

EUROPEAN QUALIFYING EXAMINATION 2009

PAPER B CHEMISTRY

This paper comprises:

- * Annex 1
Patent application 2009/B(Ch)/e/1-6
- * Annex 2
Communication 2009/B(Ch)/e/7-8
- * Annex 3
Document 1 2009/B(Ch)/e/9-11
- * Annex 4
Document 2 2009/B(Ch)/e/12-14
- * Annex 5
Letter from the applicant 2009/B(Ch)/e/15

Annex 1 (Patent Application)

Coating for food products

5 [001] The invention relates to an edible material for covering or coating food products. It also relates to a method for preparing such a material.

10 [002] Food products, such as meat or meat products, particularly pâtés, sausages, liver sausage, liver pâté and the like are generally provided with a relatively thin covering or coating layer of back fat. This coating layer increases shelf-life, prevents rapid dehydration of the meat and reduces the discoloration thereof. The coating layer can be obtained by cutting the back fat of a pig (pork fat) into thin slices. The slices are then arranged around the meat product. However, present pig breeds have very thin back fat layers and as a consequence the quantity of natural back fat available for manufacturing
15 back fat coating layers has decreased. Due to the continually increasing demand for meat products provided with a covering or coating layer, there is a need for a substitute material for natural back fat.

20 [003] A substitute material for back fat is known. This substitute material consists of finely-chopped pork rind (the skin of a pig), soy protein and finely-divided fat in the proportions 5-50%, 4-15% and 20-55% by weight, respectively, the rest being water. The substitute is prepared by adding the mixture to water, homogenizing the constituents to a paste and thereafter cooling the product. The process is performed at a temperature higher than 40°C, preferably between 75°C and 85°C. It has been found,
25 however, that this material does not satisfy practical requirements in respect of colour, stability and breakage.

30 [004] The colour of the coating should be white and the coating layer should possess a relatively high stability and elasticity in order to properly cover the products and not fall off or dry. Moreover it should be easily cuttable and have the feel of natural fat such as back fat.

[005] The invention therefore has for its object to provide a covering or coating material without the above-stated drawbacks.

[006] This is achieved according to the invention by providing an edible covering or coating material characterized by the following composition in wt. %: 10-50% beef or pork fat, 25-65% milk and/or water, 5-30% gelatine, 0-25% binders and/or thickeners and 0-5% salt. Such a material is malleable and elastic in structure, has a white colour and permits simple arrangement on or around meat products of any desired form and size. Preferably, the composition comprises both milk and water. A composition containing both milk and water has improved pouring properties and solidifies rapidly upon cooling, making it particularly suitable for directly forming the material in layer form. If both milk and water are used the weight ratio of milk to water is from 10:90 to 90:10.

[007] The invention further provides a method for preparing such a covering or coating material characterized in that a composition is prepared at a temperature of above 50°C or higher consisting of: in wt. % 10-50% beef or pork fat, 25-65% milk and/or water, 5-30% gelatine, 0-25% binders and/or thickeners and 0-5% salt, whereafter the material obtained undergoes shaping and is cooled. The temperature of above 50°C ensures that the fat is molten and can be emulsified with the other constituents. In preference, the composition is prepared at a temperature above 60°C. Such a method has the advantage that the obtained material does not require re-pasteurizing.

[008] The shaping of the composition into a layer preferably takes place by directly pouring out the composition as a layer and/or by rolling. The product obtained after cooling is a layer and can be used as such for covering or coating food products. In contrast, known back fat substitute materials are usually obtained in block form and have to be cut into slices of the desired thickness prior to use.

[009] The covering or coating material according to the invention contains 10-50 wt.% beef or pork fat and 5-30 wt.% gelatine. Gelatine acts as an emulsifier for the fat.

5 [010] The covering or coating material according to the invention may also contain up to 25 wt.% binders and/or thickeners. Suitable binders and/or thickeners are: starches such as potato starch, modified starches and carrageenan (a well-known polysaccharide thickener obtainable from red seaweed). The covering or coating material may further contain up to 5 wt.% salt which is preferably nitrite-containing.

