

COMPOSITE LAMINATED DOUGH

5 The invention relates to a composite laminated dough to be used for producing confectionery having a laminated structure, such as pies, pastries, crackers and lemon puffs and to a method of making such a dough.

10 Various methods are known for producing confectionery having a laminated structure.

15 Examples of known methods include a method which comprises wrapping a fat such as butter or margarine in a rolled dough to thereby form a dough/fat/dough structure and folding it in such a manner as to give a multilayered structure; and a method which comprises dispersing a fat in the form of particles in a dough to produce a structure wherein the fat is wrapped in the dough and then folding it in such a manner as to give a multilayered structure. When baked in an oven, the laminated dough with alternate dough and fat layers gives a confectionery product having a laminated structure, since the fat layer suppresses the emission of water vapour (including carbon dioxide when baker's yeast is employed) and thus expands or puffs up.

20 With the recent high growth of the economy and the increase in income levels, eating habits have changed accompanied by a demand for high-grade and diversified foods. In the field of baking, oven-fresh bakeries, which supply various fresh (as-baked) products including not only conventional white bread, bean-jam buns, jam buns and cream buns but also a number of variety buns, pies, pastries and buns stuffed with prepared foods, enjoy great popularity. The selling points of these oven-fresh bakeries reside in the freshness and variety of their products. Thus it is a serious problem for a

manager to characterise (differentiate) his shop from others and to obtain the necessary production space and manpower while keeping production costs reasonable.

5 It is difficult under these circumstances to prepare laminated confectionery products, such as pies and pastries, the preparation of which requires much labour in, e.g. fat wrapping, rolling and folding. When a high quality butter is to be used for producing these
10 products, the characteristics of the butter (i.e., a large change in viscosity with changes in temperature) cause the split of the fat layer and the adhesion of the dough layers to each other which makes it impossible to form a good laminated dough. When a laminated dough is
15 temporarily frozen in order to save labour, the deterioration is accelerated.

In the case of a laminated dough containing baker's yeast, the activity of the yeast is lowered whilst
20 frozen, regardless of the use of butter. When such a dough is baked in an oven, the resulting laminated products have very poor puffing properties.

In general terms, it is the object of the present
25 invention to provide a composite laminated dough wherein the above-mentioned disadvantages are eliminated or minimised.

Thus it is a first object of the present invention to provide a composite laminated dough which facilitates the production of various laminated confectionery products of widely varying properties, for example, puffing properties, flavour, colour tone, appearance and cost by combining various laminated doughs.

It is a second object of the present invention to provide a composite laminated dough containing butter whose puffing properties are improved.

It is a third object of the present invention to provide a composite laminated dough containing baker's yeast whose puffing properties, which are impaired by freezing are restored when thawed.

According to one aspect of the present invention a method of making a composite laminated dough includes making at least two laminated doughs of different compositions by wrapping a fat in a dough mainly comprising wheat flour, the fats in the respective doughs having substantially different extensibilities, and then rolling and folding each dough and then superposing the laminated doughs.

In this case, optionally there may be a further rolling and folding step following superposition.

According to a second aspect of the present invention a method of making a composite laminated dough includes making at least two wrap-in doughs of different compositions by wrapping fat in a dough mainly comprising wheat flour, the fats in the respective doughs having substantially different extensibilities, and then superposing the two wrap-in doughs and rolling and folding the superposed wrap-in doughs.

The invention also extends to a ^{composite} ~~composition~~ laminated dough comprising a plurality of adjacent layers of dough ~~mainly comprising wheat flour~~ of at least two different ^{comprising wheat flour and} types, containing a wrapped-in fat, the wrapped-in fat in
 5 at least two of the respective types of dough having substantially different extensibilities.

Both aspects of the present invention achieve the first object referred to above. Thus both aspects of the
 10 present invention permit a wide range of very satisfactory laminated confectionery products to be produced having widely varying properties, such a puffing properties, flavour, colour tone, appearance and cost by combining various laminated doughs.

15 The present invention also embraces the composite laminated doughs produced by the methods of the first and second aspects of the invention.

