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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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Señora

JEFE DE LA DIVISION DE NUEVAS CREACIONES
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

E. S. D.

REFERENCIA: Expediente No. 07-010.890

TÍTULO: "PROCESOS Y PRODUCTOS PARA HACER PAN".

SOLICITANTE: LESAFFRE ET COMPAGNIE

TRÁMITE: Respuesta a la oposición de la sociedad Aceites y Grasas Vegetales S.A. - Acegrasas S.A.

JUAN PABLO CADENA SARMIENTO, portador de la tarjeta profesional No. 57.492 del C.S.J., obrando como apoderado de la sociedad LESAFFRE ET COMPAGNIE, según lo acredita el documento de poder presentado en esa División, de acuerdo con el artículo 43 de la Decisión 486 me permito dar respuesta a la oposición presentada por la sociedad Aceites y Grasas Vegetales S.A. - Acegrasas S.A., contra la patentabilidad para la concesión de la solicitud de patente de la referencia, según el requerimiento notificado por fijación en lista de fecha 5 de septiembre de 2008.

En primer lugar, se anexa un nuevo capítulo reivindicatorio de 1-22 reivindicaciones, el cual reemplaza al anterior capítulo en su totalidad, encuentra entero sustento en la descripción y no amplía la materia de la invención. Este

capítulo fue modificado con el fin de definir y delimitar claramente la invención con respecto al estado del arte según sus características técnicas.

De otra parte, el señor Opositor señala que la invención se puede deducir de manera evidente a partir de los siguientes documentos:

1. Balcazar, Campo Elías. Tecnología de la Panificación. 1996. Tema 6, págs. 218, 222.
2. Cauvain SP, Young LS, eds. Fabricación de Pan. Editorial Acrabía S.A., 2002. Págs. 168, 192-193.
3. Calaveras, Jesús. Tratado de panificación y bollería. 1995. Disponible en: <http://dialnet.unirioja.es/serv/libro?codigo=16024>
4. Patentes US 4,788,067 y US 4,861,601.
5. Lección 17, Masas congeladas. En: Tecnología Aplicada a la Panificación, American Institute of Baking, 1993.

En cuanto a esta afirmación, se desea aclarar que ninguno de los documentos citados divulga un proceso para preparar una pieza de masa congelada y prehorneada apta para obtener un producto de pan horneado después de un horneado final, donde dicha pieza de masa se prepara con ingredientes que, adicional a harina de cereal, levadura y agua, contienen:

- una o más azúcares que toman parte en las reacciones tipo Maillard en una cantidad que excede la cantidad fermentada por la levadura antes de prehornear y suficiente para impartir color a la corteza durante el prehorneado, y/o una o más proteínas que toman parte en los mecanismos tipo Maillard, y
- fibras de alimento y/o un estabilizador de alimento.

Por lo tanto, se concluye que la presente invención cumple con los requisitos de novedad y nivel inventivo frente al arte previo citado, ya que ninguno de dichos documentos enseña ni sugiere el proceso reivindicado.

REIVINDICACIONES

1. Proceso para la preparación de una pieza de masa prehorneada congelada apta para obtener un producto de pan horneado por horneado final, que corresponde a la colocación de dicha pieza de masa prehorneada congelada en un horno a una temperatura de horno de entre 200°C y 260°C por un tiempo de 5 minutos o menos, preferiblemente 3 minutos o menos, más preferiblemente de 2 a 3 minutos; dicho proceso comprende las siguientes etapas:

- obtener una pieza de masa moldeada y fermentada lista para hornear, que corresponde a dicho producto horneado;
- prehornear dicha pieza de masa en un horno hasta que:
 - su miga se halla coagulado y
 - una corteza colorada se halla formado;
- congelar la pieza de masa prehorneada obtenida;

caracterizado porque tal prehorneado es conducido a una temperatura de horno de 220°C a 260°C, preferiblemente 230°C a 250°C, y porque la pieza de masa se prepara con ingredientes los cuales, adicional a harina de cereal, levadura y agua, contienen:

- una o más azúcares que toma parte en las reacciones tipo Maillard en una cantidad que excede la cantidad fermentada por la levadura antes de prehornear y suficiente para impartir color a la corteza durante el prehorneado, y/o una o más proteínas que toman parte en el mecanismo tipo Maillard, y
 - fibras de alimento y/o un estabilizador de alimento.
2. Proceso de acuerdo con la reivindicación 1, caracterizado porque el ingrediente que contiene una o más azúcares o una o más proteínas que toma parte en las reacciones tipo Maillard, se selecciona de una familia de polvo de suero, lactosa, glucosa, galactosa, sucrosa, fructosa, sorbitol.
3. Proceso de acuerdo con la reivindicación 1 o 2, caracterizado porque el exceso de azúcar que toma parte en las reacciones tipo Maillard es provisto por lo menos parcialmente durante la fermentación de la pieza de masa mediante al menos una preparación enzimática

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4. Proceso de acuerdo con la reivindicación 3, caracterizado porque dicha preparación enzimática contiene al menos una amiloglucosidasa.
5. Proceso de acuerdo con la reivindicación 3 o 4, caracterizado porque dicha preparación enzimática contiene al menos una enzima seleccionada de la familia de amilasas, amiloglucosidasas y hemicelulasas que liberan azúcares con 5 átomos de carbono y exoamilasas.
6. Proceso de acuerdo con la reivindicación 1, caracterizado porque dicho estabilizador de alimento se selecciona entre derivados de celulosa, peptinas, alginatos, carragininas, gelatina, almidones modificados química o físicamente, gomas y harinas pregelatinizadas.
7. Proceso de acuerdo con la reivindicación 6, caracterizado porque dicho estabilizador de alimento se selecciona entre carboximetilcelulosa, goma xantano, harina de trigo pregelatinizada y harina de maíz pregelatinizada.
8. Proceso de acuerdo tanto a la reivindicación 6, caracterizado porque dicho estabilizador de alimento se selecciona entre almidón pregelatinizado, o una fuente de almidón pregelatinizado tal como una harina de cereal pregelatinizada.
9. Proceso de acuerdo con cualquiera de las reivindicaciones 1 a 8, caracterizado porque la pieza de masa se prepara con harina de cereal, levadura, agua e ingredientes que contienen:
 - un ingrediente que contiene una o más azúcares o una o más proteínas que toman parte en las reacciones tipo Maillard, preferiblemente polvo de suero y/o glucosa;
 - un estabilizador de alimento.
10. Proceso de acuerdo con cualquiera de las reivindicaciones 1 a 9, caracterizado porque la pieza de masa se prepara con ingredientes que contienen todo lo siguiente:
 - una fuente de enzimas la cual, durante la fermentación de la masa, contribuye azúcares que toman parte en las reacciones tipo Maillard, preferiblemente amiloglucosidasa, más preferiblemente amiloglucosidasa en combinación con hemicelulasa que contribuye

azúcares C5, y todavía más preferiblemente una amiloglucosidasa, una hemicelulasa que contribuye azúcares C5 y una exoamilasa;

- un estabilizador de alimento, preferiblemente una harina de cereal pregelatinizada para la realización de pan, más preferiblemente una harina de trigo pregelatinizada.

11. Proceso de acuerdo con cualquiera de las reivindicaciones 1 a 10, caracterizado en que la pieza de masa se prepara con ingredientes que contienen cereales malteados, preferiblemente trigo malteado o cebada malteada, más preferiblemente con trigo malteado.

12. Proceso de acuerdo con cualquiera de las reivindicaciones 1 a 11, caracterizado en que la pieza de masa contiene al menos una de tres de los siguientes adyuvantes para hacer pan:

- un agente oxidante, preferiblemente ácido ascórbico;
- un emulsificador, preferiblemente el emulsificador E472e o E472f,
- una preparación enzimática seleccionada de un grupo de alfa-amilasas no maltogénicas, endo-alfa-amilasas, hemicelulasas preferiblemente del tipo endoxilanasas, lipasas, fosfolipasas, o una combinación de estas preparaciones enzimáticas;

y preferiblemente al menos dos de dichos tres adyuvantes para hacer pan, y más preferiblemente estos tres adyuvantes para hacer pan.

13. Proceso de acuerdo con cualquiera de las reivindicaciones 1 a 12, caracterizado porque la pieza de masa antes de ser prehorneada tiene una hidratación de al menos 62%.

14. Proceso de acuerdo con cualquiera de las reivindicaciones 1 a 13, caracterizada porque la pieza de masa se prepara con ingredientes que contienen una combinación de:

- un estabilizador seleccionado del grupo de derivados de celulosa, almidones pregelatinizados y harinas de cereal pregelatinizadas;
- polvo de suero; y
- dextrosa.

15. Proceso de acuerdo con una cualquiera de las reivindicaciones 1 a 14, caracterizado porque la pieza de masa se prepara con ingredientes que contiene una combinación de:

- una harina de cereal pregelatinizada para hacer pan, preferiblemente una harina de trigo pregelatinizada,
- una amiloglucosidasa, preferiblemente en combinación con una hemicelulasa que da azúcares C5 y/o una exomilasa que da maltosa.

16. Proceso de acuerdo con la reivindicación 14, caracterizado porque la pieza de masa se prepara con ingredientes que contienen, en porcentaje de Baker, una combinación de:

- 1% a 3% de dextrosa;
- 0.5 a 4% de polvo de suero, y
- 0.3% a 1% de carboximetilcelulosa y/o 1% a 4% de harina de cereal pregelatinizada para hacer pan.

17. Proceso de acuerdo con la reivindicación 16, caracterizado porque la pieza de masa, en adición a la(s) preparación(es) enzimática, se prepara con ingredientes que contienen en porcentaje de Baker una combinación de:

- 1% a 4% de harina de cereal pregelatinizada para hacer pan, preferiblemente harina de trigo pregelatinizada, y
- 0.009% a 0.020% de ácido ascórbico, preferiblemente 0.009% a 0.015% de ácido ascórbico.

18. Proceso de acuerdo con la reivindicación 11, caracterizado porque la pieza de masa se prepara con ingredientes los cuales, en porcentaje de Baker, contienen 0.1 a 1% de cereales malteados, preferiblemente trigo malteado o cebada malteada, más preferiblemente trigo malteado.

19. Pieza de masa prehorneada congelada que se puede obtener por el proceso definido en cualquiera de las reivindicaciones 1 a 18.

20. Proceso para la obtención de un producto de pan horneado caracterizado porque comprende el horneado final de una pieza de masa prehorneada congelada de acuerdo con la reivindicación 19 colocando dicha pieza de masa prehorneada congelada en un horno por un tiempo de 5 minutos o menos a entre 200°C y 260°C, preferiblemente por 3 minutos o menos a entre 200°C y 260°C.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES

2020

Bogotá, D. C., 7 de septiembre de 2010

Doctor

Juan Pablo Cadena Sarmiento

Representante

Lesaffre et Compagnie

ASUNTO

Radicación **07-10890**

Trámite 002

Evento 001

Actuación 430

Oficio

Folios **025**

Patente de Invención

☒

Patente de Modelo de Utilidad

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Vía Nacional

☐

Vía PCT (fase nacional)

☒

Cap. I

☒

Cap. II

☐

No. Sol. Internacional

PCT/EP2005/007258

Fecha de Presentación Internacional

5 de julio de 2005

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica:

1. Documentos estudiados1.1. Descripción: Folios: 70 a 97 tal como se radicó inicialmente1.2. Reivindicaciones: Folios 98 a 106 tal como se radicó inicialmente
Folios 264 a 268 tal como se modificó el 2 de marzo de 20091.3. Oposiciones:1.3.1. Folios 136 a 254*Aceites y Grasas Vegetales S. A. ACEGRASAS S.A.*1.4. Prioridad:

1.4.1. Fecha 5 de julio de 2004

País EP

Número 04015795,0

1.5. Argumentos del solicitante Folios: 261 a 263

2. Modificaciones (Artículo 34 D. 486 y Art. 22 Tratado PCT)

Se aceptan las modificaciones realizadas por el solicitante toda vez que no amplían el objeto inicial de la solicitud.

