



FRUIT JUICE

Technical  
Guidance

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# Introduction

This guidance is intended for manufacturers and other businesses that use and produce fruit juices and fruit juice nectars.

These notes primarily provide guidance on current legislation on fruit juices and fruit nectars. Previous guidance to legislation provided by the Food Standards Agency has been superseded. The guidance also includes a glossary of terms that are widely used in the juice industry, gives information on quality and authenticity considerations and mentions vegetable juices.

This guidance has been produced in collaboration with the Department of Environment Food and Rural Affairs.

## Fruit juice legislation

Within the EU fruit juice is regulated by [Council Directive 2001/112/EC](#) relating to fruit juices and certain similar products intended for human consumption, last amended by [Directive 2012/12/EU](#) of the European Parliament 19 April 2012, published in the Official Journal on 27 April 2012.

The 2012 Directive has been transposed in national regulations as:  
[The Fruit Juices and Fruit Nectars \(England\) Regulations 2013](#) SI 2013 No.2775.

Equivalent regulations for the devolved nations are:  
[The Fruit Juices and Fruit Nectars \(Wales\) Regulations 2013](#) SI 2013 No. 2750 (W. 267)  
[The Fruit Juice and Fruit Nectars \(Scotland\) Regulations 2013](#) SI 2013 No. 305  
[The Fruit Juice and Fruit Nectars \(Northern Ireland\) Regulations 2013](#) SI 2013 No. 253

The main differences in the regulations are with regard to enforcement application.

The Regulations lay down compositional standards for fruit juice and certain similar products, and provide specific labelling requirements for these products. This is done by regulating the descriptions used in respect of these products.

### Products covered by the regulations

The Regulations control the use of the names:  
‘fruit juice’, ‘fruit juice from concentrate’, ‘concentrated fruit juice’, ‘water extracted fruit juice’, ‘dehydrated fruit juice’, ‘powdered fruit juice’ and ‘fruit nectar’.  
Only products that comply with the requirements of the regulatory provisions can be traded using these names.

The Regulations also lay down what additional ingredients and substances may be added to regulated products and what treatments the products may undergo in their manufacture.

Certain particulars are required to be indicated when trading in regulated products, including:

- a requirement to indicate the kinds of fruits, or (in some cases) the number of kinds of fruits, used to make a regulated product.
- an indication of whether extra pulp and cells have been added to a fruit juice
- a requirement for a fruit juice made from a mixture of fruit juice and fruit juice from concentrate to indicate that it is partially made from concentrate or concentrates
- a requirement to indicate any added lemon juice, lime juice or acidifying agents in a concentrated fruit juice that is not intended for delivery to the final consumer.

## Fruit juice legislation

- various indications for a fruit nectar, including an indication of its fruit content.

These are also 'names prescribed by law' for the purposes of labelling. Therefore, the name under which a 'regulated product' is sold must be the product name required under the legislation.

The legislation applies only to regulated products sold as such. Non-conforming products cannot use the regulated product names.

For foods containing regulated products as ingredients, only the regulated products are subject to the Regulations. Other regulations may apply to the food as a whole, or other ingredients within it.

The regulated product names may also be used in the name of a food in the following circumstances:

- Where it is clear that the specified product in relation to which the regulated product name is used is only an ingredient of the food. (e.g. 'lemonade with real lemon juice')
- Where it is clear that the food is not, and does not contain, the regulated product.
- Where the regulated product name is used in a customary name for another food product and its use is not liable to mislead the consumer. e.g. High juice squash

Under general labelling rules relating to ingredient listing, where a regulated product is used as an ingredient in another food, the appropriate product name for that regulated product must be used to describe that product in the list of ingredients.

### What is new in these regulations

- Restoration of aromas to fruit juice and fruit juice from concentrate has become optional rather than mandatory.
- A new category of juice - water extracted fruit juice (juice produced by the diffusion of water with pulpy whole fruit or dehydrated whole fruit) has been defined.
- Freezing of fruit has been permitted as an approved method of preservation.
- Reversion to Codex Brix values for blackcurrant, guava, mango and passion fruit.
- Clarification that the use of fruit purees is acceptable in juice production and can be regarded as juice for labelling purposes.
- Inclusion of tomato in the list of fruits.
- Prohibition of sugar addition to fruit juices.
- 'no added sugar' claims will not be permitted on fruit juices.

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## Fruit juice legislation

- The product name must reflect the fruits used, in descending order, as indicated in the ingredients list.

## Regulated product definitions

### Fruit juice

#### Directive:

The fermentable but unfermented product obtained from the edible part of fruit which is sound and ripe, fresh or preserved by chilling or freezing, of one or more kinds mixed together, having the characteristic colour, flavour and taste typical of the juice of the fruit from which it comes.

Flavour, pulp, and cells obtained by suitable physical means from the same species of fruit may be restored to the juice.

In the case of citrus fruits, the fruit juice must come from the endocarp. Lime juice, however, may be obtained from the whole fruit.

Where juices are processed from fruits with pips, seeds and peel, parts or components of pips, seeds and peel should not be incorporated in the juice. This provision shall not apply to cases where parts or components of pips, seeds and peel cannot be removed by good manufacturing practices.

The mixing of fruit juice with fruit purée is authorised in the production of the fruit juice.

