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Description**FIELD OF THE INVENTION**

The invention is in the field of dairy products and relates to a quark matrix  
5 which has an improved flavour and reduced sodium content, a method for its production,  
and its use in food products.

**PRIOR ART**

For the production of quark or fresh cheese – the two terms are used  
10 interchangeably in the following – skimmed milk is usually subjected to a heat treatment  
and the proteins contained are denatured.

By subsequently adding lactic acid bacteria and rennet the so-called  
curdling (phase reversal) of the milk is carried out. The casein coagulates and forms the  
15 technically-termed curd. After aging (8 to 20 h) the curd is stirred. This triggers the whey  
separation and the two phases are then separated in the separator. The liquid acid whey  
is processed in another way and the quark matrix is adjusted to the desired fat and protein  
content by adding cream.

20 Technical manufacturing processes using corresponding separation methods  
are dominant. A variety of method designs is currently possible by varying the separation  
conditions and technical modifications of the separators. The skimmed milk use with a  
protein content of the skimmed milk of 3.3 to 3.5 wt.% is in the range from 4.10 to 4.15  
kg skimmed milk per kilogram of low-fat quark or fresh cheese to be produced (4.10 to  
25 4.15 kg skimmed milk/kg low-fat quark), if the latter have 18% dry matter. This produces  
3.10 to 3.15 kg acid whey per kilogram of low-fat quark (3.10 to 3.15 kg acid whey/kg low-  
fat quark). The protein content reaches orders of magnitude of 12.6 to 12.8 wt.%.

In addition to the manufacturing processes characterised by separation,  
30 methods are also known in which the concentration of the fermented process milk is  
carried out by ultrafiltration. For example, it is known from **US 2003/0129275 A1** (LACT  
INNOVATION) that microfiltration and ultrafiltration steps can also be used in cheese and  
quark production. The use of microfiltration on skimmed milk for the production of cheese

and whey protein products is described, for example, in **US 2003/0077357 A1** (CORNELL RES FOUNDATION).

**EP 1752046 A1** (TUCHENHAGEN) discloses a method for the production of fermented milk products, in which process milk is fermented, the fermentation product is subjected to a microfiltration, and only the acidified retentate is further processed.

In the essay entitled "*The pre-concentration of milk by nanofiltration in the production of Quark-type fresh cheeses*" MUCCHATTO ET AL describe the impact of the application of a previously nanofiltered milk on the properties of quarks, which are produced from this nanofiltered milk. Preliminary tests of the nanofiltration method were carried out with aqueous solutions of NaCl, CaCl<sub>2</sub>, MgSO<sub>4</sub>, Na<sub>2</sub>SO<sub>4</sub> lactose and whole milk. The production route corresponds to the standard quark manufacturing process, wherein a retentate resulting from the nanofiltration of whole milk is used only instead of skimmed milk in the sense of the present application. [see. **LAIT VOL. 80 (1), pp. 43-50 (2000)**]

In **DEUTSCHE MILCHWIRTSCHAFT VOL 48 (2), pp. 36-41 (1997)** a method is disclosed for fresh cheese preparation, in which the skimmed milk is concentrated by nanofiltering. The milk is then heated at 80°C for seven minutes, then stirred into a selected culture combination at 30°C and then fermented for 14 to 16 hours. After the fermentation, the desired dry matter of the end product is adjusted by ultrafiltration or separation.

**EP 1364582 A1** relates to an acidified milk product, the essential component of which is milk and/or skimmed milk and/or whey. Specifically claimed are acidified milk products which are obtained from milk and/or whey starting products by removing monovalent ions and water by means of nanofiltration

A particular problem in connection with the production of fresh cheese is to produce matrices which are neutral in flavour. If skimmed milk is preconcentrated on a quark matrix by means of ultrafiltration and then acidified, the product has a very bitter flavour and is not acceptable to the senses. This sensory deviation is particularly induced by the presence of phosphates. Alkali metal ions, especially sodium, tend to give off a

metallic flavour. The methods of the prior art for concentrating unacidified skimmed milk to quark have so far not been able to quantitatively separate phosphates and alkali metal ions, so that amounts remain in the product such that impairment of the flavour cannot be prevented.

