A METHOD OF PRODUCING A BEVERAGE

TECHNICAL FIELD

[0001] This invention generally relates to a method for the production of a fruit and/or vegetable beverage. In particular, the beverage can comprise substantially the entire edible part of the fruit and/or vegetable (including the peel when appropriate), and therefore retain the nutritional benefit of substantially the entire fruit and/or vegetable.

BACKGROUND ART

[0002] Fruit juice has been consumed for centuries as a healthy, refreshing, and enjoyable beverage. Juice is made from the extraction or pressing of the natural liquid contained in fruit. By extracting the liquid from a fruit, but leaving behind the solid components of the fruit, a product is made that is of low enough viscosity to be easy to consume as a beverage. However, by its nature a juice is low in fibre, and many of the nutrients remain in the pomace (the solids remaining after pressing the juice from the fruit). That is, much of the nutritional content of the whole fruit is discarded, so that the juice contains only a fraction of the original nutritional benefit. This is also true for some vegetable-based beverages.

[0003] A smoothie is a drink made from pureed raw fruit and/or vegetable, typically using a blender. However, this alone results in a higher viscosity puree that cannot be readily consumed as a beverage. Therefore, to produce a lower-viscosity beverage, a smoothie often has a liquid base/diluent such as water, fruit juice, or milk (or milk products). Smoothies may include other ingredients such as crushed ice, sweeteners, herbal supplements, or nutritional supplements. That is, while a smoothie can have a higher / more diverse nutrition content than a juice, the nutrition is diluted by addition of the liquid base/diluent, and/or enhanced by other supplements.

[0004] Accordingly, it would be advantageous to provide a fruit and/or vegetable beverage that can deliver the nutritional benefits substantially of, or closer to, the whole fruit and/or whole vegetable.

SUMMARY

[0005] The present disclosure is directed to a method of producing a fruit and/or vegetable beverage which includes substantially the whole edible part of the fruit and/or

vegetable, including the peel when appropriate, and therefore retains the nutritional benefit of substantially the whole edible part of fruit and/or vegetable.

[0006] The present disclosure is directed to a method for preparing a nutritious beverage substantially from the whole edible part of a fruit and/or the whole edible part of a vegetable that achieves sufficiently low viscosity so as to be pleasant to drink.

[0007] The present disclosure is directed to a nutritious beverage substantially based on the edible part of whole fruit and/or the edible part of whole vegetable that achieves sufficiently low viscosity so as to be pleasant to drink.

[0008] There is provided a method of preparing a beverage substantially from the whole edible part of fruit and/or vegetable, the method comprising the steps of:

optionally, a preparation step for preparing the fruit and/or vegetable, to thereby produce a prepared fruit and/or vegetable;

optionally, a non-edible part removal step for removing any non-edible part of the fruit and/or vegetable;

a pulping step for substantially pulping the fruit and/or vegetable or edible part thereof, to thereby produce fruit and/or vegetable pulp;

an extraction step for extracting juice from the fruit and/or vegetable pulp;

optionally, at least one spoilage prevention step for preventing or reducing spoilage;

a pulp liquefaction step for liquefaction of the fruit and/or vegetable pulp;

at least one homogenisation step for homogenising fruit and/or vegetable pulp and the juice to produce a beverage homogenate; and

a beverage preparation step comprising preparing a beverage from the beverage homogenate, wherein said beverage contains substantially the entire edible part of whole fruit and/or vegetable and is pourable.

[0009] Any suitable type of fruit or any combination of different types of fruits can be used,

such as pome fruit, citrus or berry. Suitable examples may include an apple, orange, lemon, lime, pear, peach, pineapple, quince, apricot, plum, cherry, strawberry, blackberry, raspberry, mango or grape. In some embodiments, the fruit can be a member of the plant family *Rosaceae*. In particular, the fruit can be one or more types of a pome fruit. For example, an apple, pear, nashi, loquat or quince can be used.

[0010] Typically, many pieces of fruit will be used in the method, depending on the quantity of beverage required.

[0011] Any suitable type of vegetable or any combination of different types of vegetables can be used. Suitable examples may include beetroot, celery, cucumber, cabbage, spinach, broccoli, tomato or carrot.

[0012] Typically, much vegetable produce will be used in the method, depending on the quantity of beverage required.

[0013] Any suitable combination of different types of fruits and/or vegetables can be used.