10 [011] In a preferred embodiment the covering or coating material according to the invention consists of: in wt.% 13.9% pork fat, 8.3% gelatine, 36.0% water, 19.4% milk, 20.7% potato starch and 1.7% nitrite-containing salt. In another preferred embodiment the covering or coating material according to the invention consists of: in wt.% 13.9% beef fat, 8.3% gelatine, 36.0% water, 18.4% milk, 11% potato starch, 9.7% carrageenan
15 and 2.7% nitrite-containing salt.

[012] The material of the invention can be prepared by emulsifying at a temperature of above 50°C the fat in the milk and/or water in the presence of the gelatine. The binders and/or thickeners and the salt are typically added subsequently. The salt may optionally
20 be added during preparation of the emulsion. The emulsion is preferably prepared by mixing molten beef fat or pork fat with gelatine and then adding milk and/or water. This leads to a more effective emulsification of the fat and to a more stable and more easily handleable end product, in particular at high total liquid contents. The obtained emulsion must have a temperature above 50°C, so that complete emulsification of the fat is
25 possible. Such a temperature can be obtained through use of hot milk and/or water, but also by heating the mixture after adding the milk and water. After addition of the binders and thickeners and the salt, a composition is obtained which can then be formed into any desired shape and thickness.

[013] It is essential to the invention that the method is carried out at a high total liquid content. Total liquid content is the sum of water and milk. The total fluid content is between 25-65% by weight, preferably 30-65% and more preferably 35-60% by weight. The high total liquid content of 25-65% leads to a very flexible material and minimises its fat content. The high total liquid content results in a composition with improved pouring properties which solidifies rapidly upon cooling.

[014] The shaping and cooling of the composition can be performed in any suitable manner. Preferably the composition is poured out in layer form on a conveyor belt and cooled immediately thereafter on the same conveyor belt. If desired, the (partially) cooled paste can subsequently be rolled to a thickness of approximately 1.5 to 2.5 mm. The composition can be cooled by means of flowing water, carbon dioxide or nitrogen. Prior to cooling a plastic foil is preferably arranged on the composition in order to maintain the hygiene of the product. After cooling, the obtained slab or film-like covering or coating material can be removed without difficulty from the conveyor belt. The obtained coating has the further advantage that it can be manufactured independently of the food products and is easily packaged and transportable as ready-to-use slabs or films.

[015] The covering or coating material according to the invention is malleable and elastic, has a white colour and can be arranged in simple manner on or around meat products of any desired form and size. The material has good adherence to meat products so that when these meat products are cut the covering or coating layer does not come loose.

Claims

1. Edible material for covering or coating food products such as meat and meat products consisting of:

10-50 wt.% beef or pork fat
25-65 wt.% milk and/or water
5-30 wt.% gelatine
0-25 wt.% binders and/or thickeners
0-5 wt.% salt.

2. Covering or coating material as claimed in claim 1, characterized in that it is in slab or film form.

3. Covering or coating material as claimed in claim 1 or 2, consisting of in wt.% 13.9% pork fat, 8.3% gelatine, 36.0% water, 19.4% milk, 20.7% potato starch and 1.7% nitrite-containing salt.

4. Covering or coating material as claimed in claim 1 or 2, consisting of in wt.% 13.9% beef fat, 8.3% gelatine, 36.0% water, 18.4% milk, 11% potato starch, 9.7% carrageenan and 2.7% nitrite-containing salt.

5. Method for preparing the edible covering or coating material of claims 1- 4, comprising preparing a composition at a temperature above 50°C consisting of 10-50% beef or pork fat, 25-65% milk and/or water, 5-30% gelatine, 0-25% binders and/or thickeners and 0-5% salt, whereafter the obtained material undergoes shaping and is cooled.

