

DRY POWDERED NON-DAIRY FOOD COMPOSITION CONTAINING LIQUID FAT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is broadly concerned with dried, non-dairy food compositions which can be used in lieu of traditional dairy products. More particularly, the invention is concerned with dry non-dairy compositions which comprise finely divided liquid or pourable fat particles separately enrobed or encapsulated by a carbohydrate-containing matrix. In preferred forms, a protein-free matrix is employed having a multiple component emulsifier system, along with polyunsaturated liquid fat. This gives a hypoallergenic, dietetic composition which is stable in both hot and cold aqueous emulsions and has organoleptic properties essentially identical with those of conventional dairy counterparts.

2. Description of the Prior Art

Spray dried non-dairy food compositions such as dried milks and particulate coffee whiteners or cream substitutes have been available in the past. In the case of coffee whiteners, for example, a number of commercially available compositions are in widespread use both in the home and in restaurants or other institutions. Likewise, non-dairy milks which can be reconstituted with water have also been obtainable for similar purposes.

Notwithstanding the wide availability and significant commercial success of prior ersatz non-dairy products, a number of unresolved problems remain. For example, many of these products contain milk protein as a component thereof, thus making the products totally unsuitable for those having an intolerance for such protein.

In addition, such prior products have, without known exception, required the use of relatively high melting point fats or oils which are not liquid at room temperature. Such oils and fat are highly saturated, and are therefore not desirable from a dietetic standpoint. However, prior attempts at using relatively low melting point polyunsaturated oils or fat have been unsuccessful. These failures have stemmed from the inability to spray dry liquid fats or oils and successfully enrobe or encapsulate the fat particles with a matrix. Generally, it has been found that drying is difficult or impossible with liquid fat, or if drying is accomplished the products are very unstable in aqueous emulsion. A common defect in the case of attempts to make liquid fat dried coffee whiteners is that, simply put, they do not whiten coffee but rather the oil tends to coalesce and give a very unsatisfactory result.

Prior patents and publications of background interest include the following: U.S. Pat. Nos. Re. 25,264, U.S. Pat. Nos. 2,923,628, 1,444,812, 2,933,393, 3,716,378, 3,628,972, 3,592,940, 3,097,947, 2,645,579, 1,302,486, 2,832,686, 3,102,035, 1,220,010, 2,493,324, 2,657,142, 2,650,879, 3,223,532, 3,488,198, 3,695,889, Dairy-Like Formulations provided by Central Soya, Chemurgy Division, of Chicago, Ill., and articles entitled *The Role of Soy Proteins in Milk-like Products*, Parts I and II, presented at the 29th Annual Meeting of the Pennsylvania Approved Dairy Laboratory Directors Association, Apr. 23, 1968.

SUMMARY OF THE INVENTION

The present invention overcomes the difficulties outlined above and provides solid, dried, non-dairy food

products in particulate form which contain a quantity of liquid fat (i.e., fat which is liquid or pourable at room temperature). Broadly, a given food particle in accordance with the invention comprises a particle of fat having a diameter of no more than about three microns, and an encapsulating, carbohydrate-containing matrix around the fat particle in order to render the overall food particle stable in aqueous emulsion. Preferably, the matrix contains a water soluble carbohydrate material and an appropriate emulsifier or emulsifier system.

In particularly preferred forms, the liquid fat has a melting point of no more than about 90° F., and the fat particles have a diameter of less than about one micron. Also, the most preferred carbohydrate is selected from the group consisting of corn syrup and malto-dextrins thereof having a D.E. (Dextrose Equivalent) of from about 15 to 50.

Generally speaking, in order to meet the dictates of the present invention, the particulate, dried, fat-containing products must be stable in aqueous emulsion such that two separate tests are met: (1) a 25% by volume dispersion of the particles in water, when stored at 40° F. for 72 hours, exhibits no more than about 20% fat-water phase separation; and (2) an amount of the dry product sufficient to provide about 0.36 grams of fat, when dispersed in 50 ml. of black coffee at 175° F., gives a relative reflectance of at least 50%, using an Agron Model M-500A Reflectometer standardized in the red spectral mode, 640 m.u., with a 00 calibration disc for 0 and a 44 calibration disc for 100% relative reflectance. In the case of a coffee whitener, the amount may be relatively small, e.g., about 1 gram, whereas in a low fat synthetic dried milk a much greater amount would be needed to achieve the 0.36 grams of fat level.

The most preferred end use for products in accordance with the invention is as coffee whiteners or milk and cream substitutes. In practice, the liquid fat-containing dried products in accordance with the invention give relative reflectances essentially equal to conventional hard fat counterparts and have other organoleptic properties which are likewise virtually equal to or better than the conventional non-dairy products. Therefore, a product is provided which has all of the advantages of prior formulations while at the same time using dietetically advantageous polyunsaturated fat therein.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As noted above, the dried, solid, non-dairy food particles in accordance with the invention broadly include respective fat particles encapsulated by a carbohydrate-containing matrix in order to render the overall food product stable in aqueous emulsion. Referring particularly to the fat portion, the diameter of the fat particle should be no more than about three microns, and preferably less than about one micron. The fat most advantageously has a melting point of no more than about 90° F., and is taken from the group consisting of cottonseed, soybean, corn, peanut, safflower, sunflower, olive, rapeseed, coconut, palm kernel, palm, cocoa butter, sesame, sorghum, babassu, lard, tallow, butter fat, whale, herring menhaden, pilchard, sardine, halibut, synthetic mono-, di- and tri-glycerides, and mixtures thereof. More preferably, the fat is selected from the group consisting of the oils of cottonseed, soybean, corn, peanut, safflower, coconut, palm kernel, sesame and sorghum, and mixtures thereof.