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(54) Title: SAVOURY COMPOSITION

(57) Abstract: The present invention relates to a savoury composition in the form of a granulate, a method of making such composition and to the use of such a composition preparing a soup or bouillon.



WO 2020/126707 A1

SAVOURY COMPOSITION

FIELD OF THE INVENTION

The present invention relates to a granular savoury composition comprising puffed
5 maize endosperm. The invention also relates to a method for preparing such a
composition, and to a method of preparing a savoury dish with said savoury
composition.

BACKGROUND TO THE INVENTION

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Instant bouillon is commonly used as a base for e.g. bouillon or soups. For use as a
seasoning aid, the consumer appreciates a form of the bouillon concentrate that is
easier to sprinkle on a dish. In this respect, powder and granules may be more suitable.
They share the advantage that they are easier to dispense in portions to a dish than a
15 cube. Powdered bouillon, however, may show a limited flowability, e.g. due to its
physical state, a problem which may increase over time. This may be a problem both
during storage and during the production process. When dispensed during cooking, for
example to a steaming dish, a powder may clot together or stick to the packaging
material. These effects negatively affect the appeal to the consumer, rendering
20 granulated bouillon the preference of choice for many purposes

WO 2008086918 relates to a process to produce a concentrate in the form of particles
for preparing bouillon, soups, sauces, gravies or for use as a seasoning by a) preparing
a mixture of at least two of the selected from salt, monosodiumglutamate, sugar, starch
25 fat, b) preparing particles from said mixture, at least 80% wt. of the particles having a
dimension of coarser than 2 mm as determined by sieve analysis, c) grinding said
particles to give particles with a particle dimension between 200 [μ m] and 2 mm as
determined by sieve analysis, d. optionally removing particles below a dimension of
from 200 [μ m] as determined by sieve analysis, wherein step (b) is effected by one
30 of the processes comprising granulation, agglomeration, extrusion or a combination
thereof.

WO2011069885 relates to a granular savoury food concentrate. Example 1 thereof
shows a composition comprising 42 wt.% salt, 27 wt.% starch, 7 wt.% sugar, 10 wt.%

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yeast extract, 14 wt.% flavours and spices and 5.1 wt.% water that has good granulation.

Granulated savoury compositions according to the prior art have the disadvantage that constant stirring is required to dissolve the granules in hot water. Often a starchy residue remains, which consumers perceive as undesirable.

There is a need to provide granular savoury compositions having improved dissolution properties.

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DEFINITION OF THE INVENTION

The inventors have unexpectedly found that the dissolution properties of a savoury composition can be improved by including 0.1-20 wt.% of puffed maize endosperm particles.

15

Accordingly, there is provided a savoury composition comprising, by weight of dry matter of the total composition:

- a) 0 to 85 wt.% of an edible salt selected from sodium chloride, potassium chloride and combinations thereof;
 - b) 1 to 50 wt.% of savoury taste-giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof;
 - c) 0 to 10 wt.% of water;
 - d) 0.1-20 wt.% puffed maize endosperm, wherein at least 80 wt.% of the particles of the puffed maize endosperm have an average particle size of less than 3.0 mm,
 - e) 1 to 45 wt.% of vegetable matter selected from vegetables, herbs, spices and combinations thereof;
 - f) 0 to 75 wt.% of starch component selected from flour, native starch, pregelatinised starch, maltodextrin, modified starch and combinations thereof; wherein a) to e) together preferably constitute at least 55 wt.% of the savoury composition,
- wherein the savoury composition is a granulate having a mass weighted average diameter in the range of 0.1-5 mm.

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In a second aspect, the present invention relates to a method for preparing the granulated food product described above, comprising steps of:

- 5 i) providing particles of puffed maize endosperm preferably having an average particle size of less than 3 mm and preferably having a bulk density of 30 – 100 g/L;
- ii) combining puffed maize endosperm with, savoury taste-giving ingredients, vegetable matter and optionally other food ingredients to provide a particulate savoury composition mix,
- 10 iii) granulating the savoury composition mix to provide a granulate, savoury composition.

DETAILED DESCRIPTION OF THE INVENTION

- 15 The word 'comprising' as used herein is intended to mean 'including' but not necessarily 'consisting of' or 'composed of'. In other words, the listed steps or options need not be exhaustive.