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Furthermore, in the conventional production of quark, acid whey occurs as a co-product, whose separation from the cheese curd is complicated and for which there are only limited uses.

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One way to improve the flavour properties is the use of certain starter cultures that contribute to masking bitter flavour perceptions (see **EP 2839748**, **EP 2839749 A1**, DMK), but do not alter the presence of these bitter substances, and of course do not solve the problem of the acid whey as a co-product. If it is required to separate the bitter substances – particularly in the context of products which are also low-sodium – this must be done differently.

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For example, it is proposed in **EP 2796051 A1** (DMK) to improve the flavour quality of fresh cheese or quark, by first subjecting skimmed milk to a coupled ultrafiltration and filtration and subjecting the permeate obtained thereby to a precipitation demineralisation, and combining the low-mineral filtrate with the protein-rich retentate from ultrafiltration before this mixture is then denatured, fermented and standardised. The disadvantage here, however, is that the separation of monovalent cations, especially sodium, does not take place completely and the resulting product therefore has residual bitterness. In addition, the precipitation of the calcium salts is technically complex and correspondingly expensive.

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The object of the present invention was therefore to provide a quark mixture with a reduced mineral content, in particular reduced sodium content (less than 50 ppm, preferably less than 10 ppm) and at the same time improved sensory and flavour properties specifically with regard to the teaching of the above-mentioned **EP 2796051 A1**, which is ready to be used and consumed directly without the addition of additives. At the same time, the corresponding manufacturing process is intended to avoid the production of acid whey as a waste product.

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**DESCRIPTION OF THE INVENTION**

A first subject of the invention relates to a quark matrix having a sodium content of less than 50 ppm and a dry matter of 15-20 wt.% and a protein content of 10-15% which is obtainable or is obtained by

- (a) subjecting raw milk to heat treatment, separating the cream,
- (b) subjecting the skimmed milk thus obtained to an ultrafiltration and/or a reverse osmosis, producing a retentate R1, which represents a dairy protein concentrate, and a permeate P1,
- (c) subjecting the permeate P1 to an electrodialysis step with a subsequent treatment using a cation exchanger, producing a diluate D1 reduced in salts,
- (d) combining the diluate D1 with the retentate R1,
- (e) subjecting the combination product thus obtained to heat treatment until denaturation sets in,
- (f) fermenting the denaturation product thus obtained by the addition of starter cultures and rennet, and
- (g) adjusting or standardising the fermentation product thus obtained to defined dry matter and protein contents.

Likewise provided by the present invention is a corresponding method for the production of a quark matrix, having a sodium content of less than 50 ppm comprising the following steps:

- (a) producing a skimmed milk by heat treatment of raw milk and separation of the cream;
- (b) Subjecting the skimmed milk thus obtained to an ultrafiltration and/or reverse osmosis, obtaining a retentate R1, which represents a dairy protein concentrate, and a permeate P1,
- (c) Subjecting the permeate P1 thus obtained to a subsequent treatment using a cation exchanger for obtaining a diluate D1 reduced in salts,
- (d) combining the diluate D1 with the retentate R1,
- (e) heat treating the combination product thus obtained until denaturation sets in,

(f) fermenting the denaturation product thus obtained by adding starter cultures and rennet, and

(g) Adjusting or standardisation of the fermentation product thus obtained to a defined dry matter and protein content.

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Surprisingly, it was found that the object is fully achieved extensively when skimmed milk is subjected to a combination of ultrafiltration (or reverse osmosis) and electrodialysis before the fractions thus obtained are re-mixed and further processed subsequently as described above.

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Electrodialysis has not been used in the dairy sector so far and is therefore not an obvious technology for cheese/fresh cheese production. Merely demineralising the starting milk by means of electrodialysis does not lead to the desired result, especially with regard to the reduction in the amount of acid whey. Only the combination of technologies represents the new technical teaching.

