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ABOGADOS

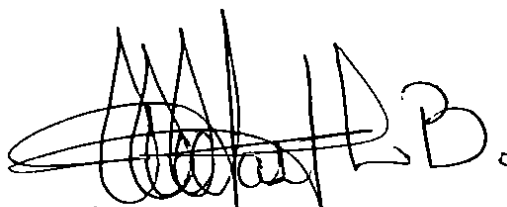
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SUPERINDUSTRIA Y COMERCIO
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Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
División de Nuevas Creaciones
E. S. D.

Ref: EXPEDIENTE No.05-042916
Solicitud Patente a nombre de
KRAFT FOODS HOLDINGS, INC

En el asunto de la referencia me permito presentar la copia certificada de la solicitud estadounidense No. 10/840.756 del 6 de mayo de 2004, de la cual se reclama prioridad en este caso.

Observo que su texto coincide con el de la presente solicitud.
Atentamente,



JERÓNIMO CASTILLO BONILLA
C.C. 79.462.057 Bogotá
T.P. 104167 C.S. Judicatura

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THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

April 28, 2005

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 10/840,750

FILING DATE: May 06, 2004

**By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS**



N. Williams
N. WILLIAMS

Certifying Officer

40

20427 U.S. PTO

**CONTINUING PATENT APPLICATION
TRANSMITTAL** (for Continuing
Applications under 37 C.F.R. § 1.53(b))

Attorney Docket No. 67596

Customer No. 22242

First Named Inventor or Application
Identifier: COLEMAN et al.

17497 U.S. PTO
10/840750



Mail Stop PATENT APPLICATION
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is a request under 37 C.F.R. § 1.53(b) for
filing a:

- ☐ Continuation application,
☐ Divisional application,
☒ Continuation-in-Part application,

)
) **CERTIFICATE OF MAILING BY "EXPRESS MAIL"**
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) Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
) FERNANDO SALAZAR
) (Typed or printed name of person mailing)
) [Signature]
) (Signature of person mailing)

of pending prior application number 10/655,250, filed on September 4, 2003 by
inventor(s) AKASHE et al. entitled "Method of Deflavoring Soy-Derived Materials
Confectionary Type Products".

Prior application information: Examiner Art Unit 1761.

1. ☐ This is a continuation or divisional application. Enclosed is a copy of the prior
application as originally filed, including specification, claims, drawings, and oath or
declaration.

- or -

- ☒ Enclosed is a patent application (for continuation, divisional, or continuation-in-part
applications) containing:

☒ 17 pages of the specification (including claims).

☐ 0 sheet(s) of drawings. ☐ Formal ☐ Informal

2. ☐ Amend the specification by inserting before the first line the sentence: --This is a
☐ continuation, ☐ division, ☐ continuation-in-part, of prior application number
 , filed , which is hereby incorporated herein by reference in its
entirety.-- The entire disclosure of the prior application, from which a copy of the
oath or declaration is supplied under paragraph 3 below, is considered as being part

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of the disclosure of the accompanying application, and is hereby incorporated by reference therein.

3. ☐ A copy of the executed Oath or Declaration filed in the prior nonprovisional application is enclosed.
4. ☒ Inventorship:
 - ☐ A newly-executed Oath or Declaration and Power of Attorney is enclosed (for continuation-in-part applications, or for continuation or divisional applications naming an inventor not named in the prior application) (§1.63(a), (d)(5) and (e)).
 - ☐ Because this application is being filed by fewer than all of the inventors named in the prior application, delete the following inventor(s) named in the prior nonprovisional application (37 C.F.R. §1.63(d)(1)(2)):

 - ☒ The names of persons believed to be the actual inventors are set forth in the enclosed unexecuted Oath or Declaration and Power of Attorney (§1.41(a) and §1.53(b)).
5. ☐ An Assignment of the invention to _____, and cover sheet are enclosed.
 - ☐ A check in the amount of \$_____ to cover the fee for recording the assignment is enclosed.
 - ☐ The Recordation Form Cover Sheet includes authorization to charge our Deposit Account for recording the assignment.
6. ☐ The prior application is assigned of record to _____.
7. ☐ A 37 C.F.R. §3.73(b) statement is enclosed where an assignee seeks to take action.
8. ☐ A preliminary amendment is enclosed.
9. ☐ Drawings:
 - ☐ Transfer the drawings from the prior application to this application and abandon said prior application as of the filing date accorded this application. A duplicate copy of this sheet is enclosed for filing in the prior application file. (May be used only if signed by person authorized by §1.138 and before payment of base issue fee.)
 - ☐ New formal drawings are enclosed.

