

IMPROVEMENTS RELATING TO ORGANIC FLAVOUR COMPOUNDS

Field of the Invention

The present invention is concerned with flavour compositions and to methods of preparing
5 same. The invention is also concerned with methods of using the compositions to impart authentic
flavour to food or beverage products, and to the flavoured food or beverage products.

Background of the Invention

10 State of the art crafted flavour compositions are prepared using a palette of flavour ingredients,
which are chemicals of natural origin, or are identical to chemicals found in nature. There are
hundreds if not thousands of such ingredients available on the flavourists' palette, and when they
are combined in creative ways they can be employed very successfully to create the flavour
subtleties so valued by the food and beverage industry.

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However, whereas manufacturers of processed foods and beverages have always demanded
great tasting crafted flavour compositions from their flavour suppliers, increasingly they expect
their suppliers to provide flavours that are compliant with the so-called "clean label" initiative.

20 The clean label initiative is not concerned with food safety or food quality. Rather, it is a
sentiment driven by a consumer need to understand back-of-pack ingredients declarations found
on processed foods and beverages. Consumers are becoming more savvy; they are reading
ingredients declarations on packaging, and they want to be able to understand and recognize what
those ingredients are in plain language. By way of illustration, an ingredient declaration containing
25 the term "Vitamin C" creates a better, cleaner or clearer impression in the minds consumers than
"E300" or "ascorbic acid", even though the terms describe the same ingredient.

The clean label (sometimes also referred to as "clear label") initiative is complex to navigate
because it consists of an unregulated set of ideals, which inherently lacks clarity. However, it is
30 generally understood and accepted that if an ingredient would not typically be found in a kitchen
store-cupboard, or it would not generally be recognized by the public at large, or worse, it has a
chemical-sounding name, it is in danger of not being considered as clean label.

This creates an obvious challenge for the use of chemical-sounding, artificial ingredients such as colours, emulsifiers, preservatives, and the like. However, crafted flavour compositions are also affected by this. More specifically, even though crafted flavours may be prepared from totally natural ingredients drawn from the flavourists' palette, nevertheless it is required that they are specifically listed in back-of-pack ingredient declarations as "flavour", "flavouring" or some variant thereof. The difficulty with this is that the term "flavour", "flavouring" or the like, may fall foul of the clean label requirement because the term is not informative of the ingredients contained within it. If consumers cannot understand the term "flavour" they may view it suspiciously as an attempt to conceal unnecessary ingredients.

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WO2016/044470 discloses examples of such flavour compositions containing completely natural ingredients comprising mixtures of essential oils extracted from hitherto known but uncommercialized mint cultivars. However, these mint oils are extracts, and because the process of extraction is not deemed to constitute minimal processing, plant extracts are considered to be flavour ingredients for labeling purposes, and not food as such, and any flavour composition containing such extracts would have to be specifically referred to as a flavour, or otherwise reference would have to be made to mint extract, on back of pack ingredients declarations rendering them unsuitable for clean label purposes.

20 As a result of the clean label initiative, manufacturers of processed food and beverage products are faced with the challenge of coming up with new ways to meet this consumer need, without compromising the quality and flavour of their products.

In principle, formulators could address the clean label issue by preparing flavour compositions composed entirely of foodstuffs. In this manner, if a fruit flavour could, hypothetically, be prepared entirely of fruit, a food or beverage product flavoured with it could contain an ingredient declaration that stating it contains "fruit", rather it contains "flavour" or an "extract". Such a declaration would be expected to meet the clean label standard because the term "fruit" is clear and well-recognized by the average consumer.

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In fact, real food pieces are already added to certain processed foods. For example, some yoghurts and desserts contain pieces of real fruit. However, it is also a fact that the fruit pieces used in these instances are merely employed for their visual impact and to create the perception of premium quality and/or authenticity, rather than to create flavour as such because the levels of useful fruit aroma compounds contained in known fruit cultivars are simply not high enough for

fruit matter, as such, to provide acceptable flavour when used in commercially reasonable amounts in processed foods and beverages. Indeed, fruit flavour preparations that have employed real fruit pieces also contain significant amounts of crafted flavour compositions comprising flavour ingredients, which are substantially responsible for the nuance, richness and character of
5 flavour that the real fruit pieces cannot provide. Accordingly, such flavour compositions, notwithstanding that they contain real fruit, would not conform with the clean label requirement.

Whilst clean label flavoured processed food or beverage products are desirable, the current state of the art cannot provide flavour compositions solely from foodstuffs that have the requisite
10 intensity, richness and complexity of flavour required by customers.

There are possibly many reasons for this, but one reason may reside in the central breeding aims of the plant and animal breeding industries. Taking plant breeding as an example, fruit varieties have been subjected to selective breeding over many years with the purpose of
15 addressing various attributes including colour, size, texture, shelf-life and yield as the central breeding aims. Unfortunately, although breeding is designed to amplify or suppress particular facets, traits, attributes or properties of fruit varieties, the amplification of volatile aroma chemicals has not been a priority, and indeed, the unintended consequence of the aforementioned central breeding aims has surely been to alter the levels of, or even eradicate, volatile aroma
20 compounds that are necessary contributors to the richness, nuance and intensity characteristic of a particular type of fruit. Indeed, as far as the applicant is aware, with the possible exception of citrus fruits as well as certain herbs and spices, there are currently no commercially available botanical varieties that can alone be employed to provide an authentic flavour to a processed food or beverage product.

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Manufacturers of processed food and beverage products may no longer be able to rely on brand loyalty alone to secure their market positions, as increasingly customers are making their purchasing decisions based on their impressions of what is written on the ingredients declaration of foods and beverages. Choosing the appropriate labelling creates a healthy and positive
30 impression in the minds of consumers and will almost certainly become an important part of branding strategy. Manufacturers recognize the importance of providing consumers with clear and easily understandable information regarding what is contained in their products, particularly if there is a good story to tell.

There remains a need for suppliers of flavours to the processed food and beverage industry to provide novel, great-tasting flavours, but there is also a developing need to provide such flavours and at the same time assist the manufacturers of processed foods and beverages to create cleaner and clearer labels for their products and in doing so, help shape their front-of-pack claims, as well
5 as their back-of-pack ingredients declarations.

Summary of the Invention

In addressing the deficiencies of the prior art, the applicant sought to produce flavour
10 compositions that were comparable in quality to those currently crafted flavour compositions prepared by mixing flavour ingredients found on the flavourists' palette, and which would assist food and beverage manufacturers to make cleaner and clearer ingredients declarations on their packaged products.

15 Unfortunately, the applicant found that this was not possible using matter obtained from single botanical or animal varieties because, owing to breeding practices over generations, no single variety of plant or animal contained a full complement of necessary aroma compounds in sufficiently high levels to deliver the desired flavours with the requisite intensity and authenticity.

20 However, the applicant found that by combining matter obtained from multiple botanical varieties or multiple animal varieties, it was possible to create satisfactory flavour compositions that were comparable with flavour compositions obtained by conventional methods.