- 20 Unless specified otherwise, numerical ranges expressed in the format 'from x to y' or 'x-y' are understood to include x and y. When for a specific feature multiple preferred ranges are described in the format 'from x to y' or 'x-y', it is understood that all ranges combining the different endpoints are also contemplated. For the purpose of the invention ambient temperature is defined as a temperature of about 20°C.

- 25 Unless indicated otherwise, weight percentages (wt.%) are based on the total weight of the composition.

- All ratios by weight as specified herein relate to weight ratios by dry weight of the respective powders.

30

Edible salt

The edible salt that is used in accordance with the present invention is selected from sodium chloride, potassium chloride and combinations thereof. Preferably, sodium

chloride represents at least 5 wt.%, more preferably at least 10 wt.% and most preferably at least 20 wt.% of said edible salt.

5 The edible salt which is employed in accordance with the invention preferably has a mass weighted average diameter in the range of 10-2000 μm , more preferably in the range of 100-1200 μm , and most preferably in the range of 200-800 μm .

Typically, at least 80 wt.% of the edible salt has a particle size in the range of 10-2000 μm . Even more preferably at least 80 wt.% of the edible salt has a particle size in the
10 range of 50-1500 μm . Most preferably, at least 80 wt.% of the edible salt has a particle size in the range of 100-1000 μm .

The savoury composition preferably contains 1-80 wt.%, more preferably at least 2.5-70 wt.%, even more preferably 5-65 wt.% and most preferably 10-60 wt.% of edible salt
15 selected from sodium chloride, potassium chloride and combinations thereof. Most preferably, the edible salt is sodium chloride.

The combination of edible salt and the one or more particulate ingredients preferably constitutes at least 50 wt.%, preferably at least 60 wt.% of the composition. Most
20 preferably the combination of edible salt and the one or more particulate ingredients constitutes 50-90 wt.% of the savoury composition.

Besides edible salt, the savoury composition may suitably contain a variety of other edible ingredients, as described elsewhere herein.

25

Savoury taste giving ingredients

The composition preferably comprises, by weight of the composition, 3-25 wt.%, preferably 5-20 wt.%, of the savoury taste giving ingredients, selected from glutamate,
30 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof.

The one or more savoury taste giving ingredients employed in the present process typically have a mass weighted average diameter of at least 10 μm , more preferably of

15-3000 μm and more preferably of 20-2000 μm , even more preferably 30-1000 μm and most preferably 40-500 μm .

Sucrose, glucose and fructose are preferably present in the savoury composition in a
5 total amount of 0 to 10 wt.%, more preferably 1 to 4 wt.%, even more preferably 1.5 to 2.5 wt.%, based on the weight of the savoury composition.

Glutamate, for example monosodium glutamate, is preferably present in the savoury composition in an amount of 0 to 25 wt.%, more preferably 5 to 20 wt.%, even more
10 preferably 10 to 20 wt.%, based on the weight of the savoury composition.

Preferably, edible acids selected from the group of lactic acid, citric acid and combinations thereof, are present in the composition in an amount of 0 to 10 wt.%, more preferably 1 to 4 wt.%, even more preferably 1.5 to 2.5 wt.%, based on the weight
15 of the savoury composition.

The savoury taste ingredients may be added as such or as part of a complex ingredient mixture. It is understood that any savoury taste-giving compound can be added as such or as part of more complex food ingredients like yeast extract; hydrolysed proteins of
20 vegetables-, soy-, fish-, or meat-origin, malt extract, beef flavourings, onion flavouring, liquid or dissolvable extracts or compositions selected from the group consisting of meat, fish, crustaceans, herbs, fruit, vegetable and mixtures thereof.

Preferably, one or more of the savoury taste giving ingredients are provided by
25 ingredients selected from the group consisting of yeast extract, hydrolysed vegetable protein, dry meat extract, dry spices, herbs and mixtures thereof

The savoury composition according to the invention preferably comprises 0 to 5 wt.%, more preferably 0.1 to 1 wt.%, or even 0.5 to 2 wt.%, dry meat extract, based on the
30 weight of the savoury composition.

Preferably, the savoury composition comprises yeast extracts and/or hydrolysed vegetable protein. Preferably, the savoury composition comprises 0 to 5 wt.% more preferably 0.1 to 3 wt.%, most preferably 0.5 to 2 wt.% yeast extracts and/or hydrolysed
35 vegetable protein, by weight of the savoury composition.

