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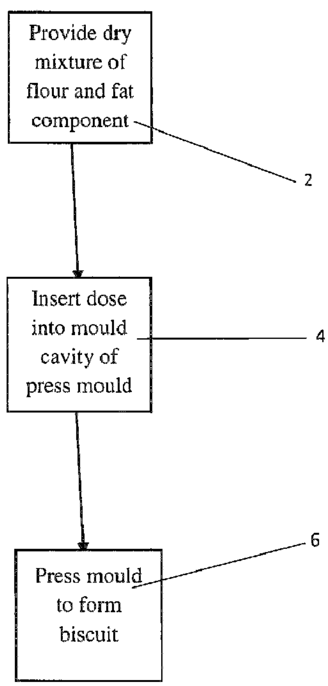

(57) Abrégé/Abstract:
A method of manufacturing a biscuit, the method comprising the steps of: a. providing a dry mixture of a flour component and a fat component; b. inserting a dose of the dry mixture into a mould cavity of a press moulding tool, wherein the dry mixture is inserted

(57) **Abrégé(suite)/Abstract(continued):**
into the mould cavity in the form of a plurality of flowable particles, the mould cavity being defined by opposed moulding surfaces, at least one of the moulding surfaces being heated by a heating mechanism in the press moulding tool; and c. press moulding the dry mixture in the mould cavity to cook the dry mixture and form a biscuit; wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit a weight ratio of (SAG)/(RAG + SAG) of from 20 to 27%, wherein SAG is slowly available glucose and RAG is rapidly available glucose. Also disclosed is a cooked biscuit comprising a cooked mixture of a flour component and a fat component, wherein the biscuit comprises a weight ratio of (SAG)/(RAG + SAG) of from 20 to 27%, wherein SAG is slowly available glucose and RAG is rapidly available glucose.

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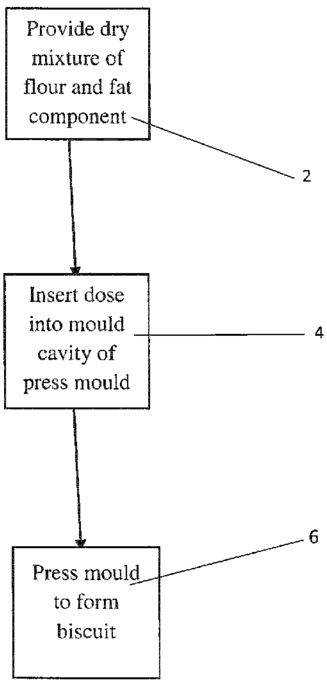
Figure 1



(57) Abstract: A method of manufacturing a biscuit, the method comprising the steps of: a. providing a dry mixture of a flour component and a fat component; b. inserting a dose of the dry mixture into a mould cavity of a press moulding tool, wherein the dry mixture is inserted into the mould cavity in the form of a plurality of flowable particles, the mould cavity being defined by opposed moulding surfaces, at least one of the moulding surfaces being heated by a heating mechanism in the press moulding tool; and c. press moulding the dry mixture in the mould cavity to cook the dry mixture and form a biscuit; wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit a weight ratio of (SAG)/(RAG + SAG) of from 20 to 27%, wherein SAG is slowly available glucose and RAG is rapidly available glucose. Also disclosed is a cooked biscuit comprising a cooked mixture of a flour component and a fat component, wherein the biscuit comprises a weight ratio of (SAG)/(RAG + SAG) of from 20 to 27%, wherein SAG is slowly available glucose and RAG is rapidly available glucose.

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Biscuit and Manufacture Thereof

The present invention relates to a method of manufacturing biscuits, and to cooked biscuits, in particular to biscuits having a high content of dietary fibre and a starch content to provide a "sustained energy" biscuit that elicits a moderate and prolonged glycemic response through a slow release of glucose after digestion.

It is well known to manufacture biscuits using a dough comprising flour, a fat or oil, typically sugar, and water.

