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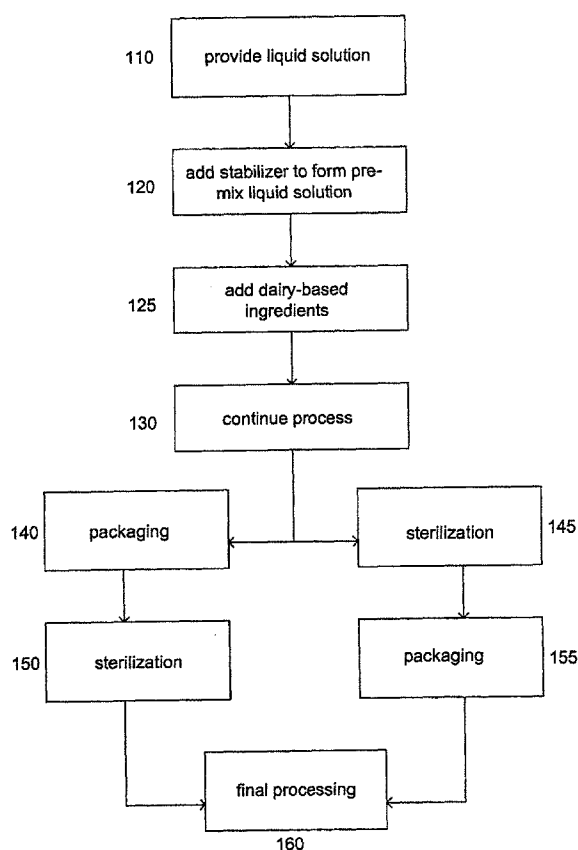
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(54) Title: STABILIZER FOR DAIRY PRODUCTS



(57) Abstract: A food stabilizer formed from natural components used in food products. The natural components include microcrystalline cellulose/alginate, native starch, or carrageenan. Effective amounts of the natural components are provided to the food product to maintain physical stability during its shelf life while imparting good mouthfeel. The food stabilizer can be incorporated in dairy-based beverages, such as milkshakes.



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STABILIZER FOR DAIRY PRODUCTS

FIELD OF THE INVENTION

[0001] The present invention relates generally to food products, and more particularly to stabilizers for dairy products.

BACKGROUND OF THE INVENTION

[0002] Milk-based or dairy products have various health benefits, such as providing calcium to promote healthy bones as well as various vitamins. One problem with dairy products is that they are susceptible to physical instability, decreasing their shelf-life. To promote longer shelf-life, stabilizers are added to the dairy products. Stabilizers also are used to develop texture in dairy products.

[0003] Conventionally, artificial stabilizers are used in dairy products. Such stabilizers include carboxymethyl cellulose (CMC) and modified starches. The use of artificial stabilizers, although serving to prolong shelf-life, is undesirable as consumers are becoming more health conscious, demanding natural ingredients. Furthermore, natural stabilizers can be used to achieve thicker mouthfeel, especially when used with low or non-fat dairy products. Accordingly, it is desirable to provide an improved stabilizer for food products.

SUMMARY OF THE INVENTION

[0004] The present invention relates to natural stabilizers used in food products, such as dairy-based products, including beverages or non-dairy based food products. The natural stabilizer can include microcrystalline cellulose ("MCC")/alginate, a combination of MCC/alginate and native starch, a combination of MCC/alginate and carrageenan, a combination of MCC/alginate, native starch and carrageenan, or a combination of native starch and carrageenan. The carrageenan can include lambda carrageenan, kappa carrageenan or iota carrageenan or a combination thereof.

Effective amounts of MCC/alginate, or combinations of MCC/alginate, native starch, or carrageenan, as disclosed above, are added to the food product achieve the desired shelf-life and mouthfeel or texture.

[0005] Another embodiment of the invention relates to forming a food product, such as a dairy-based beverage, with a natural stabilizer mixture. Forming the food product includes adding and dissolving a natural stabilizer comprising MCC/alginate, or combinations of MCC/alginate, native starch, or carrageenan, in a liquid. The liquid solution is processed to form the food product. Effective amounts of MCC/alginate, or combinations of MCC/alginate, native starch, or carrageenan, as disclosed above, and are added to the food product to maintain its physical stability through its shelf-life. In one embodiment, a stabilizer mixture can include a combination of carrageenan in amounts of about 0.0010 – 0.05 weight percent of lambda carrageenan, about 0.0010 – 0.05 weight percent of kappa carrageenan and 0.1 – 5.0% weight percent of native starch is added to the food product.

[0006] These and other objects, along with advantages and features of the present invention herein disclosed, will become apparent through reference to the following description, the accompanying drawings, and the claims. Furthermore, it is to be understood that the features of the various embodiments described herein are not mutually exclusive and can exist in various combinations and permutations.

