SUMMARY OF THE INVENTION

Various embodiments provide a method for preparing a whole soybean milk according to claim 1, a whole soybean milk according to claim 15, and a method for preparing a whole soybean milk product according to claim 18. Further embodiments are described in the dependent claims.

It is an object of the present invention to provide an economical and efficient method for preparing a whole soybean milk which has small particle diameters and shows no change in viscosity when stored for a long time.

It is a further object of the present invention to provide a whole soybean milk prepared by the above method.

To achieve the above first object, the present invention provides a method for preparing a whole soybean milk, comprising the steps of:

1) roasting and dehulling soybeans to obtain dehulled soybeans;

2) cooking dehulled soybeans to obtain cooked soybeans;

3) coarsely grinding the cooked soybeans to obtain a coarsely ground soybean liquid;

4) finely grinding particles of the coarsely ground soybean liquid in a cutting manner by using a mechanical grinding device to obtain a whole soybean liquid; and

5) homogenizing the whole soybean liquid to obtain the micro size of particles.

To achieve the above second object, the present invention provides a whole soybean milk prepared by the above method.

As a method of the present invention provides a whole soybean milk having small particle sizes based on a procedure simpler than pre-existing methods, time for preparing a whole soybean milk can be shortened. Further, as the whole soybean milk obtained by this method shows almost no change in viscosity when stored for a long time, its shelf life can be extended dramatically as compared to pre-existing whole soybean milk containing both soybean milk residue and soybean liquid, which shows viscosity increase over time.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a schematic view showing an example of a preparation process of the present invention.

FIGs. 2 and 3 show results of the particle diameter analysis of the soybean liquid after first and second micronization steps of the fine grinding process of the present invention, respectively.

What is claimed is:

1. A method for preparing a whole soybean milk having a viscosity ranging from 34 to 55 cP, comprising the steps of:

1) roasting and dehulling soybeans to obtain dehulled soybeans;

2) cooking the dehulled soybeans to obtain cooked soybeans;

3) coarsely grinding the cooked soybeans to obtain a coarsely ground soybean liquid;

4) finely grinding particles of the coarsely ground soybean liquid in a cutting manner by using a mechanical grinding device to obtain a whole soybean liquid; and

5) micro homogenizing the whole soybean liquid.

2. The method of claim 1, wherein the roasting of soybeans in the step 1) is carried out in a hot air fashion, semi-hot air fashion, flame fashion or far-infrared fashion.

3. The method of claim 2, wherein the flame fashion roasting is carried out using a drum roaster under the conditions in which the inside temperature of the drum roaster ranges from 150 to 240 ℃, the rotational speed of the drum roaster ranges from 20 to 40 rpm, the roasting time ranges from 4 to 12 minutes, and the input and output amounts of the soybeans range from 40 to 50 kg per minute.

4. The method of claim 2, wherein the hot air fashion roasting is carried out under the conditions in which the roasting temperature ranges from 150 to 200 ℃, the input rate of the soybeans ranges from 30 to 70%, the output rate of the soybeans ranges from 60 to 95%, and the roasting time ranges from 40 to 120 seconds.

5. The method of claim 2, wherein the far-infrared fashion roasting is carried out under the conditions in which the roasting temperature ranges from 180 to 230 ℃, and the roasting time ranges from 4 to 14 minutes.

6. The method of claim 1, wherein the cooking of the step 2) is carried out using hot water with a temperature of 91 to 99 ℃ for 3 to 10 minutes.

7. The method of claim 1, wherein the coarse grinding of the step 3) is carried

out by adding 2.4 to 10-fold by weight of water based on the weight of the cooked soybeans.

8. The method of claim 1, wherein the solid content of the coarsely ground soybean liquid of the step 3) ranges from 5 to 15%.

9. The method of claim 1, wherein the mechanical grinding device of the step 4) is Comitrol.

10. The method of claim 1, wherein the fine grinding of the step 4) comprises first and second micronization steps using Comitrol having 50 to 222 blades in which the distance between blades ranges from 0.001 to 0.2214 inch and the difference in depth between cutting surfaces of a blade and another blade immediately next thereto ranges from 0.0012 to 0.0237 inch.

11. The method of claim 10, wherein the first micronization step uses Comitrol having 212 blades in which the distance between blades is 0.005 inch and the difference in depth between cutting surfaces of a blade and another blade immediately next thereto is 0.0013 inch.

12. The method of claim 10, wherein the second micronization step uses Comitrol having 222 blades in which the distance between blades is 0.001 inch and the difference in depth between cutting surfaces of a blade and another blade immediately next thereto is 0.0012 inch.

13. The method of claim 1, wherein the fine grinding of the step 4) comprises first and second micronization steps using Comitrol having 172 to 241 blades in which the distance between blades ranges from 0.00043 to 0.606 inch and the difference in depth between cutting surfaces of a blade and another blade immediately next thereto ranges from 0.0001 to 0.042 inch.

14. The method of claim 1, wherein the step 5) comprises the steps of:

first micro homogenizing the whole soybean liquid obtained from the step 4) at

a pressure of 200 to 300 bar;

pasteurizing, cooling and sterilizing the obtained whole soybean liquid; and

second micro homogenizing the sterilized whole soybean liquid at a pressure of 150 to 300 bar.

15. A whole soybean milk having a viscosity ranging from 34 to 55 cP, prepared by any one of the methods of claims 1 to 14.

16. The whole soybean milk of claim 15, wherein the mean particle diameter of the whole soybean milk ranges from 25 to 35 μm.

~~17. The whole soybean milk of claim 15, wherein the viscosity of the whole soybean milk ranges from 34 to 55 cP.~~

~~18~~17. The whole soybean milk of claim 15, wherein the viscosity increase of the whole soybean milk is less than 12 cP when the whole soybean milk is stored in the form of a commercial product for 22 months at a temperature of 1 to 35 ℃.

~~19~~18. A method for preparing a whole soybean milk product, comprising the steps of mixing a whole soybean milk prepared by any one of the methods of claims 1 to 14 with sitologically acceptable foods or additives, and then stabilizing, filling, sterilizing, and cooling the resulting mixture.