3. Objeto de la invención

- Título de la solicitud (folio 1)

Procesos y productos para hacer pan

- Las reivindicaciones 1 a 22 de la solicitud en estudio se refieren a:
 - Proceso para la preparación de una pieza de masa prehorneada congelada apta para obtener un producto de pan horneado por horneado final, que corresponde a la colocación de dicha pieza de masa prehorneada congelada en un horno a una temperatura de entre 200°C y 260°C por un tiempo de 5 minutos o menos, preferiblemente 3 minutos o menos, más preferiblemente de 2 a 3 minutos, dicho proceso comprende las siguientes etapas:
 - obtener una pieza de masa moldeada y fermentada lista para hornear, que corresponde a dicho producto de horneado;
 - prehornear dicha pieza de masa en un horno hasta que
 - * su miga se halla (sic) coagulado
 - * una corteza coloreada se halla (sic) formado
 - congelar la pieza de masa prehorneada obtenida caracterizado porque tal prehorneado es conducido a una temperatura de horno de 220°C a 260°C, preferiblemente 230°C a 250°C, y porque la pieza de masa se prepara con ingredientes, los cuales adicional a harina de cereal, levadura y agua, contienen
 - una o más azúcares (sic) que toma parte en las reacciones de tipo Maillard en una cantidad que excede la cantidad fermentada por la levadura antes de prehornear y suficiente para impartir color a la corteza durante el prehorneado, y/o una o más proteínas que toman parte en el mecanismo de tipo Maillard, y
 - fibras de alimento, y/o un estabilizador de alimento
 - Proceso para la obtención de un producto de pan horneado caracterizado porque comprende el horneado final de una pieza de masa prehorneada congelada de acuerdo con la reivindicación 19 colocando dicha pieza de masa prehorneada congelada en un horno por un tiempo de 5 minutos o menos a entre 200°C y 260°C, preferiblemente por 3 minutos o menos entre 200°C y 260°C.
- Los anteriores procedimientos buscan proporcionar mejores características en el pan horneado
- La Clasificación Internacional de Patentes (IPC) para esta solicitud es **A 21 D 8/06**.

4. De la solicitud de Patente

4.1. Reivindicaciones (Artículo 30 D. 486)

El capítulo reivindicatorio de la solicitud en estudio presenta los siguientes defectos:

- 221
- No se encuentra correctamente redactado. Por su estructura todas las reivindicaciones deben constar de dos partes. Una primera parte, el preámbulo, sirve para situar el objeto de la invención dentro de un contexto técnico, es lo que se conoce y sobre lo que no se reclama ningún privilegio. La segunda parte, o parte característica, define lo que se considera novedoso y se desea proteger. Estas dos partes están separadas por expresiones como 'caracterizado por' o similares.

Al examinar el nuevo capítulo reivindicatorio el solicitante coloca como conocido *"preparación de una pieza de masa prehorneada...que corresponde a la colocación de dicha pieza de masa prehorneada congelada en un horno a una temperatura de entre 200°C y 260°C por un tiempo de 5 minutos o menos..."* y luego coloca como conocido *"caracterizado porque tal prehorneado es conducido a una temperatura de horno de 220°C a 260°C, preferiblemente 230°C a 250°C"*. Obsérvese que tal y como se encuentra redactado se podría entender que lo que el solicitante coloca como nuevo también lo coloca como conocido, estableciéndose una clara contradicción en la redacción. Se recomienda que el solicitante revise la descripción en los folios 82 y 83 (páginas 13 y 14) para definir mejor su solicitud en el capítulo reivindicatorio.

La redacción de la reivindicación 1 tampoco es congruente, toda vez que pretenden que se les proteja un procedimiento nuevo, y los pasos de dicho proceso el mismo solicitante los coloca como conocidos y no establece como nueva ninguna etapa; luego es incongruente el planteamiento ya que el hecho de afirmar que los ingredientes son los novedosos no aporta ninguna nueva etapa, toda vez que el procedimiento seguiría siendo el mismo. Lo que el solicitante debería plantear como objeto de su solicitud es una composición para prehornear y no un proceso. Un proceso es una secuencia lógica de pasos o etapas (plural, no singular) que busca un fin. De acuerdo a lo establecido en la reivindicación 1, el solicitante pretende que le sea protegido la aplicación de la 'composición' en un proceso que el mismo solicitante denomina conocido.

- El solicitante debe tener cuidado con la redacción de su solicitud. Por ejemplo, habla de "su miga se halla coagulado"; halla se refiere a "dar con una persona o cosa que se busca" cuando el solicitante debió utilizar el subjuntivo "haya" del verbo auxiliar "haber" el cual sí le da sentido al texto. Se sugiere revisar el texto.
- No se precisa la materia sobre la cual se solicita protección. Cómo se explicará en el punto 4), la presente solicitud no posee unidad de invención, por lo que no está definida la materia sobre la cual se solicita protección.

Por lo anterior, el capítulo reivindicatorio no cumple con el requisito de definición, claridad, concisión o sustento por la descripción de acuerdo al art. 30 de la Decisión 486.y/o art.22 Tratado PCT.

5. Unidad de invención (Artículo 25 D. 486)

La presente solicitud no tiene unidad de invención, dado que contempla diferentes conceptos inventivos relacionados así:

- La reivindicación 1 y sus dependientes,
- La reivindicación 18 y sus dependientes

Entre ellos no existe una relación dado que el primer grupo está referido específicamente a preparar una masa a prehornear y el segundo grupo a hornear un pan. Son dos cosas muy diferentes que no necesariamente tienen relación, pues el proceso del segundo grupo puede llevarse a cabo con masas diferentes a las relacionadas en el primer grupo.

Por lo anterior, se puede concluir que la presente solicitud no cumple con el requisito de unidad de invención.

6. Análisis de la(s) Oposición(es): (Artículo 43 D. 486):

En referencia a la oposición, esta puede ser tomada en cuenta y sus argumentos son:

- *La solicitud relaciona es un proceso de precocción de pan, congelamiento y cocción final el cual es bastante conocido y hace parte del estado de la técnica. Varios antecedentes sustentarían esta afirmación*

El opositor no relaciona explícitamente más argumentos y cita de forma general los antecedentes en mención.

Esta oficina encuentra que, de acuerdo al capítulo originalmente presentado, en efecto el solicitante enuncia un proceso general de precocción de pan: tomar una masa, tradicional, moldeada y fermentada lista para hornear, prehornear, congelar y hornear finalmente.

Los antecedentes US4861601 y 4788067 relacionan los principios de dicho proceso; estos mismos antecedentes fueron citados en la fase internacional de la presente solicitud, así como por otras oficinas tales como la de Estados Unidos y Europa.

El antecedente de Calaveras revela el proceso de las reivindicaciones iniciales, pero no relaciona condiciones de proceso, aunque un técnico medio las conoce y son habituales en el oficio.

El antecedente de "American Institute of Baking" de 1993 enuncia la fórmula que plantea el solicitante. Azúcar en exceso a ser empleada en la formulación y varios estabilizantes.

En Balcazar se enuncia también el proceso general de la presente solicitud, así como los rangos de temperatura y los principios de formulación relacionados en el documento para Colombia.

Por último en el libro "Fabricación del pan" se enuncian los principios de los problemas más frecuentes en los procesos de producción del pan y como solucionarlos, que coinciden con los principios de lo revelado en la solicitud para Colombia. Aquí se incluye el por qué del uso de los azúcares así como de otros estabilizantes.

De lo anterior se tiene que, el opositor sí relacionó una serie de documentos que afectaban directamente la solicitud originalmente presentada.

7. Determinación del Estado de la Técnica

- La fecha que se ha tenido en cuenta para determinar el estado de la técnica es 5 de julio de 2004
- Teniendo en cuenta la fecha indicada se realizó la búsqueda en el estado de la técnica de documentos relacionados con la solicitud encontrándose los siguientes documentos más relevantes:

Nº	Documento	Título	Fecha de publicación*
D1	US 4861601	Preproofed partially baked and frozen, crusty bread and method of making the same	29,08,1989
D2	US 4 788 067	Preproofed, frozen and 84% baked crusty bread and method of making the same	29,11,1988
D3	Jesús Calaveras	Tratado de panificación y bollería	1995
D4	American Institute of Baking	Tecnología aplicada a la panificación	1993
D5	Campo Elías Balcazar	Tecnología de la Panificación	1996
D6	P. Cauvin Linda Young	Fabricación de pan	2002
D7	AT 400279B	Verfahren und einrichtung zur erzeugung bzw, konservierung von vorgebackenen backwaren	15,04,1995
D8	FR 2 589 044	Pain dit a francais a precuit et congelé et son procédé de fabrication	30,04,1987
D9	EP 1 120 043	Pate feuilletée fermentée, précuite et surgelée	01,08,2001
D10	US 5 069 916	Process for microwave browning composition used for same and product produced thereby	03,12,1991

8. Análisis de patentabilidad (Artículo 14 D. 486)

En primer lugar es conveniente acotar que, tal y como se encuentra el nuevo capítulo reivindicatorio, no es posible realizar un completo análisis de patentabilidad dado que presenta profundos errores que no permiten su realización.

En segundo lugar, lo que el solicitante pretendería proteger es de uso común en el arte y se trata de procesos y productos, con sus respectivas materias primas, que se emplean cotidianamente. En este sentido esta oficina le da la razón al opositor, ya que lo que se describe en la solicitud es un proceso de precocción de pan. El solicitante buscando eludir los argumentos del opositor cambia su capítulo reivindicatorio y pone como característico las materias primas del producto y afirma que "se desea aclarar que ninguno de los documentos citados divulga un proceso para preparar una pieza de masa congelada y prehorneada apta para obtener un producto de pan horneado después de un horneado final, donde dicha pieza de masa se prepara con ingredientes que, adicional a harina de cereal, levadura y agua, contienen: - una o más azúcares que toman parte en las reacciones tipo Maillard en una cantidad que excede la cantidad fermentada por la levadura antes de prehornear y suficiente para impartir color a la corteza durante el prehorneado, y/o una o más proteínas que toman parte en los mecanismos tipo Maillard, y -fibras de alimento y/ un estabilizador de alimento."

Al respecto esta oficina está en total desacuerdo con lo expresado por el solicitante. Cualquier técnico sabe que cuando se realiza el proceso de prehorneado del pan:

- es necesario añadir azúcar en exceso. Por ejemplo en el documento D4 citado por el opositor, que corresponden a lecciones básicas de panadería, explícitamente se afirma que "el nivel de azúcar utilizado en la formula de la masa congelada dependerá del tipo de producto y de las características de la corteza que se deseen obtener. Sin embargo, es bueno recordar que el nivel de azúcar para la masa congelada es ligeramente mayor que para el mismo producto sin congelar...Los productos con mayor cantidad de azúcar generalmente muestran una mayor estabilidad al congelarse, lo cual se les atribuye a las propiedades higroscópicas del azúcar que tienden a mantener

un bajo nivel de agua libre, reduciendo así el daño a las células de levadura.”
Luego la afirmación del solicitante resulta no ser cierta

- Los antecedentes citados relacionan fibras de alimento y/o estabilizantes.
(Ver especialmente D6). Luego tampoco es cierta la afirmación del solicitante.

Vistos, entonces, todos los antecedentes, lo relacionado por el opositor y los argumentos del solicitante, esta oficina encuentra que la presente solicitud refiere procesos generales de precocción de pan con las materias primas usualmente empleadas en el arte y que no se encuentran elementos distintivos que le otorguen al capítulo reivindicatorio estudiado el merecimiento del privilegio solicitado.

