(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
26 November 2015 (26.11.2015)

WIPO | PCT

(10) International Publication Number
WO 2015/177145 A1

(51) **International Patent Classification**:
A23C 9/13 (2006.01) *A23L 2/62* (2006.01)
A23C 9/137 (2006.01) *A23G 1/56* (2006.01)

(21) **International Application Number**:
PCT/EP2015/060989

(22) **International Filing Date**:
19 May 2015 (19.05.2015)

(25) **Filing Language**: English

(26) **Publication Language**: English

(30) **Priority Data**:
62/001,801 22 May 2014 (22.05.2014) US

(71) **Applicant**: **NESTEC S.A.** [CH/CH]; CT-IAM, Avenue Nestlé 55, CH-1800 Vevey (CH).

(72) **Inventors**: **ZHENG, Ying**; 7157 Brodie Blvd, Dublin, Ohio 43017 (US). **SHER, Alexander**; 6101 Wynford Drive, Dublin, Ohio 43017 (US). **KAPCHIE, Virginie**; 6266 Ruth Ann Ct, OH, Dublin, Ohio 43016 (US). **FU, Jun-Tse Ray**; 7527 Windsor Dr., Dublin, Ohio 43016 (US).

(74) **Agent**: **KRISHNAN, Sri**; Avenue Nestlé 55, CH-1800 Vevey (CH).

(81) **Designated States** *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

WO 2015/177145 A1

(54) **Title**: LOW-SUGAR DAIRY BEVERAGES

(57) **Abstract**: Ready to drink low sugar flavored dairy beverages are provided, and methods for making such beverages are also provided. The beverage can include a dairy component, a flavor component, and a stabilizing system comprising a first stabilizing component and a second stabilizing component. The flavor component can be at least one of a cocoa component or a fruit flavoring component. The first stabilizing component is microcrystalline cellulose, carboxymethyl cellulose and further comprising carrageenans, and the second stabilizing component is at least one of gellan or a modified starch. Sugar can be present in the beverage in an amount up to about 4.5% of the beverage. The beverage can be aseptic and stable in a homogenous state for at least three months in ambient storage and preferably at least six months in ambient storage.

TITLE

LOW-SUGAR DAIRY BEVERAGES

BACKGROUND

[0001] The present disclosure generally relates to nutritional products. More specifically, the present disclosure relates to ready to drink ("RTD") reduced sugar beverages containing a dairy component, a flavor component and a stabilizing system and also relates to methods for making same.

[0002] The current trend is that consumers are more health conscious and are looking for healthier beverages with less sugar and calories but without compromising the product taste and texture. In addition, consumers demand a healthier beverage, yet they are not willing to give up the original, indulgent mouthfeel they grew up with and remember, also denoted as richness, texture or creaminess, of the beverages. Thus, many RTD beverages are transitioning from high sugar versions to versions with less sugar to limit the calories in the beverage. However, sugar reduction results in a thin, less pleasing mouthfeel of the beverages. Therefore, there is a need for a solution that improves and compensates the loss of mouthfeel in reduced sugar RTD dairy beverages to maintain the consumer preference.

[0003] While improving texture perception of reduced sugar RTD dairy beverages, the long shelf-life stability of the beverage cannot be compromised. Such stability is challenging because aseptically processed, flavored dairy beverages experience inherent gelation over time. Stabilizer ingredients added to the beverage to prevent sedimentation of particles in the beverage, such as cocoa, increase susceptibility to gelation by interacting with each other and with milk proteins. Substantially reducing or removing milk fat, cocoa and/or sugar in flavored milk beverages can also contribute to gelation, resulting in a shorter shelf-life.

[0004] There are no current solutions for shelf stable RTD flavored dairy beverages with low sugar content which have a mouthfeel similar to full sugar beverages and are shelf-stable during the life of the beverage.

SUMMARY

[0005] The present disclosure provides ready-to-drink flavored dairy beverages and also provides methods for making such beverages. The ready-to-drink flavored dairy beverages can have reduced sugar, can be aseptic, and can have a pleasant mouthfeel. The

ready-to-drink flavored dairy beverages can have an improved physico-chemical stability during ambient storage times e.g., stable for at least three months in ambient storage and preferably at least six months in ambient storage. The dairy beverages exhibits reduced gelation and overcome problems with other phase separation/instability issues during different storage conditions over the full life of the dairy beverages.

