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Herbal and Fruit infusions- Specification

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Agriculture and Food Authority- Tea Directorate
Ministry of Health — Food Safety Unit
Government Chemist's Department
Melvin Mash International Ltd
Unilever Tea Kenya Ltd
Kenya Plant Health inspectorate Service
James Finlay (Kenya) Limited
Kenya Agricultural and Livestock organization -Tea Research Institute
Ministry of industry, Trade and cooperatives
Ministry of Agriculture, Livestock and Fisheries
Kenya Tea Development Agency Ltd
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Consumer Information Network
Gold crown beverages-Kenya LTD
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Herbal and Fruit infusions- Specification

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Foreword

This Kenya Standard was prepared by Tea Technical Committee under the guidance of the Standards Project Committee in accordance with the procedures of the Kenya Bureau of Standards.

Herbal and fruit infusions are consumed not only as traditional herbal and fruit infusions, but increasingly also as preparations from herbal and fruit infusions and ingredients of other foodstuffs, such as herbal and fruit ice tea, instant preparations or concentrates from herbal and fruit infusions.

Consumption of Herbal and fruit infusions in Kenya has become popular beverages in the market. Their popularity reflects increasing consumer appreciation for the wide range of natural and refreshing tastes they offer and also due to its health and sensory properties. There is therefore need to have a standard that provides common understanding of what herbal and fruit infusions are; to promote free trade in the world market; to improve consumer's knowledge about these products; and to guide the manufacturers and traders respectively on safety and quality during production and importation of the Herbal and fruit infusions.

The standard stipulates the essential compositional, physical and chemical properties, contaminants and microbiological and labelling requirements. .

In the preparation of this standard useful information were derived from various sources mainly the local manufacturers and members of the technical committee.

During the preparation of this standard, reference was also made to the following documents:

- Guidelines for tea, herbal tea, extracts thereof and preparations, 1989, Translation by German Tea Association and German Herbal Infusions Association
- Guidelines for Herbal Tea and Fruit Infusions 2014, by European Herbal Infusions Association

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Herbal and Fruit infusions- Specification

1 Scope

This Kenya standard specifies requirements and methods of analysis and sampling for of herbal and fruit infusions. Any use for medicinal purposes is not within the scope of this standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CAC/GL 1-1979, General Guidelines on Claims
CAC/GL 2-1985; Guidelines on Nutrition Labelling
CAC/GL 23-1997; Guidelines for Use of Nutrition and Health Claims
CODEX STAN 193-19995); General Standard for contaminants and Toxins in Food and Feed
CODEX STAN 234-1999 Recommended Methods of Analysis and Sampling
KS ISO 1573; Tea – Determination of loss in mass at 103°C
KS ISO 1575; Tea – Determination of total ash
KS ISO 1577; Tea – Determination of acid-insoluble ash
KS ISO 6571; Spices, condiments and herbs – Determination of volatile oil content
KS ISO 948; Spices and condiments-sampling
KS ISO 927; Spices and condiments – Determination of extraneous matter content
KS ISO 1572; Tea – Preparation of ground sample of known dry matter content
(Total Ash)
KS ISO 2825; Spices and condiments – Preparation of a ground sample for analysis (HCL – Ash; Volatile Oil)
CAC/GL 21-1997; Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods
CODEX STAN 1-1985; General standard for the labeling of pre-packaged foods
KS ISO 4833-1:2013); Microbiology of the food chain – Horizontal method for the enumeration of microorganisms – Part 1: Colony count at 30 degrees C by the pour plate technique
KS ISO 4833-2:2013 and KS ISO 4833-2:2013/Cor 1:2014); Microbiology of the food chain – Horizontal method for the enumeration of microorganisms – Part 2: Colony count at 30 degrees C by the surface plating technique
KS ISO 21527-2:2008 Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of yeasts and moulds – Part 2: Colony count technique in products with water activity less than or equal to 0.95
KS ISO 16649-1:2001; Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of beta-glucuronidase-positive Escherichia coli – Part 1: Colony-count technique at 44 degrees C using membranes and 5-bromo-4-chloro-3-indolyl beta-D-glucuronide)
KS ISO 16649-2:2001); Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of beta glucuronidase-positive Escherichia coli – Part 2: Colony-count technique at 44 degrees C using 5-bromo-4-chloro-3-indolyl beta-D-glucuronide
KS ISO/DIS 6579-1:2014; Microbiology of the food chain -- Horizontal method for the detection, enumeration and serotyping of Salmonella -- Part 1: Horizontal method for the detection of Salmonella spp.
KS ISO 21528-2:2004; Microbiology of food and animal feeding stuffs – Horizontal methods for the detection and enumeration of Enterobacteriaceae – Part 2: Colony – count method

3 Terms and definitions

3.1 Foreign Matter

any material which is not from the intended plants, flavour used or fragments of plants e.g. sand, stones, metallic chips and any organic matter

3.2 Flavoured tea

tea to which fragrance and/or flavouring substances are added in order to lend a specific flavour.

3.3 Herbal and fruit infusions (HFI)

Infusions made from parts of plants (roots, flowers, leaves, barks, fruits, seeds or twigs) which do not originate from *Camellia sinensis* (L.) O. Kuntze and which are intended for the same use as tea.

Herbal and fruit infusions are also blends of herbal material with tea which do not fall under the category „flavoured tea“.

3.4 Flavoured herbal and fruit infusions

Herbal and fruit infusions to which fragrance and/or flavouring substances are added in order to lend a specific flavour

3.5 Extracts from herbal and fruit infusions

Watery extracts of herbal infusions which have been dehydrated

3.6 Flavoured extracts from herbal and fruit infusions

Extracts from herbal infusions and fruit to which fragrance and/or flavouring substances are added in order to lend a specific flavour.

4. Description

4.1. Product description

Herbal and Fruit infusions are parts of plants which do not originate from the tea plant (*Camellia sinensis* (L.) O. Kuntze) and which are intended for the same use as tea. They may include blends of herbal, spices and fruit infusions with tea as a minor component and are intended for food use by brewing with freshly boiling water. Flavourings and/or food ingredients with flavouring properties can be added in order to lend a specific flavour.

