

CHOCOLATE COMPOSITION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of European Patent Application No. 20158674.0, filed February 21, 2020, which is hereby incorporated by reference herein in its entirety.

FIELD OF THE INVENTION

[0002] The invention relates to a chocolate composition that is low in milk solids, comprising a plant-based protein and a plasticizer ingredient, said chocolate composition having a sensorial quality comparable to that of milk chocolate. The invention further relates to food products comprising the chocolate composition according to the invention.

BACKGROUND OF THE INVENTION

[0003] Chocolate is one of the most popular food products in the world, with many foodstuffs incorporating it in some fashion. Its typical fast melting in the mouth resulting in an explosion of bitter-sweet cocoa taste accounts at least in part for this popularity. In addition, many chocolate recipes also contain milk solids to give an extra dimension of creaminess and milky taste to the chocolate.

[0004] However, despite its appeal, milk chocolate contains significant amounts of butter fat, milk protein and lactose. As a result, milk chocolate cannot be consumed by those suffering from lactose intolerance or milk allergies. It will also be undesirable for those following a vegan diet or avoiding dairy for religious or lifestyle reasons.

[0005] Past attempts to replace milk solids in milk chocolate have resulted in a chocolate of poor sensorial quality that is brittle, not snappy and lacks the typical creamy mouthfeel and flavor of traditional milk chocolate.

[0006] Thus, there remains a need for a chocolate product reduced in milk solids with an improved quality and eating sensation.

SUMMARY OF THE INVENTION

[0007] The present invention relates to a chocolate composition comprising at least 30 weight% of cocoa solids and less than 5 weight% of milk solids, based on the total weight

of the chocolate composition, characterized in that it further comprises 0.5-15 weight% plant-based protein and 0.5-10 weight% of a plasticizer ingredient, wherein the plant-based protein does not comprise soy protein.

[0008] The present invention also relates to a food product comprising such a chocolate composition, characterized in that the food product is, for example, a bakery or confectionary product.

DETAILED DESCRIPTION

[0009] Unless otherwise specified herein, all weights are expressed as a percentage, by weight, relative to the total weight of the chocolate composition.

[0010] The present invention relates to a chocolate composition comprising at least 30 weight% of cocoa solids and less than 5 weight% of milk solids, characterized in that it further comprises 0.5-15 weight% plant-based protein and 0.5-10 weight% of a plasticizer ingredient, wherein the composition is free from soy protein.

Chocolate Composition

[0011] The terms “chocolate composition” and “chocolate” will be used interchangeably herein to refer to a substantially homogeneous and fat-continuous composition, typically comprising a mixture of cocoa liquor and/or cocoa powder, cocoa butter and/or cocoa butter replacers, equivalents, improvers, and/or substitutes, sugar and/or sugar replacers plus one or more optional ingredients such as emulsifiers and flavoring agents. Although, they should not be interpreted as being limited to any particular legal definitions of chocolate, in one aspect of the invention, the chocolate composition will be a chocolate product as defined in Directive 2000/36/EC of the European Parliament and of the Council of 23 June 2000.

[0012] The chocolate composition according to the present invention comprises cocoa solids in an amount of at least 30 weight%, preferably at least 33 weight%, more preferably at least 35 weight%. In one aspect, the composition of the invention will comprise 30-95 weight%, preferably 30-75 weight%, more preferably 30-55 weight% cocoa solids.

[0013] The term “cocoa solids” as used herein may refer to any component derived from cocoa beans such as, but not limited to, cocoa liquor, cocoa powder and/or cocoa butter.

[0014] Cocoa liquor, also called “cocoa mass”, is produced from ground cocoa beans. Prior to or after grinding, the beans may be fermented, dried, roasted, alkalized and/or treated

using any other technique known in the art. The chocolate composition of the present invention will preferably comprise 5-30 weight%, more preferably 10-25 weight%, more preferably 15-25 weight%, more preferably 18-22 weight% cocoa liquor.

[00015] Cocoa butter is the fat extracted from cocoa beans, typically by pressing the cocoa liquor. Cocoa butter may be deodorized to remove strong or undesirable tastes. Advantageously, the composition will include not less than 18 weight%, preferably not less than 20 weight%, more preferably not less than 25 weight% cocoa butter and/or cocoa butter alternatives. Indeed, cocoa butter may be replaced, in whole or in part, by cocoa butter alternatives. Cocoa butter alternatives are well known in the art and include cocoa butter replacers, cocoa butter equivalents, cocoa butter improvers, and cocoa butter substitutes. They are typically vegetable fats and/or vegetable fat fractions with similar physical or chemical properties to cocoa butter.

