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(21) International Application Number: PCT/NL95/00396 (22) International Filing Date: 21 November 1995 (21.11.95) (30) Priority Data: 9401958 23 November 1994 (23.11.94) NL (71) Applicant (for all designated States except US): FRIESLAND BRANDS B.V. [NL/NL]; Pieter Stuyvesantweg 1, NL-8937 AC Leeuwarden (NL). (72) Inventors; and (75) Inventors/Applicants (for US only): SCHAAFSMA, Anne [NL/NL]; Achlumerstraat 5, NL-8913 GL Leeuwarden (NL). GLAS, Cornelis [NL/NL]; Woelwijk 3, NL-9255 KE Tietjerk (NL). (74) Agent: SMULDERS, Th., A., H., J.; Vereenigde Octrooibureaux, Nieuwe Parklaan 97, NL-2587 BN The Hague (NL).		(81) Designated States: AL, AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, LS, MW, SD, SZ, UG). Published <i>With international search report.</i>
(54) Title: MILK PRODUCT ENRICHED WITH GROUND EGGSHELL		
(57) Abstract <p>The invention relates to the use of aseptic or sterile fine ground eggshell in foods based on milk products. As a result, products of good taste are obtained, which are enriched with calcium and which give improved calcium absorption and retention of the total calcium fraction compared with milk product-based food products enriched with calcium from other calcium sources.</p>		

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Title: Milk product enriched with ground eggshell.

This invention relates to foods based on milk products, which foods have an increased calcium content.

It is generally known that milk products make an essential contribution to the calcium supply of man. When milk products
5 are used as the only calcium source, however, a considerable amount of this calcium source must be consumed. In order to ingest the recommended daily dose of calcium, it would be necessary, for instance, to drink 1 to 1.25 liters of milk.

There is a large group of people who consume only few
10 dairy products. In addition, partly as a consequence of the proportional increase of the ageing population, there is an increase in the number of people for whom it is important to take in sufficient calcium to prevent physical ailments caused by a deficiency of calcium ions. One of these physical ailments
15 is osteoporosis.

In the light of the above, there is a need for dairy products which are enriched with calcium.

Accordingly, the object of the present invention is to provide milk product-based foods with an increased calcium
20 content, which foods are intended to prevent well-known problems associated with a low calcium intake. In particular, the object of the invention is to prepare tasty, calcium-enriched dairy products which are properly absorbable into the body, in order to guarantee a high calcium intake from a
25 preventive, prophylactic point of view.

Dairy products having an increased calcium content are already known, for instance from European patent application
0 449 354. These known dairy products are enriched with
30 inorganic calcium salts, such as CaCO_3 , CaCl_2 , $\text{Ca}(\text{OH})_2$, and $\text{Ca}_3(\text{PO}_4)_2$ or organic calcic compounds, such as calcium gluconate, calcium citrate, calcium lactate, calcium malate, calcium ascorbate, and calcium glycerophosphate, as well as mixtures thereof.

In accordance with the invention, it has now surprisingly been found that when fine ground eggshell is used as calcium source for dairy products, a product is obtained which gives improved calcium absorption and retention of the total calcium fraction in the consumer's body compared with the known dairy products enriched with calcium from other calcium sources.

In general, for preventive use of ground eggshell a daily intake of approximately 3 g egg shell is recommended.

Accordingly, the invention relates to a milk product-based food which is supplemented with aseptically obtained and/or sterilized or low-germ fine ground eggshell.

Methods of preparing the type of ground eggshell which is used in the products according to the present invention are known. In this connection, in particular explicit reference is made to European patent application 0 347 899, U.S. Patent 3,558,771 and JP-60-259160. Although in fact ground eggshell originating from all species of birds can be used, the ground eggshell is preferably prepared from the shells of chicken eggs. A typical analysis of ground eggshell derived from chicken eggs comprises about 38% calcium, 0.4% magnesium and 0.1% phosphorus. The calcium is substantially present in the form of CaCO_3 .

