With the method of the present disclosure it has become possible to prepare dairy gels by means of high isostatic pressure treatment with a substantially neutral or basic pH, a relatively high water content and without having to use coagulants or agents for lowering the pH. Furthermore, due to the improved properties of the dairy gels according to the present disclosure, it is possible to use them in a wide variety of applications, in particular food applications.

An aspect of the present disclosure relates to a method for preparing a dairy gel, comprising the steps of:

i) providing a liquid dairy composition comprising:

- a water content of 60 to 90% by weight;
- a pH of 6.5 or higher;
- a dairy protein content of 15 to 30% by weight, wherein at least 80% by weight of said dairy protein is casein; and wherein on a weight basis the ratio of total calcium to dairy protein is below 0.040; and

ii) subjecting the dairy composition to a high isostatic pressure treatment such that a dairy gel is formed, wherein the high isostatic pressure treatment is conducted by subjecting the dairy composition of step i) to a isostatic pressure of 100 to 1000 MPa.

Another aspect of the present disclosure relates to a dairy gel consisting of:

- a water content of 60 to 90% by weight;
- a dairy protein content of 15 to 30% by weight, wherein on a weight basis at least 80% of the dairy protein is casein;
- pH of 6.5 or higher;
- on a weight basis a ratio of total calcium to dairy protein below 0.040; and
- wherein on a weight basis less than 50% of any κ-casein present in the dairy gel is para-κ-casein.

An ~~first aspect~~ embodiment of the present disclosure relates to a method for preparing a dairy gel, comprising the steps of:

i) providing a liquid dairy composition comprising:

- a water content of 60 to 90% by weight;
- a pH of at least 6.5;
- a dairy protein content of 15 to 30% by weight, wherein at least 80% by weight of said dairy protein is casein; and wherein on a weight basis the ratio of total calcium to dairy protein is below 0.040; and

ii) subjecting the dairy composition to a high isostatic pressure treatment such that a dairy gel is formed.

As said, with the method according to the present disclosure it is possible to prepare dairy gels with a substantially neutral or basic pH, a relatively high water content and which gels are stable for a prolonged period of time. Furthermore, in order to prepare such gels no additives, such as coagulants or agents for lowering the pH are necessary. This is particularly advantageous for reasons that the use of additives in food products is becoming increasingly controversial.

Another ~~second aspect~~ embodiment of the present disclosure relates to dairy gels obtainable by the above mentioned method.

An ~~third aspect~~embodiment of the present disclosure relates to a dairy gel comprising:

- a water content of 60 to 90% by weight;
- a dairy protein content of 15 to 30% by weight, wherein on a weight basis at least 80% of the dairy protein is casein;
- pH of at least 6.5;
- on a weight basis a ratio of total calcium to dairy protein of below 0.040; and
- wherein on a weight basis less than 50% of any κ-casein present in the dairy gel is para-κ-casein.

Another embodiment ~~fourth aspect~~ of the present disclosure relates to a food product comprising or prepared from a dairy gel as described above.

DEFINITIONS

The term "*dairy gel*" as used herein has its normal scientific meaning and refers to a viscoelastic solid prepared from amongst others dairy proteins, i.e. a system which depending on the circumstances can flow like a viscous liquid and in others behave like an elastic solid (D.S. Horne *et al*, International Dairy Journal (1999), pp. 261-268)

The term "*milk*" as used herein has its normal scientific meaning and refers to the liquid produced by the mammary glands of mammals, such as bovines (e.g. cows), goats, sheep or camels.

The term "*skim milk*" as used herein has its normal scientific meaning and refers to a milk comprising a relatively low amount of fat, i.e. below 1% by weight of the milk.

The term "*dairy protein*" as used herein has its normal scientific meaning and refers to proteins present in milk from human or non-human mammals, such as bovines (e.g. cows), goats, sheep or camels.

The term "*protein*" as used herein has its normal scientific meaning and refers to a linear polypeptide comprising at least 10 amino acid residues.

The term "*total calcium*" as used herein has its normal scientific meaning and refers to the total amount of calcium (colloidal and non-colloidal) present in a milk composition.

