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(54) Title: A MAYONNAISE-LIKE PRODUCT

(57) Abrégé/Abstract:

The invention concerns a mayonnaise-like product, which is fat free or low fat, comprising less than 20% of edible oil, vinegar, water, yoghurt and carrageenan.

**Abstract**

A mayonnaise-like product

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### A mayonnaise-like product

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5 Mayonnaise is known in the art as being a thick emulsified food dressing prepared from edible oil, water, egg yolk containing materials and vinegar. For being designated as a mayonnaise according to existing legislation a product must contain at least 60 % oil. Although, nowadays the tendency  
10 in the market, taking in account the desires of the consumer, is to reduce the oil content and to have the above mentioned emulsified products with an oil content of less than 60 % : these products cannot any more receive the name of mayonnaise and are therefore designated as  
15 mayonnaise-like products.

The existing literature already mentions mayonnaise-like products. The German patent DE 1924465 concerns a mayonnaise-like product containing from 15 to 35 % of oil, 20 from 6 to 10 % of egg yolk, from 5 to 10 % of low fat curd, and other minor components as sugar, salt and vinegar. The problem with such a composition is the presence of egg yolk, which gives a composition which is not cholesterol-free and is not heat stable. The German patent DE 2145979 25 concerns a mayonnaise-like product containing 30 % or more oil, and between 20 and 80 % of curd or yoghurt. For having a mayonnaise-like product, it is necessary to have a certain viscosity and a texture ( fat-equivalent mouth feeling) : the presence of quark or yoghurt does not bring 30 a sufficient viscosity and texture , but this is reached taking into account the high level of oil. Another solution for reaching the high viscosity and the texture is given in EP 049 927, wherein a high content of yoghurt and a 35 combination of different hydrocolloids is used. The disadvantage is that the product is not as smooth as required for mayonnaise and the controlled gelation, which

is necessary to reach a garnishable product, is not achievable. Finally, the FR patent 2623376 concerns a mayonnaise-like product containing from 15 to 60 % of yoghurt, cream, white cheese and egg yolk. The presence of egg yolk is not desired 5 for the reasons given above and furthermore, cream and white cheese increase the viscosity but also the oil content. All these four patents mention the possibility of adding yoghurt or quark : the reason for this addition is to give to the final product an opacity similar to that of a mayonnaise and this is 10 also desired for the present invention.

The aim of the present invention is to eliminate the above mentioned drawbacks and to have a heat stable mayonnaise-like product, meaning with an oil content of from 0 % to about 20 % 15 and having at least a combination of the following four factors : an opacity, a viscosity, a texture and a taste equivalent to that of a normal mayonnaise.

The invention concerns a mayonnaise-like product, comprising 20 from 0 % to about 20 % edible oil, vinegar, water and further yoghurt and carrageenan.

The edible oil used can be of any type, for example a vegetable oil such as soy oil.

25 According to the invention, it has been found that the whitening efficiency of yoghurt is increased by the synergism with carrageenan. The use of only yoghurt as an ingredient, even at higher concentrations, does not improve the appearance 30 clearly. In the present composition, the yoghurt is present in an amount of from about 5 to 50 %. In the present specification, all the percentages are given in weight and for the yoghurt content, the amount is given based on the wet product. The yoghurt used can be of any

type, for example a yoghurt based on full-cream milk or skinned milk.

Texture is defined as being what is perceived with a spoon  
5 or in the mouth in relation to a mayonnaise impression. Texture of fat-free mayonnaise-like products is critical and an ingredient composition has to be found with optimal texture quality. A targeted design of the texture becomes  
10 possible based on the synergism between the carrageenan and the casein micelles of the yoghurt. This synergism results in a slight gelatinization which can be controlled by the concentration of the reactants. This slight gelatinization leads to a short, creamy and non-sticky texture, but can  
15 not be compared with strong gelling substances which lead to a rigid texture and sometimes to a rough structure. Examples for such strong gelling substances are agar or the combination of xanthan with locust bean gum. The viscosity  
is finally similar to that of a classical mayonnaise.  
20 Heat stability of the composition was also a major aim to enable hot filling of the product and by this to renounce on preservatives. Regarding the manufacturing principle, it was the aim to find the most simple solution with the minimum processing effort. Both, processing and ingredients  
25 costs should be minimal : this is the case with the obtained composition.

The carrageenan is present in an amount of from 0.03 to 1%: a too low amount would not lead to the above mentioned  
30 synergism and a too high amount would give a real gelatinization. Most preferably, the carrageenan used is kappa-carrageenan.