There is a general need in the art of commercial biscuit manufacture to increase productivity by reducing the number of steps in a manufacturing process flow and to minimise energy consumption.

Furthermore, there is a general need in the art of commercial biscuit manufacture to manufacture biscuits having a high nutrient density. For example, it is known to manufacture biscuits that have a high content of dietary fibre. There is a general need in the art to manufacture biscuits that have a high content of slowly digestible starch and can release glucose, through digestion of starch, steadily and continuously over an extended period of time to provide a biscuit eliciting moderate and prolonged glycemic response or "sustained energy". The advantages of sustained delivery of glucose to the body are related to general health and include improved insulin sensitivity, avoidance of hypoglycemic states due to excessive rush of glucose in the blood followed by excessive insulinemic response, chronic inflammatory states, etc..

Starch is a polymer of glucose that is digested to give the body its main source of energy: glucose. During digestion, enzymes from the body hydrolyze the starch polymer in order to release the individual monomers, glucose, thus providing energy to the body. When starch is cooked, using heat and water, the starch granules absorb water, swell and lose their ordered structure, a process called gelatinization. When such starch is eaten, the starch molecules are very susceptible to break down by digestive enzymes: the digestive enzymatic hydrolysis is quick and glucose is released rapidly. Clinically, that will result in a rapid spike of glucose in the blood to which the body responds by an equivalent rapid and excessive production of insulin to remove and store the glucose, which usually leads to an abnormally low blood glucose level (hyperglycaemia followed by reactive hypoglycaemia): at the one-meal scale, this can elicit new food cravings and unbalanced diet; in the long term, these sequences can be linked to type-2 diabetes, obesity and a chronic inflammatory state.

In contrast, in uncooked cereal flour such as wheat, the native starch molecules are packed together in an orderly manner and form compact semi-crystalline granules. The ordered state of these granules makes them less susceptible to the action of digestive enzymes, leading to a slow break down of the starch molecules toward glucose release: the process is slow and glucose is released slowly and continuously. Clinically, that will result in a slow, steady and prolonged elevation of blood glucose, eliciting only a moderate insulin response, a moderate rate of glucose clearance and no subsequent hypoglycaemia.

It is known in the art to classify starch into Slowly Digestible Starch or Slowly Available Glucose (SAG), Rapidly Digestible Starch or Rapidly Available Glucose (RAG) and Resistant Starch (RS). Rapidly available glucose (RAG) refers to the amount of glucose likely to be available for rapid absorption in the human small intestine. Slowly available glucose (SAG) refers to the amount of glucose likely to be available for slow absorption in the human small intestine. Slowly Available Glucose (SAG) and Rapidly Available Glucose (RAG) can be characterised by the Englyst method (" Rapidly Available Glucose in Foods: an In Vitro Measurement that Reflects the Glycaemic Response", Englyst et al., Am. J. Clin. Nutr., 1996 (3), 69(3), 448-454 ; "Glycaemic Index of Cereal Products Explained by Their Content of Rapidly and Slowly Available Glucose", Englyst et al., Br. J. Nutr., 2003(3), 89(3), 329-340 ; "Measurement of Rapidly Available Glucose (RAG) in Plant Foods: a Potential In Vitro Predictor of the Glycaemic Response", Englyst et al., Br. J. Nutr., 1996(3), 75(3), 327-337). .

In Englyst method, biscuit samples are prepared by manually and roughly grinding one or more biscuits. The biscuit samples are then subjected to an enzymatic digestion by incubation in presence of invertase, pancreatic alpha-amylase and amyloglucosidase under standardised conditions. Parameters such as pH, temperature (37 °C), viscosity and mechanical mixing are adjusted to mimic the gastrointestinal conditions. After an enzymatic digestion time of 20 min, glucose is measured (to provide a G20 glucose amount by weight) and is labelled RAG. After an enzymatic digestion time of 120 min, glucose is again measured (to provide a G120 glucose amount by weight) and is labelled available glucose (AG). SAG is obtained by subtracting RAG to AG (SAG = AG - RAG), i.e. G120-G20, thus, SAG corresponds to the glucose fraction released between the 20th and the 120th minute.