The total amount of edible salt and savoury taste giving ingredients in the savoury composition is preferably 20 to 90 wt.%, preferably 30 to 80 wt.%, even more preferably 40 to 70 wt.%, based on the weight of the savoury composition. It is especially preferred that the total amount edible salt and savoury taste giving ingredients in the savoury composition is higher than that of the other non-fat ingredients, like fillers, flavour ingredients and water.

Water

10

Preferably the composition comprises 2 to 10 wt.% of water, more preferably 4-8 wt.% water. The savoury composition typically contains less than 9 wt.% water. More preferably, the composition contains 1-8 wt.% water. Most preferably, the composition contains 2-7 wt.% water. The water content in the savoury composition can be measured by any standard method including drying the savoury composition and comparing the weight before and after drying.

15

The savoury composition according to the invention preferably has a water activity of less than 0.65, more preferably less than 0.5, even more preferably less than 0.4, more preferably less than 0.3 and preferably more than 0.15.

20

Puffed maize endosperm particles

Maize is cultivated around the world. The fruits or maize cobs contain the seeds of the maize, known as maize kernels. Maize kernels have a typical shape and structure, which typically includes a germ, endosperm and pericarp. The endosperm tissue of maize is particularly rich in starches, typically amylase and amylopectin. In addition, it has a relatively high fibre content. The pericarp (hull) of maize kernels is relatively strong and water-impermeable

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The particles of puffed maize endosperm can be suitably obtained by puffing of maize endosperm, followed by milling or other methods of size reduction. The term "puffing" as used herein also encompasses popping of maize endosperm. If for example popped popcorn is comminuted, the resulting mixture of particles may include germ, endosperm

and pericarp, but most of the volume and weight will usually be constituted by the expanded endosperm.

Depending on the comminution method, it may be desirable to fractionate the ground
5 material, in order to obtain a particulate material with a suitable size distribution. Such fractionation is conveniently carried out by sieving, which is a well-known technique.

The particle size distribution of the particles of puffed endosperm material used in the present invention can also conveniently be analysed by sieving. It is preferred that such
10 analysis is carried out following the sieving method described in the Examples section below.

Puffing of maize endosperm requires a high starch content. Preferably, the maize endosperm has a starch content of at least 50 wt.%, more preferably of at least 60.
15 wt.% and most preferably of at least 70 wt.%, by weight of dry matter.

A process of puffing can for example be done, by pre-cooking and drying the maize kernels, followed by a heating step (e.g. frying in oil). Alternatively, the maize kernels can for example be puffed by explosion/gun puffing, where the raw or pre-cooked maize
20 kernels are placed in a sealed drum that is rotated and heated from the outside until a certain pressure is obtained, the lid is released and all maize kernels puff at the same time, and escape the drum via the lid, and are collected in a bag where water vapour can escape.

25 Maize kernels comprise a water impermeable hull, which keeps the water inside the seed during heating, are suitable for popping. Popping is an (almost) explosive form of puffing, in which heating of the maize kernels causes starch gelatinization and pressure build-up due to steam formation until the hull bursts and the maize kernels explosively expands to form a foamy structure.

30 The particles of puffed maize endosperm are preferably obtained from puffed popcorn, more preferably from popped popcorn. Certain maize cultivars have been specifically bred for their suitability to be popped, including for instance *Zea mays* var. *everta*. Therefore, the particles of puffed maize endosperm are most preferably sourced from
35 *Zea mays* var. *everta*.

Preferably, at least 80 wt.%, more preferably at least 90 wt.% of the starch within the puffed maize endosperm is gelatinized.

- 5 The puffed maize endosperm particles preferably have a bulk density that falls within the range of 5-220 g/l. More preferably, the puffed maize endosperm particles have a bulk density that falls within the range of 15-190 g/l, most preferably a bulk density that falls within the range of 30-170 g/l. Preferably, the puffed maize endosperm has a bulk density in the range of 25 to 100 g/L, more preferably between 35 to 80 g/L, even more
10 preferably between 45 to 60 g/L .

- Preferably, at least 80 wt.% of the particles of the puffed maize endosperm have an average particle size of less than 2.0 mm, preferably wherein the at least 80 wt.% of the particles of the puffed maize endosperm have an average particle size of less than
15 1.5 mm.