All the four above mentioned factors can be further  
35 improved by adding to the composition a starch in the amount of from 2 to 6 %. This starch is a hydroxypropyl or

acetylated starch. Preferably, the starch used is the hydroxypropyl distarch phosphate or the acetylated distarch adipate, the phosphorylated distarch phosphate or the acetylated distarch phosphate.

5

If starch is present in the composition, it is normally preferable to add in said composition a non-gelling hydrocolloid like xanthan. The application of such a non-gelling hydrocolloid is effective particularly when the 10 composition is based on acetylated distarch adipate. Best texture properties, however, are achieved when hydroxypropyl distarch phosphate is used in combination with yoghurt, kappa-carrageenan and xanthan. This starch is very stable against retrogradation and contributes to the 15 creamy behaviour of the composition. The composition contains preferably of from 0 to 0.4% of xanthan.

A substance also potentially suited as whitening agent is skim milk powder. However, due to its high casein content 20 and the low pH of the mayonnaise-like product, precipitation occurs, resulting in an unacceptable sandy mouthfeel of the product. It has now been found that the precipitation of the proteins in skim milk powder can be prevented by the use of the emulsifier DATEM ( diacetyl 25 tartaric esters of mono- and diglycerides). According to this phenomenon, the application of skim milk powder or casein for improving the appearance of mayonnaise-like product becomes possible and has furthermore the additional advantage of contributing to an improved texture. Skim milk 30 powder or casein is present in the composition in the amount of from 1 to 10 % and DATEM in the amount of from 0.3 to 4 %.

The mayonnaise-like product according to the invention 35 contains further of from 0 to 25% of vegetable pieces. Any

type of vegetable can be used, for example onion or cucumber.

5 The product of the invention comprises also, if necessary, salt and/or sugar, aromas and ingredients which lead to savoury.

10 With the described composition, the aim of the most simple processing only including mixing and hot filling became possible. The heat treatment before hot filling occurs in a classical way, at around 80 °C during from several seconds to 20 minutes. The hot filling is made into the corresponding jars, which are then cooled : we reach a shelf stability of at least 12 months.

15 According to this procedure, it is also possible to renounce on preservatives without any microbiological risk, contributing to a consumer friendly ingredient list of the product. Both, the simple processing and the use of 20 standard raw materials, not being specially developed as fat replacers, contribute to very low product costs.

Examples are now described by way of illustration only.

25 **Example 1**

A screening for the effect of hydrocolloids in a yoghurt fat-free mayonnaise-like product was carried out using the following recipe :

Ingredient	%
water	59.0
yoghurt	9.7
maltodextrin	10.0
sucrose	6.0
acetylated distarch adipate	5.5
spirit vinegar (11%)	5.0
lactose	3.0
salt	1.5
hydrocolloid	0.3
Total	100.0

The mayonnaise-like products were prepared using a batch mixer. All raw materials were degassed, mixed, heated to 5 85 °C and filled in glass jars. The results can be seen from the following table :

Hydrocolloid	Sensorial description of the texture	Viscosity at 40 Pa in Pas
without (reference)	thin	48
Propylene glycol alginate	long	142
Compound of xanthan, locust bean gum and guar gum	gelatinized	10140
xanthan	thick	290
gellan	thick	175
Compound of guar gum, xanthan, carrageenan	thick, sticky	4043
kappa-carrageenan	short, thick, creamy	81980

The viscosity was measured using a Bohlin CS 50 rheometer. The product has the best texture when the viscosity is maximal without showing an off-texture like 5 gelatinized or sticky and long. This is the case for kappa-carrageenan.

#### 10 Example 2

Fat-free mayonnaise-like products were prepared with the same processing as described in example 1. The basic recipe for all products can be seen from the following table :

15

Ingredients	%
salt	1.5
sucrose	7.5
maltodextrin	3.5
lactose	3.0
spirit vinegar (11%)	5.2
flavors	0.6
yoghurt	17.0
starch ( see following table)	4.0
hydrocolloids (see following table)	0-0.4
water	add to 100 %

Detailed information on the starch and the hydrocolloids as well as the sensorial product evaluation can be seen from the following table :

Ingredients		Appearance	Texture
acetylated adipate (4%)	distarch	very glassy, slightly rough	slightly gelatinized
hydroxypropyl distarch phosphate (4%)		very glassy, slightly rough	thick
acetylated adipate (4%), kappa-carrageenan (0.2%), xanthan (0.2%)	distarch	glassy, smooth	creamy
hydroxypropyl phosphate (4%), kappa-carrageenan (0.2%), xanthan (0.2%)	distarch	glassy, smooth	thick, creamy

It can be seen that the use of kappa-carrageenan results in a creamy product and reduces the glassy appearance. Best 5 texture and appearance were obtained by the use of kappa-carrageenan and xanthan in combination with hydroxypropyl distarch phosphate.

