

of iota-carrageenan was raised to 300 parts per million. Little or no sagging or sedimentation occurred after 8 months of storage at room temperature.

EXAMPLE 17—Control

The formula of Example 11 was used except the concentration of kappa-carrageenan was lowered to 125 parts per million, while the concentration of iota-carrageenan was raised to 250 parts per million. While no sedimentation occurred, very slight sagging did occur with 1-2 months.

EXAMPLE 18—Invention

The formula of Example 7 was bottled, then subjected to sterilization. Afterwards, there was no evidence of sag after 12 months.

EXAMPLE 19—Control

The formula of Example 7 was used except kappa-carrageenan was substituted for the iota-carrageenan. The formula was bottled, then subjected to sterilization. A diagonal sag line became visible from the top to the bottom of the container within 1-3 weeks.

EXAMPLE 20—Invention

The formula of Example 6 was bottled and subjected to sterilization. Very little sedimentation was noticeable after 12 months of storage at room temperature.

EXAMPLE 21—Invention

The formula of Example 6 is passed through UHT, then cooled, bottled and sterilized. Less sag and sedimentation were present than in Example 20 after 12 months.

INDUSTRIAL APPLICABILITY

The data demonstrate that the liquid nutritional prepared in accordance with this invention possesses improved physical stability with respect to creaming, sedimentation, and sag. The problems encountered by the medical and infant nutritional industry in preparing products that exhibit good shelf life (product stability) are unique. Due to the high loadings of minerals and vitamins found in these products and the high viscosities, the nutritional industry, until now, has failed to provide a solution to this long felt need. Through the discoveries disclosed in this invention the nutritional industry can prepare and supply liquid nutritional products that do not suffer from the problems of sag, sedimentation, or creaming.

While the liquid nutritional herein described and the method of making same constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to this precise formulation and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A liquid nutritional composition comprising:

(a) a liquid nutritional mixture containing fat globules present at a concentration sufficient to have said liquid nutritional mixture be susceptible to creaming, containing suspended minerals, and containing total solids, including said suspended minerals, in the range of from about 11.88% to about 30% by weight; and

(b) iota-carrageenan present in said liquid nutritional composition at a concentration in the range of 50 to

1000 parts per million, wherein said liquid nutritional composition is essentially devoid of creaming, sagging, and sedimentation.

2. A liquid nutritional composition according to claim 1, wherein said liquid nutritional composition further comprises kappa-carrageenan, said kappa-carrageenan present at a concentration less than 25% of the total concentration of said iota-carrageenan and said kappa-carrageenan.

3. A liquid nutritional composition according to claim 1 wherein said concentration of said iota-carrageenan is in the range of 800 to 900 parts per million.

4. A liquid nutritional composition according to claim 1 wherein said concentration of said iota-carrageenan is in the range of 250 to 450 parts per million.

5. A liquid nutritional composition according to claim 4 wherein said concentration of said iota-carrageenan is in the range of 300 to 350 parts per million.

6. A liquid nutritional composition according to claim 2 wherein said concentration of said iota-carrageenan is in the range of 800 to 900 parts per million.

7. A liquid nutritional composition according to claim 2 wherein said concentration of said iota-carrageenan is in the range of 250 to 450 parts per million.

8. A liquid nutritional composition according to claim 7 wherein said concentration of said iota-carrageenan is in the range of 300 to 350 parts per million.

9. A method of preparing a liquid nutritional composition, said method comprising the steps of:

(a) preparing a mixture comprising:

(i) a liquid nutritional mixture containing fat globules present at a concentration sufficient to have said liquid nutritional mixture be susceptible to creaming, containing minerals, and containing total solids, including said suspended minerals, in the range of from about 11.88% to about 30% by weight; and

(ii) iota-carrageenan present in said liquid nutritional composition at a concentration in the range of 50 to 1000 parts per million;

(b) subjecting the said liquid nutritional composition resulting from step (a) to ultra high temperature; followed by

(c) cooling said liquid nutritional composition from said ultra high temperature; and

(d) packaging said liquid nutritional composition, wherein said liquid nutritional composition is essentially devoid of creaming, sagging, and sedimentation.

10. A method according to claim 9, wherein said liquid nutritional composition further comprises kappa-carrageenan, said kappa-carrageenan present at a concentration less than 25% of the total concentration of said iota-carrageenan and said kappa-carrageenan.

11. A method according to claim 9 wherein said concentration of said iota-carrageenan is in the range of 800 to 900 parts per million.

12. A method according to claim 9 wherein said concentration of said iota-carrageenan is in the range of 250 to 450 parts per million.

13. A method according to claim 12 wherein said concentration of said iota-carrageenan is in the range of 300 to 350 parts per million.

14. A method according to claim 10 wherein said concentration of said iota-carrageenan is in the range of 800 to 900 parts per million.