<table>
<thead>
<tr>
<th>Spice</th>
<th>Dried herb</th>
<th>Dried bulb</th>
</tr>
</thead>
</table>

**Source of variation of genuine herbs and spices**

Review from ISO standards (International Organisation for Standardisation)

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### Product: Basil (Ocimum basilicum L.)

- **Cut**
  - **ISO 11163-1995**
  - Dried leaves collected before flowering of dried sweet basil
  - *Ocimum basilicum*
  - **Varieties/cultivars**
    - Main: Egypt
    - Others: USA, France
  - **Source of variation 1 (Varieties or Species)**
  - **Source of variation 2 (Origin)**
  - **Source of variation 3 (Extraneous (e.m.) & Foreign (f.m.) matters)**
    - Max 1% (e.m.+f.m.)
    - Max 3% (seeds & stems)
  - **Source of variation 4 (Grades and recipes)**
  - **Source of variation 5 (Chemical & physical parameters)**
    - Total ash, acid-insoluble ash, VO

### Product: Black Pepper (Piper nigrum L.)

- **Whole**
  - **ISO 959-1-1998**
  - Dried berries of *Piper nigrum* L.
  - Berry = regular berry, broken berries, light berry and pepper pinhead. According to the level of cleaning, there are max levels tolerated for the 3 of them
  - **Varieties/cultivars**
    - Main: Vietnam, Brazil, India, Indonesia
    - Others: Sri Lanka, Madagascar, China, Costa Rica
  - **Source of variation 1 (Varieties or Species)**
  - **Source of variation 2 (Origin)**
  - **Source of variation 3 (Extraneous (e.m.) & Foreign (f.m.) matters)**
    - Max 1.5% and 2.5% (e.m.) according to the level of cleaning (processed vs semi- or non-processed)
  - **Source of variation 4 (Grades and recipes)**
    - Grades according to the bulk density (depending mainly on the level of light berries)
    - Light berries, pinhead and broken berries, bulk density VO, piperine, total ash
  - **Source of variation 5 (Chemical & physical parameters)**
    - VO, piperine, total ash

### Product: White Pepper (Piper nigrum L.)

- **Whole**
  - **ISO 959-2-1998**
  - Berry of *Piper nigrum* L., from which the outer pericarp has been removed
  - **Varieties/cultivars**
    - Main: Vietnam, Brazil, Indonesia, China
    - Others: Cameroun, Malaysia
  - **Source of variation 1 (Varieties or Species)**
  - **Source of variation 2 (Origin)**
  - **Source of variation 3 (Extraneous (e.m.) & Foreign (f.m.) matters)**
    - Max 0.8% (e.m.) and 1.0% (f.m.) according to the level of cleaning (processed vs semi-processed)
    - Black and broken berries are not considered as extraneous matter
  - **Source of variation 4 (Grades and recipes)**
    - Grades according to the percentage of remaining black berries
    - Two ways to get whole white pepper by removing the outer pericarp of:
      - (a) whole dry berry of *Piper nigrum* L.
      - (b) whole ripe berry of *Piper nigrum* L.
  - **Source of variation 5 (Chemical & physical parameters)**
    - VO, piperine, total ash

### Product: Capsicums & Chilli (Capsicum spp)

- **Whole, ground**
  - **ISO 972-1997**
  - **Species and varieties/cultivars**
    - (pungency, dimensions, shape and colour vary widely)
    - Main: India, China
    - Others: Mexico, Eastern Africa
  - **Source of variation 1 (Varieties or Species)**
  - **Source of variation 2 (Origin)**
  - **Source of variation 3 (Extraneous (e.m.) & Foreign (f.m.) matters)**
    - Max 1% (e.m.+f.m.)
  - **Source of variation 4 (Grades and recipes)**
  - **Source of variation 5 (Chemical & physical parameters)**
    - Ground chillies and ground capsicums are the products obtained by grinding whole chillies and whole capsicums, respectively, without any added matter.
    - Mixtures of chillies and capsicums as blended powders are common
    - Total ash, acid-insoluble ash

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BASIL (Ocimum basilicum L.)

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<th>Source of variation 2 (Origin)</th>
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<th>Source of variation 4 (Grades and recipes)</th>
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<tbody>
<tr>
<td>BASIL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cut</td>
<td>ISO 11163-1</td>
<td>Dried leaves collected before flowering of dried sweet basil</td>
<td>Varieties/cultivars</td>
<td>Main: Egypt</td>
<td>Others: USA, France</td>
<td>Max 1% (e.m.+f.m.)</td>
<td>Max 3% (seeds &amp; stems)</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td></td>
<td></td>
<td></td>
<td>Teson</td>
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BLACK PEPPER (Piper nigrum L.)

