

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
9 February 2006 (09.02.2006)

PCT

(10) International Publication Number
WO 2006/015155 A2

(51) International Patent Classification:
A23G 3/00 (2006.01)

(21) International Application Number:
PCT/US2005/026862

(22) International Filing Date: 27 July 2005 (27.07.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/900,967 28 July 2004 (28.07.2004) US

(71) Applicant (for all designated States except US): **GENERAL MILLS MARKETING, INC.** [US/US]; Number One General Mills Boulevard, P.O. Box 1113, Minneapolis, MN 55440 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **LONERGAN, Dennis, A.** [US/US]; 1825 Country Road 24, Medina, MN 55356 (US).

(74) Agents: **HORNILLA, Arlene, L.** et al.; General Mills, Inc., Number One General Mills Boulevard, P.O. Box 1113, Minneapolis, MN 55440 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

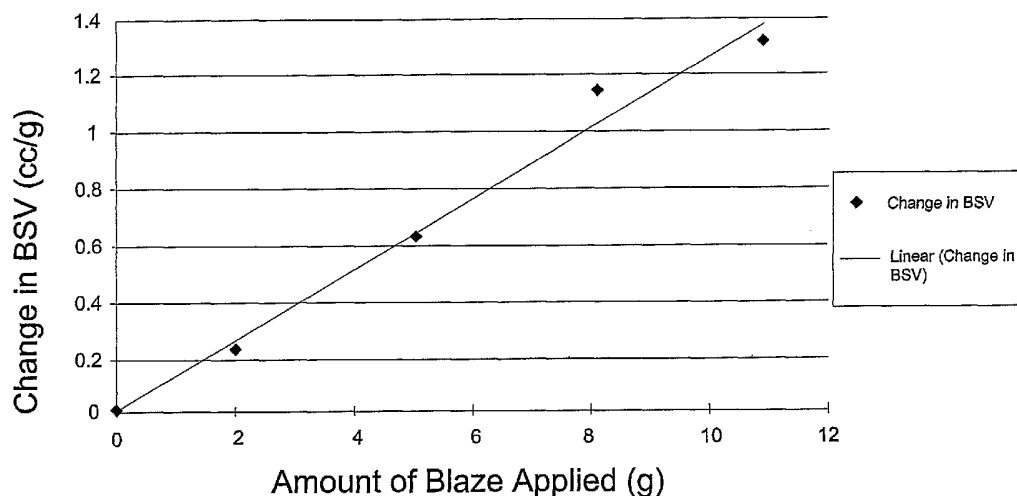
Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A METHOD OF MAKING A LAMINATED DOUGH PRODUCT AND A PRODUCT PRODUCED THEREBY

Anhydrous Glaze Increases BSV



(57) Abstract: The invention provides a baking mixture of an edible oil and a low density maltodextrin for use in preparing baked goods such as pseudo-fried baked goods and laminated dough products. The glaze comprises at least one edible oil, and an anhydrous low-density maltodextrin. As a glaze, the mixture is used to at least partially coat the food intermediate. As a shortening-like composition, the mixture is applied to a baking dough wherein a process of sheeting and folding is used to create discrete layers within a laminated dough.

A METHOD OF MAKING A LAMINATED DOUGH PRODUCT AND A PRODUCT PRODUCED THEREBY

5

BACKGROUND OF THE INVENTION

In the manufacture of many types of food products such as doughnuts, pizza doughs, pizza rolls, beignets, pizza pockets, taco shells, French fries, tortilla shells and the like, it is often desirable to endeavor to impart a fried-like texture to these products through a pseudo frying/baking step. The reason for this is that a fried food may have a softer, yet crispier crust than a traditionally baked food. The resulting rise in demand for such pseudo fried/baked products has arisen in large part due to dietary and health concerns about the consumption of fried foods and a general avoidance of frying food products in oil or fat. Nonetheless, the appearance and texture of fried food products is desired by the consumer and therefore efforts have been made to find a way of imparting a fried like appearance and texture to a food product through a baking step.

Dough that is fried will yield different products such as doughnuts, tortilla shells and the like as opposed to one that is baked, such as a loaf of bread or rolls. That is, the frying produces differences in texture, shape, color, and flavor. Therefore, in order to give a baked product an appearance similar to one that is fried, modifications must be made to the technology of making the food.

In an attempt to address this need U.S. Patent No. 5,989,603 (Lonergan et al.) describes the use of a water in oil emulsion and a hydrophilic colloid coating used to impart fried like properties to a baked dough product. The oil is selected from a number of edible oils and the edible hydrophilic colloid is selected from starches, natural gums and chemically modified polysaccharides.

