

DRINK COMPOSITION**CROSS REFERENCE TO RELATED APPLICATIONS**

This is a continuation of co-pending application Ser. No. 700,198, filed on Feb. 11, 1985, now abandoned, which is also the parent application of co-pending application Ser. No. 06/899,252, filed Aug. 21, 1986.

BACKGROUND OF THE INVENTION

This invention relates to a composition for a beverage, more particularly in powder form. The composition according to the invention is intended to be mixed with a liquid to prepare a beverage which may be frothy at its surface, for example, with hot water and soluble coffee or with hot liquid coffee to obtain a kind of "cappuccino", or with a cocoa-flavoured beverage.

There are several powder-form products for whitening coffee, from powdered milk to products containing few, if any, fats and/or lactic proteins.

U.S. Pat. No. 4,438,147 in particular describes a process for making a powder-form composition comprising a non-lactic fat, a non-lactic carbohydrate and a foam stabilizer containing proteins, such as sodium caseinate.

The manufacture of products of this kind necessitates particular precautions to ensure thorough mixing with a liquid. They have to show good wettability, high solubility and high stability to heat so that they do not flocculate, particularly in the presence of hot coffee which is slightly acidic.

SUMMARY OF THE INVENTION

The present invention is based on the surprising observation that these requirements are satisfied particularly well when a powder-form composition of which the principal constituents are 0.2 to 28% of fats, 5 to 16% of proteins, 16 to 62% of lactose and, optionally, up to 60% of other carbohydrates has a ratio by weight of proteins to lactose of from 1:3.5 to 1:5.

By way of comparison, this ratio is of the order of 1:1.4 for cow's milk.

Experience has shown that, from the point of view of heat stability, there is no advantage in deviating too far from 1:4 for the protein:lactose ratio of lactic compositions whereas compositions containing some non-lactic ingredients are less sensitive to heat.

If necessary, the particles of the composition may have small cavities of which the gaseous contents are intended to be released during mixing with a liquid, producing a froth.

DESCRIPTION OF PREFERRED EMBODIMENTS

Providing the characteristic protein:lactose ratio of from 1:3.5 to 1:5 is obtained in the powder-form product, the process for making the composition according to the invention is no different in principle from the process used for making powdered milk, repeatedly described in the literature, or a coffee whitener of the type described in U.S. Pat. No. 4,438,147. To a solution of proteins (milk, caseinate) are added a stabilizing salt and, as required, lactose, sweet whey (from the coagulation of casein with rennet), lactic and/or vegetable fats, a carbohydrate such as sucrose, starch syrup, and if necessary, flavourings.

In aqueous solution, the stabilizing salt forms a buffer which neutralizes the mild acidity of the coffee during

dissolution of the product in an aqueous medium, which contributes towards preventing flocculation of the proteins. The stabilizing salt may be, for example, a citrate or a phosphate, preferably sodium hydrogen phosphate (Na_2HPO_4), which is added in aqueous solution, for example in a quantity of from 0.6 to 1% by weight, based on dry matter, in the case of a citrate or preferably in a quantity of from 0.3 to 0.5% by weight, based on dry matter, in the case of sodium hydrogen phosphate.

The aqueous composition thus obtained, which has a solids content of from 16 to 20% by weight, is pre-heated and then heated in a plate heat exchanger or by injection of steam with a dwell period and concentrated by evaporation to a solids content of from 46 to 60%. This concentration step may be followed by another heating step with a dwell period.

Finally, the concentrate is dried by spraying in a tower and post-dried in a fluidized bed, for example.

In cases where it is desired to obtain a composition intended for the preparation of a frothy beverage, a preferably inert gas, such as nitrogen, is injected into the concentrate before it is spray-dried which produces small cavities in the particles.

The gas is preferably injected into the concentrate under a low pressure, for example, of 3-4 bars, immediately ahead of a mixing pump and the concentrate/gas mixture is taken up by a high-pressure pump situated near the mixing pump which delivers the gasified concentrate, preferably under a pressure of from 40 to 80 bars, to the nozzle of the spray-drying tower.

To avoid premature bursting of the small cavities produced in the particles during the initial phase of the drying process, it is important to ensure that the stream of hot air in the drying tower is not too vigorous. The hot air stream is preferably broken up in the manner of a jet deflector by a suitable device, for example, a screen or grille fixed to the end of the air feed pipe at the head of the drying tower so that the air pressure decreases by about half at the spray nozzle for the concentrate, the vigorous primary air stream thus being converted into a plurality of small turbulent secondary air streams.

Because of the risk of coagulation, it is difficult to dry all the lactic proteins and the liquid coffee by spraying. To obtain a mixture thereof in powder form, the acid in the liquid coffee has to be neutralized before mixing with the milk and drying or alternatively the milk and the coffee both have to be mixed in powder form. The same precautions have to be taken with the composition according to the invention as with the milk. If it is desired to make a mixed composition with soluble coffee or soluble coffee substitute on an industrial scale, instant coffee in powder or agglomerate form is preferably used for mixing with the powder-form composition according to the invention by introduction into the spray-drying tower. In one preferred process, the instant coffee or soluble coffee substitute is introduced through the pipe which returns to the tower the fine particles recovered by cyclones, for example. The proportion by weight of instant coffee or soluble coffee substitute is preferably 18 to 30% of the total. In cases where the components are mixed in powder form, it may be of advantage to colour the composition according to the invention with coffee, for example, to give the powder-form mixture a more uniform colour.

The powder-form composition according to the invention preferably has a density of the order of 300 g