[00016] Cocoa powder is produced by further grinding or milling the “dry” residue obtained from cocoa liquor after pressing. It may be natural cocoa powder, with a pH of around 5.5, or it may be processed (e.g. treated with alkali or acid). It may have a relatively high fat content, e.g. above 15 weight% residual cocoa butter, a standard fat content (e.g. 10-15 weight% cocoa butter), or a low fat content (less than 10 weight% cocoa butter). Fat-free cocoa powders may also be used (e.g. with a fat content of less than 2 weight%).

[00017] The chocolate composition according to the present invention further comprises milk solids in an amount of less than 5 weight%, preferably in an amount of less than 4 weight%, more preferably less than 3 weight%, more preferably less than 2 weight%, more preferably less than 1 weight%. Milk solids according to the present invention may be defined as any dry component derived from milk such as, but not limited to, milk fat or fractions thereof, lactose, skimmed or whole milk powder, whey, whey powder, caseinate, and/or milk hydrolysate. As used herein, “milk” refers to milks of mammalian origin (e.g. non-human milks such as cow, buffalo, sheep, and/or goat milk). In one aspect, the chocolate composition of the invention will be substantially free of milk solids.

[00018] The compositions of the invention will also be carob-free. What’s more, although they may be used to produce foodstuffs comprising fillings or inclusions, the chocolate compositions themselves will not include such components. Indeed, the compositions of the invention will preferably be homogenous (or “continuous”) chocolate compositions, i.e. with a consistent texture and structure throughout. The compositions will

preferably be moldable compositions. As used herein, the term “moldable” refers to a composition that is capable of being formed into a shape in a mold, setting (preferably at room temperature), and then retaining the molded shape after removal of the mold. Thus, the compositions of the invention will preferably not be in the form of a powder or of a particulate material. Furthermore, the compositions of the present invention will preferably have a water content of less 10% by weight based on the total weight of the composition. More preferably, they will have a water content of less 5%, more preferably less than 3%, more preferably less than 2%, more preferably less than 1% by weight.

Plant-Based Protein

[00019] The chocolate composition according to the invention comprises 0.5-15 weight%, preferably 1-10 weight%, more preferably 2-5 weight% plant-based protein, provided however that the plant-based protein does not comprise soy protein.

[00020] The term “plant-based protein” as used herein refers to proteins originating from any plant source except for soy. It will also be understood not to include any protein content incidentally present in the cocoa solids – in other words, the plant-based protein of the invention is a non-cocoa plant-based protein.

[00021] The plant-based protein may be added to the chocolate composition of the invention in the form of a powder or paste of a whole plant, or of a specific plant part (such as the seed or the fruit), or as a protein concentrate or isolate from the plant. Preferably, the plant-based protein will be from a source which is rich in protein (i.e. having a protein content of at least 10 weight%). Examples of suitable plant sources include, but are not limited to, legumes, cereals, grains, nuts and combinations of two or more thereof.

[00022] “Legumes” are plants from the family of *Fabaceae*, also called Leguminosae. Legumes suitable for use according to the present invention include but are not limited to alfalfa, clover, beans (including for example fava beans), peas, chickpeas, lentils, lupins, mesquite, carob, soybeans, peanuts, and tamarind.

[00023] “Cereals and grains” are plants of the family of *Poaceae* and include amongst others maize, oat, wheat, rice, barley, and millet. According to the present invention, suitable “cereals and grains” may also include pseudo-cereals such as buckwheat (*Polygonaceae*), quinoa (*Amaranthaceae*) and chia (*Lamiaceae*).

[00024] Suitable “nuts” may include, amongst others, hazelnuts (*Corylus*), chestnuts (*Castanea*), almonds (*Prunus dulcis*), pecans (*Carya illinoensis*), pistachios (*Pistacia vera*), walnuts (*Juglans*) and Brazil nuts (*Bertholletia excelsa*).

