insects or insect’s fragments.

4.2.11.5 Coriander has several grades on the basis of the presence of extraneous matter, split fruits and damaged, discoloured, immature, shrivelled and wee villed fruits.

NOTE Extraneous matter is all material other than coriander seeds and all other matter of animal, vegetable or mineral origin.

4.2.11.6 Whole coriander fruits shall be classified into two groups, A and B, according to the volatile oil content.

4.2.11.7 Whole coriander shall not contain foreign matter or defective fruits in excess of the limits specified in Table 16.

4.2.11.8 Whole coriander shall be graded into three grades, Grade 1, Grade 2 and Grade 3.

Table 16 - Extraneous matter in whole coriander

<table>
<thead>
<tr>
<th>Defect</th>
<th>Grade 1 % (m/m) max</th>
<th>Grade 2 % (m/m) max</th>
<th>Grade 3 % (m/m) max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraneous Matter</td>
<td>1.5</td>
<td>2.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Broken Fruits</td>
<td>5.0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Damaged, Discoloured, insect damaged, immature or shrivelled damaged, immature or shrivelled fruits</td>
<td>2.0</td>
<td>3.0</td>
<td>7.0</td>
</tr>
</tbody>
</table>

4.2.11.9 Whole and ground coriander shall conform to the requirements specified in Table 17.
Table 17 - Chemical requirements for whole and ground coriander

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Whole coriander</th>
<th>Ground coriander</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %, m/m</td>
<td>9.0 max</td>
<td>9.0 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total Ash, %, m/m dry basis</td>
<td>7.0 max</td>
<td>7.0 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble ash, %, m/m dry basis</td>
<td>1.5 max</td>
<td>1.0 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Volatile oils, ml/100g, on dry basis</td>
<td>0.3 min for grade A Between 0.1 and 1.5 for Grade B</td>
<td>0.3 min A.11</td>
<td></td>
</tr>
</tbody>
</table>

NOTE 1 Whole coriander is ground before analysis so that all particles pass through a sieve with 0.5 m apertures.

NOTE 2 For whole coriander it’s the same values for the three grades 1, 2 and 3.

4.2.12 Cumin (jira or geera)

4.2.12.1 Whole cumin shall be prepared from the fruits of the plant *Cumimum cyminum* L.

NOTE It includes two enlarged mericarps joined together, each showing five pale thin ribs with secondary ribs, ochre-grey to light brown in colour, about 8 mm in length, narrow and tapering at each end.

4.2.12.2 Ground cumin or ground geera shall be prepared from whole cumin by grinding with no added material.

4.2.12.3 Whole cumin or geera shall contain no more than 5 % m/m of extraneous matter, and no more than 25 % m/m of broken fruits.

NOTE Extraneous matter is all matter which does not constitute cumin fruits.

4.2.12.4 Whole cumin may be classified according to origin, and placed into three grades according to its extraneous matter content and the proportion of broken fruits as specified in the Table 18.

Table 18 - Grades of Cumin according to extraneous content and proportion of broken fruits

<table>
<thead>
<tr>
<th>Grades</th>
<th>Extraneous matter content % (m/m)</th>
<th>Proportion of broken fruits % (m/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1.0 max</td>
<td>5.0 max</td>
</tr>
<tr>
<td>II</td>
<td>3.0 max</td>
<td>5.0 max</td>
</tr>
<tr>
<td>III</td>
<td>5.0 max</td>
<td>5.0 max</td>
</tr>
</tbody>
</table>

4.2.12.5 Whole cumin shall be free from moulds and living insects and shall be practically free from visible dead insects or insect’s fragments.

4.2.12.6 The flavour shall be characteristic of cumin and its aroma aromatic and not musty.

4.2.12.7 Whole and ground cumin shall conform to the requirements specified in Table 19.
Table 19 - Chemical requirements for whole and ground cumin