This in vitro digestion method measures the amount of Rapidly Available Glucose (RAG), the Slowly Available Glucose (SAG) from starch and sugar, and the ratio of the two (RAG/SAG).

The Applicant has established that products with RAG/SAG < about 3.3, preferably < about 3, are good candidates for a “sustained energy” claim for a food product such as a biscuit.

It is known in the art that during a cooking process, if water content and heat are limited during a process to make a food, the native ordered state of the starch granules, the slow-digestibility property, may be preserved. For example, EP-A-2720549 discloses a method for producing a ready-to-eat biscuit comprising at least 29 wt% wholegrain cereal flour, 5 wt% to 22 wt% fat, and at most 30 wt% sugar relative to the total weight of the biscuit. The slowly-digestible-starch-over-total-available-starch ratio of the biscuit is at least 31 wt%. The biscuit has a slowly available glucose value of at least 15.0 g/100 g of biscuit. A dough including cereal flour and fat is formed, the dough including at most 8 wt% added water relative to the total weight of the dough. The cereal flour comprises refined cereal flour in an amount of at least 14.5 wt% of the dough and wherein the refined cereal flour has a water absorption under 55 % as measured by Brabender® Farinograph® according to NF-ISO-5530-1 norm. Therefore a dough with little water is used and only a slow “gentle” baking process is employed, for example using rotary moulding, in which the baking temperature is below 110 °C, and preferably below 100 °C, inside the biscuit during the first third time of the baking; for example if baking time is 7 min, for a period of 2 1/3 minutes. This disclosure accordingly requires a specific cereal flour to be employed to make the dough which is then baked using a specific slow and gentle baking process.

The present invention aims to provide an improved method of manufacturing a biscuit which can not only increase productivity by reducing the number of steps in a manufacturing process flow and minimise energy consumption but also can manufacture biscuits which can provide a slowly digestible starch content which provides a “sustained energy” biscuit that slowly releases glucose after digestion.

The present invention accordingly provides a method of manufacturing a biscuit, the method comprising the steps of:

a. providing a dry mixture of a flour component and a fat component;

b. inserting a dose of the dry mixture into a mould cavity of a press moulding tool, the mould cavity being defined by opposed moulding surfaces, at least one of the moulding surfaces being heated by a heating mechanism in the press moulding tool, wherein the dry mixture is inserted into the mould cavity in the form of a plurality of flowable particles; and
c. press moulding the dry mixture in the mould cavity to cook the dry mixture and form a biscuit;

wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit a weight ratio of (SAG)/(RAG + SAG) of from 20 to 27%, wherein SAG is slowly available glucose and RAG is rapidly available glucose.

The present invention also provides a cooked biscuit comprising a cooked mixture of a flour component and a fat component, wherein the biscuit comprises a weight ratio of (SAG)/(RAG + SAG) of from 20 to 27%, wherein SAG is slowly available glucose and RAG is rapidly available glucose.

Preferred features are defined in the dependent claims.

The resultant biscuit of the preferred embodiments of the present invention can provide a slowly digestible starch content to provide a "sustained energy" biscuit that slowly releases glucose after digestion.

The preferred embodiments of the present invention can manufacture a biscuit without forming a dough, thus eliminating some equipment requirements and processing steps conventionally used in biscuit manufacture. In the preferred embodiments, no (or very little) additional water is added to the ingredients, thereby reducing the amount of energy needed to "cook" the product and reduce the moisture content to a value acceptable in a typical biscuit of from 0.5 to 5 wt% water. The preferred process can therefore reduce equipment costs and operating costs. The physical footprint area of the biscuit manufacturing apparatus for the entire biscuit manufacturing process can be reduced.

The process can form a cereal based-continuous matrix, namely a biscuit product that holds together, without using added water as an ingredient and without forming a dough. The dry mixture that is press moulded and cooked to form the biscuit can be made by avoiding the use of added water, and using only moisture contained in the primary ingredients, for example the flour, and/or fat components, which may be fat components in the form of butter or margarine, and by optional further components.