6. Method as claimed in claim 5, characterized by mixing the beef or pork fat in molten state with the gelatine and then adding milk and/or water.
7. Food products such as meat or meat products covered or coated with an edible material as claimed in claims 1-4.

Annex 2 (Communication)

1. Document 1 (D1) describes an edible fat substitute as a coating to be applied to food products, in particular meat products. The composition is composed of fat, gelatine and water. The approximate weight ratios as disclosed in D1 (see claim 1) lead to a composition containing about 43% by weight of fat, 14% by weight of gelatine and 43% by weight of water. The coating composition is prepared by vigorously stirring the components at an elevated temperature of above 60°C. The composition solidifies on cooling. The subject-matter of claims 1, 2, 5 and 7 is not novel over D1 (Articles 52(1), 54(1) and (2) EPC). The subject-matter of claim 6 only differs from the teaching of D1 in the order in which the components are added. It is not recognisable that such a modification alone would result in an unexpected advantage.

2. Document 2 (D2) also discloses an edible coating material for food products. The coating composition according to D2 has the following composition in weight % (see paragraph [005]): 25-65% fat, 5.5-31% milk and/or water, 0.5-14% gelatine, 0-5% table salt, 3-41% starch and 0.3-11.5% carrageenan.

The claimed composition is not novel over D2 since the claimed ranges overlap with those of document D2. Any minor differences from the above teaching are considered to be obvious and within the reach of the person skilled in the art. D2 also discloses a method in which the composition is prepared by emulsification of finely-chopped fat in milk and/or water by gelatine at elevated temperature and by adding thereto the rest of the components. The paste obtained is put in a mould, heated for a few hours at the elevated temperature and cooled (see paragraphs [007] and [009]-[011]). Slabs are sliced from this material and are used to coat meat products. The subject-matter of the present claims 1, 2 and 5-7 is anticipated by D2 (Articles 52(1) and 54(1) and (2) EPC).

3. If the applicant wishes to maintain the application, new claims should be filed which take the above objections into account. Care should be taken to ensure that the new claims comply with the requirements of the EPC in respect of clarity, novelty, inventive step and unity (Articles 54, 56, 82 and 84 EPC). Care should be taken that any amendments do not introduce subject-matter which extends beyond the application as originally filed (Article 123(2) EPC).

4. In the letter of reply, the differences between the new claims and the prior art as disclosed in D1 and D2 should be indicated. The technical problem underlying the invention in view of the closest prior art and the solution to this problem should be readily derivable from the statement of the applicant (Rule 42(1)c EPC and EPO Guidelines, C-IV, 11.7).

5. In order to facilitate the examination, the applicant is requested to indicate precisely the support in the originally filed application for any amendments proposed (Article 123(2) EPC).

Annex 3 (Document 1)

Fat substitute and method of making it

5 [001] In the manufacture of meat products, such as pâtés or liver sausage it is highly desirable to provide a coating which affords a thorough protection therefor. Fat has been used for that purpose. Fat is difficult to handle and may become rancid.

[002] The main objects of this invention are:

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[003] First to provide a product which is highly satisfactory as a coating for food products. The product provides a continuous coating that is not easily ruptured or broken, is solid and is attractive in appearance. The product is also edible.

15 [004] Second to provide a product which has very high protective qualities and does not become rancid.

[005] In the manufacture of our product the ingredients may be considerably varied in proportion. The amounts used below will enable the production of a satisfactory product.

20 To 100 kg of cold water we add 30 kg of powdered dry gelatine. Preferably the water is stirred while the gelatine is added. The water and gelatine mixture (liquid gelatine) is then heated to about 82 to 87°C by placing the container in a vat of water at that temperature and this is maintained until all gelatine has been dissolved. The liquid gelatine is then placed in an agitator which is operated at high speed for a few minutes.
25 Whilst in this condition and continuing to agitate the gelatine, we gradually add into the container an oil or fat which is solid at 20°C, such as pork fat or coconut oil in the proportions of about 3 kg of fatty material to 4 kg of the liquid gelatine. The fatty material is molten and preferably at about 65°C when poured into the liquid gelatine.