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In contrast to the combination of ultrafiltration, nanofiltration and precipitation, the method according to the present invention proves not only technically less complex and faster, surprisingly not only divalent but also monovalent ions are almost completely removed in the dialysis, which leads to products with significantly lower sodium content and at the same time improved flavour quality. The sodium values are typically in the range from 5 to 50 ppm.

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### SKIMMED MILK PRODUCTION

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For the production of the skimmed milk, first a separation of non-milk components takes place, and then skimming the fat content of approx. 4 wt.% from the raw milk. This usually takes place in a specific component, preferably a separator. Such components are sufficiently well known from the prior art. Separators from GEA Westfalia Separator GmbH are very common in the dairy industry, with which the two steps can be carried out individually or together.<sup>1</sup> Corresponding components are also described, for example, in **DE 10036085 C1** (Westfalia) and are well known to the person skilled in the

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<sup>1</sup> (<http://www.westfalia-separator.com/de/anwendungen/molkereitechnik/milch-molke.html>).

art, so that no explanations are required to carry out these method steps, since they are attributable to the general specialist knowledge.

The heat treatment of the raw milk is preferably carried out in heat exchangers, wherein special plate heat exchangers have proved to be particularly suitable. A temperature gradient is applied to the heat exchangers, but this is selected such that the raw milk is heated to a temperature of approximately 70 to 80°C and in particular approximately 72 to 74°C for a residence time of at least 20 and at most 60 seconds, preferably approximately 30 seconds.

### ULTRAFILTRATION AND REVERSE OSMOSIS

In the second method step, the skimmed milk is separated by means of an ultrafiltration into dairy protein concentrate, which accumulates as retentate, and a milk permeate.

The term ultrafiltration is understood to mean filtration through membranes with a pore size of  $< 0.1 \mu\text{m}$ , while filtration for pore sizes  $> 0.1 \mu\text{m}$  is commonly referred to as microfiltration. In both cases, it is purely physical, i.e. mechanical membrane separation processes which operate according to the principle of mechanical size exclusion: all particles in the fluids that are larger than the membrane pores are retained by the membrane. The driving force in both separation processes is the differential pressure between the inlet and outlet of the filter surface, which is between 0.1 and 10 bar. The material of the filter surface can consist of stainless steel, plastic, ceramic or textile fabric depending on the area of application. There are different types of filter elements: candle filters, flat membranes, spiral wound membranes, pocket filters and hollow fibre modules, all of which are basically suitable in the sense of the present invention.

The ultrafiltration is preferably carried out at temperatures in the range from approx. 10 to approx. 55, preferably 10 to 20°C, wherein the membranes preferably have a pore diameter in the range of approx. 1,000 to approx. 50,000 and preferably approx. 5,000 to approx. 25,000 Daltons. These are preferably so-called spiral wound membranes or plate and frame module modules made of polysulfone or polyethylene membranes.

An alternative to ultrafiltration is reverse osmosis. Here, the skimmed milk is dewatered using a semipermeable membrane, thereby increasing the concentration of the valuable milk proteins. The principle is to expose the system to a pressure higher than the pressure created by the osmotic tendency to concentration balance. This allows the molecules of the solvent to migrate against their "natural" osmotic direction of propagation. The method pushes them into the compartment, in which dissolved substances are less concentrated. Milk has an osmotic pressure of less than 2 bar, the pressure used for the reverse osmosis of milk is 3 to 30 bar, depending on the membrane used and the system configuration. The osmotic membrane, which only allows the carrier liquid (solvent) to pass through and retains the dissolved substances (solutes), must be able to withstand these high pressures. If the pressure difference more than compensates for the osmotic gradient, the solvent molecules pass through the membrane like a filter, while the milk proteins are retained. In contrast to a classic membrane filter, osmosis membranes do not have continuous pores. The reverse osmosis is preferably carried out at a temperature in the range from 10 to 55, preferably 10 to 20°C using semipermeable membranes which have a cut-off of 0 to 1,000 Daltons.

