

INGREDIENT COMPOSITION

FIELD OF THE INVENTION

The invention relates to ingredient compositions in dry form encapsulated with a fat coating and the use of said ingredient compositions in food products. In particular, the invention relates to the use of said ingredient compositions to provide delayed release of ingredient(s) from the ingredient composition when consumed and/or cooked.

BACKGROUND OF THE INVENTION

Consumers are constantly looking for food products having improved organoleptic properties and sensory properties. There is also an increasing demand for foods, especially plant-based food, due to consumer's increasing desire to eat healthy, sustainably sourced food products and to generally lower their meat and dairy intake. There is also an increasing number of vegans who require food products to be completely absent of animal-derived products for ethical and health reasons. This has led to the development of various plant-based food products such as plant-based meats (meat analogue compositions) and plant-based dairy (dairy analogue compositions) which aim to mimic certain qualities of the animal-derived meat and cheese products, such as the texture, taste and/or appearance.

For example, the typical composition of known meat-analogues include water, proteins (such as soy, pea, potato and wheat), fat, carbohydrates, as well as flavourings and colourings. In order to produce a desirable meat-analogue, it is important that the final product has an appealing taste, texture and mouthfeel, and has similar taste, texture and mouthfeel to meat. Such properties are generally affected by the nature of the fat included in the meat analogue composition. The nature of the fat in meat analogue compositions also typically has an effect upon juiciness of the compositions and upon flavour release as the fats often function as carriers for fat soluble flavours. The nature of the fat is also important for providing visual similarity to meat products. In particular, the nature of the fat is also important for providing a visual marbling aspect for products such as plant-based sausages, plant-based pepperonis and meat balls.

For example, in dairy analogue compositions, the typical content of a cheese analogue composition is plant-based fat, starch, non-animal protein and water, along with additives such as flavourings and colourings. Typically, the total amount of starch and non-animal protein present in the compositions remains constant between different cheese analogue compositions. Softer cheese analogue compositions such as spreads and soft cheeses will typically contain relatively more water and less starch and protein, with the opposite being the case for hard cheese analogues.

Thus, to obtain the desired properties of a food products, especially plant-based food products, the conventional processes used include combining the usual ingredients with different fats and/or slightly modifying the ingredients, in particular the amounts of ingredients.

- 5 However, the inventors have found that the conventional food products, mainly based on the nature of fat and/or the content of other ingredients, have their limits in terms of organoleptic properties. Indeed, although slightly modifying a food composition as well as the nature of the fat provide the desired food product, it is difficult to further improve organoleptic properties of a food product, such as the browning and/or the juiciness of a meat food product; or the taste
10 and/or flavour of a dairy food product, to provide a high-quality food product reaching the consumers expectations.

In recent developments, it has been found that using alkali ingredients, optionally encapsulated, to provide a browning effect can address and/or alleviate many of the problems discussed above.

- 15 PCT/SE2022/050771 discloses a meat analogue composition comprising from 2.0% to 20.0% by weight of a fat composition; from 5.0% to 30.0% by weight of a non-animal protein; from 30.0% to 70.0% by weight of water; from 0.01% to 5% by weight of one or more colourants; and from 0.005% to 5% by weight of one or more alkali ingredients. In one embodiment, the one or more alkali ingredients are encapsulated within a fat matrix of the fat composition. In
20 Example 2 of PCT/SE2022/050771, a meat analogue composition was prepared and formed into a plant-based burger. The meat analogue composition comprised a fat matrix, made of an interesterified blend of 70 wt.% shea butter and 30 wt.% coconut oil, wherein 6wt.% of sodium bicarbonate were encapsulated.

- Nevertheless, even though the organoleptic properties, i.e. browning effect, originated from
25 the alkali ingredients provided the desired food product, a higher quality food product has not been reached.

- There remains a need for providing an ingredient composition that solves or alleviates many of the problems discussed above such as to amplify, i.e. to intensify, the effect of the ingredients, especially used in food products. Furthermore, it would be also convenient to
30 provide a high quality food product having improved organoleptic properties when compared to conventional food products.

SUMMARY OF THE INVENTION

According to a first aspect of the invention, there is provided an ingredient composition comprising one or more ingredients in dry form encapsulated with a fat coating comprising

from 20% to 85% by weight of saturated fatty acid residues; from 10% to 50% by weight of stearic acid residues (C18:0); and from 2% to 35% by weight of lauric acid residues (C12:0); wherein said percentages of fatty acid residues refers to fatty acids bound as acyl groups in glycerides in the fat coating and being based on the total weight of C4 to C24 fatty acid residues bound as acyl groups present in the fat composition; wherein

- (i) the fat coating has a solid fat content (SFC) N40 of less than 15, measured on unstabilised fat according to ISO 8292-1, preferably from 0,5 to 5, and more preferably from 1 to 3; or preferably from 6 to 12, and more preferably from 8 to 12;
- 10 (ii) the fat coating has a solid fat content (SFC) N20 of from 20 to 65, preferably from 25 to 40, more preferably from 25 to 35; or preferably from 41 to 60, more preferably from 50 to 58 as measured on the unstabilised fat according to ISO 8292-1; and/or
- 15 (iii) the fat coating has a solid fat content (SFC) N30 of from 5 to 35, preferably from 6 to 20, more preferably from 6 to 15; or preferably from 21 to 35, more preferably from 27 to 35 as measured on the unstabilised fat according to ISO 8292-1; and

wherein the weight ratio of the fat coating with respect to the ingredient composition is of from 5,0:1,0 to 15,0:1,0.

The present invention is based upon the surprising finding that the ingredient composition solves or alleviates many of the problems discussed above associated with conventional food products. The inventors have found that when the weight ratio of the fat coating with respect to the ingredient composition is of from 5,0:1,0 to 15,0:1,0; the fat coating and the one or more ingredients collaborate together to amplify the effect of the one or more ingredients when compared to a non-coated ingredient composition; one or more ingredients coated with the same fat coating and wherein the weight ratio of the fat coating with respect to the ingredients is above 15,0:1,0, such as from 25,0:1,0 to 35,0:1,0; and/or one or more ingredients coated with the same fat coating and wherein the weight ratio of the fat coating with respect to the ingredients is below 5,0:1,0, such as from 1,0:1,0 to 3,0:1,0. Indeed, in PCT/SE2022/050771, a meat analogue composition comprising a fat matrix, made of an interesterified blend of 70 wt.% shea butter and 30 wt.% coconut oil, wherein 6wt.% of sodium bicarbonate was encapsulated such that the weight ratio of the fat matrix with respect to the sodium bicarbonate was of 16,67. The inventors have found that the weight ratio of 16,67 cannot provide high organoleptic properties, and therefore cannot provide desired high quality food products.

It has been found that the use of the fat coating according to the present invention in place of conventional fats, such as coconut oil or liquids oils such as sunflower oil or rapeseed oil, also

has a positive effect on the taste of the food products when consumed or cooked. In particular, it has been found that the fat coating provides a desirable “longer” flavour release when compared to compositions containing coconut oil or liquids oils. Without being limited by any particular theory, this is believed to be due to the fat coating containing higher amounts of solid fat at mouth temperatures of 30°C to 35°C. A further advantage of the fat coating for use in the invention is that since it has a higher melting point than coconut oil and liquids oils such as sunflower oil or rapeseed oil, where it is desired to include solid fat particles in the food products, processing can be done at higher temperatures than coconut oil or liquids oils without the fat particles melting.

Furthermore, it has been found that the fat coating of the present invention has an improved nutritional profile relative to coconut oil due to having lower amounts of saturated fatty acid residues. Surprisingly, the fat coating when compared to coconut oil has been found to not negatively affect, and in some cases improve various properties of food products such as various sensory properties of the food products, for example the juiciness. It has been found that the fat coating with improved nutritional profile provides improved sensory properties of food products when consumed or cooked, in comparisons to food products comprising an equivalent amount of coconut oil. Furthermore, it has been found that the fat coating provides improved sensory properties of food products when consumed or cooked, in comparisons to food products comprising an equivalent amount of sunflower oil and rapeseed oil due to the liquid nature of the oils. A further advantage of the fat coating compared to coconut oil is easier processability and manufacture. The fat compositions thus improve both the nutritional value and sensory properties of the finished food products.