#### General:

Fruit juice is juice obtained directly from fruit. The juice is not reconstituted from concentrated juice. This form of juice is often described as 'direct juice' or 'not from concentrate juice', although these names are not controlled by the Regulations. Fruits can be transported to the production facilities where the juice is extracted, packaged and sold as fruit juice. Alternatively, the juice may be extracted in the country of origin and transported under refrigerated conditions to the country of sale, where it is often mildly pasteurised during packing to enhance preservation. This juice is usually sold in chilled cabinets at retail.

The name of the food is X Juice where X represents the type of fruit used to make the juice. The product may only contain the authorised ingredients and authorised substances laid down in the Directive. Only those food additives permitted by Regulation (EC) No 1333/2008 may be added to fruit juices and fruit nectars. Flavours and aromas recovered during the processing of juice may be added back as appropriate to the product. Only flavours and aromas obtained from the same type of fruit may be added back but they do not need to come from the same processing line. This represents a change to previous rules recognising that for many fruits not all aromas are recovered or are not of a suitable quality to be returned to the juice e.g. pineapple. The rules recognise that in some cases i.e. tropical or exotic fruits which are produced in small quantities, there may be insufficient amounts of aromas available to be able to restore them to juices. See Section 5 of this guidance on aroma restoration.

## Regulated product definitions

For grape juice only salts of tartaric acids may be restored. The production of grape juice may lead to a reduction in the level of tartaric acid salts and the Regulations permit the restoration of these salts.

For tomato juice specifically, salt, spices and aromatic herbs may be added recognising that these are often added to this type of juice, but they must be listed in the ingredients list.

Some fruits are processed only as purees such as mango or banana. The Regulations permit the products obtained from mixing a combination of juices and purees to be called 'juice'. For example, a product made from orange juice and mango puree would be permitted to use the product name 'Orange and mango juice'.

Brix levels for 'not from concentrate' juices are not laid down in law. The Brix level of these types of fruit juices should represent the level as extracted from the fruit. It should only be modified by blending with juices from the same species. If for example mandarin juice is used with orange juice the product name must reflect this accordingly and it must be listed in the ingredients list.

### Fruit juice from concentrate

#### Directive:

The product obtained by reconstituting concentrated fruit juice with potable water.

The soluble solids content of the finished product shall meet the minimum Brix level for reconstituted juice specified in the Directive- Annex V (see Appendix 1)

If a juice from concentrate is manufactured from a fruit not mentioned in this Annex, the minimum brix level of the reconstituted juice shall be the brix level of the juice as extracted to make the concentrate.

Flavour, pulp and cells obtained by suitable physical means from the same species of fruit may be restored to the fruit juice from concentrate.

The fruit juice from concentrate is prepared by suitable processes, which maintain the essential physical, chemical, organoleptic and nutritional characteristics of an average type of juice of the fruit from which it comes.

The mixing of fruit juice and/or concentrated fruit juice with fruit purée and/or concentrated fruit purée is authorised in the production of fruit juice from concentrate.

## Regulated product definitions

### General:

Fruit juice from concentrate is juice which has been concentrated (normally by evaporation under reduced pressure to reduce its volume) and returned to its original state by the addition of water.

The restored water needs to comply with Council Directive 98/83/EC on the quality of water intended for human consumption.

The name of the food for this type of product is 'X juice from concentrate' where X represents the type of fruit used to make the juice.

The term 'X juice from concentrate' must be used when trading in a juice meeting the definition above.

When a juice is made from a mixture of fruit juice and fruit juice from concentrate the product name must indicate this with a specific form of words 'partially from concentrate' or 'partially from concentrates' which must be close to the product name, in text that is clearly visible and stands out well from the background against which it appears.

During the processing of fruit juice from concentrate volatile aromas and flavours are lost during the evaporation process. In some but not all cases these products are collected and the aromas and flavours may be added back to the juices. Only flavours and aromas obtained from the same type of fruit may be added back.

Fruit juice from concentrate may also be mixed with purée and/or concentrated fruit purée and still bear the name 'fruit juice from concentrate'.

For tomato juice from concentrate, salt, spices and aromatic herbs may be added.

### Brix levels for fruit juices from concentrate:

Fruit juices from concentrate must meet the minimum Brix levels laid down in Annex V. Where a fruit is not listed in the Annex then the required Brix level of that juice should be that of the juice obtained from the fruit used to make the concentrate i.e. the juice obtained directly from the fruit in its natural state.

The Fruit Juices and Fruit Nectars (England) (Amendment) Regulations 2011 first introduced minimum Brix for fruit juices from concentrate but for four of the fruits, blackcurrant, guava, mango and passion fruit, the minimum Brix levels were higher than those in the Codex standard reflecting European industry practices. The new Regulations however provide for the lower Codex values to avoid trade barriers.

The Brix level measured is exclusive of the soluble solids of any added ingredients or additives. In addition for juices a minimum relative density 20/20 °C is determined in relation to water. The

## Regulated product definitions

measurement of the Brix level for products produced as a puree should be for the uncorrected value (i.e. without correction for acid)

The Brix levels apply to fruit juices from concentrate sold as such as well as when such juices are used as an ingredient or as a packing media in canned fruits. The Brix level applies to the finished product. In the case of canned fruit the Brix level of the juice packing media may be altered by the fruit. The product on sale to the final consumer must comply with the relevant Brix levels.

### Concentrated fruit juice

#### Directive:

The product obtained from fruit juice of one or more fruit species by the physical removal of a specific proportion of the water content. Where the product is intended for direct consumption, the removal shall be at least 50 % of the water content.

Flavour, pulp and cells obtained by suitable physical means from the same species of fruit may be restored to the concentrated fruit juice.

