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CA 2980470 A1 2016/09/29

(21) 2 980 470

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) Date de dépôt PCT/PCT Filing Date: 2016/03/22
(87) Date publication PCT/PCT Publication Date: 2016/09/29
(85) Entrée phase nationale/National Entry: 2017/09/21
(86) N° demande PCT/PCT Application No.: CA 2016/050330
(87) N° publication PCT/PCT Publication No.: 2016/149818
(30) Priorité/Priority: 2015/03/23 (US62/137,054)

(51) Cl.Int./Int.Cl. *A23C 9/00* (2006.01), *A23C 13/16* (2006.01), *A23C 19/076* (2006.01), *A23C 3/02* (2006.01), *A23C 9/12* (2006.01), *A23C 9/152* (2006.01), *A23L 33/00* (2016.01)

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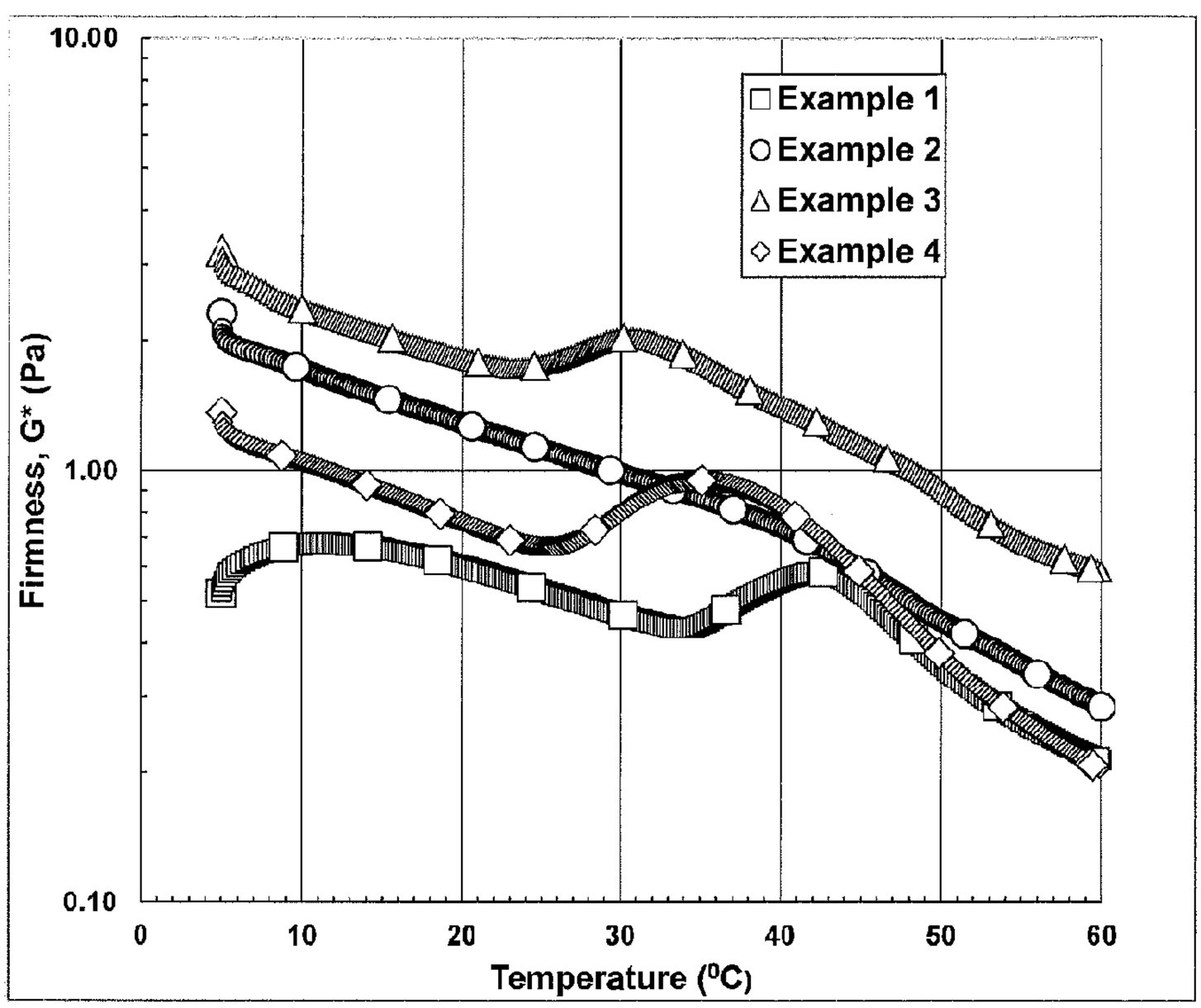
(54) Titre : COMPOSITIONS LAITIERES
(54) Title: DAIRY COMPOSITIONS

FIGURE 1 ***RTA TEST RESULTS (FIRMNESS)***



(57) Abrégé/Abstract:
A dairy composition comprises at least one acceptable organoleptic property and, if heat treated at ultra-high and/or pasteurization temperatures, the composition does not undergo unacceptable curdling and/or precipitation. In another aspect, a dairy composition comprises at least one acceptable organoleptic property and has a pH of from about 5.5 to about 6.6. The dairy composition may be a cultured dairy composition. Uses of the compositions and methods of making the compositions are provided.

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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 September 2016 (29.09.2016)

WIPO | PCT

(10) International Publication Number
WO 2016/149818 A1

(51) International Patent Classification:
A23C 9/00 (2006.01) *A23C 9/12* (2006.01)
A23C 13/16 (2006.01) *A23C 9/152* (2006.01)
A23C 19/076 (2006.01) *A23L 33/00* (2016.01)
A23C 3/02 (2006.01)

(21) International Application Number:
PCT/CA2016/050330

(22) International Filing Date:
22 March 2016 (22.03.2016)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/137,054 23 March 2015 (23.03.2015) US

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(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:

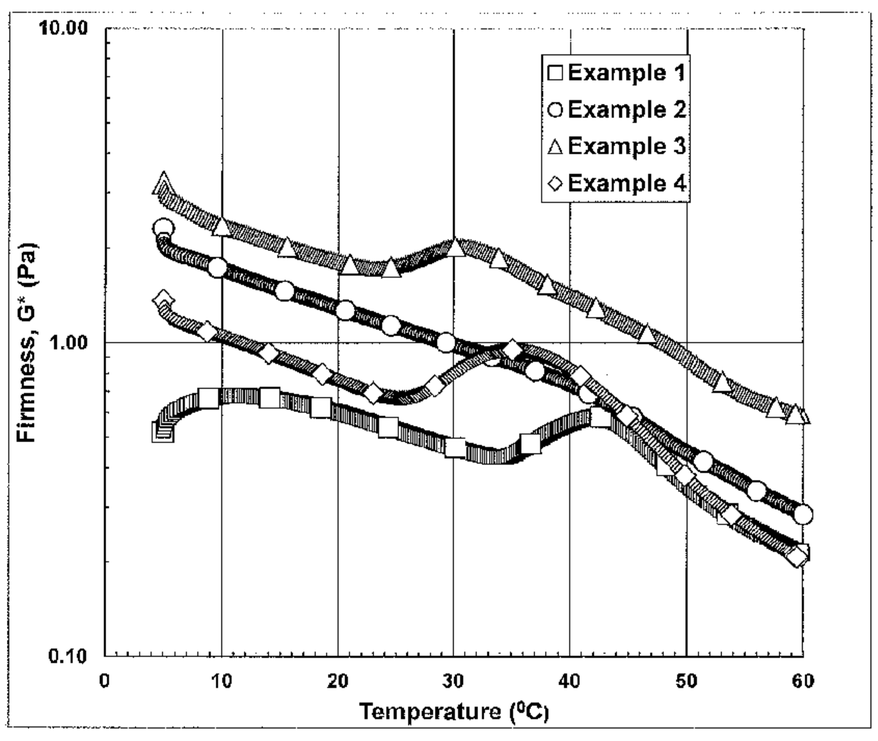
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:

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

(54) Title: DAIRY COMPOSITIONS

FIGURE 1



(57) Abstract: A dairy composition comprises at least one acceptable organoleptic property and, if heat treated at ultra-high and/or pasteurization temperatures, the composition does not undergo unacceptable curdling and/or precipitation. In another aspect, a dairy composition comprises at least one acceptable organoleptic property and has a pH of from about 5.5 to about 6.6. The dairy composition may be a cultured dairy composition. Uses of the compositions and methods of making the compositions are provided.

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DAIRY COMPOSITIONS

Field of the Invention

The present invention is directed to dairy compositions and, in particular, to organoleptically-pleasing dairy compositions and methods of making the same.

Background

Conventional dairy products, especially cultured dairy products, have a limited shelf-life, typically less than thirty days under refrigerated storage conditions, which often results in unused waste product. Dairy product manufacturers ideally desire to produce finished dairy products which are both organoleptically-pleasing but also sufficiently shelf-stable. The challenge that is often faced is improving shelf life without diminishing the desirable sensory attributes, and thus the commercial value, of the product.

Two kinds of common dairy beverages can be found in the North American market: shelf stable and refrigerated beverages. The shelf stable beverages are often water based and provide an experience of a milk shake or flavored milk. This product is usually shelf stable for several months. The refrigerated dairy beverages are often cultured and provide distinctive tartness and culture notes that the shelf stable beverages do not have. The refrigerated dairy beverages usually have a shelf life of thirty days. Following a consumer study in concept testing of the beverage, the flavor is the main driver for overall preference and purchase intent. The consumer wants acceptable flavor while offering a longer shelf life.

Dairy beverages, such as cultured dairy products, may be thermally processed to increase their stability. Unfortunately, thermally treating cultured dairy products often results in a displeasing organoleptic property.

There is a need, therefore, for a dairy product, especially ones with cultured dairy notes, that have an acceptable organoleptic property while, potentially, offering a longer shelf life.

Summary

In an aspect, there is provided a dairy composition comprising at least one acceptable organoleptic property and, if heat treated at ultra-high and/or pasteurization temperatures, the composition does not undergo unacceptable curdling and/or precipitation.

In another aspect, the dairy composition has a suitable pH such that if the composition is heat treated at the ultra-high and/or pasteurization temperatures, the composition does not undergo unacceptable curdling and/or precipitation. In yet another aspect, the UHT treatment is from about 135°C (275°F) to about 150°C (302°F). In a further aspect, the pasteurization treatment is from about 72°C to about 75°C (about 162°C to about 167°C). In another aspect, the pH range is from about 5.5 to about 6.6.

In another aspect, there is provided a dairy composition comprising at least one acceptable organoleptic property and having a pH of from about 5.5 to about 6.6.

In further aspects of the compositions described above, the at least one acceptable organoleptic property comprises acceptable tartness, smooth mouthfeel, creaminess, culture notes, or combinations thereof. In another aspect, the at least one acceptable organoleptic property comprises acceptable tartness, culture notes, or combinations thereof. In another aspect, the at least one acceptable organoleptic property comprises acceptable tartness, smooth mouthfeel, creaminess, or combinations thereof. In another aspect, the organoleptic property comprises a perceivable tartness, sourness, culture notes, smooth mouthfeel, creaminess, or combinations thereof that is associated with at least one traditional cultured dairy composition. In another aspect, the organoleptic property comprises at least one of a perceivable tartness and sourness that is associated with at least one traditional cultured dairy composition. In yet another aspect, the dairy composition has a perceivable tartness that is associated with at least one traditional cultured dairy composition. In another aspect, the culture notes are cream cheese flavor, yogurt flavor, sour cream flavor, or combinations thereof. In another aspect, the culture notes are the cream cheese flavor(s). In yet another aspect, the at least one traditional cultured dairy composition has a pH of from about 4.2 to about 5.2. In yet another aspect, the at least one traditional cultured dairy composition is selected from the group consisting of cream cheese compositions, sour cream compositions, yogurt compositions, and combinations thereof. In yet another aspect, the at least one traditional cultured dairy composition is selected from cream cheese compositions. In yet another aspect, the dairy composition has a pH range from about 5.5 to about 6.6. In a further aspect, the pH range is from about 5.8 to about 6.6.

In further aspects of the compositions described above, the dairy composition has a firmness of from about 0.1 to about 2 Pa at 37°C. In another aspect, the composition has a firmness of from about 0.4 to about 2 Pa; about 0.8 to about 2 Pa; or about 0.9 to about 2 Pa at 37°C. In further aspects, the composition has a cohesiveness of from about 0.3% to about 2%. In yet other aspects, the composition has a cohesiveness of from about 0.5% to about 2%; about 0.7% to about 2%; about 0.9% to about 2%; or about 1.3% to about 2%.