[0006] In a general embodiment, a ready to drink beverage is provided. The beverage includes: a dairy component; a flavor component selected from the group consisting of a cocoa component, a fruit flavor component, and a combination thereof; and a stabilizing system comprising a first stabilizing component and a second stabilizing component, the first stabilizing component comprises microcrystalline cellulose (MCC) and carboxymethyl cellulose (CMC) and the second stabilizing component is selected from the group consisting of gellan, a modified starch and a combination thereof.

[0007] In a related embodiment, the first stabilizing component further comprises carrageenans, such as kappa carrageenan.

[0008] In a related embodiment, the first stabilizing component is present in the beverage in an amount from 0.02 % to 0.3% of the beverage.

[0009] In a related embodiment, the second stabilizing component comprises gellan present in the beverage in an amount from 0.01% to 0.075% of the beverage.

[0010] In a related embodiment, the second stabilizing component may further comprise modified starch. The modified starch can be present in the beverage in an amount from 0.05% to 0.75% of the beverage.

[0011] In a related embodiment, the second stabilizing component comprises gellan from 0.01% to 0.075% of the beverage, and modified starch from 0.05% to 0.75% of the beverage.

[0012] In a related embodiment, sugar is present in the beverage in an amount up to about 4.5% of the beverage.

[0013] In another embodiment, a method of producing a ready to drink dairy beverage is provided. The method includes adding a stabilizing system to a dairy component and a flavor component, the flavor component selected from the group consisting of a cocoa component, a fruit flavor component, and a combination thereof, and the stabilizing system comprises a first stabilizing component that is 0.02% to 0.3% of the beverage and a second stabilizing component is present in the beverage in an amount from 0.01 % to 0.75 % of the beverage. In an embodiment, the second stabilizing component is gellan and the beverage comprises 0.01 % to 0.075 % of gellan. In another embodiment, the second stabilizing

component is modified starch and the beverage comprises 0.05 % to 0.75 % of modified starch. In yet another embodiment, the second stabilizing component comprises, or consists essentially of, gellan and modified starch, and gellan is present in an amount from 0.01 % to 0.075 % of the beverage, and modified starch is present in an amount from 0.05 % to 0.75 % of the beverage.

[0014] The first stabilizing component comprises microcrystalline cellulose (MCC) and carboxymethyl cellulose (CMC) and the second stabilizing component is selected from the group consisting of gellan, a modified starch and a combination thereof.

[0015] In a related embodiment, the method further includes producing the beverage to have reduced sugar as determined by a governmental regulation.

[0016] In another embodiment, a ready to drink aseptic beverage is provided. The beverage includes: a dairy component; a flavor component selected from the group consisting of a cocoa component, a fruit flavoring component, and a combination thereof; sugar in an amount up to about 4.5% of the beverage; and a stabilizing system comprising a first stabilizing component and a second stabilizing component, the first stabilizing component comprises microcrystalline cellulose (MCC) and carboxymethyl cellulose (CMC) and the second stabilizing component is selected from the group consisting of gellan, a modified starch and a combination thereof, and the stabilizing system is present in an amount that maintains the ready to drink aseptic beverage in a homogenous state for at least three months in ambient storage.

[0017] In a related embodiment, the first stabilizing component and the second stabilizing component are the only stabilizers in the beverage.

[0018] The first stabilizing component and the second stabilizing component can be the only stabilizers in the beverage.

[0019] In another embodiment, gellan, cellulose and carrageenan are present in a ratio by weight of about (0.7 to 15) to about (2 to 40) to 1.

[0020] In another embodiment, hydroxypropyl starch, cellulose and carrageenan are present in a ratio by weight of about (3.3 to 150) to about (2 to 40) to 1.

[0021] An advantage of the present disclosure is to provide an improved ready to drink shelf-stable flavored dairy beverage.

[0022] Another advantage of the present disclosure is to provide a ready to drink flavored dairy beverage that has an acceptable stability and desired shelf life during extended storage.

[0023] Still another advantage of the present disclosure is to provide a ready to drink flavored dairy beverage having reduced sugar that maintains a pleasant mouthfeel, body, smooth texture during the shelf-life.