[00025] In one preferred aspect of the invention the plant-based protein in the chocolate composition is pea protein. Pea protein may be present in the chocolate composition in the form of pea protein isolate, pea protein concentrate, whole pea powder, extruded micronized pea powder, hydrolyzed pea protein or the like. It may also be roasted (e.g. in the form of roasted pea powder) prior to use. Concentrates and pea protein isolates are defined in terms of their protein content. “Pea protein concentrates” have a total protein content of 60 to 75% on a dry weight basis, while “pea protein isolates” have a total protein content of 90 to 95% on a dry weight basis. “Pea protein hydrolysates” are preparations obtained by enzymatic and/or chemical hydrolysis of pea protein. Protein hydrolysates consist of a mixture of peptides of different sizes and free amino acids.

Plasticizer Ingredient

[00026] The chocolate composition of the invention is further characterized in that it comprises 0.5-10 weight% of a plasticizer ingredient. Preferably, the plasticizer ingredient will be present in the chocolate composition in an amount from 1.0 to 9 weight%, more preferably from 1.5 to 8 weight%, more preferably from 2 to 7 weight%, more preferably from 2.5 to 6 weight%.

[00027] Without wishing to be bound by theory, it is believed that the plasticizer ingredient will perform, at least in part, a comparable function in the chocolate composition of the invention to milk fat in a traditional milk chocolate. In particular, it has been found that the plasticizer ingredient will result in the chocolate composition having a less brittle structure and a more creamy mouthfeel.

[00028] In one aspect of the invention the plasticizer ingredient may be a liposoluble ingredient from a vegetable source, including vegetable fats and oils. Preferably, the plasticizer will be a vegetable fat or oil (such as palm or palm kernel oil, or shea butter) with a melting point below that of cocoa butter. More preferably, it will be selected from the group consisting of liquid oils, randomized fats and combinations of two or more thereof.

[00029] Liquid oils are oils that remain liquid at room temperature. The liquid oils used in accordance with the present invention will preferably be vegetable liquid oils, that is,

liquid oils from a vegetable source. Suitable vegetable sources include, by way of example only, almonds, pine nuts, pistachios, cashews, peanuts, hazelnuts, sesame seeds, sunflower seeds, high-oleic sunflower seeds, rapeseeds or mixtures of two or more thereof. They may also include specific varieties of cocoa beans that produce particularly soft cocoa butter such as Brazilian cocoa bean. When using such “soft” cocoa beans as plasticizers, both cocoa butter and/or cocoa liquor may be used. These will then also contribute cocoa solids to the overall composition.

[00030] The oils may be used as such – that is as oils extracted through pressing or other known methods from their source – or they may be incorporated into the chocolate composition in the form of a paste produced by grinding the source (e.g. a nut paste). Preferably the liquid oil will be present in the chocolate composition in an amount of 0.5 to 5 weight%, more preferably in an amount of 0.5 to 3 weight%, more preferably from 1 to 2 weight%. When incorporated in the form of a paste, sufficient paste will be added to achieve the preferred liquid oil content(s) as specified above.

[00031] In a specific aspect of the present invention, the plasticizer ingredient will comprise or consist of almond oil and/or hazelnut oil which will advantageously be added to the chocolate composition in the form of an almond and/or hazelnut paste.

[00032] The plasticizer ingredient may also comprise or consist of randomized fats. The term “randomized fat” as used herein refers to triglyceride compositions comprising long chain and/or short chain fatty acids that are randomly distributed over the glycerol backbones of the triglycerides. Long chain fatty acids are defined as fatty acids with 16 to 24 carbon atoms. Short chain fatty acids are defined as fatty acids with 4 to 14 carbon atoms. The ratio between long chain and short chain fatty acids in the randomized fats may range from 20/80 up to 80/20. Preferably, the ratio will be from 30/70 to 70/30, more preferably from 40/60 to 60/40. Alternatively the triglyceride composition of the randomized fat may consist only of long chain fatty acids that are randomly distributed over the triglyceride backbone. These long chain fatty acids may be saturated fatty acids (S) or unsaturated fatty acids (U). Randomized fats may be obtained by chemical and/or enzymatic interesterification or by any other method available to a person skilled in the art. Randomization may be complete or partial. A partially randomized fat is a fat which has not been allowed to react to achieve its fully converted state for a given set of reaction conditions.

[00033] In one aspect of the present invention, the randomized fat may be a randomized cocoa butter. Randomized cocoa butter may be obtained by chemical or enzymatic interesterification. It may also be obtained by deodorizing the cocoa butter for a long time (1 to 4 hours) at extremely high temperatures (above 235°C).