The term "*high isostatic pressure treatment*" as used herein has its normal scientific meaning and refers to a treatment wherein an isostatic pressure of 100 to 1000 MPa is applied to a product, such as a milk composition, during a pre-defined period of time.

The term "*casein*" as used herein has its conventional meaning (Walstra et al., 2006) and comprises native casein and micellar casein, but does not refer to sodium caseinate, potassium caseinate or calcium caseinate.

The term "*coagulant*" as used herein has its normal scientific meaning and refers to enzymes or agents able to specifically split the Phe-Met bond of κ-casein.

CLAIMS

1. Method for preparing a dairy gel, comprising the steps of:
   i) providing a liquid dairy composition comprising:
   - a water content of 60 to 90% by weight;
   - a pH of 6.5 or higher;
   - a dairy protein content of 15 to 30% by weight, wherein at least 80% by weight of said dairy protein is casein; and wherein on a weight basis the ratio of total calcium to dairy protein is below 0.040; and
   ii) subjecting the dairy composition to a high isostatic pressure treatment such that a dairy gel is formed, wherein the high isostatic pressure treatment is conducted by subjecting the dairy composition of step i) to a isostatic pressure of 100 to 1000 MPa.

2. Method according to claim 1, wherein the dairy composition of step i) has a dairy protein content of 18 to 25% by weight.

3. Method according to claim 1 or 2, wherein on a weight basis at least 85% of the protein is casein, preferably at least 90% is casein, more preferably at least 95% is casein.

4. Method according to any of the previous claims, wherein on a weight basis the ratio of total calcium to dairy protein is lower than 0.035, preferably lower than 0.032.

5. Method according to any of the previous claims, wherein the dairy composition of step i) has been prepared by means of a membrane filtration treatment, preferably an ultrafiltration treatment and/or microfiltration treatment of milk.

6. Method according to any of the previous claims, wherein on a weight basis less than 50% of any κ-casein present in the liquid dairy composition is para-κ-casein, preferably less than 20% is para-κ-casein, more preferably less than 10% is para-κ-casein.

7. Method according to any of the previous claims, wherein the pH of the dairy composition of step i) is 6.5 to 8, preferably 7 to 8.

8. Method according to any of the previous claims, wherein the high isostatic treatment is conducted by subjecting the dairy composition of step i) to a isostatic pressure of ~~100 to 1000 MPa, preferably~~ 100 to 900 MPa, ~~more~~ preferably 150 to 500 MPa.

9. Method according to any of the previous claims, wherein the high isostatic pressure treatment is conducted with a duration of 0.1 seconds to 15 minutes, preferably 1 minute to 10 minutes.

10. Method according to any of the previous claims, wherein the high isostatic pressure treatment is conducted at a temperature of 5^0C to 80^0C, preferably 15^0C to 25^0C.

11. Method according to any of the previous claims, wherein before carrying out step ii) the dairy composition is packaged and wherein the high isostatic pressure treatment of step ii) is carried out on the packaged dairy composition.

12. Method according to any of the previous claims, wherein the dairy composition of step i) comprises further food ingredients, such as vitamins, fat, cream, coloring agents, flavoring agents, edible fibers, fruit, vegetables, cereals, chocolate, nuts, grains or a combination of any of these ingredients.

~~13. Dairy gel obtainable by the method according to any of the previous claims.~~

~~14.~~13. A dairy gel ~~comprising~~consisting of:

- a water content of 60 to 90% by weight;
- a dairy protein content of 15 to 30% by weight, wherein on a weight basis at least 80% of the dairy protein is casein;
- pH of 6.5 or higher;
- on a weight basis a ratio of total calcium to dairy protein below 0.040; and
- wherein on a weight basis less than 50% of any κ-casein present in the dairy gel is

para-κ-casein.

~~15.~~14. Dairy gel according to claim ~~14~~13, wherein on a weight basis the ratio of total calcium to dairy protein is lower than 0.035, preferably lower than 0.032.

~~16. Food product comprising or prepared from a dairy gel according to claim 13 or 14-15~~.