BRIEF DESCRIPTION OF DRAWINGS

[0007] The drawing is not to scale, emphasis instead generally being placed upon illustrating the principles of the invention. In the following description, various embodiments of the present invention are described with reference to the following drawing, in which:

[0008] Fig. 1 shows processes for forming dairy-based beverages in accordance with different embodiments of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0009] The present invention relates to natural stabilizers used in food products. In one embodiment, the natural stabilizer is used for dairy products, such as dairy-based beverages. The dairy-based beverage may include milk or milk-derived ingredients, such as milk, condensed milk, cream and powdered milk. The milk or milk-derived ingredients can be, for example, high-, whole-, reduced-, low- or non-fat or skim. Other types of milk or milk-derived ingredients are also useful. Bulk sweeteners such as sucrose or high fructose corn syrup (HFCS), colors and flavorings such as cocoa powder can be added to the beverage. Other types of ingredients may also be added as desired.

[0010] The natural stabilizers can also be used with other types of dairy food products, such as milk puddings, yoghurt and yoghurt drinks. Providing the natural stabilizer in non-dairy products is also useful. For example, the natural stabilizer can be incorporated in salad dressings, syrups and sauces.

[0011] In accordance with one embodiment of the invention, a natural stabilizer mixture for food products comprises MCC/alginate. In accordance with another embodiment of the invention, a natural stabilizer mixture for food products comprises a combination of MCC/alginate and native starch. In accordance with yet another embodiment of the invention, a natural stabilizer mixture for food products comprises a combination of MCC/alginate and carrageenan. In accordance with yet another embodiment of the invention, a natural stabilizer mixture for food products comprises a combination of MCC/alginate, native starch and carrageenan. In accordance with yet another embodiment of the invention, a natural stabilizer mixture for food products comprises a combination of native starch and carrageenan. The carrageenan can include lambda

carrageenan, kappa carrageenan, or iota carrageenan, or a combination thereof. Table 1 shows examples of commercially available MCC/alginate, native starch, and carrageenan.

Table 1

MCC/ ALGINATE	NATIVE STARCH	LAMBDA CARRAGEENAN	KAPPA CARRAGEENAN	IOTA CARRAGEENAN
Avicel-plus AC 4125	Novation 4086	Viscarin GP 209F	Seakem CM 611	Viscarin SA 359
	Novation 4600	Lactarin MV 306	Kelco K-100	TICAGEL 795
	Novation 8300		Seakem X-10603	
	Novation 8600			

[0012] Effective amounts of MCC/alginate, or combinations of MCC/alginate, native starch, or carrageenan, are provided to the dairy-based beverage to achieve the desired shelf-life and mouthfeel or texture. In one embodiment, effective amounts of lambda carrageenan, kappa carrageenan and native starch are provided to achieve the desired shelf-life and mouthfeel or texture.

[0013] Typically, the desired shelf-life of the product is at least about 6 months at ambient or room temperature, for example 6 - 12 months, while giving the beverage a texture thicker than conventional whole milk, such as a milkshake consistency. The viscosity of the beverage, for example, can be about 100 - 800 centipoise. Other shelf-life durations and/or textures are also useful. During its shelf-life, the food product should maintain its physical stability.

[0014] In one embodiment, the beverage comprises about 0.0010 – 0.05 weight % of lambda carrageenan, about 0.0010 - 0.05 weight % of kappa carrageenan and about 0.1 – 5.00 weight % of native starch. Preferably, the beverage comprises about 0.0025 – 0.01 weight % of lambda carrageenan, about 0.0025 – 0.02 weight % of kappa carrageenan, and about 1.00 – 3.00 weight % of native starch. All percentages used herein are based on the total weight of the beverage.

The natural stabilizer is provided in dry-form, such as powder form. Providing the natural stabilizer in other forms may also be useful.

[0015] Fig. 1 shows a process for producing a food product in accordance with embodiments of the invention. In one embodiment, a dairy-based product is formed. Preferably, the dairy-based product is a ready-to-drink off-the-shelf beverage. The dairy-based beverage, for example, can be a flavored milk product made from a high-, whole-, reduced-, low- or non-fat or skim milk. In one embodiment, the dairy-based product comprises a milkshake. Other types of dairy-based product such as milk puddings, yoghurt and yoghurt drinks are also useful.

[0016] Initially, at step 110, a liquid solution is provided or formed. The liquid, for example, comprises water. Preferably, the water is treated. Treatment of water includes, for example, reverse osmosis.

[0017] The liquid provided is about 40-45% of the total amount of liquid used for producing the beverage. Other amounts of liquid may also be useful. The amount of liquid depends on the desired amount of beverage to be made. For example, the concentration of liquid is about 75 – 90% by weight of the total weight of the beverage. Other percentages are also useful. All percentages used herein are based on the total weight of the beverage.

