

**REGIONAL STANDARD FOR GINSENG PRODUCTS**(Asia<sup>1</sup>)**CODEX STAN 295R-2009****1. SCOPE**

- 1.1** This standard applies to the ginseng products as defined in Section 2 below and offered for direct consumption, including for catering purposes or for repacking if required. It does not apply to the product when indicated as being intended for further processing. This standard applies to ginseng products<sup>2</sup> used as a food or food ingredient and does not apply to products used for medicinal purposes.
- 1.2** This Standard applies only in those jurisdictions where products defined in 2.1 are regulated as foods.

**2. DESCRIPTION****2.1 PRODUCT DEFINITION**

The compulsory ingredient of ginseng product is fresh ginseng roots suitable to eating, derived from *Panax ginseng* C.A. Meyer and *P. quinquefolius* L., cultivated for commercial purposes and used for foods. Ginseng products should be packaged in such a manner as to safeguard the hygienic, nutritional, technological and organoleptic quality of the products.

**2.2 TYPES OF GINSENG PRODUCTS****2.2.1 Dried Ginseng****2.2.1.1 Dried Raw Ginseng**

*Dried Raw Ginseng* is manufactured when fresh ginseng roots are sun dried or hot air dried or dried using other recognized methods. The product may be classified into one of such product types that have the main root and/or lateral roots or that are powdered or sliced.

**2.2.1.2 Dried Steamed Ginseng**

*Dried Steamed Ginseng* is manufactured when fresh ginseng roots are prepared using the steaming method or other recognized methods, and dried. The product may be classified into one of such product types that have the main root and/or lateral roots or that are powdered or sliced.

**2.2.2 Ginseng Extract****2.2.2.1 Raw Ginseng Extract**

*Raw Ginseng Extract* is manufactured when soluble components of fresh ginseng roots or *Dried Raw Ginseng* are extracted, using water, ethanol or their mixture and then, they are filtered and concentrated. This product has a dark brown colour and a high viscosity when much of the water is removed from it. The product may be also presented as a powdered type through spray- or freeze-drying.

**2.2.2.2 Steamed Ginseng Extract**

*Steamed Ginseng Extract* is manufactured when soluble components of *Dried Steamed Ginseng* are extracted, using water, ethanol or their mixture and then, they are filtered and concentrated. This product has a dark brown colour and a high viscosity when much of the water is removed from it. The product may be also presented as a powdered type through spray- or freeze-drying.

**3. ESSENTIAL COMPOSITION AND QUALITY FACTORS****3.1 INGREDIENTS**

Fresh ginseng roots as defined in Section 2.1.

<sup>1</sup> Members of the Codex Alimentarius Commission in the Region of Asia are indicated on the Codex website at [http://www.codexalimentarius.net/web/members\\_area.jsp?lang=EN](http://www.codexalimentarius.net/web/members_area.jsp?lang=EN).

<sup>2</sup> Any health claims should comply with the Codex Guideleines for Use of Nutrition and Health Claims (CAC/GL 23-1997)

## 3.2 QUALITY FACTORS

Ginseng products shall have normal flavour, colour, taste and a ginsenoside pattern<sup>3</sup> unique to ginseng as well as be free from foreign matters.

### 3.2.1 Dried Ginseng

- |   |   |
|---|---|
| (a) Moisture:                           | no more than 14.0% (Powdered type: no more than 9.0%) |
| (b) Ash:                                | no more than 6.0%                                     |
| (c) Water-saturated 1-butanol extracts: | no less than 20 mg/g                                  |
| (d) Ginsenoside Rb <sub>1</sub> :       | to be identified                                      |

In addition, in case of the product manufactured from *P. ginseng* C.A. Meyer, ginsenoside Rf should be also identified.

### 3.2.2 Ginseng Extracts

#### 3.2.2.1 Ginseng Extracts (liquid form)

- |   |                      |
|---|----------------------|
| (a) Solids:                             | no less than 60.0%   |
| (b) Water-insoluble solids:             | no more than 3.0%    |
| (c) Water-saturated 1-butanol extracts: | no less than 70 mg/g |
| (d) Ginsenoside Rb <sub>1</sub> :       | to be identified     |

In addition, in case of the product manufactured from *P. ginseng* C.A. Meyer, ginsenoside Rf should be also identified.

#### 3.2.2.2 Ginseng Extracts (powdered form)

- |   |                      |
|---|----------------------|
| (a) Moisture:                           | no more than 8.0%    |
| (b) Water-insoluble solids:             | no more than 3.0%    |
| (c) Water-saturated 1-butanol extracts: | no less than 70 mg/g |
| (d) Ginsenoside Rb <sub>1</sub> :       | to be identified     |

In addition, in case of the product manufactured from *P. ginseng* C.A. Meyer, ginsenoside Rf should be also identified.

## 3.3 DEFINITION OF DEFECTS

The following defects shall be applied to the dried ginseng.