The preferred embodiments of the present invention can manufacture a biscuit by using a cooking process than applies heat and pressure in a gentle manner that does not denature proteins (in particular gluten) and keeps starch ungelatinised, thus reducing its digestibility.

The preferred embodiments of the present invention can further manufacture a biscuit that has a sufficiently high content of SAG that the biscuit would release glucose (through digestion of starch) steadily and continuously over an extended period of time, to provide a sustained energy biscuit. As discussed above, the advantages of the sustained delivery of glucose to the body are related to general health.

The preferred embodiments of the present invention can further manufacture a biscuit that can provides uncooked/native/raw cereals in a portable form, since the starch and gluten in the biscuit have the same structure as in the raw cereal flour. Furthermore, the biscuit can be made from ingredients that do not necessarily require a whole grain ingredient or the addition of dietary fibres as an additional ingredient to provide a significant amount of dietary fibres.

Embodiments of the present invention will now be described by way of example only with reference to the accompanying drawings, in which:
Figure 1 illustrates a schematic process flow of a method of manufacturing a biscuit according to a preferred embodiment of the present invention.

Referring to Figure 1, there is shown a schematic process flow of a method of manufacturing a biscuit according to a preferred embodiment of the present invention.

In a first step 2 of the method of manufacturing a biscuit, a dry mixture is provided. The dry mixture comprises a flour component and a fat component, and optional further components.

In preferred embodiments of the present invention, the flour component comprises one or more cereal grain flours, for example wheat flour, oat flour, corn flour, rye flour, rice flour or barley flour, or any combination thereof. The one or more cereal grain flours may be selected from one or more wholegrain or refined cereal flours or any combination thereof. The protein content of the flour can be from 0 to 20 wt%; e.g. protein free: 0 wt%, very low protein up to 7 wt%, low protein 7-10 wt%, high protein 10-16 wt%.

In preferred embodiments of the present invention, the fat component, also known in the art of biscuit manufacture as a shortening, which is fat used to make pastry, is selected from one or more fats or one or more oils or any combination thereof, for example vegetable fat, which may be saturated and/or unsaturated, or an animal fat or any combination thereof. The fat component may comprise butter, margarine, animal fat, vegetable fat or vegetable oil, or any combination thereof. In a particularly preferred embodiment, the fat component comprises or consists of butter.

In one preferred example, the fat component is butter and the flour component is a cereal grain flour or mixture of cereal grain flours, preferably whole grain cereal flour(s).

Typically, the dry mixture comprises from 2 to 80 parts by weight, more typically from 20 to 50 parts by weight, for example from 25 to 40 parts by weight, of the fat component per 100 parts by weight of the flour component.

Optionally, the dry mixture further comprises at least one sweetener component. The at least one sweetener component may comprises at least one sugar in solid or liquid form. Typically, the dry mixture comprises from 2 to 80 parts by weight, more typically from 20 to 50 parts by weight, for example from 25 to 40 parts by weight, of the at least one sugar per 100 parts by weight of the flour component.

In one preferred example, the dry mixture comprises from 40 to 80 wt % of the flour component, from 10 to 30 wt % of the fat component and from 10 to 30 wt % of the at least one sugar, each wt % value being based on the total weight of the flour component, the fat component and the at least one sugar. In a further preferred example, the dry mixture comprises from 50 to 70 wt % of the flour component, from 15 to 25 wt % of the fat component and from 15 to 25 wt % of the at least one sugar, each wt % value being based on the total weight of the flour component, the fat component and the at least one sugar. In each of these examples, and other preferred embodiments, preferably the flour component is a cereal grain flour or mixture of cereal grain flours, for example whole wheat flour, the fat component comprises or consists of butter and the at least one sugar comprises or consists of particles of sugar. When particles of sugar are used as an ingredient, various particle sizes may be used, and the sugar may comprise granulated sugar (average (by weight) particle size 450-600μm), and/or caster sugar (particle size range of 150-450μm).