4.2. Type of Herbal and fruit /infusions Products

The commonly used cuts/types of the products shall be as indicated (**Annex I and II**). However, the list is not exhaustive

4.3. Infusion/sensory infusion:

The standard procedure for preparation of infusion liquors for sensory evaluation shall be as in **annex III**

5. Essential composition and quality requirements

5.1. Raw materials for herbal and fruit infusions

The Common ingredients for herbal and fruit infusion shall be as described in **annex 11**

5.2 Specific properties for common herbal infusions

Herbal infusions which are sold under the following denominations consist of those parts of plants listed after the names.

5.2.1 Stinging nettle infusions, stinging nettle

Dried leaves whole or crushed, and parts of the top shoots of *Urtica dioica* L. occasionally also from *Urtica urens* L. from the stinging nettle family (*Urtica* spec.)

5.2.2 Fennel infusions, fennel

Dried fruit, usually separated into two halves, whole or crushed, of *Foeniculum vulgare* Mill. Ssp. *Vulgare* from the umbellifer family, often containing parts of stamen, stem and carpophor.

5.2.3 Rose-hip infusions, rose-hip

Peel of rose-hips, whole or crushed, consisting of the dried cupule of the spurious fruit of various types of the species *Rosa* L. belonging to the rose-tree family (*Rosaceae*), predominantly without the short hairs found at the base of the fruit, and with no more than a 10% proportion of small fruits.

5.2.4 Hibiscus blossom infusions, hibiscus blossoms, hibiscus

Dried calyx and outer calyx of *Hibiscus sabdariffa* L. belonging to the mallow family (*Malvaceae*), whole or crushed, harvested when the fruit is developed.

5.2.5 Camomile infusions, camomile

Dried flowers of *Matricaria recutita* L. (*Chamomilla recutita* (L.) Rauschert), whole or crushed, belonging to the *Compositae* or *Asteraceae* family, with a technically unavoidable proportion of other overground plant parts.

5.2.6 Spearmint infusions, spearmint

Whole or crushed top shoots of the variety *Mentha spicata* L. var. *Crispa* belonging to the Labiate flower family (*Lamiaceae*).

5.1.2.7 Lemon grass infusions, lemon grass, citron grass tea, citron grass

Dried leaves, whole or crushed, of *Cymbopogon flexuosus* W. Watson and other types of *Cymbopogon* belonging to the grass family (*Poaceae*).

5.2.8. Lime blossom infusions, lime blossom

Dried pedicles (top leaves and blossoms), whole or crushed, of *Tilia cordata* Miller, *Tilia platyphyllos* Scop and/or other types of *Tilia* belonging to the Linden plant family (*Tiliaceae*).

5.2.9 Mate, Paraguay infusions

Dried and crushed leaves and parts of shoots, toasted or untoasted, from the top shoots of of the Mate tree *Ilex paraguariensis* St. Hil belonging to the Holly family (*Aquifoliaceae*).

5.2.10 Lemon balm infusions, lemon balm

Dried leaves, whole or crushed, and parts of the top shoots of *Melisse officinalis* L. belonging to the Labiate flower family (*Lamiaceae*).

5.2.11 Orange leaf infusions, orange leaves

Dried leaves and stems, whole or crushed, of certain varieties of *Citrus aurantium* L. belonging to the Rue family (*Rutaceae*).

5.2.12 Orange blossom infusions, orange blossoms

Dried buds and petals, whole or crushed, of certain varieties of *Citrus aurantium* L. belonging to the Rue family (*Rutaceae*).

5.2.13 Peppermint infusions, peppermint

Dried leaves, whole or crushed, and parts of the top shoots of varieties of *Mentha(x) Piperita* L. belonging to the Labiate flower family (*Lamiaceae*).

5.2.14 Verbena infusions, verbena, lemon verbena infusions

Dried leaves, whole or crushed, and top shoots of *Aloysia triphylla* (L'Hérit.) Britt. syn. *Lippia triphylla* (L'Hérit.) O. Kuntze, syn. *Lippia citriodora* (Lam.) H.B.K., syn. *Verbena triphylla* L'Hérit belonging to the *Herba Verbenae* family (*Verbenaceae*)

5.1.2. Other permitted ingredients

In addition to Herbal and fruit infusions, Flavoured Herbal and Fruit infusions shall consist of:

- a) Flavorings and food ingredients with flavouring properties which are natural and nature identical fragrance or taste (e.g. juice, juice concentrate).

Note: flavourings shall not be used for the purpose of imitating or intensifying the fragrance and/or taste of any particular herbal and fruit infusions product which is marketed as such (e.g. peppermint infusion)

- b) Fruit juices (5) up to 15 g per 100 g of herbal infusion, or corresponding proportions of concentrated or dried fruit juices
- c) Food additives, if used, shall be in accordance with the Codex GSFA

5.2 Quality criteria

Herbal and fruit /infusions shall;

Have similar characteristic colour, aroma and flavour from kind of herbal/fruit from which it is made.

- a) Free of off flavours and odours,
- b) The infusions shall be clean and reasonably free from extraneous matter and shall not be adulterated.
- c) The infusions shall produce a liquor of characteristic flavour.
- d) The raw materials from which the herbal and fruit infusion (HFI) is made shall conform to the relevant Kenya standards.
- e) Herbal and fruit infusions, flavoured herbal and fruit infusions, herbal extracts and preparations there of shall be virtually free of vegetative forms of mould and foreign matters.