More particularly, the applicant found that by combining matter obtained from one botanical or
25 animal variety that contained a relative paucity of at least one flavour characteristic compound, with matter obtained from at least one other botanical or animal variety that was bred, selected or engineered to contain a relative abundance of said at least one flavour characteristic compound, it was possible to create a flavour composition that was determinative of a desired flavour profile for a target food or beverage product. Furthermore, considering that the flavour composition
30 contained only matter from botanical varieties or animal varieties, the conditions for clean label status could be observed.

Accordingly, the invention provides in a first aspect a flavour composition comprising matter obtained from at least two botanical varieties, such as fruit varieties, or matter obtained from at
35 least two animal varieties, which matter from botanical varieties in combination, or matter from

animal varieties in combination, contains flavour characteristic compounds that together are determinative of the flavour of the flavour composition.

In a second aspect there is provided a method of preparing a flavour composition comprising
5 the step of combining matter obtained from at least two botanical varieties, such as fruit varieties, or combining matter from at least two animal varieties, which matter when combined contains flavour characteristic compounds that together are determinative of the desired flavour of the flavour composition.

10 In a third aspect there is provided a flavoured food or beverage product comprising a flavour composition defined herein.

In a fourth aspect there is provided a method of preparing an ingredients declaration intended for the packaging of a flavoured food or beverage product, flavoured with a composition as defined
15 herein, the method comprising the step of omitting from the declaration the term "flavour", "flavouring" or language equivalent thereto.

In a fifth aspect there is provided a packaged flavoured food or beverage product comprising a food or beverage and a flavour composition as defined herein, wherein the packaging of said
20 packaged product contains an ingredients declaration free of any reference to the term flavour or flavouring or any equivalent thereof.

In particular embodiments of any of the aspects of the invention, the flavour composition comprises matter obtained by taking matter from a first variety that contains a paucity of at least
25 one flavour characteristic compound; and combining it with matter obtained from at least one other variety that is selected on the basis that it contains a relative abundance of said at least one flavour characteristic compound; the combination being made in a manner such as to provide a flavour composition containing flavour characteristic compounds that together are determinative of a desired flavour profile for the target food or beverage product.

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In particular embodiments of any of the aspects of the invention the varieties are of the same species.

In particular embodiments of any of the aspects of the invention the varieties are botanical varieties or animal varieties, more particularly fruit varieties, still more particularly varieties from the family Rosaceae, and more particularly still berry varieties, for example strawberry varieties.

- 5 Further and more specific objects, features and advantages will clearly appear from the detailed description given below.

Detailed Description of the Invention

- 10 With the possible exception of citrus, herb or spice varieties, unfortunately, owing to the breeding practices across generations, it is currently not possible to create flavour compositions that can deliver intense and authentic flavours to food and beverage products using matter obtained from a single botanical variety. The problem of flavouring a food or beverage with matter obtained from a single botanical or animal variety resides in the limited amount of matter that can
15 reasonably be added to a food or beverage product taking product quality and economic considerations into account. It stands to reason that it's not possible to add 150 grams of fruit to 100 grams of yoghurt and still consider the product to be a yogurt.

- As summarized hereinabove, the applicant has addressed this prior art deficiency and provides
20 flavour compositions that contain matter obtained from at least two botanical varieties or at least two animal varieties, the combined matter obtained from these varieties contains a complement of flavour characteristic compounds that together are determinative of a desired flavour. The invention is based on the concept that a first variety (botanical or animal) is bred, selected or engineered such that matter obtained from it has a very high level of (is enriched in) one or more
25 flavour characteristic compounds needed to provide a desired flavour, but which contains an insufficient amount of (a paucity) one or more other flavour characteristic compounds needed to provide the desired flavour; and matter from this first variety is combined with matter obtained from at least one other variety that is bred, selected or engineered to have very high levels of said one or more other flavour characteristic compounds, which are only insufficiently present in, or
30 absent from, matter obtained from said first variety, such that the complement of flavour characteristic compounds contained in the combination of matter is determinative of a desired flavour.

- As used herein, the term "variety" or "varieties" is used in the general sense of a plant or animal
35 grouping within a single botanical or animal taxon, more typically genus or species, which is

defined by the reproducible expression of its distinguishing and other genetic characteristics. The term may include both naturally occurring forms, as well as those derived by selection, intentional or unintentional breeding, using conventional methods or genetic engineering, with the object of creating varieties for the industrial production of one or more desired flavour characteristic
5 compounds, rather than the production of varieties that are of suitable quality to be eaten whole. The term includes hybrids and cultivars (cultivated varieties); it may also include, but is not limited to the meaning given to "plant variety" defined by UPOV; "variety" as defined by the ITPGR; or "cultivar" as defined by the ICNCP.

10 In embodiments of the invention, the botanical variety or cultivar is not a mint variety or cultivar.

The term "matter" as in "matter obtained from a variety" refers to matter obtained from botanical varieties or animal varieties, including whole fruits, vegetables or plants, or in the case of
15 animal varieties, its meat, skin or connective tissue, or any part thereof obtained by processing, including minced meat, skin or connective tissue, or de-boned meat. Taking a fruit variety as an example, and strawberry fruit in particular, "matter" refers to whole fruit, pieces of whole fruit, or parts of a fruit, such as its pulp, flesh, skin, juice, seeds and the like that is obtained by processing the fruit.

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The term "processing" generally refers to any minimal process steps that would typically be used in food preparation, e.g. kitchen preparation techniques that preferably would not result in the production of matter that is considered to be a flavour ingredient requiring specific labelling on an ingredients declaration as "flavour", "flavouring" or such like, according to any prevailing
25 regulation or industry practice. The term "processing" includes, but is not limited to heating, boiling, concentrating, freezing, e.g. freeze-concentrating, drying, filtering, sieving, centrifugation, juicing, cutting, chopping, crushing, grinding, fermenting, or any enzymatic treatment used in the preparation of foods such as fruit preparations and fruit purees.

30 Techniques such as fractional distillation, distillation, extraction, e.g. solvent extraction, derivatization or other such processes that would alter the characterization of the matter as natural under relevant legislations, such as labelling legislation, or would require a specific listing on a back-of-pack ingredients declaration that would be inconsistent with clean labelling, are not considered to be techniques commonly used in the preparation of food or beverages and so are
35 not considered to be "processing" as the term is used in the present invention.

The removal of water from botanical or animal matter is considered to be “processing” within the terms of the present invention. Furthermore, if during the removal of water should any flavour characteristic compounds be lost, for example, through volatilization, then it is also considered to
5 be “processing” to add back any amounts of flavour characteristic compounds lost.

In particular embodiments of the invention, processing at it relates to fruit matter, and more particularly strawberry matter, includes the removal of water to provide a concentrate, and the flavour composition according to the invention is a fruit concentrate, and more particularly a
10 strawberry concentrate.

The term “flavour characteristic compound(s)” as used herein refers to volatile compounds and non-volatile compounds found in botanical or animal varieties that contribute to the flavour of a particular variety, and which together with other flavour characteristic compounds contained in
15 other varieties can provide a flavour composition, which is determinative of a desired flavour used to flavour a food or beverage product. For the purpose of the present invention, a single variety either does not contain all flavour characteristic compounds determinative of a desired flavour of a flavour composition, or if a single variety does contain a full complement of flavour characteristic compounds, they are not present in sufficient quantities to provide a flavour composition with the
20 requisite intensity, or authenticity to be suitable for use in flavouring food or beverage products, and more particularly, clean-label food or beverage products.