[0014] In some examples, the method can comprise a preparation step for preparing the fruit and/or vegetable to thereby produce prepared fruit and/or vegetable, and this can be achieved in any suitable way. In some examples, the preparation step comprises washing the fruit and/or vegetable to produce washed fruit and/or vegetable. In some examples, the preparation step comprises sanitising the fruit and/or vegetable to produce a sanitised fruit and/or vegetable. For example, washing the fruit and/or vegetable can involve washing the fruit and/or vegetable in a stream of fresh water, with or without a mild detergent. For example, sanitising the fruit and/or vegetable can involve bathing, rinsing or spraying the fruit and/or vegetable in or with a mild solution of sanitiser such as peracetic acid or chlorine (e.g. sodium hypochlorite) to minimise bacteria.

[0015] The method can comprise a non-edible part removal step for removing any non-edible part of the fruit and/or vegetable, such as the stem/core or seed, to produce an entirely edible pulp. For a pome fruit, in some embodiments, the core and therefore the seeds can be removed. In some examples, the core and/or the seeds can be retained and form part of the beverage.

[0016] The non-edible part removal step can be carried out in any suitable way. The non-edible part removal step can be carried out prior to the pulping step, during the pulping step, or after the pulping step.

[0017] Preferably for a pome fruit the skin and/or peel is retained as it increases the nutrient value.

[0018] The method can comprise at least one pulping step for pulping substantially the entire fruit and/or vegetable, or edible part thereof. Pulping can be carried out in any suitable way to produce fruit and/or vegetable pulp. In some examples, a pulper machine is used.

[0019] In some examples the method can comprise a non-edible part removal step for removing any non-edible part of a first fruit and/or vegetable batch, to thereby produce a first processed fruit and/or vegetable batch. In some examples the method can comprise a pulping step for substantially pulping the first processed fruit and/or vegetable batch, to thereby produce a first processed fruit and/or vegetable pulp.

[0020] In some examples the method can comprise a pulping step for substantially pulping a second whole fruit and/or vegetable batch with non-edible parts left in, to thereby produce a second whole fruit and/or vegetable pulp.

[0021] The method can comprise a juice extraction step, to thereby produce fruit and/or vegetable juice. Juice extraction can be carried out in any suitable way to produce juice. The juice extraction step can comprise, for example, squeezing juice from the fruit and/or vegetable pulp. In other examples, centrifugation or counter-current extraction can be used.

[0022] In some examples the method can comprise an extraction step for extracting juice from the second whole fruit and/or vegetable pulp.

[0023] In some examples, the method can comprise a spoilage prevention step for preventing or reducing spoilage of the fruit and/or vegetable pulp and/or juice. In some examples, the spoilage prevention step can be carried out by conducting the method in an air- or oxygen-free or reduced environment. In some examples, the spoilage prevention step can comprise reducing oxidation of the fruit and/or vegetable pulp and/or juice by adding at least one antioxidant and/or preservative to the pulp and/or juice to prevent or reduce degradation. In some examples, an antioxidant such as ascorbic acid can be added to reduce

colour degradation. Any suitable amount of antioxidant can be used. For example, anywhere between about 0% weight/weight to about 1% weight/weight antioxidant or more (e.g. ascorbic acid) can be used, including all 0.01 increments between 0 and 1, including 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.10%, etc. In some examples, about 0.05 to 0.15% weight/weight antioxidant (e.g. ascorbic acid) is used, including all 0.01 increments between 0.05 and 0.15, including 0.06, 0.07, 0.08, 0.09, 0.10%, etc. In some examples, about 0.1% weight/weight antioxidant (e.g. ascorbic acid) is used.

[0024] An antioxidant and/or preservative can be added prior to, during or after the pulping step. The antioxidant and/or preservative can be added prior to, during or after the juice extraction step. The antioxidant and/or preservative can be added prior to, during or after the homogenisation step.

[0025] Preferably, where the fruit is a pome fruit, such as an apple, about 0.1% weight/weight antioxidant (e.g. ascorbic acid) is used.

[0026] The spoilage prevention step can be carried out at any stage of the method. For example, an antioxidant and/or preservative can be added before, during or after one or more homogenisation steps, or when pasteurising.

[0027] The method can comprise a mixing step for mixing the pulp and extracted juice together. This can be carried out in any suitable way.