[006] After the fatty material has been poured into the liquid gelatine the agitation continued for about 2 minutes which results in an emulsion. The mixture may then be placed in a container for storage and preferably cooled in a refrigerator at 2-5°C. When cooled, the product is a stable, elastic solid and, where pork fat is used, the product is
5 white.

[007] This material forms a very effective coating for meat products which it is desired to provide with a protective coating.

10 [008] The composition of the invention is applied to meat products as a liquid. The composition is heated until it melts and the product to be coated is dipped therein. Ordinarily a single dipping is sufficient for meat products such as indicated, but a second or further dipping may be used if a thicker coating is required. It is found that the coating is uniform and completely encases and seals the product, providing a tough covering
15 therefor.

[009] Our product has various uses other than those specifically mentioned and we do not wish to be understood as limiting ourselves to a fat substitute for coating meat products, although that was our primary aim in the development of our invention.

Claims

1. A composition suitable for coating meat and other food products comprising gelatine and water in the approximate weight ratio of 1 to 3 and a fatty material which is solid at 20°C, the approximate weight ratio of liquid gelatine and fatty material being about 4 to 3.
2. The method of making the composition of claim 1 which comprises the steps of dissolving gelatine in water in an approximate weight ratio of gelatine to water of 1 to 3, vigorously stirring for a few minutes, adding thereto a molten fatty material in a weight ratio of fatty material to liquid gelatine of 3 to 4 and vigorously stirring for about two minutes.

Annex 4 (Document 2: Article from "Meat processing Journal")

Coating material for food products

5 [001] The present article concerns a material on the basis of fat for coating or covering food products, in particular meat or meat products, and a method for the preparation of a fat-containing coating or covering.

10 [002] It is well known to cover a pâté, a sausage, such as liver sausage or liver pâté and the like with a thin layer of animal back fat to protect the meat product. The ever-growing demand for meat products, such as pâtés and sausages, has led to a growing demand for fat that can be used for food products. In industrial meat processing however, in particular that of pork, the fat is cut and finely chopped so that it is not possible to recover thin fat layers and therefore more than 90% of the fat cannot be used for
15 covering the meat products. Back fat layers for covering meat products require careful selection and handling which is labour intensive and therefore expensive.

[003] Due to the above-mentioned problems, substitute products have been sought but to date it was not possible to find suitable products that can both meet the strict
20 requirements for foodstuffs and have the properties that conventional back fat has as a coating. Such properties include the coating remaining adhered to pâté or sausage, also during cutting, and the product not tending to change colour or to become deformed on heating. The presently used back fat substitutes often lead to distortion of the fat layer when heated.

25 [004] A coating material is now available on the basis of fat that can be applied on or around foodstuffs, in particular meat, whereby the fat needs not to be specially selected and where a finely-chopped fat can be used thereby avoiding the labour intensive handling of the conventional back fat.

[005] The coating used is based on materials generally used in the food industry and is composed of fat, milk and/or water, gelatine, table salt or nitrite-containing salt, starch and carrageenan. The overall composition in wt.% is 25-65% fat, 5.5-31% milk and/or water, 0.5-14% gelatine, 0-5% salt, 3-41% starch and 0.3-11.5% carrageenan.

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[006] Fat can be animal or vegetable fat, any of these being useful depending on the desired whiteness of the coating material.

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[007] The fat-containing coating for foodstuffs, in particular meat products, is preferably prepared as an emulsion by mixing the animal fat in molten state with the gelatine and then adding milk and/or water. The mixture is prepared whilst stirring and maintaining the temperature above 60°C. The starch and carrageenan are added subsequently. The composition is transferred to a mould and heated to a temperature of 70°C at which it must be kept for 2 to 4 hours, whereafter it is cooled. After the product has been cooled down, it is removed from the mould and layers or slices of desired thickness can be cut or sliced from it, which can be used to coat meat products. The coating material has the advantage that it is ready to use and does not need to be re-pasteurized. Such material has also advantages over conventionally-used rigid back fat layers in that it shows better adhesion to meat or pâté during cutting the coated product and even during vacuum packaging of the meat product.