The term “flavour characteristic compound(s)” may also include a precursor of a flavour characteristic compound. Precursors are compounds that may not themselves possess an
25 interesting aroma or may not be even volatile, but which release or liberate a desired flavour characteristic compound when the matter in which it is present is consumed or processed, for example by any of the processing methods referred to hereinabove, including heating or enzymatic treatment.

30 The term “flavour composition” as used in accordance with the present invention refers to a composition, formed from matter obtained from at least two varieties, e.g. at least two botanical varieties or at least two animal varieties, which together contain flavour characteristic compounds that are determinative of a desired flavour. A flavour composition is a composition that is intended to be added to a food or beverage product, for the principal purpose of imparting flavour and not
35 nourishment to the food or beverage product.

Flavour compositions and methods of the present invention are particularly useful in creating flavours for food or beverage products, wherein the flavour intensity and character is influenced by the total content of flavour characteristic compounds. The compositions and methods are particularly useful in the creation of flavour compositions that are determinative of all manner of iconic flavours, including strawberry, but also other fruit flavours, for example raspberry, peach, mango or banana; and also important meat flavours, such as chicken or beef.

Flavour compositions that are able to impart intense and authentic strawberry flavour to food and beverage products represent particularly preferred aspects of the present invention.

The provision of intense and authentic strawberry flavour is particularly difficult owing to the sweetness, acidity and complex flavour of the authentic strawberry experience.

However, although strawberry flavour is complex, analytically, the perceptually important compounds that are reminiscent of the aroma of authentic strawberry flavour –its so-called flavour characteristic compounds - are known and readily accessible to a flavourist, and when constructing a crafted strawberry flavour composition in a classic manner, the flavourist typically would draw on the necessary flavour characteristic compounds from his palette of available ingredients and using his skill and creativity, construct the flavour composition by combining them in the requisite quantities.

When attempting to provide authentic strawberry flavour compositions using only matter obtained from strawberry varieties, however, the applicant found that it was not possible to obtain a rich, nuanced strawberry flavour with the requisite intensity using strawberry matter from any single strawberry variety.

The creation of an acceptable strawberry flavour was not a straightforward matter of incorporating one of the long-established, commercially available ready to eat varieties, such as “Elsanta” into a food or beverage product. Although these varieties are considered to be high quality and represent some of the most appealing varieties for the ready-to-eat market, due to current breeding practices, they do not contain a full complement of flavour characteristic compounds in sufficiently high quantities in order that they could be added to a food or beverage product at acceptably low levels both for economic reasons and reasons related to the product quality, and still provide the requisite intensity and quality of flavour.

On the other hand, mixing matter obtained from a plurality of strawberry varieties, each containing some, but not necessarily all, of the flavour characteristic compounds determinative of an authentic strawberry flavour, it was possible to create nuanced, rich and high intensity flavour compositions that when added to a food or beverage product could deliver an intense and authentic flavour without the need to employ such large volumes of matter that the quality or cost of the food or beverage was adversely affected.

Strawberry flavour compositions according to the present invention may contain mixtures of the following non-exhaustive list of flavour characteristic compounds found in matter obtained from at least two different strawberry varieties: methyl butyrate, ethyl butyrate, methyl 2-methylbutyrate, ethyl 2-methylbutyrate, methyl 3-methylbutyrate, ethyl 3-methylbutyrate, hexyl acetate, cis-3-hexenol, cis-3-hexenal, hexanol, hexanal, furalon, mesifurane, methyltetrahydrofuranone, maltol, gamma-decalactone, linalool, methyl anthranilate, ethyl anthranilate, methyl N-methyl anthranilate, methyl N-ethyl anthranilate, methyl epi-jasmonate, methyl dihydrojasmonate, and 2-methylbutyric acid.

Further, there are many glucoside compounds in fruits generally, and strawberry in particular, which can act as precursors for flavour characteristic compounds that are determinative of fruit flavour, and strawberry flavour in particular. They include those glucoside precursors found in fruit varieties and especially strawberry varieties that can be liberated from said varieties by, for example, heating or enzymatic activity.

In particular embodiments of the present invention, flavour compositions contain flavour characteristic compounds possessing certain strawberry flavour vectors or directions. More particularly, a strawberry flavour composition may contain one or more of: a fruity flavour characteristic compound; a green flavour characteristic compound; a sweet flavour characteristic compound; a lactone-like flavour characteristic compound; a floral concord grape-like flavour characteristic compound; a sweet body flavour characteristic compound; and optionally a precursor compound of any of the foregoing.

Fruity flavour characteristic compounds may be selected from at least one of (m)ethyl butyrate, (m)ethyl 2-methylbutyrate, (m)ethyl 3-methylbutyrate, and hexyl acetate.

Green flavour characteristic compounds, may be selected from at least one of cis-3-hexenol/al, hexanol/al;

Sweet flavour characteristic compounds may be selected from at least one of furalon,
5 mesifurane, methyltetrahydrofuranone, and maltol;

Lactone-like flavour characteristic compounds may be selected from at least one of gamma-decalactone, and other related lactones, such as gamma-octalactone, delta-decalactone, or gamma-dodecalactone.

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Floral concord grape-like flavour characteristic compounds may be selected from at least one of (m)ethyl anthranilate, methyl N-(m)ethyl anthranilate, methyl epi-jasmonate, methyl dihydrojasmonate.

15 Sweet body flavour characteristic compounds may be selected from at least one of 2-methylbutyric acid and related compounds.

Strawberry varieties that may be employed in implementing the present invention may be selected from currently known or commercial varieties, or they may be varieties that are
20 intentionally or unintentionally bred, or selected, or engineered as to be enriched in one or more of the flavour characteristic compounds that contribute to the determination of, that is they are determinative of, the flavour of strawberry, including any of the specific flavour characteristic compounds referred to hereinabove.

25 Furthermore, those strawberry varieties that are intentionally or unintentionally bred, or selected, or engineered as to contain low levels of carboxylic acids, such as malic acid or citric acid, and which are enriched in one or more of the flavour characteristic compounds, will be particularly useful in the present invention.

30 Particular strawberry varieties include, but are not limited to Alba, Albion, Alice, Alinta, Allstar, Amelia, Annapolis, Apollo, Archer, Arome, Aromas, Asia, Atlas, Benton, Bogota, Bolero, Bountiful, Brunswick, Cabot, Calypso, Camarosa, Cambridge Favourite, Camino Real, Canoga, Cassandra, Cavendish, Chambly, Chandler, Christine, Clery, Clancy, Darselect, Delia, Delite, Delmarvel, Diamante, Earlibelle, Earliglow, Elegance, El-santa, Elvira, Emily, Eros, Evangeline, Everest, Evie 2,
35 Fenella, Firecracker, Flamenco, Florence, Fort Laramie, Frel (PINK PANDA), Fruitful Summer,

Gaviota, Glooscap, Governor Simcoe, Guardian, Hapil, Hecker, Hokowase, Honeoye, Hood, Itasca, Jewel, Judibell, Kent, L'Amour, Loran, Lucy, Mae, Malling Opal, Malling Pearl, Marshall, Matis, Mesabi, Midway, Mira, Mohawk, Monterey, Northeaster, Northeastern, Ogallala, Orléans, Oso Grande, Ozark Beauty, Palomar, Pandora, Pegasus, Pelican, Pink Panda, Pinnacle, Polka, Portola, 5 Primetime, Puget Reliance, Puget Summer, Quinault, Rabunda, Rainier, Redchief, Redcrest, Redgauntlet, Redgem, Red Ruby, Renaissance, Rhapsody, Rosie, Roxana, Royal Sovereign, Sable, Saint Pierre, Sallybright, Samba, San Andreas, Sapphire, Sasha, Scott, Seascape, Seneca, Senga Sengana, Sequoia, Shuksan, Snow White, Sonata, Sophie, Strawberry Festival, Sunrise, Surecrop, Symphony, Tillamook, Titan, Totem, Tribute, Tristar, Valley Red, Variegata, Veestar, Ventana, 10 Viktoriana, Wendy, Winona, and Yamaska.