It has been recognized that it would be desirable to attempt to eliminate the water from the glaze to improve the fried qualities of the food product after baking. The presence of water tends to lead to problems caused by the water being absorbed into the surface layer of the food product, potentially making the food soggy. In situations, for example, where the food product is wheat or dough based (providing a hydrophilic surface), the absorbed water can significantly affect the overall composition of the surface of the food product and impart surface

properties not associated with a fried product. This can affect the shape of the dough product, as during baking and the additional hydration causes the dough to spread out losing its desired configuration as well as fail to achieve the desired aesthetic properties referenced above.

5 In addition to improving the taste and appearance of fried or pseudo fried baked goods, it would be advantageous to find a mixture having additional uses in preparing baked goods. For example, laminated products such as croissants, biscuits, Danish, sweet rolls, cinnamon rolls and strudel are generally formed of alternating layers of shortening and dough. Generally, a roll-in shortening or
10 butter is applied to the surface of the dough wherein the dough is folded to maintain the dough layer and fat as distinct layers. The dough is repeatedly folded to such that a desired number of individual layer is created. For example, laminated dough can comprise anywhere from about 8 to about 64 individual layers of shortening. Following baking, laminated products tend to have distinct
15 layers, a flaky crumb and crisp crust.

As such, what is needed is a baking mixture which can be used to achieve the textural and aesthetic features of fried foods as well as provide an alternative to traditional fats used in preparing laminated dough products.

SUMMARY OF THE INVENTION

20 In one embodiment of the invention, the invention provides a fried texture-imparting glaze for a food intermediate that is made up of a mixture of at least one edible oil and a maltodextrin. The glaze is applied to at least a portion of the food intermediate to create a food product capable of producing a fried texture upon a further treatment step.

25 In a further embodiment of the invention, a method for imparting a fried surface texture to a food product is described and comprises the steps of initially coating at least a portion of a food intermediate with a mixture that includes at least one edible oil and a maltodextrin. The mixture is spread over at least a portion of the food intermediate, and then finally baking the food intermediate to produce a
30 food product having a fried appearance.

In yet a further embodiment of the invention, there is also provided a food intermediate having a fried texture imparting glaze that is coated on at least a

portion of a surface of the food intermediate, the fried texture imparting glaze comprises a mixture of at least one edible oil and a maltodextrin. The mixture is applied to at least a portion of the food intermediate after forming to create a food intermediate capable of producing a fried texture without the aid of frying.

5 In a still further embodiment of the invention, a method of increasing the baked specific volume of a glazed baked dough product over dimensions of a corresponding unglazed baked dough product is described and comprises the steps of initially coating at least a portion of a food intermediate with a glaze composed of at least one edible oil and an anhydrous low density maltodextrin. The food
10 intermediate with the glaze is then baked to impart a fried texture to the baked dough product.

 This invention therefore provides the advantage that unbaked dough products, when coated with the glaze of the invention, may be used to enhance the baked specific volume (BSV) of the baked product, while simultaneously
15 imparting a fried-like texture to the baked product.

 The invention also provides a method to impart a fried texture to food products, preferably wheat based or dough products, that are baked without a frying step.

 Furthermore, an embodiment of the invention provides a method of
20 preparing laminated dough products using a shortening like composition comprising low density maltodextrin and an edible oil.

 In addition, an embodiment of the invention is directed to a non-hydrogenated fat replacement mixture for use in preparing laminated baked goods.

 All percentages are by weight (wt%) unless otherwise indicated. Further
25 embodiments of the invention, without limitation, will become apparent from the following figures, detailed description, and examples.

 As used herein, the term "intermediate" or "food intermediate" refers to a food product that is capable of undergoing one or more further treatment steps to produce a finished food product. Food intermediates include dough, such as grain-
30 based dough useable in the creation of bread, doughnuts, cereals and the like as well as batter coated items such as vegetables, French fries, seafood, meats and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

These, as well as other objects and advantages of this invention, will be more completely understood and appreciated by referring to the following more
5 detailed description of the presently preferred exemplary embodiments of the invention in conjunction with the accompanying drawings, of which:

FIGURE 1 is a chart illustrating the change in the baked specific volume compared with the amount of glaze used; and

FIGURE 2 is a graphical illustration of the level of crust hardness
10 compared to the amount of glaze used.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The embodiments of the invention described below are not intended to be exhaustive or to limit the invention to the precise forms disclosed in the following detailed description. Rather, the embodiments are chosen and described so that
15 others skilled in the art may appreciate and understand the principles and practices of the invention.

The Applicant has made the surprising discovery that the application of the anhydrous glaze to food intermediate, followed by an additional treatment or treating step such as baking, imparts a fried texture to the baked food product
20 while, in the case of dough products, also increasing the baked specific volume ("BSV") of the dough. Other treatment steps may include application of microwave energy, open flame cooking (barbequing) and the like.