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Grade I</th>
<th>Grade II</th>
<th>Grade III</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %, (m/m)</td>
<td>9.0 max</td>
<td>10.0 max</td>
<td>13.0 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash, % (m/m) dry basis</td>
<td>9.5 max</td>
<td>12.0 max</td>
<td>15.0 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble Ash, % (m/m) dry basis</td>
<td>1.5 max</td>
<td>3.0 max</td>
<td>5.0 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Non-Volatile Ether extract, % (m/m) on dry basis</td>
<td>15.0 max</td>
<td>15.0 max</td>
<td>12.0 max</td>
<td>A.10</td>
</tr>
<tr>
<td>Volatile oils, ml/100 g, on dry basis</td>
<td>2.5 min</td>
<td>1.5 min</td>
<td>1.5 min</td>
<td>A.11</td>
</tr>
</tbody>
</table>

4.2.13 Fenugreek

4.2.13.1 Fenugreek shall be constituted of the dried mature seeds of the fenugreek plant, *Trigonella foenum-graecum* L.

NOTE The fenugreek seed is oblong and rhomboidal in shape, smooth surfaced, with a deep oblique furrow on one side, and yellow to yellowish-brown in colour. The size of the seed varies with the country of origin, with the type and the variety.

4.2.13.2 Ground fenugreek shall be prepared by grinding fenugreek with no added material.

4.2.13.3 The odour of fenugreek, when freshly ground, shall be strong, pleasant, resembling celery or seep maple. Fenugreek shall be free from any off-flavours or other atypical taste, odour or flavour, particularly mustiness. Ground fenugreek shall be free from rancidity. The flavour of ground fenugreek shall be very bitter and floury.

4.2.13.4 Whole fenugreek shall contain no more than 4 % of extraneous matter.

4.2.13.5 Whole fenugreek and ground fenugreek shall conform to the requirements specified in Table 20.

Table 20 - Chemical requirements for whole and ground fenugreek

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Requirement</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %</td>
<td>11.0 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash, % (m/m) dry basis</td>
<td>5.0 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble Ash, %, dry basis</td>
<td>1.5 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Cold water soluble extract, %, dry basis</td>
<td>30.0 max</td>
<td>A.9</td>
</tr>
</tbody>
</table>

NOTE Whole fenugreek is ground before analysis so that all particles pass through a sieve with 1.0 mm apertures.

4.2.14 Turmeric or Hardi

4.2.14.1 Turmeric shall be prepared by drying or curing the primary or secondary rhizomes of the turmeric plant, *Curcuma longa* L.

NOTE Turmeric has the shape and colour typical of cultivated variety, which may have been polished by machine or retain their natural surface. In curing, rhizomes are first soaked in boiling water and then dried to prevent further growth.

4.2.14.2 Ground turmeric shall be prepared by grinding turmeric bulbs or fingers with no added material.

4.2.14.3 Whole turmeric shall contain no more than 2 % of extraneous matter and not more than 5 % of defective rhizomes.
EXAMPLE  Shrivelled, hollow, porous, or scorched during curing.

4.2.14.4 Whole turmeric shall be graded according to its presentation (rhizomes, fingers, bulbs), its origin and its extraneous matter content.

4.2.14.5 Fingers, when sold separately, shall contain no more than 7 % (m/m) of pieces (rhizomes of length less than 15 mm and screenings of fragments), and no more than 5 % (m/m) of bulbs.

4.2.14.6 Ground turmeric shall be graded according to its particle size into two types, as follows:

a) coarse powder where 98 % of the product shall pass through a sieve of aperture size 500 µm; and

b) fine powder where 98 % of the product shall pass through a sieve of aperture size 300 µm.

4.2.14.7 The degree of fineness of grinding shall be determined by the method specified in ISO 3588.

4.2.14.8 Whole and ground turmeric shall conform to the requirements of specified in Table 21.

4.2.14.9 Whole and ground turmeric may be graded in accordance with its form, content of small pieces or bulbs, content of extraneous matter.

Table 21 - Chemical requirements for whole and ground turmeric

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Whole turmeric</th>
<th>Ground turmeric</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %</td>
<td>12.0 max</td>
<td>10.0 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash, %, dry basis</td>
<td>-</td>
<td>9.0 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble ash, % dry basis</td>
<td>-</td>
<td>1.5 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Colouring powder as curcuminoïds, %, dry basis</td>
<td>-</td>
<td>2.0 min</td>
<td>A.16</td>
</tr>
</tbody>
</table>

NOTE  Whole turmeric is ground before analysis so that all particles pass through a sieve with 0.5 mm apertures.