5.3 Compositional requirement

Table 1: showing the compositional requirements for Herbal infusions

Commercial description	Acid insoluble ash % of dry mass, %	Loss of mass (moisture content), max, %
Herbal infusions		
Nettle	5.0	14
Fennel	2.5	12
Rose-hip	1.5	14
Hibiscus blossom	2.5	15
Camomile	2.5	13
Spearmint	2.5	13
Lemon grass	5.0	11
Lime blossom	2.5	13
Mate	1.0	10
Lemon balm	2.5	13
Orange blossom	2.5	12
Orange leaf	3.0	12
Peppermint	2.5	13
Verbena	3.5	12

Requirements for fruit infusions

Table 2: showing the compositional requirements for Fruit infusions

Product	Max. Acid insoluble ash % d.m.	Max. loss on drying %	Min. essential oil % d.m
Apple (fruits)	1.0	13.0	
Camomile (flowers)	2.5	13.0	0.2
Fennel (fruits)	2.5	12.0	1.0
Hibiscus (flowers)	2.5	15.0	
Honey bush (Herb)	1.0	11.0	
Lemon balm (leaves)	2.5	14.0	
Lemon grass (herb)	5.0	11.0	
Lemon verbena (herb)	3.5	12.0	0.15
Lime , linden (flowers)	2.5	13.0	
Liquorice (roots)	2.0	12.0	
Mate (leaves)	1.0	10.0	
Nettle (herb)	5.0	14.0	
Peppermint (leaves)	2.5	14.0	0.6
Rooibos (herb)	2.0	12.0	
Rooibos, green herb	2.0	12.0	
Rose hip (fruits)	1.5	14.0	
Sage(leaves)	2.0	14.0	
Spearmint (leaves)	2.5	13.0	0.6
Sweet orange (flowers)	2.5	12.0	
Sweet orange (leaves)	3.0	12.0	
METHODS OF	KS ISO 1577:1984	KS ISO 1573:1980	KS ISO 6571:1984

ANALYSIS			
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Notes:

Extracts from herbal infusions, flavoured extracts from herbal infusions and preparations from foodstuffs using tea extracts and using extracts from herbal infusions have a mass loss of no more than 8 percent.

The content of acid insoluble ash in the dry mass of tea and herbal infusions is an indicator of whether the plant fragments in question are contaminated or adulterated with mineral substances such as earth or sand in excess of the technically unavoidable limit.

The mass loss through heating under define conditions of analysis is an indicator for the content of water, volatile oil and /or other volatile components.

-In case of a blend the limits have to be calculated on the basis of the percentage of the composition

-Flavorings and additional food ingredients have to be taken into consideration

6 CONTAMINANTS

6.1 The products covered by this standard shall comply with maximum levels of the Codex General standard for contaminants and toxins in Food and feed (CODEX STAN 193-1995)

6.2 Pesticides

The products covered by this standard shall comply with maximum residue limits for pesticides established by the Codex Alimentarius Commission in the Codex General standard for contaminants and toxins in Food and feed (CODEX STAN 193-1995)

Table 3: showing the Maximum Pesticide residue limits for Herbal and Fruit infusions

Pesticide	MRL	Method of Analysis
<u>Azoxystrobin</u>	300 mg/Kg	
<u>Bromide Ion</u>	400 mg/Kg	
<u>Cyprodinil</u>	300 mg/Kg	
<u>Fludioxonil</u>	60 mg/kg	

6.3 Heavy Metals

Heavy metal contaminants, if present, shall comply with the limits specified in Table 2.

Table 4 — showing the Heavy Metals limits for Herbal and Fruit infusions

	parameter	Limits	Test method
i)	Cadmium (Cd) max.	1.0 mg/ kg	AOAC 942.17
ii)	Lead (Pb) max.sum) max.	5.0 mg/ kg	AOAC 942.17

6.4 Mycotoxins

The maximum content of aflatoxins in HFI when determined in accordance with the method described in KS ISO 16050 shall be as shown in table

Table 5: showing the Maximum aflatoxin residue limits for Herbal and Fruit infusions

	parameter	Limits	Test method
i)	Aflatoxin B1 max.	2 µg/ kg	AOAC

ii)	Aflatoxin B1, B2, G1, G2 (assum) max.	4 µg/ kg	AOAC
iii)	Ochratoxin A	20 µg/ kg	AOAC

7 HYGIENE

7.1 The Products covered by the provisions of this standard shall be prepared and handled in accordance with the appropriate sections of the General Principles of food hygiene (CAC/RCP 1-1969), and other relevant Codex texts, such as codes of hygienic practice and codes of practice

7.2 The products shall comply with any microbiological criteria established in accordance with the principles and Guidelines for the Establishment and Application of Microbiological criteria related to foods (CAC/GL 21-1997)

7.3 Herbal and fruit infusions products shall comply with microbiological requirements in Table 6

Table 6: Microbiological Limits for herbal and fruit infusions

	Type of micro-organism	Limits (Raw materials)	Limits (Dry Herbal Infusion)	Test method
	Aerobic plate count per gram	10 ⁸	10 ⁷	KS ISO 4833
i)	Yeasts max. per g	10 ⁶	10 ⁵	KS ISO 7954
ii)	moulds, max. per g	10 ⁶	10 ⁵	KS ISO 7954
vi)	<i>E. Coli</i> max. per g	10 ⁴	10 ³	KS ISO 6391
V)	<i>Salmonella</i> per 125g	Absent	Absent	KS ISO 6579

8 PACKAGING

HFI shall be packaged in food grade materials that will safeguard the hygienic, nutritional and organoleptic qualities of the product. The packaging materials shall comply with the legislation requirements of the Kenya standards.

9 LABELLING

In addition to (CODEX STAN 1-1985) General standard for the labeling of pre-packaged foods, the following specific provisions shall apply.

9.1 Name of the Product

9.1.1 HFI shall be denominated by the name of the type of the plant or part of the plant used, also in combination with the word infusion, if the product in question derives from a single plant type, for instance peppermint or peppermint /infusion, or if it is manufactured from two types of plants, for instance rose hip with hibiscus or rose hip infusion with hibiscus.

9.1.2 If HFI are manufactured from several types of plants, generic terms are also used in combination with the word infusion, for instance herbal, fruit or herbal infusion.

9.1.3 If one type of plant - except tea - accounts for a considerable percentage of the total weight and determines the character of the product, it is possible to name the herb or fruit infusion after this plant or combination thereof.

