

**COMPENDIUM
OF EHIA GUIDELINES**

**FOODSTUFF SPECIFICATIONS
FOR
HERBAL INFUSION PRODUCTS***

EDITION 2000

TABLE OF CONTENTS

Introduction

Part I. Foodstuff product specifications

- (I) Camomile
- (II) Fennel
- (III) Hibiscus
- (IV) Lime
- (V) Peppermint
- (VI) Spearmint
- (VII) Orange leaves
- (VIII) Rose hips
- (IX) Verbena

Part II. Method for sampling, sample preparation, analysis and sensory evaluation

- A. Sampling
- B. Preparation of samples
- C. Methods of analysis
- D. EHIA standard procedure for preparation of infusion liquors for sensory evaluation

*Version of 8th October 1987, amended 15th Oct. 1993, amended 12th May 2000

INTRODUCTION

Herbal infusions are a part of European tradition and culture. Their popularity in the retail foodstuff sector reflects consumer appreciation of the wide range of natural and refreshing tastes they offer. To ensure the satisfactory quality of products offered to consumers, the European Herbal Infusions Association has drawn up these retail product specifications and associated methods of sampling, analysis and sensory evaluation.

1. The product specifications lay down for each product type at the point of sale:

- (a) the botanical species, variety and plant organs to be used
- (b) limits for moisture content and extraneous mineral (soil) matter
- (c) where necessary to ensure satisfactory organoleptic quality, minimum requirements for essential oils

Adherence to these specifications will ensure that products offered to the consumer through normal retail food distribution channels have been produced by good manufacturing practice and are of satisfactory quality.

The requirements for essential oils differ in objective from those set in the Pharmacopeia for infusions sold through pharmacies for medicinal purposes. **Pharmacopeia requirements** are set at the relatively high levels needed to produce clear pharmacological effects in response to short term corrective consumption.

EHIA's requirements are set at the lower levels needed to assure delivery of satisfactory flavour in long term consumption. They are **minimum** levels which broadly reflect consumer habits and taste requirements across the whole of Europe.

2. The methods for sampling, analysis and sensory evaluation

Are designed to ensure that testing for compliance with the specifications is carried out on a rigorous technical and statistical basis, to deliver results which are truly representative of the products tested. The methods recommended are based on well-tested standard procedures established by the International Standards Organisation (ISO).

PART I. FOODSTUFF PRODUCT SPECIFICATIONS

- (I) Camomile
- (II) Fennel
- (III) Hibiscus
- (IV) Lime
- (V) Peppermint
- (VI) Spearmint
- (VII) Orange leaves
- (VIII) Rose hips
- (IX) Verbena

Edition 2000

I. CAMOMILE (*) – Foodstuff product specification ()**

1. SCOPE AND FIELD OF APPLICATION

This European Trade Specification sets minimum standards for Camomile products sold as foodstuffs and **not** as pharmaceutical products.

2. DESCRIPTION

2.1 General description

Camomile for use as an infusion consists of dried overground parts (including florets) of the blossoming plant *Matricaria chamomilla* syn. *Matricaria recutita* L.; whole, cut or ground.

2.2 Appearance

Flowerheads (consisting of the flower bottom, a calyx, white ligulas and yellowish-brown florets) and overground parts of the plants.

2.3 Microscopic characteristics of the flowers

The epidermal cells of the receptacle are rectangular or polygonal, radial in respect to the insertion point of the florets. Somewhat deeper there is a lacunous tissue with radial woodbundles accompanied by fibres and several schizogen secretory ducts. The upper epidermis of the ligulate flowers consists of papillous cells with striated cuticle. In the mesophyll, very small druses of calcium oxalate are recognizable. Pollen granules, round and three-cornered, with thorny protuberances and three sporangiums.

2.4 Organoleptic properties

The dried product (before infusion) has a characteristic spicy smell.

Standard procedure for preparation of the test infusion for evaluation: see EHIA's "Standard Procedure for Organoleptic Tests".

