# RAMA QUÍMICA

# D0

## COMPOSICIÓN DE BEBIDA EN POLVO

### CAMPO TÉCNICO

La invención se refiere a una composición de bebida en polvo, más particularmente una bebida a base de cacao, destinada a reconstituirse en leche.

### TÉCNICA ANTERIOR

Cualquier discusión de documentos de la técnica anterior no debería interpretarse como la admisión de que el contenido del documento represente los conocimientos generales del experto en la técnica en el campo de la invención.

Se conocen numerosas composiciones de bebidas en polvo a base de cacao, vendidas particularmente bajo la marca NESQUIK. El equilibrio sutil entre los diferentes ingredientes ha permitido establecer un sabor reconocible entre todos por generaciones de consumidores.

También existen otras marcas de bebidas chocolateadas en polvo. Estas bebidas comprenden, en la mayoría de los casos, cacao, azúcar refinado y aromas, en proporciones variables. También existen composiciones constituidas únicamente por cacao desgrasado. Estas composiciones son particularmente difíciles de reconstituir en leche fría, dado que forman grumos que flotan en la superficie de la leche. Por otra parte, estas composiciones tienen un sabor amargo, típico del cacao, que a veces es difícil de aceptar por ciertos consumidores.

La publicación WO 2016/124792 A1 a nombre de Nestec S.A. describe una composición de bebida en polvo baja en azúcar. En esta composición, un ingrediente del tipo dextrinas resistentes y maltodextrinas viene a reemplazar una parte del azúcar blanco utilizada generalmente en este tipo de bebidas en polvo. Sin embargo, este ingrediente no puede calificarse como natural.

Los consumidores se preocupan cada vez más de sus aportes energéticos, en particular en forma de azúcar refinado. De hecho, el aporte excesivo de azúcar está asociado a aumentar el riesgo de desarrollar ciertas enfermedades no infecciosas y al sobrepeso. No obstante, esta asociación estaría más bien relacionada con un mayor aporte energético en lugar de con los efectos de los azúcares en sí mismos. Los regímenes ricos en energía y en azúcares pueden conducir al desarrollo de enfermedades, especialmente metabólicas. Pero la sustitución de azúcares por otros ingredientes calóricos, tales como las materias grasas, los almidones o las

maltodextrinas, puede tener también efectos negativos sobre ciertos indicadores tales como los lípidos plasmáticos o la sensibilidad a la insulina. Ello refuerza la idea de que la tipología de los regímenes es el predictor principal del desarrollo de las enfermedades metabólicas, en lugar de simplemente el aporte de azúcar. En cualquier caso, los aportes medios de azúcar en la mayor parte de los países, sobrepasan los aportes recomendados por las principales autoridades de salud.

Generalmente, a los consumidores también les preocupa los ingredientes utilizados en los productos procedentes de la industria agroalimentaria, en particular a la posible presencia de colorantes, aromas o edulcorantes artificiales.

Sería, por tanto, deseable paliar al menos ciertos inconvenientes de la técnica anterior, incluso mejorar la técnica anterior, o proponer una alternativa útil. En particular, sería deseable proponer una composición de bebida en polvo a base de cacao, que comprenda únicamente en su composición ingredientes denominados naturales, o poco refinados. Una composición de este tipo debe poder fabricarse en las instalaciones industriales existentes y conservar un sabor y un color, particularmente después de su reconstitución, a los cuales están acostumbrados los consumidores. En otras palabras, es necesario que los ingredientes naturales se seleccionen de tal manera que ello no afecte al sabor ni al color de la bebida, ni requiera la instalación de nuevos equipos en las fábricas.

**BREVE DESCRIPCIÓN DE LA INVENCIÓN**

A este efecto, la presente invención se refiere a una composición de bebida en polvo, caracterizada por que comprende cacao parcialmente desgrasado no alcalinizado, azúcar moreno y lecitina, en la que la relación en peso de cacao parcialmente desgrasado no alcalinizado/azúcar moreno, varía de 0,50 a 0,65.

Según un modo de realización, el cacao parcialmente desgrasado comprende de 10 a 12 % de materia grasa, preferentemente materia grasa de cacao, es decir, manteca de cacao.

Según un modo de realización, el azúcar moreno es un azúcar de caña. Preferentemente, el azúcar moreno contiene de 90 a 98 % en peso de sacarosa. Particularmente, el azúcar moreno puede seleccionarse entre el azúcar mascabado, el azúcar terciado, el azúcar completo, el azúcar rojizo o el azúcar rubio.

Según un modo de realización, la composición de bebida en polvo comprende de 1 a 2 % de lecitina.

Según un modo de realización, la lecitina, preferentemente una lecitina de soja, se obtiene sin extracción utilizando disolvente.

En particular, la composición de bebida en polvo comprende, en peso referido a materia seca, de 33 a 40 % en peso de cacao parcialmente desgrasado no alcalinizado, de 55 a 65 % en peso de azúcar moreno, de 1 a 2 % en peso de lecitina, aroma de vainilla y polvo de canela, siendo la suma igual a 100 % en peso.

Según un modo de realización, la composición de bebida en polvo comprende un aroma de vainilla, preferentemente un extracto natural de vainilla.

Otras características, ventajas y modos de realización de la invención, se entenderán mejor después de la lectura de la siguiente descripción detallada, acompañada de los dibujos representativos de ciertos modos de realización de la invención.

**DESCRIPCIÓN DETALLADA DE LA INVENCIÓN**

Salvo indicación de lo contrario, los términos "comprender" o "contener", y sus conjugaciones, deben interpretarse de manera abierta, es decir "incluir, sin limitarse a", por oposición a los términos "constituir" o "consistir en" que tienen un sentido excluyente o exhaustivo.

Salvo indicación de lo contrario, los porcentajes son porcentajes en peso.

Salvo indicación de lo contrario, los términos científicos y técnicos deben tomarse en su sentido tal como son comúnmente comprendidos por una persona experta en la técnica, en el campo técnico al que pertenecen estos términos.

Los principales ingredientes de la composición de bebida en polvo son cacao parcialmente desgrasado no alcalinizado, azúcar moreno y lecitina.

**Cacao**

El cacao se utiliza en forma de polvo de cacao parcialmente desgrasado y no alcalinizado. En el sentido de la invención, "parcialmente desgrasado" significa que el polvo de cacao comprende de 10 a 12 % en peso de materia grasa. Se sabe que ciertos productos a base de cacao están mezclados no con materias de cacao, tales como la manteca de cacao, sino con otras fuentes de materia grasa. Para los requisitos de la invención, únicamente se contemplan materias grasas de cacao, es decir manteca de cacao. Por consiguiente, se utiliza polvo de cacao no alcalinizado, que comprende de 10 a 12 % en peso de materia grasa.

En la mayoría de los casos, en las composiciones de bebida en polvo se emplea cacao alcalinizado. De hecho, además de la mayor variabilidad de color o de aromas encontrados en los cacaos alcalinizados, éstos son más sencillos de tratar en los procesos industriales. Sin embargo, los cacaos alcalinizados no están considerados como naturales. De hecho, su proceso de fabricación comprende una etapa durante la cual el cacao se trata con un agente alcalino. Esto tiene por efecto aumentar el pH del cacao a valores de 6 a 8,5, mientras que un cacao no alcalinizado, o cacao natural, presenta un pH de 4,8 a 5,8 por término medio.

De esta manera, según un modo de realización, la composición de bebida en polvo comprende, referido a materia seca, de 33 a 40 % en peso de cacao parcialmente desgrasado no alcalinizado, preferentemente en forma de polvo. Por ejemplo, la composición de bebida en polvo comprende al menos 34 % o 35 % en peso de cacao parcialmente desgrasado no alcalinizado, y como máximo 39 %, 38 %, 37 % o 36 % en peso de cacao parcialmente desgrasado no alcalinizado. Preferentemente, la composición de bebida en polvo comprende de 35 % a 38 % en peso de cacao parcialmente desgrasado no alcalinizado.

Un cacao de este tipo parcialmente desgrasado no alcalinizado puede obtenerse de sociedades tales como, por ejemplo, BARRY CALLEBAUT u OLAM. Un procedimiento de fabricación de cacao no alcalinizado se describe, por ejemplo, en los documentos EP 3013153 y EP 3013154.

De esta manera, la composición de bebida en polvo contiene una gran proporción de cacao, con relación a otras bebidas de chocolate.

**Azúcar**

El azúcar se produce principalmente en todo el mundo, a partir de remolacha de azúcar o de caña de azúcar. Se trata de un ingrediente muy conocido. Las composiciones de bebida en polvo se fabrican generalmente con azúcar blanco, o azúcar refinado, como ingrediente. El azúcar blanco es un azúcar que contiene al menos 99,8 % de sacarosa cristalizada. Por tanto, el azúcar blanco no contiene prácticamente ninguno de los nutrientes que pueden encontrarse en el azúcar antes del refinado. Principalmente se trata de ciertas sales minerales u oligoelementos. Las etapas de refinado para producir azúcar blanco generan por tanto subproductos, tales como melaza, que convienen tratar o aprovechar.

La composición de bebida en polvo contiene azúcar moreno como ingrediente, y no azúcar blanco. La utilización de un ingrediente menos refinado permite disminuir la cantidad de subproductos asociados a la fabricación de la composición de bebida en polvo. Además,

durante las operaciones de refinado, una parte de las sales minerales u oligoelementos se conserva en lugar de perderse. De manera sorprendente, la utilización de azúcar moreno no ha tenido un efecto muy importante sobre el color de la composición de bebida en polvo. Por consiguiente, los consumidores no corren el riesgo de verse sorprendidos por un cambio de color, ni siquiera mínimo, de su bebida favorita.