9.1.4 If tea is also used and the presence of tea is emphasized, the tea content is stated in percentage of the product.

9.1.5 Flavoured Herbal and fruit infusions shall be denominated like herbal infusions, indicating in addition that they are flavoured, for instance herbal infusion, flavoured or fruit infusion, flavoured. An indication of the flavour is given, for instance flavoured herbal infusion - black currant or Blackcurrant flavor or blackcurrant and blueberry flavor infusion if more than one flavourant is used.

9.1.7 Extracts of herbal and fruit infusions shall be denominated by the name of the type of plant, or parts of plant used in combination with the words extract of... or ...-extract, if the extract in question derives from a single type of plant, for instance extract of Peppermint or peppermint extract, or if it is manufactured from two types of plants, for instance rose-hip / hibiscus extract. If such extracts are manufactured from several types of plants, generic terms are used in combination with the words extract of ... or.... Extract. If one type of plant – with the exception of tea – accounts for more than half the total, and determines the character, the extract is named after this type of plant in combination or thereof. Improved solubility in cold water can be indicated by the additional use of the term “soluble in cold water”.

9.1.8 Flavoured extracts of herbal and fruit infusions shall be denominated like extracts of herbal infusions, indicating in addition that they are flavoured, for instance flavoured extract of balm-mint or extract of balm-mint, flavoured.

The flavour is indicated, for instance flavoured extract of peppermint – lemon

Improved solubility in cold water can be indicated by the additional use of the term “soluble in cold water”.

10.1 Nutrition declaration - Any added essential nutrients declaration should be labelled in accordance with the Guidelines on Nutrition Labelling (CAC/GL 2-1985), General Guidelines on Claims (CAC/GL 1-1979) and the CAC/GL 23-1997; Guidelines for Use of Nutrition and Health Claims

10.2 Pictorial representations

Pictorial representation or graphics shall match the product. This means that e.g. pictorials can be placed on the package to represent the appropriate flavours, if they are properly labelled in the product. A pictorial representation of the herbs or fruit(s) on the label should not mislead the consumer with respect to the herb or fruit so illustrated.

10.3 brand name/trade name

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

10.5 List of Ingredients — a complete list of ingredients shall be declared on the label in descending order of proportion.

10.6 Net Contents — the net contents shall be declared by in metric units (*Systeme Internationale*).

10.7 Name or business name and Address of the manufacturer, packager, distributor, importer, exporter or vendor of the product, whichever may apply, shall be declared.

- 10.9 Instructions for use shall be declared**
- 10.10 Storage conditions or conditions for use**
- 10.11 Place/country of manufacture**
- 10.12 Date of manufacture and expiry**
- 10.13 Irradiation status, where applicable**
- 10.14 GMO status, where applicable**
- 10.15 Allergenic Status, where applicable**

11 Methods of Analysis and Sampling

The methods of sampling and analysis shall be those provided in the normative references listed in Clause 2 of this standard.

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ANNEX I: Types of Herbal and Fruit infusions

Category	Whole product	Coarse cut, square cut	Fine cut, coarse	Fine cut, fine	Granulated material	Liquid extract	Dry extract	Dry instant preparation	Dry instant preparation
Raw Materials	Dry HFI materials	Dry HFI materials	Dry HFI materials	Dry HFI materials	Dry HFI materials	Extract from HFI, additional ingredients possible	Extract from HFI, additional ingredients possible (e.g. carriers)	Extract from HFI, additional ingredients possible	Extract from HFI, additional ingredients possible
Particle size	Product dependent	2-15 mm	0.3-6 mm	0.2-2 mm	0.2-4 mm	Solution, dispersion	Depends on product and process	Depends on product and process	Solution
Application	Loose pack	Loose pack and tea bag	Tea bag	Tea bag	Tea bag	Various food preparations	Various food preparations	Instant products Instant beverages	Ready drink product liquid concentrate
Example	Peppermint leaf	Coarsely cut peppermint leaf	Finely cut peppermint leaf	Finely cut peppermint leaf	Peppermint leaf mechanically compressed	Paste-like peppermint extract	Powdered peppermint extract prepared by drying a paste-like peppermint extract	Instant preparations to be dissolved in water for the preparation of a peppermint tea drink	Bottled ready-to-drink peppermint tea drink

ANNEX II: The Common ingredients for herbal and fruit infusion

ANISE (fruits) shall consist of the ca. 2 mm long, greyish to greyish brown, finely ridged and finely pubescent, obpyriform and laterally somewhat compressed stalked cremocarps from *Pimpinella anisum* L. The mericarps have five more or less straight ridges. The odour is reminiscent of anethole, the taste is sweetish and aromatic (aniseed-like).

APPLE (fruits) shall consist of small pieces of the whole dried fruit from the genus *Malus*, especially domesticated apple (*Malus domestica* Borkh.) and crab apple (*Malus sylvestris* (L.) Mill.) are used. The colour varies from white to off-white to brownish, depending on which type is used. The smell is mildly apple-like; the taste is sweet-sour. Pomace or similar residues from fruit juice production, pectin production etc. are not used.

APPLE MINT (leaves) shall consist of the dried leaves and petioles from *Mentha suaveolens* Ehrh. The margins of the leaves are covered with silver hair. It has a fruity aromatic smell and taste.

BEE BALM (flowers) consist of the dried red lipped flowers from *Monarda didyma* L. The smell and taste are faintly lemony.

BILBERRY (fruits) shall consist of the dried fruits from *Vaccinium myrtillus* L. Synonyms for the fruit include blueberry, huckleberry and wild berry. The blueblack fruits, which can be up to 1 cm in diameter, have blue flesh and juice. The taste is sweet and aromatic. Pomace or similar residues from fruit juice-, puree-production, etc. are not used.

BITTER ORANGE (leaves) shall consist of whole or crushed dried leaves and petioles from certain varieties of *Citrus aurantium* L.. The leaves are large and oval, slightly pointed, with clearly articulated petiole and are more or less winged. The leaf is leathery, increases in thickness towards the margins, yellow-green and is dotted with oil reservoirs. The smell is aromatic and the taste is sweetish, aromatic and heavy.