The infusion has a slightly bitter aromatic taste, characteristic of camomile. The colour of the infusion is yellowish brown.

(*) Note for France: to be understood as *Matricaria chamomilla*

(**) Not meant for Italy, which necessitates a special national Guideline due to special Italian law.

3. REQUIREMENTS

3.1 Chemical and physical requirements

The product shall comply with the requirements specified in the table, in which all figures are calculated on the basis of the product oven-dried to constant mass at 103°C.

Characteristic	Requirements	Reference to method of test
Loss in mass	Max. 13%	Tea – Determination of loss in mass at 103°C ISO 1573/1980
Ash insoluble in hydrochloric acid	Max. 2.5%	Tea – Determination of acid insoluble ash ISO 1577/1987
Essential oil (volume/weight)	Min. 0.2%	Spices, Condiments and Herbs Determination of volatile oil content ISO 6571/1984

3.2 Labelling requirements: Instructions for use

All retail products must bear an instruction to prepare the beverage with boiling water.

Edition 2000

II. FENNEL – Foodstuff product specification

1. SCOPE AND FIELD OF APPLICATION

This European Trade Specification sets minimum standards for Fennel products sold as foodstuffs and **not** as pharmaceutical products.

2. DESCRIPTION

2.1 General description

Fennel (fruits, fructus foeniculi vulgaris) for use as an infusion consists of the dried fruits of those species *Foeniculum vulgare*, whole, cut or ground.

2.2 Appearance

Fruits (whole or parts, cut or ground) of yellow-green or yellow-brown colour.

2.3 Microscopic characteristics

- a) endosperm with thick-walled cells containing aleurone granules and fatty oil
- b) aleurone granules often contain calcium-oxalate rosettes of approx. 4 µ.
- c) mostly 2, seldom 3 – 4 oil ductules

2.4 Organoleptic properties

The dried product (before infusion) has a characteristic spicy smell and slightly sweet aromatic taste.

Standard procedure for preparation of test infusion for evaluation: see EHIA's "Standard Procedure for Organoleptic Tests".

The colour of the infusion is light yellow to yellow-brown. The infusion has a slightly sweet flavour and odour characteristic of fennel.

Fennel: page 2
Edition 2000

3. REQUIREMENTS

3.1 Chemical and physical requirements

The product shall comply with the requirements specified in the table, in which all figures are calculated on the basis of the product oven-dried to constant mass at 103°C.

Characteristic	Requirements	Reference to method of test
Loss in mass	Max. 12%	Tea – Determination of loss in mass at 103°C ISO 1573/1980
Ash insoluble in hydrochloric acid	Max. 2.5%	Tea – Determination of acid insoluble ash ISO 1577/1987
Essential oil (volume/weight)	Min. 1.0%	Spices, Condiments and Herbs Determination of volatile oil content ISO 6571/1984

3.2 Labelling requirements: Instructions for use

All retail products must bear an instruction to prepare the beverage with boiling water

Edition 2000

III. HIBISCUS – Foodstuff product specification

1. SCOPE AND FIELD OF APPLICATION

This European Trade Specification sets minimum standards for Hibiscus products sold as foodstuffs and **not** as pharmaceutical products.

2. DESCRIPTION

2.1 General description

Hibiscus for use as an infusion consists of the dried calyxes and outer calyxes harvested from the fruit of the species *Hibiscus sabdariffa*, whole, cut or ground.

2.2 Appearance

Calyxes and outer calyxes are palpuns, dry, fragile with a bright red to dark violet colour.

2.3 Microscopic characteristics

- a) red coloured fragments of the mesophylls without calciumoxalate druses
- b) parts of hairs and eventual glandulous hairs

2.4 Organoleptic pproperties

The dried product (before infusion) has a characteristic smell and aromatic taste (fruity-sour).

Standard procedure for preparation of test infusion for evaluation: see EHIA's "Standard Procedure for Organoleptic Tests".

The colour of the infusion is light to dark red. The infusion has a fruity-sour flavour and odour characteristic of hibiscus.

