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(54) Title: DAIRY DESSERT COMPOSITION

(57) Abstract: The invention relates to a non oven-cooked dairy dessert composition, which is devoid of eggs and comprises a stabilizing composition containing caseinate, a cellulose component and at least one hydrocolloid, and to a process for preparing it.



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DAIRY DESSERT COMPOSITION

The invention relates to a stable non oven-cooked dairy dessert composition which is devoid of eggs and comprises a stabilizing composition containing caseinate, a cellulose component and at least one hydrocolloid.

Oven-cooked milk food compositions containing eggs, such as, for instance egg entremets or milk desserts, which may be flavoured, are generally based on whole eggs and cream. Texture may be improved by adding thickening and /or gelling agents. The optimum shelf life of this type of product is of 30 days at chilled conditions (<6°C).

The egg content of the composition plays an important part in texture, while it necessarily implies cooking at high temperature, above 75°C, for at least 20 minutes in order to obtain the desired texture. From an economical viewpoint, oven-cooking involves a high consumption of energy and a subsequent significant cooling treatment if the container to be filled with the cooked milk food composition cannot stand high temperature, such as plastic containers. Such thermal treatment also involves using specific pieces of equipment and fulfilling hygiene requirements for this equipment.

Up to now, efforts have been made with respect to decreasing the egg content or increasing the content in texturing agents, which does not avoid the oven-cooking step.

EP 2 010 007 discloses a cooked milk food composition with a reduced egg content and comprising pectin. The addition of pectin in combination with a thermal treatment (cooking at a temperature above 70 °C) allows significantly decreasing the egg content while maintaining the desired texture at the end of the cooking.

However, the addition of pectin does not avoid cooking, nor does it avoid using eggs, though in lower amount.

EP 2 181 603 relates to a shelf stable hot-aerated dairy product containing a stabilizer system comprising at least two gums, where one gum is gelatine, or at least three gums, where one gum is either gelatine and the other is carrageenan and the remaining gums are different. Gelatine or a gelatine-like substance is required to maintain the aerated structure at high temperatures and to separate the air cells trapped within the matrix as the product cools, in order to avoid that the structure collapses. The preparation process also includes an acidifying step at a pH of 3.7 to 4.6.

There is thus a need for a dairy dessert composition which, though devoid of eggs, may provide the desired texture and organoleptic properties without oven-cooking (similar to those of a chilled oven-cooked cream dessert).

It would be advantageous to provide a non oven-cooked dairy dessert composition with texture and organoleptic properties similar to those of a conventional oven-cooked cream dessert, and that may be stored and remain stable at ambient temperature, namely without any phase separation or undesired softening of the texture.

It has now been found that the use of a stabilizing composition containing caseinate, a cellulose component and at least one hydrocolloid in a dairy dessert composition allows both avoiding the presence of eggs and the need for oven-cooking, while maintaining the texture usually obtained when using oven-cooking: same gel force and dynamic viscosity.

The invention thus relates to a stable non oven-cooked dairy dessert composition which is devoid of eggs and comprises a stabilizing composition containing caseinate, a cellulose component and at least one hydrocolloid.

Advantageously a dairy dessert composition according to the invention can be stored at ambient temperature (up to 30°C) for at least 3 months without any destabilization of the firmness or of the creamy and homogeneous texture, nor of the taste, while ensuring microbiological safety. Alternatively the dairy dessert composition according to the invention can be stored at chilled temperature (e.g. a temperature from 2°C to 10°C, e.g. from 4°C to 8°C) for 1-12 months. In particular, the dairy dessert composition is not frozen.

The dairy dessert composition according to the invention is ready-to-eat, without need of an oven-cooking step, neither during industrial production, nor by the consumer.

As used herein "caseinate" relates to a salt of casein protein with a base. Salts with alkali metals (such as, for example, sodium or potassium) or alkaline-earth metals (such as calcium) are suitable to the invention. "Casein protein" means all members of the milk fraction designated caseins, comprising alpha-, beta-, gamma- kappa- and lambda-caseins, and their mixtures, either synthetic or natural, in particular originating from milk cow. Sodium caseinate is preferred.