Ahora bien, si el solicitante anexa las correcciones pedidas y se permite diferenciar lo que considera inventivo, argumentando adecuadamente el porqué de las diferencias, en ese momento la oficina establecerá un nuevo análisis más completo y decidirá si se le concede o niega el privilegio pedido.

9. Conclusión:

Los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

N°	Documento N°	Reivindicaciones afectadas	Requisito que afecta
D1	US 4861601	1 - 22	Novedad
			Nivel Inventivo
D2	US 4 788 067	1 - 22	Novedad
			Nivel Inventivo
D3	Jesús Calaveras	1 - 22	Novedad
			Nivel Inventivo
D4	American Institute of Baking	1 - 22	Novedad
			Nivel Inventivo
D5	Campo Elías Balcazar	1 - 22	Novedad
			Nivel Inventivo
D6	P. Cauvin Linda Young	1 - 22	Novedad
			Nivel Inventivo
D7	AT 400279B	1 - 22	Novedad
			Nivel Inventivo
D8	FR 2 589 044	1 - 22	Novedad
			Nivel Inventivo
D9	EP 1 120 043	1 - 22	Novedad
			Nivel Inventivo
D10	US 5 069 916	1 - 22	Novedad
			Nivel Inventivo

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de SESENTA días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente. Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única N° 10 de 2001.

Alix Carmenza Céspedes de Vergel
Directora de Nuevas Creaciones (C)

Concepto Técnico No. **2959**

Examinador Técnico **202003**

El anterior requerimiento fue notificado por fijación en lista, de fecha 17 de setiembre de 2010

Pain dit "français" précuit et congelé et son procédé de fabrication.

La présente invention est relative à du pain précuit dit "français" congelé. On appelle "pain précuit", un pain ayant atteint son volume final qui ne possède pas de croûte mais une peau, pas de coloration qui, de ce fait, est un produit encore fragile. Ce tel produit doit être soumis à une nouvelle cuisson pour former la croûte et le pain final qui doit présenter les caractéristiques du pain dit "français" c'est-à-dire des alvéoles irrégulières, une croûte fine et croustillante et une forme allongée.

Les pains "précuits" ont l'avantage non négligeable pour le consommateur ou les boulangers, notamment les dépôts de pain de permettre la fourniture, soit à la clientèle, soit au consommateur au moyen de dispositifs de cuisson appropriés du pain frais, présentent cependant des problèmes dans la mesure où un tel produit est fragile puisqu'il n'est pas protégé par une croûte.

La demanderesse a découvert que l'on pouvait stabiliser par congélation sur le plan structural et microbiologique un tel produit autorisant un stockage de longue durée, sans perdre les qualités intrinsèques du pain dit "français" après la cuisson finale. Le pain cuit présente par ailleurs une teneur améliorée au rassissement.

La demanderesse a découvert que l'on pouvait réaliser un pain présentant de telles caractéristiques en préparant une pâte à pain à partir de farine boulangère de type US 55 présentant un taux de protéine compris entre 10 et 12% sur matière sèche et des caractéristiques d'alvéologramme Chopin suivantes :

W compris entre 200 et 250, $\frac{P}{L}$ compris entre 0,6 et 0,8 où P représente le gonflement, L l'allongement, entre 1 et 3% de levure biologique boulangère du type *Saccharomyces Cerevisiae*, 1,5 à 2% de sel tel que du chlorure de sodium, de l'eau et des agents dits améliorants choisis parmi l'acide ascorbique (0,01 à 0,025% et les enzymes amylolytiques associés éventuellement à de la lécithine de soja.

Les enzymes amylolytiques sont choisies notamment parmi les α -1,4-amylase, α -1,6-amylase, l'amylglucosidase.

Selon une forme de réalisation préférée on peut ajouter à la composition une ou plusieurs levure(s) chimique(s) à effet retardé dépendant de la température et/ou de l'hygrométrie, destinée(s) à maintenir en association avec les autres composants, un volume final conforme aux caractéristiques des pains dits "français".

Le pain précuit préparé à partir d'une telle pâte est utilisable après stockage même pendant quelques mois, pour préparer du pain présentant les caractéristiques du pain "français" notamment en ce qui concerne sa structure alvéolaire irrégulière, sa croûte fine et croustillante et qui a par ailleurs des propriétés de tenue au rassissement améliorées.

Le procédé conforme à l'invention consiste essentiellement à réaliser dans un premier temps le frassage ou préalliage à une première vitesse lente de la farine, de l'eau et de l'améliorant pendant une durée de 2 à 5 minutes;

Dans un deuxième temps, à une vitesse plus rapide, on procède au pétrissage pendant 6 à 20 minutes en additionnant la levure au quart de la durée du pétrissage, puis le sel au trois quart de la durée de pétrissage;

Dans un troisième temps, la pâte est divisée soit avec une diviseuse hydraulique discontinue soit avec une diviseuse volumétrique continue appelée encore peseuse, les pâtons ainsi produits sont arrondis dans une boulouse et les pâtons boulés ou non sont introduits dans une chambre de repos dite à "balancelle" quand elle est continue où la pâte se détend pendant 10 à 25 minutes selon le type de pâte et le poids des pâtons.

Les pâtons détendus sont façonnés en baguettes, pains ou petits pains. Ces pâtons sont ensuite soumis à une fermentation finale, aérés puis introduits dans un four en vue de la cuisson.

Pour réaliser les pains dits "précuits" on arrête la cuisson avant la formation de la croûte. La cuisson s'effectue conformément à l'invention de la façon suivante :

On procède dans un premier temps à une émission de buée pour permettre à la vapeur de se condenser sur le pain pendant environ 1 minute;

280/18

Leavened, prebaked and frozen laminated dough

Publication number: EP1120043

Publication date: 2001-08-01

Inventor: HARLAUX GINETTE (FR); PENET SYLVIE (FR)

Applicant: NESTLE SA (CH)

Classification:

- International: A21D8/02; A21D13/00; A21D13/08; A21D8/02;

A21D13/00; (IPC1-T): A21D13/08; A21D8/02

- European: A21D13/00F4D; A21D8/02

Application number: EP20000101475 20000126

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Also published as:

- EP1120043 (B1)
- ES2228309T (T3)
- DE600145727 (T2)

Cited documents:

- US5876586
- EP0509566
- WO9826743
- GB2102269
- GB2312367

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Abstract of EP1120043

A method of preparation of a frozen flaky pastry. A mixture of 34-45 wt.% flour, 0.5-1 wt.% salt, 2.5-5 wt.% sugar 2-3 wt.% buttermilk powder and 0.5-1 wt.% emulsifier is pre-mixed. During mixing 18-20 wt.% water, 3-6 wt.% whole egg and 2-3.5 wt.% yeast are added. At ambient temperature 20-30 wt.% plastic fatty matter is added in pieces and the paste is extruded. Two or more layers of paste are superposed and laminated. The paste is placed in a fermentation chamber, cooked, glazed with a syrup and rapid frozen without cooling and allowing to partially dehydrate. The paste may be frozen between lamination and fermentation and a softening stage may occur between freezing and fermentation. Chopped and/or puréed foodstuffs and/or a sauce and/or a cream may be placed onto the paste before fermentation. Independent claims are included for a fermented, pre-cooked frozen flaky pastry which shows no sign of staling after thawing and has on an upper surface and edible crust, which may contain hydrocarbons or hydrocarbon derivatives (sic) and may be flavored and for a cooked dish containing the claimed flaky pastry.

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(72) Inventeurs:
• Harlaux, Ginette
60000 Beauvais (FR)
• Penet, Sylvie
80430 Warlus (FR)

(71) Demandeur: SOCIETE DES PRODUITS NESTLE
S.A.
1800 Vevey (CH)

(74) Mandataire: Wavre, Claude-Alain et al
53, avenue Nestlé
1800 Vevey (CH)

(54) Pâte feuilletée fermentée, précuite et surgelée

(57) Pâte feuilletée fermentée précuite surgelée qui ne rassit pas après décongélation et procédé de fabrication d'une telle pâte feuilletée fermentée consistant à mélanger env. 35 à 45 % de farine, env. 0,5 à 1 % de sel, env. 2,5 à 5 % de sucre, env. 2 à 3 % de poudre de babeurre et env. 0,5 à 1 % d'un ou de plusieurs émulsifiants, ajouter env. 16 à 20 % d'eau, env. 3 à 5 % d'œuf entier liquide et env. 2 à 3,5 % de levure, incorporer à tempé-

rature ambiante env. 20 à 30 % de matière grasse plus, siq. en morceaux, exposer et laminier la pâte, fermenter la pâte laminée, cuire la pâte fermentée, napper une surface supérieure de la pâte dès la sortie du four et surgeler immédiatement sans ressuyage. La pâte feuilletée fermentée précuite ainsi obtenue peut être conservée longtemps à -40°C sans présenter de signes de rassisement après décongélation.

EP 1 120 043 A1

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refracter les symptômes du ramassement après décon-

gation.

[0016] A cet effet, la pâte feuilletée fermentée précé-

de signe de ramassement après décongélation, présen-

te sur une surface supérieure une pellicule caractéris-

te et est susceptible d'être obtenue par un procédé dans

lequel on la surgèle rapidement sans ressuage.

[0017] De même, dans la procédure de préparation

d'une pâte feuilletée selon la présente invention :

- on effectue un pré-mélange d'une composition con-

tenant, en % en poids, env. 25 à 45 % de farine,

env. 0,5 à 1 % de sel, env. 2,5 à 5 % de sucre, env.

2 à 3 % de poudre de bicarbonate et env. 0,5 à 1 %

d'un moussant émulsifiant,

- on ajoute à cette composition au cours de l'étape

de mélange env. 15 à 25 % d'eau, env. 3 à 6 %

de beurre fondu et env. 2 à 0,5 % de sucre,

- on incorpore à température ambiante env. 20 à 30

% de matière grasse plastiques en morceaux,

- on coupe la pâte

- on superpose au moins deux couches de pâte et on

lamine.

- on place la pâte en cellule de fermentation.

- on cuit la pâte.

- on coupe le pain des saucisses du four avec un pro-

- on surgèle.

- on surgèle rapidement la pâte sans ressuage.

[0018] Le produit utilisé pour raper la surface supé-

rieure de la pâte cuit en sortie du four peut être un shop

de sucre aromatisé ou non, un sirop de glucose de 0,

5, possible ou une gelée de fruit liquéfiée par chauffage.

On utilise de préférence un produit sirupeux à base de

glucose ou de dérivés de glucose.

[0019] On a constaté que le procédé de préparation

de la pâte feuilletée fermentée selon l'invention, bien

que ne présentant pas de succession d'étapes où l'on

ne présente pas de succession d'étapes où l'on

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ne présente pas de succession d'étapes où l'on

ne présente pas de succession d'étapes où l'on

ne présente pas de succession d'étapes où l'on

de pulvérisés contenant, en % en poids, env.

35 à 45 % de farine, env. 0,5 à 1 % de sel, env.

2,5 à 5 % de sucre, env. 2 à 3 % de poudre de

maïse, env. 0,5 à 1 % d'eau mélangée un emul-

sifiant.

on ajoute à cette composition au cours de l'éla-

pe de mélange env. 16 à 20 % d'eau; env. 3 à

8 % d'huile d'olive; env. 2 à 3,5 % de

levure.

on incorpore à température ambiante env. 20 à

30 % de matière grasse plastique en morceaux,

on coupe la pâte,

on superpose au moins deux couches de pâte

et on lamine.

on place la pâte en cellule de fermentation;

on coupe la pâte; on racle la pâte des sa sortie du four avec un

produit stérilisé.

on surgèle séparément la pâte sans ressuage.

Procédé selon la revendication 4 dans lequel on

ajoute une étape de température de surgélation de la

pâte et un entre-étape de laminage et l'étape de fer-

mentation.

Procédé selon la revendication 5 dans lequel on

ajoute une étape de température de surgélation de la

pâte et un entre-étape de laminage et l'étape de fer-

mentation.