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- ☐ Informal drawings are enclosed.
10. ☒ A separate written request under 37 C.F.R. §1.136(a)(3), which is a general authorization to treat any concurrent or future reply requiring a petition for an extension of time under 37 C.F.R. §1.136(a) for its timely submission as incorporating a petition for an extension of time for the appropriate length of time, is enclosed.
11. ☒ An Information Disclosure Statement is enclosed.
- ☒ A Form PTO/SB/08 is enclosed.
- ☐ _____ References (copies) listed as foreign patent documents or non-patent literature on Form PTO/SB/08 (37 C.F.R. § 1.98(a)(2)) are enclosed.
12. ☐ A Computer Program Listing Appendix is enclosed.
- ☐ A Transmittal Cover Letter for Computer Program Listing Appendix is enclosed.
- ☐ Two (2) Compact Discs are enclosed.
13. ☐ A Nucleotide and/or Amino Acid Sequence Submission is enclosed.
- ☐ A Computer Readable Copy is enclosed.
- ☐ A Paper Copy (Identical to Computer Copy) is enclosed.
- ☐ A Statement Verifying Identity of above Copies is enclosed.
14. ☒ A Return Receipt Postcard is enclosed (MPEP §503).
15. ☐ Priority of application number _____ filed on _____ in _____ is claimed under 35 U.S.C. §119.
- ☐ The certified copy of the priority document has been filed in prior application number _____, filed _____.
- ☐ A certified copy of the priority document is enclosed.

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16. ☒ Power of Attorney:

☐ The power of attorney in the prior application is to:

☒ Richard A. Kaba, Registration No. 30.562
FITCH, EVEN, TABIN & FLANNERY
120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-3406
and other members of the firm.

☒ Customer Number 22242.

☐ The power appears in the original papers in the prior application.

☐ Since the power does not appear in the original papers in the prior application, a copy of the power in the prior application is enclosed.

17. ☐ Cancel in this application original claims _____ of the prior application before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)

18. ☒ The filing fee is calculated below:

Fee Calculation for Claims as Filed in the Prior Application.
Less Any Claims Cancelled by Amendment

Basic Utility Fee					\$770.00	\$	770.00
Independent Claims	<u>1</u>	-	<u>3</u>	=	<u>0</u>	x	\$ 86.00 = \$ 0.00
Total Claims	<u>23</u>	-	<u>20</u>	=	<u>3</u>	x	\$ 18.00 = \$ 54.00
Fee for Multiply Dependent Claims					\$290.00		
or							
Basic Design Fee					\$340.00		
					Total Filing Fee	\$	824.00
☐ Applicant(s) assert entitlement to Small Entity Status (37 C.F.R. § 1.27), reducing the Filing Fee by half to:							\$

19. ☐ A check in the amount of \$_____ to cover the filing fee is enclosed.

20. ☐ Charge \$_____ to Deposit Account No. 06-1135.

21. ☒ The payment of the Filing Fee is to be deferred until the Declaration is filed. Do not charge our Deposit Account.

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22. ☒ The Director is hereby authorized to charge any additional fees which may be required in this application under 37 C.F.R. §§ 1.16-1.17 during its entire pendency, or credit any overpayment, to Deposit Account No. 06-1135. Should no proper payment be enclosed herewith, the Director is authorized to charge the unpaid amount to Deposit Account No. 06-1135. This request is filed in triplicate.
23. ☐ Also enclosed:
24. ☒ Address all future communications to CUSTOMER NUMBER 22242.

May 6, 2004
Date



Richard A. Kaba
Registration No. 30,562
☒ Attorney or agent of record
☐ Filed under § 1.34(a)

FITCH, EVEN, TABIN & FLANNERY
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REDUCING BAR HARDNESS VIA REPOSITIONING OF MICRONUTRIENTS WITHIN A MATRIX

Related Application

The present application is a continuation-in-part of United States
5 Patent Application Serial Number 10/655,250, filed September 9, 2003, which
is hereby incorporated by reference.

Field of the Invention

The present invention generally relates to food compositions, and more
particularly to confectionary type products such as nutritional bars. More
10 specifically, this invention relates to methods and compositions for
repositioning micronutrients (especially calcium and magnesium) in such food
products to minimize hardness and extend shelf-life.

Description of the Prior Art

Various types of nutritional food bars have been previously described.
15 Nutritional bars come in numerous flavors with variable nutrient components.
Most nutritional bars, however, contain a balance of proteins, fats,
carbohydrates, vitamins, and minerals. Humans, consume proteins, fats, and
carbohydrates for energy to maintain vital bodily functions. Proteins, fats, and
carbohydrates may be converted into glucose which is used to provide energy
20 together with a feeling of satiety. Protein and fat are more slowly converted to
energy than carbohydrates. As such, a meal consisting only of protein and/or
fat converts so slowly to energy that there is no notable rise in blood glucose
level. Alternatively, a meal consisting of pure carbohydrates converts rapidly
to energy causing a sharp, unsustainable peak in blood glucose level.
25 Therefore, balancing fat, carbohydrate, and protein content in a meal is
necessary to stabilize and prolong an elevated blood glucose level for
providing more sustained energy.

Vitamins and minerals, which are vital for the proper functioning of
metabolic pathways, may also be added to a nutritional bar. Examples of

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some of these vitamins and minerals include those vitamins and minerals listed on the U.S. Department of Agriculture's Recommended Daily Allowance (RDA) or Daily Value (DV) charts.