### ELECTRODIALYSIS

Electrodialysis is an electrochemically-driven membrane process in which ion exchange membranes are used in combination with an electrical potential difference to separate ionic species of uncharged solvents or impurities. For this purpose, the space between two electrodes is separated in an electrodialysis separator by a stack of alternating anion and cation exchange membranes. Each pair of ion exchange membranes forms a separate "cell". In technical systems, these stacks consist of more than two hundred membrane pairs. If an electrical direct voltage is applied to the electrodes, the anions migrate to the anode. The anions can simply pass through the positively charged anion exchange membranes, but are stopped at the respectively closest negatively charged cation exchange membrane. Because the same thing happens (of course with the opposite sign) with the cations, the net effect of electrodialysis is an accumulation of salts in the cells with an odd number (anion exchange membrane/cation exchange membrane), while the cells with an even number (cation exchange membrane/anion exchange membrane) become poor in salt. The solutions with increased salt

concentration are combined to form the concentrate, while the low-salt solutions form the diluate. It is recommended that the diluate is finally treated with a cation exchanger ("polisher") and, in particular, that sodium ions introduced with the dialysis are separated again.

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By means of the electrodialysis, diluates are obtained which have a sodium content reduced up to 95 wt.% with respect to the permeate used.

### DENATURATION

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In the following step, the protein-rich fraction from the ultrafiltration, i.e. the retentate, is combined with the diluate from the electrodialysis and is subjected to a heat treatment. The denaturation now taking place can be carried out in a manner known per se, namely over a period of approx. 5 to approx. 10 minutes and preferably approx. 6 minutes and temperatures of approx. 85 to approx. 90°C and in particular approx. 88°C.

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### FERMENTATION AND STANDARDISATION

The fermentation of the denatured precursor can be carried out by the known methods of the prior art. Suitable starter cultures, preferably lactic acid bacteria, and rennet are added. Probiotic bacteria of the type *Bifido bacterium lactis* B12 or *Lactobacillus acidophilus* and mesophilic bacteria such as *Lactococcus lactis* or *Leuconostoc cremoris* are particularly suitable as starter cultures.

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The two following cultures consisting of 5 or 3 probiotic bacteria are also particularly preferred, namely:

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#### Mixture 1

- (i-1) *Streptococcus thermophilus*,
- (i-2) *Leuconostoc species*,
- (i-3) *Lactococcus lactis subsp. lactis biovar diacetylactis*,
- (i-4) *Lactococcus lactis subsp. lactis* and
- (i-5) *Lactococcus lactis subsp. cremoris*, and

30

#### Mixture 2

- (ii-1) *Streptococcus thermophilus*,
- (ii-2) *Lactococcus lactis subsp. lactis* and
- (ii-3) *Lactococcus lactis subsp. cremoris*

5                   The starter cultures preferably contain

- approx. 10 to approx. 90 wt.%, preferably approx. 25 to approx. 75 wt.% and

in particular approx. 40 to approx. 60 wt.% of the mixture (i) and

- approx. 90 to approx. 10 wt.%, preferably approx. 75 to approx. 25 wt.% and

in particular approx. 60 to approx. 40 wt.% of the mixture (ii)

10               with the proviso that the quantities stated add up to 100 wt.%.

                  Starter cultures are particularly preferred which contain

- approx. 40 to approx. 60 wt.% of the mixture (i) and
- approx. 60 to approx. 40 wt.% of the mixture (ii)

15               with the proviso that the quantities add up to 100 wt.%.