EP-A-0 347 899 discloses pharmaceutical compositions for the treatment of diseases or ailments caused by calcium deficiency. While the object of the present invention is to provide a prophylactically active product, EP-A-0 347 899 is directed to more medical applications. In that patent application it is stated that the product manufactured according to the known method is most effective in powder form and is preferably ingested orally. It does not teach anything from which a skilled person might infer that the use of the above-described eggshell product or in combination with dairy products leads to improved calcium absorption and retention of the total calcium fraction.

Neither does JP-60-259160 contain such a teaching. This Japanese publication describes the fortification of bakery raw materials or raw materials for ground marine products to offer

optimum processed foods for growing children, adolescents or pregnant and nursing mothers.

U.S. Patent 3,558,771 utilizes ground eggshell as wound-healing agent which is applied topically. Oral use in whatever
5 form and for whatever purpose is neither mentioned nor suggested.

Because of the nature of the material to which the eggshell product is to be added, it is essential that aseptically obtained and/or sterile or low-germ ground eggshell
10 be added. To that end, the ground eggshell need only be treated physically. Chemical treatments such as contacting the eggshells with strongly alkaline and/or oxidative agents as is prescribed, for instance, in Canadian patent specification 728,606, and in JP-53-44662, are not necessary, and are even
15 undesired for not leading to optimal results and, in addition, considering the additional process steps. The ground eggshell used in accordance with the invention is obtained under aseptic conditions and/or while killing the germs by thermization.

The milk product enriched with calcium from ground
20 eggshell in accordance with the invention has a relatively high calcium concentration or calcium density. For instance, it is possible to increase the calcium content in whole milk to such an extent that an adult need only consume 500-700 ml milk, rather than about 1-1.25 liters, to achieve the required daily
25 calcium intake. Milk dry matter contains 1.2% calcium, 0.1% magnesium and 1% phosphorus, the greater part of the calcium being present colloiddally in the form of phosphates. In milk, amounts of about 3 g ground eggshell per 40 g dry matter can be added in order to obtain a calcium-enriched product of good
30 taste.

In fact, the amount of ground eggshell that can be used in the products according to the invention depends on the consistency of the product to be enriched and on the mouthfeel which the enriched product is required to possess. For
35 instance, structured or more viscous milk products, such as yoghurt, fresh cheese, spreads, pudding, mousses, custard and cheese, will contribute to preventing the relatively heavy

ground eggshell from settling. Further, ground eggshell should not be added in such an amount as to give rise to a more or less dry mouthfeel. This amount of ground eggshell, too, depends on the product. For instance, in fresh cheese the
5 mouthfeel will change considerably less rapidly by the addition of a large amount of ground eggshell than in whole milk. The above aspects are moreover affected by the fineness of the ground eggshell.

As already mentioned above, it has been found that ground
10 eggshell leads to improved calcium absorption and retention of the total calcium fraction. This has been demonstrated on the basis of a comparison between the apparent faecal digestibility coefficients for ground eggshell and calcium carbonate as found in piglets. As is well-known to those skilled in the art (see,
15 for instance: Swine in biomedical research. Volumes 1, 2 and 3. Plenum Press, New York, 1986. Ed. M.E. Tumbleson), piglets are suitable animal models for human food research. All this is further elaborated in Example 8 in particular.

In a preferred embodiment, the product according to the
20 invention is also enriched with a magnesium source, such as a salt. Magnesium contributes to the maintenance of a slightly higher pH of the extracellular fluids in the body. Because of this somewhat higher pH, calcium phosphate salts from bone tissue will go into solution less rapidly. From the results of
25 Example 8 (wide infra) it follows that magnesium digestibility is higher with ground eggshell as with another calcium source.

Although ground eggshell already contains magnesium ions, additional magnesium sources, e.g. Mg-containing salts, have to be added to the eggshell-enriched dairy products in order to
30 achieve a desired physiological Mg/Ca ratio of 1:3 to 1:12, *inter alia* with a view to optimum calcium retention.

Milk products in combination with eggshell are described in JP-61-199762 and JP-59-91861. These prior art documents do, however, not point to any improved calcium absorption and/or
35 -retention obtained from this specific combination. Furthermore, there is no indication in these documents from

which a skilled person would deduce a specific role of magnesium in bone metabolism.

In fact, JP-61-199762 focuses on the specific effect of vitamin K in the absorption of calcium, while dry milk is presented as source of essential amino acids.