The dimensions or product geometry of a baked product are related to the dimensions of the raw dough product. Traditionally, to obtain a baked product
25 with a desired specific volume or geometry, the dough would have to obtain a certain geometry just prior to baking. Application of the anhydrous glaze of the invention to dough products prior to baking surprisingly and unexpectedly enhanced the dimensions of the dough product after baking.

In carrying out the invention, it was discovered that by providing a vehicle
30 that would trap and hold oil at or near the surface of the food intermediate, a food product could be created that would have a fried appearance after being subjected to a further treatment step. In the invention, it was found that an anhydrous, low-

density maltodextrin sufficiently traps and holds the oil near the surface of the intermediate upon which the glaze is coated.

As used herein, the term “coated” or “coating” refers to any number of application methods by which the glaze may be imparted to the food intermediate.

5 Such methods include spraying, dipping, brush or roller applicators, fountains, baths, curtains and the like.

It is preferred that the density of the maltodextrin is between 0.05 – 0.4g/cc, and in particular that the density is between 0.10 and 0.15g/cc. Maltodextrin M700 (available from Grain Processing Corporation, Muscatine, Iowa) with a density of
10 0.13g/cc is the most preferred choice of low-density maltodextrin.

It is also preferred that the food product or food intermediate of the invention is selected from a dough or grain based product, such as but not limited to a food product selected from a doughnut, pizza dough, pizza roll, beignet, pizza pocket, taco shell, tortilla shell, foccacia bread, crumpet or laminated product. The
15 term “grain based” refers to doughs or other intermediate products produced from oats, wheat, barley, rice, corn, sorghum, etc.

As mentioned above, food products suitable for use as starting materials in the invention include any food product wherein it is desirable to achieve fried-like properties without the need for a frying step. Such food products are intended to
20 include, without limitation, a doughnut, pizza base, pizza roll, beignet, pizza pocket, taco shells, French fries, tortilla shell, foccacia bread, crumpet, batter coated products such as vegetables, meats or seafood or laminated products. Laminated products include, without limitation, croissants, flaky biscuits, Danishes and the like.

25 Furthermore, unbaked dough products suitable for use in the invention also include any dough products or food intermediates wherein it is desirable to produce finished products with an increased BSV over that which would normally be achievable from baking or frying an unglazed raw dough product. For example, the dough product could be initially frozen (that is below 32°F), refrigerated (that is
30 from about 32°F to about 45°F), or fresh (at ambient temperature), prior to application of additional treating steps such as baking.

Formulations of each of the above unbaked food products are well known to those skilled in the art, and are readily available to the public in commercial cookbooks. For example, *Beard on Bread*, contains at least one exemplary formulation of many of the above listed products, *Beard on Bread*, Ballantine Books, N.Y. (1973). An exemplary formulation for foccacia can be found in Greenstein, *Secrets of a Jewish Baker: Authentic Jewish Rye and Other Breads*, The Rossing Press, Freedom, CA, pp 112-115 (1993). An exemplary formulation for beignets, can be found in Collin, *The New Orleans Cookbook*, Alfred A. Knopf, Inc., p200, (1979). The preparation of unbaked French fries is also well known to those skilled in the art and is readily available to the public in commercial cookbooks. For example, *Potato Processing*, 4th edition, W.F. Talburt and O. Smith, 1987 AVI Publishing. Many other examples exist and are simply too numerous to reference herein.

Generally, the food products suitable for use in the invention are composed with the usual ingredients known to those skilled in the art. For the unbaked dough products the usual ingredients are flour, water and yeast. In addition to these basic ingredients, the dough products may contain sugar, non-fat milk solids, shortening, gums, surfactants, and film-forming proteins. The dough products may further comprise effective amounts of adjuncts such as flavorings, thickeners such as starches and hydrophilic colloids, nutrients such as carbohydrates, proteins, lipids and the like, antioxidants, antimicrobial agents, eggs and egg solids, acidulants, dough conditioners and enzymes, emulsifiers such as mono- and diglycerides, sodium stearoyl lactylate, vitamins, and the like.

Non-fat milk solids, which can be used in the food products of this invention, are the solids of skim milk and include proteins, mineral matter and milk sugar. Other proteins such as casein, sodium caseinate, calcium caseinate, modified casein, sweet dairy whey, modified whey and whey protein concentrate can also be used in these doughs.

Dry or liquid flavoring agents, fruit and vegetables, may also be added to a dough formulation. These include without limitation mustard, potatoes, anchovies, capers, olives, bacon, cocoa, vanilla, chocolate, butter flavor, coconut, peppermint, pineapple, cherry, nuts, spices, salts, poppy or sesame seeds, onion, garlic, cheese,

tomatoes, scallions, oat bran, jalapeno, peppers, cinnamon, raisins, chocolate chips, apples, berries, bananas, walnuts, lemon and flavor enhancers.