#### General:

The name of the food for this type of a product is 'concentrated X juice' where X represents the type of fruit used to make the juice.

Concentrated fruit juice not intended for delivery to the final consumer must indicate on its packaging, on a label attached to its packaging or in an accompanying document the presence and quantity of any added lemon juice, lime juice or acidifying agents as permitted by

Regulation (EC) 1333/2008 on food additives.

### Water extracted fruit juice

#### Directive:

The product obtained by diffusion with water of:

- pulpy whole fruit whose juice cannot be extracted by any physical means, or
- dehydrated whole fruit.

## Regulated product definitions

### General:

The name of the food for this type of product is 'water extracted X juice' where X represents the type of fruit used to make the juice.

Water extracted fruit juice is the juice obtained by diffusion with water of pulpy whole fruit where the juice cannot be extracted by physical means such as Acai fruit or from dehydrated whole fruit such as prunes or raisins.

In the case of the dehydrated product, the dried fruit product undergoes a water extraction process to produce the juice which can be either sold as such or concentrated again and restored. Further explanation of the process may be helpful to consumers in order to help them understand the nature these type of products.

### Dehydrated fruit juice and powdered fruit juice

#### Directive:

The product obtained from fruit juice of one or more fruit species by the physical removal of virtually all the water content.

#### General:

The name of the food for this type of product is 'dehydrated X juice' or 'powdered X juice' where X represents the type of fruit used to make the juice.

Dehydrated or powdered fruit juice will be in powder form or as sludge and will require the addition of water before use.

### Fruit Nectar

#### Directive:

The fermentable but unfermented product which is obtained by adding water with or without the addition of sugars and/or honey to the products defined above (fruit juice, fruit juice from concentrate, concentrated fruit juice, water extracted fruit juice, dehydrated/powdered fruit juice) to fruit purée and/or to concentrated fruit purée and/or to a mixture of those products and meets the requirements of Annex IV 2012/12/EU. (see Appendix 2)

Without prejudice to Regulation (EC) 1924/2006 on nutrition and health claims made on foods, where fruit nectars are manufactured without added sugars or with reduced energy value, sugars may be replaced wholly or partially by sweeteners, in accordance with Regulation (EC) 1333/2008.

## Regulated product definitions

Flavour, pulp and cells obtained by suitable physical means from the same species of fruit may be restored to the fruit nectar.

### General:

Fruit nectar is the product made by combining fruit juice, fruit juice from concentrate, concentrated fruit juice, water extracted fruit juice, dehydrated or powdered fruit juice, fruit puree, concentrated fruit puree or any mixture of these products with water. Sugar and/or honey may be added (within specified limits). Sweeteners may also be added. Minimum quantities of fruit juice, fruit puree, or a mixture of such juice and puree are required for these products, depending on the type of fruit used. The minimum quantities are laid down in Annex IV of the Directive (see Appendix 2).

## Raw materials

### Fruit

All fruits for the purposes of the Directive, tomatoes are also considered as fruit.

The fruit shall be sound, appropriately mature and either fresh or preserved by physical means (e.g. chilling or freezing) or by treatment(s), including post-harvest treatments applied in accordance with Union law.

The relevant EU regulations controlling the use of such treatments are Regulation (EC) No 1107/2009 and its implementing rules Regulation (EU) No 705/2011. Maximum residue levels (MRLs) are laid down in Regulation (EC) No 396/2005.

### Fruit purée

The fermentable but unfermented product obtained by suitable physical processes such as sieving, grinding, milling the edible part of whole or peeled fruit without removing the juice.

### Concentrated fruit purée

The product obtained from fruit purée by the physical removal of a specific proportion of its water content.

Concentrated fruit purée may have restored flavour which shall be obtained by suitable physical means all of which must be recovered from the same species of fruit.

### Flavour

Flavours for restoration are obtained during the processing of the fruit by applying suitable physical processes. Those physical processes may be applied to retain, preserve or stabilise the flavour quality and include squeezing, extraction, distillation, filtration, adsorption, evaporation, fractionation and concentration.

Flavour is obtained from the edible parts of the fruit, however it could also be cold pressed oil from citrus peel and compounds from the stones.

### Sugars

Sugars as defined by Council Directive 2001/111/EC relating to certain sugars intended for human consumption. Fructose syrup and sugars derived from fruits are also permitted.

### Honey

The product defined by Council Directive 2001/110/EC relating to honey.

## Raw materials

### Pulp or Cells

The products obtained from the edible parts of fruit of the same species without removing the juice.

For citrus fruit, pulp or cells are the juice sacs obtained from the endocarp.

In the case of citrus products pulp or cells are sometimes referred to as 'bits' or 'juicy bits'

## Authorised ingredients

Only certain ingredients are permitted to be added to regulated products.

### Vitamins and Minerals

Vitamins and minerals may be added to all regulated products in line with Regulation (EC) 1925/2006 on the addition of vitamins and minerals and of certain other substances to food. Vitamins and minerals must be clearly indicated on the label according to the provisions of general food labelling and nutrition labelling is compulsory wherever vitamins or minerals have been added.

If a claim is being made about the benefits of the product be aware that all nutrition and health claims made on food are subject to the general provisions of the Trade Descriptions Act 1968, and the Food Safety Act 1990.

If a nutrition and/or health claim is made or vitamins and/or minerals are added to a foodstuff a nutrition declaration in accordance with EU 1169/2011 Food Information for Consumers is required.