[0018] In accordance with the invention, an effective amount of stabilizer mixture is added to the liquid solution to form a pre-mix liquid solution. The stabilizer mixture, in one embodiment, comprises about 0.0010 – 0.05 weight % of lambda carrageenan, about 0.0010 - 0.05 weight % of kappa carrageenan and about 0.1 – 5.00 weight % of native starch. In one embodiment, the stabilizer mixture is provided as a dry-blend. For example, the stabilizer mixture may be provided in powder form.

[0019] Bulk sweeteners, such as sucrose or HFCS can be added to the liquid. Other types of sugar, such as glucose, fructose, dextrose or maltose, are also useful. Typically, about 5 - 20 weight % of sweetener is added to the liquid solution. Other amounts of sweetener can be added in order to achieve the desired sweetness and/or calorie content in the beverage. The amount of sweetener used may also depend on the flavor of the beverage. For example, a greater amount of sweetener may be desired for a chocolate-flavored beverage than for some other flavors. Other ingredients can also be added. For example, salt may be added for taste enhancement or to act as an electrolyte source. Potassium carbonate (K_2CO_3) may also be added for initial pH adjustment. Additionally, fruit purees/juices can be added for flavoring. Other flavoring ingredients can also be added.

[0020] In one embodiment, the various components added to the liquid are dissolved in a liquefier or high shear mixer. To facilitate dissolving the components in the liquid, it is heated to a temperature of 130 - 140°F. Other temperatures may also be useful.

[0021] In one embodiment, a dairy-based solution is provided. The dairy-based solution comprises, for example, condensed skim milk and cream. Other types of milk product or derivatives are also useful. Typically, the dairy-based solution is stored at about 35 - 40°F with gentle agitation. In one embodiment, the dairy-based solution provides the remaining amount of liquid needed to produce the dairy-based beverage. In one embodiment, the dairy-based solution provides the remaining about 55 - 60% of the total liquid required to produce the dairy-based beverage. Other percentages are also useful.

[0022] In one embodiment, a cocoa solution is prepared. The cocoa solution is used to produce a cocoa or chocolate-based flavored beverage. To prepare the cocoa solution, cocoa powdered is added to a liquid in a desired amount.

[0023] In one embodiment, the solution comprises about 10% of cocoa powder. Other percentages are also useful. The solution is heated to dissolve the cocoa powder. In one embodiment, the solution is heated to about 185°F for about 45 minutes. After the cocoa powdered is dissolved, the solution is cooled to about 100°F. Preparing the cocoa solution using other techniques or process parameters is also useful.

[0024] In one embodiment, the pre-mix and dairy-based solutions are mixed at step 125. The solutions are mixed in, for example, a blending tank. Depending on the application, the cocoa solution is added to the solution. For example, the cocoa solution is added to produce a chocolate or cocoa flavored beverage or food product. The mixing is performed at a temperature of about 130 - 140°F. To prepare for mixing, the dairy-based solution may be pre-heated to the blending temperature. The solutions are mixed for about 10 - 20 minutes and preferably for about 15 minutes. Other blending durations and temperatures may also be useful.

[0025] Alternatively, the liquid from the initial liquid solution can be provided by dairy-based solution. In such a case, the flavors or other ingredients can be added as well and blended accordingly.

[0026] The process continues by processing the blended solution at step 130. The processing includes adjusting the dairy solids concentration. In one embodiment, the solids concentration is adjusted to about 34 – 37 weight %. Preferably, the solids concentration is adjusted to about 35%. Other concentrations may also be useful. The solid concentration is adjusted by, for example, the addition of liquid, such as water. During this process, the solution is heated to about 165 – 170°F.

[0027] In one embodiment, the solution is pasteurized by heating the solution sufficiently. In one embodiment, a high temperature short time (HTST) process is used to pasteurize the

solution. HTST includes, for example, heating the product solution to about 165 - 170°F. Other temperatures and time durations may also be useful for the pasteurization process.

[0028] The solution is homogenized. In one embodiment, the product solution is homogenized at 3500psi/500psi. Alternative pressures may also be useful for homogenization. After homogenization, the solution is cooled to about 40°F.

[0029] Further processing is continued by adding flavoring and/or color agents, as desired. Additionally, the solution may be adjusted to the desired pH level and solids concentration. The pH level should be targeted to provide a stable solution. In one embodiment, the pH of the solution is about 6.5 – 7.4. Preferably, the pH is 7.0. Other pH levels may also be useful.

[0030] Various pH adjusters can be used to adjust the pH level of the solution. In one embodiment, K₂CO₃ is used. In one embodiment, about 20% K₂CO₃ is added to the solution. Other pH adjusters may also be useful, for example, alkaline orthophosphate, potassium hydroxide, sodium citrate or a combination thereof is provided. As subsequent processing may have an impact on the final pH level, these effects should be taken into consideration. For example, the pH should be set at a higher level if subsequent processing would cause a decrease in pH.