BITTER ORANGE (flowers) shall consist of the whole or crushed dried inflorescence and petals of certain varieties of *Citrus aurantium* L. The smell is aromatic and the taste is sweetish, aromatic and heavy.

BITTER ORANGE (peels) shall consist of the dried, whole or crushed fruit peels from *Citrus aurantium* L., whereby in addition to the outer layer (flavedo), parts of the spongy white parenchyma (albedo) are also present. The smell and taste are piquant and aromatic, typical of orange and slightly bitter. Product residues from etheric oil extraction, pectin production etc. are not used.

BLACK CHOKEBERRY (fruits) consist of the dried fruits from *Aronia melanocarpa* (Michx.) Elliott. The roundish, 6 to 13 mm large, violet-black fruits have an intensively red coloured fruit flesh. The fruits have a sweet to sour, tart aroma. Pomace or similar residues from fruit juice-, puree-production etc. are not used.

BLACKBERRY (leaves) shall consist of the dried leaves and stems of *Rubus fruticosus* L. Thorns are characteristically observed on the leaf veins, petioles and small pieces of the stems. The upper side of the leaves is green and has few hairs; the underside is felt-like. The smell is only faintly noticeable; the taste tends to be sour and astringent.

BLACKCURRANT (fruits) shall consist of the dried fruits of the currant bush, *Ribes nigrum* L. The smell is faint. The taste is sweet-sour, typical of blackcurrant. Pomace or similar residues from fruit juice-, puree-production, etc. are not used.

BLACKCURRANT (leaves) shall consist of small pieces of the slightly wrinkled leaves with a dark green upper surface and light grey-green lower surface from *Ribes nigrum* L.. A scattering of dots can be seen on the lower surface which is due to the presence of shiny yellowish glandular trichomes (hand lens). The margins of individual leaves are coarsely serrated with pointed teeth. Yellow-green, grooved remnants of petioles are often present. The smell and taste of the dried plant material is faintly reminiscent of blackcurrants.

CAMOMILE (flowers) shall consist of the dried whole or crushed inflorescence from *Matricaria recutita* L. (syn. *Matricaria chamomilla* L.) including a technically unavoidable amount of other aerial plant parts. The flower-heads have yellow tubular florets surrounded by a ring of white ligulate florets; the receptacle is light green to grey-green, conical and hollow. The smell and taste are aromatic; the aftertaste is slightly bitter.

CHICHORY (roots) shall consist of the roasted root from *Cichorium intybus* L.. The root is prickly and woody. It has a thick cortex and is surrounded by brown cork tissue. Sometimes pieces of roots have a fine striation. The root pieces turn brown during the roasting procedure. The smell and taste are typically similar to coffee.

COCOA (seeds) shall consist of seeds from *Theobroma cacao* L. The cocoa fruit is a cucumber-like fruit approximately 20 cm long and 10 to 12 cm wide, in which 40 to 60 white, bitter-tasting seeds (cocoa beans) are embedded in the mushy fruit flesh. The seeds are fermented for several days, through which they lose their bitterness and take on the brown colour and characteristic aroma. No seed coats are used.

CORNFLOWER (flowers) shall consist of the dried blue ligulate florets from *Centaurea segetum* Hill (syn. *Centaurea cyanus* L.). The smell is not clearly discernible; the taste faintly sweet to faintly salty.

DAISY (flowers) shall consist of the dried whole capitulum from *Bellis perennis* L. on which the whitish ray florets and the yellow tubular florets are visible. The dried plant material has a faintly perceptible smell and a faintly bitter taste.

ELDERBERRY (fruits) shall consist of the dried, very wrinkled, more or less spherical drupes from *Sambucus nigra* L.. The dark violet-black berries contain three elongated stones each, which in turn, contain one seed each within the hard endocarp. Occasionally fruit petioles are present. The smell is unique; the taste is sweet-sour with a characteristic aroma. Pomace or similar residues from fruit juice-, puree-production, etc. are not used.

ELDERBERRY (flowers) shall consist of the individual flowers that are stripped from the inflorescences (cymes, thyrses) by sieving, but sometimes, for operational reasons, are just cymes from *Sambucus nigra* L. cut into small pieces. The small flowers are off-white with connated, five-lobed corolla. They have a faint typical smell and a slimy-sweet strong aromatic taste.

EUCALYPTUS (leaves)

The dried material shall consist of only the adult leaves and not the oval primary leaves from particularly eucalyptol-rich varieties of *Eucalyptus globulus* Labill.. The dense, leathery, grey-green, crumbly parts of the leaf blade show numerous brown lenticels. The main leaf vein is very prominent on the underside of the leaf. A strong aromatic smell reminiscent of camphor develops when the leaves are ground. The taste is bitter and slightly astringent.

FENNEL (fruits) shall consist of whole or crushed, mature, dried, yellow-green to brownish schizocarp or parts of the schizocarp or seed, often with remains of the pistil, fruit stalk and carpophore of *Foeniculum vulgare* var. *vulgare*. The seeds are slightly curved, about 10 mm long and have five light coloured, clear ribs. The variety

vulgare has a very piquant smell and has a piquant aromatic, bitter-sweet taste. The smell of the variety dulce is pleasantly piquant and the taste sweetish, mildly piquant.

GINKGO (leaves) shall consist of the dried, deep green to yellow-green leaves of *Ginkgo biloba* L., which usually has two-lobed leaves. The margins of the leaf are laterally smooth, otherwise slightly undulated. The leaf veins reticulate nervature runs parallel without a midrib often show dichotomous ramification. The smell is faint and characteristic of the species; the taste is slightly bitter.

GINSENG (roots)

Consist of the dried, cylindrical, tapering root of *Panax ginseng* C. A. Mey. The root, which is covered with horizontal wrinkles on its upper half, divides several times from the middle downwards. The roots often bear head-like remains of truncated branches. The light yellow to light brown cortex of the root contains scattered small redorange resin reservoirs. The flesh inside the root is white to yellowish, hard, horny and brittle. The smell is pleasant; the taste is in the beginning bitter and then sweet and mucilaginous.