As is known in the art, food or nutritional bars may be substantially non-perishable and readily portable for rapid consumption. Also available are fortified food bars which advantageously provide a portion of the daily requirement of minerals and vitamins, in order to help meet nutritional needs. These fortified bars may also comprise carbohydrates, proteins, and fats. Food or nutritional bars are generally prepared by blending a mixture of ingredients together (often with a binder). The mixture is then generally molded into a size suitable for quick consumption. In the case of non-cooked food bars, ingredients are selected such that baking or cooking of the ingredients is not required.

The following are examples of nutritional bars described in the art. U.S. Patent 6,676,982 describes a nutritional food bar for sustained energy. U.S. Patent 4,055,669 teaches a high protein breakfast food bar using crushed dry cereal. U.S. Patent 4,451,488 teaches a granola food bar which combines the textural ingredients with a polyhydric alcohol binder. U.S. Patents 4,543,262, 4,832,971, and 4,859,475 teach fortified food bars having high protein and low or no lactose wherein a confectioner's coating is distributed uniformly throughout the core. U.S. Patent 4,871,557 teaches a granola food bar having high dietary fiber in the form of compressed flakes. U.S. Patent 5,612,074 teaches a fortified food bar having dietary fiber and non-animal based protein. All references cited in the present specification are incorporated by reference.

Among the components in a nutritional bar, consumers may be especially concerned with protein and calcium content. Unfortunately, higher protein and calcium content in a food bar often cause hardness of the bar over time. Therefore, described hereinbelow are methods and compositions for repositioning micronutrients, especially calcium, in a food bar to reduce hardness and, thus, to increase shelf life.

SUMMARY OF THE INVENTION

Broadly, the present invention relates to methods and compositions for repositioning calcium and/or other micronutrients in food products, such as a nutritional bars, to minimize hardness and extend shelf-life. The methods and compositions of the present invention include applying a layer of a calcium and/or other micronutrient fortified matrix to a food bar core. The matrix may be a low moisture (generally less than about 20 percent moisture, and preferably less than about 15 percent moisture) layer or coating having calcium, or other micronutrient, solubilized therein. Preferably, the matrix is a low moisture confectionary layer or coating selected from the group consisting of chocolate, caramel, fudge (e.g., adding about 1 percent chocolate liquor to caramel form a chocolate caramel fudge-like composition), hard fat, cream filling, and the like; preferably the low moisture confectionary composition is chocolate or caramel. The resultant food product advantageously contains a substantial amount of essential micronutrients without adversely effecting organoleptic qualities such as texture.

For example, in one embodiment, the invention is a fortified confectionary product comprising: (a) an amount of at least one micronutrient; (b) a core having less than 50 percent of the amount of at least one micronutrient; and (c) at least one layer of a low moisture confectionary composition containing at least 50 percent of the amount of at least one micronutrient. Preferably, the core has less than about 40 percent of the micronutrients and the layer has more than about 60 percent of the micronutrients. More preferably, the core has less than about 20 percent of the micronutrients and the layer has more than about 80 percent of the micronutrients. Preferably, the micronutrient is, or one of the micronutrients is, calcium or magnesium. Even more preferably, the core contains less than about 5 percent of calcium or magnesium, if present and the layer has more than about 95 percent of calcium and magnesium, if present. Preferably, the fortified confectionary product contains at least about 10 percent of the DV for

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calcium and/or magnesium, more preferably at least about 20 percent for calcium and/or magnesium, even more preferably at least about 50 percent for calcium and/or magnesium per single serving size (typically, for a nutritional bar, about 35 to about 50 g).

5 In a preferred embodiment, the fortified confectionary product is a nutritional bar; other food products are contemplated by the inventors. In another preferred embodiment, the micronutrient added to the confectionary product is calcium or a calcium complex. In another embodiment, the micronutrient is a vitamin and/or mineral premix (especially one containing
10 calcium and/or a calcium complex). The micronutrient may be mixtures of such components (e.g., a calcium containing compound and a vitamin and/or mineral premix). The layer containing the micronutrient (e.g., calcium, calcium complex, vitamin and/or mineral premix, or the like, and mixtures thereof) preferably is a low moisture confectionary composition; even more
15 preferably, it is a chocolate or caramel composition which is applied to the confectionary product as a layer, coating, or discrete particles. In a preferred embodiment, the micronutrient content is equal to at least 0.1 percent of the confectionary product. In yet another preferred embodiment, the at least one layer containing a micronutrient is dispersed within the confectionary product
20 by covering (or coating) the confectionary product, inserting the layer in or through the confectionary product, or providing a plurality of micronutrient containing particles in the confectionary product such that the micronutrient(s) do not adversely effect texture of the confectionary product; combinations of these dispersion methods can also be used if desired.