In further aspects of the compositions described above, the dairy composition has an extended refrigerated and/or non-refrigerated shelf-life. In another aspect, the dairy composition is heat treated at ultra-high and/or pasteurization temperatures and has an extended refrigerated and/or non-refrigerated shelf-life. In another aspect, the refrigerated shelf-life is about 60 days to about 120 days. In a further aspect, the non-refrigerated shelf-life is about 60 days to about 120 days. In another aspect, the dairy composition is heat treated at ultra-high and/or pasteurization temperatures and is stable for about 60 days to about 120 days. In further aspects, the dairy composition is organoleptically acceptable. In another aspect, the composition has an extended shelf-life without imparting an unacceptable tartness and/or other organoleptic property.

In further aspects of the compositions described above, the dairy composition comprises sources of at least one of fat and protein. In another aspect, the dairy composition comprises at least one first cultured dairy component and at least one first dairy component. In another aspect, the at least one first cultured dairy component has a protein content from about 20% to about 70% by weight of the component; more typically, the at least one first cultured dairy component has a protein content from about 50% to about 70% by weight of the component. In another aspect, the at least one first cultured dairy component has a fat content less than 5% by weight of the component; more typically, the at least one first cultured dairy component has a fat content less than about 3% by weight of the component. In another aspect, the at least one first cultured dairy component is slightly acidic. In another aspect, the at least one first cultured dairy component has a pH of from about 4.0 to about 5.5 or from about 4.2 to about 5.4. In another aspect, the at least one first cultured dairy component comprises at least one yogurt component and/or at least one sour cream component. In another aspect, the at least one first cultured dairy component comprises at least one powder. In another aspect, the at least one first cultured dairy component comprises at least one yogurt powder and/or at least

one sour cream powder. In another aspect, the at least one first cultured dairy component comprises at least one yogurt powder. In another aspect, the yogurt powder is selected from the group consisting of a low fat yogurt powder, greek yogurt powder, traditional yogurt powder, and combinations thereof.

In another aspect of the compositions described above, the at least one first dairy component is neutral. In another aspect, the at least one first dairy component has a pH of from about 6.0 to about 7.5 or from about 6.0 to about 6.5. In another aspect, the at least one first dairy component has a protein content from about 9% to about 60% by weight of the component; more typically, the at least one first dairy component has a protein content from about 10% to about 25% by weight of the component. In another aspect, the at least one first dairy component has a fat content from about 1.5% to about 70% by weight of the component; from about 10% to about 70% by weight; about 30% to about 70% by weight; about 40% to about 70% by weight; or about 50% to about 70% by weight; more typically, the at least one first dairy component has a fat content from about 60% to about 70% by weight of the component. In another aspect, wherein the at least one first dairy component comprises (i) at least one second cultured dairy component and/or (ii) at least one second dairy component. In another aspect, the at least one second cultured dairy component comprises at least one cream cheese component. In another aspect, the at least one second dairy component comprises at least one milk component. In another aspect, the at least one first dairy component comprises at least one powder. In another aspect, the at least one second cultured dairy component comprises at least one cream cheese powder. In another aspect, the at least one second dairy component comprises at least one milk powder. In another aspect, the at least one first cultured dairy component and the at least one first dairy component are present in amounts to provide the at least one acceptable organoleptic property. In another aspect, the amount of the at least one first cultured dairy component is up to about 15% by weight or up to about 10% by weight, based on the weight of the dairy composition. In another aspect, the amount of the at least one first cultured dairy component is from about 1.4% by weight to about 8% by weight, based on the weight of the dairy composition. In another aspect, the amount of the at least one first dairy component is up to about 35% by weight; up to about 20% by weight, up to about 10% by weight; or from about 2% by weight to about 10% by weight, based on the weight of the dairy composition. In another aspect, the amount of the at least one first dairy component is from about 4% by weight to about 8% by weight, based on the

weight of the dairy composition. In another aspect, the ratio of the at least one first cultured dairy component to the at least one first dairy component is any suitable ratio that yields at least one acceptable organoleptic property. In another aspect, the ratio of the at least one first cultured dairy component to the at least one first dairy component provides acceptable tartness and/or cultured notes. In another aspect, the ratio is a weight ratio of from about 25:75 to about 75:25; from about 30:70 to about 70:30; from about 35:65 to about 65:30; from about 40:60 to about 60:40; or from about 45:55 to about 55:45. In another aspect, the weight ratio is from about 50:50 to about 35:65.

In another aspect of the compositions described above, the dairy composition further comprises at least one emulsifying salt and/or at least one thickening component. In another aspect, the combination of the emulsifying salt and the thickening component is present in an amount of about 0.4% by weight to about 0.8% by weight, based on the weight of the dairy composition. In another aspect, the at least one emulsifying salt is a suitable salt selected from the group consisting of trialkali metal salts, dialkali metal salts, monoalkali metal salts, trialkaline metal salts, dialkaline metal salts, monoalkaline metal salts, and combinations thereof. In another aspect, the at least one emulsifying salt is selected from the group consisting of monosodium phosphate, disodium phosphate, dipotassium phosphate, trisodium phosphate, sodium metaphosphate (sodium hexametaphosphate), sodium acid pyrophosphate, tetrasodium pyrophosphate, sodium aluminum phosphate, sodium citrate, potassium citrate, calcium citrate, sodium tartrate, sodium potassium tartrate, and combinations thereof. In another aspect, the at least one emulsifying salt is selected from the group consisting of disodium phosphate, sodium citrate, potassium citrate, and combinations thereof. In another aspect, the amount of the at least one emulsifying salt is from about 0.2% by weight to about 1.0% by weight; about 0.3% by weight to about 0.8% by weight; about 0.4% by weight to about 0.8% by weight; or about 0.4% by weight to about 0.6% by weight, based on the weight of the dairy composition. In another aspect, the at least one emulsifying salt is selected from the group consisting of disodium salts and monosodium salts. In another aspect, the at least one emulsifying salt is two or more emulsifying salts. In another aspect, the weight ratio of two or more emulsifying salts is from about 50:50 to about 75:25. In another aspect, the at least one emulsifying salt is disodium phosphate and sodium citrate. In another aspect, the two or more emulsifying salts are disodium phosphate and sodium citrate, wherein the weight ratio of disodium phosphate to sodium citrate

is from about 50:50 to about 75:25. In another aspect, the at least one thickening component is selected from the group consisting of starches, gums, and combinations thereof. In another aspect, the at least one thickening component is selected from the group consisting of carob bean gum, gum karaya, gum tragacanth, guar gum, gelatin, sodium carboxymethyl cellulose, carrageenan, oat gum, sodium alginate, propylene glycol alginate, xanthan gum, gellan, alginate, pectin, and combinations thereof. In another aspect, the at least one thickening component is selected from the group consisting of pectin, carrageenans, and combinations thereof. In another aspect, the amount of the at least one thickening component is from about 0.05% to about 0.5% by weight or from about 0.05% to about 0.3% by weight, based on the weight of the dairy composition.

In another aspect of the compositions described above, the dairy composition further comprises an edible base liquid. In another aspect, the base liquid is an aqueous liquid. In another aspect, the base liquid is water and/or milk. In another aspect, the milk is selected from the group consisting of regular milk, reduced-fat milk, skim milk, dairy powder, non-fat dry milk, milk protein concentrate/isolate, condensed milk, whey, whey protein concentrate, ultrafiltered (UF) concentrated milk, and the like, and combinations thereof.

In another aspect of the compositions described above, the dairy composition further comprises at least one of dietary fiber, sweetener component, hydrocolloid, flavorant, colorant, vitamin, mineral, nutrients and/or other functional ingredients. In another aspect, the composition comprises the dietary fiber, wherein the dietary fiber comprises soluble and/or insoluble dietary fibers. In another aspect, the fiber is a prebiotic. In another aspect, the fiber is inulin. In another aspect, the amount of the fiber is up to about 10% or up to about 3% by weight, based on the weight of the dairy composition. In another aspect, the amount of the fiber is from about 1% by weight to about 3% by weight, based on the weight of the dairy composition. In another aspect, the composition comprises at least one sweetener component. In another aspect, the at least one sweetener component is selected from the group consisting of natural sweeteners such as sucrose, glucose, fructose, maltose, lactose, galactose, high fructose corn-syrup, artificial intensive sweeteners, and sugar alcohols, and combinations thereof. In another aspect, the composition comprises at least one flavorant. In another aspect, the amount of flavorant is up to about 15% by weight; up to about 11% by weight; or from about 1% by weight to about 11% by weight, based on the weight of the dairy composition.

In another aspect of the compositions described above, the dairy composition is a cultured dairy composition.

In another aspect of the compositions described above, there is provided a dairy product comprising the dairy composition described above. In another aspect, the dairy product is selected from the group consisting of beverages, sauces, spreads, dips, dressings, fillings, toppings, dessert-type dairy products and the like, and combinations thereof. In another aspect, the dairy product is a beverage.

In yet another aspect, there is provided a method of making the dairy composition described above, the method comprises combining and mixing together the components of the composition, optionally heating to dissolve the components; and heating at ultra-high and/or pasteurization temperatures such that the composition does not undergo unacceptable curdling and/or precipitation.

In another aspect, there is provided a method of making the dairy composition described above, the method comprises combining and mixing together the components of the composition, except for the at least one first cultured dairy component and the at least one first dairy component; adding the at least one first cultured dairy component and the at least one first dairy component with heating to dissolve the components; and heating at ultra-high and/or pasteurization temperatures such that the composition does not undergo unacceptable curdling and/or precipitation.

In yet another aspect of the methods described above, the ultra-high temperature (UHT) treatment comprises heating from about 135°C (275°F) to about 150°C (302°F) for about a few seconds. In another aspect, the pasteurization treatment comprises heating to about 145°F (63°C) for at least about 30 minutes or heating from about 72°C to about 75°C (about 162°C to about 167°C) for about 15 to about 20 seconds.

Other features and advantages of the present invention will become apparent from the following detailed description. It should be understood, however, that the detailed description and the specific examples while indicating embodiments of the invention are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from the detailed description.

Brief Description of the Drawings

Embodiments will now be described more fully with reference to the accompanying drawing in which:

Figure 1 is a graph showing the rheological thermal analysis (RTA) of various examples of a dairy product described herein.

Figure 2 is a spider plot showing the overall flavor, basic tastes and residuals of Examples 2 and 4 of the dairy product described herein in comparison to Yop™ and logo™.

Detailed Description of Embodiments

The dairy compositions provided may be used in any suitable dairy product. The dairy products may include, for example, beverages, sauces, spreads, dips, dressings, fillings, toppings, dessert-type dairy products (e.g. ice-cream, whipping cream, puddings, fillings, etc.), and the like as well as combinations thereof.

Traditionally, dairy compositions, in particular cultured dairy products, will have tartness when the product has an acidic range of pH of about 4.2 to about 5.2. If this traditional product is heat treated at ultra-high temperatures, the product is known to curdle or precipitate.

In an embodiment, the dairy composition provided is a composition that has at least one acceptable organoleptic property and, if heat treated at ultra-high and/or pasteurization temperatures, the composition does not undergo unacceptable curdling and/or precipitation. The organoleptic property may comprise acceptable tartness, sourness, smooth mouthfeel, creaminess, culture notes, or combinations thereof. More typically, the organoleptic property may comprise acceptable tartness, sourness, smooth mouthfeel, creaminess, cream cheese flavors, or combinations thereof. In another embodiment, the dairy composition has a perceivable tartness, sourness, culture notes, smooth mouthfeel, creaminess, or combinations thereof that is associated with at least one traditional cultured dairy composition. More typically, the at least one traditional cultured dairy composition has a pH of from about 4.2 to about 5.2. The culture notes may be cream cheese, yogurt and/or sour cream flavors typically associated with at least one traditional cultured dairy composition. More typically, the culture notes are cream cheese flavor(s). In yet another embodiment, the dairy composition has at least one of a perceivable tartness and sourness that is associated with at least one traditional cultured dairy composition. In yet a further

embodiment, the dairy composition has a perceivable tartness that is associated with at least one traditional cultured dairy composition. Examples of the traditional cultured dairy composition are commonly known cream cheese compositions, sour cream compositions and/or yogurt compositions. Typically, the examples are commonly known cream cheese compositions, such as Philadelphia™ cream cheese.