GRAPEFRUIT (peels) shall consist of dried, whole or crushed fruit peels of *Citrus paradise* Macfad. whereby in addition to the outer layer (flavedo), parts of the spongy white parenchyma (albedo) are also present. The smell and taste are piquant, aromatic, typical of grapefruit and slightly bitter. Product residues from etheric oil extraction, pectin production etc. are not used.

GREEK MOUNTAIN TEA (herb) shall consist of the dried, aerial parts from *Sideritis spec.* that are gathered during the flowering period. The leaves and stems are aromatic.

HAZELNUT (leaves) Consist of the dried leaves of *Corylus avellana* L.. The leaves are roundish, slightly asymmetrically pointed; the leaf margin is doubly serrated. The primary subsidiary veins are very prominent. Single hairs are found along the veins on the lower surface of the leaf. The smell and taste are faint.

HEARTSEASE (herb) consists of the dried herb of *Viola tricolor* L.. The petals can be yellowish, white, blue or blue-violet. The dried plant material has a faintly perceptible smell and tastes slimy mucilaginous and sweet.

HIBISCUS (flowers [calyxes]) shall consist of whole or crushed dried calyxes and epicalyxes from *Hibiscus sabdariffa* L. which are collected during the fruiting period. The sepals are red to dark violet and fleshy. White varieties are also used. The sepals are white to beige. They have a faint smell and a sour taste.

HONEY BUSH (herb) consists of the fermented or unfermented and dried aerial plant parts from *Cyclopia genistoides* (L.) Vent. *Cyclopia intermedia* E. Mey., *Cyclopia subternata* Vogel and/or *Cyclopia sesiliflora* Eckl. & Zeyh. which are collected during the flowering period. The smell and taste are honey-like and sweet.

LARKSPUR (flowers) shall consist of the dried flowers, the wrinkled, blue or blue-violet sepals and petals as well as the wide brown-violet stamens from *Consolida regalis* Gray (syn. *Delphinium consolida* L.). The dried plant material has a faint honey-like smell and tastes mildly adstringent.

LEMON (peels)

The dried plant material is derived from fully developed, but not completely mature lemons of the species *Citrus limon* (L.) Burm.f. The dried, whole or crushed fruit peels from *Citrus limon* (L.) Burm.f. consist of the outer layer (flavedo) as well as parts of the spongy white parenchyma (albedo). The outer pericarp layer is usually peeled off as a continuous spiral strip and dried. The small pieces are brownish yellow on the outside, dotted with dimples and whitish on the inside. They have a characteristic smell and a piquant, somewhat sour and faint bitter taste similar to lemon. Product residues from etheric oil extraction, pectin production etc. are not used.

LEMON BALM (leaves) shall consist of the whole or crushed dried leaves and parts of the upper shoots from *Melissa officinalis* L. The leaf margin is irregularly crenated or serrated. The upper leaf surface is sparsely covered with hair. The lower surface is almost hairless or is only sparsely covered with hair along the veins, but dotted with fine glands. The smell and taste are piquant, aromatic and reminiscent of lemon.

LEMON VERBENA (herb) shall consist of whole or cut, dried leaves and upper shoot regions from the verbena family (Verbenaceae) *Aloysia citriodora* Palau (syn. *Lippia triphylla* (L'Hér.) Kuntze). The serrate leaves have a lemonlike smell and taste.

LEMONGRASS (herb) shall consist of the dried, cut aerial plant parts from *Cymbopogon spec.* The leaves have parallel venation and are light green to soft brown. The smell and taste are clearly lemon-like.

LIME (peels) shall consist of the dried, whole or crushed fruit peels from *Citrus aurantiifolia* (Christm. & Panz.) Swingle, whereby in addition to the outer layer (flavedo), parts of the spongy white parenchyma (albedo) are also present. The smell and taste are piquant, aromatic, typical of lime and slightly bitter. Product residues from etheric oil extraction, pectin production etc. are not used.

LIME, LINDEN (leaves) Linden leaves shall consist of the stalked, usually heart-shaped and often asymmetrical leaves from *Tilia cordata* Mill., *Tilia platyphyllos* Scop. or *Tilia tomentosa* Moench (syn. *Tilia argentea* DC.). The leaves are more or less abundantly covered with simple or star-shaped hairs, usually denticulated or serrated to the point of being almost lobed and more rarely smooth-edged. The smell is faintly aromatic; the taste pleasantly aromatic.

37 LIME, LINDEN (flowers) shall consist of the flowers of *Tilia cordata* Mill. or *Tilia platyphyllos* Scop. As far as *Tilia cordata* Mill. and *Tilia platyphyllos* Scop. are concerned, the fragments of pale yellowish green entire bracts with a distinct reticulate nervature, which are partly fused with the lower stalk, are characteristic. *Tilia tomentosa* Moench. (syn. *Tilia argentea* DC.) has densely pubescent bracts, its flowers have petalaceous staminodes. There are also yellowish white flowers with the five sepals and five free petals, numerous stamens, and a densely pubescent superior ovary. Occasionally, buds are also present. The odour is characteristic and faintly aromatic. The taste is sweetish, mucilaginous and pleasant.

LIQUORICE (roots) shall consist of the dried, unpeeled and/or peeled roots and stolons of *Glycyrrhiza glabra* L. In the cut condition, the drug is characterized by more or less cylindrical, roughly fibrous, distinctly lemon-yellow pieces which can be readily split longitudinally. The unpeeled liquorice includes small pieces with wrinkled, grey to brownish shreds of cork. The smell is faint, but characteristic, the taste is very sweet and mildly aromatic and liquorice-like.

MALLOW (flowers) shall consist of the fused foliaceous 5-part calyx together with the epicalyx of three lanceolate segments from *Malva silvestris* L.; all the sepals are pubescent. There are five pale violet or dark bluish violet obovate petals, which are emarginate at the tip and which have a white beard at the base. The numerous stamens are fused to form a tube and the style has ten thread-like, violet stigmas. Occasionally, the flattened, 10-locular ovaries are present. The taste is typical and mucilaginous.