Acidulants commonly added to food foods include, but are not limited to, lactic acid, citric acid, tartaric acid, malic acid, acetic acid, phosphoric acid and
5 hydrochloric acid.

Dough conditioners commonly added to dough products and may include, but are not limited, to potassium sorbate, L-cysteine hydrochloride, mono- and di-glycerides, polysorbates, sodium bisulfite, sodium stearoyl lactylate, ascorbic acid and diacetyltartaric acid esters of mono- and di-glycerides (DATEM). These
10 conditioners serve to add functionality, reduce mix times, and provide softness to the doughs to which they are added.

The mixing times, temperatures and speeds for processing the dough product are known in conventional dough processing technology, but may vary depending on the particular product being prepared. Particular mixing times,
15 temperatures and speeds for particular dough products can be readily determined by one skilled in the art using conventional processing technology.

The anhydrous glaze of the invention provides a fried texture-imparting glaze for food product. The glaze comprises a mixture of an edible oil and a maltodextrin, preferably an anhydrous, low-density maltodextrin. The glaze or
20 mixture as it is used herein may optionally comprise a sweetening or flavoring agent such as sucrose or dextrose. To ensure that the glaze is maintained as an anhydrous glaze, the application of any such sweeteners or flavoring should desirably also be anhydrous in nature.

A sweeter flavor can be incorporated into the glaze by increasing the sucrose levels to 10%. Additionally, the degree of browning of the fried like
25 textured product can be modified by employing varying levels of sucrose/dextrose mixtures for example.

It may also be desirable to include an amount of a reducing sugar in the glaze to provide a browning agent thereby imparting a golden brown color to the
30 final baked product. Reducing sugars useful in the practice of the invention include, but are not limited to, dextrose, maltose, isomaltose, cellobiose, lactose, melibiose, gentiobiose, rutinose, fructose and dextrose. Preferably, the reducing

sugar is dextrose. If a reducing sugar is to be included in the glaze, it is preferred that it be present in an amount of from about 0.1 to about 5% by weight of the glaze. Furthermore, in addition to incorporating sweetening agents into the food product, anhydrous flavoring agents may also be added to the glaze. For example, 5 flavoring agents may further comprise, without limitation, spices, salts, garlic, cheeses, oat bran, cinnamon, cornmeal, lemon coconut, orange, cherry butter or butter flavor and flavor enhancers and the like. Natural and artificial colors may also be added.

The particular edible oil or combination of edible oils utilized in the 10 practice of the invention is not critical. Instead the oil or combination of oils to be used can be chosen on the basis of convenience, commercial applicability, and desired flavor. For example, and without limitation, edible oils suitable for use in the invention include plant derived oils such as olive oil, canola oil, flax seed oil, sunflower seed oil, safflower seed oil, corn oil, peanut oil, walnut oil, soy oil, and 15 the like.

The anhydrous low-density maltodextrin preferably has a density of between 0.05 – 0.4g/cc, and in particular that the density is between 0.10 and 0.15g/cc. Maltodextrin Maltrin[®] M700 with a density of 0.13g/cc is the most preferred choice of low density maltodextrin. The maltodextrin is mixed with oil 20 and can be applied to the food product in a number of ways so as to entrap the oil layer on the food product. The maltodextrin can be applied in the form of free flowing microscopic balls, or simply by spray onto the food product.

The Applicant has found that simply by glazing a food product prior to baking with an anhydrous glaze that a fried-like texture is imparted to the food 25 product on baking. Furthermore, the actual BSV of a dough product is enhanced. It is thought that the glaze on the dough's surface acts to keep the outer surface of the dough malleable without the addition of water, thereby delaying the setting of the outer dough surface, while not affecting the amount of water absorbed by the outer dough surface. In this manner, the outer surface continues to expand as the 30 inner dough is heated, resulting in an increase in the BSV.

Furthermore, the application of the glaze of the invention to food products eliminates the need for a frying step. As used herein, the term "frying" includes

deep-frying, a cooking method that traditionally uses a vat or well of heated oil and is usually employed on products such as pizza crusts, doughnuts, beignets, tortillas and the like. Additionally, "frying" also includes reference to pan-frying in more limited amounts of oil prior to baking which also provides a crisp surface crust to a food product. Examples of food products traditionally prepared in this manner include pizzas, foccacia bread and crumpets.

The invention is now illustrated in greater detail by way of the following examples, but it should be understood that the invention is not to be construed as being limited thereto.

EXAMPLE 1. The following anhydrous glaze formulation was applied to Pillsbury® dinner roll dough cut to form doughnuts, available from General Mills, Inc., Minneapolis, MN.