The dairy composition may have any suitable pH such that if the composition is heat treated at ultra-high and/or pasteurization temperatures, the composition does not undergo unacceptable curdling and/or precipitation. In typical embodiments, the pH range is from about 5.5 to about 6.6; more typically, from about 5.8 to about 6.6 or from about 5.5 to about 6.3; or most typically from about 6.0 to about 6.3. Moreover, the dairy composition may have extended refrigerated and/or non-refrigerated shelf-life, which maintains at least one acceptable organoleptic property in the finished dairy product. In a more specific embodiment, the organoleptic property comprises acceptable tartness, sourness, smooth mouthfeel, creaminess, culture notes, or combinations thereof. More typically, the organoleptic property may comprise acceptable tartness, sourness, smooth mouthfeel, creaminess, cream cheese flavors, or combinations thereof. In another embodiment, the dairy composition has a perceivable tartness, sourness, culture notes, smooth mouthfeel, creaminess, or combinations thereof that is associated with at least one traditional cultured dairy composition. More typically, the at least one traditional cultured dairy composition has a pH of from about 4.2 to about 5.2. The culture notes may be cream cheese, yogurt and/or sour cream flavors typically associated with cultured dairy compositions. More typically, the culture notes are cream cheese flavor(s). In yet another embodiment, the dairy composition has at least one of a perceivable tartness and sourness that is associated with at least one traditional cultured dairy composition. In yet a further embodiment, the dairy composition has a perceivable tartness that is associated with at least one traditional cultured dairy composition. Examples of the traditional cultured dairy composition are commonly known cream cheese compositions, sour cream compositions and/or yogurt compositions. Typically, the examples are commonly known cream cheese compositions, such as Philadelphia™ cream cheese.

In another embodiment, the dairy composition provided is a composition that has at least one acceptable organoleptic property and a pH range is from about 5.5 to about 6.6; more typically, from about 5.8 to about 6.6 or from about 5.5 to about

6.3; or most typically from about 6.0 to about 6.3. The organoleptic property may comprise acceptable tartness, sourness, smooth mouthfeel, creaminess, culture notes, or combinations thereof. More typically, the organoleptic property may comprise acceptable tartness, sourness, smooth mouthfeel, creaminess, cream cheese flavors, or combinations thereof. In another embodiment, the dairy composition has a perceivable tartness, sourness, culture notes, smooth mouthfeel, creaminess, or combinations thereof that is associated with at least one traditional cultured dairy. More typically, the at least one traditional cultured dairy composition having a pH of from about 4.2 to about 5.2. The culture notes may be cream cheese, yogurt and/or sour cream flavors typically associated with cultured dairy compositions. More typically, the culture notes are cream cheese flavor(s). In yet another embodiment, the dairy composition has at least one of a perceivable tartness and sourness that is associated with at least one traditional cultured dairy composition. In yet a further embodiment, the dairy composition has a perceivable tartness that is associated with at least one traditional cultured dairy composition. Examples of the traditional cultured dairy composition are commonly known cream cheese compositions, sour cream compositions and/or yogurt compositions. Typically, the examples are commonly known cream cheese compositions, such as Philadelphia™ cream cheese.

In other embodiments described herein, the dairy composition is a cultured dairy composition.

In further examples, the dairy composition comprises at least one source of fat and protein. In an embodiment, the dairy composition comprises at least one first cultured dairy component and at least one first dairy component, which are present in amounts to provide at least one acceptable organoleptic property. The at least one first cultured dairy component may be slightly acidic (e.g. pH of from about 4.0 to about 5.5; more typically, from about 4.2 to about 5.2). The at least one first dairy component may be neutral (e.g. pH from about 6.0 to about 7.5; more typically, from about 6.0 to about 6.5). In a typical embodiment, the chosen ratio of the at least one first cultured dairy component to the at least one first dairy component provides at least one acceptable organoleptic property. The organoleptic property may comprise acceptable tartness, sourness, smooth mouthfeel, creaminess, culture notes, or combinations thereof. More typically, the organoleptic property may comprise acceptable tartness, sourness, smooth mouthfeel, creaminess, cream cheese flavors, or combinations thereof. In another embodiment, the organoleptic property

comprises a perceivable tartness, sourness, culture notes, smooth mouthfeel, creaminess, or combinations thereof that is associated with at least one traditional cultured dairy composition. More typically, the at least one traditional cultured dairy composition has a pH of from about 4.2 to about 5.2. The culture notes may be cream cheese, yogurt and/or sour cream flavors typically associated with cultured dairy compositions. More typically, the culture notes are cream cheese flavor(s). In yet another embodiment, the organoleptic property comprises at least one of a perceivable tartness and sourness that is associated with at least one traditional cultured dairy composition. In yet a further embodiment, the organoleptic property comprises a perceivable tartness that is associated with at least one traditional cultured dairy composition. Examples of the traditional cultured dairy composition are commonly known cream cheese compositions, sour cream compositions and/or yogurt compositions. Typically, the examples are commonly known cream cheese compositions, such as Philadelphia™ cream cheese.

The at least one first cultured dairy component may be any suitable slightly acidic dairy component. The first cultured dairy component may be at least one yogurt component and/or at least one sour cream component. More specifically, the first cultured dairy component may be powder(s) such as, for example, yogurt and sour cream powders.

The at least one first dairy component may be (i) at least one second cultured dairy component and/or (ii) at least one second dairy component. The at least one second cultured dairy component may be at least one cream cheese component and/or the at least one second dairy component may be at least one milk component. The at least one first dairy component may be a powder; more typically, a cream cheese powder.

In an embodiment, the dairy composition comprises about 1.4% by weight to about 8% by weight of the at least one first cultured dairy component and about 2% by weight to about 10% by weight of the at least one first dairy component, based on the weight of the composition. In a typical embodiment, the components are blended in a chosen ratio that provides acceptable tartness and/or cultured notes. The weight ratio of the first cultured dairy component to the first dairy component is from about 50:50 to about 35:65. The at least one first cultured dairy component and the at least one first dairy component are powders. The at least one first cultured dairy component is at least one yogurt powder and the at least one first dairy component is at least one cream cheese powder.

In embodiments with the dairy composition having the at least one first cultured dairy component and at least one first dairy component, the composition may be any suitable pH such that if the composition is heat treated at ultra-high and/or pasteurization temperatures, the composition does not undergo unacceptable curdling and/or precipitation. In typical embodiments, the pH range is from about 5.5 to about 6.6; more typically, from about 5.8 to about 6.6 or from about 5.5 to about 6.3; or most typically from about 6.0 to about 6.3. Moreover, the dairy composition may have extended refrigerated and/or non-refrigerated shelf-life, which maintains at least one acceptable organoleptic property in the finished dairy product. In another embodiment, the dairy composition has a perceivable tartness, sourness, culture notes, smooth mouthfeel, creaminess, or combinations thereof that is associated with at least one traditional cultured dairy composition. More typically, the at least one traditional cultured dairy composition has a pH of from about 4.2 to about 5.2. The culture notes may be cream cheese, yogurt and/or sour cream flavors typically associated with cultured dairy compositions. More typically, the culture notes are cream cheese flavor(s). In yet another embodiment, the dairy composition has at least one of a perceivable tartness and sourness that is associated with at least one traditional cultured dairy composition. In yet a further embodiment, the dairy composition has a perceivable tartness that is associated with at least one traditional cultured dairy composition. Examples of the traditional cultured dairy composition are commonly known cream cheese compositions, sour cream compositions and/or yogurt compositions. Typically, the examples are commonly known cream cheese compositions, such as Philadelphia™ cream cheese.

In embodiments with the dairy composition having the at least one first cultured dairy component and at least one first dairy component, the composition has at least one acceptable organoleptic property and a pH range is from about 5.5 to about 6.6; more typically, from about 5.8 to about 6.6 or from about 5.5 to about 6.3; or most typically from about 6.0 to about 6.3. The organoleptic property may comprise acceptable tartness, smooth mouthfeel, creaminess, culture notes, or combinations thereof. More typically, the organoleptic property may comprise acceptable tartness, sourness, smooth mouthfeel, creaminess, cream cheese flavors, or combinations thereof. In another embodiment, the dairy composition has a perceivable tartness, sourness, culture notes, smooth mouthfeel, creaminess, or combinations thereof that is associated with at least one traditional cultured dairy composition. More typically, the at least one traditional cultured dairy composition

has a pH of from about 4.2 to about 5.2. The culture notes may be cream cheese, yogurt and/or sour cream flavors typically associated with cultured dairy compositions. More typically, the culture notes are cream cheese flavor(s). In yet another embodiment, the dairy composition has at least one of a perceivable tartness and sourness that is associated with at least one traditional cultured dairy composition. In yet a further embodiment, the dairy composition has a perceivable tartness that is associated with at least one traditional cultured dairy composition. Examples of the traditional cultured dairy composition are commonly known cream cheese compositions, sour cream compositions and/or yogurt compositions. Typically, the examples are commonly known cream cheese compositions, such as Philadelphia™ cream cheese.

In another embodiment, the dairy composition described herein may have an acceptable flavor tartness in the product without being overpowering like a traditional yogurt product, while offering a longer shelf life.

In order to maintain a smooth and creamy texture similar to a cultured product, and attempt to avoid protein precipitation and/or curdling when the dairy composition described herein is heated, emulsifying salts and/or thickening components may be added. In a typical embodiment, a combination of emulsifying salts and thickening components are used. In more specific embodiments, about 0.4% by weight to about 0.8% by weight of the combination of the emulsifying salts and thickening components may be used, based on the weight of the dairy composition.

In a further embodiment, the dairy composition provides a stable dairy composition is organoleptically acceptable. Moreover, in a more specific embodiment the composition has an extended shelf life, for example, without imparting an undesirable tartness and/or other organoleptic property.

The terms cultured or fermented with respect to dairy products/compositions are used interchangeably herein, cultured/fermented dairy components/ compositions/ products are understood to be fermented with lactic acid bacteria such as, for example, Lactobacillus, Lactococcus, and Leuconostoc. For example, the generic name of “cultured milk” is understood to mean that the milk for the product is inoculated with a starter culture which converts part of the lactose to lactic acid. Carbon dioxide, acetic acid, diacetyl, acetaldehyde and several other substances are formed in the conversion process, and these give the products their characteristic

fresh taste and aroma ("Dairy Processing Handbook", Chapter 11, Tetra Pak Processing Systems AB, 2003, 2nd Ed.).

The use of term "component" is understood to encompass "ingredient".

Culture notes/cultured dairy notes refer to the flavors and/or aromas associated with a fermented dairy products. Certain flavors, for example, may be cream cheese flavors, yogurt flavors, and/or sour cream flavors.

Dairy notes refer to milky buttery notes; such as milk.

Mouthfeel is an organoleptic property. Typically, smoother mouthfeel is expected with higher firmness at 37°C. Typical ranges for an acceptable mouthfeel may be about 0.1 to about 2 Pa at 37°C. More typically, mouthfeel ranges may be from about 0.4 to about 2 Pa; about 0.8 to about 2 Pa; or about 0.9 to about 2 Pa.

Creaminess is another organoleptic property. Typically, creaminess increases with increasing cohesiveness values. Typical ranges for an acceptable creaminess may be about 0.3% to about 2%. More typically, creaminess ranges may be from about 0.5% to about 2%; about 0.7% to about 2%; about 0.9% to about 2%; or about 1.3% to about 2%.

"Shelf-life" means the period of time at which a dairy product can be stored at room temperature or refrigerated temperatures without developing a food safety and/or an objectionable organoleptic characteristic, such as an objectionable aroma, appearance, taste, consistency, or mouthfeel. In addition, an organoleptically acceptable dairy product at a given shelf life will have no off-odor or off-flavor. "Stable" or "shelf-stable" means that the dairy product at a given time, at room temperature, does not have an objectionable organoleptic characteristic as defined above and is organoleptically acceptable. The compositions herein may have a shelf-life and/or be self-stable for about 40 to about 120 days; about 60 to about 120 days; or about 60 to about 100 days.

Ultra-high temperature (UHT) treatment and pasteurization are techniques known to those skilled in the art. Typically, UHT treatment may be from about 135°C (275°F) to about 150°C (302°F) for about a few seconds (e.g. using either indirect heating, direct steam injection or infusion). There are two types of pasteurization: "low temperature, long time," which typically means heating to about 145°F (63°C) for at least about 30 minutes, or the more common "high temperature, short time," which typically means heating from about 72°C to about 75°C (about 162°C to about 167°C) for about 15 to about 20 seconds.

Unacceptable curdling and/or precipitation is understood to mean protein agglomeration and fall-out that is not acceptable under North American standards for consumer consumption.

Any suitable at least one first cultured dairy component may be incorporated into the dairy composition in any suitable amount. The first cultured dairy component may be slightly acidic (e.g. pH of from about 4.0 to about 5.5; more typically, from about 4.2 to about 5.4). The first cultured dairy component may, therefore, be any suitable slightly acidic dairy component. The first cultured dairy component may be any dairy component that has been fermented. The protein and fat content of this component may be any suitable content. Typically, the protein content can vary from about 20% to about 70% by weight of the component. More typically, the protein content varies from about 50% to about 70% by weight of the component. Typically, the fat content can be less than 5% by weight of the component. More typically, the fat content is less than about 3% by weight of the component. The first cultured dairy component may be mostly dairy powders that have been fermented and then dried to a powder of the original component. More specifically, the first cultured dairy component may be powder(s) such as, for example, yogurt and sour cream powders.