MALLOW (leaves) shall consist of the roundish, three to seven-lobed, long-petioled leaves from *Malva silvestris* L. The leaves have palmate venation and a notched, dentate leaf margin. The taste is typical and mucilaginous.

MANDARIN ORANGE (peels) consist of the dried, whole or crushed fruit peels from *Citrus reticulata* Blanco (syn. *Citrus deliciosa* Ten.), whereby in addition to the outer layer (flavedo), parts of the spongy white parenchyma (albedo) are also present. The smell and taste are piquant and aromatic, typical of mandarin orange and faintly bitter. Product residues from etheric oil extraction, pectin production etc. are not used.

MARIGOLD (flowers) shall consist of the dried flower heads from *Calendula officinalis* L., which comprise the golden yellow, three-toothed ligulate florets, small tubular florets and a green involucre. Sporadically bent, combshaped fruits are present. The dried plant material has a faint, typical smell and tastes slightly bitter and salty.

NETTLE (herb) shall consist of the aerial parts of *Urtica spec.* of the genus *Urtica*, collected during the flowering period and dried. The leaf fragments are shrivelled and often crumpled up into a ball. The upper surface is greenish black and the lower surface is pale green. Pieces of the square stem are mostly flattened, green to brown and deeply grooved. Occasional pieces of the green flowering panicles may be present.

PEONY (flowers)

Shall consist of dried, dark red, wrinkled petals from *Paeonia officinalis* L.. It smells somewhat honey-like and has a tart and adstringent taste.

PEPPERMINT (leaves) shall consist of the whole or crushed dried leaves and parts of the upper shoot apices from *Mentha × piperita* L.. The leaves are thin, dark, occasionally light green and strongly serrated on the margins. Leaf veins and stems usually have a red-violet colouring. The stems are squarish. The smell and taste are very piquant, aromatic and cooling.

RASPBERRY (leaves) shall consist of the dried leaves and stems from *Rubus idaeus* L.. The upper surface of the leaves is dark green to brownish green and the lower surface is covered with a dense tomentum. The margin is sharply serrated. The petioles and stems are green or have a reddish colour. The smell is faint; the taste tart.

RASPBERRY (fruits) shall consist of the dried fruit parts of the aggregate fruits von *Rubus idaeus* L. The red fruit flesh has an intensively sweet as well as a characteristic aroma. Pomace or similar residues from fruit juice-, puree-production, etc. are not used.

RED SANDALWOOD (wood) shall consist of heartwood from the lower trunk of *Pterocarpus santalinus* L.f. that is free of sapwood. The wood fragments have a silky shimmer. Individual lengthwise cut vascular vessels and stripelike medullary rays in the longitudinal fracture surfaces as well as numerous vessels and undulating lighter

lines from the wood parenchyma in the cross fractures can be seen. The smell is faintly piquant; the taste is adstringent.

ROOIBOS (herb) shall consist of the dried and cut aerial parts of the plant and leaves from *Aspalathus linearis* (Burm.f.) R. Dahlg. The small pieces are oblong lanceolate in form. Fermented rooibos is red brown in colour; smell and taste are slightly sweet and reminiscent of black tea. Green rooibos is unfermented rooibos and has a greenish colour. The smell is reminiscent of hay; the taste is pleasantly spicy, herbal and mild.

ROSE (petals) shall consist of the dried petals from *Rosa spec.* As a rule, only the pink to brownish petals are used. The material smells and tastes typically of roses.

ROSE HIP (fruits) shall consist of whole or crushed dried pseudo-fruits from *Rosa canina* L. To a large extent rose hips are free of plant hair and contain a technically unavoidable content of seeds (up to 10%). The exterior of the pseudo-fruits are glossy red to red brown; the interior is light. The smell and taste are faintly sweet-sour.

SAFFLOWER (flowers) shall consist of the dried disk florets from *Carthamus tinctorius* L. Its colour can vary from a rich yellow to red-orange. Smell and taste are faint and typical.

SAGE SAGE (leaves)

The dried plant material shall consist of small broken pieces of leaves from *Salvia officinalis* L. that are often stuck together due to the fine hair covering both sides of the leaves. The network of veins can be seen on the lower surface of the leaves. The material has a strong piquant, aromatic smell and a spicy bitter and astringent taste.

SANDY EVERLASTING (flowers) shall consist of the dried staminate, lemon yellow, glossy, imbricated and slightly erect involucre leaves of *Helichrysum arenarium* (L.) Moench. The yellow orange tubular corollas are in the middle of the flower; the very small ray florets are usually not easily recognized. They have a yellow crown of hair. The smell of the dried plant material is weakly perceptible and tastes somewhat bitter and piquant.

SEA BUCKTHORN (fruits) shall consist of the dried, oval, orange-coloured accessory fruits from *Hippophae rhamnoides* L. The fruits have a sour taste. Pomace or similar residues from fruit juice-, puree-production, etc. are not used.

SPEARMINT (leaves) shall consist of the whole or crushed, dried leaves and shoot apices from varieties of *Mentha spicata* L. The veins are set deep into the upper dark green surface; the leaf surface bulges out; the veins are prominent on the leaf underside. The leaf margin features curved, pointed teeth. The stems are squarish. All parts smell and taste are spicy sharp, however lacks the cooling aftertaste of peppermint.

STRAWBERRY (leaves) shall consist of the dried leaves and individual stems with flowers of *Fragaria × ananassa* Duchesne. The upper surface of the leaf pieces are light green while the lower surface is covered with silky hair and the leaf edges are sharply serrated. The leaves have an unspecific smell; the taste is slightly bitter and aromatic.

STRAWBERRY (fruits) consist of small pieces of the dried accessory fruit from *Fragaria × ananassa* Duchesne. The small yellow achenes are on the surface of the fruit. The red fruit flesh has an intensively sweet and characteristic aroma. Pomace or similar residues from fruit juice-, puree-production etc. are not used.