20 The doughs comprising wheat flour which are used in the present invention may be prepared by adding a fat and water, optionally together with, for example, egg, milk powder, common salt, sugars, seasonings, baker's yeast and rising agent to wheat flour and kneading the
 25 resulting mixture. Examples of such doughs include pie dough, pastry dough, bread dough and croissant dough.

The precise nature of the doughs mainly comprising wheat flour is not restricted provided that a fat can be
 30 wrapped therein. The manner of wrapping may also vary widely. For instance, a fat in the form of a sheet may be wrapped in the dough in the form of a bag. Alternatively, a fat in the form of discrete particles may be dispersed in the dough. Thus, the terms
 35 "wrapping", "wrapped" and "wrap-in" in this specification

can refer to fat being dispersed within a mass of dough, in discrete particles.

5 Substantially any fat, of emulsified or unemulsified type, may be used provided that it is edible. Examples of suitable fats include natural plastic fats such as butter, plasticised fats such as margarine, plastic shortening and reverse-phase margarine and various animal and vegetable fats.

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The form of the fat to be used is not crucial provided that it can be wrapped in the dough. It may be in the form of sheets, cubes or particles.

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The fat may be used in an amount ranging from 20 to 60 parts by weight, preferably from 30 to 50 parts by weight, per 100 parts by weight of dough.

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Fats which differ from one another in their extensibility are those which differ in the degree of extension which occurs of the fat layer during wrapping-in or rolling and folding and exhibit a significant difference in their puffing properties. Examples of such a combination of two or more fats include a combination comprising a highly extensible plastic fat (e.g. margarine which is used in pies) with butter or a common plastic fat and a combination comprising a common plastic fat with a non-plastic fat. A combination of butter and margarine is preferred. The margarine which is preferably used is commercially available and sold exclusively for doughs prepared by a rolling procedure and has excellent extensibility and viscoelasticity and can withstand the rolling and folding procedures.

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If a laminated dough containing butter is to be

superposed upon a laminated dough containing margarine in the first aspect of the invention, the laminated dough containing butter may be inserted between layers of a laminated dough containing margarine and this results in a confectionery product having excellent puffing properties and flavour.

An example of a combination of fats of differing puffing properties is margarine of a type intended exclusively for rolling-in with common margarine. When such laminated doughs are superposed on one another, the laminated dough containing common margarine may be inserted between the layers of the laminated dough containing rolling-in margarine.

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In the first aspect of the invention, the rolling and folding procedures may be conducted with the use of, for example, a rolling pin or a machine such as a reverse sheeter. It is preferred that the laminated doughs consist of from 48 to 256 layers.

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After superposing the laminated doughs, they may be rolled. This may be done with a rolling pin or with a machine such as a reverse sheeter. The degree of rolling is controlled in dependence on the required characteristics of the resulting laminated confectionery product.

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The rolling and folding procedures which may be performed after the superposition of the laminated doughs in a preferred embodiment may be performed in a similar manner. It is preferred that the composite laminated dough thus obtained consists of 48 to 256 layers.

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If a wrap-in dough containing butter is to be superposed

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onto a wrap-in dough containing margarine of the type used exclusively for rolling-in when preparing a dough in accordance with the second aspect of the invention, the former dough may be inserted between layers of the latter dough. A laminated confectionery product with excellent puffing properties and flavour is obtained.

The composite laminated dough in accordance with the invention may be baked as such or it may be temporarily frozen and then thawed and baked.

The freezing procedure may be effected after the superposition of the laminated doughs using apparatus of the type commonly employed to freeze food..

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The invention will be further illustrated by way of the following Examples and Comparative Examples.

Example 1

A crust, i.e. pastry comprising a composite laminated dough of the present invention was produced from two doughs having the compositions specified below in the following manner.

<u>Dough</u>		1	2
	hard flour	500	500
	soft flour	500	500
30	egg (net)	100	100
	common salt	10	10
	shortening	50	50
	water	480	480
<u>Fat for folding</u>			
35	margarine	900	

(exclusively used for rolling-in)

butter

900

(1) The wheat flours of composition 1 were fed into a mixer.