<table>
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<tr>
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<th>Source of variation 4 (Grades and recipes)</th>
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</tr>
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<tbody>
<tr>
<td>whole</td>
<td>ISO 959-1-1</td>
<td>Dried berries of <em>Piper nigrum</em> L.</td>
<td>Varieties/cultivars</td>
<td>Main: Vietnam, Brazil, India, Indonesia</td>
<td>Others: Sri Lanka, Madagascar, China, Costa Rica</td>
<td>Max 1.5% and 2.5% (e.m.) according to the level of cleaning (processed vs semi- or non-processed)</td>
<td>Grades according to the bulk density (depending mainly on the level of light berries)</td>
</tr>
<tr>
<td></td>
<td>1998</td>
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<td></td>
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<th>Source of variation 5 (Chemical &amp; physical parameters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>whole</td>
<td>ISO 959-2-1</td>
<td>Ground black pepper berries without addition of foreign matters</td>
<td>Varieties/cultivars</td>
<td>Same as black pepper whole</td>
<td>&quot;It is recommended that a microscopic examination be carried out&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1998</td>
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</tr>
</thead>
<tbody>
<tr>
<td>whole</td>
<td>ISO 959-2-2</td>
<td>Berry of <em>Piper nigrum</em> L., from which the outer pericarp has been removed</td>
<td>Varieties/cultivars</td>
<td>Main: Vietnam, Brazil, Indonesia, China</td>
<td>Others: Cameroun, Malaysia</td>
<td>Max 0.8% (e.m.) and 1.0% (f.m.) according to the level of cleaning (processed vs semi-processed)</td>
<td></td>
</tr>
<tr>
<td></td>
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</thead>
<tbody>
<tr>
<td>ground</td>
<td>ISO 959-2-2</td>
<td>White black pepper berries without addition of foreign matters</td>
<td>Varieties/cultivars</td>
<td>Same as white pepper whole</td>
<td>-</td>
<td>Same as white pepper whole</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1998</td>
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CAPSICUMS & CHILLI (Capsicum spp)

<table>
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<th>Source of variation 1 (Varieties or Species)</th>
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<th>Source of variation 4 (Grades and recipes)</th>
<th>Source of variation 5 (Chemical &amp; physical parameters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>whole</td>
<td>ISO 972-1</td>
<td>Capsicum annuum L. and C. frutescens L., and their sub-species C. chinense, C. pubescens and C. pendulum in international trade and irrespectively of pungency, a rough differentiation is made between chillies and capsicums on purely size basis, varieties above 25 mm in length being considered a capsicum</td>
<td>Species and varieties/cultivars</td>
<td>Main: India, China</td>
<td>Others: Mexico, Eastern Africa</td>
<td>Max 1% (e.m.+f.m.)</td>
<td>Ground chillies and ground capsicums are the products obtained by grinding whole chillies and whole capsicums, respectively, without any added matter. Mixtures of chillies and capsicums as blended powders are common</td>
</tr>
<tr>
<td></td>
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## Working Group on Authenticity of Herbs and Spices