Additionally, the inventors have surprisingly found that by encapsulating the one or more ingredients, the one or more ingredients are substantially prevented from being degraded until consumption or cooking of the product, and that the one or more ingredients can remain intact until the point of consumption or cooking at which point the coating of the encapsulated one or more ingredients is broken down providing a tasty food product. It is believed that the ingredient composition collaborates with the other ingredients of the food product so as to obtain a specific chemical reaction or to prevent or delay a specific chemical reaction leading to the enhancement of the effect of the one or more ingredients. In some cases, it is believed that the released one or more ingredients may affect the other ingredients of the food product by modifying the texture and the structure of the food product so that the amplified effect of the one or more ingredients render the food product more succulent.

Typically, the ingredient composition including one or more ingredients coated with the fat coating according to the present invention refers to a separate product or an individual entity. Preferably, the weight ratio of the fat coating with respect to the ingredient composition is of

from 10,0:1,0 to 15,0:1,0; or from 5,0:1,0 to 10,0:1,0; and more preferably of from 13,0:1,0 to 15,0:1,0; or from 6,0:1,0 to 9,0:1,0. Without willing to be bound by any theory, the inventors have surprisingly found that within this specific ratio the effect of the ingredient composition reaches its optimum. Thus, the one or more ingredients are substantially prevented from being degraded until consumption or cooking of the product, and that the one or more ingredients can remain intact until the point of consumption or cooking at which point the coating of the encapsulated one or more ingredients is broken down and the food product simultaneously inherits the effect of the ingredient improving the sensory properties of the food product.

Fat coating

- 10 The term "fat" as used herein refers to glyceride fats and oils containing fatty acid acyl groups and does not imply any particular melting point. The term "oil" is used synonymously with "fat" herein.

- The term "fatty acid", as used herein, refers to straight chain saturated or unsaturated (including mono- and poly unsaturated) carboxylic acids having 4 to 24 carbon atoms. A fatty acid having x carbon atoms and y double bonds may be denoted C_x:_y. For example, palmitic acid may be denoted C₁₆:₀, oleic acid may be denoted C₁₈:₁. Percentages of fatty acids in compositions referred to herein include acyl groups in tri-, di- and monoglycerides present in the glycerides and are based on the total weight of C₄ to C₂₄ fatty acids. The fatty acid profile (i.e. composition) may be determined, for example, by fatty acid methyl ester analysis (FAME) using gas chromatography according to ISO 12966-2 and ISO 12966.4.

- Triglyceride content may be determined for example based on molecular weight differences (Carbon Number (CN)) by AOCS Ce 5-86. The notation triglyceride CN_{xx} denotes triglycerides having xx carbon atoms in the fatty acyl groups, e.g. CN₅₄ includes tristearin. Amounts of triglycerides specified with each carbon number (CN) as is customary terminology in the art are percentages by weight based on total triglycerides of CN₂₆ to CN₆₂ present in the fat composition.

- Preferably, the fat coating is a water insoluble hydrophobic coating. It is preferable that the fat coating does not breakdown in the presence of water so that the ingredients remain substantially encapsulated and prevented from degrading or interacting with any other ingredients until consumption or cooking.

Preferably, the fat coating is in the form of particles, flakes, granulates, and/or pellets/aggregates.

- More preferably, the fat coating is in the form of particles, flakes and/or granulates with a particle size distribution of from 100µm to 3mm, preferably of from 200µm to 3mm, more preferably of from 400µm to 2mm, and advantageously of from 500µm to 1.3mm. The term

particle size is used in reference to the size of a discrete particle comprising the ingredient and coating. Thus, it is preferable that at least 99% of the coated particles are able to pass through a sieve with a mesh size of from 630 μ m to 2 mm using ASTM E11 method.

Alternatively, the fat coating is in the form of particles, flakes and/or granulates with a particle size distribution of from 1mm to 7mm and preferably of from 2mm to 6mm. In one embodiment, the flakes have a thickness of from 0.2mm to 1.5mm and preferably of from 0.3mm to 0.9mm or of from 0.9mm to 1.3mm; and a diameter of from 1 to 52mm. Without willing to be bound by any particular theory, it is believed that the ingredients can be well dispersed in the food product leading to an improvement of the sensory properties.

As would be appreciated, the particle size distribution refers to the diameter of particles, flakes, granulates present in an amount of at least 80% by weight, preferably at least 85% by weight, and for example of 96% by weight, with respect to the total amount of particles, flakes, granulates, i.e. of 100 % by weight, in a sample to be measured. The distribution of diameters of the granulate described herein can be measured by known methods, including sieve tests such as, ASTM E11, which is a woven wire sieve test.

Reference herein to "diameter" when applied to non-circular (e.g. irregular shaped) granulate or flake corresponds to the largest dimension of the individual granule or flake. When a granulate diameter is measured using a sieve test, such as ASTM E11, the largest dimension may be considered to be the largest sieve size (i.e. wire opening diameter) at which granulate is retained on the sieve.

In another embodiment, the fat coating is in a bulk form. Typically, the fat coating means a sole bulk having a large size, i.e. that the fat matrix is not divided into separate units.

Typically, the fat coating comprises one or more non-animal derived oils such as a vegetable oil. This is desirable so that the ingredient composition used in a food product can be suitable for consumption by vegetarians and vegans.

Preferably, the fat coating comprises from 20% to 70% by weight of saturated fatty acids, and more preferably from 20% to 60% by weight of saturated fatty acids. In some embodiments, the fat coating comprises 65% to 85% by weight of saturated fatty acids. In other embodiments, the fat coating comprises from 20% to 65% by weight of saturated fatty acids. The amount of saturated fatty acid residues present in the fat coating may be tailored so as to provide the specific desired properties of the fat composition. For example, where the fat coating comprises a higher saturated fat content of from 65% to 85% by weight, the fat coating may be particularly useful for providing hard, brittle solid structures of fat. It can be useful for dairy products, or for meat products for which a "marbling effect" is provided to the meat food product. In other embodiments, the fat coatings comprise from 20% to 65% by weight of

saturated fatty acids. Said fat coatings have been found useful in providing the plasticized fat structure effect described above.

Typically, the fat coating comprises from 2 to 12 percent by weight of St2M triglycerides, preferably from 5 to 12 percent by weight of St2M triglycerides. A St2M triglyceride is a triglyceride molecule comprising two stearic acid residues and one residue of either lauric acid or myristic acid. Without being limited by theory, it has been found that fat compositions comprising St2M triglycerides in the amounts specified above aids in providing both the plasticized fat structure effect and the solid brittle structure marbling effect described above. The St2M triglycerides crystallise fast and bind oil well which aids in the provision of the effects discussed above.

Typically, the fat coating comprises from 5 to 35 percent by weight of CN46 and CN48 triglycerides, preferably from 10 to 30 percent by weight of CN46 and CN48 triglycerides. The abbreviation CN stands for the total carbon number of the fatty acid moieties present in the triglyceride molecule. For example, a triglyceride comprising two stearic acid residues and one lauric acid residue would have a total carbon number of 48.

Preferably, the fat coating comprises less than 10% by weight of palm oil, more preferably less than 5% by weight of palm oil, and still more preferably less than 2% by weight of palm oil. Most preferably the composition does not comprise palm oil.

The fat coating preferably is a non-hydrogenated fat composition.

Preferably, the fat coating comprises 20% by weight or less, preferably 10% by weight or less of palmitic acid (C16:0), and more preferably 5% by weight or less of palmitic acid (C16:0).

The fat coating preferably comprises a greater amount of stearic acid than palmitic acid. This is advantageous from a nutritional perspective since stearic acid has a neutral effect upon total cholesterol and LDL cholesterol levels, whereas palmitic acid is known to increase total cholesterol and LDL cholesterol levels. Typically, the fat coating comprises 20% by weight or less, and preferably 10% by weight or less of palmitic acid (C16:0). Typically, the fat coating has a weight ratio of stearic acid (C18:0) to palmitic acid (C16:0) of from 1:1 to 12:1.

Typically, the fat coating has a weight ratio of lauric acid (C12:0) to stearic acid (C18:0) of from 1:4 to 4:1. Preferably, the fat coating comprises from 5% to 25% by weight lauric acid (C12:0); preferably, wherein the fat coating comprises from 5% to 17% by weight lauric acid (C12:0); more preferably, wherein the fat coating comprises from 10% to 17% by weight lauric acid (C12:0). In another preferred embodiment, the fat coating comprises from 15% to 50% by weight stearic acid (C18:0); preferably, wherein the fat coating comprises from 20% to 50% by weight stearic acid (C18:0); more preferably, wherein the fat coating comprises from 30%

to 50% by weight stearic acid (C18:0); advantageously, wherein the fat coating comprises from 35% to 50% by weight stearic acid (C18:0); for example, wherein the fat coating comprises from 40% to 45% by weight stearic acid (C18:0).