4.2.15 Thyme

4.2.15.1 Thyme shall be leaves of the plant Thymus vulgaris L.

NOTE  The leaves have a linear shape and their length varies from 1 mm to 5 mm. The leaves of dried thyme are ash green to brownish grey in colour according to their origin. The colour of the dried flower varies from purplish pink to brownish pink.

4.2.15.2 Ground thyme shall be prepared from thyme by grinding, with no added material.

4.2.15.3 Dried thyme shall have a characteristic odour and flavour, strong and aromatic varying according to the chemical strain, thymol thyme, or linalool thyme or thymol or carvacrol thyme.

NOTE  The characteristic odour becomes stronger when dried thyme is rubbed between the fingers.

4.2.15.4 Dried thyme shall be free from any foreign odour or flavour and especially from mustiness.

4.2.15.5 Dried thyme shall contain no more than 1 % of extraneous matter. The proportion of stalks which have dimensions exceeding 10 mm in length or 2 mm in diameter shall be no more than 5% (m/m).

4.2.15.6 Whole and ground thyme shall conform to the requirements specified in Table 22.
Table 22 - Chemical requirements for whole and ground thyme

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Dried thyme</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %</td>
<td>12 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash, %, dry basis</td>
<td>14 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble ash, % dry basis</td>
<td>3.5 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Volatile oil, ml/100g, dry basis</td>
<td>1.0 min</td>
<td>A.11</td>
</tr>
</tbody>
</table>

4.2.16 Bay leaves (Laurel leaves)

4.2.16.1 Bay leaves shall be the dried leaves of *Laurus nobilis* L., *Pimenta racemosa* and any other West Indian Bay Tree species.

4.2.16.2 Extraneous matter is all matter which does not constitute the bay leaf, in particular stems.

4.2.16.3 The odour of bay leaf shall be quite pleasant, strong and delicate at the same time, but it only emanates strongly when the leaf is crushed. The flavour is aromatic, mixed with bitterness and pungency. It shall be free from any extraneous odour, in particular mustiness.

4.2.16.4 Bay leaf shall be classified according to its country of production and the dimensions of its leaves.

4.2.16.5 Whole or ground bay leaves shall conform to the requirements specified in Table 23.

Table 23 - Chemical requirements for whole or ground Bay Leaves

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Requirement</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %</td>
<td>7.0 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Total ash, %, (m/m) dry basis</td>
<td>4.5 max</td>
<td>A.5</td>
</tr>
<tr>
<td>Acid-insoluble ash, %, dry basis</td>
<td>0.5 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Volatile oil, ml/100 g, dry basis</td>
<td>1 min.</td>
<td>A.11</td>
</tr>
</tbody>
</table>

4.2.17 Curry Powder

4.2.17.1 Curry powder shall be prepared by grinding and mixing clean, dry, wholesome spices and shall be in accordance with the following:

a) contain not less than 85 % by weight of spices;

b) ground so that all particles pass through a sieve with apertures of 0.05 mm; and

c) contain added salt and added food starch, where applicable.

4.2.17.2 Curry powder is permitted to include any of the spices listed below:

a) allspice;

b) fenugreek;

c) black cumin (mangril);

d) garlic;

e) black pepper;
f) ginger;
g) cardamom;
h) mustard seed;
i) cinnamon;
j) chillis, capsicums;
k) coriander;
l) turmeric;
m) cumin (geera);
n) fennel seed; or
o) other spices.

4.2.17.3 Curry powder shall be free from rancid or musty odours or flavours, dirt, mould, insects or parts of insects, or signs of contamination by rodents.

4.2.17.4 Preservatives, other than salt, or colouring matter is not permitted to be added to curry powder.

4.2.17.5 Curry powder shall conform to the requirements specified in Table 24.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Requirement</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture, %</td>
<td>10.0 max</td>
<td>A.4</td>
</tr>
<tr>
<td>Acid-insoluble ash, %, dry basis</td>
<td>1.0 max</td>
<td>A.6</td>
</tr>
<tr>
<td>Salt, %, dry basis</td>
<td>5.0 max</td>
<td>A.15</td>
</tr>
<tr>
<td>Volatile oils, ml/100g, dry basis</td>
<td>0.25 max</td>
<td>A.11</td>
</tr>
<tr>
<td>Non-volatile Ether extract, %, dry basis</td>
<td>7.5 min</td>
<td>A.10</td>
</tr>
<tr>
<td>Crude fibre % dry basis</td>
<td>15.0 min</td>
<td>A.12</td>
</tr>
</tbody>
</table>

4.2.17.6 Labels of retail packages of curry powder shall include a list of the spices used as ingredients, in descending order of proportion by weight.