The cellulose component may contain for example methylcellulose, hydroxymethylcellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose, ethyl cellulose, carboxymethylcellulose, cellulose, microcrystalline cellulose, cellulose gum, or any mixture thereof. Preferably the cellulose component may be selected from

carboxymethylcellulose, cellulose, microcrystalline cellulose, cellulose gum, or any mixture thereof. In a preferred embodiment the cellulose component is microcrystalline cellulose.

The hydrocolloid used in the stabilizing composition can be selected, for example, from carrageenan, guar gum, locust bean gum, alginates, pectins, xanthan gum, starch and their mixtures.

Starch may be native or modified, and may be selected from wheat starch, potato starch, corn starch, sweet potato starch, tapioca starch, cassava starch, sago starch and rice starch.

Unless otherwise stated, "wt%" is understood with respect to the total weight of ingredients.

Preferably, the stabilizing composition amounts to 1 to 6 wt%, preferably 1 to 3 wt% with respect to the total weight of ingredients. In particular, the stabilizing composition comprises

- 1 to 3 wt% of caseinate

- 0.2 to 2 wt% of hydrocolloid, and

- 0.1 to 2.0 wt% of cellulose component,

with respect to the total weight of ingredients.

A preferred hydrocolloid is carrageenan, or carrageenan and starch.

A preferred cellulose component contains cellulose gum and cellulose.

The composition according to the invention preferably comprises approximately 50 to 80 wt% of a milk-based component.

By "milk-based component" is meant at least one component selected from whole milk, skimmed milk or partially skimmed milk, optionally reconstituted from milk powder, and cream.

Preferably, the total fat content of the composition according to the invention is lower than 20wt%, more preferably not more than 15 wt%, for instance from about 5wt% to about 15wt% based on the weight of the dairy composition.

The composition according to the invention may also contain usual ingredients of dairy dessert compositions such as carbohydrates, in particular sucrose or fructose, vegetal ingredients, such as cocoa, vegetable fat (cocoa butter, palm oil, coconut oil, sunflower oil, rapeseed oil), natural or artificial colouring agents, natural or artificial flavouring agents, sweeteners, inclusions such as dried or candied fruit pieces, citrus peels, nut pieces, etc.

The composition may also contain one or more food additives, such as thickening and/or gelling agents, such as, for example, gelatine. Suitable food additives are disclosed, for example, in EP 2 010 007.

The invention also relates to a process for obtaining a stable non oven-cooked dairy dessert composition as disclosed above.

- preparing a mixture containing a milk-based component and a stabilizing composition containing at least one hydrocolloid, caseinate and cellulose component,
- adjusting the pH within the range of 6.0 to 8.0
- submitting said mixture to homogenization at a temperature of 70°C to 95°C under pressure, for example at 100 bars, and
- sterilizing the mixture, for example at 140°C for at least 10s.

Filling can then be performed, preferably aseptically, after cooling to a temperature of, for instance, 60°C to 90 °C.

pH adjustment is performed by addition of a basis, such as, for example, sodium hydroxide. Preferably, the final pH of the composition is of 6.0 to 8.0, preferably 6.5 to 7.5.

Advantageously, in comparison to a standard oven-cooked milk food compositions containing eggs, no pasteurization step is needed. In a standard composition containing eggs a pasteurization step is required after the addition of the egg. Whereas, in the process of the invention all of the ingredients are simply homogenized at elevated temperature (e.g. 70°C to 95°C) and pressure, followed by sterilization (e.g. for 10-60 seconds, e.g. around 30 seconds). The simplification of the process and avoidance of the oven-cooking step thus provide clear advantages in terms of reduction of production costs, as does the avoidance of egg ingredient.

The examples below illustrate the invention, without limiting it.

Example 1

The following composition (Table 1) was prepared for making a chocolate non-oven cooked cream dessert:

Table 1

Ingredients	Example 1 (wt%)
Fresh full fat milk	62.820
Crystal sugar	7.000
Carrageenan	0.380
Chocolate	12.000
Starch	0.500
Water	5.000
Milk cream	10.000
Sodium caseinate	2.000
Cellulose component	0.300
TOTAL	100.00

The following process is used:

All ingredients are mixed at 50°C-60°C, and pH is adjusted to approximately 6.8-7.5 by sodium hydroxide. The mixture is stored under stirring and then heated at a temperature of 75°C to 95°C under a pressure of 100 bars.