Hibiscus: page 2
Edition 2000

3. REQUIREMENTS

3.1 Chemical and physical requirements

The product shall comply with the requirements specified in the table, in which all figures are calculated on the basis of the product oven-dried to constant mass at 103°C.

Characteristic	Requirements	Reference to method of test
Loss in mass	Max. 15%	Tea – Determination of loss in mass at 103°C ISO 1573/1980
Ash insoluble in hydrochloric acid	Max. 2.5%	Tea – Determination of acid insoluble ash ISO 1577/1987

3.2 Labelling requirements: Instructions for use

All retail products must bear an instruction to prepare the beverage with boiling water.

Edition 2000

IV. LIME - Foodstuff product specification

1. SCOPE AND FIELD OF APPLICATION

This European Trade Specification sets minimum standards for Lime products sold as foodstuffs and **not** as pharmaceutical products.

2. DESCRIPTION

2.1 General description

Lime for use as an infusion consists of the dried bracts and inflorescences, whole or ground, of species of the *tilia* genus known to be suitable for making infusions for consumption as a beverage.

2.2 Appearance

Bracts and inflorescences (whole, broken or ground) of yellow/green/brownish colour.

2.3 Microscopic characteristics

The flower-stem is joined to the spear-shaped bracteole.

2.4 Organoleptic properties

The dried product (before infusion) has a weak spicy smell and taste.

Standard procedure for preparation of test infusion for evaluation: see EHIA's "Standard Procedure for Organoleptic Tests".

The colour of the infusion is pale yellow. The infusion has a flavour and odour characteristic of lime.

Lime: page 2
Edition 2000

3. REQUIREMENTS

3.1 Chemical and physical requirements

The product shall comply with the requirements specified in the table, in which all figures are calculated on the basis of the product oven-dried to constant mass at 103°C.

Characteristic	Requirements	Reference to method of test
Loss in mass	Max. 13%	Tea- Determination of loss in mass at 103°C ISO 1573/1980
Ash insoluble in hydrochloric acid	Max. 2.5%	Tea – Determination of acid insoluble ash ISO 1577/1987

3.2 Labelling requirements: Instructions for use

All retail products must bear an instruction to prepare the beverage with boiling water.

Edition 2000

V. PEPPERMINT – Foodstuff product specification

1. SCOPE AND FIELD OF APPLICATION

This European Trade Specification sets minimum standards for peppermint products sold as foodstuffs and **not** as pharmaceutical products.

2. DESCRIPTION

2.1 General description

Peppermint for use as an infusion consists of the dried leaves and stems of varieties of the species *Mentha piperita*, whole, cut or ground.

2.2 Appearance

Leaves (whole, broken or ground) of green / green-brown colour with pieces of quadrangular stems.

2.3 Microscopic characteristics

- a) Diazotic stomas mostly on the lower side of the leaf, rarely on the upper side
- b) Short conical leaf hairs containing 1-2 cells, long conical leaf hairs containing 3-8 cells
- c) Small labial glandulous heads and cells.

2.4 Organoleptic properties

The dried product (before infusion) has a characteristic smell and aromatic taste.

Standard procedures for preparation of test infusion for evaluation: see EHIA's "Standard Procedure for Organoleptic Tests".

The colour of the infusion is green-brown. The infusion has a flavour and odour characteristic of peppermint.

Peppermint: page 2
Edition 2000

3. REQUIREMENTS

3.1 Chemical and physical requirements

The product shall comply with the requirements specified in the table, in which all figures are calculated on the basis of the product oven-dried to constant mass at 103°C.

Characteristic	Requirements	Reference to method of test
Loss in mass	Max. 13%	Tea – Determination of loss in mass at 103°C ISO 1573/1980
Ash insoluble in hydrochloric acid	Max. 2.5%	Tea – Determination of acid insoluble ash ISO 1577/1987
Essential oil (volume/weight)	Min. 0.6%	Spices, Condiments and Herbs Determination of volatile oil content ISO 6571/1984

3.2 Labelling requirements: Instructions for use

All retail products must bear an instruction to prepare the beverage with boiling water.