Strawberry varieties can also be selected from wild species, sub-species, natural hybrids, selections and cultivars, such as *Fragaria chiloensis*, *Fragaria virginiana*, *Fragaria x ananassa*, *F. vesca*, *F. viridis*, *F. moschata*, *F. vesca f. alba*, *F. vesca f. alba 'South Queen Ferry'*, *F. vesca ssp. vesca 'Baikal'*, *F. vesca ssp. Bracteata*, *F. vesca ssp. Americana*, *F. vesca f. semperflorens 'Red Wonder'*, *F. vesca f. semperflorens 'Yellow Wonder'*, *F. vesca ssp. vesca 'Island'*, *F. vesca ssp. vesca 'Kaiserpfalz Tilleda'*, *F. vesca ssp. vesca 'Korsika'*, *F. vesca ssp. vesca 'Multiplex'*, *F. vesca ssp. vesca 'Weimar'*, *F. vesca ssp. vesca 'Boehmen'*, *F. vesca ssp. vesca 'Tuechersfeld'*, *F. vesca ssp. vesca 'Sud-Oeland'*, *F. vesca ssp. vesca 'Großolbersdorf'*, *F. xananassa cv. 'Alba'*, *F. xananassa cv. 'Mara de Bois'*, *F. xananassa cv. 'Mieze Schindler'*, *F. xananassa cv. 'Polka'*, and *F. xananassa cv. 'Elegance'*. 15 20

Particularly useful varieties include any of the varieties selected from the group consisting of Renaissance ; *F. moschata*; Sengana; *F. virginiana W9*; *F. moschata "cotta"*; Polka; Mieze schindler; *F. vesca*; Korona; Elegance; Holiday; Snow White; and Kaisers Sämling.

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Flavour characteristic compounds may be found in matter obtained from combining any varieties known in the art that exhibit the desired aroma characteristics, more particularly from varieties that exhibit suitably high levels of one or more of the flavour characteristic compounds referred to hereinabove, and particularly any of those selected from Renaissance, *F. moschata*, 30 Sengana, *F. virginiana W9*, *F. moschata "cotta"*, Polka, Mieze schindler, *F. vesca*, Korona, Elegance, Holiday, Snow White and Kaisers Sämling.

Additionally, varieties, including any of the varieties referred to hereinabove exhibiting said desirable aroma characteristics, and particularly Renaissance and Polka, can be used as parents to 35 produce new cultivars by crossing techniques known in the art, such as, but not limited to out-

crossing, back-crossing, reciprocal crossing or selfing. These cultivars formed by such crossing, or indeed further cultivars produced in succeeding breeding cycles may be used in combination as a source of matter containing flavour characteristic compounds determinative of desired flavours.

5 The present invention is also concerned with flavour compositions that are able to impart flavour to processed food and beverage products that are characteristic of valuable botanicals, including but not limited to raspberry, mango, peach, pineapple, and banana. However, the present invention is preferably not concerned with flavour compositions that provide a citrus flavour, i.e. a flavour from the genus Citrus, including lemon, orange, lime and grapefruit, or a herb
10 or spice flavour, as there already exist essential oils from citrus and herbs and spices that can be obtained from single plant varieties, which can already impart Citrus, herb and spice flavours to food and beverage products.

Authentic raspberry flavour is provided by a combination of flavour characteristic compounds
15 from a combination matter obtained from at least two different raspberry varieties. Important flavour characteristic compounds include but are not limited to isoamyl acetate, raspberry ketone and alfa-ionone.

Raspberry varieties useful in methods and compositions of the present invention may be
20 selected from currently known or commercial varieties, or they may be varieties that are intentionally or unintentionally bred, selected or engineered as to be enriched in one or more of the flavour characteristic compounds determinative of the flavour of raspberry, including any of the specific flavour characteristic compounds referred to hereinabove.

25 Raspberry varieties useful in carrying out the present invention include but are not limited to Autumn bliss, Glen prosen, Glen ample and Tulameen Tadmor.

In another particular embodiment of the present invention flavour compositions are provided having flavour profiles that are characteristic of peach.

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Typical peach flavour characteristic compounds include but are not limited to gamma-decalactone, gamma-undecalactone, linalool and geraniol.

Peach varieties useful in methods and compositions of the present invention may be selected
35 from currently known or commercial varieties, or they may be varieties that are intentionally or

unintentionally bred, selected or engineered as to be enriched in one or more of the flavour characteristic compounds determinative of the flavour of peach, including any of the specific flavour characteristic compounds referred to hereinabove.

- 5 Peach varieties useful in carrying out the present invention include but are not limited to redskin, robin, royal hale, cardinal and scarlet lady.

In another particular embodiment of the present invention flavour compositions are provided having flavour profiles that are characteristic of pineapple.

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Typical pineapple flavour characteristic compounds include but are not limited to heptyl acetate, allyl hexanoate, 1,3,5-undecatriene, and furalon (4-hydroxy-2,5-dimethyl-3-furanone).

- 15 Pineapple varieties useful in methods and compositions of the present invention include but are not limited to smooth cayenne, abacaxi, queen, and red spanish.

In another particular embodiment of the present invention flavour compositions are provided having flavour profiles that are characteristic of banana.

- 20 Typical banana flavour characteristic compounds include but are not limited to amyl acetate, amyl butyrate, and eugenol.

- Banana varieties useful in methods and compositions of the present invention may be selected from currently known or commercial varieties, or they may be varieties that are intentionally or
25 unintentionally bred, selected or engineered as to be enriched in one or more of the flavour characteristic compounds determinative of the flavour of banana, including any of the specific flavour characteristic compounds referred to hereinabove.

- Banana varieties are derived from *Musa acuminata* and/or *Musa paradisiaca* and can have
30 different ploidy. Banana varieties useful in methods and compositions of the present invention include but are not limited to lady finger, grand nain, golden beauty, goldfinger, pisang awak, and kluai lep chang kut.

- In another particular embodiment of the present invention flavour compositions are provided
35 having flavour profiles that are characteristic of mango.

Typical mango flavour characteristic compounds include but are not limited to ocimene, cis-3-hexenal and hexenol, myrcene, and gamma-decalactone.

5 Mango varieties useful in methods and compositions of the present invention may be selected from currently known or commercial varieties, or they may be varieties that are intentionally or unintentionally bred, selected or engineered as to be enriched in one or more of the flavour characteristic compounds determinative of the flavour of mango, including any of the specific flavour characteristic compound referred to hereinabove.