El azúcar moreno contiene como máximo 98 % en peso de sacarosa, por ejemplo, de 90 a 98 % en peso de sacarosa. Preferentemente, el azúcar moreno utilizado como ingrediente es un azúcar de caña. Por ejemplo, el azúcar moreno se selecciona entre el azúcar mascabado, el azúcar terciado, el azúcar completo, el azúcar rojizo o el azúcar rubio.

De esta manera, según un modo de realización, la composición de bebida en polvo comprende, referido a materia seca, de 55 a 65 % en peso de azúcar moreno. Por ejemplo, la composición de bebida en polvo comprende al menos 56 %, 58 % o 60 % en peso de azúcar moreno, y como máximo 65 %, 64 %, 63 % o 62 % en peso de azúcar moreno. Preferentemente, la composición de bebida en polvo comprende de 58 % a 64 %, preferentemente de 60 % a 63 % en peso de azúcar moreno.

**Lecitina**

La lecitina es un emulsionante natural. Puede extraerse de plantas, por ejemplo, de soja, maíz o girasol, o de huevos, por ejemplo. Generalmente, los procedimientos de fabricación de lecitina a partir de plantas, comprenden una extracción utilizando disolventes orgánicos (hexano) o precipitando la lecitina utilizando peróxidos (US 8.232.418).

Preferentemente, según la invención, la lecitina se obtiene sin extracción utilizando disolvente u otros procesos que impliquen un tratamiento químico. De esta manera, la lecitina se obtiene únicamente utilizando procesos mecánicos tales como presión, filtración, y centrifugación. Una lecitina de este tipo se denomina natural.

Según la invención, en la fabricación de la composición de bebida en polvo se emplea lecitina de soja.

Según un modo de realización, la composición de bebida en polvo comprende, referido a materia seca, de 1 a 2 % en peso de lecitina, preferentemente lecitina de soja. Por ejemplo, la composición de bebida en polvo comprende al menos 1,1 %, 1,2 %, 1,3 % o 1,4 % en peso de lecitina, y como máximo 1,9 %, 1,8 %, 1,7 %, 1,6 % o 1,5 % en peso de lecitina. Preferentemente, la composición de bebida en polvo comprende de 1,2 % a 1,8 %,

preferentemente de 1,3 % a 1,6 % en peso de lecitina.

**Ratio**

La relación ponderal de cacao parcialmente desgrasado no alcalinizado ("cacao"):azúcar moreno ("azúcar") en la composición de bebida en polvo varía por tanto de 0,50 a 0,65, preferentemente de 0,53 a 0,63, incluso preferentemente de 0,55 a 0,60. De esta manera, la composición de bebida en polvo contiene un poco más de un tercio de polvo de cacao y un poco menos de dos tercios de azúcar. En las composiciones de bebida en polvo de la técnica anterior, la proporción de azúcar es a menudo más elevada. De esta manera, según la invención, la composición de bebida en polvo permite reducir la proporción de azúcar. De manera sorprendente, ello no ha modificado el color o el aroma de la bebida, después de la reconstitución en leche, de una manera inaceptable para los consumidores habituales.

Además, la relación en peso de lecitina*100/(cacao+azúcar) varía de 1,4 a 1,6, preferentemente de 1,45 a 1,55, y mejor aún de 1,50 a 1,55.

**Otros ingredientes**

Preferentemente, la composición de bebida en polvo contiene aromas naturales, particularmente un aroma de vainilla y canela en polvo. Estos dos ingredientes contribuyen de manera determinante al sabor tradicional de la bebida. En particular, el aroma de vainilla es un extracto natural de vainilla. De manera alternativa, el aroma de vainilla es un aroma natural que contiene toques aromáticos de vainilla. El aroma de vainilla y la canela representan, entre los dos, menos de 0,5 % en peso de la composición.

**Fabricación**

La composición de bebida en polvo puede fabricarse según un procedimiento clásico de aglomeración con vapor, en una torre de aglomeración o un lecho fluidizado. Tales procesos de fabricación se describen particularmente en la publicación WO 2016/124792 (páginas 11-12).

La invención podrá entenderse y comprenderse mejor gracias a los siguientes ejemplos, proporcionados a título ilustrativo.

**Ejemplos**

**Ejemplo 1**

En una torre de aglomeración, se prepara una composición de bebida en polvo por aglomeración con vapor según la siguiente fórmula:

| Ingrediente | % en peso seco |
|---|---|
| Polvo de cacao con 10-12 % de materia grasa, no alcalinizado | 30-40 %, por ej. 36 % |
| Azúcar moreno, por ejemplo, azúcar moreno de caña | 55-65 %, por ej. 62 % |
| Lecitina de soja natural | 1-2 %, por ej. 1,5 % |
| Aroma natural de vainilla y canela | 0,1-0,5 %, por ej. 0,5 % |

El total de los ingredientes representa el 100 % en peso

**Ejemplo 2**

En una torre de aglomeración, se prepara una composición de bebida en polvo por aglomeración con vapor según la misma fórmula que la del ejemplo 1, pero utilizando solamente 1% en peso o 1,8 % en peso de lecitina de soja y, en consecuencia, adaptando la cantidad de azúcar.

**Ejemplo 3**

Dispersando en leche 8 g de composición de bebida en polvo, se prepara una bebida de chocolate según los ejemplos 1 o 2. La leche puede estar fría, es decir, recién sacada de la nevera, templada o caliente. Por ejemplo, la leche fría está a una temperatura de 3 a 8 ºC. La composición de bebida en polvo se dispersa y se diluye satisfactoriamente, incluso en leche fría. La bebida chocolateada tiene un sabor a chocolate un poco más intenso que el NESQUIK clásico. El equilibrio entre los diferentes ingredientes permite a los consumidores reconocer el sabor de NESQUIK.

Naturalmente, el experto en la técnica podría haber contemplado otros modos de realización sin salirse, no obstante, del marco de la invención definido por las reivindicaciones expuestas a continuación.

## REIVINDICACIONES

1. Composición de bebida en polvo caracterizada por que, comprende cacao parcialmente desgrasado no alcalinizado, azúcar moreno y lecitina, en la que la relación en peso de cacao parcialmente desgrasado no alcalinizado/azúcar moreno, varía de 0,50 a 0,65.

2. Composición según la reivindicación 1, en la que el cacao parcialmente desgrasado comprende de 10 a 12 % de materia grasa.

3. Composición según la reivindicación 2, en la que la materia grasa es materia grasa de cacao.

4. Composición según cualquiera de las reivindicaciones 1 a 3, en la que el azúcar moreno es un azúcar de caña.

5. Composición según cualquiera de las reivindicaciones 1 a 4, en la que el azúcar moreno contiene de 90 a 98 % en peso de sacarosa.

6. Composición según una cualquiera de las reivindicaciones 1 a 5, en la que el azúcar moreno se selecciona entre el azúcar mascabado, el azúcar terciado, el azúcar completo, el azúcar rojizo o el azúcar rubio.

7. Composición según cualquiera de las reivindicaciones 1 a 6, que comprende de 1 a 2 % en peso de lecitina.

8. Composición según la reivindicación 7, en la que la lecitina se obtiene sin extracción utilizando disolvente, siendo preferentemente una lecitina de soja.

9. Composición según una cualquiera de las reivindicaciones 1 a 8, que comprende en peso referido a materia seca, de 33 a 40 % en peso de cacao parcialmente desgrasado no alcalinizado, de 55 a 65 % en peso de azúcar moreno, de 1 a 2 % en peso de lecitina, aroma de vainilla y polvo de canela, siendo la suma igual a 100 % en peso.

10. Composición según una cualquiera de las reivindicaciones 1 a 8, que comprende un aroma de vainilla, preferentemente un extracto natural de vainilla.

# RAMA QUÍMICA

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## ABSTRACT OF THE DISCLOSURE

A readily wettable cocoa-sugar composition is prepared by mixing water, cocoa powder, and sugar while maintaining the mixture at a temperature below 10° C. and thereafter drying the mixture.


The present invention relates to a novel and useful cocoa composition and a process for preparing same. More particularly, it relates to a cocoa and sugar composition which is easily wettable and a process for preparing the composition.

The use of a cocoa and sugar mixture for the preparation of hot and cold drinks is well known in the art. However, such mixtures are not readily wettable and disperable in cold water and/or milk. Accordingly, it is the usual practice to add a wetting agent, such as lecithin, in amounts up to about 5% in order to form a fast wetting mixture. Another method of forming such a readily wettable mixture is by the treatment of the cocoa and sugar with superheated steam in special towers. Both processes have inherent disadvantages since lecithin contributes an off-flavor and tends to cause caking upon prolonged storage while the steam treatment is expensive and yields a product of very low bulk density.

It is an object of the present invention to provide a readily wettable cocoa and sugar composition. A further object is to provide a product which is free-flowing and which is substantially non-caking in storage. A still further object is to provide a product having a high bulk density. Another object it to provide a process for forming a cocoa and sugar composition which is easily wettable. Other objects will become apparent as the description of the invention proceeds.

These objects are accomplished by the present invention which provides a readily wettable cocoa composition comprising from about 10 to about 60% by weight of cocoa and from about 90 to about 40% by weight of sugar with most of the cocoa in the composition being coated onto the surface of the sugar particles with the cocoa in turn being coated with a thin glassy layer of sugar, the particles of said composition having a bulk density of from about 0.6 to about 1.0 and a size of —20 and +150 mesh.

In a preferred embodiment of the present invention the cocoa is present in amounts of from about 10 to about 50%, more preferably from about 15 to about 25%, and substantially all of the cocoa is coated onto the surface of the sugar particles. In another embodiment, the cocoa has a fat (cocoa butter) content of from about 10 to about 20% and the particles in the composition have a bulk density of from about 0.8 to about 0.95 and a size of —50 and +100 mesh. In a still more preferred embodiment, the particles have a size of —60 and +80 mesh.