4.2.18 Celery salt

Celery salt shall be prepared by grinding and mixing salt with the ground dried leaves and stalks of the celery plant, Apium graveolens L. and shall contain no more than 75 % by weight of salt. It is permitted to contain silicon dioxide as an anti-caking agent in an amount not exceeding 0.5 %.

4.2.19 Garlic salt

Garlic salt shall be prepared by grinding and mixing salt with the ground, dried bulbs of garlic, Allium sativum L. and shall contain no more than 75 % by weight of salt. It is permitted to contain one or more of the following anti-caking agents in a total amount not exceeding 2 %:

a) calcium aluminium silicate, calcium phosphate tribasic, calcium silicate, calcium stearate, magnesium carbonate, magnesium silicate, magnesium stearate; or
b) silicone dioxide in an amount not exceeding 1 % and sodium aluminium silicate.

4.2.20 Onion salt

Onion salt shall be prepared by grinding and mixing salt with dried onion, *Allium cepa* L. and shall contain no more than 75 % by weight of salt. It is permitted to contain one or more of the following anti-caking agents in a total amount not exceeding 2 %:

a) calcium aluminium silicate, calcium phosphate tribasic, calcium silicate, calcium stearate, magnesium carbonate, magnesium silicate, magnesium stearate; or

b) silicone dioxide in an amount not exceeding 1 % and sodium aluminium silicate.

4.2.21 Pepper salt

Pepper salt shall be prepared by grinding and mixing salt with place pepper, *Piper nigrum* and shall contain no more than 75 % by weight of salt.

4.3 Microbiological limits

4.3.1 Microbiological contamination is permitted to be reduced by treatment with ethylene oxide, propylene oxide and irradiation.

NOTE Spices commonly carry large numbers of bacteria and moulds. Conditions of handling after harvest often permit extensive contamination and microbial growth although drying with heat somewhat reduces microbial numbers. The predominating flora is generally composed of aerobic spore-forming bacteria. Non-spore-forming bacteria, indicator organisms, and pathogens may be found.

4.3.2 Microbiological contaminants shall conform to the following:

a) absence of *Salmonella* in at least 25 g of sample;

b) $10^5$/g absolute maximum Yeast and moulds; and

c) $10^2$/g absolute maximum *E. Coli*.

5 Requirements for sauces

5.1 General

5.1.1 Hot sauces shall be prepared from hot peppers or chilies (*Capsicum frutescens* L., *Capsicum annuum*, *Capsicum chinense*, *Capsicum pubescens* and *Capsicum baccatum*) together with other fruit or vegetable ingredients and spices. It is permitted to contain sugar, salt, vinegar and acetic acid. The hot sauce shall be treated with heat to ensure sterility.

5.1.2 Approved food grade preservatives are permitted to be added in proportions not exceeding standard Good Manufacturing Practices.

5.1.3 Approved thickening agents are permitted to be added in small amounts to prevent separation of solid ingredients on standing.

5.2 Hot sauce and pepper sauce

5.2.1 Hot sauce and pepper sauce shall:

a) contain not less than 2.5 % by weight of acid, expressed as acetic acid; and

b) have hydrogen ion concentration, expressed as pH, not exceeding 3.6 at 25 °C.
5.2.2 Where an ingredient adds a distinctive flavour to the hot sauce, it is permitted to be included as part of the common name together with the word ‘pepper’ e.g. Hot Lime and Pepper Sauce.

5.2.3 Hot sauce and pepper sauce are permitted to contain salt not to exceed 2.75 % by volume/weight.

5.3 Hot pepper sauce

5.3.1 Hot pepper sauce shall be prepared from fresh, clean, wholesome hot peppers or chilies (Capsicum frutescens L) with no other fruit or vegetable ingredients, which may have been naturally fermented or aged.

5.3.2 Hot pepper sauce shall:

a) contain not less than 2.5 % by weight of acid, expressed as acetic acid; and

b) have a hydrogen ion concentration, expressed as pH, not exceeding 3.6 at 25 ºC.