Component of Glaze	Percentage
*Maltrin® (M700)Maltodextrin	14.5%
Vegetable Oil	84.5%
Sucrose	1%

* Maltrin® M700 Agglomerated Maltodextrin; GPC Lot No. M9603871

The low-density maltodextrin allows oil to be incorporated, in the mixture and trapped between the sugar molecules, to increase the amount of oil staying on the dough during baking.

EXAMPLE 2. The following anhydrous glaze formulation was applied to Pillsbury® dinner roll dough available from General Mills, Inc., Minneapolis, MN. The dough is used to make doughnuts.

Component of Glaze	Percentage
*Maltrin® (M700)Maltodextrin	13.89%
Vegetable Oil	76.11%
Sucrose	10%

* Maltrin[®] M700 Agglomerated Maltodextrin; GPC Lot No. M9603871

The glaze entrapped the oil and the effects of the entrapment increased the amount of oil on the surface of the dough intermediate that was evident in the resulting baked product. The oil dramatically affected the way the dough baked, as
5 seen in the final BSV, texture, appearance, and shape of the products. As seen in FIGURE 1 it is apparent that the final baked specific volume (BSV) of the doughnuts created from the dinner roll dough is dependent on how much oil glaze is applied.

The amount of glaze applied in accordance with the invention ranges from
10 between 1 to 11 grams, per serving size, more specifically between 2 and 8 grams and preferably about 3 to 5 grams and more preferably about 4 grams. As seen in FIGURE 2, the application of between 3 to 5 grams per serving size produced an acceptable crust hardness and desirable rise in the BSV. Serving size as used herein generally includes a single doughnut or item enclosed in the food package,
15 or the prescribed serving size as provided on the package itself.

The baked products of the present example had a layer of sugar on the top surface, which was slightly oily to the touch. This sugar coating can be modified to mimic a sugar-glazed doughnut. The surface of the glazed baked dough was favorably different from the control dough (without glaze). The color was more
20 golden brown, and the surface did not resemble a smooth baked surface. The surface appeared flakier and had a slight bubbly appearance. The oil had created a fried-like appearance to the dough.

The glaze used on doughnuts included upto 10% sucrose for sweetening purposes and also caused some browning.

25 To achieve a dough formulation that had the desired consistency, as well as one that could be worked with easily, the flour/water ratio was selected as follows: flour/water ratio without flavor = 1.95; or with flavor = 1.90. The target BU (Brabender Units) is 900-1000.

The process used to make the chemically leavened, refrigerated dough on
30 small scale (2000g) for experiments is outlined below. This includes steps from mixing, sheeting, cutting, and canning the dough.

There were several key developments taken to achieve the desired dough:

1. In processing, the dough temperature of 60°F was achieved by chilling the mixing bowl in the freezer (0°F) for 30-45 minutes before mixing the dough.
 2. Mix time on a Hobart mixer at speed 2 was decreased from original total of 8 minutes to 6 minutes to decrease stickiness in dough.
 3. In dough formulation, the flour/water ratio was adjusted.
 4. Shortening was used instead of vegetable oil to increase volume of baked dough.
- Final processing:
1. Chill mixing bowl for 30-45 minutes in freezer (0°F) before mixing.
 2. Fat ingredients (shortening, SSL, and mono and diglycerides) were weighed up together.
 3. Dry ingredients were weighed up together (flour, conditioner pre-blend, and sweet-whey solids).
 4. The dry ingredients were added to the mixing bowl.
 5. Weigh up and ice (1/3 of total water), the rest as liquid water. Add the bread flavor, high fructose corn syrup to the mixing bowl. Add TopNote last.
 6. Mix for 30 sec on speed 1 of Hobart Mixer.
 7. Add the fat ingredients.
 8. Mix for 3 minutes on speed 2.
 9. Cut the dough and add the second stage ingredients (leavening-- GDL, Encapsulated soda, Salt).
 10. Mix for 30 seconds on speed 1.
 11. Mix for 3 minutes on speed 2.
 12. Sheet the dough to 12 mm; 3-fold and turn 90°. Sheet dough to 6.7-7 mm.
 13. Use doughnut cutter to cut out doughnuts of 60 g.
 14. Use canner to can 8 doughnuts in Grands[®] (available from General Mills, Inc. Minneapolis, MN) can (214 x 509).
 15. Cans were then proofed for approximately 2 hours (85°F and 90% humidity).

Farinograph readings: 480 g of dough was taken to measure the BU's (Brabender Units) on the Farinograph. This was measured immediately following the mixing, to cut down on temperature change effects, and loss of moisture.