[0024] Yet another advantage of the present disclosure is to provide a ready to drink flavored dairy beverage that has stability despite reduced sugar.

[0025] Another advantage of the present disclosure is to provide a ready to drink flavored dairy beverage that has reduced sugar but a mouthfeel similar to a full sugar beverage.

[0026] Still another advantage of the present disclosure is to provide a stabilizer system that maintains a cocoa component in suspension in a dairy medium and/or water.

[0027] Yet another advantage of the present disclosure is to provide a ready to drink flavored dairy beverage having an amount of sugar reduced by about 25% or more and preferably about 40% or more relative to typical shelf-stable ready to drink flavored beverages containing dairy.

[0028] Another advantage of the present disclosure is to provide a ready to drink reduced sugar flavored dairy beverage that does not have or does not rely on polyphosphates for stability.

[0029] Additional features and advantages are described herein, and will be apparent from, the following Detailed Description.

DETAILED DESCRIPTION

[0030] All percentages expressed herein are by weight of the total weight of the composition unless expressed otherwise. When reference is made to the pH, values correspond to pH measured at 25 °C with standard equipment. As used in this disclosure and the appended claims, the singular forms "a," "an" and "the" include plural referents unless the context clearly dictates otherwise. As used herein, "about" is understood to refer to numbers in a range of numerals. Moreover, all numerical ranges herein should be understood to include all integer, whole or fractions, within the range.

[0031] As used herein, "comprising," "including" and "containing" are inclusive or open-ended terms that do not exclude additional, unrecited elements or method steps. However, the beverages provided by the present disclosure may lack any element that is not specifically disclosed herein. Thus, any embodiment defined herein using the term

"comprising" includes embodiments "consisting essentially of" and "consisting of" the disclosed components.

[0032] As used herein, "ambient storage" means storage at temperatures that are commonly measured in warehouses, in transport vehicles, in shelves or storage zone at the retailers' premises, or in the consumer's cupboard. For instance, ambient temperature may range from 15°C up to 35°C.

[0033] The present disclosure relates to shelf-stable RTD beverages containing a flavor component and one or more dairy ingredients (hereinafter "the beverage" or "the beverages"). "Ready-to-drink beverage" means a beverage in liquid form that can be consumed without further addition of liquid. The beverages can have reduced sugar. For example, the beverages can have an amount of sugar that is reduced by about 25% or more and preferably by about 40% or more relative to typical shelf-stable RTD flavored beverages containing dairy. As another example, the beverages can have "low sugar" or "reduced sugar" based on any applicable governmental regulation regarding such product statements. For example, a "low sugar" beverage contains less than 4.5 g added sugar per 100 gram of the beverage. "Added sugar" refers to caloric mono- and di-saccharides added during manufacture of the beverage, such as glucose, sucrose, maltose, fructose. However, lactose is naturally found in milk, therefore, for the purpose of this disclosure, lactose is not taken into account in "added sugar".

[0034] As used herein, the word "cellulose" refers to any combination consisting essentially of microcrystalline cellulose (MCC) and carboxymethyl cellulose (CMC), also known as colloidal cellulose.

[0035] The beverages can be aseptic and can be stabilized by a complex stabilizing system containing a first component that is microcrystalline cellulose (MCC), carboxymethyl cellulose (CMC) and optionally carrageenans, such as kappa carrageenan, and a second component that is gellan and/or a modified starch.

[0036] A unique combination of components was found for a stabilizing system that can provide reduced sugar aseptic RTD flavored dairy beverages with good physico-chemical stability during storage while also providing good mouthfeel and a pleasant, indulgent taste. The stabilizing system improves the stability of reduced-sugar aseptic shelf-stable RTD flavored dairy beverages by helping to significantly reduce undesirable gelation of the beverage at ambient temperatures as well as other temperatures.

[0037] In a general embodiment, the beverage comprises a flavor component, a dairy component, and a stabilizing system. The flavor component can be a cocoa component and/or

a fruit flavoring component. In an embodiment, the flavor component is present in the beverage in an amount from about 0.025% to about 1.0% of the beverage. The cocoa component can include one or more natural cocoas, alkalized cocoas, or other cocoa or chocolate based products. The fruit flavor component may include one or more fruit juices, soluble fruit powders, fruit extracts, fruit concentrates, fruit flavor crystals, fruit flavored powders, and the like. The fruit or fruit flavoring may be apple, orange, pear, peach, strawberry, banana, vanilla, cherry, pineapple, kiwi, grape, blueberry, raspberry, mango, guava, cranberry, blackberry or combinations thereof.