Yogurt powders are often used in the commercial and domestic preparations of a variety of yogurt-based foods, desserts, snacks, sauces, and other yogurt products. It can be mixed in both hot and cold liquids, and, in both cases, it enhances the texture and flavor. It also has good binding properties which make it an appropriate replacement for any starches, stabilizers and gums that would normally have been needed.

To make yogurt powder in the traditional way, the fat is first removed from milk and then bacterial cultures of *Lactobacilli* or *Bifidobacteria* are added to the non-fat milk; in addition, lactic acid, food flavors and whey powder may also be added to the milk. The bacteria-laden milk is set aside until it reaches a required pH, which may range between about 4 and about 5. The next step is to dehydrate the milk. The yogurt powder that is formed is usually off-white or pale yellow in color, and, depending on the ingredients that were used, it will have a protein content ranging between about 22% to about 70% by weight of the yogurt powder.

Yogurt powder can be used in a wide variety of food applications, including, for example, snacks, confections, bakery items and breakfast cereals. Yogurt powder includes dehydrated yogurt, non-fat yogurt powder, cultured dairy solids, etc. Yogurt powder pH can be an indicator of tartness. Typically, the yogurt powders used may

have a pH from about 4.0 to about 5.5, more typically, from about 4.2 to about 5.4. Some manufacturers add lactic acid as an ingredient to yogurt powder. Any suitable yogurt powders may be used. Suitable yogurt powders may include a low fat yogurt powder, kosher yogurt powder, halal yogurt powder, greek yogurt powder and/or a traditional yogurt powder (e.g. Parmalat™ yogurt powder such as greek, halal and/or fat-free yogurt powder; Glanbia™ greek yogurt).

Sour cream powder can be used in a wide variety of food applications, including, for example, sauces, dips, salad dressings, fillings, icings, and breakfast cereals. Sour cream powder may include dehydrated sour cream, citric acid, tocopherols, etc. The sour cream powder pH can be an indicator of tartness. Typically, the sour cream powders used may have a pH from about 4.0 to about 5.5, more typically, from about 4.2 to about 5.4. Any suitable sour cream powders may be used. Suitable sour cream powders may include a low fat sour cream powder, kosher sour cream powder, halal sour cream powder (e.g. Parmalat™ sour cream powder).

Typically, at least one first cultured dairy component may be present up to about 15% or up to about 10%, by weight of the dairy composition. More typically, at least one first cultured dairy component may be present from about 1.4% by weight to about 8% by weight of the dairy composition.

Any suitable at least one first dairy component may be incorporated into the dairy composition, in any suitable amount. The at least one first dairy component may be neutral (e.g. pH from about 6.0 to about 7.5; more typically, from about 6.0 to about 6.5). The protein and fat content of this component may be any suitable content. Typically, the protein content can vary from about 9% to about 60% by weight of the component. More typically, the protein content varies from about 10% to about 25% by weight of the component. Typically, the fat content can vary from about 1.5% to about 70% by weight of the component; about 10% to about 70% by weight; about 30% to about 70% by weight; about 40% to about 70% by weight; or about 50% to about 70% by weight. More typically, the fat content is about 60% to about 70% by weight of the component. The at least one first dairy component may be mostly dairy powders that have been fermented and then dried to a powder of the original component. More specifically, the at least one first dairy component may be powder(s) such as, for example, any suitable dairy source, including cream cheese components (e.g. the at least one second cultured dairy component) and/or milk components (e.g. the at least one second dairy component). The cream cheese

component may include natural cream cheeses, a cream cheese substitutes, and/or cream cheese analogs. The cream cheese component may contain a minimum of 30% fat; more typically about 50% to about 70% fat; or most typically, about 60% to about 70% fat. The cream cheese substitute or analog is a product which resembles real cream cheese, but may contain at least 20 percent vegetable oil (e.g., palm oil, canola oil, hydrogenated soybean oil, and the like) and less than about 10 percent milk fat. Some examples of the cream cheese component includes Kraft Cheeztang Blend™ from Kraft Food Ingredients (Memphis, Tenn.). Typically, the cream cheese component is a cream cheese powder (e.g. Parmalat™ cream cheese powder and Kraft Foods Ingredient cream cheese powder). The cream cheese powder may be comprised of, for instance, a dehydrated blend of cream cheese (pasteurized milk and cream, cheese culture, salt and carob bean gum), nonfat milk and sodium phosphate. As noted above, the at least one first dairy component may include any suitable milk component including, for example, milk, reduced-fat milk, skim milk, dairy powder, non-fat dry milk, milk protein concentrate/isolate, condensed milk, whey, whey protein concentrate, ultrafiltered (UF) concentrated milk, and the like.

Typically, the at least one first dairy component may be present up to about 35% by weight; up to about 20% by weight, up to about 10% by weight; or from about 2% by weight to about 10% by weight of the dairy composition. More typically, the at least one first dairy component may be present from about 4% by weight to about 8% by weight , based on the weight of the dairy composition. Most typically, the dairy component is the cream cheese powder.

In the dairy composition, the ratio of the at least one first cultured dairy component to the at least one first dairy component is any suitable ratio that yields at least one acceptable organoleptic property. Typically, the ratio (based on a weight ratio) may be from about 25:75 to about 75:25; from about 30:70 to about 70:30; from about 35:65 to about 65:30; from about 40:60 to about 60:40; or from about 45:55 to about 55:45. More typically, the ratio may be from about 50:50 to about 35:65. Most typically, the ratio chosen provides an acceptable tartness and/or cultured notes.

In the dairy composition, depending on the dairy product formed, any suitable liquid may be incorporated, in any suitable amount. With respect to a dairy beverage, the base liquid may include any suitable aqueous liquid(s). For example, the aqueous liquids may include water and/or milk. Milk may encompass regular milk, reduced-fat milk, skim milk, dairy powder, non-fat dry milk, milk protein

concentrate/isolate, condensed milk, whey, whey protein concentrate, ultrafiltered (UF) concentrated milk, and the like

The pH of the dairy composition is any suitable pH such that when the composition is heat treated at ultra-high and/or pasteurization temperatures, the composition does not undergo unacceptable curdling and/or precipitation. Typically, the pH range is from about 5.5 to about 6.6; more typically, from about 5.8 to about 6.6 or from about 5.5 to about 6.3; or most typically from about 6.0 to about 6.3.

Other edible ingredients or additives optionally may also be added to the dairy composition including vegetable oil, sweetener, salt, fiber, emulsifier, hydrocolloid, stabilizer, flavorant, colorant, vitamin, mineral, nutrients and/or other functional ingredients.

Emulsifying salt(s) may be incorporated into the dairy composition. Emulsifying salts are known to complex with calcium ions in cheese compositions to solubilize the protein, increase protein hydration and swelling, to facilitate emulsification of fat, and to adjust and stabilize pH. The emulsifying salt(s) are suitable salts selected from the group consisting of trialkali metal salts, dialkali metal salts, monoalkali metal salts, trialkaline metal salts, dialkaline metal salts, monoalkaline metal salts, and combinations thereof. Specific examples of emulsifying salts include monosodium phosphate, disodium phosphate, dipotassium phosphate, trisodium phosphate, sodium metaphosphate (sodium hexametaphosphate), sodium acid pyrophosphate, tetrasodium pyrophosphate, sodium aluminum phosphate, sodium citrate, potassium citrate, calcium citrate, sodium tartrate, sodium potassium tartrate, or combinations thereof. The emulsifying salts may be selected and present in an amount effective to stabilize the dairy composition such that, for example, when the composition is heat treated, an acceptable product is formed from the composition (e.g. without unacceptable curdling or precipitation). The emulsifying salts may be selected and present in an amount effective to provide at least one acceptable organoleptic property. For example, the organoleptic property includes an acceptable smooth and creamy mouthfeel.

Typical amounts of the emulsifying salt(s) used may be from about 0.2% by weight to about 1.0% by weight; about 0.3% by weight to about 0.8% by weight; about 0.4% by weight to about 0.8% by weight; or about 0.4% by weight to about 0.6% by weight, based on the weight of the dairy composition. Typically, two or more emulsifying salts are present in the composition. The ratio (based on weight) may be

from about 50:50 to about 75:25. More typically, the ratio of salts are (dialkali metal salts or dialkaline metal salts) to (monoalkali metal salts or monoalkaline metal salts). For example, the ratio of disodium salts (e.g. disodium phosphate) to monosodium salts (sodium citrate).

Any suitable sweetener component(s) may be incorporated into the dairy composition and may be incorporated in any suitable amount. Examples of sweetener components include, for example, natural sweeteners such as sucrose, glucose, fructose, maltose, lactose, galactose, high fructose corn-syrup, artificial intensive sweeteners, and sugar alcohols. Natural sweeteners may be incorporated in any suitable amount, generally up to about 20% by weight of the dairy composition; typically, up to about 10% by weight or about 3% by weight to about 7% by weight. Artificial intensive sweeteners and/or sugar alcohols may be incorporated in any suitable amount, generally about 0.001% to about 0.03% by weight, based on the weight of the dairy composition.

Any suitable thickening component(s) may be incorporated into the dairy composition and may be incorporated in any suitable amount. Thickening components may include, for example, starches and gums. The thickening component may be incorporated in any suitable amount (typically, the amount may be from about 0.05% to about 0.5% by weight of the dairy composition or from about 0.05% to about 0.3% by weight). The gums can be selected from the group consisting of carob bean gum, gum karaya, gum tragacanth, guar gum, gelatin, sodium carboxymethyl cellulose, carrageenan, oat gum, sodium alginate, propylene glycol alginate, xanthan gum, gellan, alginate, pectin or combinations thereof. More typical thickening agents are proteinaceous materials, such as gelatin, and whey protein concentrate, natural and synthetic hydrophilic colloids, such as carboxymethyl cellulose, vegetable/fruit gums, such as locust bean gum, carob bean gum, guar gum, pectin, carrageenans and alginates, and various starches and modified starches.

Any suitable dietary fiber(s) may be incorporated into the dairy composition. The fiber may be obtained from cereal, vegetable and fruit sources and includes bran-containing materials and cellulosic substances. The fiber may be soluble and/or insoluble dietary fibers, which includes prebiotics. Dietary fibers may include in this regard wheat fiber, any form of cellulose including microcrystalline cellulose, α-cellulose, microporous cellulose, and microbial cellulose and oat fiber, soy fiber, tea leaf fibers (as a cellulose and tea tannin source), brewer's grain, other vegetable fiber

such as psyllium husk fiber, oat bran, fruit fiber, chitin, tuber fiber (including the insoluble components of Jerusalem artichoke and chicory root from which the inulin may be obtained) and the like. Suitable prebiotics may include, for example, inulin and oligosaccharaides such as manno-oligosaccharides, galacto-oligosaccharides, and fructo-oligosaccharides. More specific examples include inulin (e.g., Beneo™ Orafti –Inulin-HPX (High performance Inulin powder for fat replacement at high processing temperatures, average DP ≥ 23; ORAFTI Group, Belgium); modified corn and wheat dextrins (e.g., Nutriose™; Roquette, France; Fibersol-2™; Matsutani Chemical Industry Co.), fructo-oligosaccharide, polydextrose, Benefiber™ (Novartis Consumer Health, Inc.), acacia gum, pectin, guar gum, locust bean gum, hemicelluloses, β-glucan, and the like as well as combinations thereof. The dietary fiber may be incorporated in any suitable amount. Typically, the fiber may be present up to about 10% or up to about 3%, by weight of the dairy composition. More typically, the fiber is present from about 1% by weight to about 3% by weight, based on the weight of the dairy composition.

Inulin as employed in this specification includes mixtures of naturally-occurring polyfructoses having a degree of fructose polymerization (Dp) of about 2 to about 90 fructose units polymerized by β-2,1-bonds. Inulin is a naturally-occurring, glucose-terminated polyfructose, as obtainable for example by aqueous extraction from plant sources such as Jerusalem artichokes, chicory, dahlias and dandelions.