Low-density maltodextrin physically entraps the oil molecules, preventing the oil from flowing as readily. This minimized the amount of oil drip from the dough surface before and during baking. Therefore, enough oil stayed on the dough during baking to retain the doughnut shape, and produce a crust that resembled a fried doughnut's crust.

The doughnut dough formulation as used in the above examples is as follows. All weight percentages are approximate:

	<u>Ingredient</u>	<u>Percent</u>
	Flour	50
	Water	26
	Conditioner	4
15	TopNote	2
	Flavoring	.25
	Mono/Diglycerides	1
	Sweet Whey Solids	1.5
	Shortening	5
20	SSL/HFCS	6.25
	Salt	1
	Soda	1
	GDL	2

The doughnuts baked with the glaze had dimensions that were similar to the fried yeast-raised doughnuts. The crucial dimensions that were measured included the final height, diameter, and diameter of the doughnut hole. The BSV of the doughnuts were also measured. The target dimensions are a diameter of 9.0-9.5 cm, a height of 3.0-4.0 cm. Along with this, the doughnuts need to resemble a circle more than an oval. The BSV for the doughnuts is the highest achieved through use of a glaze. One reason for this observed increase may be the slower baking time of the doughnuts. The layer of oil and sugar on top of the doughnuts

slows down the heat transfer and moisture loss at the top crust. The slower heat transfer occurring from the top compared to a baked doughnuts without glaze may also allow the inside dough to be more pliable for a longer period of time to increase the amount expanding inside.

5 The outside texture of the doughnuts baked with the anhydrous glaze is more crisp and thin than a control baked without glaze. The anhydrous glaze provides a crunchier skin on the doughnuts, compared to a softer one from the fried doughnuts. The following Table 1 outlines how the Instron compression test of these doughnuts baked with anhydrous glaze compares with the fried and baked
10 doughnuts.

 The anhydrous glaze allows the dough to bake up to acceptable dimensions (height, diameter, baked specific volume). These dimensions had been measured on fried yeast-raised Pillsbury's® dough previously. The baked specific volume was measured using rapeseed oil for varying amounts of glaze (0g to 11g) applied
15 to the top of the food intermediate. This was done 2 hours after the food intermediate finished baking. Table 1 shows a comparative illustration between baked, fried and baked/glaze coated doughnuts.

Table 1

Doughnut product	Firmness (g/mm)	Inflection (g/mm)
Baked doughnut	338.7	101.3
Fried doughnut	157.5	152.7
Baked doughnut with glaze	235.2	182.7

20 The anhydrous glaze improves the texture (firmness) from the baked doughnut without the glaze. The difference in texture may be related to the difference found in surface moisture content between a fried doughnut and the glazed baked doughnut. The moisture content in the fried doughnut's outside crust is higher than that of the glazed doughnut. Differences in fat content (glazed being
25 slightly higher than the fried) may also have an effect on texture. Table 2 outlines the fat and moisture content using the anhydrous glaze for the baked doughnut product.

Table 2

Test Subject	% Fat	% Moisture
Whole doughnut	18.81	21.65
Outside Crust	28.57	11.77
Inside Crumb	7.14	32.45

Four doughnut samples were tested to determine the relationship between the softness of the crust and the amount of glaze used on the doughnuts. The four samples included one doughnut with no glaze, another with 2 grams of glaze, one with 4 grams of glaze and the final sample having 6 grams of glaze. The samples were baked in an oven for 23 minutes at a temperature of 325°F and were then allowed to cool for one hour. Samples were then tested on a texture analyzer.

The analysis showed that the sample having the four grams of glaze had the lowest crust and crumb index and needed the least amount of force to cut through the crust. The stiffness of the crust and crumb was the least in the sample that had no coating and in the one that had 6 grams of glaze applied (see FIGURE 2).

In summary, the experimental results show that the anhydrous glaze of the invention provides a fried texture to a food product without actually subjecting it to a traditional frying step. The fried texture can be observed when using either a conventional lab oven or an impingement oven. The present glaze can also cause an increase in total area when it is bake in a conventional lab oven.

In addition to its use as an anhydrous glaze, low-density maltodextrin physically entraps edible oil to form a semi-solid, shortening like composition that is spreadable or positionable as a shortening flake. The composition is shelf-storable and can effectively retain the edible oil on the food product and thereby effectively replace shortening in the preparation and baking of dough products (e.g., laminated, underdeveloped, undeveloped and the like) such as but not limited to croissants, biscuits, Danish, sweet rolls, cinnamon rolls and strudel. By trapping a suitable edible oil within the maltodextrin structure, a mixture having a shortening-like consistency can be applied to a baking dough in a similar manner as a more traditional solid fat such as shortening or butter. By utilizing this shortening-like composition, edible oils can be rolled in and layered such that

discrete layers of the baking dough and shortening-like composition are maintained during the sheeting and folding process associated with laminated dough products. Depending on the laminated dough product, the sheeting and folding process can lead to well over sixty individual layers of the shortening like composition which will provide the flaky and crisp texture associate with laminated dough products. The shortening-like composition is now illustrated in greater detail by way of the following example, but it should be understood that the invention is not to be construed as being limited thereto.