The mixture is then submitted to sterilization at 140°C for 30 s. After cooling, the mixture is filled into cups under hot conditions (70-90°C)

An homogeneous non oven cooked chocolate dessert was obtained with the following characteristics:

- dry matter content (wt%): 34%

- fat content (wt%): 10%

- pH: 6.5-7.5

- water activity (A_w): approx. 0.98

- protein content (wt%): 4,7%

- texture and consistency: the product is considered smooth, with a thick and sticky texture and a thick fat coating layer.

Texture characteristics of a commercial oven cooked dessert and of the composition of example 1 were determined by penetrometry and dynamic viscosity measurements. For penetrometry measurements, a Texture Analyser, TAXT2I is used. For the dynamic viscosity

measurements, the rheometer Anton Paar was used at a speed of 100s^{-1} with two plates of a geometry 50mm.

The results are shown in Table 2 below.

Table 2

	Gel force (g)	Dynamic viscosity ($\text{Pa}\cdot\text{s}$)
Oven cooked commercial product at 8°C	146-217	2.28- 3.48
Composition of example 1 at 8°C	238	7.94
Composition of example 1 at 25°C	118	3.30

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The results show that at 8°C , the composition of example 2 has a gel force which is comparable to that of the commercial product.

At 25°C , the gel force is slightly lower than that of the commercial product, while the dynamic viscosity is similar.

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Example 2

The following composition (Table 3) was prepared according to the process of example 1 for making a non oven cooked milk cream dessert.

Table 3

Ingredients	Example 2 (wt%)
Fresh full fat milk	69.000
Crystal sugar	13.000
Carrageenan	0.5
Starch	1.5000
Milk cream	10.000
Sodium caseinate	1.000
microcrystalline cellulose	1.000
Skimmed milk powder	4.000
TOTAL	100.00

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An homogeneous non oven cooked milk cream dessert was obtained with the following characteristics:

- dry matter content (wt%): 33%

- fat content (wt%): 6.5%

5 - pH: 6.5-7.5

- water activity (A_w): approx. 0.98

- protein content (wt%): 4.8%

- texture and consistency: the product is considered smooth, with a thick and sticky texture and an thick fat coating.

CLAIMS

1. A non oven-cooked dairy dessert composition, which is devoid of eggs and comprises a stabilizing composition containing caseinate, a cellulose component and at least one hydrocolloid.

2. The composition according to claim 1, characterized in that the hydrocolloid is selected from carrageenan, guar gum, locust bean gum, alginates, pectins, xanthan gum, starch or a mixture thereof.

3. The composition according to claims 1 or 2, characterized in that the cellulose component is selected from carboxymethylcellulose, cellulose, microcrystalline cellulose, cellulose gum, or a mixture thereof.

4. The composition according to any one of claims 1 to 3, characterized in that the stabilizing composition amounts to 1 to 6 wt%, preferably 1 to 3 wt% with respect to the total weight of ingredients.

5. The composition according to any one of claims 1 to 4, characterized in that the stabilizing composition comprises 1 to 3 % of caseinate, 0.2 to 2% of hydrocolloid, and 0.1 to 2 % of cellulose component, with respect to the total weight of ingredients.

6. The composition according to any one of claims 1 to 5, characterized in that the hydrocolloid is carrageenan, or carrageenan and starch.

7. The composition according to any one of claims 1 to 6, characterized in that the cellulose component contains cellulose gum and cellulose.

8. The composition according to any one of claims 1 to 7 characterized in that it contains approximately 50 to 80 wt% of a milk-based component.

9. The composition according to any one of claims 1 to 8 characterized in that it has a total fat content lower than 20wt%, preferably lower than 15wt%.

10. The composition according to any one of claims 1 to 9 characterized in that it has
5 final pH of 6.0 to 8.0, preferably of 6.5 to 7.5.

11. A process for obtaining a shelf stable non oven-cooked dairy dessert composition according to any one of claims 1 to 10, comprising
- preparing a mixture containing a milk-based component and a stabilizing composition
10 containing caseinate, a cellulose component and at least one hydrocolloid .
- adjusting the pH within the range of 6.0 to 8.0
- submitting said mixture to homogenization at a temperature of 70°C to 95°C under pressure,
- and, sterilizing the mixture.