### Food Additives

Only those food additives authorised by Regulation (EC) No 1333/2008 and permitted for addition to fruit juices and nectars can be used and must be clearly labelled.

In practice there are very few additives permitted for use in fruit juices and nectars.

Those for juices are:

E 170	Calcium carbonate	only grape juice
E 200-203	Sorbic acid - sorbates	only grape juice, unfermented for sacramental use
E 220-228	Sulphur dioxide –sulphites	only certain juices – see details in 1333/2008
E 296	Malic acid	only pineapple juice
E 300	Ascorbic acid	all juices
E 330	Citric acid	all juices
E 336	Potassium tartrates	only grape juice
E 440	Pectins	only pineapple & passion fruit juice
E 900	Dimethyl polysiloxane	only pineapple juice

For permitted levels and for additives authorised in nectars see regulation (EC) No 1333/2008

### Restored flavour

Flavours and aromas recovered during fruit juice processing are now optionally permitted to be restored to fruit juices, fruit juice from concentrate, concentrated fruit juice and nectars.

Restored flavour represents the volatile products such as cold pressed oils, essence aromas and essence oils which are collected during the fruit juice manufacturing process.

The optional requirement allows for product differentiation and takes into account the fact that

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## Authorised ingredients

for many fruits flavours and aromas are not collected or are not available in sufficient amounts. For example the new rules recognise that flavours for many tropical fruits are difficult to recover and are in short supply or often unobtainable for other fruits such as pineapple the aromas recovered are of insufficient quality to add back and would detrimentally affect the taste of the juice.

The general requirement is that a not from concentrate (NFC) juice should be representative of the juice of the fruit from which it comes and a fruit juice from concentrate should be representative of an average type of juice of the fruit from which it comes.

### Pulp or Cells

Can be added to fruit juices, fruit juice from concentrate, concentrated fruit juice and nectars.

### Tartaric acid salts

May be restored in grape juice only.

The production of grape juice may lead to a reduction in the level of tartaric acid salts and it is permitted to restore these salts.

### Sugars and/or Honey

For nectars only – sugars and/or honey may be added up to 20% of the total weight of the finished product; and/or sweeteners.

### Lemon and/or lime juice (or their concentrates)

For fruit juices, fruit juice from concentrate, concentrated fruit juice, water extracted fruit juice, dehydrated/powdered fruit juice and nectars, lemon and/or/lime juice or their concentrates may be added to regulate acidity, up to 3g per litre of juice, expressed as anhydrous citric acid.

### Salt, spices and aromatic herbs

May be added to tomato juice and tomato juice from concentrate only.

## Authorised treatments and substances

Only the following treatments may be applied and substances added to regulated products

- Mechanical extraction processes
- The usual physical processes (including squeezing, milling and pressing)
- Desulphitation for grape juice but only to allow for the removal of sulphur dioxide used to preserve grapes and only if the total quantity of sulphur dioxide in the finished product does not exceed 10 mg per litre of the juice.
- Enzyme preparations:  
pectinases (for breakdown of pectin), proteinases (for breakdown of proteins) and amylases (for breakdown of starch) that meet the requirements of Regulation (EC) 1332/2008 on food enzymes
- Edible gelatine, tannins, silica sol, charcoal, nitrogen, bentonite as an absorbent clay and plant proteins from wheat, peas or potatoes for clarification.
- Chemically inert filtration aids and precipitation agents (including perlite, washed diatomite, cellulose, insoluble polyamide, polyvinylpyrrolidone, polystyrene) which comply with Regulation (EC) 1935/2004.
- Chemically inert adsorption aids which comply with Regulation (EC) 1935/2004 used to reduce the limonoid and naringin content of citrus juice without significantly affecting the limonoid glucosides, acid, sugars (including oligosaccharides) or mineral content.

# Labelling

## Specific Labelling

### Indication of fruits used

For all regulated products the name of the fruit(s) must be given as part of the product name (e.g. 'grapefruit juice', 'strawberry nectar', 'lemon juice from concentrate') and in the order of decreasing volume present when the product is manufactured from two or more kinds of fruit.

For regulated products the common name or the botanical name of the fruit species listed in Annex V of the directive must be used. (See Appendix 1) Where a fruit species is not listed in the Annex then the common or correct botanical name for that fruit species should be used.

Where a juice contains more than two kinds of fruit, the product name must be supplemented by a list of the names of the fruits used, the words 'several fruits' or similar wording, or by the number of different fruits used, for example '6 fruits juice' or 'five fruit tropical juice'. The names of the type of fruits must be given in the ingredient list. The 'similar wording' needs to convey the impression that more than two different types of fruit have been used. The use of terms such as 'tropical', 'exotic' or even mixed berry may not on their own, necessarily convey that. While such terms may be used as the fancy name, the product name for the purposes of the Regulations must contain a complete list of the fruits used in descending order of quantity or an alternative term reflecting that it is composed of more than two kinds of fruit.

### Indication of added pulp and extra cells

Where extra pulp or cells, other than those originally extracted from a product, are added to fruit juice then such addition must be indicated on the label.

The mandatory labelling of added pulp or cells requirement relates only to their addition to fruit juice. In practice it is understood that manufacturers may want to highlight the addition of extra pulp or cells to any of the regulated products in order to differentiate products and inform consumers about the nature of the product, this is a purely voluntary measure.

### Fruit Nectar labelling

Nectars need to comply with the general specification set out in Annex IV of the Directive, (see Appendix 2) including the minimum fruit juice and puree requirements for that particular fruit species.