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<th>Source of variation 3</th>
<th>Source of variation 4</th>
<th>Source of variation 5</th>
</tr>
</thead>
</table>
| **Cassia**
(Cinnamomum spp)
(ground, quill, chip)
| ISO 6538 1997 | Chinese type cassia : bark of Cinnamomum cassia Indonesian type cassia : bark of Cinnamomum burmanii Vietnamese type cassia : bark of Cinnamomum loureirii Whole quills : scraped epidermis of the internal bark of mature cassia shoots rolled into a single or double quill Scraped bark : bark obtained from the young shoots scraped with a curved knife Unscraped bark : as above but unscraped Pieces : resulting from the trimming/sorting/handling/packing of quills, scraped or unscraped Ground cassia : powder obtained by grinding the various types described above excluding all additives | Species | Main : Indonesia, Vietnam, China | Exogenous matter in cinnamon includes leaves, stems, chaff and other vegetable matter together with sand, earth and dust : max 1% | Scraped or unscraped Small pieces, which may be scraped or unscraped, resulting from the trimming, sorting, handling and packing of the rolls. | Total ash, acid-insoluble ash, VO |
| **Cinnamon**
(Cinnamomum zeylanicum B.)
(ground, quill, chip)
| ISO 6539 2014 | Sri Lankan-type is dried bark of cultivated varieties of Cinnamomum zeylanicum B. under the following forms. Quill : scraped peel of inner bark of mature plantation cinnamon shoots joined together by overlaps whose hollow is filled with small pieces of the same peel Quilling : broken quill Feathering : obtained by peeling/scraping bark of small twigs and stalks Strip : dried unpeelable bark inclusive of the outer bark Ground : powder obtained by grinding the various types described above excluding all additives | Varieties/cultivars | Main : Sri Lanka Others : Madagascar, Seychelles | Exogenous matter in cinnamon includes leaves, stems, chaff and other vegetable matter together with sand, earth and dust : max 1% | Quill grades according to : foxing (occurrence of reddish-brown patches on the surface of the quills (may turn darker with time), diameter, length, broken | Total ash, acid-insoluble ash, VO |
| **Coriander**
(Coriandrum sativum L.)
(whole, ground)
| ISO 2255 1996 | Dried mature fruit of Coriandrum sativum L. Fruits spherical to elliptical | Varieties/cultivars | Main : Morocco, Ukraine, Eastern Europe, Egypt, India Others : Western Europe, China, Iran | Max 1.5% (e.m.+f.m.) for grade 1 Max 2% (e.m.+f.m.) for grade 2 Max 4% (e.m.+f.m.) for grade 3 | Grade as a function of split, damaged, discoloured, immature, shrivelled and weevilled fruits | Total ash, acid-insoluble ash, VO |
| **Cumino**
(Cuminum cyminum L.)
(whole, ground)
| ISO 6465 2009 | Fruits of Cuminum cyminum L. | - | Main : Turkey, Syria, India Others : Iran | Max 0.5% (e.m.) Max 1% (e.m.) for grade I Max 2% (e.m.) for grade II Max 3% (e.m.) for grade III | Grades according to level of extraneous matter level | Total ash, acid-insoluble ash, VO, non-volatile ether extract |
| **Garlic**
(Allium sativum L.)
(flake, slice, grit, ground)
<p>| ISO 5560 1997 | Dried cloves of garlic cultivars (Allium sativum L.) | Varieties/cultivars | Main : China Others : US | Max 0.5% (e.m. : skin and root) | No bleaching or precooking No grade described in ISO | Total ash, acid-insoluble ash, volatile organic sulfur compounds, cold-water-soluble extract |</p>
<table>
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<tr>
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<th>Source of variation 1: VARIETIES OR SPECIES (according to ISO)</th>
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<th>Source of variation 3: Extraneous (e.m.) &amp; foreign (f.m.) matters (according to ISO 934)</th>
<th>Source of variation 4: Grades and recipes (according to ISO)</th>
<th>Source of variation 5: Chemical &amp; physical parameters (according to ISO or ESA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GINGER</td>
<td>ISO 1003-2008</td>
<td>Dried, peeled or unpeeled rhizome of Zingiber officinale Roscoe, may be limed</td>
<td>Varieties/cultivars: Main: China, India, Nigeria, Indonesia. Others: Nepal, Bangladesh</td>
<td>Max 1% (e.m.)</td>
<td>Max 0.5% (f.m.)</td>
<td>-</td>
<td>Total ash, acid-insoluble ash, VO, calcium content</td>
</tr>
<tr>
<td>NUTMEG</td>
<td>ISO 6577-2002</td>
<td>Kernel of the dried ripe fruit of the nutmeg tree Myristica fragrans. Not applicable to Myristica argente. May be limed presenting a whitish surface colour</td>
<td>Varieties/cultivars: Main: Indonesia. Others: India, Sri Lanka, Zanzibar, West Indies.</td>
<td>Max 0.5% (e.m.+f.m.)</td>
<td>-</td>
<td>Whole sound nutmegs classified as a function of size (60/65, 80/85, 100/110, 110/120, 120/130 and 130/150 nut per pound). Sound shrivels (shrivelled but no insect attack). BWP or defectives.</td>