In preferred embodiments of the present invention, the dry mixture contains no added water. In this specification, the term "no added water" means that no liquid water has been added to the dry mix and any moisture content in the dry mix is present in the various added ingredients, for example in butter which has a typical moisture content of about 25 wt% based on the weight of the butter. Typically, the dry mixture has a moisture content of from 3 to 7 wt%, for example from 4 to 6 wt%, based on the weight of the dry mixture.

The dry mixture may optionally comprise one or more of the following ingredients: leavening agent from 0 to 10 parts per 100 parts of flour; salt (sodium chloride) from 0 to 6 parts per 100 parts of flour; natural extracts from 0 to 75 parts per 100 parts of flour; flavouring from 0 to 20 parts per 100 parts of flour; inclusions (such as nuts, chocolate pieces, etc.) from 0 to 100 parts per 100 parts of flour; and cheese/dairy products from 0 to 100 parts per 100 parts of flour.

In order to form the dry mixture, the dry ingredients (e.g. wheat flour and sugar) are initially mixed together in a mixer to form a uniform powder/particulate mixture. Thereafter the solid and/or liquid fat component is added. When the fat component is solid, for example a butter, the fat component is added as particles. In a preferred embodiment, chilled, grated butter is added to the mixture of dry ingredients. The resultant mixture, which is a dry mixture because no water has been added or in alternative embodiments substantially no water (i.e. less than 2 wt% based on the total weight of the mixture) has been added, is then mixed to form a uniform dispersion of the ingredients as a plurality of flowable particles without forming a homogeneous dough.

In a second step 4, a dose of the dry mixture is inserted into a mould cavity of a press moulding tool. The dry mixture is inserted into the mould cavity in the form of a plurality of flowable particles. The plurality of flowable particles form an inhomogeneous agglomerate of the particles in the mould cavity.

The mould cavity is defined by opposed moulding surfaces, at least one of the moulding surfaces being heated by a heating mechanism in the press moulding tool. Typically, the press moulding tool comprise a pair of opposed platens, each platen defining a respective one of the opposed moulding surfaces, and each platen is heated by the heating mechanism. Preferably, in the pair of opposed platens, a lower platen is stationary and an upper platen is movable by an actuator, for example a piston, in opposite directions towards and away from the lower platen so as respectively to close and open the mould cavity.

In a third step 6, the dry mixture is press moulded in the mould cavity to cook the dry mixture and form a biscuit. The actuator pushes the opposed moulding surfaces towards each other to close the mould cavity and urge the ingredients of the dry mixture against the hot moulding surfaces. This pushing action can be done in a single movement, i.e. press, then release, or in several successive stages. The heated moulding surfaces cook the ingredients to form a cooked biscuit.

Typically, the at least one moulding surface is heated by the heating mechanism to a temperature of from 80 to 220 °C, more typically from 80 to 180 °C, for example from 100 to 140 °C. Typically, the press moulding applies a moulding pressure of from $1x10^5$ to $6x10^5$ N/m^2, for example from $2x10^5$ to $4x10^5$ N/m^2. Typically, the press moulding is conducted for a period of from 10 seconds to 4 minutes, more typically from 30 seconds to 2 minutes, for example from 45 seconds to 75 seconds.

Typically, the dose has a mass of from 5 to 50 grams, for example from 10 to 25 grams.

The press moulding step reduces the moisture content of the dry mixture during cooking to provide that the cooked biscuit has a typical moisture content of from 0.5 to 5 wt%, more typically from 1 to 3 wt%, for example from 1 to 2 wt%, based on the weight of the cooked biscuit. Such final moisture ranges are readily achievable using the cooking conditions of time and temperature as described above with an initial moisture content in the dry mixture of from 3 to 7 wt%, for example from 4 to 6 wt%, based on the weight of the dry mixture.