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Mango varieties useful in carrying out the present invention include but are not limited to: tommy atkins, keitt, haden, glenn, autulfo, sensation, irwin, and ivory.

15 In another particular embodiment of the present invention flavour compositions are provided having flavour profiles that are characteristic of chicken.

Authentic chicken flavour can be provided by a combination of matter containing flavour characteristic compounds obtained from a combination of at least two different chicken varieties. Important flavour characteristic compounds include but are not limited to 2-methylfuran-3-thiol, 20 2,4-decadienal, cis-4-hexen-3-one, or precursors thereof; particularly useful for boiled chicken are compounds selected from 3-mercapto-2-butanone, gamma butyrolactone, methional and 2,4-heptadienal, or precursors thereof; whereas compounds particularly useful for roasted chicken flavour include acetylpyrazine, trimethyl-pyrazine and acetylthiazole.

25 Whereas chicken varieties can be used that contain these flavour characteristic compounds, given the fact that chicken flavoured food products are always heat-treated, one can employ matter from chicken varieties that contain flavour characteristic compound precursors that can react and be liberated to form flavour characteristic compounds. For example, in a particular embodiment, one can combine high cysteine or glutathione chicken varieties and high glucose (or 30 other monosaccharides) chicken varieties, and heat them to generate Maillard products in accordance with techniques known in the art.

In another particular embodiment of the present invention flavour compositions are provided having flavour profiles that are characteristic of beef.

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Authentic beef flavour can be provided by a combination of flavour characteristic compounds obtained from a combination of matter obtained from at least two different beef varieties. Important volatiles flavour characteristic compounds include but are not limited to 2-methyl-furan-3-thiol, 12-methyl-tridecanal, and 2,4-nonadienal.

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Whereas matter obtained from beef varieties can be used that contain these flavour characteristic compounds, given the fact that beef flavoured food products are always heat-treated, one can employ matter obtained from beef varieties that contain flavour characteristic compound precursors that can react and be liberated to form highly flavoured compounds. For example, in a particular embodiment, one can combine matter obtained from high cysteine (or other amino acids like methionine, alanine, glycine, and the like) beef varieties and matter from high glucose (or other monosaccharides like fructose, ribose, galactose, and the like) beef varieties, and heat it to generate Maillard products.

15 The flavour composition of the present invention may consist essentially of the matter obtained from at least two botanical varieties, or at least two animal varieties. Accordingly, in a particular aspect of the invention, the flavour composition may be comprised of 100 wt % of matter obtained from at least two botanical varieties, or at least two animal varieties.

20 Should it be desired, however, the flavour composition may contain other ingredients or adjuvants that add to the organoleptic properties or the chemical or physical stability of the flavour composition.

A flavour composition according to the present invention may be added to a processed food or beverage product in an amount sufficient to provide it with a desired flavour. The trained flavourist using his skill and knowledge and having regard to the target flavour composition; the target food or beverage product; processing conditions both before and after the flavour composition is mixed with the product; as well as intended storage conditions, will know the precise amount of flavour composition to be employed, or can determine the amounts using only routine skill and knowledge.

As a generality, however, the level of flavour composition added will reside within an interval between about 5 and 20 wt % based on the total weight of the flavoured food or beverage product.

35

Depending on the type of flavour that is desired to be imparted to a flavoured food or beverage product, flavour characteristic compounds from matter obtained from the botanical or animal varieties should be present individually at levels residing within the interval of about 0.1 to about 100 ppm based on the weight of the flavoured food or beverage product. Any of the flavour
5 characteristic compounds referred to specifically herein, if employed in a flavour composition, may be employed in amounts such that they are present in the processed food or beverage product at levels falling within the interval of about 0.1 to about 100 ppm.

Methods of preparing flavour compositions as well as flavoured food or beverage products
10 form additional aspects of the invention.

In a method of preparing a flavour composition, the particular varieties that are employed may be selected from known varieties on the basis that they contain levels of desirable flavour characteristic compounds, such that the combination of matter obtained from the varieties
15 contains a complement of flavour characteristic compounds in sufficiently high quantities that when incorporated into a food or beverage product the complement of flavour characteristic compounds in the flavour composition is determinative of a desired flavour. Alternatively, varieties may be intentionally or unintentionally bred, or they may be engineered, in order that when matter obtained from them is combined, it contains the requisite levels of a complement of
20 flavour characteristic compounds determinative of a desired flavour.

The particular varieties selected, bred or engineered for use in the preparation of a flavour composition according to the present invention may not be particularly pleasant to consume in and of themselves because they may not contain a full complement of desirable flavour
25 characteristic compounds in the required amounts in order that they are pleasant to consume as such. For example, it is contemplated that varieties useful in methods of the present invention may be selected, bred or engineered in order that they are highly enriched in certain flavour characteristic compounds, but may contain a relative paucity, or absence of others.

30 Accordingly, the technical difficulty of flavouring a food or beverage product using only matter obtained from botanical or animal varieties is overcome by methods of the present invention wherein flavour characteristic compounds determinative of a desired flavour that cannot be provided by a single botanical or animal variety, are provided when matter obtained from at least one variety that may be enriched in certain desired flavour characteristic compounds, but not in
35 others, is combined with matter from at least one other variety that is enriched in certain of said

other flavour characteristic compounds, such that the combination of matter contains a complement of flavour characteristic compounds that is determinative of a desired flavour.

In a particular embodiment of the present invention, the method of forming a flavour
5 composition comprises the steps of:-

- i) providing matter obtained from at least one botanical variety or at least one animal variety that contains a relative paucity of one or more flavour characteristic compounds;
- 10 ii) providing matter obtained from one or more different botanical variety or from one or more different animal varieties that is enriched in said one or more flavour characteristic compounds referred to in i); and
- iii) combining matter obtained from the steps i) and ii) in a manner that produces a mixture of
15 flavour characteristic compounds that together are determinative of a desired flavour.

In other embodiments of the invention, a method of forming a flavoured food or beverage product is provided by mixing the flavour composition formed according to the steps i) through iii) and adding the matter of step iii) to a food or beverage product in an amount sufficient to provide
20 a desired flavour.

In more particular embodiments of the invention, in a method of forming a flavour compositions or flavoured food or beverage products, said at least one botanical varieties are strawberry varieties.
25

In a still more particular embodiment of the invention, there is provided a method of preparing a strawberry flavour composition, the method comprising the steps of:

- i) providing matter obtained from at least one strawberry variety that contains a relative paucity of
30 one or more flavour characteristic compounds selected from the group consisting of:
methyl butyrate, ethyl butyrate, methyl 2-methylbutyrate, ethyl 2-methylbutyrate, methyl 3-methylbutyrate, , ethyl 3-methylbutyrate, hexyl acetate, cis-3-hexenol, cis-3-hexenal, trans-2-hexenal, trans-2-hexenol, hexanol, hexanal, furalon, mesifuran, 2-methyltetrahydrofuran-3-one, maltol and related compounds, gamma-decalactone, other lactones (gamma-jasmin lactone,
35 gamma-dodecalactone), linalool and related (nerolidol), methyl anthranilate, ethyl anthranilate,

methyl N-methyl anthranilate, methyl N-ethyl anthranilate, methyl epi-jasmonate, methyl dihydrojasmonate, and 2-methylbutyric acid and related (3-methylbutyric acid);

ii) providing matter obtained from at least one strawberry variety different from step i), which
5 contains a relative abundance of at least one flavour characteristic compound referred to in i) above; and

iii) mixing the matter from i) and ii) to form a strawberry flavour composition, wherein the flavour characteristic compounds in said flavour composition together are determinative of a desired
10 strawberry flavour.