Procédé selon la revendication 5 dans lequel on

ajoute une étape de température de surgélation de la

pâte et un entre-étape de laminage et l'étape de fer-

mentation.

Procédé selon la revendication 5 dans lequel on

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mentation.

Procédé selon la revendication 5 dans lequel on

ajoute une étape de température de surgélation de la

pâte et un entre-étape de laminage et l'étape de fer-

mentation.

celle qui fondent à l'ébullition. On prépare ensuite, pour

celle restée, une crème d'amande en mélangeant les

ingrédients suivants (pour 100 g de crème): env. 15 g

de sucre, env. 2 g d'amande, env. 2 g d'huile de maïs mo-

de, env. 11 g de sucre cristallisé, env. 16 g d'œuf entier

liquide, env. 7 g de jaune d'œuf liquide, env. 25 g de

pour la crème d'amande et env. 22 g d'eau. Les pulvérisés

sont dispersés dans les liquides à l'aide d'un mélangeur

Hobart à petite vitesse puis le mélange est homogénéi-

sé pendant 2 minutes à grande vitesse.

[0070] La pâte obtenue de façon identique à l'exem-

ple 1 est découpée en triangles d'environ 50 g. Env. 10

g de crème d'amande sont déposés au centre de ce

triangle de pâte qui est ensuite roulé de manière à for-

mer un croissant.

[0071] Le produit fini obtenu est mis en cellule de fer-

mentation et cuit de manière identique à la procédure

décrite dans l'exemple 1.

[0072] Dès la sortie du four le produit est racle d'un

stop de sucre et introduit immédiatement après dans

une cellule de surgélation à -40 °C pendant env. 15 mi-

nutes de manière à atteindre une température de -20

°C env. à cœur.

[0073] Le produit surgelé est stocké en cartons à

-20 °C. La décongélation du produit peut se faire de ma-

nière identique à ce qui est expliqué dans l'exemple 1.

Exemple 5

Fondant à la poêle

[0074] On procède de la manière décrite à l'exemple

1, à l'exception du fait qu'une demi poêle au stop rem-

place l'opération de fabrication et que le rasepage est réalisé à

l'aide d'une poêle de tout type, quelle que soit la poêle de

type, de la poêle ou de la poêle.

Revendications

1. Pâte feuilletée fermentée précuite surgelée ne pré-

sentant pas de signe de ressassement après décon-

gélation présentée sur une surface supérieure une

poêle comestible et susceptible d'être préparée

par un procédé dans lequel on la surgèle rapide-

ment sans ressuage.

2. Pâte feuilletée selon la revendication 1, dans la-

quelle la poêle comestible comprend des gluci-

des ou des dérivés de glucides.

3. Pâte feuilletée selon la revendication 2, dans la-

quelle la poêle comestible est aromatisée.

4. Procédé de préparation d'une pâte feuilletée, dans

laquelle on effectue un pré-mélange d'une composition

l'aide d'un pinceau avec un mélange d'eau (50%) et de

siropage blanc arôme abricot (10 %), puis immédiatement

mont surgelés dans un surgélateur aux environs -33 à

-40°C sans étape de ressuage. Le produit cuit est introduit

en conditionnement en carton, éventuellement séparé par

des intercalaires en plastique, et stocké aux environs

de -20 à -30°C.

[0062] Le produit peut être conservé 9 mois aux envi-

rons de -25 °C sans présenter de signe de ressasse-

ment après décongélation.

[0063] Le produit est décongelé décongelé à l'exem-

ple 1, à l'exception de la température d'environ 15 à 25

°C pendant environ 45 minutes/1 heure 30. Le produit

ainsi décongelé présente des caractéristiques organo-

leptiques et texturales identiques à celles d'un produit

non surgelé. Un tel produit conserve en outre ses qua-

lités organoleptiques, après décongélation, sur une pé-

riode allant jusqu'à 24 heures.

[0064] La décongélation du produit cuit surgelé peut

se faire de manière accélérée grâce à un passage dans

un four micro-ondes à faible puissance de manière à

amener le produit aux alentours d'une température de

Foible de 15 à 25°C.

[0065] Le produit décongelé conserve pendant 24

heures ses caractéristiques texturales et organolepti-

ques sans présenter de signe de ressassement.

Exemple 2

Exemple 3

[0066] On procède de la manière décrite dans l'exem-

ple 1, à l'exception du fait que l'on surgèle la pâte à

l'aide d'un assemblage qui permet la mise en place de

la pâte aux alentours de -18 à -40°C. On met le produit

en assemblage surgelé en température avant la mise en

cellule de fermentation. Le temps de fermentation est

de 15 à 25°C.

[0067] Le produit cuit surgelé est introduit dans une

cellule de fermentation pour pousser

à 15 à 17 °C pendant 1 heure environ,

c'est de manière à obtenir une température à cœur de

-2°C à 0°C. Une fois terminé, le produit est introduit en

cellule de fermentation pour pousser

à 15 à 17 °C pendant 1 heure environ,

c'est de manière à obtenir une température à cœur de

-2°C à 0°C. Une fois terminé, le produit est introduit en

cellule de fermentation pour pousser

à 15 à 17 °C pendant 1 heure environ,

c'est de manière à obtenir une température à cœur de

-2°C à 0°C. Une fois terminé, le produit est introduit en

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-2°C à 0°C. Une fois terminé, le produit est introduit en

cellule de fermentation pour pousser

à 15 à 17 °C pendant 1 heure environ,

c'est de manière à obtenir une température à cœur de

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[64] PROCESS FOR MICROWAVE BROWNING,
COMPOSITION USED FOR SAME AND
PRODUCT PRODUCED THEREBY

[75] Inventors: Lawrence L. Beckholz, Middletown;
Marion A. Saeli, Bounton; Brian
Byrne, East Brunswick, all of N.J.

[73] Assignee: International Flavors & Fragrances
Inc., New York, N.Y.

[21] Appl. No.: 700,778
[22] Filed: May 16, 1991

Related U.S. Application Data

[60] Continuation-in-part of Ser. No. 396,498, Oct. 12, 1990,
which is a division of Ser. No. 335,529, Jun. 8, 1990,
Pat. No. 4,985,261, which is a continuation-in-part of
Ser. No. 440,794, Nov. 24, 1989, Pat. No. 4,941,697,
which is a division of Ser. No. 356,303, May 25, 1989,
Pat. No. 4,804,960, which is a continuation-in-part of
Ser. No. 295,450, Jan. 10, 1989, Pat. No. 4,884,184.

[51] Int. Cl.³ A23L 1/00; A21D 6/00
[52] U.S. Cl. 426/743; 426/762;
426/703; 426/549

[58] Field of Search 426/243, 262, 265, 305,
426/496, 549

References Cited

[56] U.S. PATENT DOCUMENTS
407,356 9/1886 Tan et al. 426/107

4,518,618 5/1985 Hein et al. 426/762
4,735,812 8/1988 Bryson et al. 426/762
4,857,540 8/1989 Pachment et al. 426/107
4,882,184 11/1989 Beckholz et al. 426/743
4,968,332 11/1990 Steinko et al. 426/762

Primary Examiner—George Young
Attorney, Agent, or Firm—Arthur L. Liberman

ABSTRACT

[57] Described is a process for carrying out microwave
browning on baked goods and products produced
thereby. The process comprises the step of providing:
(a) a composition of matter consisting essentially of
procedures of a Maillard reaction product flavor, a
solvent capable of raising the dielectric constant of
the surface of a foodstuff to be cooked whereby the
cooking time will be less than 6 minutes (such as
water or a mixture of propylene glycol and water
or a mixture of glycerine and water or a mixture of
propylene glycol and glycerine or propylene gly-
col or glycerine taken alone;
(b) providing an uncooked baked goods foodstuff,
e.g. dough;
(c) coating the foodstuff with (a) onto the surface of
the uncooked foodstuff; and
(d) exposing the uncooked coated foodstuff with
microwave radiation for a period of under 360
seconds whereby the resulting product is caused to
be edible as a cooked foodstuff.

4 Claims, No Drawings

PROCESS FOR MICROWAVE BROWNING,
COMPOSITION USED FOR SAME AND PRODUCT
PRODUCED THEREBY

This application is a continuation-in-part of applica-
tion for U.S. Letters Patent, U.S. Ser. No. 396,498 filed
on Oct. 12, 1990 which is a division of application for
U.S. Letters Patent, U.S. Ser. No. 335,529 filed on Jan.
8, 1990, now U.S. Pat. No. 4,985,261 issued on Jan. 15,
1991, which is a continuation-in-part of application for
U.S. Letters Patent, U.S. Ser. No. 440,794 filed on Nov.
24, 1989, now U.S. Pat. No. 4,941,697 issued on July 24,
1990 which is a division of application for U.S. Letters
Patent, U.S. Ser. No. 356,303 filed on May 25, 1989,
now U.S. Pat. No. 4,804,960 issued on Feb. 27, 1990,
which is a continuation-in-part of application for U.S.
Letters Patent, U.S. Ser. No. 295,450 filed on Jan. 10,
1989, now U.S. Pat. No. 4,882,184 issued on Nov. 21,
1989.

BACKGROUND OF THE INVENTION

The increased use of microwaves for cooking has
given rise to a large market in microwaveable foods.
While the advantage of microwave cooking over con-
vection oven cooking is the time savings, the disadvan-
tage is that baked goods and meats do not develop the
surface browning or crust formation expected with
convection oven cooking.

Our objective has been to create that browning
which enhances the products appearance, making it
look as if it were cooked in a convection oven.

In the microwave, food does not have sufficient time
or temperature for the chemical reactions responsible for
browning to react. Therefore, for a microwave
browning system to work, it must accelerate the rate of
the browning reactions or locally increase the surface
temperature. Ultimately, the reaction responsible for
browning have to be accelerated in the relatively
short time frame dictated by the foods preparation con-
ditions. The times needed for preparing microwave
foods vary depending upon the power output of the
microwave unit and the moisture content of the food to be cooked.
A typical 750 watt microwave will cook baked goods in
40 seconds to 4 minutes, while meat will take 6 to 15
minutes.

Several additional requirements for a successful mi-
crowave browning system are as follows:

1. In addition to the desired browning effect, it must
be able to generate either no aroma or one which is compati-
ble with the target food;
2. the browning reaction must not take place before
cooking the food; and
3. after cooking, the browning must stop, and not
darken substantially.

The reactions responsible for browning during con-
vection oven cooking are the caramelization of sugars
and the Maillard reaction between naturally occurring
reducing sugars, amino acids, amines, peptides and pro-
teins which results in the formation of colored melanoi-
dins. Until recently (1984) there were numerous patent
and literature references to such reactions for the pro-
duction of flavors, where the generation of color was
inconsequential or objectionable. In the past few years
several patents have appeared wherein microwave
browning created by Maillard reactions have been the
topic.

Although the prior art does take advantage of the
reaction between reducing sugars and amino acids, it
has not made any correlation of reaction variables such as
pH, solvent, or sugar reactivity and in addition, it does
not take into account certain requirements of the nature
of the sugar or sugar mixtures to be used, e.g., a mixture
containing 30-60% fructose in addition to other sugars.

THE INVENTION

Our invention has shown that the order of sugar
reactivities observed for the typical thermally induced
Maillard and Maillard reactions holds true in micro-
wave cooking and has a particular advantage when
using a sugar composition containing from 30-60%
fructose. As expected, pentoses are more reactive than
hexoses and 6-deoxyhexoses are more reactive than
hexoses.

There is a strong relationship between pH and reac-
tivity. At pH's in the range of 9-13, the browning reac-
tion is accelerated relative to acid pH's. Such a rate
enhancement is attributed to the removal of a proton
from the amino acid, leaving the amino group un-
protonated and, therefore, more nucleophilic. The con-
sequence of the latter is to accelerate nucleophilic sub-
stitution of the amino group on the carbonyl of the
reducing sugar. Since this reaction is the first step in the
formation of color, it can be concluded that this is the
rate determining step to melanoidins. In food applica-
tions, the pH is adjusted to a range of 9-13 by the addi-
tion of sodium bicarbonate, although any base would
achieve the same effect.