The amount and type of color and/or flavor depends on the desired color and flavor of the final dairy product. Any suitable flavorant(s) (also known as flavorings, flavors, or flavoring agents) may be used. Flavorants that may be used include those artificial and natural flavors known in the art, for example synthetic flavor oils, natural flavoring aromatics and/or oils, oleoresins, extracts derived from plants, leaves, flowers, fruits, and the like, flavor powders such as, for example, yogurt flavor powder, and combinations comprising at least one of the foregoing flavorants. Non-limiting representative flavors include citrus flavors, including lemon, orange, lime, grapefruit, vanilla, fruit essences, including apple, pear, peach, grape, strawberry, raspberry, blackberry, cherry, plum, pineapple, apricot, banana, melon, tropical fruit, mango, mangosteen, pomegranate, papaya, honey lemon, and the like, or combinations thereof. More typical flavorants used are vanilla, and various fruit flavors (e.g. Zentis strawberry fruitprep; Firmenich strawberry flavor; strawberry cheesecake flavor; and/or vanilla flavor). The flavorants may be incorporated in any suitable amount. Typically, the flavorants may be up to about 15% by weight; up to

about 11% by weight; or from about 1% by weight to about 11% by weight of the dairy composition.

Examples of traditional cultured dairy compositions include current, commercial cultured dairy compositions such as cream cheese compositions, yogurt compositions and/or sour cream compositions. Some examples include cream cheese, full fat soft cream cheese, Neufchatel cream cheese, sour cream, fat-free sour cream, low-fat sour cream, low-fat yogurt, greek yogurt, regular yogurt, kefir, quark, fromage frais, etc.

The dairy products made from the dairy compositions described herein may be packaged in bulk, multi-, or single serving packages. The dairy composition may optionally be aseptically packaged.

The dairy composition may be made using any suitable method. In one embodiment, the method comprises combining and mixing together components of the composition, optionally heating to dissolve the components; and heating at ultra-high and/or pasteurization temperatures such that the composition does not undergo unacceptable curdling and/or precipitation.

In another method, the ultra-high temperature (UHT) treatment comprises heating from about 135°C (275°F) to about 150°C (302°F) for about a few seconds. In a further method, the pasteurization treatment involves heating to about 145°F (63°C) for at least about 30 minutes or heating from about 72°C to about 75°C (about 162°C to about 167°C) for about 15 to about 20 seconds.

In another example, the method comprises combining and mixing together components of the composition, except the yogurt and dairy components; adding the yogurt and dairy components with heating to dissolve the components; and heating at ultra-high and/or pasteurization temperatures such that the composition does not undergo unacceptable curdling and/or precipitation. More particularly, the heating does not affect at least one organoleptic property. The organoleptic property may comprise acceptable tartness, sourness, smooth mouthfeel, creaminess, culture notes, or combinations thereof.

In understanding the scope of the present application, the term "comprising" and its derivatives, as used herein, are intended to be open ended terms that specify the presence of the stated features, elements, components, groups, integers, and/or steps, but do not exclude the presence of other unstated features, elements, components, groups, integers and/or steps. The foregoing also applies to words having similar meanings such as the terms, "including", "having" and their

derivatives. It will be understood that any aspects described as "comprising" certain components may also "consist of" or "consist essentially of," wherein "consisting of" has a closed-ended or restrictive meaning and "consisting essentially of" means including the components specified but excluding other components except for materials present as impurities, unavoidable materials present as a result of processes used to provide the components, and components added for a purpose other than achieving the technical effect of the invention.

Terms of degree such as "about" and "approximately" as used herein mean a reasonable amount of deviation of the modified term such that the end result is not significantly changed. These terms of degree should be construed as including a deviation of at least ± 5% of the modified term if this deviation would not negate the meaning of the word it modifies.

When introducing elements disclosed herein, the articles "a", "an" and "the" are intended to mean that there are one or more of the elements.

The above disclosure generally describes the present invention. A more complete understanding can be obtained by reference to the following specific Examples. The Examples are described solely for purposes of illustration and are not intended to limit the scope of the invention. Changes in form and substitution of equivalents are contemplated as circumstances may suggest or render expedient. Although specific terms have been employed herein, such terms are intended in a descriptive sense and not for purposes of limitation.

EXAMPLES

Although the examples provided below were treated at ultra-high temperatures (UHT), it is understood that these examples could also be treated at pasteurization temperatures or, alternatively, be treated at pasteurization temperatures only.

Example 1

A dairy beverage was produced by combining and mixing together about 71.35% by weight of water with about 0.3% by weight of disodium phosphate, about 0.1% by weight of sodium citrate, about 0.25% by weight of Milazzo pectin, and about 1.75% by weight of inulin HPX (Beneo Orafti). The mixture was heated up to about 110 °F for about two minutes. After heating, about 6% by weight of the yogurt powder (Parmalat or Glanbia greek yogurt) was mixed for about two more minutes.

The cream cheese powder (Parmalat or Kraft Foods Ingredient cream cheese powder) was then added at intervals up to about 10% by weight and agitation was conducted for two more minutes. These ingredients were mixed for about sixty minutes or until full hydration was achieved. Once blending was completed, about 10% by weight of strawberry puree and about 0.25% of strawberry flavor was added and mixed for about five minutes. The mixture was then placed through a homogenizer and the mixture was then heated up to about 287°F to yield the dairy product, which was collected and had an approximate pH of 5.9. The composition of the product is further outlined in Table 1.

The dairy product was homogenous and showed no signs of separation or curdling. It had a creamy texture similar to a drinkable yogurt. Organoleptically, the product was creamy and smooth in the mouth with a slight cream cheese flavor profile and moderate tartness associated with a traditional cultured product. Additionally, the product offered a longer shelf life than a regular drinkable yogurt due to the ultra-high temperature treatment.

Table 1:

	Formula (% by weight)
Water	71.35%
Fiber (Beneo Orafti) - Inulin - HPX	1.75%
Disodium Phosphate	0.30%
Sodium Citrate	0.10%
Milazzo Pectin	0.25%
Zentis StrawberryFruit Prep	10.00%
Fermenich Strawberry Flavour	0.25%
Parmalat Yogurt Powder	6.00%
Parmalat Cream Cheese powder	10.00%
	100.00%

Example 2

A dairy beverage was produced by combining and mixing together about 75.5% by weight of water with about 0.3% by weight of disodium phosphate, about 0.1% by weight of sodium citrate, about 0.25% by weight of Milazzo pectin, about 5% by weight sugar, about 0.05% by weight carrageenan and about 1.75% by weight of inulin HPX (Beneo Orafti). The mixture was heated up to about 110 °F for about two minutes. After heating, about 6% by weight of the yogurt powder (traditional yogurt) was mixed for about two more minutes. The cream cheese powder (Parmalat or Kraft Foods Ingredient cream cheese powder) was then added at intervals up to about 10% by weight and agitation was conducted for two more minutes. These ingredients were mixed for about sixty minutes or until full hydration was achieved. Once blending was completed, about 1% by weight of vanilla flavor was added and mixed for about five minutes. The mixture was then placed through a homogenizer and the mixture was then heated up to about 287°F to yield the dairy product, which was collected and had an approximate pH of 5.9. The composition of the product is further outlined in Table 2.

The dairy product was homogenous and showed no signs of separation or curdling. It had a creamy texture similar to a drinkable yogurt. Organoleptically, the product was creamy and smooth in the mouth with a slight cream cheese flavor

profile and moderate tartness associated with a traditional cultured product. Additionally, the product offered a longer shelf life than a regular drinkable yogurt due to the ultra-high temperature treatment.

Table 2:

	Formula (% by weight)
Water	75.55%
Fiber (Beneo Orafti) - Inulin - HPX	1.75%
Carageenan CL 220	0.05%
Sugar (Granulated)	5.00%
Disodium Phosphate	0.30%
Sodium Citrate	0.10%
Milazzo Pectin	0.25%
Vanilla FF1156 Flavour	1.00%
Yogurt Powder	6.00%
KFI Cream Cheese powder	10.00%
	100.00%

Example 3

A dairy beverage was produced by combining and mixing together about 6.00% by weight of UF (ultra-filtered) skim milk and about 65.35% by weight of water with about 0.3% by weight of disodium phosphate, about 0.1% by weight of sodium citrate, about 0.25% by weight of Milazzo pectin, and about 1.75% by weight of inulin HPX (Beneo Orafti). The mixture was heated up to about 110 °F for about two minutes. After heating, about 6% by weight of the yogurt powder (Parmalat or Glanbia greek yogurt) was mixed for about two more minutes. The cream cheese powder (Parmalat or Kraft Foods Ingredient cream cheese powder) was then added at intervals up to about 10% by weight and agitation was conducted for two more minutes. These ingredients were mixed for about sixty minutes or until full hydration was achieved. Once blending was completed, about 10% by weight of strawberry puree and about 0.25% of strawberry flavor was added and mixed for about five minutes. The mixture was then placed through a homogenizer and the mixture was

then heated up to about 287°F to yield the dairy product, which was collected and had an approximate pH of 5.9. The composition of the product is further outlined in Table 3.

The dairy product was homogenous and showed no signs of separation or curdling. It had a creamy texture similar to a drinkable yogurt. Organoleptically, the product was creamy and smooth in the mouth with a slight cream cheese flavor profile and moderate tartness associated with a traditional cultured product. Additionally, the product offered a longer shelf life than a regular drinkable yogurt due to the ultra-high temperature treatment.

Table 3:

	Formula (% by weight)
UF skim milk	6.00%
Water	65.35%
Fiber (Beneo Orafti) - Inulin - HPX	1.75%
Disodium Phosphate	0.30%
Sodium Citrate	0.10%
Milazzo Pectin	0.25%
Zentis StrawberryFruit Prep	10.00%
Firmenich Strawberry Flavour	0.25%
Parmalat Yogurt Powder	6.00%
Parmalat Cream Cheese powder	10.00%
	100.00%

Example 4

A dairy beverage was produced by combining and mixing together about 6.00% by weight of UF skim milk and about 69.50% by weight of water with about 0.3% by weight of disodium phosphate, about 0.1% by weight of sodium citrate, about 0.25% by weight of Milazzo pectin, about 5% by weight sugar, about 0.05% by weight carrageenan and about 1.75% by weight of inulin HPX (Beneo Orafti). The mixture was heated up to about 110 °F for about two minutes. After heating, about 6% by weight of the yogurt powder (traditional yogurt) was mixed for about two more minutes. The cream cheese powder (Parmalat or Kraft Foods Ingredient cream cheese powder) was then added at intervals up to about 10% by weight and agitation was conducted for two more minutes. These ingredients were mixed for about sixty minutes or until full hydration was achieved. Once blending was completed, about 1% by weight of vanilla flavor was added and mixed for about five minutes. The mixture was then placed through a homogenizer and the mixture was then heated up to about 287°F to yield the dairy product, which was collected and had an approximate pH of 5.9. The composition of the product is further outlined in Table 4.

The dairy product was homogenous and showed no signs of separation or curdling. It had a creamy texture similar to a drinkable yogurt. Organoleptically, the product was creamy and smooth in the mouth with a slight cream cheese flavor profile and moderate tartness associated with a traditional cultured product. Additionally, the product offered a longer shelf life than a regular drinkable yogurt due to the ultra-high temperature treatment.

Table 4:

	Formula (% by weight)
UF skim milk	6.00%
Water	69.50%
Fiber (Beneo Orafti) - Inulin - HPX	1.75%
Carrageenan CL 220	0.05%
Sugar (Granualted)	5.00%
Disodium Phosphate	0.30%
Sodium Citrate	0.10%
Milazzo Pectin	0.30%
Vanilla FF1156 Flavour	1.00%
Parmalat Yogurt Powder	6.00%
Parmalat Cream Cheese powder	10.00%
	100.00%

Example 5

Mouthfeel and Creaminess in Beverages

Rheology thermal analysis (RTA) tests were conducted to better understand mouthfeel and creaminess. These tests were conducted on the compositions outlined in Examples 1 to 4.

In rheological thermal analysis (RTA), linear viscoelastic properties of the examples was measured as a function of temperature. The following instrument and parameters were used:

i) Rheometer: DHR

ii) Test Geometry: Couette with DIN sand blasted bob

iii) Test: Temperature Ramp Test:

- Loading temperature: about 5°C
- Temperature Range: about 0 to about 60°C (Heating RTA)
- Heating/cooling Rate: about 1 °C/min
- Stress: about 10Pa
- Frequency: about 10 rad/s

- Sampling Rate : Maximise points
- All the tests were repeated until two overlaying curves were obtained.
-

Rheological Characteristics are as follows:

Firmness: Firmness is proportional to the molar concentrations of intermolecular bonds. It is represented by the shear modulus G that is given by G=nRT where n represents the molar concentration of the bonds, R is the gas constant, T is the temperature in K. The firmness is calculated from G' values by taking into account the viscoelastic behavior of the material. Since for all these materials G'>>G", G (shear modulus or firmness) will be approximately the same as G'

Relaxation Time: It is the measure of how fast material relaxes to an equilibrium state after releasing the applied stress/strain. Viscous liquid relaxes faster by dissipating the energy through flow and will have 0 relaxation time. Elastic solids take longer time to reach an equilibrium state by stretching themself back. Hence materials with lower relaxation time will stick to surface on application of an uniform strain. Relaxation time is inversely proportional to Tan delta. Relaxation time is also a measure of how quickly material responds to stimuli (change in temperature, shear rate, etc.)