The present invention also provides a process for forming a readily wettable cocoa composition which comprises mixing from about 4 to about 12% by weight of water a composition containing from about 10 to about 60% by weight of cocoa powder and from about 90 to about 40% by weight of sugar while maintaining the mixture at a temperature below about 10° C. and thereafter drying mixture. Preferably, the water is used in amounts of from about 6 to about 11% and more preferably 8 to 10%.

In a preferred embodiment of the present invention the mixing is accomplished by tumbling, and the drying of the mixture is accomplished below about 34° C. by utilizing either dry air or a silica gel with agitation. The drying preferably takes place at a temperature below about 34° C. in order to prevent the melting of the fat (cocoa butter) in the cocoa. Otherwise, the fat will exude to the surface of the particles and cause poor wetting after extended storage.

The term "cocoa" is used to signify the powder which results from the crushing, grinding and pressing of the cocoa beans. In general, the cocoa particles will pass a 100 mesh screen and have a fat (cocoa butter) content of from about 10 to about 20%. In some instances, the cocoa is completely defatted which renders it even more easily wettable. The term "sugar" is used in its conventional sense to mean the sweetening agent derived from sugar cane, sugar beets and the like. Chemically, the term includes the common sugars such as sucrose and glucose. It also includes other sugars such as fructose and the like. The sugars in general have a bulk density of about 1 and will be 10 and +150 mesh. The "thin glassy layer of sugar" is used to signify a layer having a glossy smooth surface and is probably composed of amorphorus rather than crystalline sugar. The bulk density referred to is given in grams/cc. and the expression "—20 and +150 mesh" merely signifies that substantially all of the particles will pass through a 20 mesh screen and be retained on a 150 mesh screen.

In carrying out the process, the mixture should be maintained at a temperature below about 10° C. while adding water to prevent the agglomeration of particles. As hereinafter shown in the examples, the drying of the mixture may be carried out in a number of ways. However, it is preferred to carry out the drying at a temperature below 34° C. while agitating the mixture. By utilizing this technique, the final product will have a very long shelf life. If one uses the other drying techniques, the final product will be readily wettable but will have a rather short shelf life, i.e., about 10 days.

The invention will now be described by reference to the drawing. The figure shows a particle of the cocoa composition produced in accordance with the present invention.

In the drawing the sugar particle **1** is coated with a layer of cocoa **2** which in turn is coated with a thin glassy layer of sugar **3**. The cocoa tends to smear out on the sugar particle giving a thin discontinuous layer.

The following examples are given to illustrate the invention and are not intended to limit it in any manner. All parts are given in parts by weight unless otherwise expressed.

## EXAMPLE 1

### Procedure A

To a Hobart mixer is added 100 grams of cocoa powder (11% fat), 400 grams of —100 mesh cane sugar (sucrose), 5 grams of crushed Dry Ice and 40 grams (8%) of water. The Dry Ice is added to keep the temperature below about 5° C. The mixture is stirred for about 15 minutes until the temperature rises from 0° C. to about 20° C.

### Procedure B

To the 540 grams of the resulting mixture of cocoa and sugar are added 400 grams of ¼ inch balls of non-attriting silica gel. The resulting mixture is tumbled in a ceramic crock for one hour and then sieved through a 20 mesh screen to remove the silica balls. The silica balls can be dried at 200° C. for 30 minutes for reuse.

The resulting product has a bulk density of 0.9 grams/cc. and a sinking time in cold milk of about 1 second. The product is non-caking and free-flowing after one month storage. The residue (from a 12 gram sample) on a 60 mesh screen after 7 seconds stirring in 5° C. milk is about 0.5 grams. When the product is examined under the microscope it can be seen that the cocoa has coated the sugar granules and that substantially no cocoa appears in the composition as separate discrete particles. The cocoa on the granules has a glassy surface showing that the sugar has coated the cocoa with a thin glassy layer of sugar (amorphous).

## EXAMPLE 2

Procedure A of Example 1 is repeated in order to obtain the cocoa, sugar and water mixture.

The 540 grams of the resulting mixture are put in a fluidized bed and dried with dry air at room temperature (20° C.). The air is dried by passing it through a column of silica gel. After about 20 minutes, the moisture content of the mixture has dropped from about 8% to about 1%. The mixture is then removed from the fluidized bed.

The resulting product has a bulk density of 0.9 grams/cc. and a sinking time in cold milk of about 10 seconds. The product is non-caking and free-flowing after one month storage. The residue (from a 12 gram sample) on a 60 mesh screen after 7 seconds stirring in 5° C. milk is about 1 gram. When examined under the microscope, the product is essentially the same as that described in Example 1.

## EXAMPLES 3 THROUGH 10

Procedure A and procedure B of Example 1 is repeated employing varying amounts of water. The water is employed in amounts of 10 grams (2%), 20 grams (4%), 30 grams (6%), 40 grams (8%), 45 grams (9%), 50 grams (10%), 55 grams (11%) and 60 grams (12%).

The composition is readily wettable throughout the ranges of 30 to 55 grams (6 to 11%) of water. When 20 grams (4%) of water is utilized the product has improved wettability but would not be commercially acceptable as instant cocoa due to the marginal improvement in wettability. At 60 grams (12%), the product has improved wettability but would not be acceptable for a commercial instant cocoa. The excess water causes a fudge-like consistency that is difficult to handle and dry. A particularly preferred product is produced using a 40 to 50 grams ( 8 to 10%) of water. The products resulting from the use of from 20 grams (4%) to 60 grams (12%) look essentially the same as that described in Example 1 when they are examined under the microscope.

At 10 grams (2%) of water the product has no noticeable increase in wettability. When examined under the microscope, the cocoa particles project from the surface rather than being coated unto the sugar.



## EXAMPLES 11 THROUGH 19

Procedure A and procedure B of Example 1 is repeated employing varying amounts of cocoa and sugar. All other conditions remain the same.

| Example | Cocoa, percent | Sugar, percent | Comments |
|---|---|---|---|
| 11 | 10 | 90 | Improved wettability but too little cocoa. |
| 12 | 20 | 80 | Excellent wettability, excellent product. |
| 13 | 30 | 70 | Excellent wettability, good product. |
| 14 | 40 | 60 | Do. |
| 15 | 50 | 50 | Excellent wettability, fair product. |
| 16 | 60 | 40 | Slightly improved wettability, poor product. |
| 17 | 70 | 30 | Poor wettability, poor product. |
| 18 | 80 | 20 | Do. |
| 19 | 90 | 10 | Do. |

When the products containing 10 to 60% of cocoa are examined under the microscope they look essentially the same as the product of Example 1. The product containing 70, 80 and 90% of cocoa shows rough cocoa particles on the surface rather than layers of cocoa as described in Example 1 and shown in the drawing.

## EXAMPLE 20

Procedure A of Example 1 is repeated in order to obtain the cocoa, sugar and water mixture.

The 540 grams of the resulting mixture is put in a fluidized bed and dried with air heated to a temperature of 230° F. After about 20 minutes, the moisture content of the mixture has dropped from about 8 to about 1%. The mixture is then removed from the fluidized bed.

The resulting product has a bulk density 0.9 grams/cc. and a sinking time in cold milk of about 10 seconds. The residue (from a 12 gram sample) on a 60 mesh screen, after 7 seconds stirring in 5° C. milk, is about 1 gram. When examined under the microscope, the product is essentially the same as that described in Example 1.

After about 10 days storage in a sealed glass container, the wettability decreases substantially. The example shows that while various methods of drying may be utilized, it is preferred to dry at a low temperature with silica gel or dry air.

## EXAMPLE 21

Procedure A of Example 1 is repeated in order to obtain the cocoa, sugar and water mixture.

The 540 grams of the resulting mixture are put in a pan in a dead air oven at a temperature of about 230° F. After about 10 minutes the moisture content of the mixture has dropped from about 8% to about 1%. The mixture is then removed from the oven and the resulting cake is broken up into fine pieces.

The resulting product has substantially the same characteristics as the product of Example 20 including the loss of wettability after about 10 days storage in a sealed glass jar. The example again shows that the preferred method for making a readily wettable product is the use of dry air or silica gel at a low temperature. However, if the product is to be utilized within about 10 days, the procedure of either Example 20 or 21 could be used.

Many equivalent modifications will become apparent to those skilled in the art from a reading of the foregoing without a departure from the inventive concept.

What is claimed is:

1. A process for forming a readily wettable cocoa composition which comprises mixing from about 4 to about 12% by weight of water with a composition containing from about 10 to about 60% by weight of cocoa powder and from about 90 to about 40% by weight of sugar while maintaining the mixture at a temperature below about 10° C. and thereafter drying the mixture.

2. A process for forming a readily wettable cocoa composition which comprises mixing from about 4 to

about 12% by weight of water with a composition containing from about 10 to about 50% by weight of cocoa powder and from about 90 to about 50% by weight of sugar while maintaining the mixture at a temperature below about 10° C. and thereafter simultaneously agitating and drying the mixture at a temperature below 34° C.

3. A process for forming a readily wettable cocoa composition which comprises mixing from about 6 to about 11% by weight of water with a composition containing from about 10 to about 50% by weight of cocoa powder and from about 90 to about 50% by weight of sugar while maintaining the mixture at a temperature below about 10° C. and thereafter drying the mixture by tumbling the mixture with silica gel particles at a temperature below about 34° C.

