CLAIMS

1. A method for producing a concentrated product by a freeze-concentration method, which comprises:

an ice crystal generation step in which a milk component-containing fluid to be treated is cooled to generate ice crystals of said fluid to be treated in said fluid to be treated, and to form a mixed fluid of said ice crystals and a concentrated fluid in which said fluid to be treated is concentrated by generating said ice crystals; and

an ice crystal separation step in which said mixed fluid is separated into said concentrated fluid to be treated and said ice crystals by a crystal separation column to retrieve said concentrated fluid be treated.

2. The method for producing a concentrated product by a freeze-concentration method according to Claim 1, characterized in that a step of forming a mixed fluid of said ice crystals and a concentrated fluid in which said fluid to be treated is concentrated and a step of separating said mixed fluid into said concentrated fluid to be treated and said ice crystals to retrieve said concentrated fluid be treated are performed on the batch basis.

3. The method for producing a concentrated product by a freeze-concentration method according to Claim 1 or 2, characterized in that said ice crystal generation step and said ice crystal separation step following said ice crystal generation step are repeated one time or more than one time for said concentrated fluid to be treated that has been retrieved during said ice crystal separation step.

4. The method for producing concentrated products by a freeze-concentration method according to Claim 3, characterized in that the second or subsequent ice crystal generation step(s) is performed for new fluid to be treated that is obtained by adding a volume of said fluid to be treated equivalent to the volume of said ice crystals that have been separated during said immediately preceding ice crystal separation step to said concentrated fluid to be treated that has been retrieved during said immediately preceding ice crystal separation step.

5. The method for producing concentrated products by a freeze-concentration method according to any one of Claims 1 to 4, characterized in that said fluid to be treated is any one of raw milk, skimmed milk, fermented milk, lactic acid beverage, whey, and buttermilk.

6. The method for producing concentrated products by a freeze-concentration method according to any one of Claims 1 to 5, characterized in that more than 70% of aromatic components are retained compared with untreated product.

7. The method for producing concentrated products by a freeze-concentration method according to any one of Claims 1 to 6, characterized in that more than 70% of live useful microorganisms are retained compared with untreated product.