- Insect-damaged ginseng***: Ginseng that is visibly damaged by insects or contains dead insects
- Mouldy ginseng***: Ginseng that is visibly affected by mould

## 3.4 CLASSIFICATION OF "DEFECTIVES"

A container that fails to meet one or more of the applicable quality requirements, set out in Sections 3.2 and 3.3, shall be considered a "defective".

## 3.5 LOT ACCEPTANCE

A lot can be considered as meeting the applicable quality requirements referred to in Sections 3.2 and 3.3, when the number of "defectives", defined in Section 3.4, does not exceed the acceptance number (c) of the appropriate sampling plan.

<sup>3</sup> The unique constituents of ginseng are found to be a complex mixture of saponins often referred to as ginsenosides, and more than 30 ginsenosides are known. Ginsenoside Rb<sub>1</sub> or ginsenoside Rf is one of the major ginsenosides. Ginsenoside Rb<sub>1</sub> is identified in all ginseng species in quantities, while ginsenoside Rf is identified mainly in *Panax ginseng* C.A. Meyer.

#### **4. CONTAMINANTS**

The products covered by this Standard shall comply with the maximum levels of the *Codex General Standard for Contaminants and Toxins in Foods* (CODEX/STAN 193-1995).

The products covered by this Standard shall comply with the maximum residue limits for pesticides established by the Codex Alimentarius Commission.

#### **5. HYGIENE**

**5.1** It is recommended that the products covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice - General Principles of Food Hygiene* (CAC/RCP 1-1969), and other relevant Codex texts, such as Codes of Hygienic Practice and Codes of Practice.

**5.2** The products should comply with any microbiological criteria established in accordance with the *Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997).

#### **6. LABELLING**

The products covered by this Standard shall be labelled in accordance with the *Codex General Standard for the Labelling of Prepackaged Foods* (CODEX STAN 1-1985). In addition, the following specific provisions apply:

##### **6.1 NAME OF THE PRODUCT**

The name of the products defined in subsections 2.2.1.1, 2.2.1.2, 2.2.2.1 and 2.2.2.2 shall be “*Dried Raw Ginseng*”, “*Dried Steamed Ginseng*”, “*Raw Ginseng Extract*”, and “*Steamed Ginseng Extract*”, respectively. In this case, the products manufactured with *P. ginseng* C.A. Meyer can be named “*White Ginseng*”, “*Red Ginseng*”, “*White Ginseng Extract*”, and “*Red Ginseng Extract*”.

##### **6.2 NAME OF THE GINSENG SPECIES**

All ginseng products shall be labelled the scientific or common name of the ginseng that is used as raw material. The common names of the ginseng shall be declared in accordance with the law and custom of the country where the product is consumed, in a manner not to mislead the consumer.

##### **6.3 COUNTRY OF ORIGIN**

The country of origin of the product and/or raw material shall be declared if its omission is likely to mislead or deceive the consumer.

##### **6.4 LABELLING OF NON-RETAIL CONTAINERS**

Information about non-retail containers shall be given on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer, packer or distributor, as well as storage instructions, shall appear on the container. However, lot identification, and the name and address of the manufacturer, packer or distributor may be replaced by an identification mark, provided that such a mark is clearly shown in the accompanying documents.

##### **6.5 OTHER LABELLING REQUIREMENTS**

Except when otherwise specified by national legislation, the products should have a clear marking to indicate that they are not intended for medicinal purposes, including other labelling(s) stipulated by any country where ginseng products are distributed.

#### **7. METHODS OF ANALYSIS AND SAMPLING**

##### **7.1 DETERMINATION OF MOISTURE**

According to AOAC 925.45.

##### **7.2 DETERMINATION OF SOLID**

According to AOAC 925.45 and calculated by subtracting the content of water from 100%.

**7.3 DETERMINATION OF ASH**

According to AOAC 923.03.

**7.4 DETERMINATION OF WATER-INSOLUBLE SOLIDS**

According to the method described in Annex A.

**7.5 DETERMINATION OF WATER-SATURATED 1-BUTANOL EXTRACTS**

According to the method described in Annex B.

**7.6 IDENTIFICATION OF GINSENOSES  $Rb_1$  AND  $Rf$**

According to the method described in Annex C.

**Annex A****Determination of Water-insoluble Solid Content**

Place ca 1 g sample in 25 ml centrifugal tube with constant weight. Add 15 ml of distilled water and dissolve the sample. Centrifuge for 15 min at 3000 rpm and discard supernatant. Repeat twice this centrifugation. Dry centrifugal tube and residue to constant weight at 105°C. Report results in percent.

$$\text{water-insoluble solid content (\%)} = (W_1 - W_0) / S \times 100$$

S: weight of sample (g)

W<sub>1</sub>: weight of centrifugal tube and residue after drying (g)

W<sub>0</sub>: weight of centrifugal tube (g)

\* The method mentioned in Annex A is stipulated in the Korean Food Standards Law and modifies the "AOAC Official Method 950.66."