                  In a further preferred embodiment, the five microorganisms which form the mixture (i) and the three micro-organisms which form the mixture (ii), respectively contain approximately the same amounts. In this context, “approximately the same” is to

20               be understood to mean that in mixture (i) the five microorganisms are respectively contained in amounts of  $20 \pm 5$  wt.% and in mixture (ii) the three microorganisms are respectively contained in amounts of  $33 \pm 5$  wt.%. Instead of using the two commercially available preparations (i) and (ii) together, it is of course also possible in principle to use the five microorganisms individually and then to mix them in such a way that a starter

25               culture mixture is obtained with which the flavour-improved quark products are obtained. Such starter cultures then preferably contain

- approx. 20 to approx. 30 wt.% *Streptococcus thermophilus*,
  - approx. 5 to approx. 15 wt.% *Leuconostoc species*,
  - approx. 5 to approx. 10 wt.% *Lactococcus lactis subsp. lactis biovar diacetylactis*,
- 30
- approx. 20 to approx. 30 wt.% *Lactococcus lactis subsp. lactis*,
  - approx. 20 to approx. 30 wt.% *Lactococcus lactis subsp. cremoris*, and
- with the proviso that the quantities stated add up to 100 wt.%.

Starter cultures are particularly preferred which contain

- 25 wt.% *Streptococcus thermophilus*,
- 12 wt.% *Leuconostoc species*,
- 13 wt.% *Lactococcus lactis subsp. lactis biovar diacetylactis*,
- 25 wt.% *Lactococcus lactis subsp. lactis*,
- 25 wt.% *Lactococcus lactis subsp. Cremoris*

All of the microorganisms mentioned are freely available commercially.

The temperature at which the fermentation is carried out depends on the temperature range which is optimal for the microorganisms respectively used; typically the temperature is in the range of approx. 18 to approx. 35°C and preferably approx. 30°C.

The quark matrix obtained after the fermentation is then, for example, adjusted to the desired content of dry matter and proteins by adding cream (such as the fraction, which both production of the skimmed milk is obtained). The dry matter content is preferably approx. 15 to approx. 20 wt.% and in particular approx. 18 wt.%. The protein content can be approx. 10 to approx. 15 wt.%, and preferably approx. 12 wt.%.

#### INDUSTRIAL APPLICABILITY

Another object of the present invention relates to the use of the quark matrices according to the present invention in food products. This is to be understood to mean that the matrices as such form part of the food, for example a fresh cheese preparation or a quark dish, or are used as an ingredient in the course of the production of the food, for example in the production of quark cakes.

## EXAMPLES

**COMPARATIVE EXAMPLE V1**

4,000 kg of skimmed milk were treated at 88°C for 6 min and the proteins contained  
5 were denatured. Lactic acid bacteria according to mixture (i) and rennet were added to  
the mixture, and the mixture was aged at 30°C for approx. 18 h and then stirred. The  
fermentation product was then placed in a centrifuge and approx. 3.2 kg of acid whey was  
separated off as a liquid component. The remaining quark mixture (approx. 800 kg) was  
adjusted to a fat content of 40 wt.% in the dry matter and a protein content of 12 wt.%  
10 by adding cream.

**COMPARATIVE EXAMPLE V2 (analogous to EP 2796051 A1)**

4,000 kg of skimmed milk were subjected to ultrafiltration with a spiral  
wound membrane (cut-off 25,000 Daltons) at 20°C. The protein-rich retentate was  
15 separated off and the permeate was subjected to nanofiltration with a spiral wound  
membrane at 20°C (cut-off 500 Daltons). Sodium and potassium salts were separated off  
with the permeate. The retentate was then treated by adding an aqueous calcium chloride  
solution which had been adjusted to pH = 6 with NaOH, and the phosphates were  
precipitated as calcium phosphate. The permeate thus obtained was combined with the  
20 protein-rich retentate from the first step, treated for 6 min at 88°C and the proteins  
contained were denatured. The mixture was mixed with lactic acid bacteria according to  
mixture (i) and rennet and stirred at 30°C for approx. 2 h. The fermentation product was  
then placed in a centrifuge and the acid whey separated as a liquid component. The  
remaining quark mixture was adjusted to a fat content of 40 wt.% in the dry matter and a  
25 protein content of 12 wt.% by adding cream.

