FAT EMULSION PRODUCT AND PROCESS FOR PRODUCING THE SAME

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a dried non-dairy fat emulsion product suitable for use as a coffee whitener and to the method of producing the product. More particularly, the invention relates to a protein-free dried fat emulsion product, which, when reconstituted with an aqueous media, such as coffee, provides a stable oil-in-water emulsion food product.

2. Description of the Prior Art

In recent years, dried, non-dairy coffee whiteners have become of increasing importance in the food industry because of their ability to whiten coffee and their economy, taste, ease of handling and excellent shelf-life. Such dry, non-dairy coffee whiteners are prepared as an emulsion concentrate which is spray dried and, on addition to an aqueous media such as coffee or tea, form a reconstituted oil-in-water emulsion which whitens and flavors the beverage. Generally, such powdered whiteners comprise, on a dry weight basis, 25%–50% vegetable fat, 35%–65% carbohydrate (such as corn syrup solids, sucrose, etc.), 3%–12% protein, 1%–5% emulsifiers, 0.55–3% stabilizer and stabilizing salts, plus minor amounts of coloring and flavoring agents and anti-caking agents.

In such dry coffee whitener formulations, the vegetable fat or oil, which has a particle size of about 1–3 microns in diameter, provides whitening power, body and viscosity. The whitening effect is produced in coffee or tea primarily as a result of light reflected from the surface of finely emulsified fat globules. The carbohydrate acts as a carrier for the fat to retard coalescense of the fat and provides some sweetness effect. Emulsifiers, such as mono-and diglycerides, diacetyl tartaric acid esters of mono-and diglycerides, propylene glycol-monostearate, lecithin, and the like are incorporated to maintain the fat globules in dispersion. However, it has been found that while such conventional emulsifiers are effective in stablizing the liquid emulsion concentrate prior to the drying step, they are ineffective following drying procedures. Thus, in the production of a coffee whitener, a stable liquid emulsion concentrate containing fat or oil, water and conventional emulsifier can not be dried and reconstituted in coffee to form the same stable emulsion, for upon reconstitution a breakdown of the emulsion occurs as evidenced by separation of the fat and coalescense of the fat globules, with little or no whitening of the coffee.

This problem has been overcome heretofore by including in the liquid emulsion concentrate, a water dispersible protein, such as sodium caseinate or soy protein. The inclusion of protein in the liquid emulsion concentrate has been found to be necessary to stabilize the emulsion through the drying step, so that when the dried product is reconstituted in coffee, a stable emulsion is provided.

While this use of protein in the formulation has enabled dried coffee whiteners to be prepared having excellent stability and whitening, it is disadvantageous in some respects. In formulations which contain protein, it is also common to include in the products, stabilizers, such as carrageenin, alginates, guar gum, etc., and/or stabilizing salts, such as sodium citrate, tetrasodium pyrophosphate, etc. to improve the colloidal dispersibility of the protein. The inclusion of these materials, of course, increases the cost of the dried product. Moreover, while sodium caseinate is legally defined to be a non-dairy material, its inclusion in the emulsion makes the product unacceptable to some ethnic groups. The use of other water dispersible proteins, such as soy protein, has been less than satisfactory due to off-flavors, feathering of the protein in coffee and other problems. While the prior art has proposed a number of solutions in order to reduce or eliminate protein from dried coffee whiteners, none of these prior suggestions has been completely satisfactory.

SUMMARY OF THE INVENTION

It has now been discovered that a dried fat emulsion product having excellent stability and coffee whitening characteristics can be prepared without the use of protein by incorporating in the formulation a chemically modified dextrinized starch having a lipophilic character. Such chemically modified starches have been found to be effective in maintaining a stable emulsion subsequent to drying of the liquid emulsion concentrate so that protein may be eliminated from the formulation. Thus, a liquid emulsion concentrate containing water, vegetable fat or oil, carbohydrate, emulsifier and the chemically modified dextrinized starch having a lipophilic character is prepared and dried to provide a product which, upon reconstitution by addition to an aqueous media such as coffee or tea, disperses easily in hot liquids with no sign of fat "oiling off" or emulsion instability and which has a whitening effect in coffee equal or superior to conventional whiteners. The pH of this liquid emulsion concentrate must be maintained at about 4.0 or below prior to drying, in order for the chemically modified starch to effectively stabilize the emulsion through the drying step. One or more buffering salts are added to the dried emulsion concentrate to improve the flavor of the product as a coffee whitener.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

More specifically, the product of the present invention is a dry, stable, protein free fat emulsion product, which is provided by forming a liquid emulsion concentrate having a controlled pH and containing a fat or oil, an emulsifier and a chemically modified dextrinized starch having a lipophilic character, and drying the liquid emulsion concentrate. A wide variety of edible fats or oils may be used in the present invention. The fat or oil may be of animal or vegetable source, but should have a bland or neutral flavor and long term stability towards oxidation and the development of rancidity. Moreover, in formulating dried coffee whiteners it is generally preferred to use fats with a melting point of about 110° F.–115° F. so that a major portion of its triglycerides will remain in a solid state at the maximum temperatures usually encountered in handling, shipping and storage of the product. Fats and oils which may be used include partially or fully hydrogenated vegetable fats and oils such as, for example, cottonseed oil, coconut oil, corn oil, soybean oil, peanut oil, sunflower oil, palm kernel oil, and the like, and mixtures thereof, tallow and lard.

The amount of fat or oil in the dried product may vary from about 20% to 50% by weight, with levels of between about 25% to 50% by weight of the dried product being preferred.