Zero shear viscosity: It is the product of firmness (shear modulus) and relaxation time. It is the material property related internal structure of the material and independent of applied strain rate.

Complex viscosity: It is the viscosity estimated from a dynamic rheological experiments. It is the flow property of the material as a response to applied sinusoidal to stress/strain. For this study this was measured at a frequency of 10 rad/s. Note The material is highly shear thinning and hence complex viscosity at 10rad/s is significantly lower than the zero shear viscosity.

Cohesiveness: It is the percentage of bonds at 25°C retained after equilibrating the samples at 37°C (mouth).

Tan Delta: It is the ratio of energy dissipated to the energy stored in a viscoelastic material, when the material is subjected to stress or strain.

RTA Test Results (Firmness)

The RTA test results are shown in Figure 1 and Tables 5A-5C below. The peaks in the middle of Figure 1 were due to air entrapped in the products, which affects the rheology of the sample.

Viscoelastic Properties at Selected Temperatures

Table 5A:

	Properties at 5°C (Refrigerated Temp)			
Sample Number	Firmness (Pa)	Relaxation Time (s)	Apparent Zero Shear Viscosity (Pa.s)	Complex viscosity at 10 rad/s
Example 1	0.519	0.012	0.006	0.018
Example 2	2.310	0.029	0.068	0.122
Example 3	3.231	0.041	0.133	0.200
Example 4	1.363	0.021	0.029	0.062

Table 5B:

	Properties at 25°C (Room Temp)			
Sample Number	Firmness (Pa)	Relaxation Time (s)	Apparent Zero Shear Viscosity (Pa.s)	Complex viscosity at 10 rad/s
Example 1	0.530	0.015	0.008	0.021
Example 2	1.123	0.022	0.025	0.052
Example 3	1.757	0.038	0.067	0.105
Example 4	0.667	0.016	0.010	0.026

Table 5C:

	Properties at 37°C (Mouth Temp)				
Sample Number	Firmness (Pa)	Relaxation Time (s)	Apparent Zero Shear Viscosity (Pa.s)	Complex viscosity at 10 rad/s	Cohesiveness (%)
Example 1	0.488	0.015	0.007	0.018	0.921
Example 2	0.814	0.020	0.016	0.036	0.725
Example 3	1.612	0.039	0.062	0.097	0.917
Example 4	0.922	0.024	0.022	0.045	1.382

Typically, smoother mouthfeel is expected with higher firmness at 37°C. Based on the rheology results, mouthfeel was the best with Example 3. The order of mouthfeel in the examples was Example 3>Example 4>Example 2>Example 1.

Typically, creaminess increases with increasing cohesiveness values. Based on the rheology results, creaminess was the best with Example 4. The order of creaminess in the examples was Example 4> Example 1>Example 3>Example 2.

Example 6

The following products are reduced fat dairy products. The method for making such products was similar to the methods as outlined above for making the products of Examples 1 and 2, but using different levels of cream cheese powder and yogurt powder. In order to adjust the protein level in the beverage, ultra filtered skim milk was used to adjust to the desired level.

A) The composition of one product is shown in Table 6, which delivered low tartness compared to a traditional cultured product; however, slight cream cheese notes were present in the beverage.

Table 6:

3.70% Yogurt and Cream Cheese powder	
	Formula (% by weight)
UF skim milk	32.00%
Water	56.90%
Fiber (Beneo Orafti) - Inulin - HPX	1.75%
Carageenan 1 - Viscarin GP 109	0.00%
Sugar (Granualted)	5.00%
Disodium Phosphate	0.30%
Sodium Citrate	0.10%
Pectin	0.25%
Yogurt Powder	1.39%
Cream Cheese powder	2.31%
	100.00%

B) The compositions of various other products (with 4% fat content) are shown below in Tables 7 to 11, which delivered tartness at different levels and low to high levels of cream cheese.

Table 7:

9.40% Yogurt and Cream Cheese powder	
Balanced tartness and good cream cheese tang.	**Formula (% by weight)**
Water	85.10%
Yogurt Flavor Powder	0.50%
Fiber (Beneo Orafti) - Inulin - HPX	0.00%
Sugar (Granualted)	5.00%
Disodium Phosphate	0.00%
Sodium Citrate	0.00%
Pectin	0.00%
Yogurt Powder	3.57%
Cream Cheese powder	5.83%
	100.00%

Table 8:

19.75% Yogurt and Cream Cheese powder	
High tartness and low cream cheese tang.	**Formula (% by weight)**
Water	74.75%
Yogurt Flavor Powder	0.50%
Fiber (Beneo Orafti) - Inulin - HPX	0.00%
Sugar (Granualted)	5.00%
Disodium Phosphate	0.00%
Sodium Citrate	0.00%
Pectin	0.00%
Yogurt Powder	14.81%
Cream Cheese powder	4.94%
	100.00%

Table 9:

7.95% Yogurt and Cream Cheese powder	
Sweet and dairy notes and low to no tartness	**Formula (% by weight)**
Water	86.56%
Yogurt Flavor Powder	0.50%
Fiber (Beneo Orafti) - Inulin - HPX	0.00%
Sugar (Granualted)	5.00%
Disodium Phosphate	0.00%
Sodium Citrate	0.00%
Pectin	0.00%
Yogurt Powder	1.99%
Cream Cheese powder	5.96%
	100.00%

Table 10:

8.67% Yogurt and Cream Cheese powder	
Dairy notes and low tartness	**Formula (% by weight)**
Water	85.83%
Yogurt Flavor Powder	0.50%
Fiber (Beneo Orafti) - Inulin - HPX	0.00%
Sugar (Granualted)	5.00%
Disodium Phosphate	0.00%
Sodium Citrate	0.00%
Pectin	0.00%
Yogurt Powder	2.77%
Cream Cheese powder	5.90%
	100.00%

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Table 11:

12.86% Yogurt and Cream Cheese powder	
Medium to high tartness and low cream cheese tang.	**Formula (% by weight)**
Water	81.64%
Yogurt Flavor Powder	0.50%
Fiber (Beneo Orafti) - Inulin - HPX	0.00%
Sugar (Granualted)	5.00%
Disodium Phosphate	0.00%
Sodium Citrate	0.00%
Pectin	0.00%
Yogurt Powder	7.33%
Cream Cheese powder	5.53%
	100.00%

Example 7

A sensory panel of nine people were trained to identify and define the appearance, aroma, flavor and mouthfeel characteristics of each product prior to testing; a modified Sensory Spectrum methodology was followed. The lexicon for the sample set was developed; intensities for attributes were rated on 15 cm scales. 100 mL samples of each of the four products (Example 2, Example 4, Yop™ and logo™), were served at 4°C in a monadic, 3 replication, randomized experimental design. ACCE-IT™, ACCE's proprietary software, was used for data collection. Intensities of each attribute in the categories of flavor were rated on a 15 cm line scale. Unsalted crackers and water were used as palate cleansers. All data were significance tested at the 95% confidence level; significant mean scores >0.0 were reported on spider plots (see Figure 2). The results are shown below in Tables 12A to 12B and in Figure 2.

Table 12A: Flavor and Basic Tastes

Attribute	Example 2	Example 4	Yop™	logo™
Overall flavor strength	4.9[a]	4.8[a]	5.0[a]	5.0[a]
Cream	0.0[a]	0.0[a]	0.2[a]	0.0[a]
Whole milk	2.3[b]	2.4[b]	3.8[a]	3.7[a]
Powdered milk	4.0[a]	3.8[a]	0.0[b]	0.0[b]
Yogurt	1.7[b]	1.6[b]	4.0[a]	4.1[a]
Sour Cream	0.7[a]	0.8[a]	0.6[a]	0.8[a]
Cream cheese	3.3[a]	3.2[a]	0.0[b]	0.0[b]
Vanilla	3.2[a]	3.2[a]	3.7[a]	3.8[a]
Lactic acid (plain yogurt)	3.0[b]	3.0[b]	4.6[a]	4.4[a]
Sweetness	2.4[b]	2.6[b]	3.5[a]	3.4[a]
Saltiness	3.2[a]	2.5[a]	0.4[b]	0.4[b]
Sourness	1.6[b]	1.4[b]	2.4[a]	2.5[a]
Astringency	2.2[bc]	2.1[c]	2.5[ab]	2.6[a]
Tartness	2.1[b]	1.9[b]	4.2[a]	4.4[a]

Table 12B: Residuals

Attribute	Example 2	Example 4	Yop™	logo™
Overall intensity	1.7[a]	1.7[a]	1.8[a]	1.8[a]
Sweetness	0.7[b]	0.7[b]	1.2[a]	1.1[a]
Saltiness	1.2[a]	1.0[a]	0.1[b]	0.1[b]
Sourness	0.5[b]	0.4[b]	1.1[a]	1.0[a]
Astringency	1.7[ab]	1.6[b]	1.9[a]	1.7[ab]

*With respect to the letters used in the tables, if the letters are the same, the attribute is not significantly different at 95% confidence. If the letters are different, the attribute is significantly different from each other at 95% confidence.

Trained panel results indicated that Examples 2 and 4 demonstrated perceivable sourness, tartness and cream cheese flavors typically associated with traditional cultured dairy products.

With respect to flavor and taste attributes, and in comparison with logo™ and Yop ™, Examples 2 and 4 had detectable intensities of the following attributes and

were: stronger in powdered milk flavor and cream cheese flavor; weaker in whole milk flavor, yogurt flavor, lactic acid flavor; weaker in sweetness, sourness, tartness; stronger in saltiness.

The description and examples as set forth are not intended to be exhaustive or to limit the scope of the invention. Many modifications and variations are possible in light of the above teaching without departing from the spirit and scope of the following claims. It is intended that the scope of the present invention be defined by the claims appended hereto, giving full cognizance to equivalents in all respects.

WHAT IS CLAIMED IS:

1. A dairy composition comprising at least one acceptable organoleptic property and, if heat treated at ultra-high and/or pasteurization temperatures, the composition does not undergo unacceptable curdling and/or precipitation.

2. The dairy composition of claim 1, wherein the dairy composition has a suitable pH such that if the composition is heat treated at the ultra-high and/or pasteurization temperatures, the composition does not undergo unacceptable curdling and/or precipitation.

3. The dairy composition of claim 1 or 2, wherein the UHT treatment is from about 135°C (275°F) to about 150°C (302°F).

4. The dairy composition of any one of claims 1 to 3, wherein the pasteurization treatment is from about 72°C to about 75°C (about 162°C to about 167°C).

5. The dairy composition of any one of claims 1 to 4, wherein the pH range is from about 5.5 to about 6.6.

6. A dairy composition comprising at least one acceptable organoleptic property and having a pH of from about 5.5 to about 6.6.

7. The dairy composition of any one of claims 1 to 6, wherein the at least one acceptable organoleptic property comprises acceptable tartness, sourness, smooth mouthfeel, creaminess, culture notes, or combinations thereof.

8. The dairy composition of claim 7, wherein the at least one acceptable organoleptic property comprises acceptable tartness, sourness, culture notes, or combinations thereof.

9. The dairy composition of claim 7, wherein the at least one acceptable organoleptic property comprises acceptable tartness, smooth mouthfeel, creaminess, or combinations thereof.

10. The dairy composition of any one of claims 1 to 9, wherein the organoleptic property comprises a perceivable tartness, sourness, culture notes, smooth mouthfeel, creaminess, or combinations thereof that is associated with at least one traditional cultured dairy composition.

11. The dairy composition any one of claims 1 to 9, wherein the organoleptic property comprises at least one of a perceivable tartness and sourness that is associated with at least one traditional cultured dairy composition.

12. The dairy composition of any one of claims 1 to 9, wherein the dairy composition has a perceivable tartness that is associated with at least one traditional cultured dairy composition.

13. The dairy composition of any one of claims 1 to 13, wherein the culture notes are cream cheese flavor, yogurt flavor, sour cream flavor, or combinations thereof.

14. The dairy composition of claim 13, wherein the culture notes are the cream cheese flavor(s).

15. The dairy composition of any one of claims 10 to 14, wherein the at least one traditional cultured dairy composition has a pH of from about 4.2 to about 5.2.

16. The dairy composition of any one of claims 10 to 14, wherein the at least one traditional cultured dairy composition is selected from the group consisting of cream cheese compositions, sour cream compositions, yogurt compositions, and combinations thereof.