As used herein, the term “relative paucity” refers to an amount of a flavour characteristic compound contained in matter obtained from a single variety which is organoleptically insufficient to provide a desired flavour impression when incorporated into a flavour composition and diluted
15 into a food or beverage product.

By extension, the terms “enriched” or “relative abundance” refers to an amount of the flavour characteristic compound contained in one or more varieties, which is perceivable when incorporated in a flavour composition and diluted into a food or beverage product such that it
20 provides a desired flavour impression.

It will be apparent to the skilled person that the invention is not concerned with the provision of a single botanical or animal variety containing a full complement of all the flavour characteristic compounds necessary to create a flavour composition determinative of any particular desired
25 flavour.

Rather, the invention is concerned with the provision of a kit, or a tool-box, consisting of multiple, that is, at least two, at least three, at least four, at least five, at least six, at least seven, at least eight, at least nine, at least ten or more blocks of matter, each obtained from a single
30 botanical variety or animal variety. The invention contemplates that each variety that forms the basis of a block of matter produces at least one, but not all, of the flavour characteristic compounds in sufficient quantities necessary to produce a flavour composition, which can be optionally processed according to suitable processing techniques referred to herein, and mixed in appropriate quantities to provide a desired flavour composition. The flavour characteristic
35 compounds that are not present in sufficiently high quantities in any given variety, can be provided

in other blocks of matter obtained from other varieties, such that when the different blocks of matter are combined, the entire complement of flavour characteristic compounds are present in sufficient concentration to form a desired flavour composition.

5 Accordingly, the invention provides in another of its aspects a kit of parts for use in the formation of a flavour composition as defined herein, said kit of parts comprising at least two blocks of matter obtained from botanical varieties or at least two blocks of matter obtained from animal varieties, each block containing at least one flavour characteristic compound, but not all of the flavour characteristic compounds in sufficient quantities to be determinative of the flavour of
10 the flavour composition, but when mixed together the combined matter comprises all flavour characteristic compounds determinative of the flavour composition.

By way of example, in the case of a strawberry flavour kit or tool box, it may comprise a lactone block providing a particular lactone flavour characteristic compound; a green block providing a
15 particular aldehyde flavour characteristic compound; an floral block, providing a floral flavour characteristic compound; and fruity block, providing a particular ester flavour characteristic compound; and a jammy block, providing a furaneol flavour characteristic compound.

Owing to the fact that certain flavour characteristic compounds contained in commercially
20 available strawberry varieties are present in too low concentrations to be useful in the creation of flavour compositions according to the present invention, it is particularly important to make blocks of matter enriched in these compounds using the methods described herein. Exemplary of these particularly important blocks of matter is a fruity ester block comprising the flavour characteristic compounds, such as methyl butyrate or ethyl butyrate; a flowery block comprising flavour
25 characteristic compounds such as linalool or nerolidol; a sweet, jammy block comprising flavour characteristic compounds such as furaneol and mesifurane; and a lactone block comprising flavour characteristic compounds such as gamma-decalactone.

Flavour compositions comprising one or more of these particular blocks of matter are
30 particularly useful in the preparation of flavour compositions of the present invention.

Given that each block is created to provide a particular flavour characteristic compound or compounds, and not a full complement determinative of a desired flavour composition, it is anticipated that the varieties selected, bred, or engineered for the purpose of the present invention would not in themselves be particularly useful or valued as ready to eat varieties, and in
35 fact, they may be particularly unsuitable for the ready to eat market. Indeed, in the creation of

flavour compositions of the present invention, particular embodiments employ only matter obtained from varieties that are not, or would not be considered to be, of requisite quality for the ready to eat market.

5 In the creation of flavour compositions of the present invention, it is not necessary that the blocks of matter used to create a particular flavour composition should be obtained from varieties of the same species. For example, in the creation of a strawberry flavour, the blocks of matter may be obtained only from strawberry varieties, or one or more blocks may be obtained from a different type of botanical, such as cranberry or apple. Indeed, applicant found that matter
10 obtained from the fruit of varieties of paw paw (*Asimina triloba*) were particularly high in fruity ester compounds, which could be used to provide those flavour characteristic compounds that are those esters described above, in exercise of the present invention.

In another particular embodiment of the present invention, there is provided a method of
15 imparting a strawberry flavour to a food or beverage product, said method comprising the step of mixing the strawberry flavour composition made according to the method set forth in steps i) to iii) above, and mixing it with a food or beverage product.

As stated hereinabove, the matter used in the preparation of flavour compositions may be
20 processed matter.

In an embodiment of the present invention, in the preparation of flavour compositions comprising matter obtained from varieties of fruit, such as strawberry, the fruit matter may be processed to remove water, and as such the flavour composition is composed of a fruit
25 concentrate, and more particularly a strawberry concentrate.

Water-removal may be undertaken using any techniques known in the art, however, preferably it is carried out by freezing the water out of the fruit material. More particularly, water may be removed by the technique of freeze-concentration. Freeze-concentration is a process whereby the
30 temperature of an aqueous solution is lowered to partially freeze the water in order to create a slurry of ice crystals dispersed in a concentrated solution. Applied to the present invention, fruit matter, more particularly strawberry matter, can be phase-separated into an aqueous phase sitting above a solid sediment, and the aqueous phase subjected to freeze-concentration. Once the ice crystals are formed they can be removed before the sediment and concentrated aqueous

phase can be mixed to form matter in the form of a fruit concentrate for use in the preparation of flavour compositions.

Freeze-concentration is a particularly useful technique because as crystals of pure water ice are formed, the technique can be used to selectively remove only water from the fruit matter. This can be particularly important if it is desired to create flavour compositions that can be used for clean label products as it is important that the processing technique, save for the removal of water, does not substantially alter the composition of the fruit matter.

10 In particular embodiments of the invention, it may be desirable to process fruit matter, more particularly strawberry fruit matter to remove certain substances that can adversely impact the organoleptic properties of the flavour composition. More particularly, it may be desirable to remove carboxylic acids, such as malic acid and citric acid, commonly found in fruit material, and which becomes concentrated to organoleptically unacceptable levels when water is removed.

15

Accordingly, in an embodiment of the invention fruit matter, and in particular strawberry matter, used in the creation of flavour compositions is subjected to a processing step to reduce carboxylic acid content, and more particularly to reduce malic acid or citric acid content.

20 In an embodiment of the invention, carboxylic acid levels in the processed fruit matter can be reduced to a level such that the pH of the fruit matter is restored to the pH characteristic of the fruit matter before removal of water. In the case of strawberry fruit matter, processing is undertaken to remove carboxylic acids until the pH of the processed matter is restored to a value between about 3 and 4.3.