5 The fat coating may be made from naturally occurring or synthetic fats, fractions of naturally occurring or synthetic fats, or mixtures thereof, that satisfy the requirements for fatty acids and triglyceride compositions discussed above. Preferably, the fat coating is derived from a blend of naturally occurring fats.

10 Preferably, the fat coating comprises an interesterified fat, and more preferably the fat coating comprises an interesterified fat blend. The interesterified fat or interesterified fat blend may be produced by chemical interesterification, enzymatic interesterification, or a combination thereof.

15 In some embodiments, the interesterified fat or interesterified fat blend is produced by an enzymatic interesterification reaction which does not reach an equilibrium product distribution. It has been found that these embodiments provide a fat coating product with optimum properties for use in a food products, such as the properties discussed above.

Processes for the preparation of the fat compositions such as the interesterification reactions discussed above are known in the art, and are discussed in, for example, Dijkstra, A. J. Interesterification. In: The Lipids Handbook 3rd Edition, pages 285 – 300 (F. D. Gunstone, J. L. Harwood, and A. J. Dijkstra (eds.), Taylor & Francis Group LLC, Boca Raton, FL) (2007).

20 Preferably, the fat coating comprises an interesterified fat blend comprising a vegetable oil high in stearic acid and a vegetable oil high in lauric acid. Preferably, the vegetable oil high in stearic acid is also high in monounsaturated fatty acids such as oleic acids. Accordingly, in typical embodiments, the fat coating comprises an interesterified fat blend comprising at least one fat selected from shea butter, shea stearin, shea olein, cocoa butter, cocoa stearin, cocoa
25 olein, allanblackia fat, kokum fat, mango kernel fat, sal fat, illipe butter, and mixtures thereof; and at least one oil selected from coconut oil, coconut oil stearin, coconut oil olein, palm kernel oil, palm kernel olein, palm kernel stearin, babassu oil, and mixtures thereof.

30 In preferable embodiments, the fat coating comprises an interesterified blend of shea butter and coconut oil or an interesterified blend of shea stearin and coconut oil. For example, in some embodiments, the fat coating comprises an interesterified blend of from 20% to 80% by weight of shea butter and from 20% to 80% by weight of coconut oil. In other embodiments, the fat coating comprises an interesterified blend of from 20% to 80% by weight of shea stearin and from 20% to 80% by weight of coconut oil.

For example, the fat coating comprises a blend of (i) from 20% to 80% by weight of an interesterified blend of from 20% to 80% by weight of shea butter and/or shea stearin and from 20% to 80% by weight of coconut oil; and (ii) from 20% to 80% by weight of sunflower oil.

- Alternatively or in addition, the fat coating comprises a blend of (i) from 20% to 80% by weight of an interesterified blend of from 20% to 80% by weight of shea butter and/or shea stearin and from 20% to 80% by weight of coconut oil; and (ii) from 20% to 80% by weight of rapeseed oil.

Ingredient composition

- Any ingredient for use in food products may be used in ingredient compositions of the invention. Typically, the ingredient composition may comprise one or more ingredients in dry form.

- The term "dry form" used herein is intended to mean that the one or more ingredients comprise less than 10 wt.% water, less than 5 wt.% water, preferably less than 2 wt.% water, more preferably less than 1 wt.% water, even more preferably that it is substantially free from water. In other examples, the a_w of the dry phase is 0.90 or lower, more preferably below 0.80. The one or more ingredients are typically provided in a substantially dehydrated state to reduce microbial growth as far as possible so as to extend shelf life.

- Typically, the one or more ingredients in dry form comprise an acidic ingredient, polyhydroxy compound, alkali ingredient, non-animal protein, stabilizer, coloring additive, flavoring additive, emulsifier, antioxidant, gellant, preservative, starch, thickener, probiotic, vitamin, milk, egg, amino acids, yeast, enzymes, gluten, preservatives, gums, polysaccharides, sweeteners, oxidising agents, plant extracts and/or a combination thereof.

- It will be appreciated that the amount of one or more acidic ingredients will be dependent upon the strength of the one or more acidic ingredients. Typically, stronger acidic ingredients will be included in the ingredient composition in a lower amount whereas weaker acidic ingredients will be included in the ingredient composition in higher amounts. Preferably, the one or more acidic ingredients comprise an inorganic acid, an organic acid or a combination thereof. In one embodiment, the organic acid is selected from citric acid, acetic acid, ascorbic acid, fumaric acid, succinic acid, lactic acid, malic acid, tartaric acid, or a combination thereof. In one embodiment, the inorganic acid is selected from hydrochloric acid, phosphoric acid, sulphonic acid, sulfuric acid, or a combination thereof. The inventors have found that the acidic ingredients improve the juiciness and the mouthfeel of food products, especially meat food products.

Surprisingly, the inclusion of these encapsulated acidic ingredients in food products has been found to improve various properties of food products including juiciness, tenderness and mouthfeel of the compositions. It is believed that the encapsulated acidic ingredients have an enhanced thermal stability leading to stable acidic ingredients. In particular, it has been found

5 that the encapsulated acidic ingredients can act like a juiciness agent to provide a juicy effect upon cooking of the food product similar to that observed in animal meat, whilst also effectively mimicking the texture of animal meat when compared to an analogous food product comprising the same amount by weight of non-encapsulated acidic ingredients or not comprising any acidic ingredients. Indeed, the inventors have surprisingly found that by

10 encapsulating the acidic ingredients, the acidic ingredients are substantially prevented from being degraded until cooking of the product, and that the acidic ingredients can remain intact until the point of cooking at which point the encapsulated acidic ingredients are broken down and the food product product is simultaneously juicy. It is believed that the encapsulated acidic ingredients collaborate with other ingredients of the food product so as to obtain a specific

15 chemical reaction leading to an amount of juice, mainly fat and water, released mimicking the one released by real meat upon cooking. In addition, the sensation of having a greasy coating and moisture on the tongue and surfaces of the mouth, i.e. the mouthfeel, can be felt as well as an instant flavour and taste impression from the water phase and delayed release of flavours from the fat over a longer period of time.

20 Typically, the one or more alkali ingredients comprise a food grade edible alkali ingredient. Typically, the one or more alkali ingredients comprise an alkali metal salt, an alkaline earth metal salt, an ammonium salt, an amine, or a combination thereof. Preferably, the one or more alkali ingredients comprise a hydroxide, carbonate, bicarbonate, chloride, gluconate, acetate or sulfide salt of a sodium, potassium, calcium, magnesium or ammonium cation. More

25 preferably, the one or more alkali ingredients comprise sodium bicarbonate, magnesium bicarbonate, potassium bicarbonate, ammonium bicarbonate, sodium hydroxide, potassium hydroxide, calcium hydroxide, magnesium hydroxide, ammonium hydroxide, or any combination thereof.

It has been found by the inventors that the inclusion of the alkali ingredients sometimes

30 prematurely breaks down known colourants prior to cooking so that the red colour of the uncooked food products, especially meat food products, is lost or degraded merely by storage, and thus by the time the food products are cooked the raw colour has already been lost. In order to solve this problem, the inventors have surprisingly found that by encapsulating the alkali ingredients, the alkali ingredients are prevented from degrading the colourants until

35 cooking of the product, meaning that the raw appearance of the food products can be

maintained until the point of cooking at which point the colourants are broken down as the food products is simultaneously browned.

Furthermore, the alkali ingredients are substantially prevented from interacting with the one or more colourants present in the food products, and preferably completely prevented from
5 interacting with the one or more colourants present in the food products whilst the food products are in uncooked form. Upon cooking or partial cooking, the one or more encapsulated alkali ingredients are released from their encapsulation within the food products such that they are able to interact with the one or more colourants present in the composition.

Preferably, the one or more ingredients of the invention comprise one or more non-animal
10 proteins, such as one or more proteins derived from fungi, plants, bacteria or a combination thereof.

Typically, the non-animal protein comprises plant protein. Preferably, the plant protein is selected from algae protein, black bean protein, canola wheat protein, chickpea protein, fava protein, lentil protein, lupin bean protein, mung bean protein, oat protein, pea protein, potato
15 protein, rice protein, soy protein, sunflower seed protein, wheat protein, white bean protein, and protein isolates or concentrates thereof. Alternatively or additionally, the non-animal protein may also comprise seitan, rice protein, mushroom protein, legume protein, tempeh, yam flour, tofu, mycoprotein, peanut flour, yuba, or a combination thereof. Alternatively or additionally, the non-animal protein may also comprise methylococcus, hydrogenotropic
20 bacteria, Heme-containing protein, or a combination thereof.