Edition 2000

VI. SPEARMINT – Foodstuff product specification

1. SCOPE AND FIELD OF APPLICATION

This European Trade Specification sets minimum standards for Spearmint products sold as foodstuffs and **not** as pharmaceutical products.

2. DESCRIPTION

2.1 General description

Spearmint for use as an infusion consists of the dried leaves and stems of varieties of the species *Mentha crispa*, whole, cut or ground.

2.2 Appearance

Leaves (whole, broken or ground) of green / green-brown colour with pieces of quadrangular stems.

2.3 Microscopic characteristics

- a) To be identified by numerous fragile pieces of the leaf-border with blistered leaf-ribs between the nerves on the upper side
- c) Hairs consisting of between 1 to 6 cells, glandular scales with a short stem-cell and mostly heads made up of 12 cells.

2.4 Organoleptic properties

The dried product (before infusion) has a characteristic smell and aromatic taste.

Standard procedure for preparation of the infusion for evaluation: See EHIA's "Standard Procedure for Organoleptic Tests".

The taste of the infusion is spicy and not cooling. The infusion smells strong and spicy.

3. REQUIREMENTS

3.1 Chemical and physical requirements

The product shall comply with the requirements specified in the table, in which all figures are calculated on the basis of the product oven-dried to constant mass at 103°C.

Characteristic	Requirements	Reference to method of test
Loss in mass	Max. 13%	Tea – Determination of loss in mass at 103°C ISO 1573/1980
Ash insoluble in hydrochloric acid	Max. 2.5%	Tea – Determination of acid insoluble ash ISO 1577/1987
Essential oil (volume/weight)	Min. 0.6%	Spices, Condiments and Herbs Determination of volatile oil content ISO 6571/1984

3.2 Labelling requirements: Instructions for use

All retail products must bear an instruction to prepare the beverage with boiling water.

Edition 2000

VII. ORANGE LEAVES - Foodstuff product specification

1. SCOPE AND FIELD OF APPLICATION

This European Trade Specification sets minimum standards for Orange leaves products sold as foodstuffs and **not** as pharmaceutical products.

4. DESCRIPTION

4.1 General description

Orange leaves for use as an infusion consist of the dried leaves and leaf-stems, whole, cut or ground, of varieties of the species citrus aurantil and bigaradia known to be suitable for making infusions for consumption as a beverage.

4.2 Appearance

Leaves (whole, broken or ground) of green colour with pieces of stems.

4.3 Microscopic characteristics

The leaves are egg-shaped, 10 – 15 cm long, up to 7 cm broad with a wide leaf-stem. The upper side is grey-green, the under side is light green.

4.4 Organoleptic properties

The dried product (before infusion) has a characteristic smell and aromatic taste.

Standard procedure for preparation of test infusion for evaluation: see EHIA's "Standard Procedure for Organoleptic Tests".

The colour of the infusion is clear green. The infusion has a flavour and odour characteristic of orange leaves.

Orange leaves: page 2
Edition 2000

5. REQUIREMENTS

5.1 Chemical and physical requirements

The product shall comply with the requirements specified in the table, in which all figures are calculated on the basis of the product oven-dried to constant mass at 103°C.

Characteristic	Requirements	Reference to method of test
Loss in mass	Max. 12%	Tea – Determination of loss in mass at 103°C ISO 1573/1980
Ash insoluble in hydrochloric acid	Max. 3.0%	Tea – Determination of acid insoluble ash ISO 1577/1987

5.2 Labelling requirements: Instructions for use

All retail products must bear an instruction to prepare the beverage with boiling water.

Edition 2000

VIII. ROSE HIPS – Foodstuff product specification

1. SCOPE AND FIELD OF APPLICATION

This European Trade Specification sets minimum standards for rose hips products sold as foodstuff and **not** as pharmaceutical products.