**EXAMPLE 1**

4,000 kg of skimmed milk was subjected to ultrafiltration with a spiral wound  
membrane (cut-off 25,000 Daltons) at 20°C. The protein-rich retentate was separated off  
30 and the permeate was subjected to electrodialysis at 20°C with subsequent treatment  
using a cation exchanger. The diluate thus obtained was combined with the protein-rich  
retentate from the first step, treated for 6 min at 88°C and the proteins contained were  
denatured. The mixture was mixed with lactic acid bacteria according to mixture (i) and

rennet and stirred at 30°C for approx. 2 h. The fermentation product was then placed in a centrifuge and the acid whey separated as a liquid component. The remaining quark mixture was adjusted to a fat content of 40 wt.% in the dry matter and a protein content of 12 wt.% by adding cream.

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**TASTING**

The quark matrices were stored for 24 hours in a refrigerator at 10°C, then adapted for 5 minutes to the ambient temperature and then the flavour and sensory qualities were judged by 5 examiners, wherein the scale of (1) = "slightly present" to (5) = "pronounced" was used. The sodium content of the products was also determined. The results are summarised in **Table 1**. The average values of the tasting are given. Example 1 is according to the present invention, Examples V1 and V2 serve for comparison.

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**Table 1**

Tasting results

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|                                  | V1             | V2  | 1   |
|----------------------------------|----------------|-----|-----|
| <i><b>Flavour assessment</b></i> |                |     |     |
| - bitter                         | 4.0            | 2.5 | 1.5 |
| - sandy                          | 4.0            | 2.5 | 1.5 |
| - fresh                          | 2.0            | 4.0 | 4.5 |
| <i><b>Sensory assessment</b></i> |                |     |     |
| - creamy                         | 2.5            | 4.0 | 4.5 |
| - soft                           | 2.5            | 4.0 | 40  |
| <i><b>Na content [ppm]</b></i>   | Not determined | 145 | 34  |

20

The product according to the present invention is not distinguished from the closest prior art by the fact that it has a sodium content reduced by more than ¾, but also by the fact that in the tasting it is perceived as less bitter and less sandy and also tends to be fresher and creamier.

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The methods according to Examples 1 and V1 and V2 are again schematically explained in **Figure 1** below. The abbreviations have the following meaning:

30

T = Heat treatment (denaturation)

|   |    |                    |
|---|----|--------------------|
|   | FM | = Fermentation     |
|   | SP | = Separation       |
|   | ST | = Standardisation  |
|   | UF | = Ultrafiltration  |
| 5 | NF | = Nanofiltration   |
|   | DM | = Demineralisation |
|   | MX | = Mixing           |
|   | ED | = Electrodialysis  |

**Patentkrav**

**1.** Kvarkgrundmasse med et natriumindhold på mindre end 50 ppm og et tørstofindhold på 15 til 20 vægtprocent og et proteinindhold på 10 til 15 vægtprocent, opnået ved

- 5           (a) at råmælk underkastes en temperaturbehandling og fløden fraskilles,  
             (b) at den således opnåede skummetmælk underkastes en ultrafiltrering  
             og/eller en omvendt osmose og dermed fremstilles et retentat R1, som  
             repræsenterer et mælkeproteinkoncentrat, og et permeat P1,  
             (c) at permeatet P1 underkastes en elektrodialyse med en efterfølgende  
10           kationbytterbehandling og dermed fremstilles et diluat D1,  
             (d) at diluatet D1 kombineres med retentatet R1,  
             (e) at det således opnåede kombinationsprodukt underkastes  
             temperaturbehandling, indtil denaturering indtræder,  
             (f) at det således opnåede denatureringsprodukt gennem tilsætning af  
15           starterkulturer og osteløbe fermenteres, og  
             (g) at det således opnåede fermenteringsprodukt indstilles til et defineret  
             tørstof- og proteinindhold.