25 In another embodiment of the present invention, a fortified confectionary product prepared by the following method is described: (a) blending a mixture of ingredients together to form a core; (b) preparing a low moisture confectionary composition; (c) mixing at least one micronutrient into the low moisture confectionary composition to provide a fortified confectionary
30 composition; (d) applying at least one layer of the fortified confectionary composition to the core; and (e) molding the core having at least one layer of

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the fortified confectionary composition to form the fortified confectionary product.

In a preferred embodiment, the fortified confectionary composition or layer matrix of the fortified confectionary product produced by way of the
5 aforementioned method has a concentration of at least about 0.5 percent, and preferably about 1 to about 3 percent, of the at least one micronutrient. In another embodiment, the confectionary product is a nutritional bar containing calcium in the form of elemental calcium, calcium compounds, or calcium
10 complexes; preferably the calcium is in the form of calcium compounds (i.e., calcium cations). In another preferred embodiment, the layer applied to the core is a chocolate or caramel layer, a chocolate or caramel coating, or a plurality of chocolate or caramel particles containing at least one micronutrient. In yet another embodiment, the amount of micronutrient contained in the confectionary product is equal to at least about 0.1 percent of the confectionary product. In a
15 preferred embodiment, the at least one layer containing a micronutrient is dispersed within the confectionary product by covering (or coating) the confectionary product, inserting the layer in or through the confectionary product, or providing a plurality of micronutrient containing particles in the confectionary product such that the micronutrient(s) do not adversely effect texture of the
20 confectionary product; combinations of these dispersion methods can also be used if desired.

DETAILED DESCRIPTION

This invention relates generally to methods and compositions for the repositioning of a micronutrient in a food product, especially confectionary type
25 food products such as nutritional bars. In a preferred embodiment, a mineral, such as calcium and/or magnesium, is distributed into a matrix comprising a low-moisture confectionary layer and/or a low-moisture confectionary coating of a food product. Preferably, calcium and/or magnesium would distributed almost

exclusively, and preferably exclusively, in the low moisture confectionary layer and/or the low moisture confectionary coating. Other examples of micronutrients that may be distributed into the low-moisture confectionary layer or coating include vitamin A, vitamin C, vitamin E, vitamin D, thiamin, riboflavin, niacin, vitamin B6, folate, vitamin B12, biotin, pantothenic acid, iron, phosphorus, iodine, zinc, selenium, copper, manganese, chromium, and molybdenum. Additionally, vitamin and/or mineral premixes may be incorporated into the low-moisture confectionary layer or coating. Up to about 50 percent of these vitamins and minerals (but preferably not calcium and/or magnesium) may be distributed in the core if desired. The vitamin and/or mineral premixes for use with the present invention may include any combination of vitamins and/or minerals. Examples of such vitamins and minerals are listed hereinabove. The invention is particularly useful for minimizing hardness and extending the shelf-life of a resulting food product containing calcium or a calcium complex. Preferably the minerals are in the form of cations or complexes to increase their bioavailability.

Certain nutritional bars (e.g., BALANCE® Bars) are low moisture, high protein product which may contain significant amounts of calcium. High levels of protein may lead to adverse organoleptic properties in the food bar such as undue hardness over its expected shelf life. Although not wishing to be limited by theory, it is believed that this change is due to slow hydration of the protein by the limited water present in such nutritional bars. Thus, the hardness of the bar may increase as the the protein matrix in the food bar becomes hydrated. Again not wishing to be limited by theory, it is believed that increased amounts of calcium and/or other minerals in the core tends to worsen the bar hardness problem, often to unacceptable levels through the mineral cations interactions with the proteins, thereby allowing additional moisture uptake by the proteins. Experimental results indicate that the presence of calcium within the bar core is a major contributor to hardness over time.

In one especially preferred embodiment, at least about 0.5 percent (and preferably about 1 to about 3.0 percent) calcium or calcium complex (e.g., tricalcium phosphate) is added to a chocolate or caramel layer and/or chocolate or caramel coating. In other embodiments the tricalcium phosphate may be added to other types of matrixes such as fudge, hard fat, cream filling, and the like. In any case, the matrix containing a micronutrient (e.g., mineral), such as, for example, calcium or calcium complex, is added as a layer or coating to a nutritional bar. The preferred matrix for containing calcium is a chocolate or caramel coating and/or chocolate or caramel layer. By positioning the calcium, or other micronutrient, in a chocolate or caramel coating and/or chocolate or caramel layer, the ability of the calcium to complex with the protein matrix in the bar core is minimized, thus, resulting in reduced bar hardness and increased shelf-life. In a preferred embodiment, the chocolate or caramel layer and/or chocolate or caramel coating contain at least 50 percent (i.e., 50 to 100 percent) of the total amount of calcium (or calcium complex) contained in the confectionary product. In another embodiment, the chocolate or caramel and/or chocolate or caramel coating contain at least 50 percent (i.e., 50 to 100 percent) of the total amount of vitamin and/or mineral premix contained in the confectionary product. In a preferred embodiment, the core of the confectionary product contains less than 50 percent (i.e., 0 to 50 percent) of the total amount of calcium (or calcium complex) contained in the confectionary product. In another embodiment, the core of the confectionary product contains less than 50 percent (i.e., 0 to 50 percent) of the total amount of vitamin and/or mineral premix contained in the confectionary product.