2. DESCRIPTION

2.1 General description

Rose hips without seed (Cynosbati Fructus sine semine) for use as an infusion consist of the dried pseudocarps of varieties of the species *Rosa canina* with the hairs removed, but with a technically unavoidable proportion (max. 10%) of seeds, whole, cut or ground.

2.2 Appearance

Light red/brown to dark red/brown, dried, rugose-looking peel/pseudocarps.

2.3 Microscopic characteristics

- a) Fine pointed, husky hairs with one cell
- b) The pulp of the cupule contains carotin in partly aculeate or amorphous granules.

2.4 Organoleptic properties

The dried product (before infusion) has a characteristic smell and aromatic taste (sweet-sour).

Standard procedure for preparation of test infusion for evaluation: see EHIA's "Standard Procedure for Organoleptic Tests".

The colour of the infusion is light brownish to dark brown. The infusion has a flavour and odour characteristic of rose hips (fruity-sweet-sour).

Rose hips: page 2
Edition: 2000

3. REQUIREMENTS

3.1 Chemical and physical requirements

The product shall comply with the requirements specified in the table, in which all figures are calculated on the basis of the product oven-dried to constant mass at 103°C.

Characteristic	Requirements	Reference to method of test
Loss in mass	Max. 14%	Tea – Determination of loss in mass at 103°C ISO 1573/1980
Ash insoluble in hydrochloric acid	Max. 1.5%	Tea – Determination of acid-insoluble ash ISO 1577/1987

3.2 Labelling requirements: Instructions for use

All retail products must bear an instruction to prepare the beverage with boiling water.

Edition 2000

IX. VERBENA – Foodstuff product specification

1. SCOPE AND FIELD OF APPLICATION

This European Trade Specification sets minimum standards for Verbena products sold as foodstuffs and **not** as pharmaceutical products.

2. DESCRIPTION

2.1 General description

Verbena for use as an infusion consists of the dried leaves and stems of varieties of the species *Lippia citriodora* (or *verbena triphylla*), whole, cut or ground.

2.2 Appearance

Leaves (whole, broken or ground) of green colour with pieces of stems.

2.3 Microscopic characteristics

The leaves are 4 – 9 cm long, spear-shaped and grey-green with a strong middle rib.

2.4 Organoleptic properties

The dried product (before infusion) has a characteristic smell and aromatic taste.

Standard procedure for preparation of test infusion for evaluation: see EHIA's "Standard Procedure for Organoleptic Tests".

The colour of the infusion is clear green. The infusion has a flavour and odour characteristic of verbena.

Verbena: page 2
Edition: 2000

3. REQUIREMENTS

3.1 Chemical and physical requirements

The product shall comply with the requirements specified in the table, in which all figures are calculated on the basis of the product oven-dried to constant mass at 103°C.

Characteristic	Requirements	Reference to method of test
Loss in mass	Max. 12%	Tea Determination of loss in mass at 103°C ISO 1573/1980
Ash insoluble in hydrochloric acid	Max. 3.5%	Tea – Determination of acid insoluble ash ISO 1577/1987
Essential oil (volume/weight)	Min. 0.15%	Spices, Condiments and Herbs Determination of volatile oil content ISO 6571/1984

3.2 Labelling requirements: Instructions for use

All retail products must bear an instruction to prepare the beverage with boiling water.

Edition 2000

Part II: METHODS FOR SAMPLING, SAMPLE PREPARATION, ANALYSIS AND SENSORY EVALUATION

A. SAMPLING

The method of sampling to be used is ISO 948 – 1980 – “Spices and Condiments – Sampling” modified as follows for the purpose of sampling retail packs of infusions:

1. Section 2.3 – Increment

In the case of retail herbal infusion products, an increment is a minimum of 1 unit of retail sale or 25 g (whichever is the larger).