There are certain additional labelling requirements for fruit nectars: an indication of the minimum content of fruit juice, fruit puree or any mixture of those ingredients is required, in the form of 'fruit content: ...% minimum'. This information must be placed in the same field of vision

# Labelling

as the product name. The product name may appear on the front of the pack or alternatively the product name may be on the back of the pack, with a fancy name on the front.

Fruit nectars made wholly from one or more concentrated products should be labelled as fruit nectar 'from concentrate' or fruit nectar 'from concentrates'.

Fruit nectars made partly from one or more concentrated products should be labelled as fruit nectar 'partially from concentrate' or 'partially from concentrates'.

This information must appear close to the product name in text that is clearly visible and stands out well from the background against which it appears. In practice this means it should be immediate and easy for the consumer to see that the product is made or partially made from concentrate(s).

Fruit nectars containing any added sugars or foods used for sweetening properties including food additive sweeteners defined in Regulation (EC) 1333/2008 are not permitted to contain a claim stating that sugars have not been added or any similar claim which might be construed as having the same meaning by the consumer. In practice this means that 'no added sugar' claims will only be permitted on nectars which are composed of juice or puree and water.

Nectars are a particular exception to general rules regarding the use of 'no added sugar' claims when food additives sweeteners are added to a food.

When a 'no added sugar' claim or similar claim that sugars have not been added is made on fruit nectars and sugars are naturally present in the fruit nectar the words 'contains naturally occurring sugars' must also appear on the label.

## General labelling

All regulated products must be sold under the relevant product name for the regulated product; this will also be the 'name prescribed by law' (i.e. the legal name) of the product for the purposes of Article 17 of EU 1169/2011 Food Information to the Consumer Regulations (FIC)

Any labelling information, with which a regulated product is required to be marked, must be presented in accordance with the manner of marking provisions of FIC.

## Durability

Fruit juices and nectars must be marked with either a 'best before' or a 'use by' date.

The Food Information Regulation clarifies the meaning implied by each of the durability coding formats: 'Use By' and 'Best Before'.

'Use By' should only be put on foodstuffs which could be potentially harmful to health after the marked date.

'Best Before' should be employed where shelf-life is limited by quality reduction rather than health concerns.

## Labelling

Chilled fruit juices should be marked with 'best before' durability labelling. These products have been pasteurised or treated so that they present no health risk.

Very short shelf-life (<14 days) unpasteurised fruit juices, on the other hand, should be labelled with a 'use by' durability labelling.

Producers of fruit juices preserved by means other than heating, e.g. high pressure, should evaluate the perishability and safety of the product and decide on whether a 'use by' date or 'best before' date is appropriate for the product.

Storage instructions if appropriate should be given in order to maintain the quality of a juice

### Indication of Treatment e.g. Pasteurisation

The Food Information Regulation (EU 1169/2011) requires that processing techniques used in the production of foodstuffs should be declared on the label if it could mislead the consumer not to do so. The majority of packaged fruit juice sold in the UK (>99%) is pasteurised, with heat treatment being an inherent part of the manufacture of a concentrated juice so would not require labelling.

Some consumer confusion could exist in the case of certain juice categories e.g. freshly squeezed juices, where it is not implicit that pasteurisation has taken place.

Where fruit juice described as 'freshly squeezed' has been pasteurised, the indication of treatment should therefore accompany the name, e.g. 'freshly squeezed orange juice lightly pasteurised'.

If such juices have been treated under pressure, there must be an indication of this along with the name (e.g. 'high pressure processed juice').

New processes that are unfamiliar to consumers should be indicated; e.g. high pressure processing, pulsed electric field etc.

### Marketing Terms (pure; 100% juice, freshly squeezed)

For fruit juices the term 'pure' should only be used for fruit juices where nothing has been added to the juice. It may be used for juices reconstituted with water.

Legislation no longer permits the addition of sugar to impart sweetness to juices but additional substances such as lemon or lime juice to correct acidic taste and the use of additives in line with 1333/2008 is still permitted. Terms such as 'pure' or '100% juice' should not be used where additives or additional ingredients including ascorbic acid are added.

The term 'freshly squeezed' should only be used to describe juice obtained direct from the fruit (i.e. not prepared from concentrates) where there has been a short time between extraction and packaging and the 'use by' date given on the product is within 14 days of juice extraction.

### Alternative designations for fruit juice and fruit nectar (Fruit Juice Directive Annex III)

Certain national products specific to some Members States have been given an exemption so that they do not have to use the terms “fruit juice” or “fruit nectar”. These specific products, made to traditional recipes, are commonly understood by consumers in those countries to be juices or nectars. These alternative terms are specifically provided for and listed in Annex III of the Fruit Juice Directive.

Only the exact names provided for in the Annex can be used they cannot be translated.

### Smoothies

There is no legal definition of a smoothie laid down in law.

There is no standard method of manufacture, however, fruit smoothies usually contain crushed fruit, purees and fruit juice.

Smoothie type products which are composed entirely from juices and fruit purees and contain no other ingredients will fall under the Fruit Juice and Fruit Nectars Regulations 2013 and as such are subject to the same regulations as fruit juice, their product name should reflect this accordingly.

The addition of other ingredients to the product such as milk or yogurt would take them outside the Regulations although the individual fruit juice components of the products would still need to comply with the rules.