Another unexpected finding is that the solvent in
which the Maillard browning reaction is run dramati-
cally affects the rate of browning. Appropriate solvents
such as triacetin and vegetable oil, are solvents in
browning reaction systems since the reagents are not
soluble in the solvent. Polar products are soluble, how-
ever, not all members of this solvent class are useful for
microwave browning. Ethanol is an unacceptable sol-
vent, since the rate of the browning reaction in this
solvent is on the order of hours. Using water, propylene
glycol and glycerine the rate of browning is rapid in our
system, since the desired coloration in 40 seconds
to 4 minutes (360 seconds).

The mechanism of solvent action is believed to be
twofold. First, the ability of the solvent to solubilize the
reagents (including fructose) is essential; however, that
in itself is insufficient to qualify a solvent without the
second property. The successful solvent has the ability
to absorb microwave radiation (2450 MHz) and retain
this absorbed energy as heat. Solvents with high heat
capacities, high viscosities and low thermal conductiv-
ities are desirable, as they facilitate heat retention. With
the above properties, the solvent effectively focuses
part of the microwave radiation on the food's surface,
locally raising the temperature and accelerating the
browning reaction. Propylene glycol and glycerine are
two materials which meet the necessary requirements as
microwave browning solvents in our system when de-
signed to run the microwave reaction at times less than 3
minutes. Water is a material which meets the necessary
requirement as a microwave browning solvent for our
system when running the microwave reaction at 6 min-
utes or less.

The Maillard reaction product useful in the system of
this invention is as follows:

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- (a) from about 10 up to about 20% proline;
(b) from about 2 up to about 5% ribose;
(c) from about 30 up to about 60% fructose; from about 40 up to about 60% solvent.
The solvent compositions may be as follows:
(i) water;
(ii) propylene glycol;
(iii) glycerine;
(iv) mixtures of water with glycerine;

EXAMPLE II

Blotters weighing 0.61 grams were dosed with 0.10 grams of test solutions. The test solution were placed on the center of the blotters. Blotters spotted in this manner were irradiated with 2450 MHz microwave (750 watts) radiation for various periods of time, starting at 20 seconds. The results of testing variables are summarized in Table II.

TABLE II

EX-AM- PLE	Amino Acid	Amino Acid Wt.	Sugar	Sugar Wt.	Solvent	Solvent Wt.	Initial pH	pH ADJ Agent	pH ADJ Agent Wt.	Microwave Time	Color Appearance	Aroma
II-1	Proline	3.7 g	Rhamnose	5.3 g	Ethanol	16 g	7-8	NaHCO ₃	2.7 g	20 sec.	White	None
II-2	Proline	3.7 g	Rhamnose	5.3 g	Ethanol	16 g	7-8	NaHCO ₃	2.7 g	40 sec.	Burnt	Bready
					Glycerine	25 g				20 sec.	Brown	Sweet
II-3	Proline	3.7 g	Rhamnose	5.3 g	Ethanol	16 g	6-7	NaHCO ₃	2.7 g	40 sec.	White	None
								HOAc	2.2 g	80 sec.	White	None
II-4	Proline	3.7 g	Rhamnose	5.3 g	Ethanol	16 g	6-7	NaHCO ₃	2.7 g	120 sec.	White	None
II-5	Proline	3.7 g	Rhamnose	5.3 g	Glycerine	50 g	7-8	NaHCO ₃	2.7 g	20 sec.	Golden	Sweet
II-6	Proline	3.7 g	Rhamnose	5.3 g	Ethanol	16 g	7-8	NaHCO ₃	2.7 g	20 sec.	Golden	Bready
II-7	Proline	3.7 g	Rhamnose	5.3 g	Ethanol	16 g	7-8	NaHCO ₃	2.7 g	20 sec.	Golden	Bready
II-8	Proline	3.5 g	Ribose	4.5 g	Ethanol	16 g	7-8	NaHCO ₃	2.7 g	80 sec.	White	None
II-9	Proline	3.5 g	Ribose	4.5 g	Ethanol	16 g	7-8	NaHCO ₃	2.7 g	20 sec.	Dry Dark	Bready
II-10	Proline	3.5 g	Ribose	4.5 g	Ethanol	16 g	7-8	NaHCO ₃	2.7 g	20 sec.	Dark Brn	Sweet
II-11	Proline	3.5 g	Ribose	4.5 g	Ethanol	16 g	6-7	NaHCO ₃	2.7 g	20 sec.	Golden	Sweet
II-12	Proline	12.5 g	Fructose	33.5 g	Water	50 g	7-8	Sodium Bicarbonate	20.0 g	360 sec.	Brown	Bready, Vanilla-like

- (v) mixtures of water with propylene glycol; and
(vi) mixtures of propylene glycol with glycerine.

When using mixtures of solvents the ratios of water:propylene glycol may vary from about 1:99 up to about 99:1. When using mixtures of water and propylene glycol the ratio of water:propylene glycol may vary from 1:99 up to 99:1. When using mixtures of propylene glycol and glycerine the ratio of propylene glycol:glycerine may vary from 1:99 up to about 99:1.

Thus, the solvents useful in the carrying out of our invention have dielectric constants which cause the cooking via microwave radiation to take place under 360 seconds (in the range of from about 40 seconds up to about 360 seconds).

The principles given above are illustrated in the following examples.

EXAMPLE I

Into 100 ml beakers were placed exactly 40.4 g of solvent. Each beaker was irradiated with 245 OMHz microwave radiation for 20 seconds, after which the solvents temperature was measured. Experiments were run in triplicate. The results for several solvents are set forth in the following Table I.

TABLE I

SOLVENT	TEMPERATURE (C.)
Propylene glycol	91
Glycerine	88
Ethanol	78
Water	41
Tracerin	80

What is claimed is:

1. A process for providing a cooked baked goods foodstuff comprising the steps of:

(a) providing an uncooked baked goods composition having a continuous surface;

(b) providing a mixture of:

(i) 10-20% proline;

(ii) 2-5% ribose;

(iii) 30-60% fructose; and

(iv) 40-60% of a solvent selected from the group consisting of:

water;

propylene glycol;

glycerine;

a mixture of water and glycerine;

a mixture of propylene glycol and

water; and

a mixture of propylene glycol and

glycerine;

(c) coating the mixture of (b) onto the surface of an uncooked foodstuff provided in (a); and

(d) exposing the thus coated uncooked foodstuff to microwave radiation for a period of time between 40 seconds and 360 seconds,

with the pH of the coating being in the range of from about up to about 13.

2. The product produced according to the process of claim 1.

3. The process of claim 1 wherein the solvent is water.

4. the product produced according to the process of claim 3.

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EXTENDED SHELF LIFE BAKERY COMPOSITION AND BAKERY PRODUCTS

(76) Inventors: Terry Lynn Pruden, Belleville, IL (US); Bassey Oghan Ekpo, O'Fallon, MO (US); Feng Guan, Chesterfield, MO (US); Douglas Alan James, Matoon, IL (US); Alan Duane Guyon, Toledo, IL (US)

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ABSTRACT

A bakery product composition providing a baked product having an extended shelf life comprising a dough comprising flour, yeast (optional), water and an extended bakery shelf life composition comprising an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid, an effective amount of at least one of moisture retention composition comprising at least one of guar gum, Arabic gum, xanthan gum, carboxymethylcellulose and (c) an effective amount of at least one enzyme selected from an amylase, protease and pentosanase. The amount of said shelf life extending composition present is that amount which is an effective combination comprising (a), (b) and (c) results in a shelf life extended beyond fourteen days for a baked product prepared from said dough composition.

Correspondence Address:

Patrick W. Rasche

Armstrong Teasdale L.L.P.

Suite 2600

One Metropolitan Sq.

St. Louis, MO 63102-2740 (US)

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EXTENDED SHELF LIFE BAKERY COMPOSITION AND BAKERY PRODUCTS

BACKGROUND OF THE INVENTION

[0001] This invention relates generally to food preservation and more particularly, this invention relates to an extended shelf life bakery product composition, an extended shelf life (fresh) bakery dough composition and a method for extending the shelf life of bakery dough compositions.

[0002] Bakery products (baked goods) are a highly desired food product consumed by persons and enjoyed as a food. Baked products may be purchased at a store or a bakery as fresh, frozen and refrigerated. People eat bakery products because of a highly desired taste, organoleptic quality and texture of the bakery product. Bakery products have been a mainstay in humans' diet for thousands of years providing essential elements needed for life.

[0003] However some bakery products are displayed or stored on grocer's or baker's shelves or are stored in the home for various length periods of time as fresh or refrigerated after baking. Such storage time (shelf storage) is relatively short duration presently so that the actual total time spent in storage after baking does not exceed the stated (package marked) shelf-life of the product. Typically this known shelf storage time ranges from about two days to about fourteen days.

[0004] To a large extent shelf life is set by bakers, manufacturers and grocers. Shelf life is generally the window of time that a food item retains its quality taste, texture and nutritional value. Typically shelf life is based on safety, quality and nutrition considerations.

[0005] Extended shelf life is highly desired and is determined largely by environmental considerations such as oxygen, moisture and heat exposure of the baked product. Excessive amounts of oxygen, moisture and heat contacting the baked product will cause loss of nutritional value and the presence of off flavors, odors and rancidity.

[0006] Thus it is highly desired to be able to provide an extended shelf life for a fresh or refrigerated bakery product (i.e. having extended microbial stability) such as on a store or market shelf, bakery shelf, home storage area or display counter for more than about sixteen days.

BRIEF DESCRIPTION OF THE INVENTION

[0007] In one aspect, a bakery product composition is provided that comprises a dough comprising flour, water, table salt and optionally a leavening agent and containing a shelf life preserving composition comprising (a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid; (b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose and (c) an effective amount of at least one enzyme selected from amylase, protease, and pentosanase; and wherein the effective amount present is an amount which in an effective combination results in a shelf life extended beyond sixteen days for a bakery product prepared from the dough composition.

[0008] In another aspect an extended shelf life preserving composition is provided that is useful in a bakery product that comprises an effective amount of at least one salt of

propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid, an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose and an effective amount of at least one enzyme selected from an amylase, protease, and pentosanase.

[0009] In another aspect, an extended shelf life bakery product is provided that comprises a bagel having shelf life greater than sixteen days.

[0010] In another aspect, a bakery product composition is provided wherein the effective amount of the total of (a), (b) and (c) ranges from about 0.21 to about 6 parts by total weight dough.

[0011] In another aspect, a bagel is provided comprising an extended shelf life additive package therein which extends the shelf life of a fresh bagel prepared therefrom to between about sixteen days and twenty-six days.

[0012] In another aspect, a bagel is provided wherein the shelf life of the bagel is from about sixteen days to about twenty-six days.

[0013] In another aspect, a method for extending the shelf life of a bakery composition comprises adding to a dough of a bakery product a shelf life preserving composition comprising an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid, an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose and an effective amount of at least one enzyme selected from an amylase, protease, and pentosanase.

[0014] In another aspect a method for preserving the shelf life of a bakery composition comprises adding to a dough of a bakery product a shelf life extending composition comprising an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid, an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose and an effective amount of at least one enzyme selected from an amylase, protease, and pentosanase.

[0015] A method of extending the shelf life of a dough based composition comprises adding to said dough a shelf life extending additive composition comprising (a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid; (b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose; and (c) an effective amount of at least one enzyme selected from an amylase, protease, and pentosanase.