[0031] The concentration of solids in the solution can be adjusted as desired. In one embodiment, the solids concentration is adjusted by adding liquid. In one embodiment, the solids concentration is adjusted to achieve the desired concentration range. For example, the final beverage may contain a concentration of about 5-40 weight % total solids, of which about 2-10 weight % is comprised of milk fat solids. Other concentrations may also be useful. The range may be selected based on desired nutritional value, taste, and/or texture. Other considerations may include regulatory and labeling requirements. However, this adjustment may

affect the total weight of the final product. To accommodate this change in volume, more stabilizers, as well as other ingredients, may need to be added.

[0032] In accordance with one embodiment of the invention, the solution is packaged at step 140. Packaging includes filling the solution into appropriate containers before hermetically sealing the containers. The containers, for example, comprise 8 fl oz size glass bottles. Other types and sizes of containers are also useful. The solution in the containers is then sterilized at step 150. Sterilization may be performed in a batch process in retorts or autoclaves by subjecting the containers to heat in, for example, a steam chamber. In one embodiment, the containers are heated to about 255°F to achieve a Fo value of at least about 4.0.

[0033] After sterilization, final processing is conducted at step 160. In one embodiment, final processing includes cooling the beverages and performing final packaging, such as labeling and boxing.

[0034] In another embodiment of the invention, after the pH and solids concentration have been adjusted to the desired level, the liquid is sterilized at step 145. The sterilization process comprises ultra high temperature (UHT) treatment. In one embodiment, UHT treatment includes subjecting the liquid to high temperatures, such as by direct steam injection or steam infusion, or by indirect heating in a heat exchanger. The sterilization is typically conducted in a closed system.

[0035] Thereafter, the sterilized liquid is cooled to about 400F and aseptically filled into appropriate containers at step 155. Final processing is then performed, such as labeling and boxing, at step 160.

EXAMPLES

[0036] Various dairy-based beverages have been prepared in accordance with the process described. Ingredients for different dairy-based beverages are shown in Tables 1 - 5 as follows:

Table 1

INGREDIENTS	WEIGHT %
Milk Fat Solids	5.500
Milk Solids Non-Fat (MSNF)	6.000
Sucrose	13.000
Seakem CM 611 (kappa carrageenan)	0.015
Viscarin GP 209F (lambda carrageenan)	0.003
Novation 8600 (native starch)	2.000
Alkalized Cocoa Powder	0.100
Flavors (natural)	0.370
Sodium Chloride	0.045
LycoPen 2%SG (natural color)	0.100
Potassium Carbonate	0.030
Water*	72.837

* Includes moisture from all ingredients

Table 2

INGREDIENTS	WEIGHT %
Milk Fat Solids	5.300
Milk Solids Non-Fat (MSNF)	4.950
Sucrose	13.500
Seakem CM 611 (kappa carrageenan)	0.015
Viscarin GP 209F (lambda carrageenan)	0.003
Novation 8600 (native starch)	2.000
Alkalized Cocoa Powder	2.000
Flavors (natural)	0.300
Potassium Carbonate	0.030
Water*	71.902

* Includes moisture from all ingredients

Table 3

INGREDIENTS	WEIGHT %
Milk Fat Solids	4.720
Milk Solids Non-Fat (MSNF)	4.860
Sucrose	14.000
Seakem CM 611 (kappa carrageenan)	0.015
Viscarin GP 209F (lambda carrageenan)	0.010
Novation 8600 (native starch)	3.000
Banana Puree (MU-22-04)	1.000
Flavors (natural)	1.150
Sodium Chloride	0.120
Annatto Color 03133	0.008
Potassium Carbonate	0.030
Water*	71.087

* Includes moisture from all ingredients

Table 4

INGREDIENTS	WEIGHT %
Milk Fat Solids	5.500
Milk Solids Non-Fat (MSNF)	6.000
Sucrose	13.000
Avicel-plus AC 4125 (MCC/alginate)	0.80
Novation 8600 (native starch)	1.00
Sodium citrate	0.20
Alkalized Cocoa Powder	0.100
Flavors (natural)	0.370
Sodium Chloride	0.045
Lycopen 2%SG (natural color)	0.100
Potassium Carbonate	0.030
Water*	72.855

* Includes moisture from all ingredients

Table 5

INGREDIENTS	WEIGHT %
Milk Fat Solids	5.300
Milk Solids Non-Fat (MSNF)	4.950
Sucrose	13.500
Avicel-plus AC 4125 (MCC/alginate)	1.00
Sodium citrate	0.20
Alkalized Cocoa Powder	2.000
Flavors (natural)	0.300
Potassium Carbonate	0.030
Water*	72.720

* Includes moisture from all ingredients

[0037] While the invention has been particularly shown and described with reference to various embodiments, it will be recognized by those skilled in the art that modifications and changes

may be made to the present invention without departing from the spirit and scope thereof. The scope of the invention should therefore be determined not with reference to the above description but with reference to the appended claims along with their full scope of equivalents.