More preferably, the non-animal protein comprises texturized vegetable proteins, preferably wherein the texturized vegetable proteins comprise texturized pea proteins, texturized fava proteins, texturized soy proteins, texturized wheat proteins or a combination thereof.

Plant protein is a source of protein which is obtained or derived from plants. The plant protein
25 may be any suitable plant protein and may comprise a mixture of plant proteins and/or may include protein isolates or concentrates. Examples of suitable plant proteins include those discussed above. As discussed above, preferably, the plant protein comprises textured vegetable proteins (TVP). TVPs are extruded proteins which may be dry by low-moisture extrusion, high-moisture extrusion or other technologies. TVP is widely available and may be
30 made from plant sources as mentioned above, such as soy flour or concentrate. In dry form, TVP can comprise up to about 70 wt.% of protein, typically about 60 to 70 wt.% of protein.

In one embodiment, the one or more ingredients comprise a stabilizer comprising vegetable derived protein, vegetable fibre and/or a polysaccharide. Preferably, the vegetable derived protein comprises pea protein, the vegetable fibre comprises pea fibre, and/or the
35 polysaccharide comprises methylcellulose. Most preferably, the stabilizer blend comprises

vegetable derived protein comprising pea protein, vegetable fibre comprising pea fibre, and polysaccharide comprising methylcellulose.

Preferably, the starch is selected from non-modified starches, modified starches, or a combination thereof. More preferably, the one or more starches are selected from non-
5 modified or modified vegetable starch, rice starch, tapioca starch, or a combination thereof. In one embodiment, the one or more starches are selected from modified starch derived from potatoes, pea starch, or a combination thereof. For example, the one or more starches are selected from potato starch, waxy maize starch, tapioca starch, pea starch or a combination thereof.

10 The one or more ingredients may further comprise one or more of: i) polysaccharides and/or modified polysaccharides, preferably selected from methylcellulose, hydroxypropyl methylcellulose, carboxymethyl cellulose, maltodextrin, carrageenan and salts thereof, alginic acid and salts thereof, agar, agarose, agarpectin, pectin and alginate; and ii) gums, preferably selected from xanthan gum, guar gum, locust bean gum, gellan gum, gum arabic,
15 vegetable gum, tara gum, tragacanth gum, konjac gum, fenugreek gum, and gum karaya.

Suitable coloring additive, flavoring additive, emulsifier, antioxidant, gellant, preservative, thickener, probiotic, vitamin, amino acids, milk, egg, yeast, enzymes, gluten, preservatives, sweeteners, oxidising agents, plant extracts and/or a combination thereof known in the art may be used in the ingredient composition.

20 Preferably, the ingredient composition is suitable for consumption by vegetarians and vegans. Accordingly, the ingredient composition may be substantially free of animal protein, and more preferably, the ingredient composition is free of animal protein.

Preferably, the ingredient composition is substantially free of animal-derived products, and more preferably, the ingredient composition is free of animal-derived products.

25 Preferably, the ingredient composition is free of hydrogenated oils.

Preferably, the ingredient composition is free of alkali ingredients, cocoa butter, or a combination thereof.

Alternatively, the ingredient composition may comprise animal-derived products such as animal derived proteins or fats. Accordingly, the ingredient composition may further comprise
30 one or more animal-derived products such as animal oils, marine oils, animal-derived proteins, animal-derived polysaccharides, or any combination thereof. The one or more animal-derived products may comprise animal milk proteins, animal milk fats, or a combination thereof. Thus, the ingredient composition may be suitable for consumption by vegetarians on the basis that they comprise non-animal protein and proteins or fats derived from animal milk. These

ingredient compositions are suitable for consumption by vegetarians since they do not include fats or proteins derived from animal.

Food products

According to a second aspect of the invention, there is provided a food product that is an
5 uncooked food product, a cooked food product, or a partially cooked food product.

In one embodiment, the food product is an animal-based product or a plant-based food product.

In one embodiment, the animal-based product is selected from a meat food product, a dairy
10 food product or a seafood product. The meat food product may be a burger, sausage, pepperoni, meat ball, nugget, patty, mince product, chicken breast, meatloaf, bacon, steak, whole muscle, or cold cuts. The seafood food product may be a calamari product; crustacean product such as a prawn product, a lobster product, a crab product, a crabstick product, a scampi product; or a fish product such as a fish cake or a fish filet. The dairy food product may be a frozen dessert, drink, ice cream, dairy powder, fermented product, yellow fat, spread,
15 cream cheese, liquid non-dairy creamer or whipping cream.

Preferably, the plant-based food product is a vegetarian or vegan substitute food product.

More preferably, the food product is selected from a meat substitute food product, a dairy food substitute product or a seafood substitute product. The meat food substitute product may be a burger, sausage, pepperoni, meat ball, nugget, patty, mince product, chicken breast,
20 meatloaf, bacon, steak, whole muscle, cold cuts, or other product intended to mimic conventional meat-based food products. The seafood food substitute product may be a calamari product; crustacean product such as a prawn product, a lobster product, a crab product, a crabstick product, a scampi product; or a fish product such as a fish cake or a fish filet; or other product intended to mimic conventional seafood-based products. The dairy food
25 substitute product may be a frozen dessert, drink, ice cream, dairy powder, fermented product, yellow fat, spread, cream cheese, liquid non-dairy creamer, whipping cream; or other product intended to mimic conventional dairy-based food products.

The properties of the meat-analogue composition or food products prepared using the composition may be measured by any suitable means. Properties of interest may include
30 juiciness (and/or dryness), mouthfeel, hardness, adhesiveness, springiness, cohesiveness, gumminess, chewiness and resilience. Such means include taste testers, which can provide feedback on properties of the composition or food product such as juiciness (or dryness), mouthfeel, texture, chewiness and hardness. Typically multiple testers will be asked to mark one or more properties of the composition or food product, such as on a scale from 1 to 5. If

multiple testers are asked, an average of the results can be taken to observe the general impression of the food product.

Properties of the composition or food product may also be measured using specialized equipment. For example, texture profile analysis (TPA) is a technique used to characterize textural attributes of solid and semisolid materials and may be used to determine the hardness, adhesiveness, springiness, cohesiveness, gumminess, chewiness and resilience. Gumminess is defined as the product of hardness x cohesiveness. Chewiness is defined as the product of gumminess x springiness (hardness x cohesiveness x springiness). In this technique, the test material may be compressed two times in a reciprocating motion, mimicking the chewing movement in the mouth, producing a Force versus Time (and/or distance) graph, from which the above information can be obtained. TPA and the classification of textural characteristics is described further in Bourne M. C., Food Technol., 1978, 32 (7), 62-66 and Trinh T. and Glasgow S., 'On the texture profile analysis test', Conference Paper, Conference: Chemeca 2012, Wellington, New Zealand, and may be performed as described therein.

The Force versus Time (and/or distance) graph typically includes two peaks in force, corresponding to the two compressions, separated by a trough. Force may be measured in gravitational force equivalent (g-force, g) or Newtons (N).

Hardness (g or N) is defined as the maximum peak force experienced during the first compression cycle.

Adhesiveness is defined as the negative force area for the first bite, i.e. the area of the graph between the two peaks in force which is at or below a force of 0 g or N. This represents the work required to overcome the attractive forces between the surface of a food and the surface of other materials with which the food comes into contact, i.e. the total force necessary to pull the compression plunger away from the sample. For materials with a high adhesiveness and low cohesiveness, when tested, part of the sample is likely to adhere to the probe on the upward stroke. Lifting of the sample from the base of the testing platform should, if possible, be avoided as the weight of the sample on the probe would become part of the adhesiveness value. In certain cases, gluing of the sample to the base of a disposable platform has been advised but is not applicable for all samples.

Springiness, also known as elasticity, is related to the height that the food recovers during the time that elapses between the end of a first compression and the start of a second compression. During the first compression, the time from the beginning of the compression at force = 0 g or N to the first peak in force is measured (referred to as 'Cycle 1 Duration'). During the second cycle, the time from the beginning of the second compression at force = 0 g or N to the second peak in force is measured (referred to as 'Cycle 2 Duration'). Springiness is calculated as the ratio of these values, i.e. 'Cycle 2 Duration' / 'Cycle 1 Duration'.

