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deionized water are slowly added with agitation to the mixture in the processing vessel.

78.0 lbs. of a vitamin/mineral premix, and 4.0 lbs. of cysteine are, then added with agitation to the processing vessel, and allowed to mix thoroughly.

The formulation (70°–80° F.) from the processing vessel is pumped through a two-stage Gaulin homogenizer. The second stage pressure is 500 PSI, and the first stage pressure is 2500 PSI. The product flows from the homogenizer to a plate heat exchanger where it is cooled to 40° F. and then pumped to a 2nd 1000 gallon processing vessel. 8.4 lbs. of flavor and color orange/yellow No. 6 are added slowly with agitation to the 2nd vessel.

After 10 minutes of mixing, quality control samples are taken for moisture (80.0%), pH (pH 3.8), specific gravity (1.067) and vitamin content (48 mgC/100 gms of solution).

The product is sterilized in a Cherry Burrell Unitherm thermo-processor at a minimum processing temperature of 204° F., for 4.33 seconds residence in the hold tube.

The product is then cooled to 160° F. and aseptically homogenized in a two-stage homogenizer (pressure settings as above), and aseptically packaged (at 70° F.) in 8 oz. (237 ml) Tetra Brik packages.

#### EXAMPLE 2

##### Liquid Nutritional Formulation with Fat and Fiber (8,000 lbs.)

An emulsifier solution of 4 lb. of polyglycerol ester in 100.0 lbs. of (180° F.) deionized water is added to 5326.0 lbs. of deionized water in a 1,000 gallon processing vessel. 20 lbs. of hydrolyzed guar gum, 310.4 lbs. of whey protein concentrate, and 1192.0 lbs. of sucrose are added to the processing vessel and mixed with the emulsifier solution. 168.0 lbs. of high oleic sunflower oil is then added to the processing vessel and the ingredients mixed thoroughly. A solution of 24.8 lbs. of phosphoric acid and 14.4 lbs. of citric acid in 500 lbs. of deionized water are slowly added with agitation to the mixture in the processing vessel. The mixture is then heated to 160°–165° F.

62.0 lbs. of a mineral premix, and 4.0 lbs. of cysteine are then added with agitation to the processing vessel, and allowed to mix thoroughly.

The formulation (160°–165° F.) from the processing vessel is pumped twice through a two-stage Gaulin homogenizer. The second stage pressure is 500 PSI, and the first stage pressure is 2500 PSI. The product flows from the homogenizer to a plate heat exchanger where it is cooled to 40° F. The mixture is then pumped to a 2nd 1,000 gallon processing vessel. 16.0 lbs. of vitamin premix in 250 lbs. of deionized water are added to the processing vessel. 8.4 lbs. of flavor and color orange/yellow No. 6 are then added slowly with agitation to the 2nd vessel.

After 10 minutes of mixing, quality control samples are taken for moisture (78.0%), pH (pH 3.8), specific gravity (1.067) and vitamin C content (48 mgC/100 gms of solution).

The product is sterilized in a Cherry Burrell Unitherm thermo-processor at a minimum processing temperature of 204° F., for 4.33 seconds residence in the hold tube.

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The product is then cooled to 160° F. and aseptically homogenized in a two-stage homogenizer (pressure settings as above), and aseptically packaged (at 70° F.) in 8 oz. (237 ml) Tetra Brik packages.

What is claimed is:

1. Liquid oral nutritional formulation comprising based on the total formulation calories about 40 to 90% of calories as carbohydrates, about 2 to 30% of calories as protein, about 0 to 35% of calories as fat, and about 0 to 17% of calories as fiber; characterized in that the formulation contains a combination of sucrose and L-cysteine to reduce non-enzymatic browning and has a pH of from about 3.5 to 3.9; wherein said L-cysteine comprises from about 0.025 to about 0.20% based on total weight of said formulation, and said sucrose comprises about 40 to 90% of the total formulation calorie, and said protein comprises at least 60% by weight whey protein.

2. The oral nutritional formulations of claim 1 having in addition 100% of U.S. RDA of vitamins and minerals.

3. The oral nutritional formulations of claim 2 comprising one or more amino acids selected from the group consisting of arginine, isoleucine, leucine, valine and combinations thereof.

4. The oral nutritional formulations of claim 1, wherein the carbohydrates comprise from about 60 to 85% of the total formulation calories.

5. The oral nutritional formulations of claim 1, wherein protein comprises from about 5 to 25% of the total formulation calories.

6. The oral nutritional formulations of claim 1, wherein the fat comprises from about 0 to 25% of the total formulation calories.

7. The oral nutritional formulations of claim 1, wherein the fiber comprises from about 0 to 5% of the total formulation calories.

8. The oral nutritional formulations of claim 1 wherein the carbohydrate source is selected from the group consisting of corn syrup solids, glucose, fructose, maltodextrin, and combinations thereof.

9. The oral nutritional formulations of claim 8 provided that when corn syrup solids or maltodextrin is used, that the corn syrup solids or maltodextrin be used in combination with either, glucose, or fructose, or combinations of, glucose or fructose, with the corn syrup solids or maltodextrin content of the combination being less than 40% of the total carbohydrate combination.

10. The oral nutritional formulations of claim 8 provided that when a combination of corn syrup solids and maltodextrin is used, that the corn syrup solids and maltodextrin be used in combination with either, glucose, or fructose, or combinations of, glucose or fructose, with the corn syrup solids and maltodextrin content of the combination being less than 40% of the total carbohydrate combination.

11. The oral nutritional formulations of claim 1 wherein the protein source is selected from the group consisting of whey protein, caseinate, soy protein, egg whites and combinations thereof.

12. The oral nutritional formulations of claim 1 wherein the fat source is selected from the group consisting of high oleic acid sunflower oil, canola oil, olive oil; safflower oil, cottonseed oil, corn oil, soybean oil and medium chain triglycerides.

13. The oral nutritional formulations of claim 1 wherein