[0038] The dairy component can include one or more dairy ingredients or dairy substitute ingredients. For example, the dairy ingredients can be milk, milk fat, milk powder, skim milk, milk proteins and combinations thereof. Examples of suitable dairy proteins are casein, caseinate, casein hydrolysate, whey, whey hydrolysate, whey concentrate, whey isolate, milk protein concentrate, milk protein isolate, and combinations thereof. Furthermore, the dairy protein may be, for example, sweet whey, acid whey, α-lactalbumin, β-lactoglobulin, bovine serum albumin, acid casein, caseinates, α-casein, β-casein and/or γ-casein. Suitable dairy substitute ingredients include soy proteins, rice proteins and combinations thereof, for example. In an embodiment, the beverage comprises at least one of skim milk, whole pasteurized milk or non-fat milk powder. In a preferred embodiment, the beverage does not have added oil.

[0039] The stabilizing system has a first stabilizing component comprising microcrystalline cellulose (MCC) and carboxymethyl cellulose (CMC). In an embodiment, the first stabilizing component further comprises carrageenans, such as kappa carrageenan. The first stabilizing component can be present in an amount of 0.03% to 0.20% of the beverage, preferably from 0.05% to 0.19%, more preferably from 0.10% to 0.15%.

[0040] The stabilizing system has a second stabilizing component that is at least one of gellan or modified starch. Preferably, the gellan is high acyl gellan. The modified starch can be a physically modified and/or chemically modified starch, and non-limiting examples of suitable starch sources include wheat, barley, rye, rice, tapioca, potato and corn. In an embodiment, the second stabilizing component is present in an amount up to 0.825 wt% of the beverage, such as up to 0.5% of the beverage, such as about 0.1% of the beverage for example.

[0041] In an embodiment, the first stabilizing component and the second stabilizing component are the only the stabilizers in the beverage.

[0042] The beverage can be made aseptic to achieve commercial sterility and food safety standard for consumption. Aseptic treatment of the beverage may be performed by pre-heating the beverage, for example to about 75 to 85 °C, and then injecting steam into the beverage to raise the temperature to about 140 to 160 °C, for example at about 150 °C. The beverage may then be cooled, for example by flash cooling, to a temperature of about 75 to 85 °C, homogenized again, further cooled to about room temperature and filled into containers, such as cans. Suitable apparatuses for aseptic treatment of the beverage are commercially available. The stabilizing system can maintain the aseptic RTD dairy beverage in a homogenous state for three months in ambient storage and preferably at least six months in ambient storage. In the context of this disclosure, shelf-life stability may be assessed at 20°C during 6 months. and 30°C for 3 months, and 1 months at 38°C.

[0043] The combination of the disclosed amounts of MCC, CMC, optionally carrageenans, and at least one of gellan or a modified starch, was found to assist in maintaining good suspension and emulsion stability of the beverage, reducing gelation and other phase separation issues during the storage, and improving mouthfeel. For example, the stabilizing system can maintain the flavor component in suspension in an aqueous/dairy medium and stabilize proteins while also preventing or minimizing other phase separation issues.

[0044] The beverages can also include one or more additional ingredients such as flavorants, artificial sweeteners, natural sweeteners, colorants or a combination thereof. Sweeteners can be sugar-based, such as sucrose, invert syrup, fructose syrup, glucose syrup with various DE, maltodextrins with various DE and combinations thereof, for example. Sugarless sweeteners can include, but are not limited to, sugar alcohols such maltitol, xylitol, sorbitol, erythritol, mannitol, isomalt and lactitol, hydrogenated starch hydrolysates, saccharin, cyclamate, acetosulfame, an L-aspartyl-based sweetener, or mixtures thereof.

[0045] Usage level of the flavorants, sweeteners and colorants will vary greatly and will depend on such factors as potency of the sweetener, desired sweetness of the beverage, the level and type of flavor used, and cost considerations. Any suitable combinations of added sugar and/or sugarless sweeteners may be used in the beverages. In an embodiment, added sugar is present in an amount from about 0% to about 4.5% of the beverage, such as about 1% to about 4.2% or about 2% to about 4% of the beverage.