## Quality and Authenticity

To provide a uniform basis for evaluation of the quality, identity and authenticity of juices it is often necessary to complement legislation with guidance. The BSDA recommends that fruit juice manufacturers, processors and manufacturers follow the AIJN (European Fruit Juice Association) Code of Practice.

The Code of Practice consists of a set of reference guidelines describing in detail the characteristic natural components of industrial processed fruits by setting analytical requirements including: Brix, Acid, Sugars, Flavonoids, Mineral contents and Isotopic parameters.

The Code currently contains reference guidelines for 26 different juices, those listed in Annex V of the Fruit Juice Directive (see Appendix 1) and in addition:

acerola	aronia
carrot	cranberry
kiwi	lime
pomegranate	

Provisional brix and relative density values for the following 28 fruits varieties are also given:

bilberry/blueberry	blackberry
boysenberry	cashew apple
cloudberry	Crowberry
date	elderberry
gooseberry	lingonberry
lychee	melon
papaya	plum
prune	quetsche
quince	redcurrant
rosehip	rowanberry
sallow-thorn berry	sloe
soursop	stonesbaer
sugar apple	umbu
water melon	white currant

AIJN have also agreed provisional brix values for a further 11 vegetable juices:

broccoli	cauliflower
celery	green pepper
kale	onion
pumpkin	red beet (beetroot)
red pepper	rhubarb
spinach	

A guideline for coconut water is being developed.

## Vegetable Juices

Vegetable juices, other than tomato, are not covered by the Fruit Juice Directive, however, due to the many similarities, for best practice it would seem sensible to treat them in the same way.

Additionally a number of products are manufactured as combinations of fruit juice and vegetable juice.

The same product categories would apply, e.g. vegetable juice, vegetable juice from concentrate, concentrated vegetable juice, vegetable nectar (minimum vegetable contents apply for nectars) etc.

Some vegetable juices are produced by non alcoholic fermentation and would be termed X (type of fermentation) vegetable juice.

### DEFINITIONS

#### Vegetable

Vegetables can be considered as the edible parts of root, bulb and tuber vegetables (e.g. carrot, garlic, potatoes) stem and sprout vegetables (e.g. asparagus), leaf and flower vegetables (spinach, cauliflower), fruit vegetables (cucumber, pumpkin) and seed vegetables/legumes (e.g. peas) plus rhubarb and others.

The vegetables shall be sound, appropriately mature and either fresh or preserved by physical means (e.g. chilling or freezing) or by treatment(s), applied in accordance with Union law.

#### Vegetable purée

The fermentable but unfermented product obtained by suitable physical processes without removing the juice.

#### Concentrated vegetable purée

The product obtained from vegetable purée by the physical removal of a specific proportion of its water content.

#### Vegetable pulp

Product obtained in the same way as vegetable puree whereby a part of the juice is removed.

#### Flavour

Flavours for restoration are obtained during the processing of the named vegetable by applying suitable physical processes. Those physical processes may be applied to retain, preserve or stabilise the flavour quality and include squeezing, extraction, distillation, filtration, adsorption, evaporation, fractionation and concentration.

# Vegetable Juices

## AUTHORISED INGREDIENTS

### Vitamins & minerals

Vitamins and minerals may be added in line with Regulation (EC) 1925/2006 on the addition of vitamins and minerals and of certain other substances to food.

### Restored pulp & flavours

Flavours and pulp restored to vegetable juice and vegetable juice from concentrate must come from the same species of vegetable.

### Sugars

Sugars as defined by Council Directive 2001/111/EC. Fructose syrup and sugars derived from fruit and vegetables are also permitted.

### Honey

The product defined by Council Directive 2001/110/EC relating to honey.

### Lemon juice (or concentrate)

For all the defined products the addition of lemon juice or concentrated lemon juice is permitted as an acidity regulator.

### Carbon dioxide

Carbon dioxide, as an ingredient, is permitted.

### Salt, spices & aromatic herbs

Salt, sea salt or iodised or fluoridated salt and potassium chloride or mixtures of them, herbs, spices and their natural flavourings and extracts are all permitted.

### Flavourings, extracts and edible oils

Vegetable derived natural flavourings and vegetable derived extracts and edible oils are permitted.

### Vinegar

Vinegar is permitted.

# Vegetable Juices

## Drying agents

Substances used to dilute or disperse with no technological role other than to dry and obtain a dried product.

## Food Additives

Only those food additives authorised by Regulation (EC) No 1333/2008 are permitted.  
The addition of x acid shall not be allowed in x acid fermented products, e.g. the addition of lactic acid shall not be allowed in lactic acid fermented products.

## AUTHORISED TREATMENTS and SUBSTANCES

- Mechanical extraction processes
- The usual physical processes (including squeezing, milling and pressing)
- Enzyme preparations meeting the requirements of Regulation (EC) 1332/2008 on food enzymes.
- Edible gelatine, tannins, silica sol, charcoal, nitrogen, absorbent clays (bentonite) and calcium carbonate for clarification.
- Chemically inert filtration aids and precipitation agents (including perlite, washed diatomite, cellulose, insoluble polyamide, polyvinylpolypyrrolidone, polystyrene) which comply with Regulation (EC) 1935/2004.

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## JUICE TERMS

### Clarified Juices

Clarified or clear juices are processed to remove the fine suspended particles of pulp that are naturally present in most juices. There are a number of methods used for clarification depending on the type of fruit and processing facilities available, including filtration, fining, ultrafiltration and enzyme treatment.

### Cloudy Juices

Most juices when extracted from the fruit are naturally cloudy due to the presence of fine pulp particles suspended in the juice.