Cohesiveness is defined as the ratio of the positive force area, i.e. the area under the curve above a force of 0 g or N, during the second compression to that during the first compression. Cohesiveness may be measured as the rate at which the material disintegrates under mechanical action. Tensile strength is a manifestation of cohesiveness. If adhesiveness is low compared with cohesiveness then the probe is likely to remain clean as the product has the ability to hold together. Cohesiveness is usually tested in terms of the secondary parameters brittleness, chewiness and gumminess.

Gumminess is defined as the product of hardness x cohesiveness and is a characteristic of semisolid foods with a low degree of hardness and a high degree of cohesiveness.

Chewiness is defined as the product of gumminess x springiness (which equals hardness x cohesiveness x springiness) and is therefore influenced by the change of any one of these parameters.

Resilience is a measurement of how the sample recovers from deformation both in terms of speed and forces derived. It is taken as the ratio of areas from the first probe reversal point, i.e. the point of maximum force, to the crossing of the x-axis, i.e. at 0 g or N, and the area produced from the first compression cycle between the start of compression and the point of maximum force. In order to obtain a meaningful value of this parameter, a relatively slow test speed should be selected that allows the sample to recover, if the sample possesses this property.

20 Uses of ingredient compositions and food products

According to a third aspect of the invention, there is provided the use of an ingredient composition in a food product. Preferably, the use further comprises using the ingredient composition in a food product as described above.

Preferably the use further comprises using the ingredient composition to improve delayed release of one or more ingredients from the ingredient composition when consumed and/or cooked when compared to a non-coated ingredient composition; one or more ingredients coated with the same fat coating and wherein the weight ratio of the fat coating with respect to the ingredients is above 15,0:1,0; such as from 25,0:1,0 to 35,0:1,0; and/or one or more ingredients coated with the same fat coating and wherein the weight ratio of the fat coating with respect to the ingredients is below 5,0:1,0; such as from 1,0:1,0 to 3,0:1,0. Without willing to be bound by any theory, it is believed that the fat coating and the one or more ingredients according to the present invention collaborate together to amplify the effect of the one or more ingredients and therefore improve the organoleptic properties of the food products leading to high quality food products compared to conventional food products.

Preferably, the use further comprises using the ingredient composition to enhance the ingredient taste of a cooked food product. By the delaying the release of the ingredient during

cooking it is possible to maintain a greater taste of the ingredient, thereby allowing it perceived taste to be enhanced. By way of example, this may be due to the ingredient not being lost during cooking through release of water and/or fat, or due to preventing the ingredient from being degraded.

- 5 In addition, the use further comprises using the ingredient composition to enhance the flavour profile of a cooked food product. As will be appreciated, the taste of foods can be significantly enhanced by way of a combination of ingredients, such as herbs and spices. By control of the release of such ingredients, it is possible to ensure that they are present in combination after cooking and thereby enhance the overall taste of a food product. As noted above, this may
10 for example, be due to the ingredient(s) not being lost during cooking through release of water and/or fat, or due to preventing the ingredient(s) from being degraded.

- More preferably, the use further comprises using the ingredient composition as a juiciness agent. The inventors have found that in particular, when the ingredient composition according to the invention is used in meat food products, especially in plant-based meat food products,
15 the juiciness is improved when compared to an analogous meat food product comprising the ingredient composition as such, and/or an analogous meat food product not comprising the ingredient composition. It is believed that the ingredient composition will be released upon cooking to react with the other components of the meat food product to improve the quantity and/or quality of juice that will be released by the meat food product. Improved juiciness of a
20 plant-based meat food product comprising the ingredient composition is believed to make the meat food product more closely resemble the mouthfeel, juiciness and succulence of animal meat products.

- Alternatively, or in addition, the use further comprises using the ingredient composition as a mouthfeel agent. The inventors have found that in particular, when the ingredient composition
25 according to the invention is used in meat food products, especially in plant-based meat food products, the ingredient composition improving the juiciness of the food product will release a higher amount of juice when compared to an analogous meat food product comprising the ingredient composition as such, and/or an analogous meat food product not comprising the ingredient composition. Thus, the sensation of having a greasy coating and moisture on the
30 tongue and surfaces of the mouth can be felt as well as an instant flavour and taste impression from the other ingredient and delayed release of flavors from the fat over a longer period of time. The mouthfeel is believed to enable a plant-based meat food product to more closely resemble the mouthfeel and delayed flavors release of animal meat products.

- Alternatively, or in addition, the use further comprises using the ingredient composition as a
35 tenderness agent. The inventors have found that the tenderness of the food products is further

improved by using the ingredient composition. It is believed that the delayed release of the ingredient(s) upon consumption or cooking renders the food products juicy and leads to a mouthfeel feeling leading to tender food products.

- 5 Preferably, the use further comprises using the fat coating to substantially reduce, inhibit or prevent interaction of the one or more ingredients in the food product prior to consumption and/or cooking the food analogue composition or food product.

Process of manufacturing

- 10 According to a third aspect of the invention, there is provided a process of manufacturing an ingredient composition as described herein, wherein the process comprises coating ingredient(s) in dry form with a fat coating.

Preferably, the coating is performed by fluidized bed coating, spray drying, combining the fat coating with the one or more ingredients, or any combination(s) thereof.

In some embodiments, the process comprises the followings steps:

- 15 A). heating the fat coating,
B). combining the fat coating with the one or more ingredients,
C). optionally, cooling the combination obtained in step B) to obtain a dough,
D). optionally, cutting the dough.

Preferably in step D), the cutting is performed by dicing, or chopping.

- 20 Any suitable process for the preparation of the food products known in the art may be used to produce food products. Typically, a process of a food product according as described herein comprises: combining water; non-animal protein; optionally a fat composition; one or more encapsulated ingredients; and optionally one or more additional components so as to form the food composition; and optionally forming the food composition into food products.

DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a graph representing the content of moisture in a juice released upon cooking depending on the content of encapsulated acid ingredients into plant-based burgers.

5 DETAILED DESCRIPTION OF THE INVENTION

The following examples are for illustrative purposes only and are not intended to limit the scope of the invention in any way.

Example 1

10 Fat A was prepared by chemical interesterification of a blend of 70 wt% shea butter and 30 wt% coconut oil.

Various properties of Fat A are shown in Table 1 below and contrasted against comparative fats coconut oil and sunflower oil.

Table 1

	Comparative fat sunflower oil	Comparative fat coconut oil	Fat A
Fatty acid residue concentrations (wt%)			
C4:0	0,0	0,0	0,0
C6:0	0,0	0,6	0,2
C8:0	0,0	8,0	2,4
C10:0	0,0	5,9	1,8
C12:0	0,0	47,6	14,3
C14:0	0,1	18,1	5,4
C16:0	5,5	9,0	4,6
C18:0	3,5	2,9	32,9
C18:1c	27,7	6,2	32,4
C18:1tr	0,0	0,0	0,0
C18:2c	61,2	1,5	4,7
C18:2tr	0,5	0,0	0,0
C18:3	0,3	0,0	0,1
C20:0	0,3	0,1	1,0
SAFA	10,1	92,2	62,7
Carbon Number			
26	0,0	0,2	0,0

28	0,0	0,8	0,0
30	0,0	2,0	0,0
32	0,0	10,3	0,2
34	0,0	14,4	0,4
36	0,2	17,5	0,7
38	1,5	16,5	2,0
40	0,0	10,1	2,1
42	0,0	7,2	5,5
44	0,0	4,0	7,4
46	0,0	2,2	5,8
48	0,2	2,2	22,6
50	1,4	4,0	9,3
52	17,6	3,8	7,2
54	74,4	3,7	35,4
56	3,1	0,0	1,7
CN46+48	0,2	4,4	28,4
St2M	0,0	0,3	6,4
SFC10°C	0	81	54
SFC20°C	0	38	28
SFC30°C	0	0	9
SFC35°C	0	0	4
SFC40°C	0	0	1,5

It can be seen that Fat A has a higher solid fat content at mouth temperature of from 30°C to 35°C. As discussed above, this is believed to contribute to longer flavour release from the meat analogue compositions when consumed. It can also be seen that Fat A has a lower saturated fatty acid residue content than coconut oil, and also contains a greater content of C46 and C48 triglycerides, and also St2M triglycerides. The latter are fast crystallising triglycerides, which contribute towards the structure building properties of the fat coating.

Method for preparation of plant-based burgers

- 10 Plant-based burgers A0 to A4 were made from meat analogue compositions comprising Fat A.