[0046] In an embodiment, the beverage does not have artificial sweetener. In an embodiment, the beverage is a low sugar beverage. Non-limiting examples of suitable flavorants include chocolate enhancers, cream/dairy enhancers, vanilla flavors or a

combination thereof. In an embodiment, the one or more flavorants are present in the beverage in an amount from about 0.025% to about 1% of the beverage in addition to the cocoa component and/or the fruit flavor component.

[0047] In an embodiment, the beverage further includes one or more vitamins and/or minerals. The vitamins can be present in the beverage in an amount from about 0.01% to about 0.5% of the beverage. The vitamins include, but are not limited to, vitamin C and group B vitamins, and other non-limiting examples of suitable vitamins include ascorbic acid, ascorbyl palmitate, vitamins B1, B2, B6, B12, and Niacin (B3), or combination of thereof. The vitamins may also include Vitamins A, D, E and K and acid vitamins such as pantothenic acid, folic acid and biotin. The Vitamin A may be present as Vitamin A Palmitate. Vitamin D3 is an example of a suitable Vitamin D.

[0048] The minerals can be present in the beverage in an amount from about 0.0025% to about 1% of the beverage. Non-limiting examples of the minerals include calcium, magnesium, iron or a combination thereof. The source of calcium can include calcium carbonate, calcium phosphate, calcium citrate, other insoluble calcium compounds or a combination thereof. The source of magnesium can include magnesium phosphate, magnesium carbonate, magnesium hydroxide or combination of thereof. The source of iron can include iron ammonium phosphate, ferric pyrophosphate, ferric phosphate, ferrous phosphate, other insoluble iron compounds, aminoacids, iron chelating compounds such as EDTA, or combinations thereof. The minerals may also include zinc, iodine, copper, phosphorus, manganese, potassium, chromium, molybdenum, selenium, nickel, tin, silicon, vanadium and boron.

[0049] The ready to drink beverages can be made using any suitable process. For example, a process of making the beverages includes dissolving the raw materials in fluid milk/water and hydration (e.g., wetting) of a flavor component such as cocoa powder or fruit flavor powder for about 45 minutes to about 90 minutes at about 90 °C to about 95 °C to form the beverage. The beverage can then be subjected to ultra high temperature ("UHT") heat treatment at about 140 °C to about 151 °C for about 2 seconds to about 12 seconds and aseptic homogenization from about 30 bars to about 300 bars. The UHT heat treatment can be followed by aseptic filling of the ready to drink beverage into a suitable container.

[0050] EXAMPLES

[0051] By way of example and not limitation, the following examples are illustrative of various embodiments of the present disclosure.

[0052] Example 1

[0053] A control aseptic liquid dairy beverage was prepared, containing 200 ppm of additional carrageenan, 0.1% gellan, and 0.15% of a first stabilizing component (MCC, CMC and 150 ppm carrageenan). A sample aseptic liquid dairy beverage according to the present disclosure was also prepared, containing 0.1% gellan and 0.15% of the same stabilizing component. Both control beverage and sample beverage contain about 3% of milk protein, about 1% of milk fat, about 4% of added sugar, and about 0.1% of alkalized cocoa, in the total beverage.

[0054] When compared with the control beverage, the sample beverage lacks the additional carrageenan. After 3 months storage at 20°C), unacceptable gel formation occurred in the control beverage, and much reduced gel formation occurred in the beverage according to the present disclosure.

[0055] Example 2

[0056] A control aseptic liquid dairy beverage was prepared, containing 1% modified starch, 200ppm of carrageenan, and 0.15% of a first stabilizing component. A sample aseptic liquid dairy beverage according to the present disclosure was prepared containing 1% modified starch and 0.15% of the first stabilizing component. Both control beverage and sample beverage contain about 3% of milk protein, about 1% of milk fat, about 4% of added sugar, and about 0.1% of alkalized cocoa, in the total beverage.

[0057] When compared with the control beverage, the sample beverage lacks the additional carrageenan. After 3 months storage at 20°C, unacceptable gel formation occurred in the control beverage, and much reduced gel formation occurred in the beverage according to the present disclosure.