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[008] The coating material should be as white as possible, because any brownish discoloration of the coating will give the impression that the offered product is less valuable or even spoiled. As the raw material, pork fat is preferably used, beef fat is yellower and therefore less suitable.

25

[009] The following example illustrates the preparation of the coating.

[010] Finely-chopped pork fat was heated to 65°C and melted. Table salt and gelatin were stirred into the molten fat. Milk and water (65°C) were then added and the mixture was stirred to form an emulsion. A mixture of potato starch and carrageenan powder was added to thicken and to stabilise the composition. The material obtained has the following approximate composition in wt%: 51.0 % fat, 18.2% milk, 3.6% water, 4.5% gelatine, 1.8% table salt, 18.2% potato starch and 2.7% carrageenan.

[011] The obtained paste was transferred to a closed mould, heated to a temperature of 80-90°C, held for 3 hours at this temperature and cooled to obtain the finished product. Subsequently the product was cut into slices 2 mm thick. The thus obtained layers or slices can be applied to pâtés or around sausages by machine or by hand. The obtained end product has a white appearance and results in a well adhering coating. The good adhesion of the coating to meat products is particularly advantageous when the meat products are packed under vacuum.

Annex 5 (Letter from the applicant)

Dear Mr Wurst,

5 Having heard the objections raised by the EPO, we have a comment. They probably do not understand how far-reaching our invention is. At first glance it might look very trivial, but it is far from that. First with the present invention it has become possible to actually provide the coating material as an independent product which can be marketed on its own. In the last half year, we have sold 20 tons of coating film. When the product, as
10 explained in our application, paragraph [008], is poured into a film and optionally rolled to reduce its thickness, it can be wound up into a coil. The coil is kept cool until needed. When we filed the application we did not realise the value of the film. It has become a very popular product in the meat processing industry.

15 We have carried out a comparison between a product that has been poured to a film according to the invention and a product that has been formed by cutting into slabs from larger blocks formed as in the prior art. It could be shown that the surface of the poured film has a different structure from that of the cut slabs or slices. The adhesion of the so-formed coating to the food product is also improved because of this structure.

20

Yours sincerely,

Mr Bacon

FatInnovation

Working copy (for cutting and pasting)**Claims of Annex 1 (Patent application)**

1. Edible material for covering or coating food products such as meat and meat products consisting of:

10-50 wt.% beef or pork fat
25-65 wt.% milk and/or water
5-30 wt.% gelatine
0-25 wt.% binders and/or thickeners
0-5 wt.% salt.
2. Covering or coating material as claimed in claim 1, characterized in that it is in slab or film form.
3. Covering or coating material as claimed in claim 1 or 2, consisting of in wt.% 13.9% pork fat, 8.3% gelatine, 36.0% water, 19.4% milk, 20.7% potato starch and 1.7% nitrite-containing salt.
4. Covering or coating material as claimed in claim 1 or 2, consisting of in wt.% 13.9% beef fat, 8.3% gelatine, 36.0% water, 18.4% milk, 11% potato starch, 9.7% carrageenan and 2.7% nitrite-containing salt.
5. Method for preparing the edible covering or coating material of claims 1- 4, comprising preparing a composition at a temperature above 50°C consisting of 10-50% beef or pork fat, 25-65% milk and/or water, 5-30% gelatine, 0-25% binders and/or thickeners and 0-5% salt, whereafter the obtained material undergoes shaping and is cooled.
6. Method as claimed in claim 5, characterized by mixing the beef or pork fat in a molten state with the gelatine and then adding milk and/or water.
7. Food products such as meat or meat products covered or coated with an edible material as claimed in claims 1-4.