DETAILED DESCRIPTION OF THE INVENTION

[0016] In an embodiment, a bakery product composition comprises a shelf life extending and preserving composition whereby a bakery product (i.e. a dough based product) is imparted with an extended shelf life from about sixteen days to about twenty-six days. In an embodiment, the shelf life extending composition is admixed and added to the unbaked dough or to a partially baked dough. The dough is baked whereupon the extended shelf life is manifested in the baked product. In an embodiment, the shelf life extending composition comprising (a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and

benzoic acid, (b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose and (c) an effective amount of at least one enzyme selected from amylase, protease, and pentosanase is integrated and admixed into an unbaked or partially baked dough prior to, at or during baking. After baking or partial baking, the extended shelf life from about sixteen days to about twenty six days is manifested.

[0017] Nonlimiting useful examples of a dough based product include any bakeable food which is based on a dough and a baked food prepared therefrom including but not limited to bagels, English muffins, waffles, bread, French toasts, buns, doughnuts, quick bread, French bread, pumpkin bread, sourdough bread, pancake, pizza crust, breadstick, brioche, rolls, cinnamon rolls, cookies, biscuits, crepes, croissants, shells, Danish dough, pie and tart shells, puff pastry, pastry, strudels, scones and vol-au-vent, corn yeast rolls, beer rolls, buttercakes, frosting, fudge, cakes, phyllo dough, yeast breads and cereal based food products.

[0018] As used herein, the term "baking" includes the process of applying effective energy in the form of heat utilizing an oven or suitable heating transfer apparatus capable of providing and directing heat to a dough based product to convert flour, water (and optionally yeast) present in the dough product to a baked product as a result of the effective and sufficient application of heat to the product.

[0019] As used herein, the term "heat energy" includes energy including convection, radiation, and/or microwave energy applied in a form effective and sufficient to accomplish baking of a product. Baking energy may be imparted to the product by a combination of one or more of convection, radiation and/or microwave energy application means such as an oven or convection and radiation application means. Baking mechanisms including electric, gas, wood and solar stoves, ovens, and furnaces may be employed if desired to achieve the desired temperature level. An open fire or hearth may be employed as a baking mechanism. The amount of time employed in cooking will be determined from a number of factors including the amount of dough and composition to be baked, the water content and other variables of the baking operation.

[0020] As used herein, the term "oven" includes any heated environment or enclosure capable of providing and applying heat energy to an unbaked or unbaked item to convert that item to a baked product. Typically in such an enclosure sufficient heat energy is supplied for baking, heating and drying a dough based product to convert an unbaked or partially baked dough to a baked form. One or more ovens may be employed if desired, for example, in a series fashion or parallel fashion.

[0021] Various illustrative useful types of ovens and suitable heating and baking apparatus, kneaders, mixing equipment and other apparatus, useful in preparing and baking a dough based product to form a dough and to form a baked product from dough are disclosed in Perry's Chemical Engineers' Handbook, Seventh Edition, Robert H. Perry and Don W. Green, ISBN 0-07-049841-5, 1997.

[0022] As used herein, the term "dough based product" includes a dough containing compositions, unbaked, partially baked and baked dough compositions which comprise flour, water (and optionally yeast or optionally a chemical

leavening agent) and which form a desirable baked product when subjected to effective amounts of heat energy sufficient to impart baking to the product.

[0023] As used herein, the term "dough" includes dough based flour, i.e., having at least a substantial flour component, wherein the flour component is flour made or derived from grains such as wheat, oats, barley, rye, millet and corn mixed with water. Optionally, salt, eggs, sugars, fruits and other baking additives may be added to give bakery products flavor, change its texture or increase its nutritional value.

[0024] In an embodiment, bakery products are made by use of a leavening agent or without a leavening agent. In a further embodiment, leavening is accomplished by using yeast or chemical leavening agents such as baking soda, baking powder, or sodium pyrophosphate in the dough to effect a rise in dough.

[0025] As used herein, the term "croissant" includes raw, pre-baked and triangle croissants.

[0026] As used herein the term "shelf life" means that the measurement of shelf life is measured starting from the day of baking and is measured forward in time generally in terms of days, from that baking day. An extended shelf life of about sixteen days to twenty six days is intended to mean a shelf life of sixteen days to about twenty six days after baking.

[0027] In an embodiment, the bakery composition further comprises butter, unbaked, dough, proofed/pre-proofed dough, pre-baked dough, partially baked dough, and baked dough products. Also included are bakery products stored under refrigerated and ambient conditions.

[0028] The novel bakery dough herein comprises flour, optionally yeast, and water to which has been added at least one salt of an acid selected from the group consisting of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid.

[0029] An illustrative bakery composition (recipe) is shown in Table I following with illustrative components shown in illustrative ranges in parts by weight.

TABLE I

Component	Broad Range	Narrow Range
Flour	30-65	45-60
Water	20-65	30-50
Leavening Agent (Optional)	0-4	1-3
Ordinary Table Salt	0.1-3	0.5-1.5
(a)	0.15-3	0.7-2
(b)	0.05-2	2.1-1.5
(c)	0.01-1	0.05-0.8
Other Optional Ingredients or Additives	0.8-16	3-12
Total	100	100

[0030] Any suitable flour (including all purpose and enriched flours) may be employed herein which is sufficient to provide protein(s) to form gluten and give rise. However, an enriched wheat flour is generally utilized to provide a higher protein content and provide more gluten to baked bread and to bakery products.

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[0031] Methods for preparing a baked product are hereinafter described with particularity to bread and bagel merely as an illustrative embodiment of baking a baked product. It is to be understood that those presently available techniques for baking English muffins, waffles, bread, French toasts, buns, doughnuts, quick bread, French bread, pumpernickel bread, sourdough bread, pancake, pizza crust, breadstick, brioche, rolls, cinnamon rolls, cookies, biscuits, crepes, croissants, shells, Danish dough, pie and tart shells, puff pastry, pastry, strudels, scones and vol-au-vent, corn yeast rolls, beer rolls, buttercakes, frosting, fudge, cakes, phyllo dough, yeast breads and cereal based food products may be employed. It is further understood that a variety of recipes exist which include for a plethora of ingredients which may be employed with this novel shelf life extending and preserving composition. Various toppings may be employed to enhance flavor, appeal and attractiveness.

[0032] In an embodiment, flour comprises wheat flour which is most commonly whole wheat and white. White flour is milled from the endosperm of wheat. Enriched flour may be used whereby supplements including extra vitamins and minerals have been added to white flour. Wheat flour contains glutenin and gliadin proteins that combine with water to form gluten which allows the dough to stretch and trap gas and air bubbles.

[0033] Other illustrative useful flours include those from grains, oilseeds, and legumes such as oilseeds (soybean, flax, safflower, peanut, rapeseed, coconut, cottonseed, and sesame) and legume flours (navy bean, lupine, lima bean, chickpea, cowpea, fababean, pigeon pea, and lentil). In an embodiment, the flour comprises bean flour, peanut flour, sunflower flour, buckwheat flour and soy flour.

[0034] Tap or distilled water may be employed. Orange juice may be employed as a source of water as well as other suitable fruit juices.

[0035] Illustrative useful yeasts herein include commercial yeast, Baker's yeast, Fleischman's® yeast and include yeasts which have the capability to raise dough and include related species and strains of *Saccharomyces cerevisiae*. Both regular active dry and rapid-rise dry yeast can be employed.

[0036] As used herein, the term "baking soda" includes sodium bicarbonate. Baking powder may be used as it comprises baking soda with an acid which is mixed with either starch or flour and cream of tartar or other acid forming substance such as anhydrous sodium aluminum sulfate.

[0037] Other illustrative useful leavening agents include sodium acid pyrophosphate, $\text{Na}_2\text{H}_2\text{P}_2\text{O}_7$, also referred to known as disodium pyrophosphate and disodium dihydrogen pyrophosphate.

[0038] Nonlimiting illustrative useful baking powders include those which comprise sodium acid pyrophosphate, sodium bicarbonate, corn and/or wheat starch, monocalcium sulphate, and calcium sulphate; sodium bicarbonate, corn starch, aluminum sulphate and sodium sulphate; monocalcium sulphate, calcium sulphate; sodium acid pyrophosphate, sodium bicarbonate, cornstarch, monocalcium sulphate, calcium sulphate; and corn starch, monocalcium sulphate and sodium bicarbonate. (Arm & Hammer® Bak-

ing Soda, Church & Dwight Co. Inc., 469 North Harrison Street, Princeton, N.J. 08543 USA)

[0039] In an embodiment, sourdough bread is a useful dough based product and is made using a combination of wild yeast (often *Candida milleri*) and an acid-generating bacteria (*Lactobacillus sanfrancisco* sp. nov).

[0040] In addition to different flours, additional ingredients which may be added to dough base products to impart different flavors and textures include eggs and sugar. Fats and oils (also called shortening), can be added to bread dough to create a tender, richer bread with a finer consistency if desired. Other useful illustrative ingredients include raisins, almonds, sesame seeds, and poppy seeds, and herbs and spices, such as cumin and cinnamon.

[0041] Leavening is an option in preparing a bakery product to produce rise by physical and chemical means. The leavening selected is usually dependent on the balance and kind of ingredients in the formula, and the handling and processing involved.

[0042] In an embodiment, non-iodized table salt such as sodium chloride and a wide variety of flavorings are used to obtain the type and variety of product wanted.

[0043] Bread is generally made from dough by mixing, kneading, rising, dough, shaping and baking the dough in a variety of processes.

[0044] In an embodiment, flour is admixed with yeast, and liquid ingredients usually water and any additional ingredients such as salt, sugar, and shortening are admixed therewith to form dough. The dough will gradually thicken upon stirring and after the dough is difficult or too thick to stir, the dough may be kneaded by repeatedly pressing, folding, massaging and turning the dough. In an embodiment, Fleischman's® yeast or Baker's yeast may be employed as yeast.

[0045] Kneading of dough is accomplished by pressing the dough against a rigid surface for example hand or machine pressing dough against a resistance such as a counter or table top or pressing dough against or on a stone. If desired, kneading may be carried out in a kneading machine wherein kneading is accomplished by action of metal or plastic blades against the dough such as in a bread making machine.

[0046] An effective amount of one or more salts of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid is employed and is added to the dough. One or more of these salts may be employed as in an admixture to provide an effective amount. While the acid may be added to the dough composition, the salt form is preferred for enhanced effectiveness such as for example, a sorbate, acetate or lactate.

[0047] In an embodiment, salts include alkali metal salts such as sodium and potassium salts and alkaline earth metal salts such as calcium and magnesium of the aforementioned acids. In an embodiment such salts are water soluble, dissociate and are of food grade quality.

[0048] Illustrative useful nonlimiting salts include sodium propionate, sodium sorbate, sodium phosphate, sodium citrate, sodium acetate, sodium lactate, sodium benzoate, potassium sorbate, potassium phosphate, potassium citrate, potassium acetate, potassium lactate, potassium benzoate, potassium sorbate, potassium phosphate, calcium propi-

onate, calcium sorbate, calcium phosphate, calcium citrate, calcium acetate, calcium lactate, calcium benzoate, magnesium propionate, magnesium sorbate, magnesium phosphate, magnesium citrate, magnesium acetate, magnesium lactate, magnesium benzoate, magnesium sorbate and magnesium phosphate and mixtures thereof.

[0049] In an embodiment, an effective amount of components (a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid, (b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose and (c) an effective amount of at least one enzyme selected from amylase, protease, and pentosanase are admixed with the dough.

[0050] Typically an effective amount of (a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid, (b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose and (c) an effective amount of at least one enzyme selected from amylase, protease, and pentosanase is in the range from about 0.21 to about 6 parts by weight dough.

[0051] These components include an effective amount of at least one of guar gum, gum Arabic, CMC and xanthan gum.