25

Applicant found that a particularly preferred method for the reduction of said carboxylic acids was to absorb the acid on food grade resin. Resins with a high affinity for carboxylic acid are particularly preferred, such as the commercially available Lewatit MP 62 BG resin.

30 The present invention comprises a number of advantages and benefits over the state of the art flavour creation techniques, in that it provides a method for creating clean-label flavour compositions that are made entirely of matter obtained from combinations of botanical varieties or combinations of animal varieties, and which are at least as intense, complex and authentic as those flavours made by current state of the art processes.

35

As used herein, the term “clean-label” refers to an initiative that is concerned with the information that should be included in the list of ingredients contained in packaged processed foods and beverages. As this term relates to flavour compositions that are used to flavour processed foods and beverages, it means that a flavour composition is deemed to be clean-label
5 and would not need to be listed as a flavour on labelling or packaging, if it is free of ingredients, that is flavour ingredients, that would not be ordinarily considered to be items of food or beverage by consumers, and consumed as such.

By way of example, although the compound methyl anthranilate is an important aroma
10 compound and is found in strawberries, the compound, isolated from strawberry, would not be consumed as a food as such, and so the use of this compound as such in the preparation of a flavour composition, would require that the flavour composition is specifically labeled as a flavour additive or ingredient. Whereas, on the other hand, if a flavour composition consists of matter obtained from a mixture of strawberry varieties (which are regarded as foods as such) and one
15 variety contained methyl anthranilate, such a flavour composition would be considered to be made from food, e.g. strawberry matter and therefore would not need to be labeled as a flavouring, and be considered clean-label as a result.

Accordingly, the invention provides in another of its aspects a clean label food or beverage
20 product flavoured with a flavour composition as hereinabove described.

In embodiments of the invention there is provided a clean label food or beverage product flavoured with a flavour composition that is a fruit concentrate, and more particularly a strawberry concentrate, as described herein above.

25

In embodiments of the invention there is provided a clean label food product that is a dairy product, and more particularly a yoghurt product, flavoured with a flavour composition that is a fruit concentrate, and more particularly a strawberry concentrate as described herein above.

30 It will be understood by those skilled in the art that the flavour compositions of the present invention can be used to benefit a wide variety of food or beverage products, which require complex and authentic flavours. Indeed, it is contemplated that the presently disclosed compositions and methods can be employed in a variety of food and beverage products. The term “food product” is to be interpreted broadly, and includes any food product set forth in 21 CFR
35 101.12. Non-limiting examples of food products include frozen desserts, yogurts, baked goods,

fillings, nutritional drinks, beverages, salad dressing or similar dressing, sauces, icings, puddings and custards, batters, and the like.

There now follows a series of examples that serve to further illustrate the invention. The following examples are given to illustrate preferred embodiments of the invention as it is now preferred to practice it. It will be understood that these examples are illustrative and the invention is not to be considered as restricted thereto except as indicated in the appended claims.

Example 1

10

Creation of a Strawberry flavoured yoghurt

Strawberry fruit flavours were prepared by homogenising 5 strawberry varieties using equal measures of strawberry and sugar, and pasteurizing the mixture.

15

The strawberry fruit flavours contained the following levels of specific ingredients. From Variety 1: 250 ppm of gamma-decalactone ; From Variety 2: 15 ppm of hexanal; From Variety 3: 18 ppm of linalool; From Variety 4: 105 ppm ethyl butyrate; and from From Variety 5: 450 ppm of furaneol.

20

A mix was prepared that contained 20 % of matter from each of the Varieties 1 through 5. This mixture was added to a plain yoghurt at 15 % w/w ratio.

This strawberry yoghurt, labelled as yoghurt 1, was evaluated blind by an experienced sensory panel against a supermarket strawberry yoghurt containing 15% of a fruit preparation and natural flavour, labelled as yoghurt 2.

25

The panel judged yoghurt 1 to be superior to yoghurt 2. They thought yoghurt 1 was more fruity, more full and more fresh in comparison with yoghurt 2.

30 Example 1a

The strawberry fruit flavours contained the following levels of specific ingredients.

From Variety 1: 100 ppm of gamma-decalactone ; from Variety 2: 25 ppm of hexanal; from Variety 3: 200 ppm of linalool; from Variety 4: 2800 ppm ethyl butyrate; and from Variety 5: 650 ppm of furaneol.

35

A mix was prepared that contained 20 % of matter from each of the Varieties 1 through 5. This mixture was added to a plain yoghurt at 10 % w/w ratio.

5 This strawberry yoghurt, labelled as yoghurt 1, was evaluated blind by an experienced sensory panel against a supermarket strawberry yoghurt containing 10% of a fruit preparation and natural flavour, labelled as yoghurt 2.

 The panel judged yoghurt 1 to be superior to yoghurt 2. They thought yoghurt 1 was more
10 fruity, more full and more fresh in comparison with yoghurt 2.

Example 1b

 The strawberry fruit flavours contained the following levels of specific ingredients.

15 From Variety 1: 280 ppm of gamma-decalactone ; from Variety 2: 20 ppm of linalool; from Variety 3: 120 ppm ethyl butyrate; and from Variety 4: 520 ppm of furaneol.

 A mix was prepared that contained 25 % of matter from each of the Varieties 1 through 4. This mixture was added to a plain yoghurt at 10 % w/w ratio.

20

 This strawberry yoghurt, labelled as yoghurt 1, was evaluated blind by an experienced sensory panel against a supermarket strawberry yoghurt containing 10% of a fruit preparation and natural flavour, labelled as yoghurt 2.

25 The panel judged yoghurt 1 to be superior to yoghurt 2. They thought yoghurt 1 was more fruity, more full and more fresh in comparison with yoghurt 2.

Example 1c

 The strawberry fruit flavours contained the following levels of specific ingredients.

30 From Variety 1: 260 ppm of gamma-decalactone ; from Variety 2: 120 ppm of linalool; from Variety 3: 1650 ppm ethyl butyrate.

 A mix was prepared that contained 33 % of matter from each of the Varieties 1 through 3. This mixture was added to a plain yoghurt at 10 % w/w ratio.

35

This strawberry yoghurt, labelled as yoghurt 1, was evaluated blind by an experienced sensory panel against a supermarket strawberry yoghurt containing 10% of a fruit preparation and natural flavour, labelled as yoghurt 2.

- 5 The panel judged yoghurt 1 to be superior to yoghurt 2. They thought yoghurt 1 was more fruity, fuller and fresher in comparison with yoghurt 2.

Example 1d

The strawberry fruit flavours contained the following levels of specific ingredients.

- 10 From Variety 1: 200 ppm of gamma-decalactone ; from Variety 2: 400 ppm of furaneol; from Variety 3: 100 ppm ethyl butyrate.

A mix was prepared that contained 33 % of matter from each of the Varieties 1 through 3. This mixture was added to a plain yoghurt at 10 % w/w ratio.

15

This strawberry yoghurt, labelled as yoghurt 1, was evaluated blind by an experienced sensory panel against a supermarket strawberry yoghurt containing 10% of a fruit preparation and natural flavour, labelled as yoghurt 2.

- 20 The panel judged yoghurt 1 to be superior to yoghurt 2. They thought yoghurt 1 was more fruity, fuller and fresher in comparison with yoghurt 2.