The fortified compositions prepared by the present methods are ideally suited for use in snack items such as nutritional bars and other confectionary type products. However the compositions and methods described herein may also be used in cereals, baked products, candies, cookies, cereal bars, and the like. Such confectionary products are generally prepared by combining the

calcium fortified matrixes prepared by the methods described herein with the confectionary product. The confectionary products of the present invention may also include sweeteners and other desired ingredients including, for example, flavors (e.g., cocoa, vanilla, chocolate, milk, and the like), additional nutritional additives (e.g., vitamins, minerals, antioxidants, and the like), fruit, colorants, processing aids (e.g., gums, emulsifiers, and the like), edible acids, and the like). Generally, optional ingredients such as flavors, nutritional additives, colorants, processing aids and the like are present at 0 to about 5 percent.

Generally, the confectionery products of this invention contain about 0.1 to about 5 percent calcium, or calcium complex, and more preferably about 0.1 to 2 percent. In another embodiment, the matrix (e.g., chocolate or caramel layer or chocolate or caramel coating) has a concentration of micronutrient between about 0.1 and about 5 percent, and more preferably between about 0.5 and about 3 percent. Protein content in the confectionary products of this invention may contain about 0.5 to about 50 percent of protein, and more preferably about 10 to about 35 percent. Especially preferred confectionary products include nutritional bars comprising a core and at least one calcium fortified layer or coating. For the purposes of this invention, a "core" is intended to mean the center of the bar. For purposes of this invention, a "layer" is intended to mean a discrete layer either covering a product or extending through a product or discrete particles or bits within a product. Thus, for purposes of this invention, a layer could include a coating covering or enrobing a nutritional bar, a discrete layer through or within a nutritional bar, and/or particles or bits within a nutritional bar. The coatings or layers can be continuous or non-continuous. Preferably the calcium or calcium complex is contained within such layers (preferably chocolate or caramel coating or chocolate or caramel layers or particles) in order to offset the tendency of the calcium, when placed in the bar core (i.e., center) to adversely affect the texture of the nutritional bar. Calcium and/or calcium complexes when placed in the core of nutritional bars (especially when present

in high concentrations) tends, over time, to adversely effect the organoleptic properties, especially the texture (i.e., becoming too firm or hard) of the nutritional bar and, thereby, limiting the shelf life. By incorporating the micronutrients (e.g., calcium and/or calcium complex) within the low moisture confectionary coating and/or components, this problem is significantly reduced and/or eliminated. Thus, nutritional bars containing calcium (or other micronutrients) in the low moisture confectionary coating and/or low moisture confectionary layers have shelf lives on the order about 9 months or even longer at ambient temperatures. Generally, a similar nutritional bar having calcium distributed throughout the core would have a shelf life of less than 9 months (e.g., generally about 4 to about 8 months).

The calcium fortified low moisture confectionary coatings and/or low moisture confectionary layers of this invention have good meltability, flowability, and organoleptic properties. Although such coatings and layers are ideally suited for use in confectionary products such as nutritional bars, they may also be used in other confectionary products such as candy, candy bars, icing, cookies, ice cream, other frozen dairy products, and the like.

The confectionery products of this invention may contain about 0.5 to about 75 percent sweetener, and preferably about 10 to about 50 percent sweeteners. Sweeteners that can be used include both natural and artificial sweeteners. Examples of such sweeteners include natural sugars such as sucrose, fructose, glucose, maltose, high fructose corn syrup, and lactose and artificial sweetening agents such as saccharin, aspartame, acesulfame potassium, and sucralose. Of course, others sweeteners normally used in food processing can be used if desired. Other ingredients normally used in confectionary type products may also be included in the confectionary products of this invention.

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A better understanding of the present embodiment and of its many advantages may be clarified with the following examples, given by way of illustration. Unless noted otherwise, all percentages are by weight.

Examples

5 **Basic Composition For Core.** A nutritional bar (50 g), available commercially as BALANCE® GOLD™ (flavor caramel nut blast), contained about 210 calories, about 7 g total fat, about 4 g saturated fat, no cholesterol, about 110 mg sodium, about 115 g potassium, about 22 g total carbohydrate, less than about 1 g dietary fiber, about 13 g sugar, and about 15 g total protein (soy and
10 milk protein). This composition was used as the core of the examples described below.