17. The dairy composition of any one of claims 10 to 14, wherein the at least one traditional cultured dairy composition is selected from cream cheese compositions.

18. The dairy composition of any one of claims 1 to 17, wherein the dairy composition has a pH range from about 5.5 to about 6.3.

19. The dairy composition of claim 18, wherein the pH range is from about 5.8 to about 6.3.

20. The dairy composition of any one of claims 1 to 19, wherein the composition has a firmness of from about 0.1 to about 2 Pa at 37°C.

21. The dairy composition of claim 20, wherein the composition has a firmness of from about 0.4 to about 2 Pa; about 0.8 to about 2 Pa; or about 0.9 to about 2 Pa at 37°C.

22. The dairy composition of any one of claims 1 to 21, wherein the composition has a cohesiveness of from about 0.3% to about 2%.

23. The dairy composition of claim 22, wherein the composition has a cohesiveness of from about 0.5% to about 2%; about 0.7% to about 2%; about 0.9% to about 2%; or about 1.3% to about 2%.

24. The dairy composition of any one of claims 1 to 23, wherein the dairy composition has an extended refrigerated and/or non-refrigerated shelf-life.

25. The dairy composition of any one of claims 1 to 23, wherein the dairy composition is heat treated at ultra-high and/or pasteurization temperatures and has an extended refrigerated and/or non-refrigerated shelf-life.

26. The dairy composition of claim 25, wherein the refrigerated shelf-life is about 60 days to about 120 days.

27. The dairy composition of claim 25, wherein the non-refrigerated shelf-life is about 60 days to about 120 days.

28. The dairy composition of any one of claims 1 to 23, wherein the dairy composition is heat treated at ultra-high and/or pasteurization temperatures and is stable for about 60 days to about 120 days.

29. The dairy composition of any one of claims 1 to 28, wherein the dairy composition is organoleptically acceptable.

30. The dairy composition of any one of claims 1 to 23, wherein the composition has an extended shelf-life without imparting an unacceptable tartness and/or other organoleptic property.

31. The dairy composition of any one of claims 1 to 30, wherein the dairy composition comprises sources of at least one of fat and protein.

32. The dairy composition of claim 31, wherein the dairy composition comprises at least one first cultured dairy component and at least one first dairy component.

33. The dairy composition of claim 31, wherein the at least one first cultured dairy component has a protein content from about 20% to about 70% by weight of the component; more typically, the at least one first cultured dairy component has a protein content from about 50% to about 70% by weight of the component.

34. The dairy composition of claim 32 or 33, wherein the at least one first cultured dairy component has a fat content less than 5% by weight of the component; more typically, the at least one first cultured dairy component has a fat content less than about 3% by weight of the component.

35. The dairy composition of any one of claims 32 to 34, wherein the at least one first cultured dairy component is slightly acidic.

36. The dairy composition of claim 35, wherein the at least one first cultured dairy component has a pH of from about 4.0 to about 5.5 or from about 4.2 to about 5.4.

37. The dairy composition of any one of claims 32 to 36, wherein the at least one first cultured dairy component comprises at least one yogurt component and/or at least one sour cream component.

38. The dairy composition of any one of claims 32 to 36, wherein the at least one first cultured dairy component comprises at least one powder.

39. The dairy composition of any one of claims 32 to 36, wherein the at least one first cultured dairy component comprises at least one yogurt powder and/or at least one sour cream powder.

40. The dairy composition of claim 39, wherein the at least one first cultured dairy component comprises at least one yogurt powder.

41. The dairy composition of claim 40, wherein the yogurt powder is selected from the group consisting of a low fat yogurt powder, greek yogurt powder, traditional yogurt powder, and combinations thereof.

42. The dairy composition of any one of claims 32 to 41, wherein the at least one first dairy component is neutral.

43. The dairy composition of claim 42, wherein the at least one first dairy component has a pH of from about 6.0 to about 7.5 or from about 6.0 to about 6.5.

44. The dairy composition of any one of claims 32 to 43, wherein the at least one first dairy component has a protein content from about 9% to about 60% by weight of the component; more typically, the at least one first dairy component has a protein content from about 10% to about 25% by weight of the component.

45. The dairy composition of any one of claims 32 to 44, wherein the at least one first dairy component has a fat content from about 1.5% to about 70% by weight of the component; from about 10% to about 70% by weight; about 30% to about 70% by weight; about 40% to about 70% by weight; or about 50% to about 70% by weight; more typically, the at least one first dairy component has a fat content from about 60% to about 70% by weight of the component.

46. The dairy composition of any one of claims 32 to 45, wherein the at least one first dairy component comprises (i) at least one second cultured dairy component and/or (ii) at least one second dairy component.

47. The dairy composition of claim 46, wherein the at least one second cultured dairy component comprises at least one cream cheese component.

48. The dairy composition of claim 46 or 47, wherein the at least one second dairy component comprises at least one milk component.

49. The dairy composition of any one of claims 32 to 48, wherein the at least one first dairy component comprises at least one powder.

50. The dairy composition of any one of claims 46 to 49, wherein the at least one second cultured dairy component comprises at least one cream cheese powder.

51. The dairy composition of any one of claims 46 to 50, wherein the at least one second dairy component comprises at least one milk powder.

52. The dairy composition of any one of claims 32 to 51, wherein the at least one first cultured dairy component and the at least one first dairy component are present in amounts to provide the at least one acceptable organoleptic property.

53. The dairy composition of any one of claims 32 to 52, wherein the amount of the at least one first cultured dairy component is up to about 15% by weight or up to about 10% by weight, based on the weight of the dairy composition.

54. The dairy composition of claim 53, wherein the amount of the at least one first cultured dairy component is from about 1.4% by weight to about 8% by weight, based on the weight of the dairy composition.

55. The dairy composition of any one of claims 32 to 54, wherein the amount of the at least one first dairy component is up to about 35% by weight; up to about 20% by weight, up to about 10% by weight; or from about 2% by weight to about 10% by weight, based on the weight of the dairy composition.

56. The dairy composition of claim 55, wherein the amount of the at least one first dairy component is from about 4% by weight to about 8% by weight, based on the weight of the dairy composition.

57. The dairy composition of any one of claims 32 to 56, wherein the ratio of the at least one first cultured dairy component to the at least one first dairy component is any suitable ratio that yields at least one acceptable organoleptic property.

58. The dairy composition of claim 57, wherein the ratio of the at least one first cultured dairy component to the at least one first dairy component provides acceptable tartness and/or cultured notes.

59. The dairy composition of claim 57 or 58, wherein the ratio is a weight ratio of from about 25:75 to about 75:25; from about 30:70 to about 70:30; from about 35:65 to about 65:30; from about 40:60 to about 60:40; or from about 45:55 to about 55:45.

60. The dairy composition of claim 59, wherein the weight ratio is from about 50:50 to about 35:65.

61. The dairy composition of any one of claims 1 to 60, further comprising at least one emulsifying salt and/or at least one thickening component.

62. The dairy composition of claim 61, the combination of the emulsifying salt and the thickening component is present in an amount of about 0.4% by weight to about 0.8% by weight, based on the weight of the dairy composition.

63. The dairy composition of claim 61 or 62, wherein the at least one emulsifying salt is a suitable salt selected from the group consisting of trialkali metal salts, dialkali metal salts, monoalkali metal salts, trialkaline metal salts, dialkaline metal salts, monoalkaline metal salts, and combinations thereof.

64. The dairy composition of claim 61 or 62, wherein the at least one emulsifying salt is selected from the group consisting of monosodium phosphate, disodium phosphate, dipotassium phosphate, trisodium phosphate, sodium metaphosphate (sodium hexametaphosphate), sodium acid pyrophosphate, tetrasodium pyrophosphate, sodium aluminum phosphate, sodium citrate, potassium citrate, calcium citrate, sodium tartrate, sodium potassium tartrate, and combinations thereof.

65. The dairy composition of claim 64, wherein the at least one emulsifying salt is selected from the group consisting of disodium phosphate, sodium citrate, potassium citrate, and combinations thereof.

66. The dairy composition of any one of claims 61 to 65, wherein the amount of the at least one emulsifying salt is from about 0.2% by weight to about 1.0% by weight; about 0.3% by weight to about 0.8% by weight; about 0.4% by weight to about 0.8% by weight; or about 0.4% by weight to about 0.6% by weight, based on the weight of the dairy composition.

67. The dairy composition of any one of claims 61 to 66, wherein the at least one emulsifying salt is selected from the group consisting of disodium salts and monosodium salts.

68. The dairy composition of any one of claims 61 to 67, wherein the at least one emulsifying salt is two or more emulsifying salts.

69. The dairy composition of claim 68, wherein the weight ratio of two or more emulsifying salts is from about 50:50 to about 75:25.

70. The dairy composition of any one of claims 61 to 68, wherein the at least one emulsifying salt is disodium phosphate and sodium citrate.

71. The dairy composition of claim 69, wherein the two or more emulsifying salts are disodium phosphate and sodium citrate, wherein the weight ratio of disodium phosphate to sodium citrate is from about 50:50 to about 75:25.

72. The dairy composition of any one of claims 61 to 71, wherein the at least one thickening component is selected from the group consisting of starches, gums, and combinations thereof.

73. The dairy composition of claim 72, wherein the at least one thickening component is selected from the group consisting of from the group consisting of carob bean gum, gum karaya, gum tragacanth, guar gum, gelatin, sodium

carboxymethyl cellulose, carrageenan, oat gum, sodium alginate, propylene glycol alginate, xanthan gum, gellan, alginate, pectin, and combinations thereof.

74. The dairy composition of claim 73, wherein the at least one thickening component is selected from the group consisting of pectin, carrageenans, and combinations thereof.

75. The dairy composition of any one of claims 61 to 74, wherein the amount of the at least one thickening component is from about 0.05% to about 0.5% by weight or from about 0.05% to about 0.3% by weight, based on the weight of the dairy composition.

76. The dairy composition of any one of claims 1 to 75, further comprising an edible base liquid.

77. The dairy composition of claim 76, wherein the base liquid is an aqueous liquid.

78. The dairy composition of claim 76, wherein the base liquid is water and/or milk.

79. The dairy composition of claim 76, wherein the milk is selected from the group consisting of regular milk, reduced-fat milk, skim milk, dairy powder, non-fat dry milk, milk protein concentrate/isolate, condensed milk, whey, whey protein concentrate, ultrafiltered (UF) concentrated milk, and the like, and combinations thereof.

80. The dairy composition of any one of claims 1 to 79, further comprising at least one of dietary fiber, sweetener component, hydrocolloid, flavorant, colorant, vitamin, mineral, nutrients and/or other functional ingredients.

81. The dairy composition of claim 80, wherein the composition comprises the dietary fiber, wherein the dietary fiber comprises soluble and/or insoluble dietary fibers.

82. The dairy composition of claim 81, wherein the fiber is a prebiotic.

83. The dairy composition of claim 82, wherein the fiber is inulin.

84. The dairy composition of any one of claims 80 to 83, wherein the amount of the fiber is up to about 10% or up to about 3% by weight, based on the weight of the dairy composition.

85. The dairy composition of claim 84, wherein the amount of the fiber is from about 1% by weight to about 3% by weight, based on the weight of the dairy composition.

86. The dairy composition of any one of claims 80 to 85, wherein the composition comprises at least one sweetener component.

87. The dairy composition of claim 86, wherein the at least one sweetener component is selected from the group consisting of natural sweeteners such as sucrose, glucose, fructose, maltose, lactose, galactose, high fructose corn-syrup, artificial intensive sweeteners, and sugar alcohols, and combinations thereof.

88. The dairy composition of any one of claims 80 to 87, wherein the composition comprises at least one flavorant.

89. The dairy composition of claim 88, wherein the amount of flavorant is up to about 15% by weight; up to about 11% by weight; or from about 1% by weight to about 11% by weight, based on the weight of the dairy composition.

90. The dairy composition of claim 88, wherein the dairy composition is a cultured dairy composition.

91. A dairy product comprising the dairy composition of any one of claims 1 to 90.

92. The dairy product of claim 91, wherein the dairy product is selected from the group consisting of beverages, sauces, spreads, dips, dressings, fillings, toppings, dessert-type dairy products and the like, and combinations thereof.

93. The dairy product of claim 92, wherein the dairy product is a beverage.

94. A method of making the dairy composition of any one of claims 1 to 93, the method comprising combining and mixing together the components of the composition, optionally heating to dissolve the components; and heating at ultra-high and/or pasteurization temperatures such that the composition does not undergo unacceptable curdling and/or precipitation.