[0058] Example 3

[0059] A non-limiting example formulation is set forth in the below table listed the key ingredients of aseptic, flavored milk containing the first stabilizer system and gellan.

Ingredients	**Range (w/w%)**
Milk fat	0.3– 2
Alkalized Cocoa	0.1 - 2
Added Sugar	0 – 4.5
High Acyl Gellan	0.01 - 0.075
Cellulose	0.02 – 0.3
Carrageenan	0.005 - 0.015
Skim Milk	remain

[0060] Example 4

[0061] A non-limiting example formulation is set forth in the below table listed the key ingredients of aseptic, flavored milk containing the first stabilizer system and starch.

Ingredients	Range (w/w%)
Milk fat	0.3 – 2
Alkalized Cocoa	0.1 - 2
Added Sugar	0 – 4.5
Hydroxypropyl starch	0.05 - 0.75
Cellulose	0.02 – 0.3
Carrageenan	0.005 - 0.015
Skim Milk	remain

[0062] Example 5

[0063] A non-limiting example formulation is set forth in the below table listed the key ingredients in aseptic, flavored milk containing the first stabilizer system and in combination of gellan and modified starch.

Ingredients	Range (w/w%)
Milk fat	0.3 – 2
Alkalized Cocoa	0 – 2
Added Sugar	0 – 4.5
High Acyl Gellan	0.01 – 0.075
Hydroxypropyl starch	0.05 - 0.75
Cellulose	0.02 – 0.3
Carrageenan	0.005 - 0.015
Skim Milk	remain

[0064] The above recipes may also comprise milk cream to adjust fat level, milk protein to comply with regulation. It may also include minerals, e.g. calcium carbonate, for mineral fortification.

[0065] The recipes can also contain different flavors and sweeteners.

[0066] It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of

the present subject matter and without diminishing its intended advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

CLAIMS

The invention is claimed as follows:

1. A ready to drink beverage comprising:

a dairy component;

a flavor component selected from the group consisting of a cocoa component, a fruit flavor component, and a combination thereof; and

a stabilizing system comprising a first stabilizing component and a second stabilizing component, the first stabilizing component comprises microcrystalline cellulose (MCC) and carboxymethyl cellulose (CMC) and the second stabilizing component is selected from the group consisting of gellan, a modified starch and a combination thereof.

2. The ready to drink beverage of claim 1, wherein the first stabilizing component further comprises carrageenans.

3. The ready to drink beverage of claim 2, wherein carrageenan is present from 0.005% to 0.015% of the beverage.

4. The ready to drink beverage of claim 2 or 3, where the weight ratio of gellan to cellulose and to carrageenan ranges from about (0.7 to 15) to about (2 to 40) to 1.

5. The ready to drink beverage of claim 2 or 3, wherein the weight ratio of modified starch to cellulose and to carrageenan ranges from about (3.3 to 150) to about (2 to 40) to 1.

6. The ready to drink beverage according to any of claims 1 to 5, wherein the first stabilizing component is present in the beverage in an amount from 0.03% to 0.2 % of the beverage.

7. The ready to drink beverage according to any one of claims 1 to 6, wherein the second stabilizing component is gellan and is present in the beverage in an amount from 0.01% to 0.075% of the beverage.

8. The ready to drink beverage according to any one of claims 1 to 6, wherein the second stabilizing component is starch and is present in the beverage in an amount from 0.05% to 0.75% of the beverage.

9 The ready to drink beverage according to any one of claims 1 to 6, wherein the second stabilizing component the combination of starch and gellan is present in the beverage in a total amount from 0.06% to 0.825% of the beverage.

10. The ready to drink beverage according to any one of claims 1 to 9, wherein added sugar is present in the beverage in an amount up to about 4.5% of the beverage.

11. The ready to drink beverage according to any one of claims 1 to 10, wherein gellan is high acyl gellan.

12. The ready to drink beverage according to any one of claims 1 to 11, wherein modified starch is hydroxypropyl starch.

13. A method of producing a ready to drink dairy beverage comprising the steps of:

adding a stabilizing system to a dairy component and a flavor component, the flavor component selected from the group consisting of a cocoa component, a fruit flavor component, and a combination thereof, and the stabilizing system comprises a first stabilizing component and a second stabilizing component;

the first stabilizing component comprises microcrystalline cellulose (MCC) and carboxymethyl cellulose (CMC), and the first stabilizing component is 0.02% to 0.3% of the beverage; and

the second stabilizing component is selected from the group consisting of 0.01% to 0.075 % of gellan based on the total beverage, 0.05% to 0.75% of modified starch based on the total beverage, and 0.06% to 0.825% of a combination of gellan and modified starch based on the total beverage.