4. A process for forming a readily wettable cocoa composition which comprises mixing from about 6 to about 11% by weight of water with a composition containing from about 10 to about 50% by weight of cocoa powder and from about 90 to about 50% by weight of sugar while maintaining the mixture at a temperature below about 10° C. and thereafter drying the mixture by agitating the mixture with dry air at a temperature below 34° C.



5. The process of claim 3 wherein the water is added in amounts of from about 8 to about 10%.

6. The process of claim 4 wherein the water is added in amounts of from about 8 to about 10%.


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# RAMA QUÍMICA

# D2

This invention relates to an improved sugar-cocoa mix which is readily miscible with and dispersible in cold liquids such as milk, as well as in hot liquids, to produce a chocolate drink; and the invention includes the new sugar-cocoa mix and the method of producing it.

The cocoa powder of commerce is substantially insoluble in cold aqueous media such as water or milk. Furthermore, because of its low density and hydrophobic or water repellent character, cocoa powder is not readily wetted, tending to float on the surface of the liquid in clumps of dry aggregates. Even vigorous mechanical mixing will not disperse these clumps throughout the body of the liquid. The hydrophobic character of cocoa is not modified to a great extent when the cocoa is simply mixed mechanically with sugar; and the resulting mix is not readily dispersed when stirred into a cold liquid, the sugar dissolving and the cocoa floating on the surface in clumps.

In hot liquids, such as hot water or hot milk, the hydrophobic character of cocoa is modified by heat so that a dispersion is more readily made with moderate agitation. And for hot drinks a simple mechanical mixture of sugar, cocoa and other bodying and flavoring ingredients can be used without special treatment; but this method is unsatisfactory with cold liquids.

It has been proposed to make sugar-cocoa mixes containing sugar, cocoa and emulsifier intimately bound together so that the hydrophobic character of the cocoa is neutralized and so that the product consists of particles having a relatively uniform size which do not separate or stratify when handled during packing and shipping. But the preparation of such products generally requires special equipment or extensive processing, or the utilizing of special grades of the various ingredients, or may be difficult to vary or control to yield products having the desired properties.

The present invention provides an improved sugar-cocoa mix in dry form which is readily miscible with and dispersible in cold liquids such as cold milk, as well as in hot liquids, to produce a chocolate drink, and which is also suitable for preparing chocolate flavored candies, such as fudge, cake icings and other products in a minimum amount of time. The improved product is moreover one which is readily prepared in conventional low cost equipment from commercially available ingredients without having to resort to complicated or costly methods of processing.

The improved sugar-cocoa product of the present invention has the advantage of easy dispersibility, uniformity of particle composition and size and with a flexibility of product, due to the wide range in proportions and types of sugar, cocoa and aqueous spray which may be used, such that mixes of varying wetting out and dispersion rates, bulk densities, and shades of colors can be readily produced.

The improved process of the present invention for producing the sugar-cocoa mix requires no special expensive equipment and a minimum of processing and enables commercially available grades or types of ingredients to be used. An improved cocoa mix can thus be made easily and economically, which is a valuable product for use in making both cold and hot drinks, as well as for the production of chocolate flavored candies, cake



icings, and other food uses where cocoa and sugar are desirable ingredients.

In the improved method of the present invention, the sugar-cocoa mixture is produced in a form in which the sugar and cocoa particles and flavoring materials are cemented together with solid sugar deposited from solution in contact with the individual particles and acting as a binder to cement sugar and cocoa particles to other sugar and cocoa particles and to each other. This improved method increases the effective weight of the cocoa particles and enhances their dispersibility. When the improved composite particles produced by this process are introduced into a liquid, the sugar component of the particles dissolves and the attached cocoa particles wet out before they can coalesce into a non-wettable unit. The composite particles can be distributed evenly throughout the volume of the liquid by simple moderate stirring, so that the attached cocoa particles can also be dispersed quickly and evenly throughout the liquid.

In carrying out the process and producing the improved sugar-cocoa mix, in which the sugar and cocoa particles etc., are cemented together to form small aggregates by the action of solid sugar deposited from an aqueous solution in contact with the various solid particles, the dry sugar-cocoa mix is treated with a small and regulated amount of an aqueous liquid, particularly water or a sugar solution, introduced in the form of finely divided liquid particles which are uniformly distributed through the dry mix. When water is used, the individual small particles which comprise the liquid spray will dissolve a small amount of the sugar to form a sugar solution. The admixing of the fine spray droplets of aqueous liquid with the dry ingredients results in the production of small aggregates of sugar and cocoa particles. On drying to remove the water, the sugar which is deposited from the solution acts as a binder to cement together sugar and cocoa particles to other sugar and cocoa particles and to each other.

A limited and regulated amount of the finely divided liquid is applied and distributed throughout the dry sugar-cocoa mix so that the aggregates formed are small aggregates and so that the formation of large aggregates is avoided or minimized. In general, the amount of aqueous liquid added, which serves to wet and form small aggregates of the sugar and cocoa particles, will be a small percentage of the weight of the dry sugar-cocoa mix, varying somewhat with the relative proportions of and the particle size of the dry ingredients of the mix and with the concentration and spraying characteristics of the aqueous liquid. In general, the amount of water introduced as water spray, or wet steam spray or as an aqueous solution spray will be between about 2% and 9% of the dry ingredients to which the liquid is added. The amount will vary somewhat with the fineness of subdivision of the liquid used. The amount of such added liquid is limited so that the mixture remains freely flowing thus avoiding caking or sticking of the mass in the processing equipment.

The liquid used to form the cementum for the sugar and cocoa particles is advantageously a sugar solution such as a solution of invert sugar, sucrose, dextrose or other commercially available forms of sugars. And sugar solutions containing a substantial percentage of sugar can advantageously be used, e.g., sugar solutions containing 25% or 50% of invert sugar or sucrose.

The aqueous liquid added to the dry mix, when added in the form of a sugar solution, or as water which forms a sugar solution in the mix, should be added in a finely sub-divided form for most efficient use in forming aggregates in the mix. This fine state of subdivision can be obtained in various ways, for example, by reducing the aqueous liquid to a fine spray by atomizing it using com-

pressed air, as through the use of a spray gun or other device capable of forming a fine mist or spray.

An advantageous method of adding water in finely divided form to the dry mix is by injecting a stream of wet steam at essentially atmospheric pressure into the dry mixture of sugar, cocoa, flavoring and other desirable solid ingredients in a mixing machine, or other suitable apparatus, and with mixing and agitation of the mixture. The wet steam condenses upon contact with the cooler surface of the mix to produce extremely fine particles of water and these act by dissolving sugar, which is subsequently recrystallized on drying to cause an ultimate cementing, or binding together of the particles. When the aqueous liquid is introduced in this way, it gives a much more finely dispersed state than when e.g., an air spray gun is used to introduce the aqueous spray. The use of wet steam also raises the temperature of the mix somewhat and keeps the amount of oversized product (on 35 mesh screen) at a minimum due to a more efficient use of the water introduced into the mix in this way. Also, the use of wet steam gives a product which after drying enables less emulsifying agent (lecithin) to be used to achieve the same degree of wetting out and dispersibility than when the water is introduced by the pressure spray method.

In carrying out the process and producing the sugar-cocoa mix a dry mixture of sugar, cocoa, flavor and other desirable solid ingredients is placed in a mixing machine or other suitable apparatus. Into this mixture there is injected and mixed a small and regulated amount of finely divided liquid, such as sugar solution, in the form of a fine mist, or spray, or water in the form of a fine mist or spray, or in the form of wet steam. The aqueous liquid can be applied as a spray at ordinary temperatures, but is better used at somewhat elevated temperatures if the concentration of sucrose or other sugar solids is high.

The amount of the aqueous liquid incorporated into the mix will vary somewhat with the fineness of subdivision of the liquid particles and should be sufficient to convert all or nearly all the particles of sugar, cocoa, etc., of the dry mix into small aggregates by cementing together the sugar and cocoa particles to the necessary extent, yet avoiding caking and sticking together of the mass in the processing equipment and allowing the mass to retain a relatively dry feel. The maintenance of this desirable physical condition during processing imposes an upper limit on the amount of aqueous liquid that may be used.

When water is used to bring about the desired aggregation of sugar and cocoa particles, a result is obtained similar to that occurring when a sugar solution is used. The similarity of results when water is used instead of sugar solution is due to the dissolution of some sugar from the sugar particles in contact with the water introduced to form sugar solution which acts as cementum to bind together the particles constituting the aggregate. Upon drying the individual particles are held together by the sugar which crystallizes or is deposited from the cementum. Thus sugar solution may be used directly to bring about the desired aggregation or the sugar solution may be formed "in situ" by using water. In both cases, the liquid is introduced in a state of fine subdivision and is uniformly distributed throughout the dry mix to form small aggregates. Some of the fine sugar and cocoa particles are completely wetted by the liquid used and some appear to be affixed to the surface of the small particles of liquid and of the aggregates formed therewith.

The spraying of the mixture of sugar and cocoa with the finely divided liquid, or the treatment with wet steam, is advantageously carried out while the mixing is in progress. A variation of this procedure is to add the cocoa and the liquid spray either simultaneously or alternately to the sugar while the mixing is in progress. The effect of adding the finely divided liquid is to cause sticking together of the sugar and cocoa particles so as to cover over the sticky liquid, yielding non-sticky and substantially free-flowing conglomerated units.



The conglomerate resulting from the above procedures is neither completely a sugar particle coated with cocoa, nor a cocoa particle coated with sugar, but consists of sugar particles and cocoa particles bound together in a somewhat random manner. The cementing liquid, and the sugar deposited therefrom on drying, partially or wholly fill in the space between the particles thus holding the particles together in a cohesive mass, and partially or wholly coating each individual sugar and cocoa particle.