[00034] Preferably the randomized fat will be present in the chocolate composition in an amount of 0.5 to 5 weight%, more preferably in an amount of 0.5 to 3 weight%, more preferably from 1 to 2 weight%.

[00035] Advantageously, liquid oils and/or randomized fats used in accordance with the present invention will not comprise any hydrogenated fat. Preferably, the plasticizer ingredient will not comprise any hydrogenated fat. Hydrogenation is a well-known process to the person skilled in the art. During the hydrogenation process, unsaturated fatty acids present in oil and/or fat are reacted with hydrogen in the presence of a nickel catalyst and the double bonds of the unsaturated fatty acids are turned into saturated single bonds. Hydrogenation is mostly applied to give a harder structure and a higher melting point to the fat and/or oil.

[00036] Preferably, emulsifiers such as lecithin and/or PGPR will not be used as plasticizers. Thus, the plasticizer ingredient will preferably be present in addition to any such emulsifiers.

Bulking Ingredient

[00037] The chocolate composition of the present invention may also comprise a bulking ingredient. The bulking ingredient will preferably be included in an amount of 0.5 to 15 weight%, preferably in an amount of 2 to 12 weight%, more preferably in an amount of 4 to 10 weight%. The bulking agent may be selected from the group consisting of oligosaccharides, polysaccharides, soluble dietary fibres, insoluble dietary fibres and mixtures of two or more thereof.

[00038] Oligosaccharides are saccharide polymers containing a small number, typically three to ten, of monosaccharides. Suitable oligosaccharides for use in the present invention include fructo-oligosaccharides (FOS). FOS are short chains of fructose molecules found in many vegetables. They are considered soluble dietary fibres. Another type of suitable oligosaccharides is galacto-oligosaccharides (GOS), which also occur naturally. They consist of short chains of galactose molecules. These compounds cannot be digested in

the human small intestine, and instead pass through to the large intestine, where they promote the growth of Bifidobacteria, which are beneficial to gut health.

[00039] Suitable polysaccharides include glucose polymers such as starch, and starch-derivatives such as glucose syrup, maltodextrin and dextrin. Fructans and inulin are further examples of suitable polysaccharides. These are polymers of fructose with a much higher degree of polymerization than FOS. They are also considered soluble dietary fibres. Another example of soluble fibre suitable for use in the present invention is polydextrose which is obtained by thermal polymerisation of dextrose. Suitable polysaccharides may also include agar, galactomannans such as guar gum, locust bean gum, and amylopectins, pectin and combinations of two or more of the above.

[00040] Suitable insoluble fibres may be selected from the group consisting of resistant starches, cereal fibres, fruit fibres, fibres of legumes and mixtures of two or more thereof.

[00041] Preferably, the bulking ingredient will be selected from the group consisting of vegetable fibres, dextrin, maltodextrin, polydextrose, inulin, dehydrated grain syrups, pectin, and mixtures of two or more thereof.

[00042] Alternatively, the bulking agent will include or consist of vegetable fibres selected from the group consisting of cereal and grain fibres, fruit fibres and mixtures of two or more thereof, preferably rice fibres, pea fibres, coconut fibres, soy fibres and mixtures of two or more thereof.

[00043] The chocolate composition of the present invention may also comprise other ingredients such as emulsifiers and/or flavourings. Emulsifiers suitable for use in the present invention will be well known to a person skilled in the art and may include, by way of example only, lecithin, PGPR and/or variants thereof such as hydrolysed or PC-enriched (or phosphatidylcholine-enriched) lecithin. Flavourings may include, but are not limited to, vanilla flavour, vanillin, caramel flavour, and the like.

Sweeteners

[00044] The chocolate composition will preferably include one or more sweeteners. These may be selected from caloric sweeteners such as sucrose and/or non- or low-caloric sweeteners. Non- and low-caloric sweeteners include, without limitation, high intensity sweeteners such as aspartame, saccharin, and steviol glycosides, and sugar alcohols. Sugar

alcohols (also called polyols), include amongst others sorbitol, mannitol, xylitol, maltitol, maltitol syrup, lactitol, erythritol, isomalt and hydrogenated starch hydrolysates.