<td>Total ash, acid-insoluble ash, VO, calcium content</td>
</tr>
<tr>
<td>ONION</td>
<td>ISO 5559-1995</td>
<td>Dehydrated bulbs of any onion cultivars (Allium cepa L.) without any bleaching or precooking. Bulbs being practically free from soil, outer skins, stems, leaves and roots. Varieties/cultivars (white, yellow and red onions): Main: China. Others: India, USA, Turkey.</td>
<td>Varieties/cultivars: Main: China. Others: India, USA, Turkey.</td>
<td>Max 0.5% (white onion, extra)</td>
<td>Max 1% (yellow or red onion, extra)</td>
<td>Max 2% (yellow or red onion, 1)</td>
<td>Max 5% (yellow or red onion, 2)</td>
</tr>
<tr>
<td>OREGANO</td>
<td>ISO 7925-1995</td>
<td>Dried leaves of perennial Origanum genus (wild marjoram), species and sub-species (Lamiaceae family) excluding Origanum majorana (sweet marjoram), in the whole or ground form. Warning: &quot;oregano, Mexican type&quot; does not come from the Origanum genus, but from the Lippia genus.</td>
<td>Varieties/cultivars: Main: Turkey, Morocco, Mexico, Peru, Chile. Others: Italy, Greece, France.</td>
<td>Max 1% and 3% (e.m.) according to the level of cleaning (processed vs semi-processed). Broken stalk and other parts of the plant in the oregano below 3% Flowing tops shall not be considered as e.m.</td>
<td>-</td>
<td>VO, total ash, acid-insoluble ash</td>
<td></td>
</tr>
<tr>
<td>PAPRIKA</td>
<td>ISO 7540-2006</td>
<td>Ground paprika is the product obtained by grinding the ripe dried fruits of different varieties of Capsicum annuum. Varieties/cultivars: Main: China, Peru, Others: US, Spain, Hungary, Serbia, Israel, South Africa.</td>
<td>Varieties/cultivars: Main: China, Peru, Others: US, Spain, Hungary, Serbia, Israel, South Africa.</td>
<td>Extraneous matters and foreign matters measured by microscopic examination, specs as per agreement between buyer and seller. Prepared from pericarp and seeds of the fruit; may contain a variable amount of placenta, calyx and stalk. Additives (antioxidants, anti-caking agents, etc.) allowed if labeled in accordance with the regulations of the target country. Colour varies according to quality: 4 categories ranging from 60 to 120 asta.</td>
<td>-</td>
<td>Scoville (pungency), total ash, acid-insoluble ash, non-volatile other extract</td>
<td></td>
</tr>
<tr>
<td>SAFFRON</td>
<td>ISO 3632-2011</td>
<td>Filament: dried stigmas with a part of style of the Crocus sativus L. flower. Cut filament: styles removed. Saffron powder: filaments of the Crocus sativus L. flower.</td>
<td>Varieties/cultivars: Main: Iran. Others: Greece, Spain, Afghanistan, Morocco, India, Italy.</td>
<td>&quot;No matter added to natural product&quot;, No foreign matters from animals: Max 5%, 3% and 0.5% (e.m.) as per grade Max 1%; 0.5% and 0.1% (f.m.) as per grade</td>
<td>3 grades according to colour strength (expressed as crocin): I = 120 I = 170 II = 200</td>
<td>Total ash, acid-insoluble ash, cold-water-soluble extract, picrocrocin, safranal, crocin</td>
<td></td>
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<th>Source of variation 2 ORIGIN</th>
<th>Source of variation 3 Extraneous (e.m.) &amp; foreign (f.m.) matters (according to ISO 928)</th>
<th>Source of variation 4 Grades and recipes (according to ISO)</th>
<th>Source of variation 5 Chemical &amp; physical parameters (according to ISO or ESA)</th>
</tr>
</thead>
</table>
| star anise  
*Illicium verum* Hook) whole | ISO 11178 1995 | Dried mature fruit of *Illicium verum*  
Beware of contamination by *Illicium anisatum* (Japanese star anise) which is not edible | - | Main : China, Others : Vietnam, India | Max 2% (e.m.+f.m.)  
Max 3% stalks | Grades according to the percentage of broken and abnormal fruits | VO, total ash |
| thyme  
*Thymus vulgaris* L.) whole, cut, ground | ISO 6754 1996 | Dried leaves and flowers of *Thymus vulgaris* in the rubbed form | Chemotypes | Main : Poland, Turkey, Morocco, Egypt  
Others : Spain, France | Max 1% (f.m.) | - | VO, total ash, acid-insoluble ash |
| turmeric  
*Curcuma longa* L.) whole, ground | ISO 5562 1983 | Cured primary or secondary rhizomes, called commercially bulbs or fingers, of *Curcuma longa* L. | - | Main : India  
Others : China, Thailand, Indonesia | Foreign matters may be chaff, dried leaves, stones, particles of soil, dust and mud | Whole turmeric is graded according to its presentation (rhizomes, fingers or bulbs), its origin and its extraneous matter content. | Total ash, acid-insoluble ash, colouring power |

**NOTE**

ISO 927 - 2009 Determination of extraneous and foreign matter contents

Extraneous matters : all matter visible to the naked eye or with a maximum 10 times magnifying power that is not part of the plant to which the spice or herb belongs

Foreign matters : all matter visible to the naked eye or with a maximum 10 times magnifying power which are species waste belonging to the plant to which the spice or herb belongs