

METHODS FOR STABILIZING LIQUID NUTRITIONAL PRODUCTS AND PRODUCTS SO STABILIZED

BACKGROUND OF THE INVENTION

The present invention relates generally to the treatment of patients and products or treating patients. More specifically, the present invention relates to enteral solutions or providing nutritional support to patients.

It is of course known to feed patients, requiring nutrition in a hospital or other health care setting (including a home), with enteral or parenteral nutrition solutions. Parenteral nutrition solutions include solutions that are infused intravenously into the patient through an IV system. Enteral products include products that are fed into a patient's gastrointestinal system typically through a nasogastric feeding tube.

There are a variety of different products that have been designed to provide enteral nutritional support to a patient. Some of these products are designed to provide all necessary nutrients. On the other hand, a number of the enteral products can also be used as supplements to a normal diet. Some of these products are directed to specific disease states while other products are more generic and broad based for providing nutritional support to patients who cannot obtain necessary nutrients through traditional means of eating food.

Depending on the indication of the enteral solution, the formulation may change. For example, certain patient populations may require increased protein levels. Likewise, certain patient populations may require hydrolyzed or non intact protein.

Nutritional enteral products include: Glytrol®; Nutri-Hep®; NutriVent®; Probalance®; RenalCal®; Crucial®; Peptamen®; Peptamen VHP®; NuBasics®; NuBasics VHP®; Entrition®; Nutren®; Reabliang; Reablian HN®; Replete®; Travasor®; Peptamen Jr.®; and Elementra®, all available from Nestlé Clinical Nutrition, Deerfield, Ill. A number of other manufacturers sell enteral nutrition products including Ross Laboratories a division of Abbott Laboratories, Mead Johnson, and Novartis.

In certain enteral products serum separation has been observed. This physical instability reduces the product's elegance. Further, it may create an adverse impression in the minds of some consumers regarding the product's quality and acceptability, even though such serum separation does not adversely affect the quality or efficacy of the product.

There is therefore a need for improving the stability of at least certain enteral solutions.

SUMMARY OF THE INVENTION

The present invention provides methods for stabilizing nutritional products including enteral solutions. Additionally, the present invention provides solutions so stabilized.

To this end, the present invention provides an enteral formula comprising a protein source, a lipid source, and carbohydrates including high amylose starch and guar gum.

In an embodiment, the protein source comprises approximately 10% to about 25% of the total calories.

In an embodiment, the lipid source comprises approximately 25% to about 50% of the total calories.

In an embodiment, carbohydrates comprise approximately 40% to about 60% of the total calories.

Preferably, the high amylose starch comprises at least approximately 50% amylose.

In an embodiment, high amylose starch and guar gum as a total comprise approximately 2.25% to about 7.5% of the total caloric content.

In an embodiment, high amylose starch comprises approximately 2% to about 6.5% of the total caloric content.

In an embodiment, the product includes xanthan.

In an embodiment, guar gum comprises 0.25% to about 1.0% of the total caloric content.

In an embodiment, the weight ratio of high amylose starch to guar gum is approximately 2.5:1 to 16:1.

In an embodiment, the product includes carrageenan.

In another embodiment the present invention provides an enteral product comprising a hydrolyzed whey protein source, a source of lipids, and a sufficient amount of a stabilizer to prevent serum separation, the stabilizer including high amylose starch and guar gum.

In an embodiment, the protein source comprises approximately 10% to about 25% of the total calories.

In an embodiment, the lipid source comprises approximately 25% to about 50% of the total calories.

In an embodiment, high amylose starch and guar gum as a total comprise approximately 2.25% to about 7.50% of the total caloric content.

In an embodiment, high amylose starch comprises approximately 2.0% to about 6.5% of the total caloric content.

In an embodiment, guar gum comprises 0.25% to about 1.0% of the total caloric content.

In an embodiment, the weight ratio of high amylose starch to guar gum is approximately 2.5:1 to 16:1.

In an embodiment, the source of lipids includes medium and long chain triglycerides.

In an embodiment, the product at 1500 Kcal provides at least 100% of the U.S. RDA of vitamins and minerals.

In an embodiment, the product has a caloric content of approximately 1.0 Kcal/ml.

In yet a further embodiment of the present invention, a method of stabilizing an enteral solution is provided. The method comprises the step of adding to an enteral solution a stabilizing amount of high amylose starch and guar gum.

Accordingly, an advantage of the present intention is to provide nutritional products including enteral solutions having greater stability.

A further advantage of the present invention is to provide a stabilizer system for nutritional products.

Still further, an advantage of the present invention is to provide nutritional products that have improved compatibility of ingredients, especially starches and gums.

Further, an advantage of the present invention is to provide an enteral solution including hydrolyzed whey protein having a stabilizing combination of starch and gum.

Moreover, an advantage of the present invention is to provide methods of stabilizing enteral solutions.