**2.** Fremgangsmåde til fremstilling af en kvarkgrundmasse med et natriumindhold  
20 på mindre end 50 ppm, omfattende følgende trin:

- (a) at fremstille en skummetmælk ved temperaturbehandling af en råmælk  
             og at fraskille fløden;  
             (b) at underkaste den således opnåede skummetmælk for en ultrafiltrering  
             og/eller omvendt osmose til opnåelse af et retentat R1, som repræsenterer  
25           et mælkeproteinkoncentrat, og et permeat P1,  
             (c) at underkaste det således fremstillede permeat P1 en elektrodialyse  
             med en efterfølgende kationbytterbehandling til opnåelse af et diluat D1,  
             (d) at kombinere diluatet D1 med retentatet R1,  
             (e) at temperaturbehandle det således fremstillede kombinationsprodukt  
30           indtil denaturering indtræder,

(f) at fermentere det således fremstillede denatureringsprodukt ved tilsætning af starterkultur og osteløbe, og

(g) at indstille det således fremstillede fermenteringsprodukt til et defineret tørstof- og proteinindhold.

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**3.** Fremgangsmåde ifølge krav 2, **kendetegnet ved, at** ultrafiltreringen udføres med membraner, som har en selektivitet (cut-off) fra 1.000 til 50.000 dalton.

**4.** Fremgangsmåde ifølge kravene 2 og/eller 3, **kendetegnet ved, at**  
10 ultrafiltreringen udføres med spiralviklingsmoduler og/eller plade-ramme-moduler.

**5.** Fremgangsmåde ifølge mindst et af kravene 2 til 4, **kendetegnet ved, at** ultrafiltreringen udføres ved en temperatur i området fra 10 til 55 °C.

15 **6.** Fremgangsmåde ifølge mindst et af kravene 2 til 5, **kendetegnet ved, at** den omvendte osmose udføres med semipermeable membraner, som har en selektivitet (cut-off) fra 0 til 1.000 dalton.

**7.** Fremgangsmåde ifølge mindst et af kravene 2 til 6, **kendetegnet ved, at** den  
20 omvendte osmose udføres ved en temperatur i området fra 10 til 55 °C.

**8.** Fremgangsmåde ifølge mindst et af kravene 3 til 7, **kendetegnet ved, at** kombinationsproduktet af diluatet D1 og retentatet R1 i løbet af et tidsrum fra 5 til 10 min underkastes en varmebehandling fra 85 til 90 °C og derved  
25 denatureres.

**9.** Fremgangsmåde ifølge mindst et af kravene 2 til 8, **kendetegnet ved, at** der tilsættes kulturer og osteløbe til denatureringsproduktet ved 25 til 35 °C.

30 **10.** Fremgangsmåde ifølge mindst et af kravene 2 til 9, **kendetegnet ved, at** der anvendes kulturer, som er en af de to følgende blandinger 1 eller 2:

Blanding 1

(i-1) *Streptococcus thermophilus*,

(i-2) *Leuconostoc species*,

(i-3) *Lactococcus lactis subsp. lactis biovar diacetylactis*,

5 (i-4) *Lactococcus lactis subsp. lactis* og

(i-5) *Lactococcus lactis subsp. cremoris*, og

Blanding 2

(ii-1) *Streptococcus thermophilus*,

(ii-2) *Lactococcus lactis subsp. lactis* og

10 (ii-3) *Lactococcus lactis subsp. Cremoris*

**11.** Fremgangsmåde ifølge mindst et af kravene 2 til 10, **kendetegnet ved, at** fermenteringsproduktet indstilles til et tørstofindhold på 15 til 20 vægtprocent og et proteinindhold på 10 til 15 vægtprocent.

15

**12.** Fremgangsmåde ifølge mindst et af kravene 2 til 11, **kendetegnet ved, at** fermenteringsproduktet indstilles gennem tilsætning af en del af flødefractionen fra trin (a).

20 **13.** Anvendelse af kvarkgrundmassen ifølge krav 1 i et levnedsmiddelprodukt.