#### Example 3

10

Products with the same basic recipe as in the preceding example were manufactured with acetylated distarch adipate (4%) and kappa-carrageenan (0.2%). A second product was produced with additionally 0.2 % xanthan. With this latter 15 product, absolutely no side product detachment in the glass jars was observed.

#### Example 4

20 Products with the same basic recipe as in example 2 were manufactured using hydroxypropyl distarch phosphate (4%), xanthan (0.2 %) and kappa-carrageenan (0.2 %). Further

ingredients used and results of the sensorial product evaluation can be seen from the following table.

Ingredients	Appearance	Texture
Skim milk powder (3.5 %)	white, not glassy	sandy, very thick, creamy
Skim milk powder (3.5%), DATEM (1.5%)	white, not glassy	not sandy, very thick, creamy

5 The results show that skim milk powder leads to a white product and prevents a transparent product appearance. The sandiness arising with skim milk powder can be prevented by the additional use of the emulsifier DATEM. Furthermore,  
10 in comparison with the results of example 2, it can be seen that these ingredients positively also contribute to an improved product texture.

As already stated in example 1, the filling of the glass jars occur at a temperature of around 80 °C during about 20  
15 min and the obtained mayonnaise-like product retains all its properties of opacity, texture, taste and viscosity during at least 12 months.

It is possible according to the invention to propose to the  
20 consumer a substantially fat-free mayonnaise-like product presenting characteristics very near to a normal mayonnaise.

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**CLAIMS:**

1. A food product having a viscosity like mayonnaise which comprises a mixture of an edible oil, a yoghurt, a carrageenan, a starch, water and vinegar components wherein the starch component is selected from the group consisting of a hydroxypropyl starch and an acetylated starch and wherein, by weight, the edible oil component is in an amount of from 0% to about 20%, the yoghurt component is in an amount of from about 5% to 50%, the carrageenan component is in an amount of from 0.03% to 1% and the starch component is in an amount of from 2% to 6%.
2. A food product having a viscosity like mayonnaise prepared by a process comprising mixing components comprising, by weight based upon product weight, an edible oil in an amount of from 0% to about 20%, a yoghurt in an amount of from about 5% to 50%, a carrageenan in an amount of from 0.03% to 1% and a starch selected from the group consisting of a hydroxypropyl starch and an acetylated starch in an amount of from 2% to 6% and comprising water and vinegar to obtain the food product.
3. A food product having a viscosity like mayonnaise prepared by a process comprising mixing components comprising, by weight based upon product weight, yoghurt in an amount of from about 5% to 50%, a carrageenan in an amount of from 0.03% to 1% and a starch selected from the group consisting of a hydroxypropyl starch and an acetylated starch in an amount of from 2% to 6% and comprising water and vinegar, and wherein the components mixed do not comprise an edible oil ingredient, to obtain the food product.
4. A food product according to claim 1 or 2 or 3 wherein the starch is selected from the group consisting of hydroxylpropyl distarch phosphate, acetylated distarch phosphate and acetylated distarch adipate.

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5. A food product according to claim 1 or 2 or 3 wherein the carrageenan is kappa-carrageenan.
6. A food product according to claim 1 or 2 or 3 wherein the components further comprise a non-gelling hydrocolloid.
7. A food product according to claim 6 wherein the non-gelling hydrocolloid is xanthan.
8. A food product according to claim 7 wherein the xanthan is present and in an amount up to 0.4% by weight.
9. A food product according to claim 7 wherein the starch is hydroxypropyl distarch phosphate and the carrageenan is kappa-carrageenan.
10. A food product according to claim 6 wherein the starch is acetylated distarch adipate.
11. A product according to claim 1 or 2 or 3 wherein the components further comprise vegetable pieces present in an amount of up to 25%.
12. A food product according to claim 2 or 3 wherein the components further comprise skim milk powder and a diacetyltauric ester in amounts, respectively, of from 1% to 10% and from 0.3% to 0.4%.