**Annex B****Determination of water-saturated 1-butanol extracts****1. Preparation of water-saturated 1-butanol**

Mix 1-butanol with water in separatory funnel in the ratio of 70:30 and shake it vigorously. Let stand until the upper and lower phases are separated. Discard lower layer (water layer).

**2. Analysis method****2.1 Dried ginseng**

Weigh ca 5 g test portion, ground to pass 80 mesh or finer sieve, into 250 ml erlenmeyer flask and reflux with 50 ml water saturated 1-butanol on a water bath at 80°C for 1 hour. Decant 1-butanol into another 250 ml erlenmeyer flask. Repeat twice the above extraction. Combine the solvent and filter into a 250 ml separatory funnel. Add 50 ml of distilled water. Shake and stand until the upper and lower layer are separated completely into two layers. Collect 1-butanol layer (upper layer) in an evaporation flask, vacuum-evaporate to dryness. Add 50 ml of diethyl ether, re-flux it on a water bath approximately at 46°C for 30 minutes, and decant the diethyl ether. Dry flask and contents to constant weight at 105°C. Report increase in weight flask as "1-butanol extracts in ginseng". Express the result as mg per gram on dried ginseng.

$$\text{water-saturated 1-butanol extracts (mg/g)} = (A-B) / S$$

S: weight of sample (g)

A: weight of flask after concentrating and drying extracts (mg)

B: weight of flask (mg)

**2.2 Ginseng extract (including a powered type)**

Place 1~2 g sample in 250 ml erlenmeyer flask, dissolve in 60ml water and transfer into separating funnel. Add 60ml of diethyl ether. Shake and stand until the upper and lower layer are separated. Collect lower layer and extract with 60 ml water saturated 1-butanol for three times. Combine the solvent into a 250 ml separatory funnel. Add 50 ml of distilled water. Shake and stand until the upper and lower layers are separated completely into two layers. Collect 1-butanol layer (upper layer) in an evaporation flask with constant weight, vacuum-evaporate to dryness. Dry flask and contents to constant weight at 105°C. Report increase in weight flask as "1-butanol extracts in ginseng extract". Express the result as mg per gram on ginseng extract.

**References**

1. Planta Medica, Vol. 25, pp 194-202, 1974
2. Chem. Pharm Bull., Vol. 14, pp 595-600, 1966
3. Korean J. Ginseng Sci., Vol. 10(2), pp 193-199, 1986

## Annex C

**Identification of ginsenosides Rb<sub>1</sub> and Rf**

Ginsenosides in ginseng products can be identified either by thin layer chromatography (TLC) or high performance liquid chromatography (HPLC).

**1. Preparation of sample solution**

Dilute the dried 1-butanol extract of Annex B with ten-fold volume of methanol, dissolve completely, and filter through 0.45 µm membrane filter.

**2. Preparation of standard solution**

Dissolve standard ginsenosides, such as ginsenoside-Rb1 and -Rf, in methanol to make a 1% solution and filter through 0.45 µm membrane filter.

**3. Identification****3.1 Thin layer chromatography**

Spot 2-5 µl of the standard and sample solutions, as indicated in the above, on TLC plate (silica gel), previously dried at 110°C for 15 minutes in dry oven. Develop with an upper solution of 1-butanol:ethylacetate:water (5:1:4, v/v/v) or a lower solution of chloroform:methanol:water (65:35:10, v/v/v). Spray 10% sulfuric acid or 30% sulfuric acid-ethanol solution over TLC plate and oven dry it at 110°C for 5-10 minutes to reveal its colour. Identify the ginsenosides of Ginseng products by comparing the Rf values and colours with those of standard ginsenosides.

**3.2 High performance liquid chromatography**

Prepare standard and sample solutions, as indicated in the above. Analyze ginsenoside with HPLC depending upon the operating condition. Identify ginsenosides of sample by comparing retention times of peaks with those of the standard.

**<Operating condition>**

*Column:* NH<sub>2</sub> column, µ-Bondapak C18 column, carbohydrate analyzing column or equivalent

*Detector:* UV (203 nm) or ELSD

*Eluent:* UV: acetonitrile: water (30:70, v/v)

ELSD: acetonitrile: water: isopropanol (94.9:5.0:0.1, v/v/v)

*Flow rate:* 1.0 ml/min ~ 2.0 ml/min

**References**

1. Journal of Chromatography, Vol. 921, Issue 2, 2001, pp 335-339
2. Journal of Chromatography, Vol. 868, Issue 2, 2000, pp 269-276
3. Journal of Chromatography, Vol. 356, 1986, pp 212-219
4. Journal of Chromatography, Vol. 499, 1990, pp 453-462
5. Planta Medica, Vol. 212, Issue 1, 1981, pp 37-49
6. J. Pharm. Soc. Korea, 23(3,4), 1979, pp181-186