The press moulding conditions and the dry mixture are selected to provide in the cooked biscuit a weight ratio of SAG/(RAG + SAG) of from 20 to 27%, for example from 23 to 27%. Typically, the cooked biscuit has up to 20 wt% SAG per 100 grams of starch, for example from 15 to 17 wt% SAG per 100 grams of starch. The cooked biscuit may also have from 44 to 49 wt% RAG per 100 grams of starch.

In preferred embodiments of the present invention, the press moulding conditions and the composition of the dry mixture are selected to provide in the cooked biscuit a weight ratio of rapidly available glucose (RAG) to slowly available glucose (SAG) of up to 3.3, optionally up to 3.1, further optionally less than 3, typically from 2.4 to 2.9.

The present invention will now be illustrated by the following non-limiting Example.

Example 1

Wheat flour and sugar were mixed together using a domestic food mixer at room temperature (25 °C) for a period of 10 seconds. Chilled butter was grated into the mixture, and the resultant mixture was stirred manually. Thereafter the mixture was mixed using the mixer to form a plurality of flowable particles.

The weight ratios of the ingredients was 60 wt% refined wheat flour, 20 wt% sugar and 20 wt% butter. No water was added to the ingredients. Since the moisture content of the butter was about 25 wt% of the weight of the butter, the mixture had a moisture content of from 4 to 6 wt% based on the weight of the mixture.

A dose of the flowable particles was inserted into a mould cavity of a press moulding machine as described above. The opposed platens were heated to a temperature of 100 to 140 °C). The flowable particles formed an inhomogeneous agglomerate of the particles in the mould cavity. The mixture was pressed within the press mould cavity for a period of 1 minute under a moulding pressure of from $2x10^5$ to $4x10^5$ N/m^2. The mould cavity was opened and a cooked biscuit was removed.

The biscuit was analysed, as discussed above, to determine the SAG and RAG content. The biscuit had 45.6 wt% RAG and 17.0 wt% SAG, and consequently 37.4 wt% Resistant Starch (RS), each based on the total weight of the starch. This provided a RAG/SAG weight ratio of 2.7 and a (SAG)/(RAG +SAG) weight ratio of 27%.

Example 2

Example 1 was repeated and the resultant biscuit had 47.9 wt% RAG and 15.5 wt% SAG, and consequently 36.6 wt% Resistant Starch (RS), each based on the total weight of the starch. This provided a RAG/SAG weight ratio of 3.1 and a (SAG)/(RAG +SAG) weight ratio of 24%.

Example 3

Example 1 was repeated and the resultant biscuit had 49.0 wt% RAG and 14.7 wt% SAG, and consequently 36.3 wt% Resistant Starch (RS), each based on the total weight of the starch. This provided a RAG/SAG weight ratio of 3.3 and a (SAG)/(RAG +SAG) weight ratio of 23%.

These Example all show that a biscuit can be made from a flowable particulate mixture of flour and fat, and sugar, without any added water, and that then the mixture can be press moulded at elevated temperature in a short processing time to form a biscuit. It is not required to add water or to form a dough. The method provides increased productivity by reducing the number of steps in a manufacturing process flow and minimises energy consumption.

The resultant biscuit has good nutritional properties. The biscuit can provide a slowly digestible starch content to provide a "sustained energy" biscuit that slowly releases glucose after digestion.

CLAIMS:

1. A method of manufacturing a biscuit, the method comprising the steps of:

a. providing a dry mixture of a flour component and a fat component, wherein the dry mixture contains no added water, or added water of less than 2 wt% based on the total weight of the mixture, and the dry mixture has a moisture content of from 3 to 7 wt% based on the weight of the dry mixture;

b. inserting a dose of the dry mixture into a mould cavity of a press moulding tool, the mould cavity being defined by opposed moulding surfaces, at least one of the moulding surfaces being heated by a heating mechanism in the press moulding tool, wherein the dry mixture is inserted into the mould cavity in the form of a plurality of flowable particles; and

c. press moulding the dry mixture in the mould cavity to cook the dry mixture and form the biscuit, wherein the at least one moulding surface is heated by the heating mechanism to a temperature of from 80 to 180°C, and the press moulding is conducted for a period of from 30 seconds to 2 minutes, wherein the press moulding step reduces the moisture content of the dry mixture during cooking to provide that the cooked biscuit has a moisture content of from 1 to 3 wt% based on the weight of the cooked biscuit;

wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit a percentage weight ratio of (SAG) to (RAG + SAG) of from 20 to 27%, wherein SAG is slowly available glucose and RAG is rapidly available glucose.