JP-69-91861 relates to the combination of the amino acid glycine, citric acid, a lactic-acid-rich milk fraction and eggshells or oyster shells - as well as absorbable calcium granules.

Advantages are moreover gained when, with a view to good calcium retention, vitamin D or vitamin-D-rich raw material, such as fishliver oil, is added to the ground eggshell enriched dairy product. Also, lactose, a fluoride-, vanadium-, boron-, silicium-ion source or vitamin sources such as A, K, C can positively affect the maximum effect of the calcium enrichment.

The milk products that can be enriched according to the invention are liquid products, which may or may not be in concentrated, structured, highly viscous and/or fermented form.

Structured or more viscous milk products, such as yoghurt, fresh cheese, spreads, pudding, mousses, custard and cheese, contribute, as stated, to non-settlement of the ground eggshell.

The milk product-based product according to the invention can moreover be brought into powdered form.

Suitable milk raw materials for the preparation of the products according to the invention comprise whole milk, low-fat milk, skim milk, cream, whey and buttermilk. Derivatives thereof, such as caseins, casein phosphopeptides, whey proteins, lactose, desalted whey products, milk protein hydrolysates, milk fat fractions and butter oil, as well as the products mentioned in powder form, can also be used as raw material.

It is further possible to add known additives to the ground eggshell-enriched milk products, for instance microingredients such as vitamins, minerals, flavors, amino acids (such as lysine, arginine, glycine, cysteine, methionine), binders, emulsifiers, antioxidants, additional

sugars, vegetable fats or proteins, dextrans, dietary fibers, etc.

The invention will now be explained in more detail in and by the examples below. Unless otherwise stated, percentages and parts are always based on the weight of the total composition.

Example 1

A semifinished product was prepared by dissolving ground eggshell and maltodextrin MD 20 in low-fat milk and drying this by known methods on a wheel dryer to form a powder. The semifinished product obtained was finally mixed with a conventional vitamin and mineral premix in dry form, such that the final product comprised:

68 parts low-fat milk dry substance, 5 parts fine ground eggshell, 24 parts maltodextrin MD 20 and 3 parts vitamin and mineral premix.

A composition was obtained, which contained per 100 grams: 20.5% protein, 14% fat, 2400 mg Ca, 500 mg Mg, 7 mg Fe, 3 mg Zn, 250 µg Cu, 94 µg iodide, 500 IU D3, 2500 µg β-carotene, 2500 IE vitamin A, 25 mg vitamin E, 50 µg vitamin K, 2500 µg vitamin B1, 4500 µg vitamin B2, 18750 µg niacin, 5000 µg vitamin B6, 500 µg folic acid, 5000 µg pantothenic acid, 5 µg vitamin B12, 75 µg biotin and 150 mg vitamin C.

The Ca:Mg ratio was 5:1.

Example 2

In accordance with Example I, by mixing a product was prepared, starting from low-fat milk powder, a powder prepared by jointly drying ground eggshell and maltodextrin on a wheel dryer after priorly dissolving the maltodextrin and the ground eggshell in water, and the vitamin-mineral premix in dry form.

Compared with the product according to Example I, a product of improved stability and appreciation was obtained, after a milk solution had been prepared from this powder.

Example 3

A powdered product was prepared under dry mixing of 6% whole milk powder, 30% powdered product prepared from skim milk and vegetable fat (rapeseed oil + olein + oil rich in
5 eicosapentaenoic acid and docosahexaenoic acid), 31% skim milk powder, 20% desalted whey powder, 8% Fibruline R (containing soluble dietary fibers in the form of inulin), 2% fine ground eggshell and 3% vitamin-mineral premix.

The product comprised per 100 grams: 22.5% protein, 12.5%
10 fat, 8% dietary fibers, 350 IUs vitamin D3.

The Ca:Mg ratio was 4:1.

Example 4

A low-fat fresh cheese product was prepared, which
15 contained 10 g milk proteins and 3.5 g carbohydrates per 100 g. Under stirring, per 100 g of this product, 3 g ground eggshell was aseptically added until a homogeneous product of good taste was obtained.

Then portion packages were filled with the thus prepared
20 product.