[0038] What is claimed is:

CLAIMS

1. A food product comprising:
a base food component; and
a natural food stabilizer mixture comprising carrageenan and native starch.
2. The food product of claim 1 wherein the base food component comprises a dairy-based food component.
3. The food product of claim 2 wherein the dairy-based food component comprises a dairy-based beverage including a milkshake.
4. The food product of claim 1 wherein the base food component comprises a non-dairy food component.
5. The food product of claim 1 wherein the carrageenan and native starch are provided in effective amounts to maintain physical stability of the base food component during shelf-life.
6. The food product of claim 5 wherein the carrageenan comprises lambda carrageenan, kappa carrageenan, or iota carrageenan or a combination thereof.
7. The food product of claim 5 wherein the carrageenan comprises lambda carrageenan or kappa carrageenan, or a combination thereof.
8. The food product of claim 5 wherein the natural stabilizer comprises about 0.0010 – 0.05 weight percent of lambda carrageenan, about 0.0010 – 0.05 weight percent of kappa carrageenan and 0.1 – 5.0% weight percent of native starch.
9. The food product of claim 1 wherein the food product comprises a pH of about 6.5 – 7.4.
10. A food product comprising:
a base food component; and
a natural food stabilizer mixture comprising

microcrystalline cellulose/alginate.

11. The food product of claim 10 wherein the base food component comprises a dairy-based food component.
12. The food product of claim 11 wherein the dairy-based food component comprises a dairy-based beverage including a milkshake.
13. The food product of claim 10 wherein the base food component comprises a non-dairy food component.
14. The food product of claim 10 wherein the microcrystalline cellulose/alginate is provided in an effective amount to maintain physical stability of the base food component during shelf-life.
15. The food product of claim 14 wherein the natural stabilizer comprises about 0.10 -1.50 weight percent of microcrystalline cellulose/alginate.
16. The food product of claim 10 wherein the food product comprises a pH of about 6.5 – 7.4.
17. A food product comprising:
a base food component; and
a natural food stabilizer mixture comprising
microcrystalline cellulose/alginate and native starch.
18. The food product of claim 17 wherein the base food component comprises a dairy-based food component.
19. The food product of claim 18 wherein the dairy-based food component comprises a dairy-based beverage including a milkshake.

20. The food product of claim 17 wherein the base food component comprises a non-dairy food component.
21. The food product of claim 17 wherein the microcrystalline cellulose/alginate and native starch are provided in effective amounts to maintain physical stability of the base food component during shelf-life.
22. The food product of claim 21 wherein the natural stabilizer comprises about 0.10 -1.50 weight percent of microcrystalline cellulose/alginate and about 0.1 – 5.00 weight percent of native starch.
23. The food product of claim 17 wherein the food product comprises a pH of about 6.5 – 7.4.
24. A food product comprising:
 - a base food component; and
 - a natural food stabilizer mixture comprising microcrystalline cellulose/alginate and carrageenan.
25. The food product of claim 24 wherein the base food component comprises a dairy-based food component.
26. The food product of claim 25 wherein the dairy-based food component comprises a dairy-based beverage including a milkshake.
27. The food product of claim 24 wherein the base food component comprises a non-dairy food component.
28. The food product of claim 24 wherein the microcrystalline cellulose/alginate and carrageenan are provided in effective amounts to maintain physical stability of the base food component during shelf-life.

29. The food product of claim 28 wherein the carrageenan comprises lambda carrageenan, kappa carrageenan, or iota carrageenan or a combination thereof.
30. The food product of claim 28 wherein the carrageenan comprises lambda carrageenan or kappa carrageenan, or a combination thereof.
31. The food product of claim 28 wherein the natural stabilizer comprises about 0.0010 – 0.05 weight percent of lambda carrageenan, about 0.0010 – 0.05 weight percent of kappa carrageenan and 0.1 – 1.50% weight percent of microcrystalline cellulose/alginate.
32. The food product of claim 24 wherein the food product comprises a pH of about 6.5 – 7.4.
33. A food product comprising:
a base food component; and
a natural food stabilizer mixture comprising
microcrystalline cellulose/alginate, native starch, and carrageenan.
34. The food product of claim 33 wherein the base food component comprises a dairy-based food component.
35. The food product of claim 34 wherein the dairy-based food component comprises a dairy-based beverage including a milkshake.
36. The food product of claim 33 wherein the base food component comprises a non-dairy food component.
37. The food product of claim 33 wherein the microcrystalline cellulose, native starch, and carrageenan are provided in effective amounts to maintain physical stability of the base food component during shelf-life.