### Cloudy Concentrate (Citrus)

Cloudy concentrates are specialised citrus products manufactured by extracting deoiled peel and pulp residues with hot water with the addition of pectolytic enzymes. The filtered, extracted cloudy liquid is then pasteurised and concentrated to 50°Brix.

### Comminute

Comminutes are specialised citrus products produced at juice manufacturers, ingredient combinations are producer specific and may contain the following: juice concentrate, essential oil, peel flakes, milled peels and cloudy concentrate.

### Concentrated Fruit Juice

See Section 3

### Cut-back

Cut-back is a process whereby single strength fruit juice is added to concentrate to improve quality characteristics and the Brix of the concentrate is therefore cut-back, for example from 65° to 45° Brix

# Glossary

## Dehydrated Fruit Juice

See Section 3

## Direct Juice

See Fruit Juice

## Freshly Squeezed Juice (or freshly pressed)

Juice is literally squeezed or extracted from the fruit and filled directly into the appropriate container for a very short shelf life but may be lightly processed for longer life. FSA Guidelines require that the product should have a shelf life of no more than 14 days.

## Fruit Juice

See Section 3

Often termed Not From Concentrate (NFC) or Direct Juice

## Fruit Juice from Concentrate

See Section 3

## Not from Concentrate

See Fruit Juice

## Fruit Nectars

See Section 3

## Fruit Puree

Puree is the fermentable but unfermented product obtained by any suitable physical process such as sieving, grinding, milling the edible part of whole or peeled fruit without removing the juice. This is applicable to any type of fruit but certain fruits, such as mango, are very pulpy and tend to be pureed instead of squeezing to produce juice.

# Glossary

## Concentrated fruit purée

The product obtained from fruit purée by the physical removal of a specific proportion of its water content.

## Pulp Wash (water extracted soluble solids)

Pulp wash is produced by washing fruit pulp residues after juice extraction to extract any remaining juice.

## Water Extracted Fruit Juice

See Section 3

## PROCESS TERMS

### Aseptic

Product is heated to destroy any viable micro-organisms and is then filled into sterile containers under aseptic conditions and sealed. The resulting product is 'commercially sterile'. Aseptically packed product does not need to be stored chilled for micro-biological reasons but prolonged storage at high temperatures leads to a reduction in product quality.

### Cold Pressed

'Cold pressed' is the term that refers to materials such as raw fruit and vegetables being put under pressure with a membrane to extract raw (cold) juice. This can be done under pressure via a hydraulic press, a belt press or through a traditional gradual press.

The term is generally used as the descriptor for raw, cold processed fruit/veg juices, in some cases the term can be confused with High Pressure Processing due to many cold pressed juices subsequently being High Pressure Processed to extend their shelf life.

'Cold press' has also been used to describe juices extracted via centrifugal force, however, as heat is generated during this process with no pressing activity, it would be viewed as misleading.

### High Pressure Processing (HPP)

High Pressure Processing is a non-thermal process that preserves the organoleptic properties of a food product, extends the life and reduces the risk of food pathogens and food spoilage

# Glossary

organisms. The process allows juices to maintain a similar sensory and nutritional quality to an unprocessed counterpart by using pressures that are typically around 600MPa (6000bar) and a holding time that is usually upwards of a minute.

This process is particularly effective for use with chilled high acid juices and juice drinks with a pH of <4.2 where the life of the product can be extended considerably over pasteurised fresh products. A consideration however is that although the process is effective at inactivating vegetative cells the pressures used commercially aren't sufficient to inactivate spores and do not necessarily deactivate the enzymes naturally present in the fruit juice or vegetable juices. This can limit the shelf life as separation occurs if the juices have not been previously heat treated in some way.

## Pasteurisation

Pasteurisation refers to the heat processing given to the juice. The processing has two functions:

- Inactivation of any enzymes that could cause chemical and physical changes in the juice.
- Destruction of micro-organisms capable of growing in the juice during its life.

Pasteurisation conditions depend upon the product involved, its intended shelf life and the storage conditions to which it will be subjected.

## Pulsed Electric Field (PEF)

In PEF processing a substance is placed between two electrodes and a pulsed electric field is applied. The electric field enlarges the pores of the cell membranes which kills the cells and releases their contents. The electrical energy delivered to the product is partially transformed into thermal energy but the treatment time is in microseconds. Although the temperature peak can reach more than 60°C in high intensity treatments, the thermal load compared to a traditional thermal pasteurisation is much lower.

## OTHER TERMS

### Acidity

The acidity of fruit juices is due to a mixture of acids but in general the citrus juices are measured in terms of the percentage citric acid anhydrous, apple juice in terms of malic acid and grape juice as tartaric acid

# Glossary

## Alicyclobacillus (ACB)

*Alicyclobacillus* contamination has become a major concern and challenge to the fruit juice industry. *Alicyclobacillus* species are acid tolerant and commercially applied pasteurisation techniques do not deactivate the spores. With *Alicyclobacillus* spoilage juice products develop a disinfectant-like odor and/or flavour (due to guaiacol production). Spoilage has been seen with a wide variety of fruit juices but is particularly prevalent in orange and apple juices.

## Brix

In a pure sucrose solution the °Brix relates to the soluble solids that are the percentage of dissolved sucrose. A syrup of 10% sucrose by w/w has a Brix of 10°. In a juice the term Brix refers to all the soluble solids and the amount of acid present will affect the value as well as the sugars present.