EXAMPLE 3: The following paste-like formulation can be used with a baking dough to form a laminated dough product, for example Pillsbury[®] croissants available from General Mills, Inc., Minneapolis, MN.

Component of Shortening-like composition	Percentage
*Maltrin [®] (M700)Maltodextrin	15%
Vegetable Oil	85%

All publications, patents and patent documents are incorporated by reference herein, as though individually incorporated by reference. The invention has been described with reference to specific and preferred embodiments and techniques. However, it should be understood that many variations and modifications might be made without departing from the spirit and scope of the invention.

It will thus be seen according to the invention a highly advantageous glaze for imparting a fried texture has been provided. While the invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it will be apparent to those of ordinary skill in the art that the invention is not to be limited to the disclosed embodiment, that many modifications and equivalent arrangements may be made thereof within the scope of the invention, which scope is to be accorded the broadest interpretation of the appended claims so as to encompass all equivalent structures and products.

WHAT IS CLAIMED:

1. A laminated dough product comprising:
 - a baking dough; and
 - a shortening like composition comprising at least one edible oil and anhydrous low-density maltodextrin,
- 5 wherein the density of the maltodextrin is between 0.05-0.4 g/cc, and
 - wherein the shortening-like composition is applied to a baking dough such that discrete layers of the baking dough and the shortening-like composition are maintained during sheeting and folding of the laminated
- 10 dough product.
2. The laminated dough product as recited in claim 1, wherein the edible oil is selected from plant derived oils.
3. The laminated dough product according to claim 1, wherein the laminated dough product is selected from the group consisting of a croissant, a biscuit, a
- 15 Danish, a sweet roll, a cinnamon roll and a strudel.
4. A method for preparing a laminated dough product with a shortening-like composition comprising the steps of:
 - providing at least one edible oil;
 - providing an anhydrous low-density maltodextrin;
- 20 mixing said at least one edible oil and said anhydrous low-density maltodextrin to form the shortening-like composition;
- spreading the shortening-like composition on a sheet of baking dough; and
- layering the baking dough by sheeting and folding the baking dough
- 25 to form a laminated dough intermediate having a plurality of discrete layers of baking dough and shortening-like composition.

5. The method for preparing a laminated dough product according to claim 4, further comprising the step of baking the laminated dough intermediate.
6. The method for preparing a laminated dough product according to claim 4, wherein the density of the maltodextrin used in said shortening-like composition is
5 between 0.05-0.4g/cc.
7. The method for preparing a laminated dough product according to claim 4, wherein the laminated dough product is selected from the group consisting of: a croissant, a flaky biscuit, a Danish, a sweet roll, a cinnamon roll and a strudel.
- 10 8. A dough product comprising:
a biscuit dough; and
a shortening flake comprising at least one edible oil and anhydrous
low-density maltodextrin,
wherein the density of the maltodextrin is between 0.05-0.4 g/cc.