2. A method according to claim 1, wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit a weight ratio of RAG to SAG of up to 3.3.

3. The method according to claim 1 or 2, wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit a weight ratio of RAG to SAG up to 3.1.

4. The method according to any one of claims 1 to 3, wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit a weight ratio of RAG to SAG less than 3.

5. A method according to any one of claims 1 to 4, wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit a weight ratio of RAG to SAG of from 2.4 to 2.9.

6. A method according to any one of claims 1 to 5, wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit a percentage weight ratio of (SAG) to (RAG + SAG) of from 23 to 27%, wherein SAG is slowly available glucose and RAG is rapidly available glucose.

7. A method according to any one of claims 1 to 6, wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit from 15 to 17 wt% SAG per 100 grams of starch in the cooked biscuit.

8. A method according to any one of claims 1 to 7, wherein the press moulding conditions and the dry mixture are selected to provide in the cooked biscuit from 44 to 49 wt% RAG per 100 grams of starch in the cooked biscuit.

9. A method according to any one of claims 1 to 8, wherein the at least one moulding surface is heated by the heating mechanism to a temperature of from 100 to 140 °C.

10. A method according to any one of claims 1 to 9, wherein the press moulding applies a moulding pressure of from $1x10^5$ to $6x10^5$ N/m^2.

11. A method according to claim 10, wherein the moulding pressure is from $2x10^5$ to $4x10^5$ N/m^2.

12. A method according to any one of claims 1 to 11, wherein the press moulding is conducted for a period of from 45 seconds to 75 seconds.

13. A method according to any one of claims 1 to 12, wherein the dose has a mass of from 5 to 50 grams.

14. A method according to claim 13, wherein the dose has a mass of from 10 to 25 grams.

15. A method according to any one of claims 1 to 14, wherein the press moulding tool comprise a pair of opposed platens, each platen defining a respective one of the opposed moulding surfaces.

16. A method according to claim 15, wherein each platen is heated by the heating mechanism.

17. A method according to claim 15 or claim 16, wherein in the pair of opposed platens, a lower platen is stationary and an upper platen is movable by an actuator in opposite directions towards and away from the lower platen so as respectively to close and open the mould cavity.

18. A method according to claim 17, wherein the actuator is a piston.

19. A method according to any one of claims 1 to 18, wherein the moisture content is within the flour component and/or the fat component.

20. A method according to any one of claims 1 to 19, wherein the dry mixture has a moisture content of from 4 to 6 wt% based on the weight of the dry mixture.

21. A method according to any one of claims 1 to 20, wherein the cooked biscuit has a moisture content of from 1 to 2 wt% based on the weight of the cooked biscuit.

22. A method according to any one of claims 1 to 21, wherein the flour component comprises one or more cereal grain flours selected from the group consisting of one or more wholegrain, one or more refined cereal flours, and any combination thereof, the one or more cereal grain flours being selected from one or more flours selected from wheat flour, oat flour, corn flour, rye flour, rice flour or barley flour, and any combination thereof.

23. A method according to any one of claims 1 to 22, wherein the fat component the fat component comprises butter, margarine, animal fat, vegetable fat or vegetable oil, or any combination thereof.

24. A method according to claim 23, wherein the fat component comprises or consists of butter.

25. A method according to any one of claims 1 to 24, wherein the dry mixture comprises from 2 to 80 parts by weight of the fat component per 100 parts by weight of the flour component.

26. A method according to claim 25, wherein the dry mixture comprises from 25 to 40 parts by weight of the fat component per 100 parts by weight of the flour component.