14. A ready to drink aseptic beverage comprising:

a dairy component;

a flavor component selected from the group consisting of a cocoa component, a fruit flavor component, and a combination thereof;

sugar in an amount up to about 4.5% of the beverage; and

a stabilizing system comprising a first stabilizing component and a second stabilizing component, the first stabilizing component comprises microcrystalline cellulose (MCC) and carboxymethyl cellulose (CMC) and the second stabilizing component is selected from the group consisting of gellan, a modified starch and a combination thereof, and the stabilizing system is present in an amount that maintains the ready to drink aseptic beverage in a homogenous state for at least three months in ambient storage.

15. The ready to drink beverage of claim 15, wherein the first stabilizing component and the second stabilizing component are the only stabilizers in the beverage.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/060989

A. CLASSIFICATION OF SUBJECT MATTER
INV. A23C9/13 A23C9/137 A23L2/62 A23G1/56
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A23C A23L A23G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, FSTA, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2011/076572 A1 (NESTEC SA [CH]; PASCUAL TERESITA BAUTISTA [US]; VALDEZ MONICA CHRISTIN) 30 June 2011 (2011-06-30) paragraph [0001] - paragraph [0044] examples -----	1-15
X	WO 2011/103454 A1 (HERSHEY CO [US]; MILICI JOSEPH [US]; PRESTON AMY GRIEL [US]; ARENTZ HE) 25 August 2011 (2011-08-25) paragraph [0001] - paragraph [0032]; table A paragraph [0042] - paragraph [0045] paragraph [0057] - paragraph [0071]; table 4 ----- -/--	1-15

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 July 2015	23/07/2015

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Alevisopoulos, S

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/060989

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 376 396 A (CLARK ROSS C [US]) 27 December 1994 (1994-12-27) column 1, line 1 - column 3, line 45; example 1	1-15
A	US 2005/266138 A1 (YUAN C R [US] ET AL) 1 December 2005 (2005-12-01) paragraph [0002] - paragraph [0006] paragraph [0015] - paragraph [0038]; examples 5-6	1-15

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2015/060989

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2011076572 A1	30-06-2011	CA 2784954 A1	30-06-2011
		EP 2515667 A1	31-10-2012
		WO 2011076572 A1	30-06-2011
WO 2011103454 A1	25-08-2011	CA 2827050 A1	25-08-2011
		CN 102791140 A	21-11-2012
		US 2011135786 A1	09-06-2011
		US 2014295040 A1	02-10-2014
		WO 2011103454 A1	25-08-2011
US 5376396 A	27-12-1994	AT 195056 T	15-08-2000
		AU 680495 B2	31-07-1997
		AU 6558394 A	21-11-1994
		CA 2158867 A1	10-11-1994
		DE 69425433 D1	07-09-2000
		DE 69425433 T2	06-12-2001
		DK 0697818 T3	04-09-2000
		EP 0697818 A1	28-02-1996
		ES 2149268 T3	01-11-2000
		GR 3034560 T3	31-01-2001
		JP H08509611 A	15-10-1996
		NO 954280 A	26-10-1995
		PT 697818 E	31-01-2001
		US 5376396 A	27-12-1994
		WO 9424887 A1	10-11-1994
US 2005266138 A1	01-12-2005	AR 049120 A1	28-06-2006
		AR 087531 A2	03-04-2014
		BR PI0511559 A	02-01-2008
		CA 2568204 A1	15-12-2005
		CN 101001538 A	18-07-2007
		EP 1771086 A2	11-04-2007
		JP 5419349 B2	19-02-2014
		JP 2008500048 A	10-01-2008
		PE 00732006 A1	27-02-2006
		RU 2377870 C2	10-01-2010
		TW I376205 B	11-11-2012
		US 2005266138 A1	01-12-2005
		US 2013302502 A1	14-11-2013
		US 2015044353 A1	12-02-2015
		WO 2005117607 A2	15-12-2005