Anhydrous Glaze Increases BSV

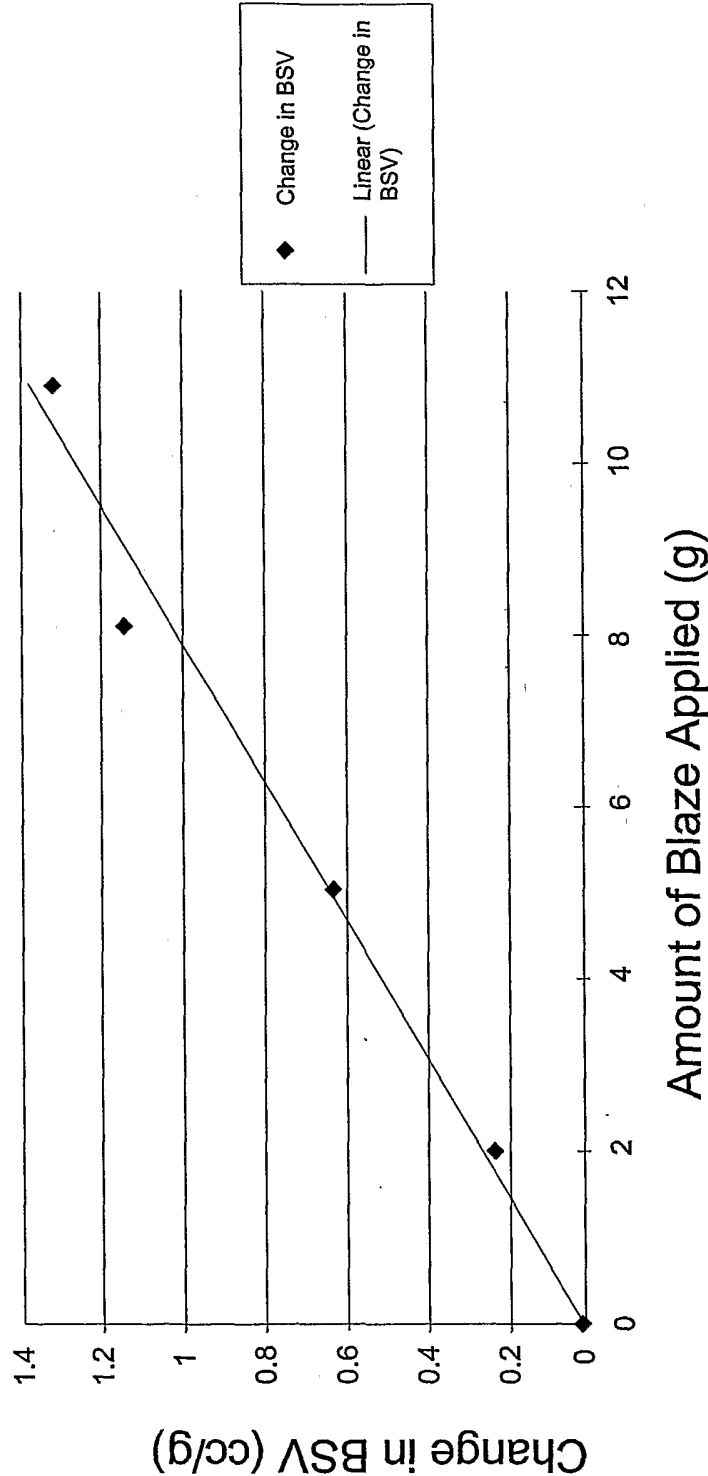


Fig. 1

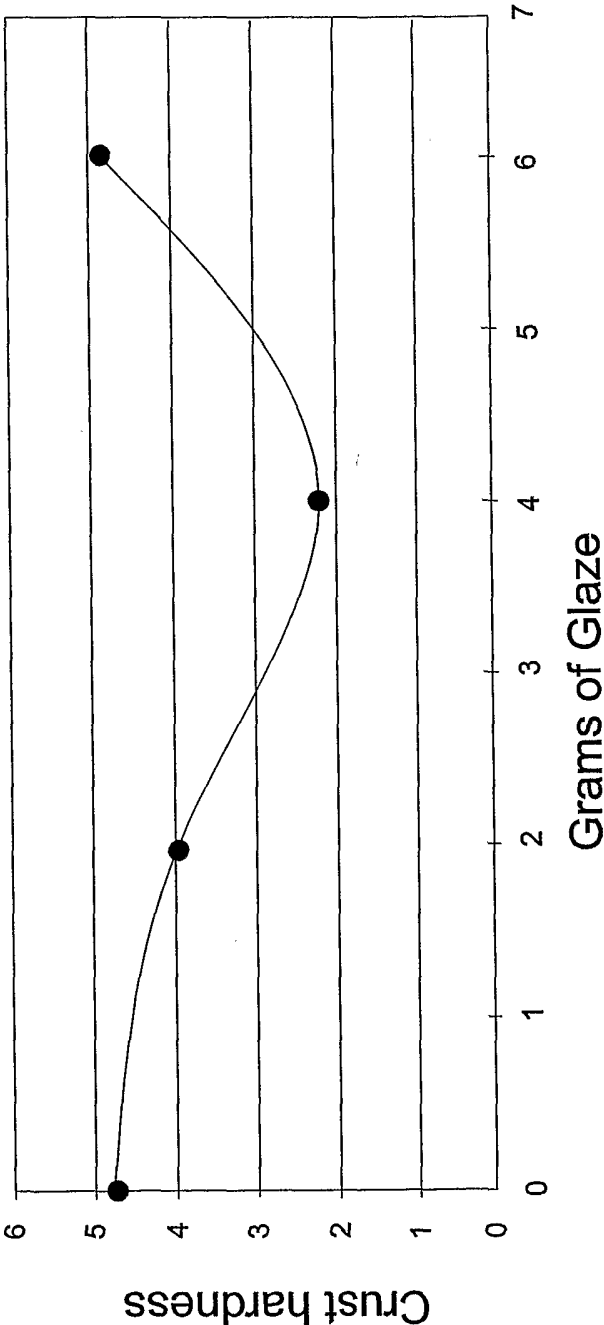


Fig. 2