[0028] In some example, the method can comprise a mixing step for mixing extracted juice with fruit and/or vegetable pulp, to produce a juice-pulp mixture. This can be achieved in any suitable way. In some examples the method can comprise a step of mixing the juice extracted from the second whole fruit and/or vegetable pulp with the first processed fruit and/or vegetable pulp, to produce a juice-pulp mixture.

[0029] The method can comprise a pulp liquefaction step for liquefaction of the pulp or juice-pulp mixture. This can be carried out in any suitable way. More than one pulp liquefaction step can be carried out. In some examples, the pulp liquefaction step involves subjecting the pulp to one or more macerating enzymes that act, for example, on soluble pectin and on cell wall components. The pulp liquefaction step can assist in lowering viscosity and maintenance of texture. Suitable macerating enzymes may include, but are not limited to, pectinase, amylase, cellulase, hemicellulose, pectolyase, pectozyme and polygalacturonase. Addition of a macerating

enzyme to the pulp can increase the release of phenolic and other nutritionally important components. Macerating enzymes can break down components (e.g. pectin in fruit) that otherwise causes the pulp to be too viscous to be drinkable as a pleasant beverage.

[0030] In some examples, the method can comprise at least one pulp liquefaction step for liquefaction of the pulp or juice-pulp mixture.

[0031] The beverage's ingredient content can be tailored for the particular type of fruit and/or vegetable used. For example, some types of fruit may have a higher starch content and require a different amount and/or type of enzyme in order to achieve the required viscosity.

[0032] In some examples, the macerating enzyme is a pectinase enzyme. Any suitable amount of a pectinase enzyme can be used. For example, anywhere between about 10 ppm to about 1000 ppm enzyme can be used, including all 5 ppm increments between 10 and 1000, including 25 ppm, 30 ppm etc. In some examples, about 100 ppm of a pectinase enzyme is used for a pome fruit extract.

[0033] In some examples, a macerating enzyme can be added before, during or after one or more homogenisation steps.

[0034] In some examples, the step of pulp liquefaction involves subjecting the pulp or juice-pulp mixture to one or more macerating enzymes at an appropriate temperature for an appropriate time, to optimise enzymatic action. There are virtually infinite options for the hold temperature and hold time for this step. That is, the higher the temperature, the less time required – as long as the temperature is not so high as to inactivate the enzyme. The step of pulp liquefaction could be done at room temperature but would take a lot longer. Preferably, the step of pulp liquefaction is carried out at approximately 55°C for about 30 minutes. This particular temperature is high enough to optimise enzymatic action without inactivating the enzyme or causing excessive discolouration of the juice. This temperature is also high enough to be beyond the growth range for some significant microbes.

[0035] The method can comprise a juice modification step for modifying one or more properties of the extracted juice, to produce a modified extracted juice. This can be carried out in any suitable way. In some examples, one or more modifying enzymes are used, for example, for debittering of citrus fruit juice or preventing darkening of juice.

[0036] The method can comprise at least one homogenisation step for homogenising the pulp and the juice (juice-pulp mixture). This can be carried out in any suitable way. In some examples, a high-shear mixer is used for mixing, emulsifying and homogenising. A suitable example of a high-shear mixer is a Silverson™ high-shear mixer.

[0037] The method can comprise a first homogenisation step for breaking down initial particle size of the pulp (and/or juice, if relevant) so that the pulp liquefaction (liquefication) step is more effective.

[0038] The method can comprise a second homogenisation step for reducing the particles to a fine enough size to reduce viscosity, such that the beverage or beverage homogenate is pourable and preferably provides a smooth mouthfeel, and preferably prevents significant separation of the beverage during storage.

[0039] In some examples, a first homogenisation step is carried out before an enzymic liquefaction step, and a second homogenisation step is carried out after the enzymic liquefaction step.

[0040] One or more of the homogenisation steps can comprise heating the pulp and the juice (juice-pulp mixture) during homogenisation using a heat exchanger, for more efficient pulp liquefaction, preferably more efficient enzymatic digestion of the pulp.

[0041] The method can comprise a beverage preparation step comprising preparing a beverage from the beverage homogenate. In some examples, reduced viscosity, decreased turbidity, and/or improved filterability are achieved. This can be carried out in any suitable way.