38. The food product of claim 37 wherein the carrageenan comprises lambda carrageenan, kappa carrageenan, or iota carrageenan or a combination thereof.
39. The food product of claim 37 wherein the carrageenan comprises lambda carrageenan or kappa carrageenan, or a combination thereof.
40. The food product of claim 37 wherein the natural stabilizer comprises about 0.10 – 1.50 weight percent of microcrystalline cellulose/alginate, about 0.0010 – 0.05 weight percent of lambda carrageenan, about 0.0010 – 0.05 weight percent of kappa carrageenan and 0.1 – 5.0% weight percent of native starch.
41. The food product of claim 33 wherein the food product comprises a pH of about 6.5 – 7.4.
42. A method for processing a food product comprising:
adding a natural stabilizer to a liquid, the natural stabilizer mixture comprises carrageenan and native starch;
dissolving the natural stabilizer mixture in the liquid to form a pre-mix liquid solution;
and
processing the pre-mix liquid solution to form a food product.
43. The method of claim 42 comprising processing a dairy-based beverage.
44. The method of claim 43 wherein the adding of the natural stabilizer mixture comprises adding effective amounts of carrageenan and native starch to maintain physical stability of the base food component during its shelf-life.
45. The method of claim 43 wherein adding the natural stabilizer mixture comprises adding the lambda carrageenan, kappa carrageenan, or iota carrageenan or a combination thereof.

46. The method of claim 43 wherein adding the natural stabilizer mixture comprises adding about 0.0010 – 0.05 weight percent of lambda carrageenan, about 0.0010 – 0.05 weight percent of kappa carrageenan and 0.1 – 5.0% weight percent of native starch.
47. The method of claim 42 wherein the adding the natural stabilizer mixture comprises adding effective amounts of carrageenan and native starch to maintain physical stability of the base food component during its shelf-life.
48. The method of claim 42 wherein adding the natural stabilizer mixture comprises adding the lambda carrageenan, kappa carrageenan, or iota carrageenan or a combination thereof.
49. The method of claim 42 wherein adding the natural stabilizer mixture comprises adding about 0.0010 – 0.05 weight percent of lambda carrageenan, about 0.0010 – 0.05 weight percent of kappa carrageenan and 0.1 – 5.0% weight percent of native starch.
50. The method of claim 42 wherein processing the pre-mix liquid comprises:
adding the pre-mix solution to a dairy-based solution; and
blending the pre-mix and dairy-based solution at an elevated temperature; and
sterilizing the solutions.
51. The method of claim 50 wherein the liquid of the pre-mix solution comprises about 0 - 80 weight percent of the total weight of liquid of the beverage and the dairy-based solution comprises about 20 - 100 weight percent of the total weight of the liquid of the beverage.
52. The method of claim 50 further comprises:
adjusting the solids of the solutions to a solids target level; and
adjusting pH of the food product to a pH target level.
53. A method for processing a food product comprising:

adding a natural stabilizer to a liquid, the natural stabilizer mixture comprises microcrystalline cellulose/alginate;
dissolving the natural stabilizer mixture in the liquid to form a pre-mix liquid solution;
and
processing the pre-mix liquid solution to form a food product.

54. The method of claim 53 comprising processing a dairy-based beverage.

55. The method of claim 54 wherein the adding of the natural stabilizer mixture comprises adding an effective amount of microcrystalline cellulose/alginate to maintain physical stability of the base food component during its shelf-life.

56. The method of claim 54 wherein adding the natural stabilizer mixture comprises adding about 0.10 – 1.50 weight percent of microcrystalline cellulose/alginate.

57. The method of claim 53 wherein the adding the natural stabilizer mixture comprises adding an effective amount of microcrystalline cellulose/alginate to maintain physical stability of the base food component during its shelf-life.

58. The method of claim 53 wherein adding the natural stabilizer mixture comprises adding about 0.10 – 1.50 weight percent of microcrystalline cellulose/alginate.

59. The method of claim 53 wherein processing the pre-mix liquid comprises:
adding the pre-mix solution to a dairy-based solution; and
blending the pre-mix and dairy-based solution at an elevated temperature; and
sterilizing the solutions.

60. The method of claim 59 wherein the liquid of the pre-mix solution comprises about 0 - 80 weight percent of the total weight of liquid of the beverage and the dairy-based solution comprises about 20 - 100 weight percent of the total weight of the liquid of the beverage.
61. The method of claim 59 further comprises:
- adjusting the solids of the solutions to a solids target level; and
 - adjusting pH of the food product to a pH target level.
62. A method for processing a food product comprising:
- adding a natural stabilizer to a liquid, the natural stabilizer mixture comprises microcrystalline cellulose/alginate and native starch;
 - dissolving the natural stabilizer mixture in the liquid to form a pre-mix liquid solution;
 - and
 - processing the pre-mix liquid solution to form a food product.
63. The method of claim 62 comprising processing a dairy-based beverage.
64. The method of claim 63 wherein the adding of the natural stabilizer mixture comprises adding effective amounts of microcrystalline cellulose/alginate and native starch to maintain physical stability of the base food component during its shelf-life.
65. The method of claim 64 wherein adding the natural stabilizer mixture comprises adding about 0.10 – 1.50 weight percent of microcrystalline cellulose/alginate and about 0.1 – 5.00 weight percent of native starch.
66. The method of claim 62 wherein the adding the natural stabilizer mixture comprises adding effective amounts of microcrystalline cellulose/alginate and native starch to maintain physical stability of the base food component during its shelf-life.