Example 2

Creation of a wild strawberry flavour yoghurt

- 25 Strawberry fruit flavours were prepared by homogenising 6 strawberry varieties using equal measures of strawberry and sugar, and pasteurizing the mixture.

The strawberry fruit flavours contained the following levels of specific ingredients.

- From Variety 1: 250 ppm of gamma-decalactone; from Variety 2: 15 ppm of hexanal; from Variety
30 3: 18 ppm of linalool; from Variety 4: 100 ppm ethyl butyrate; from Variety 5: 450 ppm of furaneol;
from Variety 6: 15 ppm of methyl anthranilate.

A mix was prepared that contained 16.7 % of each fruit preparation. This mixture was added to a plain yoghurt at 15 % w/w ratio.

35

This strawberry yoghurt, labelled as yoghurt 1, was evaluated blind by an experienced sensory panel against a supermarket strawberry yoghurt containing 15% of fruit flavour and natural flavour, labelled as yoghurt 2. The panel judged the yoghurt 1 to be superior to yoghurt 2. They thought yoghurt 1 was more fruity, more full and more fresh in comparison with yoghurt 2.

5

Example 3

Creation of a Strawberry flavoured yoghurt with strawberry and apple

Strawberry fruit flavours were prepared by homogenising 4 strawberry varieties and 1 apple variety using equal measures of strawberry and sugar, and pasteurizing the mixture.

10

The strawberry fruit flavours contained the following levels of specific ingredients. From Variety 1: 250 ppm of gamma-decalactone ; from Variety 2: 15 ppm of hexanal; from Variety 3: 18 ppm of linalool; from apple Variety 1: 100 ppm ethyl butyrate; and from strawberry Variety 5: 450 ppm of furaneol .

15

A mix was prepared that contained 20 % of matter from each of the fruit Varieties 1. This mixture was added to a plain yoghurt at 15 % w/w ratio.

This strawberry yoghurt, labelled as yoghurt 1, was evaluated blind by an experienced sensory panel against a supermarket strawberry yoghurt containing 10% of a fruit preparation and natural flavour, labelled as yoghurt 2.

20

The panel judged yoghurt 1 to be superior to yoghurt 2. They thought yoghurt 1 was more fruity, more full and more fresh in comparison with yoghurt 2.

25

Example 4

Creation of a Strawberry flavoured yoghurt with strawberry and peach

Strawberry fruit flavours were prepared by homogenising 5 strawberry varieties using equal measures of strawberry and sugar, and pasteurizing the mixture.

30

The strawberry fruit flavours contained the following levels of specific ingredients.

From Peach variety 1: 250 ppm of gamma-decalactone ; from strawberry Variety 2: 15 ppm of hexanal; from Variety 3: 18 ppm of linalool; from Variety 4: 100 ppm ethyl butyrate; and from from Variety 5: 450 ppm of furaneol.

35

A mix was prepared that contained 20 % of matter from each of the Varieties 1 through 5. This mixture was added to a plain yoghurt at 15 % w/w ratio.

5 This strawberry yoghurt, labelled as yoghurt 1, was evaluated blind by an experienced sensory panel against a supermarket strawberry yoghurt containing 10% of a fruit preparation and natural flavour, labelled as yoghurt 2.

10 The panel judged yoghurt 1 to be superior to yoghurt 2. They thought yoghurt 1 was more fruity, more full and more fresh in comparison with yoghurt 2.

Example 5

Creation of a Strawberry flavoured yoghurt with strawberry and pawpaw

15 Strawberry fruit flavours were prepared by homogenising 4 strawberry varieties and 1 apple variety using equal measures of strawberry and sugar, and pasteurizing the mixture.

The strawberry fruit flavours contained the following levels of specific ingredients.

20 From Variety 1: 250 ppm of gamma-decalactone ; from Variety 2: 15 ppm of hexanal; from Variety 3: 18 ppm of linalool; from Pawpaw Variety 1: 100 ppm ethyl butyrate; and from strawberry Variety 5: 450 ppm of furaneol.

25 A mix was prepared that contained 20 % of matter from each of the fruit Varieties. This mixture was added to a plain yoghurt at 15 % w/w ratio.

30 This strawberry yoghurt, labelled as yoghurt 1, was evaluated blind by an experienced sensory panel against a supermarket strawberry yoghurt containing 10% of a fruit preparation and natural flavour, labelled as yoghurt 2.

The panel judged yoghurt 1 to be superior to yoghurt 2. They thought yoghurt 1 was more fruity, more full and more fresh in comparison with yoghurt 2.

We claim:

1. A flavour composition comprising matter from at least two botanical varieties, wherein a first variety contains a relative paucity of at least one flavour characteristic compound; and wherein at least one other variety is selected, bred or engineered such that matter obtained from it contains a relative abundance of said at least one flavour characteristic compound, such that when the matter obtained from the botanical varieties is combined, it contains a complement of the flavour characteristic compounds that together are determinative of the desired flavour of the flavour composition.
2. A flavour composition according to claim 1, wherein the botanical varieties are fruit varieties.
3. A flavour composition according to claim 1 or claim 2 wherein the botanical varieties are strawberry varieties.
4. A flavour composition according to any of the preceding claims wherein the matter is processed to remove water.
5. A flavour composition according to claim 4, wherein the matter is a fruit concentrate.
6. A flavour composition according to claim 5, wherein the fruit concentrate is a strawberry concentrate.
7. A flavour composition according to claim 6 wherein the strawberry concentrate has a pH in the range of 3 to 4.3.
8. A flavour composition according to any of the preceding claims comprising flavour characteristic compounds selected from the group consisting of methyl butyrate, ethyl butyrate, methyl 2-methylbutyrate, ethyl 2-methylbutyrate, methyl 3-methylbutyrate, ethyl 3-methylbutyrate, hexyl acetate, cis-3-hexenol, cis-3-hexenal, hexanol, hexanal, furalon, mesifurane, methyltetrahydrofuranone, maltol, Gamma-decalactone, linalool, methyl anthranilate, ethyl anthranilate, methyl N-methyl anthranilate, methyl N-ethyl anthranilate, methyl epi-jasmonate, methyl dihydrojasmonate, and 2-methylbutyric acid, precursors of any of the foregoing compounds, and mixtures thereof.

9. A method of preparing a flavour composition as defined in any of the preceding claims, the method comprising the steps of:-

- i) providing matter obtained from at least one variety, which contains a relative paucity of at least one flavour characteristic compound;
- 5 ii) selecting matter obtained from at least one other variety, which contains a relative abundance of said at least one flavour characteristic compound referred to in i);
- iii) mixing the matter from i) and ii) such that the complement of flavour characteristic compounds is determinative of the flavour of the flavour composition.

10 10. A method according to claim 9, wherein the varieties are strawberry varieties.

11. A method according to claim 10, wherein the matter is strawberry concentrate.

12. A food or beverage product comprising a flavour composition as defined in any of the claims 1
15 through 8.

13. A packaged flavoured food or beverage product according to claim 12, wherein the packaging of said packaged product contains an ingredients declaration free of any reference to the term flavour, flavouring or any equivalent language thereto.

20

14. A dairy food or beverage product according to claim 13.

15. A fruit yoghurt product according to claim 13 or 14, wherein the ingredients declaration refers to yoghurt, fruit and optionally sugar.

25