[0042] Preferably the beverage homogenate is rendered pourable. Preferably, the beverage has a final viscosity ranging between about 50 cP and about 500 cP, including all about 1 cP increments between 50 and 500, including 51 cP, 52 cP, 53 cP etc. Preferably, the beverage has a final viscosity ranging between about 150 cP and about 250 cP, including all about 1 cP increments between 150 and 250, including 151 cP, 152 cP, 153 cP etc. Preferably, the beverage has a final viscosity of about 200 cP. In some examples, the viscosity of the beverage homogenate is modified using, for example, a diluent or base such as fruit and/or vegetable juice, or water.

[0043] In some examples, the beverage preparation step comprises adding a functional ingredient, to further improve the health benefits of the beverage. This can be carried out in any suitable way. Any suitable type of functional ingredient can be used. In some examples, the functional ingredient can be a sweetener, herbal supplement or nutritional supplement.

[0044] The method can comprise a pasteurisation or preservation step, to thereby produce a pasteurised or preserved beverage. Pasteurisation or preservation can be carried out in any suitable way. This may include hot/warm fill, and/or addition of a suitable preservative, and/or high-pressure processing.

[0045] In some examples, the beverage is heated to a temperature of more than 65°C, so that the beverage is still 64°C when bottled or otherwise packaged and sealed. The pasteurisation step can comprise placing the packaged beverage in a pasteurisation bath at 64°C for about 10 minutes.

[0046] In some examples, the preservation step can comprise adding a preservative. Any suitable preservative can be used to enhance product stability, such as dimethyl decarbonate, or any other suitable processing aid (eg. antioxidant, organic acid or acidulant).

[0047] The method can comprise a packaging step to produce a packaged or bottled beverage. This step can be carried out in any suitable way. In some examples, the beverage is packaged into bottles utilising a method that effectively preserves the beverage for the intended shelf life. This may include hot/warm fill, and/or addition of a suitable preserving compound, and/or high-pressure processing.

[0048] The method can comprise a storage step to produce a stored beverage. In some examples, the stored beverage is cooled, labelled, and stored for distribution. With a pome fruit beverage, for example, it may be necessary to store refrigerated to prevent the colour from darkening too quickly. This may be true for other fruit and vegetable based beverages. In some examples, the stored beverage is frozen.

[0049] There is provided a method of preparing a beverage substantially from the whole edible part of fruit and/or vegetable, the method comprising the steps of:

[0050] optionally, a preparation step for preparing the fruit and/or vegetable, to thereby produce a prepared fruit and/or vegetable;

[0051] a non-edible part removal step for removing any non-edible part of a first fruit and/or vegetable batch, to thereby produce a first processed fruit and/or vegetable batch;

[0052] a pulping step for substantially pulping the first processed fruit and/or vegetable batch, to thereby produce a first processed fruit and/or vegetable pulp;

[0053] a pulping step for substantially pulping a second whole fruit and/or vegetable batch with non-edible parts left in, to thereby produce a second whole fruit and/or vegetable pulp;

[0054] an extraction step for extracting juice from the second whole fruit and/or vegetable pulp;

[0055] optionally, at least one spoilage prevention step for preventing or reducing spoilage;

[0056] a mixing step for mixing the juice extracted from the second whole fruit and/or vegetable pulp with the first processed fruit and/or vegetable pulp, to produce a juice-pulp mixture;

[0057] a pulp liquefaction step for liquefaction of the juice-pulp mixture;

[0058] at least one homogenisation step for homogenising the juice-pulp mixture to produce a beverage homogenate; and

[0059] a beverage preparation step comprising preparing a beverage from the beverage homogenate, wherein said beverage contains substantially the entire edible part of whole fruit and/or vegetable and is pourable.