EXAMPLE 1. A nutritional bar having a similar composition as the BALANCE® GOLD™ bar described above was prepared with a caramel coating layer fortified with calcium. The caramel coating layer (about 12 g and about 3 to
15 about 6 mm thick) contained approximately 0.15 g of tricalcium phosphate; the resulting coated nutritional bar contained about 0.75 percent calcium. The caramel was prepared according to a standard caramel recipe containing corn syrup, sugar, water, fat, protein, flavor, and lecithin and contained about 4 percent protein. Generally, the caramel may be prepared with up to about 20
20 percent protein; preferably, however, the caramel contains about 3 to about 5 percent protein. The tricalcium phosphate was metered into warmed caramel with agitation. A caramel layer was applied to the nutritional bar by forming a slab of caramel on a chilled roller and positioning the caramel layer on top of the core using, for example, a Sollich triple-layer bar line. The core with its caramel
25 layer could, if desired, be enrobed with a compound coating using, for example, a Sollich commercial confectionery enrober.]

 A control nutritional bar was prepared by blending an equivalent amount of tricalcium phosphate into the core of a similar nutritional bar.

The inventive nutritional bar (i.e., having a calcium fortified caramel layer) has similar organoleptic properties as compared to the control (i.e., having a calcium fortified core) as prepared. The control bar, however, exhibited undesirable hardness after storage for about 6 months at ambient temperatures. The inventive bar did not exhibit such hardness after a storage time of about 12 months under the same conditions.

EXAMPLE 2. A nutritional bar was prepared with a calcium fortified chocolate coating containing about 1.6 percent tricalcium phosphate; the resulting nutritional bar contained about 0.3 to about 0.4 percent calcium. A commercial chocolate composition (containing sugar, modified palm kernel oil, protein, cocoa powder, lecithin, and flavor) was melted in a jacketed container heated with circulating hot water (about 75°C). The tricalcium phosphate was added to the melted chocolate composition and dispersed therein with mixing for about 30 minutes to provide a slurry wherein the tricalcium phosphate particles were completely enrobed by the chocolate composition. The resulting mixture was then allowed to cool to or near ambient temperature; the resulting viscous chocolate mixture was poured onto a flat surface and allowed to solidify. Approximately 48 hours later, the calcium containing chocolate composition was remelted and then used to enrobe a nutritional bar core (same as in Example 1). Similar results were obtained as in Example 1.

EXAMPLE 3. A nutritional bar was prepared with a caramel layer fortified with calcium, magnesium, and a vitamin/mineral premix (containing 23 vitamins and minerals). The fortified caramel mixture contained 96.25 percent caramel, 0.61 percent tricalcium phosphate, 1.00 percent magnesium oxide, and 2.14 percent of the vitamin/mineral premix. The caramel was prepared according to a standard caramel recipe containing corn syrup, water, fat, protein, flavor, and lecithin. The calcium, magnesium, and 75 percent of the vitamin/mineral premix was added to the caramel in a steam jacketed kettle at a temperature of about 45°C. The remainder of the vitamin/mineral premix was included in the

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Docket 67596

nutritional bar core. The fortified caramel mix was applied to the nutritional bar core layer using a Sollich Compression Roller Bar Line. Similar results were obtained as in Examples 1 and 2.

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CLAIMS

1. A fortified confectionary product comprising:
 - (a) an amount of at least one micronutrient;
 - (b) a core having less than about 50 percent of the amount of the at least one micronutrient; and
 - (c) at least one layer of a low moisture confectionary composition containing at least about 50 percent of the amount of the at least one micronutrient,wherein the at least one micronutrient does not adversely effect texture of the confectionary product.
2. The confectionary product of claim 1, wherein the low moisture confectionary composition is selected from the group consisting of chocolate, caramel, fudge, hard fat, and cream filling.
3. The confectionary product of claim 2, wherein the low moisture confectionary composition is selected from the group consisting of chocolate and caramel.
4. The confectionary product of claim 3, wherein the confectionary product is a nutritional bar.
5. The confectionary product of claim 3, wherein the at least one micronutrient includes calcium and wherein essentially all the calcium is contained in the at least one layer.
6. The confectionary product of claim 1, wherein the low moisture confectionary composition is caramel.

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7. The confectionary product of claim 2, wherein the amount of the at least one micronutrient is equal to at least about 0.1 percent of the confectionary product.

8. The confectionary product of claim 1, wherein the at least one layer is (1) a continuous or non-continuous coating on the food product, (2) a continuous or non-continuous layer within the fortified food product, or (3) a plurality of particles within or on the food product.

9. The confectionary product of claim 3, wherein the at least one layer is (1) a continuous or non-continuous coating on the food product, (2) a continuous or non-continuous layer within the fortified food product, or (3) a plurality of particles within or on the food product.

10. The confectionary product of claim 1, wherein the confectionary product is prepared by a method comprising:

- (a) blending a mixture of ingredients together to form the core;
- (b) preparing the low moisture confectionary composition;
- (c) mixing at least one micronutrient into the low moisture confectionary composition to form the at least one layer;
- (d) combining the core and the at least one layer to form the confectionary product.

11. The confectionary product of claim 3, wherein the confectionary product is prepared by a method comprising:

- (a) preparing a mixture of ingredients to form the core;
- (b) preparing the low moisture confectionary composition;
- (c) mixing at least one micronutrient into the low moisture confectionary composition to form the at least one layer;

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(d) combining the core and the at least one layer to form the confectionary product.