The drying of the resulting mixture can be carried out with conventional drying apparatus and procedures such as are used for drying solids containing small quantities of moisture. Simple air drying of the material at temperature of 40 to 50° C. is satisfactory. During the drying process, the moisture in the cementing liquid evaporates and solid sugar forms between the sugar and cocoa particles and firmly holds these particles together.

The particles of the resulting mix are fairly uniform in size and each particle contains the ingredients attached together in the form of an integrated composite unit which does not separate into the various primary ingredients during mechanical handling, such as screening. The composite particles, both large and small, have all the ingredients distributed within the particles in a substantially uniform manner so that any screen fraction of the mix contains the ingredients in approximately the same proportions.

The dried mix is readily screened to remove any large size conglomerates which may have formed. These large aggregates can be minimized and even eliminated by using efficiently and properly designed spraying and mixing equipment. In general, all particles passing through a Tyler 35 mesh screen are satisfactory to be used in the final product. Particles retained on the 35 mesh screen can be pulverized in a conventional manner and returned to the start of the process for respraying with the cementing liquid in admixture with added ingredients.

The product thus produced is suitable for most uses and can be packaged directly. However, the rate of wetting out and the rate of dispersion of the sugar-cocoa mix can be further increased by a final coating of the aggregated particles and the few separate cocoa particles still remaining unaggregated in the mix with an edible surface active agent such as lecithin. This final coating is advantageously accomplished by spraying the dried mix at ordinary temperatures in a suitable mixing machine or other apparatus with a solution of lecithin.

The solution of lecithin thus used is advantageously a solution of oil soluble lecithin in an edible oil such as corn oil. When the product is thus sprayed only sufficient lecithin-corn oil solution is used to give a very thin surface coating to the particles. Inasmuch as the previous treatment produces conglomerate units, the surface areas of which are much less than the corresponding surface areas of the orginal untreated particles, an economical use of the emulsifying agent results.

An alternative method of treating the sugar-cocoa mix after drying is to spray the mixture with a small amount of a solution of water soluble lecithin in water, or in aqueous sugar solution, advantageously an invert syrup. But the use of the lecithin in oil solution, is particularly advantageous since the fatty materials in the cocoa particles are partially soluble in oil and thus the lecithin can penetrate the surface of the hydrophobic cocoa and thus act more efficiently as a surface active agent than when the lecithin is used in aqueous solution which has little affinity and penetrating power for the cocoa.

A further and alternative procedure is to add the lecithin to the aqueous sugar solution used as a cementing liquid so that the dry mixture of sugar and cocoa is

sprayed with such lecithin-containing aqueous sugar solution, thus incorporating the lecithin in the dry sugar-cocoa mix. But, in general, this method is less advantageous than that in which the lecithin is applied as a final spray dissolved in oil. This mix requires no further processing and can be packaged directly.

When properly compounded, as described above, the dry finely divided sugar-cocoa mix, on being stirred with cold milk, wets out and disperses without the formation of agglomerates on the surface of the liquid.

It is one advantage of the present invention that the cocoa used may be the ordinary cocoa of commerce, such as cocoa powder, most of the particles of which pass a 200 mesh screen. The commercial product usually contains 10% to 30% of fat. For a low fat cocoa-sugar mix, which is generally desirable for cold drink mixes, the cocoa used is advantageously low fat cocoa of around 12% to 16% fat content.

The sugar used in making the mix may vary in particle size and may include, e.g. confectioner's 4X grade, with or without added corn starch to prevent caking, about 90% of such sugar passing through a 200 mesh Tyler screen. Other grades of sugar, up to medium fine granulated (approximately 95% on the 35 mesh Tyler screen) can even be used if a sugar-cocoa mix with coarse particle size is desired or is no objectionable.

A crystalline sugar containing invert may advantageously be used for initial admixing with the cocoa before spraying with the cementing liquid. Such sugars can be made, as is well known, by spraying finely powdered or even granulated sugar with invert solution. Or they may be made by pulverizing invert sprayed granulated sugar. These invertized sugars may contain any desired quantity of invert. By the use of these sugars additional invert may be incorporated into the final sugar-cocoa mix over that possible when only a spraying solution containing invert is used.

The particle size of the sugar and cocoa used in making the sugar-cocoa mix affects somewhat the dispersion rate of the resulting product. The sugar-cocoa agglomerates may vary in size depending on whether they are made up from an assemblage of a few particles of cocoa and sugar or a much larger number of particles. Size control of the aggregate can be obtained by regulation of the amount, composition, temperature, and liquid droplet size of the aqueous spray, and of the speed of the mixer used during preparation of the mix.

The treatment of the mixture of sugar and cocoa with the spray solution or wet steam can be carried out either as a batch operation, or as a continuous process. A batch operation can be carried out by spraying a mixture of the sugar and cocoa particles with the finely divided sugar solution or with wet steam with thorough mixing with the regulated amount of the cementing solution or steam spray. In carrying out the process in a continuous manner, the solution can be sprayed onto the mixture of sugar and cocoa and then mixed therewith, or wet steam applied thereto, in apparatus such as screw-type conveyors, or rotating drums designed for supplying the dry mixture and progressively causing it to pass through the apparatus and for spraying the cementing solution onto the mixture or treating with wet steam with continued agitation followed by drying the resulting product and screening it before passing it to the packaging equipment.

It is one advantage of the present process that it does not require special expensive equipment, nor does it require a cooking operation during which the sugar solutions are raised to high temperatures and kept there to reduce the water content. Considerable variation in process variables is allowable without undue effect on the final product and the whole process is easy to control and does not require precise control instruments.

The proportions of sugar and cocoa used in forming the improved dry sugar-cocoa mix may be varied considerably. In the examples hereinafter given, the ratio of



sucrose to cocoa varies between 3.8 to 1 and 4.3 to 1. The taste and sweetness of the product can be varied by using other proportions.

When the dried product is finally sprayed with a solution of lecithin and oil, different commercially available edible oils can be used. A solution of lecithin in a bland vegetable oil, such as corn oil, may be advantageously used to give a product with enhanced dispersibility. The lecithin used when dissolved in such an edible oil will be an oil soluble grade of lecithin. When the lecithin is used in water solution a water soluble lecithin will be used. Various proportions of lecithin can be used, e.g., 1 part of lecithin to 2 parts of corn oil, or 1 part of lecithin to about 12 parts of invert sugar solution (50% solids).

The invention will be further illustrated by the following specific examples, but it will be understood that the invention is not limited thereto. The parts are by weight.

*Example 1*

1150 parts of confectioners' 4X sugar without added cornstarch (90% through a 200 mesh Tyler screen) and 270 parts of powdered cocoa (Wilbur-Suchard Richred grade, 14–16% fat content) are sprayed with 200 parts of hot (80° C.) 50° Brix total invert sugar solution using an air pressure spray gun under 20 pounds per square inch gauge air pressure. The cementing liquid is sprayed slowly onto the sugar and cocoa while mixing continuously in a Hobart mixer, Model N–50, using speed No. 1.

After completion of addition of invert solution, mixing is stopped and the moist mixture is air dried at 40° to 50° C. The dry mix is passed through a 35 mesh Tyler screen. The coarse tailings can be reground and reprocessed. The screened, dried product consists of sugar and cocoa particles cemented together.

This cocoa and sugar mix can be used directly, or the dispersibility can be enhanced by addition of lecithin in corn oil. Onto the screened dried mix being agitated in the Hobart mixer on speed No. 1 is sprayed a solution of oil-soluble lecithin (Borden Co. specification B–60S15) (1 part) in Mazola corn oil (2 parts). The total amount of lecithin solution sprayed is 2.25 parts per 100 parts of dried screened mix. No additional drying is required after the spraying of the lecithin-corn oil solution and the product is ready for packaging.

*Example 2*

Three hundred parts of powdered cocoa (Wilbur-Suchard Richred grade, 14–16% fat content) and 7.5 parts of solid lecithin are thoroughly ground together in a mortar to form an intimate mixture of powdered cocoa and the mixture is sifted twice through a flour sifter. 1160 parts confectioners' 4X sugar (without added cornstarch) is introduced into the mixing bowl of a Hobart mixer, Model N–50, and while the sugar is mixed continuously at No. 1 speed, 215 parts of hot (80° C.) 50° Brix total invert sugar solution are sprayed onto the sugar using an air pressure spray gun under 20 pounds per square inch gauge air pressure. Simultaneously with the spraying, the previously prepared cocoa-lecithin mix is sprinkled in slowly. Addition of ingredients requires about 15 minutes, more or less, after which mixing is stopped. The moist mix is air dried at 40° to 50° C. The dry mix is passed through a 35 mesh Tyler screen. The coarse tailings can be reground and reprocessed. The screened, dried product consists of sugar, cocoa, and lecithin cemented together, and is ready for packaging.

*Example 3*

1150 parts of confectioners' 4X sugar without added cornstarch (90% through a 200 mesh Tyler screen) and 270 parts of powdered cocoa (Wilbur-Suchard Richred grade, 14–16% fat content; 98.3% through a 200 mesh Tyler screen) are sprayed with wet steam while mixing continuously in a Hobart mixer, Model N–50, using speed

No. 1. During treatment with steam the temperature of the mix rises to 40° to 50° C. due to the heating effect concomitant with introduction of steam. After this treatment the wet mix is air-dried at 40° to 50° C. The dry mix is passed through a 35 mesh Tyler screen. The coarse tailings can be re-ground and reprocessed.

The screened, dried product consists of sugar and cocoa particles cemented together. This cocoa and sugar mix can be used directly, or the dispersibility can be enhanced by addition of lecithin in corn oil. Onto the screened dried mix being agitated in the Hobart mixer on speed No. 1 is sprayed a solution of oil-soluble lecithin (Borden Co. specification B–50S15) (1 part lecithin dissolved in 2 parts corn oil). The total amount of lecithin solution sprayed is 1 part per 100 parts of dried screened mix. No additional drying is required after the spraying of the lecithin-corn oil and the product is ready for packaging.