[0059a] In one aspect, the present disclosure is directed to a method of preparing a beverage substantially from the whole edible part of fruit and/or vegetable, the method comprising the steps of:

optionally, a preparation step for preparing the fruit and/or vegetable, to thereby produce a prepared fruit and/or vegetable;

a non-edible part removal step for removing any non-edible part of a first fruit and/or vegetable batch, to thereby produce a first processed fruit and/or vegetable batch;

a pulping step for substantially pulping the first processed fruit and/or vegetable batch, to thereby produce a first processed fruit and/or vegetable pulp;

a pulping step for substantially pulping a second whole fruit and/or vegetable batch, to thereby produce a second whole fruit and/or vegetable pulp;

an extraction step for extracting juice from the second whole fruit and/or vegetable pulp;

optionally, at least one spoilage prevention step for preventing or reducing spoilage;

a mixing step for mixing the juice extracted from the second whole fruit and/or vegetable pulp with the first processed fruit and/or vegetable pulp, to produce a juice-pulp mixture;

a pulp liquefaction step for liquefaction of the juice-pulp mixture and to lower the

viscosity, wherein said pulp liquefaction step includes subjecting the juice-pulp mixture to one or more macerating enzymes;

at least one homogenisation step for homogenising the juice-pulp mixture to produce a beverage homogenate; and

a beverage preparation step comprising preparing a beverage from the beverage homogenate, wherein said beverage contains substantially the entire edible part of whole fruit and/or vegetable and wherein the beverage is configured to have a viscosity between about 50 cP and about 500 cP.

[0060] In another aspect, there is provided a beverage when produced by the method as defined herein.

[0060a] In another aspect, there is provided a beverage based substantially from the entire edible part of whole fruit and/or vegetable, comprising:

fruit and/or vegetable pulp from substantially the edible part of a first whole fruit and/or vegetable; and

juice from a fruit and/or vegetable pulp from substantially the edible part of a second whole fruit and/or vegetable;

wherein said beverage has a viscosity between about 50 cP and about 500 cP, and retains substantially the entire edible part of whole fruit and/or vegetable.

[0061] There is provided a pome fruit beverage prepared substantially from the entire edible part of whole fruit and retaining the nutritional benefit of substantially the entire edible part of the whole fruit, comprising:

about 50-70% weight/weight fruit pulp, comprising substantially the entire edible part of whole fruit;

about 30-60% weight/weight juice of whole fruit; and

about 0-1% weight/weight antioxidant, such as ascorbic acid,

wherein said beverage retains the nutritional benefit of substantially the entire edible part of whole fruit and said beverage is capable of being poured.

[0062] Preferably the beverage homogenate is rendered pourable. Preferably, the beverage has a final viscosity ranging between about 50 cP and about 500 cP, including all about 1 cP

increments between 50 and 500, including 51 cP, 52 cP, 53 cP etc. Preferably, the beverage has a final viscosity ranging between about 150 cP and about 250 cP, including all about 1 cP increments between 150 and 250, including 151 cP, 152 cP, 153 cP etc. Preferably, the beverage has a final viscosity of about 200 cP.

[0063] Preferably, the beverage comprises about 58-62% weight/weight fruit pulp.

[0064] Preferably, the beverage comprises about 38-42% weight/weight juice.

[0065] Preferably, the beverage comprises anywhere between about 0.05% weight/weight to about 0.15% weight/weight antioxidant (e.g. ascorbic acid), including all 0.01 increments between 0.05 and 0.15, including 0.06, 0.07, 0.08, 0.09%, etc. Preferably, about 0.1% weight/weight antioxidant (e.g. ascorbic acid) is used.

[0066] Preferably, the beverage is prepared from the entire edible part of the pome fruit, which includes the peel.

[0067] Preferably, the beverage is prepared from the entire edible part of an apple, which preferably includes the peel.

[0068] Preferably, the beverage is prepared from two batches of pome fruit such as apple, whereby the pulp is obtained from a first batch of apples, preferably processed to lack non-edible parts, and the juice is extracted from a second batch of apples, preferably obtained from whole apples containing non-edible parts.

[0069] Any of the features described herein can be combined in any combination with any one or more of the other features described herein within the scope of the disclosure.

[0070] The reference to any prior art in this specification is not, and should not be taken as an acknowledgement or any form of suggestion that the prior art forms part of the common general knowledge.

BRIEF DESCRIPTION OF THE FIGURES

[0071] Figure 1 shows a process for preparing a ‘whole apple’ beverage, according to an embodiment of the present invention.