The following procedure was used for the preparation of the plant-based burgers A0 to A4 of the following examples:

1. The proteins were hydrated with cold water (5 °C) according to the quantities shown in Table 1 and further hydrated for 30 minutes in cold storage (5°C); during hydration the protein mixture was stirred every 10 min
2. All other ingredients in powder form (stabilizer blend⁺⁺⁺ and flavours) were mixed and hydrated with ice water (1-3°C) by blending for at least 1 minute, following which they were stored in a fridge (5 °C) for at least 30 minutes;
3. The proteins were chopped for 20 seconds at low speed;
4. The ingredients from steps 2 and 3 and any further ingredients (e.g. colours, fats) according to the quantities shown in Table 1 were combined and the resulting dough blended for about 2 minutes;
 - regarding Comparative Sample A1, Sample A2, Sample A3 and Comparative Sample A4: The encapsulated ingredient compositions in a form of bulk were prepared by homogenously mixing citric acid into Fat A at room temperature before the addition of them in step 4.
5. The dough was rested in a fridge (operating at a temperature of 5 °C) for at least 30 minutes;
6. Burgers (diameter 8 cm; height 2 cm; weight 100g) were made from this dough and stored in the freezer (operating at a temperature of -18°C) for at least 24 hours. Prior to cooking, burgers were thawed in the fridge (5°C) overnight.
7. Samples were cooked by heating on a frying pan with rapeseed oil (5g) for 10 min (and turned every 1.5 minutes).

⁺⁺ The proteins referred to above are a blend of textured pea proteins (protein content minimum 70%; format: strips) and textured fava proteins (protein content minimum 60%; format: chunks).

⁺⁺⁺ The stabiliser blend referred to above is a blend of pea proteins (protein content minimum 83%; format: powder), pea fibre and methylcellulose.

The compositions of the burgers are shown below in Table 2.

Table 2

Samples	Comparative Sample A0	Comparative Sample A1	Sample A2	Sample A3	Comparative Sample A4
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Ingredients	(amount wt.%)				
cold Water (5°C)	37.1	36.9	36.7	36.3	34.1
Citric acid	0	0.5	1.0	2.0	8.0
Fat A (Room temperature)	14.9	14.8	14.8	14.6	13.7
Weight ratio fat coating /acid	-	29.6	14.8	7.3	1.71
Total weight % of ingredient composition	-	15.2	15.8	16.6	21.7
textured protein ⁺⁺	18.7	18.6	18.6	18.4	17.2
Stabilizer ⁺⁺⁺	6.3	6.3	6.3	6.2	5.8
Ice water (1°C)	20.5	20.4	20.3	20.1	18.8
Flavour	0.8	0.8	0.8	0.8	0.7
colourants	1.7	1.7	1.7	1.7	1.6
TOTAL	100	100	100	100	100

Properties of the burgers of the examples after frying

Moisture in juice released (%) and moisture released per cooked mass (%) were measured by the following method:

5

- After frying, the sample is taken out of the pan and the sample weight is recorded ("cooked mass");
- The sample is left to cool for 5 min (exactly 5 min)
- Weight of the dish to collect the juice is recorded (e.g. cup) and aeropress (Aerobie Model A80; use without filter paper) is positioned on the dish;
- The sample is chopped into pieces via 6 parallel and 6 perpendicular cuts;
- Chopped samples are placed in the aeropress and compressed using a force / weight

10

- of 7 kg for 5 min;
- Weight of extracted juice is recorded and juice per cooked mass (%) is calculated;
 - Extracted juice is decanted in a test tube and sealed;
 - Extracted juice is heated to a temperature above the fats' melting points in a heating cabinet, typically 50°C;
 - Moisture content of the juice is analyzed with a moisture analyzer (Halogen Moisture Analyzer HE73, Mettler Toledo) in triplicate, the average is calculated and documented as Moisture in juice released (%); and
 - Moisture released per cooked mass (%) is calculated by multiplying Moisture in the juice released (%) with juice per cooked mass (%).

Table 3

Property After Frying	Comparative Sample A0	Comparative Sample A1	Sample A2	Sample A3	Comparative Sample A4
Moisture in juice released (%)	33.1	42.5	47.6	50.1	39.1
Moisture released per cooked mass (%)	2,2	2,6	3,8	3,9	2,9

Figure 1 and the above Table clearly show that Samples A2 an A3 according to the invention have the highest percentage of moisture in the juice released upon cooking as well as the highest percentage of moisture released per cooked mass. The inventors have surprisingly found that an optimum moisture is reached when the ingredient composition to form plant-based burgers comprises a weight ratio of the fat coating with respect to the ingredient composition which is of from 5,0:1,0 to 15,0:1,0. An optimized moisture leads to an optimized mouthfeel sensation and optimized juiciness.

Example 2

Fat A as described in Example 1 was used.

Fat B was prepared by chemical interesterification of a blend of 71 wt% shea stearin and 29 wt% coconut oil. Various properties of Fat B are shown in Table 4 below.

5 Table 4

	Fat B
Fatty acid residue concentrations (wt%)	
C4:0	0,0
C6:0	0,2
C8:0	2,3
C10:0	1,7
C12:0	13,9
C14:0	5,3
C16:0	4,4
C18:0	44,5
C18:1c	24,0
C18:1tr	0,0
C18:2c	2,2
C18:2tr	0,0
C18:3	0,0
C20:0	1,2
SAFA	<u>73,7</u>
Carbon Number	
26	0,0
28	0,0
30	0,0
32	0,2
34	0,3
36	0,6
38	1,9
40	2,0
42	5,2

44	7,2
46	5,8
48	22,4
50	9,3
52	7,1
54	36,4
56	2,0
CN46+48	28,2
St2M	11,4
SFC10°C	78
SFC20°C	55
SFC30°C	30
SFC35°C	15
SFC40°C	10

Method for preparation of plant-based burgers

Plant-based burgers B0 and B1 were made from meat analogue compositions comprising Fat A and Fat B.

- 5 The procedure described in Example 1 was used for the preparation of the plant-based burgers B0 and B1 except that the ingredient composition was in a form of granulates and that the burgers were stored during 13 days before cooking.

- Regarding sample B1:

Fat A was added in step 4.

- 10 The encapsulated ingredient compositions in a form of granulates were prepared by melting Fat B, spreading it out on a baking sheet in a thin layer of approximately 1-2 mm, distributing the citric acid evenly on its surface, folding the baking sheet so as to combine two layers of fat and acid, freeze at -18°C until solid, cut into granulates of 2-5 mm diameter and freeze until use before the addition of them in step 4, which happens in such a way
- 15 that first all other ingredients are mixed and the granulates are added only for the last 1 minute of mixing.

- Regarding sample B0:

The citric acid was added in step 2.

Fat A was added in step 4.

- 20 Fat B was added in a form of granulates, which were prepared and added in step 4

according to the process described above for sample B1, except that no citric acid was added to Fat B.

The compositions of the burgers are shown below in Table 5.

Table 5

Samples	Comparative Sample B0	Sample B1
Ingredients	(amount wt.%)	
cold Water (5°C)	38,1	38,1
Citric acid	0,5	0,5
Fat A (Room temperature)	13,0	13,0
Fat B	5,4	5,4
Weight ratio fat coating /acid	-	10,2
Total weight % of ingredient composition	-	5,9
textured protein ⁺⁺	15,3	15,3
Stabilizer ⁺⁺⁺	5,6	5,6
Ice water (1°C)	21,1	21,1
Flavour	1,0	1,0
TOTAL	100	100

5

Properties of the burgers of the examples after frying

Juice per cooked mass (%), moisture in juice released (%) and moisture released per cooked mass were measured by the method disclosed in Example 1.

Table 6

Property After Frying	Comparative Sample B0	Sample B1
Juice per cooked mass (%)	10.7	12.6
Moisture in juice released (%)	43.3	45.0
Moisture released per cooked mass (%)	4.6	5.7

Table 6 shows that sample B1 has a higher percentage of juice per cooked mass and a higher percentage of moisture in juice released as well as of moisture released per cooked mass
5 when compared respectively to Comparative Sample B0.