*Example 4*

1150 parts of pulverized cane sugar containing 5.7% invert sugar and 270 parts of powdered cocoa (Wilbur-Suchard Richred grade, 14–16% fat content, 98.3% through a 200 mesh Tyler screen) are sprayed with 167 parts of hot (80° C.) 50° Brix total invert sugar using an air pressure spray gun under 20 pounds per square inch gauge air pressure. The cementing liquid is sprayed slowly onto the sugar and cocoa while mixing continuously in a Hobart mixer, Model N–50, using speed No. 1.

After completion of addition of invert solution, mixing is stopped and the moist mixture is air dried at 40° C. to 50° C. The dry mix is passed through a 35 mesh Tyler screen. The coarse tailings can be reground and reprocessed. The screened, dried product consists of sugar and cocoa particles cemented together.

This cocoa and sugar mix can be used directly, or the dispersibility can be enhanced by addition of lecithin in corn oil. Onto the screened dried mix being agitated in the Hobart mixer on speed No. 1 is sprayed a solution of oil-soluble lecithin (Borden Co. specification B–60S15) (1 part) in Mazola corn oil (2 parts). The total amount of lecithin solution sprayed is 2 parts per 100 parts of dried screened mix. No additional drying is required after the spraying of the lecithin-corn oil solution and the product is ready for packaging.

The process as illustrated by the examples can be varied in the proportions of sugar and cocoa, in the fineness of the sugar used, in the cementing liquid used and in the incorporation of lecithin in the product.

Thus, solid lecithin may be ground with dry cocoa and an invert sugar solution added simultaneously with the resulting dry cocoa to confectioners' 4X sugar with continuous mixing in a Hobart mixer, using a hot invert sugar solution of 50° Brix (about 90% invert sugar and 10% sucrose) and containing about 50% sugar in solution and using the sucrose, cocoa, etc. in approximate proportions of 78% to 80% sucrose, 18% to 20% cocoa, 2% to 6% invert sugar solids, 0.75% to 1% lecithin and 1.5% to 2% corn oil.

Instead of using a 50° Brix invert sugar solution, a solution of 25° Brix can be used, or even water without sugar with the resulting formation of a sugar solution by dissolving some of the sugar of the mix.

An alternative procedure is to spray the cocoa and sugar with a solution of lecithin in corn oil (0.75 to 1% lecithin and 1.5% to 2% corn oil) during mixing in a Hobart mixer followed by spraying with hot 50° Brix invert sugar solution.

Improved results are obtained as above described, by a final spray of lecithin in an edible oil, such as corn oil, after the mix has been prepared and dried and before packaging.

The improved sugar-cocoa mix of the present invention has the desirable characteristics of a product for use in making chocolate drinks, e.g., by stirring the product in cold milk, as well as for other purposes. The improved mix is free from any objectionable segregation into sugar and cocoa particles, has a desirable and almost instantaneous wetting out action and is almost instantaneously and permanently dispersed in the liquid into which it is introduced. The improved mixes have a desirable bulk density for packaging in definite sized containers and have a long shelf-life without deterioration and without requiring special packaging or storage facilities. The bulk density of the product will vary somewhat with the method of preparation, the type cementing liquid spray solution used and also with the particle size of the sugar used.



The use of any aqueous liquid which of itself will act as a cementing liquid or act to produce a cementing liquid, such as a solution of invert sugar or water, is advantageous and the product resulting therefrom is improved with increased quantities of such spray solution but the amount used should be below that which will produce an unworkable sticky mixture. Whereas the sugar-cocoa mix without the addition of such a cementing agent is unsatisfactory for use with cold milk, the use of such a cementing liquid followed by drying and cementing together of sugar and cocoa particles results in the production of a satisfactory mix.

The bulk density of the final product varies somewhat with the quantity of cementing liquid used. And the final treatment of the dried mix with the solution of lecithin in an edible oil, such as corn oil, generally reduces the bulk density somewhat. In general, the coarser the sugar particles used initially in making the mix, the higher the bulk density of the finished mix. Also, with somewhat coarser sugar particles used initially, a somewhat improved wetting out rate is obtained in the final mix, with a somewhat reduced dispersion rate of the final mix in the liquid.

It will thus be seen that the present invention provides an improved sugar-cocoa mix which is readily miscible with and dispersible in liquids, and particularly in cold liquids such as milk, to produce a chocolate drink as well as for use in hot liquids and for other purposes where chocolate flavored candies, fudge icings, or other products are desired.

It will further be seen that the present invention provides a simple and inexpensive method of producing a cocoa-sugar mix without requiring expensive apparatus for the process. The process is one in which a dry sugar-cocoa mix is cemented together with a liquid cementum, such as an invert sugar solution applied in a finely divided state and distributed throughout the mixture to cement the particles together into aggregates, or with the use of water in a finely divided state to form the cementing liquid, and with the solid sugar formed by drying the sugar solution acting as the cementing medium for the individual particles.

We claim:

1. The method of producing a dry sugar-cocoa mix having aggregates composed of individual particles of sugar and cocoa cemented together which comprises applying to and admixing with a preformed dry mixture containing separate, individual sugar and cocoa particles a limited amount, between about 2% and 9% of the dry mix, of an aqueous liquid in a state of fine subdivision and with agitation of the mix to cause the formation of a freely-flowing mixture of small aggregates composed of sugar and cocoa particles, and drying the resulting mixture causing solid sugar deposited from the liquid to act as a binder between the solid particles.

2. The process according to claim 1 in which the sugar is invert sugar.

3. The method of producing a dry sugar-cocoa mix which comprises spraying finely divided aqueous cementing liquid in limited amount between about 2% and 9% of the dry mix, on a preformed dry mixture of separate, individual sugar and cocoa particles with continued ad-

mixture during introduction of the liquid particles to form a freely flowing mixture of small aggregates of sugar and cocoa particles and drying the resulting mixture.

4. The method of producing a dry sugar-cocoa mix which comprises mixing sugar and cocoa particles to form an intimate dry mixture, spraying the mixture with a limited amount between about 2% and 9% of the dry mix, of an aqueous sugar solution with continued agitation of the mixture during introduction of the liquid to cause formation of a freely-flowing mixture of small aggregates of sugar and cocoa particles and drying the resulting mixture causing solid sugar deposited from the liquid to act as a binder between the solid particles.

5. The method of producing a dry sugar-cocoa mix which comprises mixing sugar and cocoa particles to form an intimate dry mixture, treating the mixture with a limited amount between about 2% and 9% of the dry mix, of wet steam with agitation of the mass during introduction of the steam to cause the formation of a freely-flowing mixture of small aggregates composed of sugar and cocoa particles and drying the resulting mixture causing solid sugar deposited from the liquid to act as a binder between the solid particles.

6. The process of producing a dry sugar-cocoa mix which comprises applying to an intimate dry mixture of sugar and cocoa particles a small and regulated amount between about 2% and 9% of the dry mix, of an aqueous



liquid in a state of fine subdivision and with agitation of the mix to form a freely flowing mixture of small aggregates of sugar and cocoa particles, drying the resulting product and applying a small amount of a solution of lecithin thereto.

7. The process of producing a dry sugar-cocoa mix which comprises applying to an intimate dry mixture of sugar and cocoa particles a small and regulated amount between about 2% and 9% of the dry mix, of an aqueous liquid in a state of fine subdivision and with agitation of the mix to form a freely flowing mixture of small aggregates of sugar and cocoa particles, drying and resulting product and applying a small amount of an aqueous solution of lecithin thereto.

8. The process according to claim 7 in which the lecithin is applied in the form of a solution of lecithin in an edible oil.

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# RAMA QUÍMICA

# D3

# COCOA POWDER COMPOSITIONS

## FIELD OF THE INVENTION

The present invention relates to instant cocoa powder compositions for use in the preparation of beverages and/or foodstuffs. In particular, the invention relates to compositions which have good wettability and dispersibility in cold liquids.

## BACKGROUND OF THE INVENTION

Cocoa powder, typically containing 10-26% fat, is used in the food industry for a variety of applications, including confectionery, bakery, frozen desserts and beverages. In the beverage industry, it is mixed with sugar and used to produce compositions for both hot and cold beverages. Unfortunately, this results in products which are deemed to be highly calorific and there has therefore been a long felt need for healthier cocoa-based beverages.

This could be achieved by reducing the sugar content. Unfortunately, however, such modifications have, in the past, lead to a critical decrease in dispersibility of the cocoa powder compositions, especially in cold liquids. It is indeed desirable that such compositions should wet out and disperse rapidly into cold (e.g. refrigerated) milk or water, producing a beverage which has a smooth texture (mouth-feel), which is uniform in appearance and which is stable for at least several minutes while the beverage is being consumed. Unfortunately, when low-sugar cocoa powder compositions are added to cold liquids a number of undesirable phenomena are observed, including the formation of floating lumps ("lumping") at the liquid's surface due to poor wetting and excessive sedimentation of cocoa powder aggregates, leading to an overall undesirable sensory experience and limiting the product's application in key sectors such as for the production of milkshakes and chocolate milk drinks.

To date, this problem has been addressed by adding wetting agents such as oil and fat compositions or silica to the cocoa powder compositions (see JP2005110593 or US patent 4,016,337 for example). This is, however, considered undesirable from a consumer perspective. It is indeed the case that consumers are increasingly seeking to reduce the quantity of additives in their diets. An alternative solution – the use of high levels of

emulsifiers such as lecithin – has also been proposed. Indeed, most major cocoa producers sell "lecithinated cocoa powders" but these still take more than two minutes to wet out and disperse in cold water. Increasing the lecithin level does not improve dispersibility but will lead to stickiness and handling problems which, in turn, can result in the formation of difficult-to-disperse lumps.