12. The process according to claim 11, characterized in that the hydrocolloid is
15 selected from carrageenan, guar gum, locust bean gum, alginates, pectins, xanthan gum, starch or a mixture thereof.

13. The process according to claim 11 or 12, characterized in that the cellulose
20 component is selected from carboxymethylcellulose, cellulose, microcrystalline cellulose, cellulose gum, and their mixtures.

14. The process according to any one of claims 11 to 13, characterized in that the
stabilizing composition amounts to 1 to 6 wt%, preferably 1 to 3 wt% with respect to the total
25 weight of ingredients.

15. The process according to any one of 11 to 14, characterized in that the stabilizing
composition comprises 1 to 3 % of caseinate, 0.2 to 2% of hydrocolloid, and 0.3 to 1 % of
cellulose component, with respect to the total weight of ingredients.

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16. The process according to any one of claims 11 to 15, characterized in that after
sterilization, filling is performed, preferably aseptically, at a temperature of 60 to 90°C.

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER		
INV.	A23C9/152	A23C9/154
	A23L1/0562	A23L1/187
ADD.		
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)		
A23C A23L		
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 practicable, search terms used)		
EPO-Internal , WPI Data, BIOSIS, FSTA		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE GNPD [Onl i ne] Mi ntel ; 1 September 2011 (2011-09-01) , Anonymous: "Strawberry Cheesecake Dessert" , XP002675140, retri eved from www.gnpd.com Database accessi on no. 1639575 the whol e document	1-3 , 9 , 10
A	----- -/- .	4,5 ,8, 11-16
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
4 January 2013		14/01/2013
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Barac, Domi ni ka

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/075299

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 GNPD [Onl i ne] Mi ntel ; 1 May 2010 (2010-05-01) , Anonymous : "Ready t o Eat Chocol ate Puddi ng" , XP002675141 , retri eved from www.gnpd. com accessi on no. 1286340	1-3 , 9 , 10
A	the whol e document	4,5 ,8, 11-16
X	----- DATABASE GNPD [Onl i ne] Mi ntel ; 1 Apri l 2007 (2007-04-01) , Anonymous : "Chocol ate Puddi ng" , XP002675142 , retri eved from www.gnpd. com Database accessi on no. 690587	1-3 ,6,9 , 10
A	the whol e document	4,5 ,8, 11-16
X	----- DATABASE GNPD [Onl i ne] Mi ntel ; 1 March 2009 (2009-03-01) , Anonymous : "Yogurt Powder Mi x" , XP002675143 , retri eved from www.gnpd. com Database accessi on no. 1060482	1-3 ,6,9 , 10
A	the whol e document	4,5 ,8, 11-16
X	----- DATABASE GNPD [Onl i ne] Mi ntel ; 1 June 2009 (2009-06-01) , Anonymous : "Bl ack Sesame Dessert" , XP002675144, retri eved from www.gnpd. com Database accessi on no. 1102300	1-3 , 9 , 10
A	the whol e document	4,5 ,8, 11-16
X	----- US 3 236 658 A (LITTLE LAWRENCE L) 22 February 1966 (1966-02-22) exampl es 1,2,3	1-5
X	----- US 2004/047965 AI (HAINDL RUDOLF [AT] ET AL) 11 March 2004 (2004-03-11) paragraphs [0006] , [0009] , [0011] - [0020] cl aims 1,8,9 , 13,21	1-4,6, 10-16 5,8,9
A	----- -/--	

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2012/075299

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2006/119064 A2 (ASINOM RES INC [US]; BARUA NRI PEN [US]) 9 November 2006 (2006-11-09) * examples * paragraphs [0031] , [0034] -----	1-16
A	US 2007/104846 A1 (WELCH FRANK [US]) 10 May 2007 (2007-05-10) the whole document -----	1-16
A	US 5 284 674 A (FAZIO SUSAN C [US]) 8 February 1994 (1994-02-08) claim 1 example 1 -----	1-16

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2012/075299

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3236658	A	22-02-1966	NONE
US 2004047965	A1	11-03-2004	NONE
Wo 2006119064	A2	09-11-2006	CA 2607720 A1 09-11-2006 Wo 2006119064 A2 09-11-2006
US 2007104846	A1	10-05-2007	NONE
US 5284674	A	08-02-1994	NONE