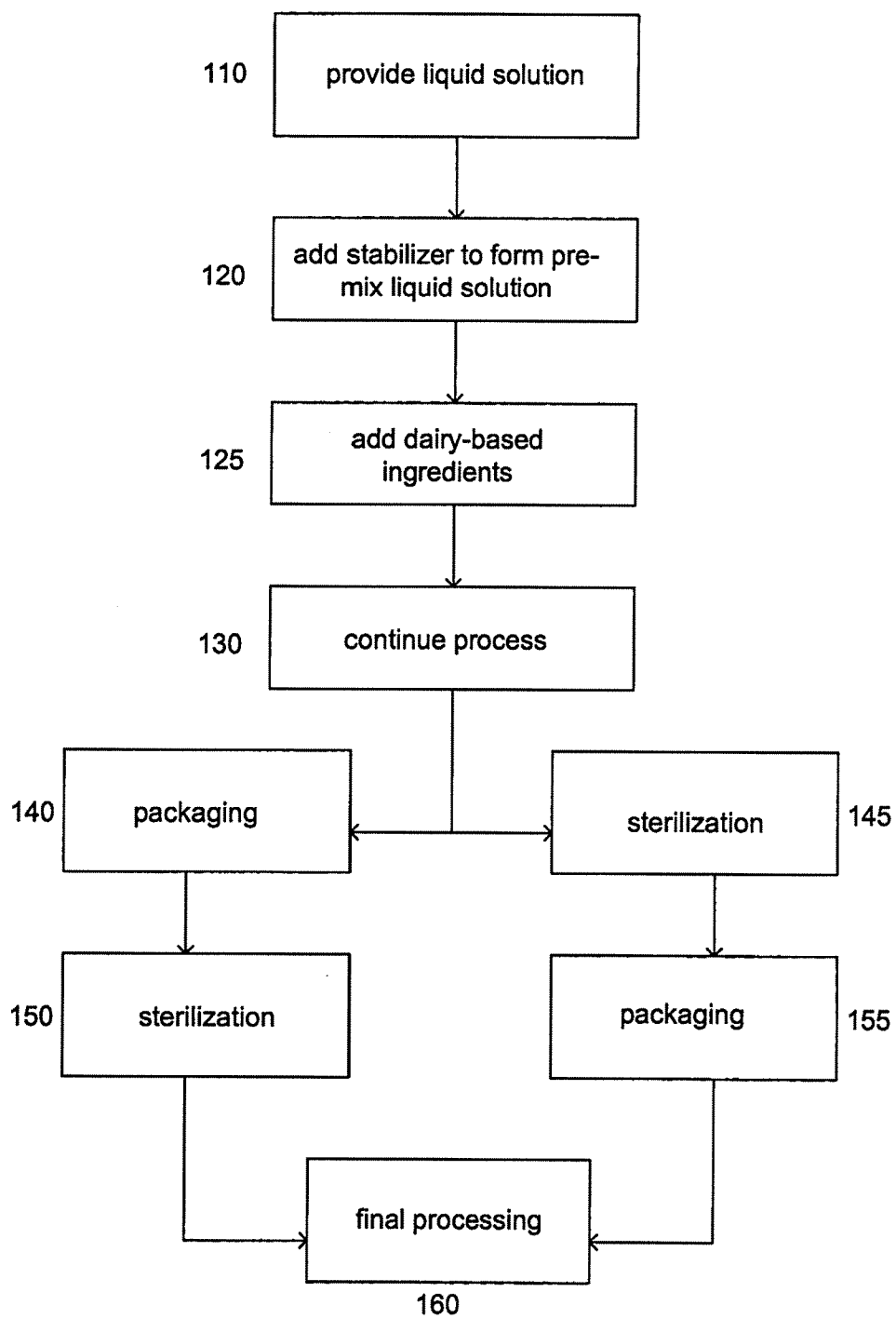
67. The method of claim 62 wherein adding the natural stabilizer mixture comprises adding about 0.10 – 1.50 weight percent of microcrystalline cellulose/alginate and about 0.1 – 5.00 weight percent of native starch.
68. The method of claim 62 wherein processing the pre-mix liquid comprises:
adding the pre-mix solution to a dairy-based solution; and
blending the pre-mix and dairy-based solution at an elevated temperature; and
sterilizing the solutions.
69. The method of claim 68 wherein the liquid of the pre-mix solution comprises about 0 - 80 weight percent of the total weight of liquid of the beverage and the dairy-based solution comprises about 20 - 100 weight percent of the total weight of the liquid of the beverage.
70. The method of claim 68 further comprises:
adjusting the solids of the solutions to a solids target level; and
adjusting pH of the food product to a pH target level.
71. A method for processing a food product comprising:
adding a natural stabilizer to a liquid, the natural stabilizer mixture comprises microcrystalline cellulose/alginate and carrageenan;
dissolving the natural stabilizer mixture in the liquid to form a pre-mix liquid solution;
and
processing the pre-mix liquid solution to form a food product.
72. The method of claim 71 comprising processing a dairy-based beverage.
73. The method of claim 72 wherein the adding of the natural stabilizer mixture comprises adding effective amounts of microcrystalline cellulose/alginate, native starch, and carrageenan and to maintain physical stability of the base food component during its shelf-life.