27. A method according to claim 26, wherein the fat component is butter and the flour component is a cereal grain flour or mixture of cereal grain flours.

28. A method according to any one of claims 1 to 27, wherein the dry mixture further comprises at least one sweetener component.

29. A method according to claim 28, wherein the at least one sweetener component comprises at least one sugar in solid or liquid form.

30. A method according to claim 29, wherein the dry mixture comprises from 2 to 80 parts by weight of the at least one sugar per 100 parts by weight of the flour component.

31. A method according to claim 30, wherein the dry mixture comprises from 25 to 40 parts by weight of the at least one sugar per 100 parts by weight of the flour component.

32. A method according to any one of claims 29 to 31, wherein the dry mixture comprises from 40 to 80 wt % of the flour component, from 10 to 30 wt % of the fat component and from 10 to 30 wt % of the at least one sugar, each wt % value being based on the total weight of the flour component, the fat component and the at least one sugar.

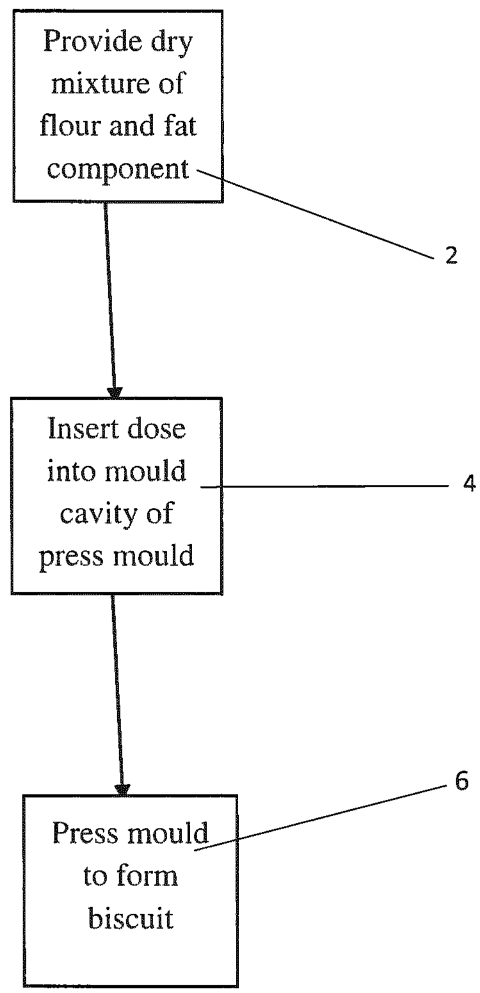
33. A method according to claim 32, wherein the dry mixture comprises from 50 to 70 wt % of the flour component, from 15 to 25 wt % of the fat component and from 15 to 25 wt % of the at least one sugar, each wt % value being based on the total weight of the flour component, the fat component and the at least one sugar.

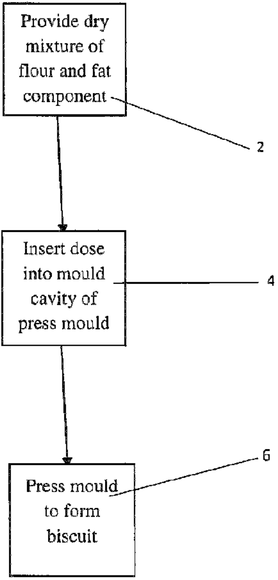
34. A method according to claim 33, wherein the flour component is a cereal grain flour or mixture of cereal grain flours, the fat component comprises or consists of butter and the at least one sugar comprises or consists of particles of sugar.

35. A method according to claim 34, wherein the flour component is a whole wheat flour.

36. A method according to any one of claims 1 to 35, wherein the plurality of flowable particles form an inhomogeneous agglomerate of the particles in the mould cavity.

Figure 1


Provide dry mixture of flour and fat component
2
Insert dose into mould cavity of press mould
4
6
Press mould to form biscuit


Provide dry mixture of flour and fat component
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