[0052] Guar gum (also called guaran) is extracted from the seed of the leguminous shrub *Cyamopsis tetragonoloba*. Gum Arabic is a dried exudate obtained from the stems and branches of *Acacia senegal* (L.) Willdenow or closely related species of *Acacia* (fam. Leguminosae). Gum arabic also is called gum talha as it comprises high-molecular weight polysaccharides and their calcium, magnesium, and potassium salts, which on hydrolysis yield arabinose, galactose, rhamnose, and glucuronic acid. (CAS No. 9000-11-7, 9000-32-4 also known as sodium carboxymethyl cellulose and sodium cellulose glycolate carmellose).

[0053] Carboxymethylcellulose (CMC) is a derivative of cellulose made from alkali and chloroacetic acid.

[0054] Xanthan gum is manufactured and sold by C.P. Kelco of Wilmington, Del. USA as the Keltrol (R) family of products. Rhodia Food Ingredients of Cranbury, N.J. as the Rhodigel family of products, and Archer Daniels, Midland Company of Decatur, Ill. USA.

[0055] Xanthan gum is a microbial polysaccharide produced by a pure culture aerobic submerged fermentation of *Xanthomonas campestris*. Xanthan gum is comprised of a backbone of 1,4 linked D-glucose with trisaccharide side chains on alternating anhydroglucose units. The side chains comprise a glucuronic acid residue between two mannose units.

[0056] Examples of useful xanthan gums include those such as Keltrol, Keltrol F, Rhodigel, Keltrol T, Keltrol R D, and Rhodigel Clear. Xanthan gum is typically available as a powder of varying suitable particle sizes.

[0057] Typical enzymes employed as a component (c) include one more of a hydrolytic, oxidizing, and reducing enzyme including one or more of an amylase, including bacterial amylase, protease and pentosanase and mixtures thereof.

[0058] Useful amylases include any enzyme which degrades a polysaccharide and includes diastases such as alpha-amylase and beta-amylase and amlopectin, the branched form.

[0059] Useful proteases include carboxypeptidase, elastase, trypsin, L-cysteine, chymotrypsin, papain, subtilisin, thermolysin, pancreatin, peptidases and mixtures thereof and an enzyme which breaks a peptide or polypeptide bond.

[0060] Useful pentosanases include pentosanase such as that prepared from *Trichoderma* sp. and which contains high xylanase activity together with beta-1,3-glucanase, galactomannase and cellulase.

[0061] Useful proteases, amylases and pentosanases are disclosed in Biochemistry, Third Edition, Lubert Stryer, W. H. Freeman and Company, NY, ISBN 0-7167-1920-X and -7. (Also Proteases.net, <http://www.proteases.net/>)

[0062] A pH adjustment agent is typically included in the bakery composition. Useful pH adjustment agents include but are not limited to mono calcium phosphate and acid salts. Phosphates may be employed as a pH adjustment agent. Mono, di and triphosphates may be employed. These are typically employed as their alkali metal or alkaline earth metal salt(s) or as mixtures thereof.

[0063] If desired, monocalcium phosphate may be employed in the composition to adjust pH of the dough composition to a desired pH range wherein the shelf life enhancing additive package provides enhanced shelf life beyond fourteen days shelf life. Typically the pH is adjusted to or maintained in the range from about 3.8 to about 6.5 and preferably from about 4.5 to about 5.5.

[0064] Sugars, dough conditioners, oxidizing agents and other additives may be admixed in the bakery composition. In an embodiment, various amounts, types and combinations of such additives may be employed depending on the type of bakery product, the texture desired and organoleptic quality desired.

[0065] Any suitable sugar may be employed in the composition including syrups such as corn syrup. Conventional high fructose corn syrup, (sugar) yeast (creamed yeast, or creamed yeast with water removed), and mono and diglycerides may be employed from any conventional source.

[0066] Illustrative useful sugars in the composition include but are not limited to granulated sugar, regular sugar, extra fine and fine sugar, fruit sugar, baker's special, superfine, ultrafine, bar sugar, confectioners (or powdered) sugar, coarse sugar, sanding sugar, brown sugar (turbinado), light and dark brown sugar, muscovado or Barbados sugar, free flowing brown sugar, liquid sugars (liquid sucrose and amber liquid liquid sucrose), invert sugar, liquid invert and total invert liquid sugar and mixtures thereof. Useful sugars including reducing and nonreducing sugars. In an embodiment, sugar (common table) is employed. Sugar includes fructose and glucose based sugars.

[0067] Illustrative useful monoglycerides, diglycerides and triglycerides in the composition include those derived from glycerol which are also known as triacylglycerides (triacyl-, diacyl- and monoacylglycerol). Also useful herein are lipids having one or two long-chain alkyl groups joined by an ether linkage to glycerol, the other(s) chain(s) being esterified with conventional fatty acid(s). These alkyl ethers of glycerol are described with their acyl counterparts (monoalkyl glycerols and alkyl-diacylglycerols).

[0068] Normal amounts of table salt (sodium chloride- NaCl) typically employed in the dough are in the range from about 1/4 teaspoon to about 1 teaspoon per cup of flour.

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[0069] Novamyl® enzyme, an amylase, sold by Novo Nordisk, Franklinton, N.C., USA or Novo Nordisk Pharmaceuticals, Inc., 100 College Road West, Princeton, N.J. 08540 USA is a useful enzyme.

[0070] A useful dough conditioner (oxidizing agent) which may be employed comprises Special Enhanced SC, available from Cain Food Industries, P.O. Box 35066, Dallas, Tex., 75019-0066.

[0071] If desired, mixtures of glycerides and alkali earth metal stearates may be employed in the composition such as that available as Panodan 205K (diacetyl tartaric acid ester of monoglycerides and calcium stearate)—supplied by Danisco Coflor USA, Inc., 201 New Century Parkway, New Century, Kans., 66031, USA; or Danisco Coflor, Langebrogade 1, P.O. Box 17, DK-1001, Copenhagen, Denmark.

[0072] Illustrative useful stearates include sodium and potassium stearate and calcium and magnesium stearate and mixtures thereof.

[0073] Vital wheat gluten is preferably employed. Vital wheat gluten is prepared from starches by a combination of centrifuge and subsequent washings and screenings.

[0074] Various bakeable fillings may be added in the dough composition prior to baking if desired. Illustrative useful fillings include fruit fillings including cherries.

[0075] In an embodiment, illustrative bagel dough compositions of this invention include compositions (recipes) shown in the Table II following:

TABLE II

Ingredients	Ranges (%)	
Flour	50	— 65
Water	20	— 40
Sugar	0.5	— 8
Yeast	0.5	— 4
Salt	0.2	— 3
Mono & Diglycerides	0.05	— 2
Glucose	0.1	— 2
Sorbate	0.05	— 1
Propionate	0.05	— 1
Panodan	0.05	— 3
Phosphate	0.05	— 1
L-Cysteine	0.05	— 1
Dough conditioner	0.05	— 1
Gum	0.05	— 2
Enzymes	0.01	— 1

[0076] The process of preparing an extended shelf life bakery composition such as an extended shelf life bagel comprises admixing batched dough ingredients for an amount of time sufficient to develop a consistent textured dough. Dough preparation is generally done first in making yeast based bakery products such as bread. Bread making involves mixing, kneading, and rising the dough, shaping and baking the unbaked bakery product or bread.

[0077] In an embodiment, bread dough is made by mixing flour, yeast (optional), water and table salt (NaCl) to form an initial bread dough. In an embodiment, the initial dough is kneaded by repeatedly kneading, pressing, turning, massaging and folding the dough. The dough is allowed to stand for a few hours so the bread rises. The kneading, pressing,

turning, massaging and folding may be repeated if desired after the initial rise and as often as desired to effect a desirable rise.

[0078] A slicing device such as a knife or a slicing machine is used to slice the dough into loaves and place the loaves into baking pans or suitable baking apparatus. Slicing may be done manually or automatically by machine. The loaves are run through a temperature- and humidity-controlled chamber, where they rise again. In an embodiment, the loaves pass through a hot-air convection oven where they are baked.

[0079] Automated equipment may be used and the dough placed into electric mixers that mix and knead batches of dough. The dough is proofed in temperature and humidity controlled chambers. The dough is shaped and placed in steam-injected or convection ovens, then cooled and mechanically sliced.

[0080] Dough ingredients include flour, water, yeast (optional) and table salt. An effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid is added along with the texture enhancement composition to form the initial dough.

[0081] It is understood that various admixtures of (a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid, (b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose and (c) an effective amount of at least one enzyme selected from amylase, protease, and pentosanase, including combinations thereof and as individual components thereof, may be added to the dough or conversely the dough may be added to an admixture of various components of (a), (b) and (c). Generally admixing of ingredients is carried out to an effective and adequate degree of mixing such as thorough mixing, in a process of preparing a dough and a baked product therefrom.

[0082] After the initial dough preparation, the dough is separated (by cutting) for example into pieces of dough of a desired weight and rolled into a mass, preferably a ball shape. The dough is proofed in an intermediate proofer (under ambient conditions) and transported to a bagel making machine.

[0083] In proofing, the bakery product is subject to a warm temperature such as about 90° F.—about 95° F. and about 80%—about 85% relative humidity for an effective proofing time in a proofer. It is understood that proofing time will vary with size of product, cabinet temperature and humidity, and composition and age of dough. Most bakery products require proofing time between about 30 minutes and about 50 minutes, or until the product is about doubled in size.

[0084] Typically an illustrative proofer comprises a box or chamber wherein the temperature and relative humidity can be controlled. Typically the bagel making machine comprises a cup and mandrel.

[0085] A slow delivery time from the intermediate proofer to the bagel machine is preferred to allow the dough to relax which prepares the dough for proofing. During this stage, the product is formed into the desired shape of a bagel. Generally the elapsed time for a slow delivery is in the range from about 5 to about 15 minutes.

[0086] A useful illustrative bagel machine comprises a Thompson Bagel machine available from Thompson Bagel Machine, 8945 Ellis Avenue, Los Angeles, Calif. 90034-3380.

[0087] Bagels may be prepared in a number of ways. In an embodiment, the dough balls are dropped into a cup and mandrel bagel former where the dough is rolled into a ring around a center mandrel. Uncooked bagels are conveyed to indexing equipment where the uncooked bagels are prepared for further proofing (raising).

[0088] Uncooked bagels are processed in a final proofer where the uncooked bagels are exposed to warm and humid conditions which causes the yeast to react with other ingredients and raise the dough by release of carbon dioxide.

[0089] Upon exiting the final proofer, bagels are conveyed through a cooker where they are conveyed through boiling water and cooked on both sides. Typically an illustrative cooker comprises a water bath and a conveyor.

[0090] In an embodiment, cooked bagels are conveyed through a dryer where gas fired burners dry the outside of the bagel in preparation for baking.

[0091] Typically the dryer comprises a belt conveyor and a hot air blower. The bagels are generally dried to a moisture content so that no stick issues are presented for baking.

[0092] The dried bagels are then passed through an oven where they are exposed to varying burner settings to accomplish baking. Typically the oven comprises a belt conveyor and a heating unit.

[0093] The baked bagels are quick cooled to about 75° F. to about 85° F. to form cooled bagels. The cooled bagels are then sliced in a slicing device and passed through a metal detector and mechanically bagged for delivery to a point of use.

[0094] The bagel product is fresh at this time and is consumable by a person as a nutritious food. The fresh bagel of this invention provides a good taste and an extended shelf life in the range from about sixteen days to about twenty six days.

[0095] The intermediate proofing is carried out for about 5 to about 15 minutes at a temperature from about 55° to about 85° F. Final proofing is carried out at a temperature from about 50% to about 95% relative humidity and about 55° F. to about 115° F. from about 10 to about 50 minutes.

[0096] Cooking follows at about 200° F. to about 212° F. for about 1 to about 5 minutes. The oven is operated at about 300° F. to about 650° F. for about 5 to about 25 minutes.

[0097] The air temperatures to the cooler is operated at about 45° F. to about 85° F. from about 15 to about 60 minutes.

[0098] The freezer is operated at about -30° F. degrees to about -20° F.