[00045] Preferably, the confectionary composition will not include maltitol, lactitol, and/or erythritol in an amount of more than 30 weight%, more preferably not in an amount of more than 20 weight%, more preferably not in an amount of more than 10 weight%, more preferably not in an amount of more than 5 weight%. Advantageously, it will contain substantially no maltitol, lactitol, and/or erythritol. In one aspect, it will not include any sugar alcohols. In another aspect, the composition will not include any high intensity sweeteners. In another aspect, it will not include any non- or low-caloric sweeteners.

[00046] Preferably, the sweetener will consist of sucrose. The amount of sucrose in the chocolate composition will preferably be at least 30 weight%, more preferably at least 30.5 weight%, more preferably at least 32 weight%, more preferably at least 35 weight%.

[00047] In one aspect of the invention the chocolate composition comprises at least 30 weight% of cocoa solids and less than 0.2 weight% of milk solids, characterized in that it further comprises 0.5-15 weight% plant-based protein, 0.5-10 weight% of a plasticizer ingredient and at least 30 weight% of sucrose, wherein the composition is free from soy protein.

[00048] In another aspect of the invention, the chocolate composition comprises at least 30 weight% of cocoa solids and less than 2 weight% of milk solids, characterized in that it further comprises 0.5-15 weight% plant-based protein and 0.5-5 weight% of a liquid oil and/or a randomized cocoa butter, wherein the composition is free from soy protein.

[00049] In yet another aspect of the invention, the chocolate composition comprises at least 30 weight% of cocoa solids and less than 2 weight% of milk solids, characterized in that it further comprises 0.5-15 weight% plant-based protein, 3-8 weight% maltodextrin and 2-5 weight% of a liquid oil and/or a randomized cocoa butter, wherein the composition is free from soy protein.

[00050] Advantageously, the chocolate composition according to the invention shows very similar properties to milk chocolate. Along with the cocoa butter, milk solids are responsible for some of the most important properties of milk chocolate products. These properties include its sensory qualities, it's (creamy mouth feel and snap, for instance, or its quicker melting behavior compared to dark chocolate. It was found that the chocolate composition according to the invention, although not brittle, maintains the desired snappy

effect when broken or bitten into. Additionally, it was found to have a creamy eating sensation that is comparable to that of milk chocolate.

[00051] The chocolate composition of the present invention can be produced by any conventional method for making chocolate known to the skilled person. The cocoa solids and other ingredients of the chocolate composition according to the invention are mixed, ground and conched substantially in the same manner one would produce chocolate, using any methods known to those of skill in the art of chocolate making. Once the chocolate composition is processed, it can be placed in molds, or otherwise formed or applied in and/or onto food products as is known in the art.

Food Products

[00052] As such, the present invention further relates to food products comprising chocolate compositions as described herein. These food products will preferably be bakery products and/or confectionary products but could also include other dairy-free or dairy-reduced food products (termed “dairy alternative” products).

[00053] A “bakery product” can be defined as any food product wherein flour is used to produce a dough or a batter. Examples of bakery products are, without limitation, breads such as bagels, buns, rolls, biscuits and loaf breads; cookies; brownies; muffins; desserts such as cakes, cheesecakes and pies; snack cakes; sweet goods such as doughnuts, Danish, sweet rolls, cinnamon rolls and coffee cake.

[00054] A “confectionary product” is a food item that is rich in sugar. Confectionary products may be amongst others candies, candied nuts, candy bars, caramels, chocolates, chocolate bars, chocolate drops, chocolate in the form of hollow figures or any desired shape, filled chocolate bars, pralines, truffles, cereal bars, chewing gum, pastillage, and other confections that are made primarily of sugar.

[00055] A “dairy-alternative” product is an alternative for products traditionally based on milk such as but not limited non-dairy beverages; frozen desserts like ice cream; and other chilled desserts; non-dairy alternatives for cultured dairy such as yoghurt, cream and fresh or cream cheeses; and dairy alternatives for custard-based desserts.

[00056] Chocolate compositions of the invention may be used in food products in any form such as melted and mixed into the recipe of the end product, in the form of fillings, inclusions, toppings or coatings, molded around other discrete ingredients such as nuts, fruit,

dried fruit, biscuits or biscuit pieces, candy pieces or shapes, and the like, or any combination of two or more thereof. Thus, the present invention also relates to bakery products, confectionery products, and frozen or chilled desserts comprising the chocolate compositions of the present invention as a filling, inclusion, topping and/or coating, and to confectionery products comprising the chocolate compositions of the present invention together with one or more discrete ingredients.