12. The confectionary product of claim 11, wherein the at least one layer contains about 0.5 to about 3 percent of the at least one micronutrient.

13. The confectionary product of claim 12, wherein the confectionary product is a nutritional bar.

14. The confectionary product of claim 13, wherein the at least one micronutrient includes calcium.

15. The confectionary product of claim 14, wherein a single serving of the confectionary product provides at least about 50 percent of the DV of calcium.

16. A fortified food product comprising:

(a) an amount of at least one micronutrient;

(b) a core; and

(c) at least one layer containing the at least one micronutrient,

wherein the at least one layer is selected from the group consisting of chocolate, caramel, fudge, hard fat, and cream filling and wherein the organoleptic properties of the fortified food product are enhanced throughout its shelf life as compared to a similar food product wherein the at least one micronutrient is distributed throughout the core.

17. The fortified food product of claim 16, wherein the fortified food product is a nutritional bar, wherein the at least one micronutrient includes calcium, and wherein essentially all the calcium is contained in the at least one layer.

18. The fortified food product of claim 16, wherein the at least one layer is (1) a continuous or non-continuous coating on the food product, (2) a continuous or non-continuous layer within the fortified food product, or (3) a plurality of particles within or on the food product.

19. The fortified food product of claim 17, wherein the at least one layer is (1) a continuous or non-continuous coating on the food product, (2) a continuous or non-continuous layer within the fortified food product, or (3) a plurality of particles within or on the food product.

20. The fortified food product of claim 18, wherein a single serving of the fortified food product provides at least about 50 percent of the DV of calcium.

21. The fortified food product of claim 19, wherein a single serving of the fortified food product provides at least about 50 percent of the DV of calcium.

22. The fortified food product of claim 20, wherein the at least one layer is selected from the group consisting of chocolate and caramel.

23. The fortified food product of claim 21, wherein the at least one layer is selected from the group consisting of chocolate and caramel.

**REDUCING BAR HARDNESS VIA REPOSITIONING
OF MICRONUTRIENTS IN A MATRIX**

ABSTRACT

Described herein are methods and compositions for repositioning
5 micronutrients, especially calcium, in a food product, such as a nutritional bar, to
minimize hardness and extend shelf-life. The methods and compositions of the
present invention include applying a layer of a micronutrient, especially calcium,
fortified matrix to a food bar core. The matrix is a low moisture confectionary
layer or coating, preferably a chocolate or caramel layer or coating having
10 calcium, or other micronutrient, solubilized therein. The resultant food product
advantageously contains a substantial amount of essential micronutrients without
adversely effecting organoleptic qualities such as texture.

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**DECLARATION
FOR UTILITY OR DESIGN
PATENT APPLICATION**

	)	Attorney Docket No.:	1410/67596
	)		
	)	Customer No.:	22242
	)		
	)		
	)	First Named Inventor:	COLEMAN et al.
☒	)	Declaration Submitted With	
	)	Initial Filing	
	)	Application Number:	
	)		
☐	)	Declaration Submitted After	
	)	Initial Filing	
	)	Filing Date:	Herewith
	)		
	)	Art Unit:	
	)		
	)	Examiner Name:	

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

REDUCING BAR HARDNESS VIA REPOSITIONING
OF MICRONUTRIENTS WITHIN A MATIRX

(Title of Invention)

the specification of which:

☒ is attached hereto, or

☐ was filed by an authorized person on my behalf on _____ as United States Application Number _____ or PCT International Application Number _____, and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below, and I have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application, on

Declaration 1-0803

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this invention filed by me or my legal representatives or assigns and having a filing date before that of the application on which priority is claimed:

<u>Prior Foreign Application Number(s)</u>	<u>Country</u>	<u>Foreign Filing Date</u>	<u>Priority Not Claimed</u>
			☐
			☐
			☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet attached hereto.

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below:

<u>Provisional Application Number(s)</u>	<u>Provisional Application Filing Date</u>
--	--

☐ Additional provisional application numbers are listed on a supplemental priority data sheet attached hereto.

I hereby claim the benefit under Title 35, United States Code, §120, of any prior United States application(s), or under §365(c) of any PCT international application(s) designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose all information known by me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56, which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

<u>Prior U.S. Application Number</u>	<u>Prior PCT International Application Number</u>	<u>Filing Date of U.S. or PCT International Application</u>	<u>Patent Number (if applicable)</u>
10/655,250		September 9, 2003	

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet attached hereto.

As a named inventor, I hereby appoint Debbie K. Wright, Registration No. 33,817; Thomas A. Marcoux, Registration No. 29,826; Valerie Calloway, Registration No. 40,546; and the practi-

Declaration 2-0803

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tioners associated with Customer Number 22242, with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith, and request that all correspondence and telephone calls in respect to this application be directed to FITCH, EVEN, TABIN & FLANNERY, Suite 1600, 120 South LaSalle Street, Chicago, Illinois 60603-3406, Telephone No. (312) 577-7000, Facsimile No. (312) 577-7007, CUSTOMER NUMBER 22242.