95. A method of making the dairy composition of any one of claims 28 to 60, the method comprising combining and mixing together the components of the composition, except for the at least one first cultured dairy component and the at least one first dairy component; adding the at least one first cultured dairy component and the at least one first dairy component with heating to dissolve the components; and heating at ultra-high and/or pasteurization temperatures such that the composition does not undergo unacceptable curdling and/or precipitation.

96. The method of claim 94 or 95, wherein the ultra-high temperature (UHT) treatment comprises heating from about 135°C (275°F) to about 150°C (302°F) for about a few seconds.

97. The method of any one of claims 94 to 96, wherein the pasteurization treatment comprises heating to about 145°F (63°C) for at least about 30 minutes or heating from about 72°C to about 75°C (about 162°C to about 167°C) for about 15 to about 20 seconds.

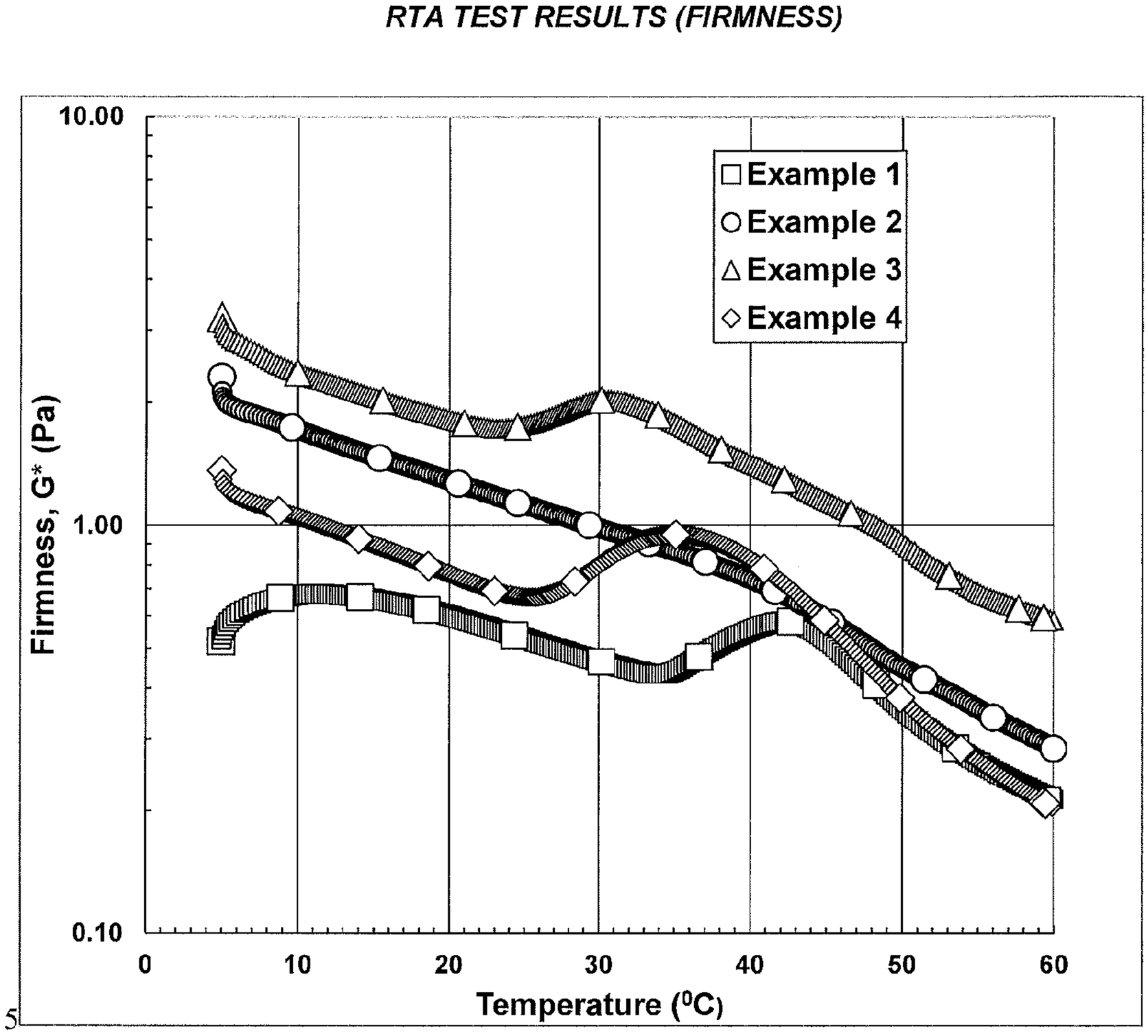

RTA TEST RESULTS (FIRMNESS)
10.00
1.00
0.10
Firmness, G* (Pa)
Example 1
Example 2
Example 3
Example 4
0
10
20
30
40
50
60
Temperature (⁰C)

FIGURE 1

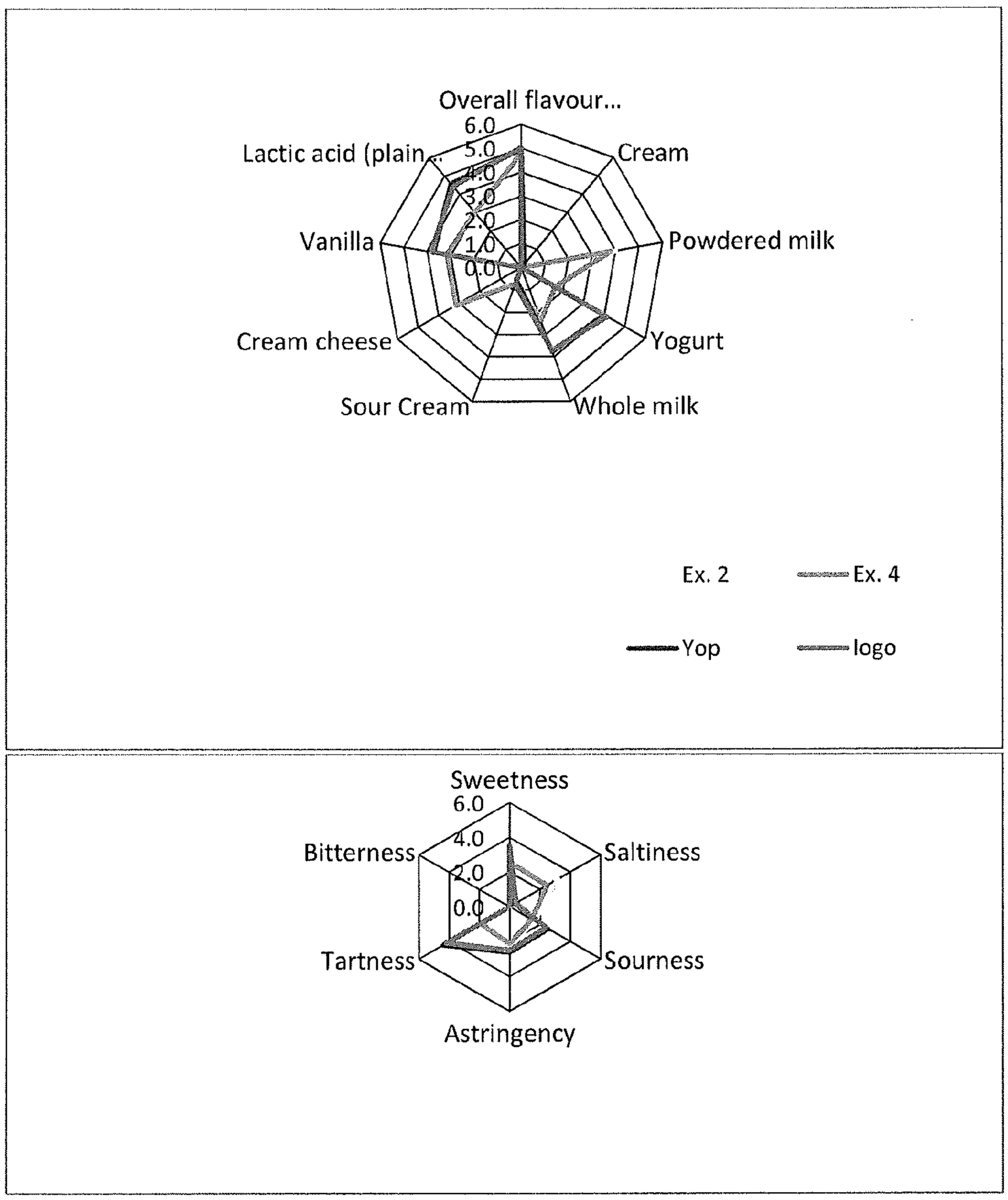
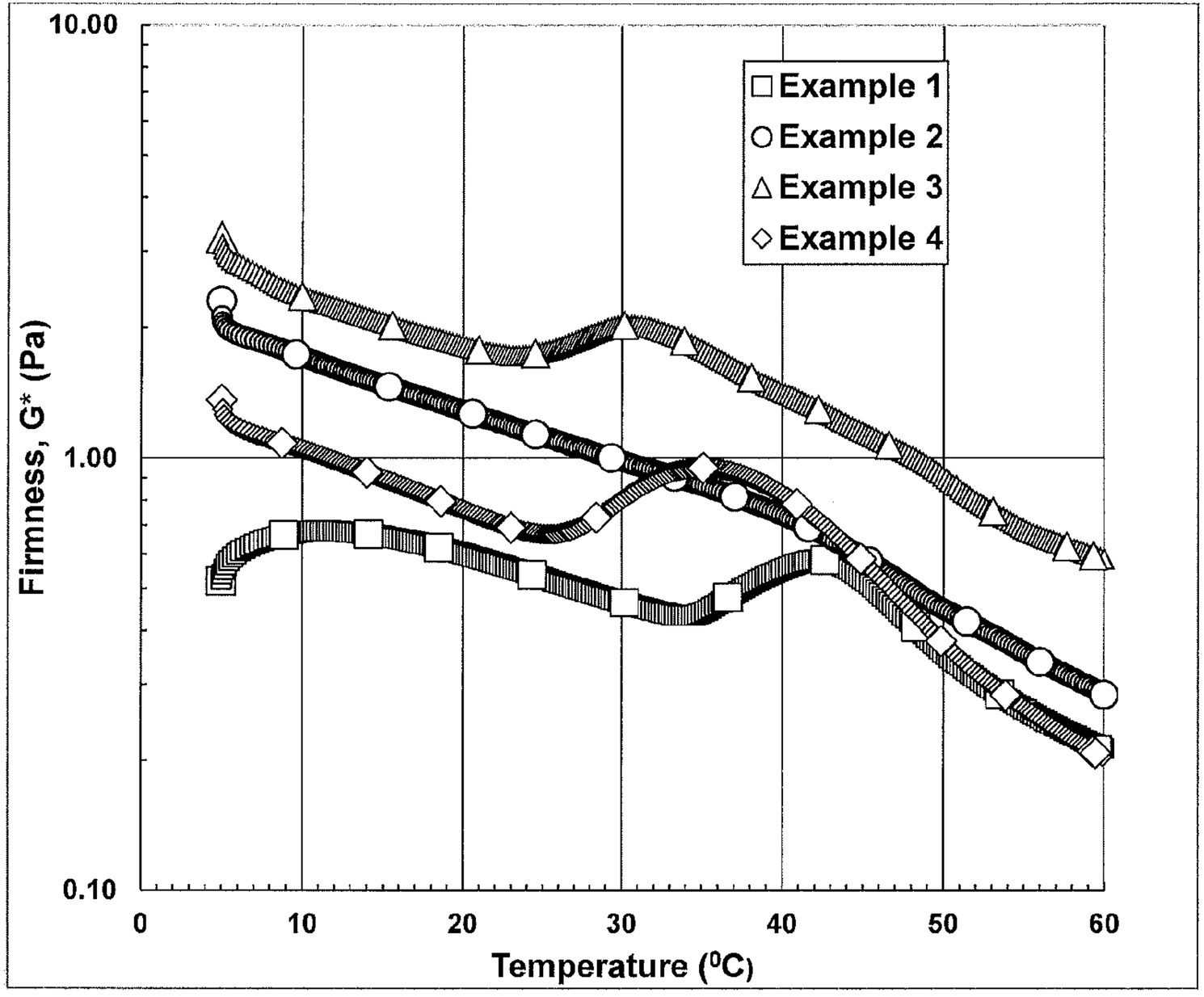

Overall flavour...
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Lactic acid (plain...
Cream
Vanilla
Powdered milk
Cream cheese
Yogurt
Sour Cream
Whole milk
Ex. 2
Ex. 4
Yop
logo
Sweetness
6.0
4.0
2.0
0.0
Bitterness
Saltiness
Tartness
Sourness
Astringency

FIGURE 2

FIGURE 1

RTA TEST RESULTS (FIRMNESS)