EXAMPLES

[00057] A number of samples (1-14) were prepared using the recipes shown in Table 1, below. The ingredients used are described in Table 2.

[00058] The dry ingredients (including any bulking agents and vegetable protein ingredients), the cocoa liquor and a part of the cocoa butter were mixed together for 10 minutes in a Hobart mixer at a temperature of 45 to 50°C. The cocoa butter addition was adapted on a case-by-case basis to get a correct texture for refining. Optimal fat content in the mixer was 25-26%.

[00059] The resulting chocolate paste was then refined in a Bühler three roll refiner, in order to produce refiner flakes having a reduced particle size between 18 and 24µm.

[00060] The refiner flakes were then dry-conched for 6 hours at a temperature of 65°C in a 5kg batch Bühler Elkolino monoshaft conche running clockwise at a rotor speed of 1000 rpm. Additional cocoa butter was added when needed during the filling of the conche, in order to ensure a proper mechanical shearing and a good flavour development. At the end of the dry conching, any remaining cocoa butter and PGPR was added to the conche. The mixture was then wet-conched for 30 min at 1500rpm counter-clockwise at a temperature of 45°C. The chocolate mass was then unloaded.

[00061] Plasticizer ingredients were added into the chocolate mass manually in a bucket after conching to avoid contaminating the conching equipment with potential allergens like e.g. nuts. If necessary, viscosity and yield value of the resulting chocolate were adjusted by adding further cocoa butter and/or emulsifiers (resulting in the total amounts indicated in Table 1).

[00062] After adjustment of the rheology, the chocolate underwent a hand tempering process and was moulded into bars. Tempering involves the controlled heating and cooling of

the mixture to selectively cause the crystallisation of the cocoa butter in the preferred crystalline form V.

[00063] Several of the obtained chocolates were then analysed to determine viscosity, yield value and colour using the methods described below. The results are shown in Table 3.

ANALYTICAL METHODS

Particle Size

[00064] A small amount of finished chocolate is placed on the measuring surface of a Mitutoyo micrometer (0-25mm). By pressing, an indication of the size of the largest non-compressible particles can be measured.

Colour

[00065] Color values are expressed as Hunter L, -a and -b values, where the L value represents the “brightness” of the product (black/white scale), the “a” value represents the amount of green/red and the “b” value represents the amount of yellow/blue. The quotient of “a” over “b” represents the redness of the product. The following procedure is used to determine the color value of chocolate.

[00066] A small amount of chocolate at 50°C is poured into an optically neutral petri dish (diameter 55mm) right to the top. The petri dish is then placed on a calibrated spectrophotometer Minolta CM2500D (Illuminant D65, 10° observer, read values in Hunter L -a and b values, software Minolta SPECTRA MAGIC version 1.00). The L, a and b-values of the chocolate sample are then measured and recorded following the manufacturer’s instructions.

Flow Properties

[00067] The flow behaviour of the chocolate is measured by the ICA-Method 46 – 2000 - Viscosity of Cocoa and Chocolate Products using a rheometer RM200 (Lamy Rheology Instruments, Champagne au Mont d’Or, France). It is a shear-rate imposed rheometer whereby its speed ranges from 0.3 to 1500rpm and the torque from 0.05 to 30 mNm. The temperature of the measuring cell is kept at 40°C. A small amount of chocolate is brought into the tube. After pre-shearing the chocolate for 10 min at 5s⁻¹, a stepped flow procedure is applied by increasing and decreasing the shear rate while measuring the shear

stress. The Casson model is used to define Casson Yield stress and Casson Viscosity for recipes with a fat content below 38%. For recipes with a fat content higher than 38% a polynomial model is used.

Table 1: Recipes

Ingredients (%) / Sample no.	1	2	3	4
WAF Cocoa Liquor	19.51	19.55		19.56
WAF Cocoa Butter	32.36	32.42		32.44
Soft cocoa butter			33.12	
Soft cocoa liquor			20.23	
Sugar	37.21	37.29	38.59	37.31
Rice proteins	2.86			
Pea proteins		2.86	2.96	2.86
Pea fibers				4.1
Maltodextrin		4.10	4.24	
Dried rice syrup	4.09			
Almond paste	2.86	2.86		2.86
Vanillin	0.01	0.01	0.01	0.01
PGPR	0.13	0.05	0.05	0.05
Hydrolyzed lecithin	0.98			
Soy lecithin		0.86	0.79	0.79
TOTAL (%)	100	100	100	100
Theoretical fat content (%)	45.55	45.24	44.89	45.40