5.4 Hot pepper mash

5.4.1 Hot pepper mash shall be prepared from fresh, clean, wholesome hot peppers or chilies (Capsicum frutescens L, Capsicum annuum, Capsicum chinense, Capsicum pubescens and Capsicum baccatum) with no other fruit or vegetable ingredients, which may have been naturally fermented or aged.

5.4.2 Hot pepper mash shall contain a minimum of 60 % hot peppers by weight.

5.4.3 Hot pepper mash may:

a) contain a maximum of 35 % by weight of acetic acid; and

b) have a maximum of 5 % by weight of salt.

6 Hygiene during processing

6.1 Spices, spice salts and sauces shall be processed in accordance with the relevant sections of CRS 6: 2010 or as approved by the national competent authority.

6.2 Raw materials shall be inspected before processing and sorted before use.

6.3 Buildings shall be properly constructed, designed for ease of maintenance, cleaning, and pest control.

6.4 The factory shall operate an acceptable sanitation programme and maintain adequate sanitary facilities as recommended by the national competent authority.

6.5 Workers handling raw materials, processing equipment, or packaging of the product shall undergo an annual medical examination to determine whether they are fit and free from any communicable diseases that may contaminate the product.

6.6 Where raw materials for spices are fumigated to control insects, the fumigant shall be approved by the national competent authority and fumigation carried out with appropriate precautions.

7 Packaging

7.1 Retail containers shall be made of non-toxic materials that will not contaminate the product or affect its colour, aroma, flavour, or consistency, and shall be designed to withstand stresses that may occur during packing, handling, transport and storage.
7.2 Retail containers shall be made of materials that can resist deterioration or corrosion over a period of time exceeding the length of the shelf life of the product.

7.3 Plastic material used in packaging spices shall not absorb oils from the product.

7.4 Where metal containers are used, their internal surfaces shall be compatible with the product, and, if lacquered or coated, shall not release components of such coating into the product during the shelf life.

7.5 Retail containers shall be protected in transport and storage by suitable shipping cartons or containers.

7.6 Sauce shall be packed in retail containers while hot, and the closure put in place as soon as possible so that there is a hermetic seal, and a vacuum is produced in the head space.

8 Labelling requirements

The labelling on retail containers of spices, spice salts and sauces shall be:

a) legible;

b) clearly and prominently displayed;

c) in the official language(s) of the country in which the product is being sold; and

d) in accordance with the CRS 5.

9 Quality assurance

9.1 It is recommended that the manufacturer of the products that are included in this standard operates a quality assurance system approved by the national competent authority.

9.2 It is recommended that the products included in this standard be produced under an approved quality assurance system.

10 Sampling

10.1 Sampling of spices and spice salts

Sampling of spices and spice salts shall be carried out in accordance with ISO 948: 1980.

10.2 Sampling of sauces

Sampling of spices and spice salts shall be carried out in accordance with the recommendations of the national competent authority.

11 Test methods

11.1 The test methods recommended in Annex A shall be used to determine whether a sample from a lot conforms to the requirements of 4 or 5, as appropriate.

NOTE These recommended test methods may also be used in quality control, but other methods which are more rapid and of equal or comparable accuracy may be used.

11.2 The report of a test for any characteristic shall include a reference to the method used.

11.3 Where it is necessary to verify the levels of arsenic, copper, lead, or zinc in a product covered by this standard, test methods published by one of the following organisations shall be used:
b) International Union of Pure and Applied Chemistry, Latest Edition; or
c) FAO/WHO Codex Alimentarius Commission, Methods of Analysis- Volume 13.

12 Conformity

12.1 A lot or consignment sampled as stated in 10 shall be deemed to conform to the requirements of this standard if:

a) the tests results for each characteristic satisfy the requirements of 5 or 6 as appropriate;
b) inspection of retail containers shows that the labelling is in accordance with 9; and
c) reports of tests on samples taken within the past year show that the requirements for toxic elements are satisfied.

12.2 Spices, spice salts, and sauces produced under an approved quality assurance system shall be deemed to conform to this standard if:

a) test results on routine samples taken from production satisfy the requirements stated in 5 or 6;
b) there is evidence on file that the manufacturers of any food additives or ingredients have been certified; and
c) test results of samples of products taken within the past year show that the requirements for toxic elements are met.
Annex A  
(normative)

Test methods for the analysis of spices

A.1 The latest editions of the following test methods specified in Table A.1 are recommended for testing of spices.