As can be seen from the foregoing discussion, there is still a need in the art for a lower-calorie cocoa powder composition which has satisfactory dispersibility in cold liquids. The present invention provides such a composition.

## SUMMARY OF THE INVENTION

According to a first aspect of the present invention, there is provided a cold dispersible cocoa powder composition comprising (a) a defatted cocoa powder; and (b) 30-75% bulking sugar by weight.

According to another aspect of the present invention, there is provided a process for producing a dispersible cocoa powder composition comprising the step of: mixing a defatted cocoa powder and/or a defatted cocoa cake with 30-75% bulking sugar by weight.

According to a further aspect of the present invention, there is provided a beverage and/or foodstuff comprising – or produced with – such a composition.

According to yet another aspect of the present invention, there is provided the use of a defatted cocoa powder to increase the dispersibility of a cocoa powder composition having a low bulking sugar content.

## DETAILED DESCRIPTION

The present invention provides a dispersible cocoa powder composition comprising cocoa powder and a bulking sugar.

### Cocoa Powder

The cocoa powder may be from any source and processed according to any methods known

in the art (e.g. to improve taste, texture and/or appearance). It may, for instance, be tempered to obtain a tempered cocoa powder, alkalized or dutched to improve color and/or flavor, or milled to obtain a finer or more uniform composition. Preferably, the cocoa powder will have an average particle size of 2-100 microns, more preferably of 5-50 microns, more preferably of 5-20 microns. According to one particular embodiment, the cocoa powder will have an average particle size of 8-12 microns.

Importantly, the cocoa powder will be a defatted cocoa powder. Typically, cocoa powders contain 10-12% cocoa butter by weight. Cocoa powders are described as "low-fat cocoa powders" as soon as they have a cocoa butter content below 10% by weight. Cocoa butter content can be reduced using any known method. A suitable method is described in WO2004/034801 (Cargill, Incorporated). Cocoa powders suitable for use in the present invention will preferably have a cocoa butter content of 5% by weight or less, more preferably of 2% by weight or less, more preferably of 1% by weight or less. According to a particular embodiment, the cocoa powders will be substantially fat-free. Advantageously, fat-free cocoa powders will not need to be tempered.

Cocoa powder is included in the present composition in an amount of 25 to 70% by weight, preferably in an amount of 30 to 60% by weight, even more preferably in an amount of 40-60% by weight, based on total dry weight of the composition. According to one possible embodiment, the composition will comprise approximately 30% cocoa powder by weight.

**Bulking Sugar**

The term "bulking sugar" as used herein refers to sugars suitable for use as bulking agents in the preparation of food or beverage compositions. They may also be used to increase the sweetness of the final product. Suitable examples of bulking sugars include, but are not limited to: sucrose, fructose, dextrose, maltodextrin, polydextrose and mixtures of two or more thereof. Alternatively, low calorie or calorie free sweeteners can be used, if necessary in combination with additional, ideally flavorless, bulking agents. Preferably, the bulking sugar will be sucrose and/or dextrose. It may be present in a crystalline, powder or liquid form (e.g. in the form of a syrup or of sugar pre-dissolved in water). Preferably a fine or extra fine crystalline sugar will be used. Alternatively, powdered sugars (of the "icing sugar" type) may be used.

Bulking sugars have traditionally been used in amounts of 80% or more by weight based on the total weight of the cocoa powder composition. This has been necessary to achieve a minimum level of dispersibility. Nonetheless, dispersibility in cold liquids has remained unsatisfactory. It has now surprisingly been found that, with the present invention, a satisfactory level of dispersibility can be achieved, even in cold liquids, with bulking sugar levels below 80% by weight. Thus, the cocoa powder compositions of the present invention will comprise only 30-75% bulking sugar by weight. Preferably, they will comprise 40-70%, more preferably 40 to 60%, bulking sugar by weight. For low calorie applications, it will be preferred to use less than 40% bulking sugar by weight.

**Cold Dispersibility**

The expressions "cold dispersible" and "dispersible in cold liquids" as used herein refer to the fact that the compositions of the present invention are capable of being completely (or substantially completely) dispersed in a cold liquid in a relatively short time frame. Cold liquids will be understood to be liquids (such as water or milk) maintained at room temperature or below and, in particular, refrigerated liquids (having a temperature of about 5-7°C). Dispersibility can be assessed using a number of criteria including: wettability (if and how quickly a composition sinks through the surface of a liquid), lumping (if and how much of the composition remains on the liquid's surface after simple manual stirring) and sedimentation (the rate at which the composition sinks to the bottom of the liquid after stirring).

The cocoa powder compositions of the present invention will advantageously have a shorter wettability time than equivalent compositions in which the cocoa powder has either a standard or a high cocoa butter content (i.e. a cocoa butter content of 10% or more by weight). Ideally, the compositions of the present invention will have a wettability, measured according to Method 1, of less than 30 seconds, although for certain applications, a wettability of up to 90 seconds would still be a significant improvement. According to certain preferred embodiments, they will have a wettability of less than 20 seconds. When added to cold milk, the compositions will preferably be characterized by a substantial absence of lumping and a very slow rate of sedimentation (preferably, only a very small amount of composition will have sedimented 10 seconds after stirring).

**Emulsifier**

Although it will not be necessary, according to certain embodiments, it may be desirable for the composition of the present invention to include one or more emulsifiers. Although any known emulsifier can be used (provided, of course, that it is safe for human consumption), it will be preferred to use a lecithin such as soy or sunflower lecithin.

When used, the composition will advantageously include the at least one emulsifier in an amount of no more than 15% by weight, preferably of no more than 10% by weight, more preferably of between 1 and 8% by weight, more preferably of between 2 and 7% by weight and, according to one particular embodiment, of between 2.5 and 6% by weight based on total dry weight of the cocoa powder.

**Other Ingredients**

In addition to the one or more emulsifiers, the composition of the present invention may also include one or more additional, optional ingredients. These may include, by way of example only, stabilizers, additional bulking agents, coloring agents, flavoring agents, milk solids, vitamins, polyphenols, nutraceuticals and so on. The requirement for and choice of such additional ingredients will be readily determined by a person skilled in the art depending, in particular, on the desired end use of the composition.

Notably, dispersibility of the present compositions will not depend on the use of so-called wetting agents. Wetting agents are compositions which are added to a cocoa powder to improve its wettability. They include compositions such as fatty acid esters (see JP2005168366 from Morinaga & Co. or JP2005110593 from Riken Vitamin Co.) or certain polyol compositions, but do not include emulsifiers. As such, the composition of the present invention will preferably be free of such wetting agents. In particular, the defatted cocoa powder will not need to be – and will therefore preferably not be – coated with a wetting agent. Specifically excluded from the scope of the present invention is a cocoa powder composition (and any sweetened cocoa powder compositions produced therefrom) characterized in that it comprises, on a dry weight basis, 75-95% cocoa powder and 0.5-20% of at least one hydrophilic agent, wherein the cocoa powder is coated with the at least one hydrophilic agent and wherein the hydrophilic agent is preferably selected from one or more polyols and/or one or more sugars.

**Process**

A process for producing a dispersible cocoa powder composition is also part of the present invention. In particular, the present invention provides a process for producing a dispersible cocoa powder composition comprising the step of: mixing a defatted cocoa powder and/or a defatted cocoa cake with 30-75% bulking sugar by weight.

The term "cocoa powder" is defined above. The term "cocoa cake", by contrast, refers to an unprocessed form of cocoa powder. By way of background information, cocoa nibs are ground to produce a cocoa liquor which is then pressed to extract cocoa butter, leaving the cocoa cake. The cake is milled and optionally sieved to produce cocoa powder. The process of the present invention may use cocoa powder or cocoa cake as a starting material in the production of the final cocoa powder compositions. It will of course be understood by the skilled person that mixtures of cocoa powder and cocoa cake may also be used.

The term "mixing" may refer, for example, to simple mechanical mixing (e.g. with a paddle, disc, pin or knife mixer), to granulation (i.e. mixing of the cocoa powder with a wetted bulking sugar, for example a bulking sugar mixed with approximately 5% water based on total dry weight of the composition), to homogenization (e.g. in a high-shear mixer), to agglomeration or any other mixing or blending methods known to those skilled in the art. According to certain embodiments, it may be preferred to use agglomeration.

Agglomeration is a technique which is well known and routinely used in the art. According to one particular embodiment, it will consist of mixing the defatted cocoa powder and/or cocoa cake with bulking sugar in the form of a powder (e.g. of the icing sugar type) and subjecting the obtained mixture to a curtain of steam.

As noted above, the dispersible compositions of the present invention may also comprise one or more emulsifiers. As such, the above method may also include the step of adding one or more emulsifiers to the composition. Although the emulsifier(s) may be added both before and/or after the step of mixing the cocoa powder and/or cocoa cake with the bulking sugar, it will preferably be added to and blended with the cocoa powder and/or cocoa cake before introducing the bulking sugar. Methods of blending emulsifiers into cocoa powder are well known in the art and any such known method may be used. Preferably, the one or more

emulsifiers will be added to and blended with the cocoa powder and/or cocoa cake at a temperature in the range of 20 to 100°C, more preferably at a temperature above 50°C, for instance, in the range of 60 to 100°C. Advantageously, it will be added/blended at a temperature above 75°C such as at a temperature in the range of 80 to 100°C. According to particular embodiments, it will be added/blended at a temperature of about 60°C or about 90°C. Mixing will be preferably be performed in such a way that the cocoa powder will be coated with the one or more emulsifiers.