SUNFLOWER (petals) shall consist of the dried ligulate florets from *Helianthus annuus* L. The smell and taste are aromatic and sweetish.

SWEET BLACKBERRY (leaves) shall consist of the dried leaves and stems of *Rubus chingii* var. *suavissimus* (S. Lee) L.T. Lu (syn. *Rubus suavissimus* S. K. Lee.). Both sides of the green leaves are covered with hair; the margins of the leaf are doubly serrated. The three to seven-lobed form of the leaves and the prickles on the petioles are characteristic. The smell is only faintly noticeable; the taste is sweet, herbal with slightly bitter nuances.

SWEET ORANGE (leaves) Consist of whole or crushed dried leaves and petioles from different varieties of *Citrus sinensis* (L.) Osbeck. The leaves are large and oval, slightly pointed, with clearly articulated petiole. The leaf is leathery, increases in thickness towards the margins, yellow-green and is dotted with oil reservoirs. The smell is aromatic and the taste is sweetish, aromatic and heavy.

SWEET ORANGE (flowers) consist of the whole or crushed dried inflorescence and petals of certain varieties of *Citrus sinensis* (L.) Osbeck. The smell is aromatic and the taste is sweetish, aromatic and heavy.

SWEET ORANGE (peels) shall consist of the dried, whole or crushed beige-yellowish to orangereddish fruit peel from different varieties of *Citrus sinensis* (L.) Osbeck, whereby in addition to the outer layer (flavado) parts of the

spongy white parenchyma (albedo) are also present. The smell and taste is aromatically fresh, typical of orange and slightly bitter.

SWEET VIOLET SWEET VIOLET (flowers) shall consist of the dried dark violet, occasionally white or pink coloured flowers from *Viola odorata* L. The spur-like protuberance of the lower petal is the same colour and overhangs the extensions of the green calyx. The material has a characteristic sweet smell and taste.

WALNUT (leaves) shall consist of the dried pinna from *Juglans regia* L.. Both side of the dried and cut plant material is brownish green; the material is crumbly and somewhat stiff. On some areas, an almost rectangular tessellation can be seen along the smooth leaf margin and on the lower leaf surface that is formed by the leaf veins. The dried plant material has a faint aromatic smell and an adstringent faintly bitter, scratching taste.

WHITE JASMINE (flowers) shall consist of the dried flowers from *Jasminum officinale* L. The initially white flowers with five stellate petals are dirty white to brownish light yellow in the dried state. They possess a characteristic intensive flowery, aromatic smell and taste. **Caffeine-containing HFI**

COLA NUT (seeds) Consist of the dried kernels from *Cola acuminata* (P. Beauv.) Schott & Endl. or *Cola nitida* (Vent.) Schott & Endl. (syn. *Cola vera* K. Schum.) from the genus *Cola* that are often collapsed into the two seed leaves. The appearance of cola seeds varies; most are spherical to ovoid or somewhat angular; the exterior is wrinkled, brown or red brown and the interior is cinnamon brown. They are very hard and have a granular structure. The dried plant material is odourless and tastes somewhat adstringent and bitter.

GUARANA (seeds) shall consist of the glossy, dark brown seeds from *Paullinia cupana* H.B.K., which are spherical or are flattened on one side and have a large, light brown scar. The seed coat is thin, brittle and can be easily removed. The seeds have no clearly perceptible smell and the taste is bitter.

MATÉ (leaves) shall consist of the dried, roasted or unroasted, crushed leaves and parts of the shoots of the yerba mate tree *Ilex paraguariensis* A. St.-Hil. Depending on the treatment, mate leaves are light green or medium to dark brown in colour. Green mate smells mildly aromatic. It has a spicy, mildly astringent and slightly bitter taste. Roasted mate has a smoky, roasted smell. It has an adstringent, slightly burnt and mildly bitter taste.

Annex III

The standard procedure for preparation of infusion liquors for sensory evaluation

Introduction

Herbal and Fruit Infusions are foodstuffs which are traditionally consumed due to its health- and sensory properties. Besides the physical and chemical quality parameters described in **clause 5**, the sensory characteristics are of special importance for the overall product quality.

To characterise the sensory quality of, 3 basic types of sensory examinations have to be assessed:

- Colour of liquor**
- Aroma (smell) of liquor**
- Flavour (taste) (and possible “Off-Flavour”) of liquor**

For proper evaluation of the sensory quality, THIE recommends its Standard Procedure for Preparations of Infusion Liquors for Sensory Evaluation. For comparable results, it is important to define basic test parameters:

1. Water Quality

Flavour, colour and appearance (e.g. clearness, turbidity) of the liquor are affected by the hardness (mineral composition) of the water used for infusion. Therefore, water used for the sensory test should be demineralised, non-chlorinated water.

2. Water Temperature

Recommend freshly boiling water. This is to ensure that most of the valuable plant substances are extracted into the brew. Lower water temperatures normally result in an incomplete extraction, which also strongly affects the overall quality of the infusion.

3. Weight of HFI, Volume of Water for Infusion, Infusion Time

For reasons of homogeneity it is recommended to use higher weights for loose HFI / coarse cut materials. The following parameters are recommended:

- Fine cut: 2 g/ 0,2 L/ 5 min
- Coarse cut: 15 g/ 1 L/ 8 min

Procedure

- Weigh into a cup/glass beaker the amount of material given above for fine cut resp. coarse cut.
- Fill the cup/glass beaker with the corresponding amount of freshly boiling water.
- Ensure that HFI is properly wetted, e.g. stir with a tea spoon/glass stirrer.

- Allow to brew for the corresponding brewing time.
- Pour the liquor through a sieve to ensure that no extractives are retained in the infused material.
- Colour is evaluated optically against an agreed standard. The standard is prepared in the same way and at the same time.
- Aroma and flavour are evaluated by tasting against an agreed standard. The standard is prepared in the same way and at the same time. Test results are assigned to the lot and documented.

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