FIGURE (1/1)

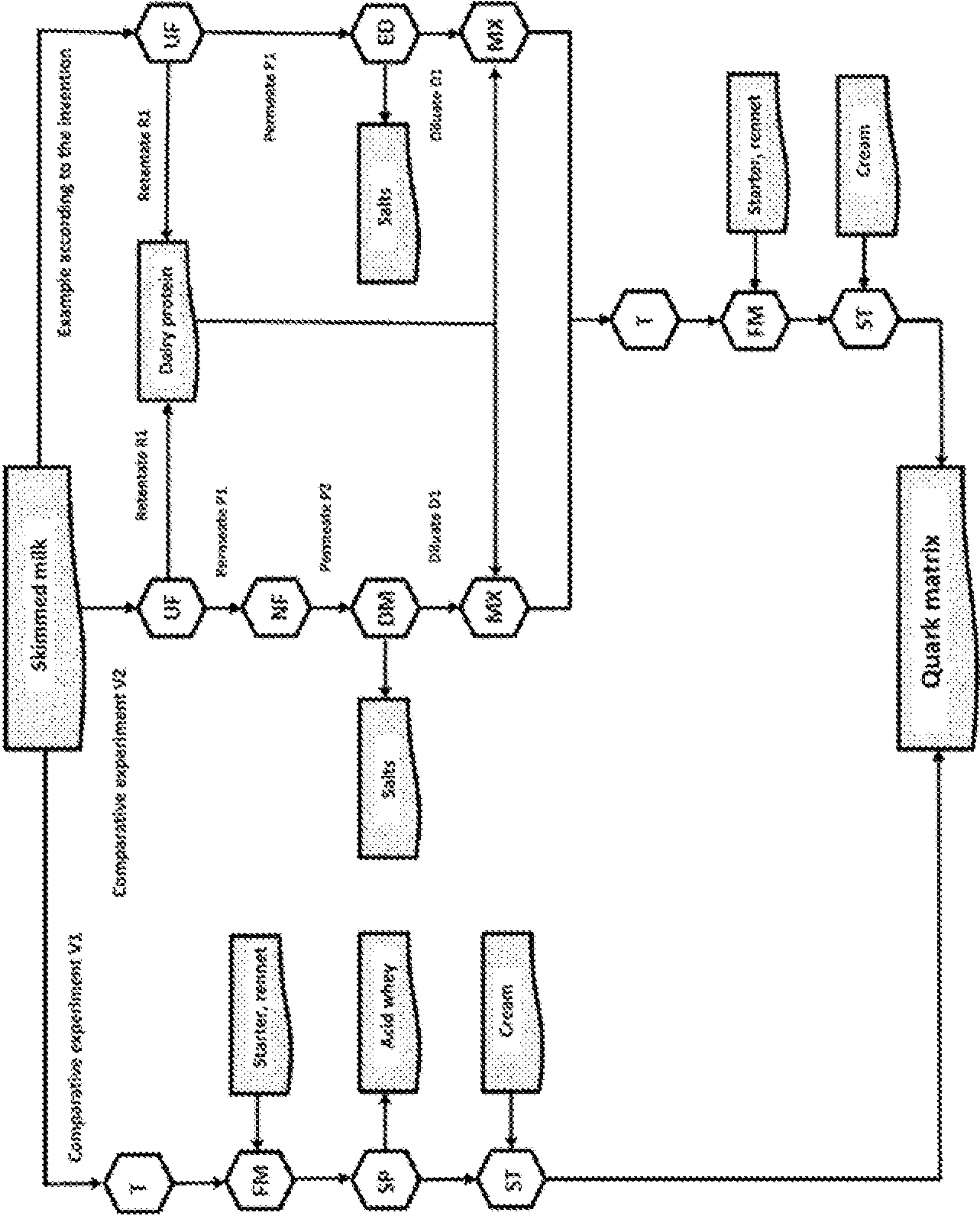


Figure 1/1