[0099] The amount of residence time in the process steps of preparing the bagel as illustratively aforescribed is sufficient to effectively carry out and accomplish each respective aspect of the process. Those of skill in the art will readily understand equipment which can be suitably employed to prepare a baked product of this invention after reading this specification and claims.

[0100] The amount of shelf life extending additive package employed is that amount which when employed in a combination results in an increase in the shelf life of the fresh and refrigerated bakery product in excess of that employed to achieve a fourteen day shelf life.

[0101] The amount of (a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid, (b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose and (c) an effective amount of at least one enzyme selected from amylase, protease, and pentosanase employed is determined by subjecting the fresh or refrigerated bagel containing effective amounts of shelf life extending and preserving composition (a), (b) and (c) to a mold and thereafter measuring the amount of mold accumulated thereon over a period of days after the bagel is placed in contact with the mold. A control is employed.

[0102] More in particular, a useful method of evaluating and determining extended shelf life is based on the first observation of mold on a bagel following an inoculation with mold. In such an evaluation, a series of bagels are prepared and are appropriately placed in contact with mold inoculation. Typically a composite of mold is used from a known active mold culture. Organisms are cultured individually on standard laboratory culture media and equal numbers of varieties are combined to form a composite mold culture.

[0103] Sleeves of bagels are provided and are inoculated with a selected number of mold spores per gram weight of bagel. An effective inoculation is carried out, such as by injection in a bagel beneath its surface or by placing mold spores on the surface of a top bagel. Inoculated bagels are kept at room temperature from about 73° F. to about 77° F.

[0104] Samples of the inoculated bagels are inspected and a mold count is made. While various mediums may be employed, a typical useful medium is potato dextrose agar (PDA) with antibiotics. Typical evaluation conditions include an incubation time of about 5 days, a temperature of about 25° C. and an aerobic atmosphere.

[0105] Shelf life of a fresh bagel may be determined by any number of useful shelf life test methods including inoculation and evaluation such as the above which provide a useful method for determining the shelf life of a bagel.

EXAMPLE

[0106] The Example below is provided to illustrate the subject invention and is not included for the purpose of limiting the invention.

[0107] The dough composition comprised a composition consistent with that illustrated in Table II.

[0108] The bagels were packaged in plastic bags and were inoculated with mold spores. A control was maintained of uninoculated bagels. The inoculum was introduced onto the bagels by injection onto the surface. After inoculation, the bagels were stored at about 73° F.—about 77° F. for a period of days.

[0109] Samples of bagels were inspected for visible mold growth until visible mold is present on the inoculated samples. A composite sample was prepared for microbial analysis.

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[0110] The microbiological stability of a food product was determined by contacting it with spoilage microorganisms. When the level of the organisms does not increase during shelf-life storage, the product formulation is resistant to microbial growth and is considered microbiologically stable.

[0111] Table III following shows mold counts of inoculated and uninoculated bagels at viable intervals. Bagels prepared in accordance with this invention were determined to have a shelf life from about sixteen days to about twenty six days according to microbial analysis.

TABLE III

Week	Uninoculated Samples		Inoculated Samples	
	Mold Count (cfu/g)*	Visual Mold Analysis	Mold Count (cfu/g)	Visual Mold Analysis
1	<10	0	3,600	0
2	<10	0	2,500	0
3	<10	0	600	0
4	<10	0	210	0
5	<10	0	200	0

*cfu/g: Colony forming units per gram

** 35 days satisfactory

[0112] While the invention has been described in terms of various specific embodiments, those skilled in the art will recognize that the invention can be practiced with modification within the spirit and scope of the claims.

What is claimed is:

1. A bakery product composition providing a baked product having an extended shelf life, said bakery product composition comprising a dough comprising flour, water, and optionally yeast, said shelf life extending composition comprising:

(a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid;

(b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum, carboxymethylcellulose;

(c) an effective amount of at least one enzyme selected from an amylase, protease and pentosanase;

wherein the amount of (a), (b) and (c) is an amount which in an effective combination of (a), (b) and (c) results in a shelf life extended beyond fourteen days for a fresh or refrigerated product prepared from said dough composition.

2. A bakery product composition in accordance with claim 1 wherein said bakery product further comprises batter, dough, proofed/pre-proofed, pre-baked, and baked products.

3. A bakery product composition in accordance with claim 2 wherein said bakery product is stored under refrigerated or ambient conditions.

4. A bakery product composition in accordance with claim 3 wherein said effective amount of the total of (a), (b) and (c) is in the range from about 0.21 to about 6 parts by weight dough.

5. A bakery product composition in accordance with claim 4 wherein said effective amount of (a), (b) and (c) ranges from about 0.47 to about 5.9 parts by weight dough.

6. A bakery product composition in accordance with claim 3 wherein said salt comprises an alkali metal salt which is selected from at least one of sodium and potassium.

7. A bakery product composition in accordance with claim 3 wherein said salt comprises an alkaline earth metal which is selected from at least one of calcium and magnesium.

8. A bakery product composition in accordance with claim 3 wherein said acetic and salt is sodium acetate.

9. A bakery product composition in accordance with claim 3 wherein said propionate is sodium propionate.

10. A bakery product composition in accordance with claim 3 wherein said salt is sodium sorbate.

11. A bakery product composition in accordance with claim 5 wherein said shelf life of said baked product is extended to about twenty-six days and said baked product is a bagel.

12. An extended shelf life bakery composition useful in a dough based bakery product, said composition comprising:

(a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid;

(b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum, carboxymethylcellulose; and

(c) an effective amount of at least one enzyme selected from an amylase, protease and pentosanase, wherein the amount in an effective combination comprising the total amount of (a), (b) and (c) results in a shelf life extended beyond fourteen days for a bakery product prepared from said dough based composition.

13. A bakery product composition in accordance with claim 12 wherein said bakery product further comprises batter, dough, proofed/pre-proofed, par-baked, and baked products.

14. A bakery product composition in accordance with claim 13 wherein said bakery product is stored under refrigerated or ambient (fresh) conditions.

15. A bakery product composition in accordance with claim 14 wherein said effective amount of (a), (b) and (c) is in the range from about 0.284 to about 5.8 parts by weight dough.

16. A bakery product composition in accordance with claim 15 wherein said effective amount of (a), (b) and (c) ranges from about 0.321 to about 5.7 parts by weight dough.

17. A bakery product composition in accordance with claim 16 wherein said effective amount of (a), (b) and (c) ranges from about 0.358 to about 5.6 parts by weight dough.

18. A bakery product composition in accordance with claim 14 wherein said salt comprises an alkali metal salt selected from at least one of sodium and potassium.

19. A bakery product composition in accordance with claim 15 wherein said salt comprises an alkaline earth metal salt.

20. A bakery product composition in accordance with claim 15 wherein said acetic salt is sodium acetate.

21. A bakery product composition in accordance with claim 15 wherein said propionate is sodium propionate.

22. A bakery product composition in accordance with claim 15 wherein said sorbic salt is sodium sorbate.

23. A bakery product composition in accordance with claim 15 wherein said shelf life is extended to about twenty-six days.

24. A bakery product in accordance with claims 15 wherein said bakery product is a bagel.

25. A bakery product composition in accordance with claim 12 wherein the amount of shelf life enhancing composition is in the range from about 0.6% to about 2% when ingredients of the dough are expressed on a bakers % basis.

26. A bakery product composition in accordance with claim 25 wherein said amount is from about 0.75% to about 1%.

27. A bakery product composition in accordance with claim 26 wherein the extended shelf life is about sixteen days to about twenty-six days.

28. A bakery product composition in accordance with claim 27 wherein said shelf life is from about twenty one days to about twenty-six days.

29. A fresh bagel prepared from a dough formulation having the composition of claim 12 which extends the shelf life of a fresh bagel prepared therefrom to a shelf life from about sixteen days to about twenty-six days.

30. A bagel in accordance with claim 28 wherein said bagel is refrigerated.

31. A bagel in accordance with claim 29 wherein the shelf life of the bagel is in the range from about twenty days to about twenty-six days.

32. An enlarged bagel dough comprising a bagel dough containing a shelf life preserving composition comprising:

(a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid;

(b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum, carboxymethylcellulose; and

(c) an effective amount of at least one enzyme selected from amylase, protease and pentosanase, wherein the amount of said shelf life extending composition present is that amount which in an effective combination results in a shelf life extended beyond fourteen days for a bagel prepared from said dough composition.

33. A bagel dough in accordance with claim 32 wherein the shelf life of a bagel prepared therefrom has a shelf life from about fifteen days to about twenty-six days.

34. A bakery product composition in accordance with claim 33 wherein said bakery product further comprises batter, dough, proofed/pre-proofed, pre-baked, and baked products.

35. A bakery product composition in accordance with claim 34 wherein said bakery product is stored under refrigerated or ambient conditions.

36. A bakery product composition in accordance with claim 34 wherein said effective amount of (a), (b) and (c) is in the range from about 0.395 to about 5.5 parts by weight dough.

37. A bakery product composition in accordance with claim 36 wherein said effective amount of (a), (b) and (c) ranges from about 0.432 to about 5.4 parts by weight dough.

38. A bakery product composition in accordance with claim 37 wherein said effective amount of (a), (b) and (c) ranges from about 0.469 to about 5.3 parts by weight dough.

39. A method for extending the shelf life of a bakery composition, wherein the method comprises adding to a dough of a bakery product a shelf life preserving composition comprising:

(a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid;

(b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose; and

(c) an effective amount of at least one enzyme selected from an amylase, protease, and pentosanase, wherein the amount of said shelf life preserving composition present is that amount which in an effective combination results in a shelf life preserved beyond fourteen days for a bakery product prepared from the dough composition.

40. A method in accordance with claim 39, wherein said salt is selected from at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid.

41. A method in accordance with claim 40 wherein said bakery product further comprises batter, dough, proofed/pre-proofed, par-baked, and baked products.

42. A method in accordance with claim 41 wherein said bakery product is stored under at least one of frozen, refrigerated, and ambient conditions.

43. A bakery product composition in accordance with claim 42 wherein said effective amount of (a), (b) and (c) is in the range from about 0.506 to about 5.2 parts by weight dough.

44. A bakery product composition in accordance with claim 43 wherein said effective amount of (a), (b) and (c) ranges from about 0.543 to about 5.1 parts by weight dough.

45. A bakery product composition in accordance with claim 44 wherein said effective amount of (a), (b) and (c) ranges from about 0.58 to about 5.0 parts by weight dough.

46. A method in accordance with claim 44 wherein said salt comprises an alkali metal salt.

47. A method in accordance with claim 44 wherein said salt comprises an alkaline earth metal salt.

48. A method in accordance with claim 46 wherein said salt is sodium acetate.

49. A method in accordance with claim 44 wherein said propionate is sodium propionate.

50. A method in accordance with claim 44 wherein said sorbic and salt is sodium sorbate.

51. A method in accordance with claim 44 wherein said shelf life of said baked product is extended to about twenty-six days.

52. A method for preserving the shelf life of a bakery composition, wherein said method comprises adding to a dough of a bakery product a shelf life preserving or extending composition comprising:

(a) an effective amount of at least one salt of propionic, sorbic, phosphoric, citric, acetic, lactic and benzoic acid;

(b) an effective amount of at least one of guar gum, Arabic gum, xanthan gum and carboxymethylcellulose; and

(c) an effective amount of at least one enzyme selected from an amylase, protease, and pentosanase, wherein the amount of said shelf life preserving composition present is that amount which in an effective combination of (a), (b) and (c) results in a shelf life extended beyond sixteen days for a bakery product prepared from the dough composition.

53. A bakery product composition in accordance with claim 52, wherein said bakery product is selected from at least one of bagels, English muffins, waffles, bread, French toasts, buns, doughnuts, quick bread, French bread, pumpernickel bread, sourdough bread, pancake, pizza crust,

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