Example 5

In accordance with Example IV, 3 g ground eggshell per
100 g was included in low-fat yoghurt which contained 4 g milk proteins, 4 g carbohydrates and 1.5 g milk fat per 100 g.

25

Example 6

60 parts sugared condensed whole milk which contained 8% milk fat, 20% fat-free milk dry substance, 45% saccharose and 27% water, were mixed, under stirring, with 40 parts of a
30 mixture consisting of 45% saccharose, 20% fine ground eggshell, 5% vitamin and mineral premix and 30% water until a homogeneous mass was obtained.

The thus prepared product was packaged in sticks.

35 Example 7

A powdered premix-product was prepared, destined for application in food products, for instance in meat and cakes,

under dry mixing of 40% sodium caseinate, 40% eggshell and 20% magnesium premix based on lactose (milk sugar).
The Ca:Mg-ratio was 4.0:1.0.

5 Example 8

For the purpose of determining the apparent digestibility of calcium, the following test was performed on piglets.

In this test aseptic ground eggshell was compared with calcium carbonate of a purity in excess of 98%
10 (complexometrically determined) from Boom B.V., Meppel, Netherlands.

Fourteen castrated male piglets (COFOK), 5 weeks old, weighing about 10 kg, were placed in a metabolic cage with a Tenderfoot floor. In this cage the temperature was adjusted to
15 24°C, while the air humidity was maintained at a constant level. The metabolic cage was illuminated with daylight and fluorescent tubes between 8.00 and 17.00 hours.

After an acclimatisation period of 6 days and a pre-test period of 10 days, the following test was performed for 7 days.

20 On the basis of their weight and general health condition, two groups of 6 piglets were selected from the 14 animals. Each group was given an experimental diet, one having 1% calcium carbonate, the other having 1% ground eggshell as most important calcium source. The piglets were fed twice a day,
25 receiving an amount of feed 2.2 times as large as their normal energy requirement. The feed was given in a water:feed ratio of 2.5:1 and had the composition as summarized in Table 1.

Table 1. Composition of diets (%)

Ingredient	Diet	
	I / CaCO ₃	II / ground eggshell
Barley	15.00	15.00
Wheat	60.65	60.65
10 Wheat gluten meal	8.00	8.00
Casein	10.00	10.00
Fat ¹⁾	2.00	2.00
Premix ²⁾	1.00	1.00
Salt	0.20	0.20
15 NaH ₂ PO ₄ ·2H ₂ O	0.50	0.50
MgO	0.10	0.10
KHCO ₃	1.00	1.00
L-lysine HCl	0.20	0.20
L-threonine	0.05	0.05
20 L-tryptophan	0.05	0.05
Cr ₂ O ₃	0.25	0.25
CaCO ₃	1.00	-
Ground eggshell	-	1.00

25 1) Composition of fat mixture : coconut fat 10%, tallow 35%,
lard 35%, soybean oil 20%.

2) Premix per 1 kg feed:
9000 IU vitamin A, 1800 IU vitamin D₃, 40 mg vitamin E, 5 mg
riboflavin, 30 mg niacin amide, 12 mg d-pantothenic acid,
30 350 mg choline chloride, 40 µg vitamin B₁₂, 3 mg vitamin K,
50 mg vitamin C, 1 mg folic acid, 0.1 mg biotin, 2.5 mg
CoSO₄·7H₂O, 0.2 mg Na₂SeO₃·5H₂O, 0.5 mg KI, 400 mg
FeSO₄·7H₂O, 80 mg CuSO₄·5H₂O, 70 mg MnO₂, 200 mg ZnSO₄·H₂O,
40 mg Tylosin.

35 The faeces of the piglets were collected in stoma bags
which had been attached to the anus, and analysed. For the
determination of the apparent digestibility of calcium, the

total feed intake and the total amount of faeces per piglet were measured. The stoma bags were emptied daily.

The faeces were weighed and stored at -20°C until the end of the test period. Then the faeces were freeze-dried, ground, homogenized, sampled and analysed for calcium content and fat content according to known techniques. These contents were converted to wet faeces contents.