The composition preferably comprises 1-20 wt.%, by weight of the composition, of oil, preferably 2-15 wt.%, more preferably 5-10 wt.%, of oil.

- 20 The composition preferably has a density of 0.8 to 1.6 kg/l, at 20°C. Preferably, the density is 1.1 to 1.5 kg/l, at 20°C, more preferably 1.2 to 1.4 kg/l, at 20°C.

- Preferably, the combination of edible salt and the one or more particulate ingredients constitutes at least 60 wt.% of the savoury composition, preferably wherein the
25 combination of a) -e) constitutes at least 75 % of the savoury composition.

Vegetable matter

- Preferably, the composition comprises vegetable matter selected from vegetables,
30 herbs, spices and combinations thereof. This vegetable matter is preferably applied in the form of leaves, slices, florets, dices or other pieces. Thus, the savoury composition preferably comprises 0 to 30 wt.%, more preferably 0 to 20 wt.% and even more preferably 1 to 10 wt.% by dry weight of the total composition of such vegetable matter selected from vegetables, herbs, spices and combinations thereof. Examples of
35 sources of vegetable matter include parsley, dill, basil, chives, sage, rosemary, thyme,

oregano, leek, onion, mushrooms, broccoli, cauliflower, tomato, courgette, asparagus, bell pepper, egg plant, cucumber, carrot and coconut flesh.

Starch component

5 The savoury composition preferably contains a starch component selected from flour native starch, pregelatinised starch, maltodextrin, modified starch and combinations thereof. The starch component is preferably present in the savoury composition in a concentration of 3-20 wt.%, more preferably of 4-18 wt.% and most preferably of 5-15
10 wt.%. The starch component is preferably selected from native starch, maltodextrin, pregelatinised starch and combinations thereof. Even more preferably, the starch component is selected from native starch, pregelatinised starch and combinations thereof. Most preferably, the starch component is native starch. The starch component typically has a mass weighted mean diameter in the range of 5-200 µm, more preferably
15 of 10-100 µm, most preferably of 12-60 µm.

The savoury composition comprises 0-5 wt.% starch component, preferably 0-2 wt.% starch component. In other words, preferably, the savoury composition is essentially free from starch components.

20

Fat component

The terms "oil" and "fat" encompass fats that are liquid at ambient temperature as well as fats that are solid or semi-solid at ambient temperature. Thus, 'fat' and 'oil' are used
25 interchangeably unless specified otherwise. A fat component as used herein may be a mixture of a liquid oil and a solid fat. Where applicable the prefix 'liquid' or 'solid' is added to indicate if the fat or oil is liquid or solid at ambient temperature as understood by the person skilled in the art. The solid fat content at a given temperature (for example the N20 at 20°C) can suitably be determined using ISO 8292-1 (2012) – Determination
30 of solid fat content by pulsed NMR.

The savoury composition comprises 1-50 wt.%, preferably 5-45 wt.%, even more preferably 10-40 wt.% fat component.

35 In general, it is preferred that the edible oil is edible vegetable oil, as these typically comprise a relatively large amount of unsaturated glycerides. Examples of sources of

conventional edible oils and fats include coconut oil, palm kernel oil, palm oil (and fractions thereof including palm olein and palm stearin), marine oils (including fish oil), lard, tallow fat, butter fat, chicken oil, soybean oil, safflower oil, cotton seed oil, rapeseed oil, linseed oil, sesame oil, poppy seed oil, corn oil (maize oil), sunflower oil, peanut oil, rice bran oil, olive oil, algae oil, shea fat, and alanblackia and blends thereof. For the purpose of this invention, algae oils are considered vegetable oils. Meat fats such as chicken and or beef fat may also be present in the savoury compositions according to the invention.

10 More preferably, the edible oil is selected from soybean oil, sunflower oil, rapeseed oil, corn oil (maize oil), olive oil, linseed oil, palm olein and fractions and combinations thereof, and even more preferably from sunflower oil, rapeseed oil, olive oil and linseed oil.

15 Preferably, the total fat content of the savoury composition is 10-30 wt.%, more preferably 10-35 wt.%, even more preferably 10-20 wt.%.

The SAFA content of the fat that is employed to prepare the fat containing powder mixture preferably does not exceed 60% by weight of the total amount of fatty acids.