CLAIMS

1. Ingredient composition comprising one or more ingredient(s) in dry form encapsulated with a fat coating comprising from 20% to 85% by weight of saturated fatty acid residues; from
5 10% to 50% by weight of stearic acid residues (C18:0); and from 2% to 35% by weight of lauric acid residues (C12:0); wherein said percentages of fatty acid residues refers to fatty acids bound as acyl groups in glycerides in the fat coating and being based on the total weight of C4 to C24 fatty acid residues bound as acyl groups present in the fat composition; wherein
 - 10 (i) the fat coating has a solid fat content (SFC) N40 of less than 15, measured on unstabilised fat according to ISO 8292-1, preferably from 0,5 to 5, and more preferably from 1 to 3; or preferably from 6 to 12, and more preferably from 8 to 12;
 - (ii) the fat coating has a solid fat content (SFC) N20 of from 20 to 65, preferably from
15 25 to 40, more preferably from 25 to 35; or preferably from 41 to 60, more preferably from 50 to 58 as measured on the unstabilised fat according to ISO 8292-1; and/or
 - (iii) the fat coating has a solid fat content (SFC) N30 of from 5 to 35, preferably from 6 to 20, more preferably from 6 to 15; or preferably from 21 to 35, more preferably
20 from 27 to 35 as measured on the unstabilised fat according to ISO 8292-1; andwherein the weight ratio of the fat coating with respect to the ingredient composition is of from 5,0:1,0 to 15,0:1,0.
2. Ingredient composition according to Claim 1, wherein the weight ratio of the fat coating with respect to the ingredient composition is of from 10,0:1,0 to 15,0:1,0; or from 5,0:1,0 to
25 10,0:1,0.
3. Ingredient composition according to Claim 1 or 2, wherein the weight ratio of the fat coating with respect to the ingredient composition is of from of from 13,0:1,0 to 15,0:1,0; or from 6,0:1,0 to 9,0:1,0.
4. Ingredient composition according to any one of claims 1 to 3, wherein the fat coating
30 is hydrophobic.
5. Ingredient composition according to any preceding claim, wherein the fat coating is in the form of particles, flakes, and/or granulates.
6. Ingredient composition according to claim 5, wherein the particles, flakes and/or

granulates have a particle size distribution of from 1mm to 7mm and preferably of from 2mm to 6mm.

7. Ingredient composition according to claim 5 or 6, wherein the flakes have a thickness between 0.2mm and 1.5mm and preferably of from 0.3mm to 0.9mm or of from 0.9mm to 1.3mm; and a diameter of from 1 to 52mm
8. Ingredient composition according to any one of Claims 5 or 7, wherein the particles, flakes and/or granulates have an average particle size of from 100µm to 3mm, preferably of from 200µm to 3mm, more preferably of from 400µm to 2mm, and advantageously of from 500µm to 1.3mm.
9. Ingredient composition according to any one of Claims 5, wherein fat coating is in a form of bulk.
10. Ingredient composition according to any preceding claim, wherein the fat coating comprises one or more non-animal derived oils.
11. Ingredient composition according to any preceding claim, wherein the fat coating comprises from 20% to 70% by weight of saturated fatty acids such as from 20% to 60% by weight of saturated fatty acids; preferably from 65% to 85% by weight of saturated fatty acids or from 20% to 65% by weight of saturated fatty acids.
12. Ingredient composition according to any preceding claim, wherein the fat coating comprises from 5 to 35% by weight of CN46 and CN48 triglycerides, preferably from 10 to 30% by weight of CN46 and CN48 triglycerides.
13. Ingredient composition according to any preceding claim, wherein the fat coating comprises from 2 to 12% by weight of St2M triglycerides, preferably from 5 to 12% by weight of St2M triglycerides.
14. Ingredient composition according to preceding claim, wherein the fat coating comprises less than 10% by weight of palm oil; preferably, wherein the composition comprises less than 5% by weight of palm oil; more preferably, wherein the composition comprises less than 2% by weight of palm oil; and most preferably wherein the composition does not comprise palm oil.
15. Ingredient composition according to any preceding claim, wherein the fat coating is a non-hydrogenated fat coating.
16. Ingredient composition according to any preceding claim, wherein the fat coating comprises 20% by weight or less, preferably 10% by weight or less of palmitic acid (C16:0), and more preferably 5% by weight or less of palmitic acid (C16:0).
17. Ingredient composition according to any preceding claim, wherein the fat coating has

a weight ratio of stearic acid (C18:0) to palmitic acid (C16:0) of from 1:1 to 12:1.

18. Ingredient composition according to any preceding claim, wherein the fat coating has a weight ratio of lauric acid (C12:0) to stearic acid (C18:0) of from 1:4 to 4:1.

19. Ingredient composition according to any preceding claim, wherein the fat coating
5 comprises from 5% to 25% by weight lauric acid (C12:0); preferably, wherein the fat coating comprises from 5% to 17% by weight lauric acid (C12:0); more preferably, wherein the fat coating comprises from 10% to 17% by weight lauric acid (C12:0).

20. Ingredient composition according to any preceding claim, wherein the fat coating
10 comprises from 15% to 50% by weight stearic acid (C18:0); preferably, wherein the fat coating comprises from 20% to 50% by weight stearic acid (C18:0); more preferably, wherein the fat coating comprises from 30% to 50% by weight stearic acid (C18:0); advantageously, wherein the fat coating comprises from 35% to 50% by weight stearic acid (C18:0); for example, wherein the fat coating comprises from 40% to 45% by weight stearic acid (C18:0).

21. Ingredient composition according to any preceding claim, wherein the fat coating
15 comprises an interesterified fat, preferably wherein the fat coating comprises an interesterified fat blend.

22. Ingredient composition according to Claim 21, wherein the interesterified fat or interesterified fat blend has been produced by chemical interesterification, enzymatic interesterification, or a combination thereof.

20 23. Ingredient composition according to Claim 21 or Claim 22, wherein the interesterified fat or interesterified fat blend is produced by an interesterification reaction that is stopped prior to reaching an equilibrium product distribution.

24. Ingredient composition according to any preceding claim, wherein the fat coating
25 comprises an interesterified fat blend comprising at least one fat selected from shea butter, shea stearin, shea olein, cocoa butter, cocoa stearin, cocoa olein, allanblackia fat, kokum fat, mango kernel fat, sal fat, illipe butter, and mixtures thereof; and at least one oil selected from coconut oil, coconut oil stearin, coconut oil olein, palm kernel oil, palm kernel olein, palm kernel stearin, babassu oil, and mixtures thereof.

25. Ingredient composition according to any preceding claim, wherein the fat coating
30 comprises an interesterified blend of shea butter and coconut oil or an interesterified blend of shea stearin and coconut oil.

26. Ingredient composition according to any preceding claim, wherein the fat coating comprises an interesterified blend of from 20% to 80% by weight of shea butter and from 20% to 80% by weight of coconut oil.

35 27. Ingredient composition according to any preceding claim, wherein the fat coating comprises an interesterified blend of from 20% to 80% by weight of shea stearin and from

20% to 80% by weight of coconut oil.

28. Ingredient composition according to any preceding claim, wherein the fat coating comprises a blend of (i) from 20% to 80% by weight of an interesterified blend of from 20% to 80% by weight of shea butter and/or shea stearin and from 20% to 80% by weight of coconut oil; and (ii) from 20% to 80% by weight of sunflower oil.

29. Ingredient composition according to any preceding claim, wherein the fat coating comprises a blend of (i) from 20% to 80% by weight of an interesterified blend of from 20% to 80% by weight of shea butter and/or shea stearin and from 20% to 80% by weight of coconut oil; and (ii) from 20% to 80% by weight of rapeseed oil.

30. Ingredient composition according to any preceding claim, wherein the one or more ingredients comprise acidic ingredient, polyhydroxy compound, alkali ingredient, non-animal protein, stabilizer, coloring additive, flavoring additive, emulsifier, antioxidant, gellant, preservative, starch, thickener, probiotic, vitamin, milk, egg, amino acids, yeast, enzymes, gluten, preservatives, gums, polysaccharides, sweeteners, oxidising agents, plant extracts and/or a combination thereof.

31. Ingredient composition according to any preceding claim, wherein the one or more ingredients comprise one or more acidic ingredients selected from an inorganic acid, an organic acid or a combination thereof.

32. Ingredient composition according to Claim 31, wherein the organic acid is selected from citric acid, acetic acid, ascorbic acid, fumaric acid, succinic acid, lactic acid, malic acid, tartaric acid, or a combination thereof.

33. Ingredient composition according to Claim 31 or 32, wherein the inorganic acid is selected from hydrochloric acid, phosphoric acid, sulphonic acid, sulfuric acid, or a combination thereof.

34. Ingredient composition according to any preceding claim, wherein the one or more ingredients comprises one or more alkali ingredients selected from an alkali metal salt, an alkaline earth metal salt, an ammonium salt, an amine, or a combination thereof.