Table 2: Ingredients

Ingredient Name	Ingredient Detail / Origin	Function
WAF Cocoa Liquor	Rain Forest Alliance West African cocoa liquor / Cargill	Cocoa Solids
WAF Cocoa Butter	Rain Forest Alliance West African cocoa butter / Cargill	Cocoa Solids
Sugar	Standard icing sugar	Sweetener

Rice proteins	Rice proteins Remypro N80+/ Beneo	Protein
Pea proteins	Pea protein isolates Pisane® B9/ Cosucra	Protein
Soft cocoa butter	Brazilian soft deodorized cocoa butter / Cargill	Plasticizer + Cocoa Solids
Soft cocoa liquor	Brazilian soft deodorized cocoa liquor / Cargill	Plasticizer + Cocoa Solids
Almond paste	Almond milk paste / Di Bartolo	Plasticizer
Pea fibers	Pea fibre Swelite® / Cosucra	Bulking Agent
Maltodextrin	Maltodextrin C Dry™ MD01915/ Cargill	Bulking Agent
Dried rice syrup	Dehydrated rice syrup Sipadry-rice 32/ Meurens Natural	Bulking Agent
Vanillin	Vanillin / Prova	Flavor
PGPR	Polyglycerol polyricinoleate Radamuls Poly 2253K/ Oleon	Emulsifier
Hydrolized lecithin	Soya lecithin Topcithin NGM/ Cargill	Emulsifier
Soy lecithin	Soya lecithin Epikuron 135 F IP/ Cargill	Emulsifier

Table 3: Measurements

Sample	2	4
Viscosity	0.359	0.36
Yield Value	1.46	1.64
L	38.73	39.76
a	8.86	9.05
b	10.39	11.15

CLAIMS

1. A chocolate composition comprising at least 30 weight% of cocoa solids and less than 5 weight% of milk solids, based on the total weight of the chocolate composition, characterized in that it further comprises 0.5-15 weight% plant-based protein and 0.5-10 weight% of a plasticizer ingredient, wherein the composition is free from soy protein.
2. A chocolate composition according to claim 1, characterized in that the plant-based protein is selected from the group consisting of a legume, cereal, grain, and nut protein and combinations of two or more thereof.
3. A chocolate composition according to claim 1 or claim 2, characterized in that the plant-based protein is pea protein.
4. A chocolate composition according to any of claims 1 to 3, characterized in that the plasticizer ingredient is a liposoluble ingredient from a vegetable source.
5. A chocolate composition according to any of claims 1 to 4, characterized in that the liposoluble ingredient is selected from the group consisting of liquid oil, randomized fats and combinations of two or more thereof.
6. A chocolate composition according to claim 5, characterized in that the fats are non-hydrogenated fats.
7. A chocolate composition according to claim 5 or claim 6, characterized in that the liquid oil is selected from the group consisting of oils sourced from almonds, pine nuts, pistachios, cashews, hazelnuts, peanuts, sesame seeds, sunflower seeds, high-oleic sunflower seeds, rapeseeds and mixtures of two or more thereof.
8. A chocolate composition according to any one of claims 1 to 7, characterized in that the composition further comprises a bulking ingredient selected from the group

consisting of oligosaccharides, polysaccharides, soluble dietary fibres, insoluble dietary fibres and mixtures of two or more thereof.

9. A chocolate composition according to claim 8, characterized in that the bulking ingredient is selected from vegetable fibres, dextrin, maltodextrin, polydextrose, inulin, dehydrated grain syrups, pectin and mixtures of two or more thereof.
10. A chocolate composition according to claim 8 or claim 9, characterized in that the vegetable fibres are selected from the group consisting of: cereal or grain fibres, fruit fibres and mixtures of two or more thereof, preferably rice fibres, pea fibres, coconut fibres soy fibres and mixtures of two or more thereof.
11. A chocolate composition according to any of the preceding claims, characterized in that it further comprises sucrose.
12. A chocolate composition according to any of the preceding claims, characterized in that it is substantially free from milk solids.
13. A chocolate composition according to any of the preceding claims, characterized in that it does not contain maltitol and/or erythritol.
14. A carob-free chocolate composition according to any of the preceding claims.
15. A food product comprising the chocolate composition according to any of the preceding claims and one or more further ingredients.