## Brix/Acid Ratio

The Brix divided by the acidity gives a ratio that is sometimes referred to as the maturity index as it relates to the relationship between sugar level and acid level. Higher ratios refer to sweeter products and lower ratios to more acidic products. When referring to ratio it is important to know whether it is a corrected ratio from a corrected Brix or not.

## Corrected Brix

For a pure sucrose solution the refractometer reading will measure the sugar and give an exact figure for Brix. However, for a juice containing acid the amount of acid present will lower the refractometer reading and a correction will need to be applied from a given table to give the corrected Brix, this can be particularly significant for high acid juices such as lemon and lime.

## Ochratoxin A

Ochratoxin A is one of the most abundant food-contaminating mycotoxins formed naturally during the growth of some micro-fungi (moulds), it is associated with cereals, coffee and grapes. The level is regulated by [EU 1881/2006](#) (as amended), currently a maximum limit of 2.0µg/kg is set for ochratoxin A in grape juice.

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## Patulin

Patulin is a toxic metabolite formed naturally during the growth of a diverse range of micro-fungi (moulds), which occur commonly on many fruit, vegetable and cereal products and is particularly associated with apples. It occurs only in mould-damaged fruits; presence of mould does not necessarily mean that patulin will be present in a fruit but provides *a priori* evidence that it may be present. The British Soft Drinks Association has developed a Code of Practice to define 'Best Manufacturing Practices' to ensure that apple juice produced and sold in the UK is of the highest quality and that patulin levels are minimised

The level is regulated by [EU 1881/2006](#) (as amended), currently a maximum limit of 50.0µg/kg is set for patulin in apple juice for apple puree specifically for babies the level is 10µg/kg.

## pH

pH is an indication of acidity and refers to the concentration of the hydrogen ions. It is important in relation to micro-organisms. The pH of a juice will determine whether certain micro-organisms can survive in it. Typically pathogenic micro-organisms will not survive at a pH below 4.

## Refractometric Brix

This refers to the Brix reading as measured by a refractometer instrument directly.

# Appendix 1

## Minimum Brix levels

### Annex V of fruit juice directive

Common Name of the Fruit	Botanical Name	minimum Brix levels
Apple (*)	<i>Malus domestica</i> Borkh.	11.2
Apricot (**)	<i>Prunus armeniaca</i> L.	11.2
Banana (**)	<i>Musa x paradisiaca</i> L. (excluding plantains)	21.0
Blackcurrant (*)	<i>Ribes nigrum</i> L.	11.0
Grape (*)	<i>Vitis vinifera</i> L. or hybrids thereof <i>Vitis labrusca</i> L. or hybrids thereof	15.9
Grapefruit (*)	<i>Citrus x paradisi</i> Macfad.	10.0
Guava (**)	<i>Psidium guajava</i> L.	8.5
Lemon (*)	<i>Citrus limon</i> (L.) Burm.f.	8.0
Mango (**)	<i>Mangifera indica</i> L.	13.5
Orange (*)	<i>Citrus sinensis</i> (L.) Osbeck	11.2
Passion fruit (*)	<i>Passiflora edulis</i> Sims	12.0
Peach (**)	<i>Prunus persica</i> (L.) Batsch var. <i>persica</i>	10.0
Pear (**)	<i>Pyrus communis</i> L.	11.9
Pineapple (*)	<i>Ananas comosus</i> (L.) Merr.	12.8
Raspberry (*)	<i>Rubus idaeus</i> L.	7.0
Sour cherry (*)	<i>Prunus cerasus</i> L.	13.5
Strawberry (*)	<i>Fragaria x ananassa</i> Duch.	7.0
Tomato (*)	<i>Lycopersicon esculentum</i> , Mill.	5.0
Mandarin (*)	<i>Citrus reticulata</i> Blanco	11.2

For those products marked with an asterisk (\*), which are produced as a juice, a minimum relative density is determined as such in relation to water 20/20 °C.

For those products marked with two asterisks (\*\*), which are produced as a puree, only a minimum uncorrected Brix reading (without correction of acid) is determined.

## Appendix 2

## Special provisions for fruit nectars

## Annex IV of Fruit Juice Directive

Fruit nectars made from	minimum juice and/or puree content (% by volume of finished product)
1. Fruits with acidic juice unpalatable in the natural state	
Passion fruit	25
Quito naranjillos	25
Blackcurrants	25
Whitecurrants	25
Redcurrants	25
Gooseberries	30
Seabuckthorn berries	25
Sloes	30
Plums	30
Quetsches	30
Rowanberries	30
Rose hips	40
Sour cherries	35
Other cherries	40
Bilberries	40
Elderberries	50
Raspberries	40
Apricots	40
Strawberries	40
Mulberries/blackberries	40

Fruit nectars made from	min juice %
Cranberries	30
Quinces	50
Lemons and limes	25
Other fruits belonging to this category	25
2.Low-acid, pulpy or highly flavoured fruits with juice unpalatable in the natural state	
Mangoes	25
Bananas	25
Guavas	25
Papayas	25
Lychees	25
Azeroles (Neapolitan medlars)	25
Soursop	25
Bullock's heart or custard apple	25
Sugar apples	25
Pomegranates	25
Cashew fruits	25
Spanish plums	25
Umbu	25
Other fruits belonging to this category	25
3.Fruits with juice palatable in the natural state	
Apples	50
Pears	50
Peaches	50
Citrus fruit except lemons and limes	50
Pineapples	50
Tomatoes	50
Other fruits belonging to this category	50





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