[0072] Preferred features, embodiments and variations of the invention may be discerned

CLAIMS

1. A method of preparing a beverage substantially from the whole edible part of fruit and/or vegetable, the method comprising the steps of:

optionally, a preparation step for preparing the fruit and/or vegetable, to thereby produce a prepared fruit and/or vegetable;

a non-edible part removal step for removing any non-edible part of a first fruit and/or vegetable batch, to thereby produce a first processed fruit and/or vegetable batch;

a pulping step for substantially pulping the first processed fruit and/or vegetable batch, to thereby produce a first processed fruit and/or vegetable pulp;

a pulping step for substantially pulping a second whole fruit and/or vegetable batch, to thereby produce a second whole fruit and/or vegetable pulp;

an extraction step for extracting juice from the second whole fruit and/or vegetable pulp;

optionally, at least one spoilage prevention step for preventing or reducing spoilage;

a mixing step for mixing the juice extracted from the second whole fruit and/or vegetable pulp with the first processed fruit and/or vegetable pulp, to produce a juice-pulp mixture;

a pulp liquefaction step for liquefaction of the juice-pulp mixture and to lower the viscosity, wherein said pulp liquefaction step includes subjecting the juice-pulp mixture to one or more macerating enzymes;

at least one homogenisation step for homogenising the juice-pulp mixture to produce a beverage homogenate; and

a beverage preparation step comprising preparing a beverage from the beverage homogenate, wherein said beverage contains substantially the entire edible part of whole fruit and/or vegetable and wherein the beverage is configured to have a viscosity between about 50 cP and about 500 cP.

2. The method of claim 1, wherein the at least one homogenisation step comprises a first homogenisation step before the pulp liquefaction step and a second homogenisation step after the pulp liquefaction step.

3. The method of claim 1, wherein the pulp liquefaction step is carried out simultaneously with a first homogenisation step.

4. The method of any one of claims 1-3, wherein the macerating enzyme is selected from a group

consisting of pectinase, amylase, cellulase, hemicellulose, pectolyase, pectozyme and polygalacturonase and any combination thereof.

5. The method of claim 4, wherein the macerating enzyme is a pectinase enzyme.

6. The method of claim 5, wherein the pectinase enzyme is present at about 100 ppm.

7. The method of any one of claims 1 to 6, wherein the pulp liquefaction step is carried out at a temperature from about 45°C to about 65°C.

8. The method of claim 7, wherein the pulp liquefaction step is carried out at a temperature of about 55°C.

9. The method of any one of claims 1 to 8, wherein the least one spoilage prevention step comprises the addition of at least one antioxidant or preservative, such as ascorbic acid, to the pulp and/or the juice.

10. The method of claim 9, wherein the at least one antioxidant or preservative is present from about 0.05% weight/weight to about 0.15% weight/weight.

11. The method of any one of claims 1 to 10, wherein the method further comprises a pasteurisation step, carried out at 64°C for about 10 minutes.

12. The method of any one of claims 1 to 11, wherein the fruit is a pome fruit.

13. The method of claim 12, wherein the pome fruit is an apple.

14. The method of any one of claims 1 to 13, wherein the beverage is configured to comprise about 50-70% weight/weight fruit pulp, about 30-60% weight/weight juice of whole fruit, and about 0.01-0.15% weight/weight antioxidant.

15. The method of any one of claims 1 to 14 wherein the pulping step for the second whole fruit and/or vegetable batch is performed with non-edible parts left in.

16. A beverage when produced by the method of any one of claims 1-15.

17. A beverage based substantially from the entire edible part of whole fruit and/or vegetable, comprising:

fruit and/or vegetable pulp from substantially the edible part of a first whole fruit and/or vegetable; and

juice from a fruit and/or vegetable pulp from substantially the edible part of a second whole fruit and/or vegetable;

wherein said beverage has a viscosity between about 50 cP and about 500 cP, and retains substantially the entire edible part of whole fruit and/or vegetable.

18. The beverage of claim 17, comprising

about 50-70% weight/weight fruit pulp; and

about 30-60% weight/weight juice.

19. The beverage of claim 17 or 18, wherein the beverage has a viscosity of about 150 cP - 250 cP.

20. The beverage of any one of claims 17-19, wherein the beverage comprises about 58-62% weight/weight fruit pulp.

21. The beverage of any one of claims 17-20, wherein the beverage comprises about 38-42% weight/weight juice.

22. The beverage of any one of claims 17-21, wherein the fruit and/or vegetable is a pome fruit, optionally including a peel of the pome fruit.

23. The beverage of claim 22 wherein the pome fruit is an apple.

24. The beverage of any one of claims 17-23 wherein the beverage includes about 0-1% weight/weight antioxidant, such as ascorbic acid.