Other steps that may be included in the method of the present invention will be apparent to a person skilled in the art. For example, the method may include one or more drying steps, cooling steps and/or tempering steps. It may also include one or more milling and/or sieving steps.

Milling (or grinding) can be achieved using any means known in the art, preferably under standard cocoa processing parameters. Ideally, the milling step will be used to achieve the desired average particle size defined above. Milling may be performed on the defatted cocoa powder and/or cocoa cake, before addition of the bulking sugar and/or it may be performed after addition of the bulking sugar. For example, a milling step may be used after agglomeration. Sieving will preferably be carried out after milling (if used) with a 0.1 to 2.0 mm sieve.

The process of the invention may also include the addition of one or more further optional ingredients as defined above (e.g. flavoring agents). The addition of such additional ingredients may be performed at any stage in accordance with normal practice in the industry.

Compositions obtained by the above method, and food or beverage compositions to which they may be added or in which they are included, are also part of the present invention.

**Beverages and Foodstuffs**

Although the present composition can be used in the preparation of any conceivable type of beverage and/or foodstuff, it will be particularly suited for use in the preparation of beverages and/or foodstuffs which are dependent upon the satisfactory dispersion of a dry powder in a cold liquid. Examples of such products may include, without limitation, chocolate milk and

other milk-based drinks, flavored yogurt drinks, milkshakes, sauces, infant formulas, creams, icings, mousses and whipped or "instant" desserts. Of course, the composition of the present invention may also be used in the preparation of hot beverages and/or foodstuffs such as hot chocolate drinks or sauces. The compositions of the present invention, which are produced with defatted cocoa powder and with a lower sugar content than usual, will be particularly desirable for use in the production of healthy and/or low- or reduced-calorie products.

The use of a defatted cocoa powder to increase the dispersibility of a cocoa powder composition having a low sugar content, especially in cold liquids (as compared to the same compositions prepared with standard cocoa powders) is also a part of the present invention, various embodiments of which are described in more detail in the following, non-limiting examples.

## EXAMPLES

**Methods for assessing dispersibility**

- **Method 1: Wettability**

150 ml of sterilized skimmed milk at 7°C is poured into a beaker. 15 grams of a selected cocoa powder or cocoa powder composition to be tested are gently poured onto the surface of the liquid. The experiment is carried out at room temperature, e.g. 25°C. The time it takes for the powder to completely sink below the surface of the liquid is recorded as wettability time and graded as listed in Table 1.

| Table 1: Wettability (W) | |
|---|---|
| Grade | Time required for complete wetting |
| Very good | 0 – 30 seconds |
| Good | 31 - 60 seconds |
| Moderate | 61 - 120 seconds |
| Weak | 121 – 180 seconds |
| Poor | More than 180 seconds |

- **Method 2: Lumping and Sedimentation**

Once wettability time has been recorded (or after 3 minutes have passed, whichever occurs

first), the liquid is manually stirred with a small dessert spoon, 15 times clockwise and 15 times anti-clockwise. The liquid is then left to settle for 10 seconds and the quantity of powder still on the surface – also referred to as "floaters" or "lumping" – is estimated (in relation to the total amount of powder added). Finally, the beakers are placed on a mirror stand to determine how much powder has settled onto the bottom ("sedimentation"). Lumping and sedimentation are graded according to the criteria of Tables 2 and 3, respectively.

| Table 2: Lumping (L) | |
|---|---|
| Grade | Description |
| 90-100% | All or nearly all powder remaining on the surface |
| 50-90% | More than half of the powder remaining on the surface |
| 20-50% | Substantial amount of powder remaining on the surface |
| 1-20% | Small to moderate amount of powder remaining on the surface |
| Less than 1% | No powder remaining on the surface |

| Table 3: Sedimentation (S) | |
|---|---|
| Grade | Description |
| 90-100% | All or nearly all product at the bottom |
| 50-90% | More than half of the product at the bottom |
| 20-50% | Substantial amount of product at the bottom |
| 1-20% | Small to moderate amount of product at the bottom |
| Less than 1% | No product on the bottom |

**Examples**

The following compositions were prepared by mechanical mixing:

Table 4

| Ingredients (wt%) | Ref 1 | Ref 2 | P1 | P2 |
|---|---|---|---|---|
| 10/12 Cocoa Powder (Gerkens™ DP70 cocoa powder*) | 100 | - | - | - |
| 10/12 lecithinated cocoa powder (Gerkens™ DP70W cocoa powder*) | - | 100 | - | - |

| | | | | |
|---|---|---|---|---|
| Defatted Cocoa Powder (0.6% cocoa butter) | - | - | - | - |
| Defatted Cocoa Powder (0.6 wt% cocoa butter) | - | - | 100 | 95 |
| Soy Lecithin | - | - | - | 5 |

* from Cargill

For P2, the soy lecithin was simply mixed with the cocoa powder. The same lecithin was used as is used in the production of DP70W (10/12 cocoa powder with lecithin). The cocoa powder used in all the examples had an average particle size of approximately 8-12 microns. Mixing was performed at 60-65°C in a Hobart-type mixer for 30 minutes.

Samples of the above products were then used, with varying amounts of bulking sugar (sucrose) to form both agglomerates and granulates as follows:

- agglomerates were formed by mixing the samples with icing sucrose, milling the mixture at 0.5 mm and subjecting it to a curtain of steam. The resulting agglomerates were sieved and the 0.5-1 mm fraction was selected for wettability tests.

- granulates were formed by mixing the samples with fine sucrose (with an average particle size of 0.35-0.55 mm) which is wetted with 5% water by weight based on the final composition. The sucrose is wetted and the cocoa powder sticks to the sucrose granules.

The wettability of both the agglomerates and the granulates in cold milk (7°C) of these final compositions was then determined after at least 7 days storage at room temperature, using the Method 1 described above. Results for the agglomerates are shown in Tables 5 and 6. Results for the granulates are shown in Table 7.

Table 5: wettability of agglomerates with varying bulking sugar content

| Sugar | Sample | Ref. 1 | Ref. 2 | P1 |
|---|---|---|---|---|
| 80% (ref) | W | >180s | 60s | 15.4s |
| | L | 50-90% | 1-20% | 0% |
| | S | 1-20% | 1-20% | 0% |
| 70% | W | >180s | >180s | 16.3s |

| | | | | |
|---|---|---|---|---|
| | L | 50-90% | 50-90% | 0% |
| | S | 1-20% | 1-20% | 0% |
| 60% | W | >180s | >180s | 64.7s |
| | L | 50-90% | 50-90% | 0% |
| | S | 1-20% | 1-20% | 0% |

Table 6: wettability of agglomerates with varying bulking sugar content

| Sugar | Sample | Ref. 1 | Ref. 2 | P2 |
|---|---|---|---|---|
| 50% | W | >180s | >180s | 9.4 |
| | L | 50-90% | 50-90% | 0% |
| | S | 1-20% | 1-20% | 0% |
| 40% | W | >180s | >180s | 21.6 |
| | L | 50-90% | 50-90% | 0% |
| | S | 1-20% | 1-20% | 0% |

Table 7: wettability of granulates with varying bulking sugar content

| Sugar % | Sample | Ref. 1 | Ref. 2 | P1 |
|---|---|---|---|---|
| 80% (ref) | W | >180s | >180s | 15.4s |
| | F | 50-90% | 50-90% | 0% |
| | S | 1-20% | 1-20% | 1-20% |
| 70% | W | >180s | >180s | 17.3s |
| | F | 50-90% | 50-90% | 0% |
| | S | 1-20% | 1-20% | 1-20% |

As demonstrated by the above results, the compositions of the present invention not only have better dispersibility in cold liquids than standard cocoa powder alone, but also better dispersibility than standard cocoa powder when mixed with an emulsifier, whether prepared by granulation or agglomeration and even at lower bulking sugar concentrations.

The above examples of the compositions of the present invention and methods for preparing them is not intended to be exhaustive or limiting but are merely included for illustrative purposes. Various equivalent modifications are possible within the scope of the invention, as those skilled in the art will recognize. The teachings of the present invention are applicable to

other powder compositions. They may not be limited to the compositions and methods described above.

## CLAIMS

1. A cold dispersible cocoa powder composition comprising:
- a defatted cocoa powder; and
- 30-75% bulking sugar by weight.

2. A composition according to claim 1, characterized in that it has a wettability, measured according to Method 1, of less than 30 seconds.

3. A composition according to claim 1 or claim 2, characterized in that the cocoa powder has an average particle size of 2-100 microns, preferably 5-50 microns, more preferably 5-20 microns, more preferably 8-12 microns.

4. A composition according to any one of the preceding claims, characterized in that the defatted cocoa powder has a cocoa butter content of 5% by weight or less, preferably of 2% by weight or less, more preferably of 1% by weight or less, more preferably the defatted cocoa powder will be substantially fat-free.

5. A composition according to any one of the preceding claims, characterized in that it comprises 40-70% bulking sugar by weight.

6. A composition according to any one of the preceding claims, characterized in that the bulking sugar is sucrose and/or dextrose.

7. A composition according to any one of the preceding claims, characterized in that it further comprises an emulsifier, preferably lecithin.

8. A composition according to any one of the preceding claims, characterized in that the defatted cocoa powder is not coated with a hydrophilic agent.

9. A process for producing a dispersible cocoa powder composition comprising the step of: mixing a defatted cocoa powder and/or a defatted cocoa cake with 30-75% bulking sugar by weight.

10. A beverage and/or foodstuff comprising a composition according to any one of claims 1 to 8 or obtainable according to the process of claim 9.

11. Use of a defatted cocoa powder to increase the dispersibility of a cocoa powder composition having a low bulking sugar content.