35. Ingredient composition according to Claim 34, wherein the one or more alkali ingredients are selected from a hydroxide, carbonate, bicarbonate, chloride, gluconate, acetate or sulfide salt of a sodium, potassium, calcium, magnesium and/or ammonium cation; preferably wherein the one or more encapsulated alkali ingredients are selected from sodium bicarbonate, magnesium bicarbonate, potassium bicarbonate, ammonium bicarbonate, sodium hydroxide, potassium hydroxide, calcium hydroxide, magnesium hydroxide, ammonium hydroxide, or any combination thereof.

36. The ingredient composition according to any preceding claim, wherein the one or more

ingredients comprise a non-animal protein derived from fungi, plants, bacteria or a combination thereof.

37. The ingredient composition according to any one of claims 30 to 36, wherein the non-animal protein comprises plant protein, preferably, wherein the plant protein is selected from
5 algae protein, black bean protein, canola wheat protein, chickpea protein, fava protein, lentil protein, lupin bean protein, mung bean protein, oat protein, pea protein, potato protein, rice protein, soy protein, sunflower seed protein, wheat protein, white bean protein, and protein isolates or concentrates thereof.

38. The ingredient composition according to any one of claims 30 to 37, wherein the non-animal protein comprises seitan, rice protein, mushroom protein, legume protein, tempeh, yam
10 flour, tofu, mycoprotein, peanut flour, yuba, or a combination thereof.

39. The ingredient composition according to any one of claims 30 to 38, wherein the nonanimal protein comprises methylococcus, hydrogenotropic bacteria, Heme-containing protein, or a combination thereof.

40. The ingredient composition according to any one of claims 30 to 39, wherein the non-animal protein comprises texturized vegetable proteins, preferably wherein the texturized vegetable proteins comprise texturized pea proteins, texturized fava proteins, or a combination
15 thereof.

41. The ingredient composition according to any one of claims 30 to 40, wherein the one
20 or more ingredients comprise a stabilizer comprising vegetable derived protein, vegetable fibre and a polysaccharide; preferably, wherein the vegetable derived protein comprises pea protein, the vegetable fibre comprises pea fibre, and the polysaccharide comprises methylcellulose.

42. The ingredient composition according to any one of claims 30 to 41, wherein the one
25 or more ingredients comprise a starch selected from non-modified starches, modified starches, or a combination thereof; preferably, from non-modified or modified vegetable starch, rice starch, tapioca starch, or a combination thereof; more preferably, from modified starch derived from potatoes, pea starch, or a combination thereof; and for example, from
30 potato starch, waxy maize starch, tapioca starch, pea starch or a combination thereof.

43. The ingredient composition according to any one of claims 30 to 42, wherein the one or more ingredients comprise may further comprise one or more of: i) polysaccharides and/or modified polysaccharides, preferably selected from methylcellulose, hydroxypropyl
35 methylcellulose, carboxymethyl cellulose, maltodextrin, carrageenan and salts thereof, alginate

acid and salts thereof, agar, agarose, agarpectin, pectin and alginate; and ii) gums, preferably selected from xanthan gum, guar gum, locust bean gum, gellan gum, gum arabic, vegetable gum, tara gum, tragacanth gum, konjac gum, fenugreek gum, and gum karaya.

44. The ingredient composition according to any preceding claim, wherein the ingredient
5 composition is substantially free of animal protein, preferably, wherein the meat analogue composition is free of animal protein.

45. The ingredient composition according to any preceding claim, wherein the ingredient composition is substantially free of animal-derived products, preferably, wherein the meat analogue composition is free of animal-derived products.

10 46. The ingredient composition according to any preceding claim, wherein the ingredient composition is free of hydrogenated oils.

47. The ingredient composition according to any preceding claim, wherein the ingredient composition is free of alkali ingredients, cocoa butter, or any combination thereof.

48. The ingredient composition according to any preceding claim, wherein the ingredient
15 composition is substantially free of animal-derived products, preferably, wherein the ingredient composition is free of animal-derived products.

49. The ingredient composition according to any preceding claim, wherein the ingredient composition further comprises one or more animal-derived products such as animal oils, marine oils, animal-derived proteins, animal-derived polysaccharides, or any combination
20 thereof.

50. The ingredient composition according to Claim 49, wherein the one or more animal-derived products comprise animal milk proteins, animal milk fats, or a combination thereof.

51. A food product comprising the ingredient composition according to any one of claims 1 to 50.

25 52. The food product according to claim 51, wherein the food product is an uncooked food product, a cooked food product, or a partially cooked food product.

53. The food product according to claim 51 or 52, wherein the food product is an animal-based product or a plant-based food product.

54. The food product according to claim 53, wherein the animal-based product is selected
30 from a meat food product, a dairy food product or a seafood product.

55. The food product according to claim 54, wherein the meat food product is a burger, sausage, pepperoni, meat ball, nugget, patty, mince product, chicken breast, meatloaf, bacon, steak, whole muscle, or cold cuts.

56. The food product according to claim 55, wherein the seafood food product is a calamari
35 product; crustacean product such as a prawn product, a lobster product, a crab product, a crabstick product, a scampi product; or a fish product such as a fish cake or a fish filet.

57. The food product according to claim 56, wherein the dairy food product is a frozen dessert, drink, ice cream, dairy powder, fermented product, yellow fat, spread, cream cheese, liquid non-dairy creamer or whipping cream.

58. The food product according to claim 53, wherein the plant-based food product is a
5 vegetarian or vegan substitute food product.

59. The food product according to anyone of claims 53 or 58, wherein the food product is selected from a meat substitute food product, a dairy substitute food product or a seafood substitute product.

60. The food product according to claim 59, wherein the meat food substitute product is a
10 burger, sausage, pepperoni, meat ball, nugget, patty, mince product, chicken breast, meatloaf, bacon, steak, whole muscle, cold cuts, or other product intended to mimic conventional meat-based food products.

61. The food product according to claim 59, wherein the seafood substitute food product is a calamari analogue product; crustacean product such as a prawn analogue product, a
15 lobster analogue product, a crab analogue product, a crabstick analogue product, a scampi analogue product; or a fish analogue product such as a fish cake or a fish filet; or other product intended to mimic conventional seafood-based food products.

62. The food product according to claim 59, wherein the dairy food substitute product is a frozen dessert, drink, ice cream, dairy powder, fermented product, yellow fat, spread, cream
20 cheese, liquid non-dairy creamer, whipping cream; or other product intended to mimic conventional dairy-based food products.

63. Use of an ingredient composition according to any one of claims 1 to 50 in a food product.

64. Use of an ingredient composition according to claim 63, wherein the food product is as
25 defined in any one of claims 51 to 62.

65. Use according to anyone of Claim 63 or 64, wherein the use further comprises using the ingredient composition to improve delayed release of one or more ingredients from the ingredient composition when consumed and/or cooked when compared to a non-coated ingredient composition; one or more ingredients coated with the same fat coating and wherein
30 the weight ratio of the fat coating with respect to the ingredients is above 15,0:1,0; such as from 25,0:1,0 to 35,0:1,0; and/or one or more ingredients coated with the same fat coating and wherein the weight ratio of the fat coating with respect to the ingredients is below 5,0:1,0; such as of from 1,0:1,0 to 3,0:1,0.

66. Use according to any one of claims 63 to 65, to enhance the ingredient taste of a
35 cooked food product.

67. Use according to any one of claims 63 to 66, to enhance the flavour profile of a cooked food product.
68. Use according to anyone of claims 63 to 67, wherein the use further comprises using the ingredient composition to increase the organoleptic properties of a food product.
- 5 69. Use according to anyone of claims 63 to 68, wherein the use further comprises using the fat coating to substantially reduce, inhibit or prevent interaction of one or more ingredients in the food product prior to consumption and/or cooking the food analogue composition or food product.
70. A process of manufacturing an ingredient composition according to any one of Claims 1 to 50, wherein the process comprises coating ingredient(s) in dry form according to any one of claims 1-3, 30-50 with a fat coating according to any one of claims 1-29.
- 10 71. The process according to claim 70, wherein the coating is performed by fluidized bed coating, spray drying, combining the fat coating with the one or more ingredients or any combination(s) thereof.
- 15 72. The process according to claim 71, wherein the process comprises the followings steps:
A). heating the fat coating,
B). combining the fat coating with the one or more ingredients,
C). optionally, cooling the combination obtained in step B) to obtain a dough,
D). optionally, cutting the dough.
- 20 73. The process according to claim 72, wherein in step D), the cutting is performed by dicing, or chopping.