I hereby declare that all statements made herein of my own knowledge are true, and that all statements made herein on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity or enforceability of the application or any patent issued thereon.

Full name of sole or one joint inventor: Edward Charles Coleman
(Given names first, with Family name last)

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Date: _____

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Citizenship: USA

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Inventor's signature: _____

Date: _____

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Mundelein, IL 60060

Citizenship: USA

Declaration 3-0803

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Attorney Docket No. 1410/67596

Full name of one joint inventor: Michael Tancredi
(Given names first, with Family name last)

Inventor's signature: _____

Date: _____

Residence: Sparta, NJ
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Post Office Address: 14 Stonebridge Road
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Citizenship: USA

Full name of one joint inventor: Brenda Kay Smith
(Given names first, with Family name last)

Inventor's signature: _____

Date: _____

Residence: Mahwah, NJ
(City and State for U.S. Residents; City and Country for others)

Post Office Address: 1120 Sage Court
Mahwah, NJ 07430

2° EXAMEN DE FORMA, PATENTE DE INVENCION

Radicación N° **05-42916**

Folio ~~66~~

Concepto Técnico N° **848**

Clasificación Internacional de Patentes: **A23L 1/00**

Practicado el examen de acuerdo a lo establecido en el Art. 38 de la Decisión 486, se determinó que esta solicitud de **Patente**:

- SI [☒] NO [] Contiene un resumen de la invención (Art. 26-e)
- SI [☒] NO [] Contiene el título o nombre de la invención (Art. 27-d)
- SI [☒] NO [] Contiene la descripción de la invención (Art. 26-b)
- SI [] NO [] NO ES APLICABLE [☒] Contiene los dibujos necesarios para comprender la invención (Art. 26-d)
- SI [☒] NO [] Contiene una o más reivindicaciones (Art. 26-c)
- SI [] NO [] NO ES APLICABLE [☒] Han sido desarrollados los productos a partir de recursos genéticos o de sus productos derivados de los que cualquiera de los Países Miembros es país de origen (Art. 26-h)
- SI [] NO [] NO ES APLICABLE [☒] Los productos y o procedimientos han sido obtenidos o desarrollados a partir a partir de los conocimientos tradicionales de las comunidades indígenas, afro americanas, o locales de los Países Miembros, de acuerdo a lo establecido en la Decisión 391 y sus modificaciones y reglamentaciones vigentes (Art. 26-i)
- SI [] NO [☒] La invención se refiere a un producto relativo a un material biológico (Art. 26-j)
- SI [☒] NO [] NO ES APLICABLE [] La prioridad coincide con la materia reivindicada.
- SI [☒] NO [] **CUMPLE LOS REQUISITOS TÉCNICOS**

OBSERVACIONES Y OTROS: SI [] NO [] Ver hoja(s) anexa(s)

• .

EXAMINADOR TÉCNICO: 202051

Bogotá D C, octubre 28 de 2005.



2020
Bogotá D C

Doctor(a):
JERONIMO CASTILLO BONILLA.
Apoderado

REFERENCIA:	Radicación N°	05-42916
	Trámite	002
	Evento	001
	Actuación	416
	Oficio N°	1261
	Folios	001

Teniendo en cuenta que la solicitud de privilegio de patente que se tramita bajo el expediente indicado en la referencia, reúne los requisitos de forma establecidos en los artículos 26 y 27 de la Decisión 486, de la Comisión de la Comunidad Andina, y en las demás disposiciones vigentes sobre la materia, se envía el extracto de la solicitud a la oficina de comunicaciones para efecto de su publicación en la Gaceta de Propiedad Industrial, conforme lo establece el artículo 40 de la Decisión 486, a **partir del 04 de mayo de 2006**, por indicación del solicitante.

Cúmplase
Dado en Bogotá D C,

31 OCT. 2005



ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe División de Nuevas Creaciones.

202051

DIVISION DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No 05-042916

EL EXTRACTO DE LA PRESENTE SOLICITUD DE **PATENTE DE INVENCION**

FUE PUBLICADO EN LA GACETA DE PROPIEDAD INDUSTRIAL No **564** DE

FECHA **31** DE **MAYO DEL 2006**, EL TERMINO HABIL SEÑALADO POR LA

LEY EXPIRA EL **31 DE AGOSTO DEL 2006**

NOTA: Dentro del plazo de los seis (6) meses siguientes a partir de la fecha de publicación en la gaceta de Propiedad Industrial, deberá solicitar y cancelar el examen de patentabilidad so pena de que la solicitud caiga en abandono, de acuerdo con lo establecido en el Artículo 44 de la Decisión 486/2000.

SE PRESENTARON OPOSICIONES POR PARTE DE TERCEROS.

SI X _____

NO - - - - -

Bogotá D.C, AGOSTO DE 2006