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(2) Cold water (at approximately 5°C), egg and common salt were homogeneously mixed together and added to (1). The resulting mixture was mixed by stirring at a low speed for 2 minutes and then at a moderate speed for 4 to 5 minutes.

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(3) After adding shortening, the mixture was mixed by stirring at a low speed for 2 minutes, at a moderate speed for 3 minutes, and then at a high speed for 1 minute, Kneading temperature: 20°C±1°C.

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(4) The dough was introduced into a retarder (2°C) for resting for approximately 1 hour.

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(5) The fat was wrapped with the dough.

(6) The dough was folded in four twice to give a dough consisting of 16 layers.

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(7) The dough was introduced into a retarder for resting.

(8) The dough was folded in four once and rolled until the thickness was 10 mm. Thus a laminated dough containing margarine and consisting of 64 layers was obtained.

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(9) A laminated dough containing butter was prepared from composition 2 using the steps through the described above in (1) to (8).

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(10) The laminated dough containing butter (Composition 2) obtained in (9) was superposed upon the laminated dough containing margarine (Composition 1) obtained in (8) in such a manner that the former was inserted between the latter (thickness: approximately 30 mm). The superposed doughs were rolled until their thickness was 10 mm and then cut into pieces (100 mm in length, 10 mm in width). The pieces were placed on a baking sheet in such a manner that the cross-section of each piece was directed upwards.

(11) After baking at 200°C for 12 minutes, a crust was obtained. This crust had lifted or risen 50 mm (the average of 10 pieces) and was well-baked. It had a light texture and a butter-rich flavour.

The laminated dough of composition 1, in which the margarine was of the type exclusively used for rolling-in with excellent extensibility and viscoelasticity properties, provides continuous fat layers in the pie dough and has good puffing properties. On the other hand, the laminated dough of composition 2 provides discontinuous fat layers and has poor puffing properties, since the butter has poor extensibility and a narrow range of viscoelasticity temperatures and thus the hardness of the dough is different to that of the dough during rolling after resting.

The composite laminated dough of Example 1 produces a crust which is well baked and has a light texture and a butter-rich flavour. Such a crust cannot be obtained by merely mixing the above-mentioned two doughs nor by preliminarily blending them.

Comparative Example 1

A crust was produced using a composition which was the same as composition 2 specified in Example 1.

5 (1) Three layers of laminated dough containing butter (64 layers, thickness: 10 mm) were prepared by the steps (1) to (8) described in Example 1.

10 (2) The three layers containing butter obtained in (1) were superposed upon each other (thickness: approximately 30 mm) and then rolled until the thickness was reduced to 10 mm. Then the dough was cut into pieces (100 mm in length, 10 mm in width). The obtained pieces were placed on a baking sheet in such a manner that the cross-section of each piece was directed upwards.

15 (3) After baking at 200°C for 12 minutes, a crust was obtained. This crust rose 40 mm (the average of 10 pieces) and was not well-baked. It had a butter-rich flavour but a heavy texture.

20 Example 2

A crust comprising a composite laminated dough of the present invention was produced from the compositions specified below in the following manner.

<u>Dough</u>		1	2
25	hard flour	500	500
	soft flour	500	500
	egg (net)	100	100
	common salt	10	10
	shortening	50	50
30	water	480	480
<u>Fat for folding</u>			
	margarine	900	
	(exclusively used for rolling-in)		
	butter		900
35	(1) The wheat flours of composition 1 were fed into		

a mixer.

5 (2) Cold water (at approximately 5°C), egg and common salt were homogeneously mixed together and added to (1). The resulting mixture was mixed by stirring at a low speed for 2 minutes and then at a moderate speed for 4 to 5 minutes.

10 (3) After adding shortening, the mixture was mixed by stirring at a low speed for 2 minutes, at a moderate speed for 3 minutes, and then at a high speed for 1 minute, Kneading temperature: 20°C±1°C.

15 (4) The dough was introduced into a retarder (2°C) for resting for approximately 1 hour.