Table A.1 — Test methods for the analysis of spices

<table>
<thead>
<tr>
<th>Test method</th>
<th>ISO</th>
<th>BS 4585</th>
<th>AOAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filth</td>
<td>1208</td>
<td>Part 14</td>
<td>-</td>
</tr>
<tr>
<td>Extraneous matter</td>
<td>927</td>
<td>Part 1</td>
<td>43.1.16 (18th Edition)</td>
</tr>
<tr>
<td>Defective</td>
<td>927</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Moisture</td>
<td>939</td>
<td>Part 2</td>
<td>43.1.04 (18th Edition)</td>
</tr>
<tr>
<td>Total ash</td>
<td>928</td>
<td>Part 3</td>
<td>43.1.05 (18th Edition)</td>
</tr>
<tr>
<td>Acid-insoluble ash</td>
<td>930</td>
<td>Part 9</td>
<td>43.1.05 (18th Edition)</td>
</tr>
<tr>
<td>Water-insoluble ash</td>
<td>929</td>
<td>Part 10</td>
<td>30.007</td>
</tr>
<tr>
<td>Cold water extract</td>
<td>941</td>
<td>Part 5</td>
<td>-</td>
</tr>
<tr>
<td>Ethanol extract</td>
<td>940</td>
<td>Part 4</td>
<td>43.1.09 (18th Edition)</td>
</tr>
<tr>
<td>Non-volatile ether extract</td>
<td>1108</td>
<td>Part 6</td>
<td>43.1.08 (18th Edition)</td>
</tr>
<tr>
<td>Volatile oil</td>
<td>6571</td>
<td>Part 15</td>
<td>43.1.14 (18th Edition)</td>
</tr>
<tr>
<td>Crude fibre</td>
<td>5498</td>
<td>-</td>
<td>43.1.12 (18th Edition)</td>
</tr>
<tr>
<td>Loss on heating</td>
<td>1003</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mass per litre</td>
<td>959-1, Annex B</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Salt content</td>
<td>Estimate Cl by titration with AgNO₃</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Colouring powder of turmeric</td>
<td>5566</td>
<td>Part 13</td>
<td>43.1.02 (18th Edition)</td>
</tr>
<tr>
<td>Piperine in pepper</td>
<td>5564</td>
<td>Part 12</td>
<td>43.1.17 (18th Edition)</td>
</tr>
<tr>
<td>Calcium content</td>
<td>1003, Annex A</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Starch content</td>
<td>-</td>
<td>-</td>
<td>43.1.11 (18th Edition)</td>
</tr>
</tbody>
</table>
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The Standards Council is the controlling body of the Bureau of Standards and is responsible for the policy and general administration of the Bureau.

The Council is appointed by the Minister in the manner provided for in the Standards Acts, the Council appoints committees for specific purposes.

The Standards Act, 1968 sets out the duties of the Council and the steps to be followed for the formulation of a standard.

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The following is an outline of the procedure which must be followed in the preparation of documents:

1. The preparation of standards documents is undertaken upon the Standards Council’s authorization. This may arise out of representations from national organizations or existing Bureau of Standards’ Committees or Bureau staff. If the project is approved it is referred to the appropriate sectional committee or if none exists a new committee is formed, or the project is allotted to Bureau staff.

2. If necessary, when the final draft of a standard is ready, the Council authorizes an approach to the Minister in order to obtain the formal concurrence of any other Minister who may be responsible for any area which the standard affects.

3. With the approval of the Standards Council, the draft document is made available for general public comments. All interested parties, by means of notice in the Press, are invited to comment. In addition copies are forwarded to those known to be interested in the subject.

4. The Committee considers all the comments received and recommends a final document to the Standards Council.

5. The Standards Council recommends the document to the Minister for publication.

6. The Minister approves the recommendation of the Standards Council.

7. The declaration of the standard is gazetted and copies placed for sale.

8. On the recommendation of the Standards Council the Minister may declare a standard to be compulsory.

9. Amendments to and revisions of standards normally require the same procedure as is applied to the preparation of the original standard.

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