The digestibility coefficients (DC) of Ca, Mg and crude fat were calculated from the amounts of Ca, Mg and crude fat in the diets, the amounts of these components in the wet faeces, the feed intake of the piglet and the amount of faeces produced by that piglet. The average DC was determined per group. Table 2 summarizes the apparent DCs of calcium, magnesium and crude fat.

Table 2. Apparent faecal digestibility coefficients of calcium, magnesium and crude fat in the diets.

Component	Diet	
	I / CaCO ₃	II / ground eggshell
Calcium	66.9 ± 7.9	71.3 ± 3.8
Magnesium	34.0 ± 4.6	36.3 ± 4.0
Crude fat	77.8 ± 2.1	78.3 ± 1.4

Values given as average ± standard deviation

The digestibility of calcium and magnesium is higher in piglets that were given ground eggshell as calcium source than in the piglets that were given CaCO₃ >98%.

By correction of the data to a recovery of chromium of 100% the differences in digestibility coefficients of calcium and magnesium became even larger (calcium 72.2 versus 66.7; magnesium 38.2 versus 33.4 in advance of ground eggshell).

The eggshell diet showed the same digestibility of the fat fraction as the calcium carbonate diet did.

CLAIMS

1. A food based on milk products, which is supplemented with aseptically obtained and/or sterilized or low-germ fine ground eggshell.
2. A food according to claim 1, which is also enriched with a
5 magnesium source, such as a magnesium salt.
3. A food according to claim 1 or 2, which is also enriched with vitamin D.
4. A food according to any one of the preceding claims, which
10 food is derived from whole milk, low-fat milk, skim milk, cream, whey and/or buttermilk.

INTERNATIONAL SEARCH REPORT

International Application No.

PC, /NL 95/00396

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A23C9/152 A23C9/13 A23C19/076

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A23C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X, P	DATABASE WPI Week 9515 Derwent Publications Ltd., London, GB; AN 95-110552 & JP,A,07 033 668 (MARUHA CO) , 3 February 1995 see abstract ---	1,3,4
X	PATENT ABSTRACTS OF JAPAN vol. 11 no. 24 (C-399) & JP,A,61 199762 (NOMURA GIICHI) 4 September 1986, cited in the application see abstract --- -/--	1,4

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

 International Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Derwent Publications Ltd., London, GB; AN 93139535 & JP,A,05 076 313 (NAKASHIMA NOCHIKUSAN KENKYUSHO KK) , 30 March 1993 see abstract	1
Y	--- PATENT ABSTRACTS OF JAPAN vol. 010 no. 136 (C-347) & JP,A,60 259160 (SEIICHI WATANABE) 21 December 1985, cited in the application see abstract	1,4
Y	--- DATABASE WPI Week 8427 Derwent Publications Ltd., London, GB; AN 84-168194 & JP,A,59 091 861 (BIKO KK) , 26 May 1984 cited in the application see abstract	1,4
A	--- PATENT ABSTRACTS OF JAPAN vol. 10 no. 230 (C-365) & JP,A,61 067460 (ERIKA KK) 7 April 1986, see abstract	1
A	--- PATENT ABSTRACTS OF JAPAN vol. 4 no. 77 (C-013) & JP,A,55 042543 (ONOZUKA YUICHIRO) 25 March 1980, see abstract	1
A	--- DATABASE WPI Week 7822 Derwent Publications Ltd., London, GB; AN 78-39549a & JP,A,53 044 662 (FUJISHIMA D) , 21 April 1978 cited in the application see abstract	1
A	--- EP,A,0 449 354 (COÖPERATIEVE CONDENSFABRIEK FRIESLAND) 2 October 1991 cited in the application	
A	--- EP,A,0 347 899 (ZAPADOSLOVENSKE HYDINARSKE ZAVODY) 27 December 1989 cited in the application -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-449354	02-10-91	NL-A- 9000613	16-10-91
		DE-D- 69101166	24-03-94
		DE-T- 69101166	01-06-94

EP-A-347899	27-12-89	AT-T- 127020	15-09-95
		DE-D- 68924006	05-10-95
		DE-T- 68924006	25-01-96
		JP-A- 2056434	26-02-90
		SU-A- 1783984	23-12-92
		US-A- 5045323	03-09-91