20 (5) After wrapping the fat, the dough was rolled until the thickness was reduced to 20 mm to produce a wrapping-in dough containing margarine of the type exclusively used for rolling-in.

 (6) A wrap-in dough containing butter prepared from composition 2 by steps (1) to (5) above.

25 (7) The wrap-in doughs obtained in (5) and (6) were superposed on each other and rolled. After folding in four twice, a dough consisting of 32 layers was obtained.

30 (8) The dough was introduced into a retarder for resting.

35 (9) After folding in four once, the dough was rolled until the thickness was reduced to 10 mm and then cut into pieces (100 mm in length, 10 mm in width). These pieces were placed on a baking sheet in such a

manner that the cross-section of each piece was directed upwards.

5 (10) After baking at 200°C for 12 minutes, a crust or pastry was obtained.

10 This crust had a layered structure of alternating continuous and discontinuous layers. The baked product rose by 45 mm (the average of 10 pieces) and was characterised by a flakey and less brittle texture.

15 The dough of composition 1, in which the margarine was of the type exclusively used for rolling and had a very good extensibility and viscoelasticity, had continuous fat layers and good puffing properties. On the other hand, the dough of composition 2 had discontinuous fat layers and forms a structure similar to that of a kneaded dough, since the butter used therein has no properties which are suitable for rolling or cooling, plasticising and
20 controlling of crystallisation and thus cannot provide appropriate extensibility or viscoelasticity during the production of the crust.

25 The composite laminated dough produced results in a crust which has a structure of alternating continuous and discontinuous layers and a flakey and less brittle texture. When baked, the crust rises, i.e. is puffed. In the case of a crust of a single-layer structure, a higher degree of rising is desirable. In the case of a
30 crust comprising layers differing from each other, however, the quality of the structure cannot always be determined exclusively on the extent to which it rises.

35 Such a crust cannot be obtained either by mixing the two above-mentioned doughs nor by preliminarily blending them

Comparative Example 2

A crust was produced using composition 1 specified in Example 2.

5 (1) Steps (1) to (5) of Example 2 were repeated and after rolling to a thickness of 20 mm, a wrap-in dough containing margarine exclusively used for rolling-in was produced.

10 (2) This dough was folded in two and then in four twice to produce a dough consisting of 32 layers.

 (3) The dough was baked in the same manner as described in Example 1.

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The crust had a layered structure exclusively comprising continuous layers and rose 50 mm (the average of 10 pieces) after baking. It had a flakey and brittle texture.

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CLAIMS

1. A method of making a composite laminated dough
5 including making at least two laminated doughs of
different compositions by wrapping a fat into a dough
mainly comprising wheat flour, the fats in the respective
doughs having substantially different extensibilities,
and rolling and folding each dough and then superposing
10 the laminated doughs.
2. A method of making a composite laminated dough
including making at least two wrap-in doughs of different
compositions by wrapping fat in a dough mainly comprising
15 wheat flour, the fats in the respective doughs having
substantially different extensibilities, then superposing
the wrap-in doughs and rolling and folding the superposed
wrap-in doughs.
- 20 3. A method as claimed in claim 1 further comprising
the step of rolling and folding the superposed laminated
doughs.
- 25 4. A method as claimed in Claim 1 or Claim 2 in which
two different fats are used, margarine and butter.
5. A composite laminated dough comprising a plurality
of adjacent layers of dough ~~mainly comprising wheat flour~~
30 ~~of at least two different types~~ ^{comprising wheat flour and} containing a wrapped-in
fat, the wrapped-in fat in at least two of the respective
types of dough having substantially different
extensibilities.
- 35 6. A composite laminated dough as claimed in Claim 5
comprising doughs of two different types, one of which



contains butter and the other contains margarine.

7. A method of making a composite laminated dough
substantially as specifically herein described in ^{either} ~~any one~~
5 of Examples 1 ~~to 3~~ and 2.

8. A composite laminated dough substantially as
specifically herein described in ^{either} ~~any one~~ of Examples 1 ~~to~~
3 and 2.