74. The method of claim 72 wherein adding the natural stabilizer mixture comprises adding the lambda carrageenan, kappa carrageenan, or iota carrageenan or a combination thereof.
75. The method of claim 72 wherein adding the natural stabilizer mixture comprises adding about 0.0010 – 0.05 weight percent of lambda carrageenan, about 0.0010 – 0.05 weight percent of kappa carrageenan, 0.1 – 5.0 weight percent of native starch, and 0.10 – 1.50 weight percent of microcrystalline cellulose/alginate.
76. The method of claim 71 wherein the adding the natural stabilizer mixture comprises adding effective amounts of microcrystalline cellulose/alginate, native starch, and carrageenan to maintain physical stability of the base food component during its shelf-life.
77. The method of claim 71 wherein adding the natural stabilizer mixture comprises adding the lambda carrageenan, kappa carrageenan, or iota carrageenan or a combination thereof.
78. The method of claim 71 wherein adding the natural stabilizer mixture comprises adding about 0.0010 – 0.05 weight percent of lambda carrageenan, about 0.0010 – 0.05 weight percent of kappa carrageenan, 0.1 – 5.0 weight percent of native starch and 0.10 – 1.50 weight percent of microcrystalline cellulose/alginate.
79. The method of claim 71 wherein processing the pre-mix liquid comprises:
adding the pre-mix solution to a dairy-based solution; and
blending the pre-mix and dairy-based solution at an elevated temperature; and
sterilizing the solutions.
80. The method of claim 79 wherein the liquid of the pre-mix solution comprises about 0 - 80 weight percent of the total weight of liquid of the beverage and the dairy-based solution comprises about 20 - 100 weight percent of the total weight of the liquid of the beverage.

81. The method of claim 79 further comprises:
adjusting the solids of the solutions to a solids target level; and
adjusting pH of the food product to a pH target level.
82. A method for processing a food product comprising:
adding a natural stabilizer to a liquid, the natural stabilizer mixture comprises microcrystalline cellulose/alginate and carrageenan;
dissolving the natural stabilizer mixture in the liquid to form a pre-mix liquid solution;
and
processing the pre-mix liquid solution to form a food product.
83. The method of claim 82 comprising processing a dairy-based beverage.
84. The method of claim 83 wherein the adding of the natural stabilizer mixture comprises adding effective amounts of microcrystalline cellulose/alginate, native starch, and carrageenan and to maintain physical stability of the base food component during its shelf-life.
85. The method of claim 83 wherein adding the natural stabilizer mixture comprises adding the lambda carrageenan, kappa carrageenan, or iota carrageenan or a combination thereof.
86. The method of claim 83 wherein adding the natural stabilizer mixture comprises adding about 0.0010 – 0.05 weight percent of lambda carrageenan, about 0.0010 – 0.05 weight percent of kappa carrageenan, 0.1 – 5.0 weight percent of native starch, and 0.10 – 1.50 weight percent of microcrystalline cellulose/alginate.
87. The method of claim 82 wherein the adding the natural stabilizer mixture comprises adding effective amounts of microcrystalline cellulose/alginate, native starch, and carrageenan to maintain physical stability of the base food component during its shelf-life.

88. The method of claim 82 wherein adding the natural stabilizer mixture comprises adding the lambda carrageenan, kappa carrageenan, or iota carrageenan or a combination thereof.
89. The method of claim 82 wherein adding the natural stabilizer mixture comprises adding about 0.0010 – 0.05 weight percent of lambda carrageenan, about 0.0010 – 0.05 weight percent of kappa carrageenan, 0.1 – 5.0 weight percent of native starch and 0.10 – 1.50 weight percent of microcrystalline cellulose/alginate.
90. The method of claim 82 wherein processing the pre-mix liquid comprises:
adding the pre-mix solution to a dairy-based solution; and
blending the pre-mix and dairy-based solution at an elevated temperature; and
sterilizing the solutions.
91. The method of claim 90 wherein the liquid of the pre-mix solution comprises about 0 - 80 weight percent of the total weight of liquid of the beverage and the dairy-based solution comprises about 20 - 100 weight percent of the total weight of the liquid of the beverage.
92. The method of claim 90 further comprises:
adjusting the solids of the solutions to a solids target level; and
adjusting pH of the food product to a pH target level.

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Fig. 1