2. Section 6.1 – Number of containers to be taken for sampling

- (a) A container is the outer box in which units of sale are delivered to the retail outlet.
- (b) For the purpose of determining compliance with limits for acid-insoluble ash, the number of containers to be sampled is given in the table.
- (c) For the purpose of determining compliance with limits for loss in mass and requirements for essential oils, the minimum number of containers to be sampled is 10. For lots comprising more than 100 containers, the square root of the number of containers should be sampled.
- (d) For the purpose of determining compliance with all requirements at the packing factory, a minimum of 10 increments should be taken throughout the packing run. When a packing run comprises more than 100 containers, the square root of the number of containers should be sampled.

B. PREPARATION OF SAMPLES

- 1. Bulk samples intended for determining compliance with limits for acid insoluble ash should be ground as described in ISO 2825 – 1981 – Spices and Condiments – Preparation of ground sample.
- 2. Bulk samples intended for sensory evaluation and for determining compliance with limits for loss in mass and requirements for essential oils should be well-mixed, but **not** ground.

C. METHODS OF ANALYSIS

- 1. Tea – Determination of loss in mass at 103°C
ISO 1573/1980
- 2. Tea – Determination of total ash – ISO 1575/1987
- 3. Tea – Determination of acid-insoluble ash
ISO 1577/1987
- 4. Tea – Preparation of a ground sample of known dry matter content
ISO 1572/1980 (for total ash/HCL-ash)
- 5. Spices, Condiments and Herbs – Determination of volatile oil content
ISO 6571 - 1984
- 6. Spices and Condiments – Preparation of ground sample
ISO 2825 – 1981

D. EHIA STANDARD PROCEDURE FOR PREPARATION OF INFUSION LIQUORS FOR SENSORY EVALUATION

Introduction

1. The chemical requirements of EHIA specifications for herbal infusions products are by themselves insufficient to ensure that the organoleptic (taste, smell) and other sensory properties (colour) meet the requirements for sensorically sound products which are implicit in the specifications. Only expert sensoric evaluation carried out under standard conditions can provide this assurance; this document lays down suitable conditions for such expert evaluation.
2. There are basically three types of sensory properties which have to be assessed:
 - (a) Colour of liquors
 - (b) Aroma (smell) of liquors
 - (c) Flavour (and possible “off-flavour”) of liquors

Full assessment of these properties often calls for testing at more than one liquor strength – for example colour is normally assessed at consumer strength, whilst aroma and flavour (especially “off-flavour”) are assessed at higher liquor strengths. Finally, the liquor strengths to be used depend on the botanical variety under test.

3. Accordingly, this specification lays down for each variety **two** cup volume/material weight ratios to be used in preparing liquors for sensory tests. By agreement between interested parties, tests may be carried out using either or both of these ratios (A + B, table 1)*

Procedure

1. Weigh into a cup (150 ml or 200 ml) the amount of material shown in table 1. If a cup with a different volume is used, the weight of material taken must be adjusted to correspond to the volume/weight ratio specified.*
2. Fill the cup with freshly boiling water. ** Allow to brew for 5 minutes.
3. Decant the liquors.

Footnotes:

* The test report must state which of the 2 ratios has been used (A and/or B) together with the volume of the cup used.

** The flavour and appearance of the liquor are affected by the hardness (mineral composition) of the water used. The water used for the test should preferably be similar to the drinking water in the area where the product is to be consumed.

Edition 1999

Table 1

Cup volume/material weight ratios and material weights to be used

Variety	A			B		
	CV/MW**	Weight(g) for 150 ml	200 ml	CV/MW**	Weight(g) for 150 ml	200 ml
Mint*	125	1.20	1.60	80	1.88	2.5
Lime	125	1.20	1.60	50	3.00	4.0
Verbena	115	1.30	1.74	50	3.00	4.0
Camomile	200	0.75	1.00	80	1.88	2.5
Rose hips	80	1.88	2.50	50	3.00	4.0
Hibiscus	80	1.88	2.50	50	3.00	4.0
Orange leaves	100	1.50	2.00	50	3.00	4.0
Fennel	80	1.88	2.50	50	3.00	4.0

Footnotes:

* Peppermint and spearmint

** Ratio of cup volume (ml) to material weight (g).