20 More preferably, said SAFA content does not exceed 40 wt.%, most preferably it does not exceed 20 wt.%.

Fat in the present invention include oils and fats that are solid or liquid between 20 and 70 °C. The total fat, preferably present in an amount as indicated in the paragraph here above, preferably has a solid fat content at 20 °C (N20) of 0 to 80 wt.%, preferably 5 to 50 wt.%, more preferably 10 to 40 wt.%, based on the weight of the fat. The total fat preferably has a solid fat content at 30 °C (N30) of 1 to 60 wt.%, more 3 to 55 wt.%, even more preferably 10 to 50 wt.%, based on the weight of the fat.

30 The composition of the invention comprises preferably 2 to 40 wt.%, more preferably 5 to 30 wt.%, even more preferably 7 to 20 wt.% and most preferably 10 to 15 wt.% of solid fat at 20 °C (N20), based on the weight of the savoury composition.

The melting point of the fat is preferably in the range of 20 to 70°C, more preferably in the range of 25 to 65°C, even more preferably in the range of 30 to 60 °C, most

preferably in the range of 35 to 50°C. The melting point is considered the lowest temperature at which the solids level according to ISO 8292 1D 2008 is below 0.5%.

The composition preferably comprises 20 to 50 wt.%, preferably 25 to 45 wt.%, even more preferably 30 to 40 wt.%, most preferably 35 to 38 wt.% of palm oil component, having N20 of at least 60% and N30 of at least 40%.

Preferably, the savoury composition is a granulate as defined herein having a mass weighted average diameter in the range of 0.1-5 mm, said granulate comprising the following components:

- a) 35-85 wt.%, preferably 40-75 wt.% of edible salt;
 - b) 3-20 wt.%, preferably 4-15 wt.% fat;
 - c) 2-20 wt.%, preferably 5-15 wt.% of the savoury taste-giving ingredients;
- wherein the wt.% is by weight of dry matter of the total composition.

Preferably, the savoury composition is a granulate as defined herein having a mass weighted average diameter in the range of 0.1-5 mm, said granulate comprising the following components:

- a) 0-50 wt.%, preferably 2-40 wt.% of edible salt;
 - b) 3-20 wt.%, preferably 4-15 wt.% fat;
 - c) 2-20 wt.%, preferably 5-15 wt.% of the savoury taste-giving ingredients;
- wherein the wt.% is by weight of dry matter of the total composition.

The granulate preferably has a mass weighted average diameter in the range of 0.2-2 mm, most preferably in the range of 0.25-1.5 mm.

The product of the invention is in granulated form, where the average granule size is 0.5 mm to 5.0 mm in either length or diameter. If the granule size is more than 5.0 mm in length or diameter, the granule becomes brittle and easily broken or crumbled during transportation and/or storage. Additionally, granules that are too large need more time to dissolve in water. On the other hand, the granules should not be too small, preferably having a length or diameter not less than 0.5 mm. Granules that are too small tend to conglomerate in water and are hard to fully dissolve in water even with stirring. In addition, fine granules have strong hygroscopicity. Thus, a powdery product will absorb moisture from the air and become hydrated, resulting in deterioration of the product and

a shorter shelf-life. Preferably, the granules of the invention have an average size of 1.2 mm to 3.5 mm in either length or diameter. Although not critical, a product having a uniform granule size is preferred, for optimum dissolvability and flowability.

5 A second aspect of the invention relates to a method for preparing the granulated food product described above, comprising steps of:

- i) providing particles of puffed maize endosperm preferably having an average particle size of less than 3 mm and preferably having a bulk density of 30 – 100 g/L;
- 10 ii) combining puffed maize endosperm with savoury taste-giving ingredients, vegetable matter and optionally other food ingredients to provide a particulate savoury composition mix,
- iii) granulating the savoury composition mix to provide a granulate, savoury composition.

15

The amounts and preferred embodiments given for the savoury composition defined herein apply *mutatis mutandis* to the embodiments of the process as defined herein.

20 Preferably, the puffed maize endosperm is combined with an edible salt, a fat component, water and/or a starch component.

The granulation method may any one selected from sifting, high shear granulation, fluidized bed granulation, extrusion-spheronization granulation, spray drying granulation, tablet compression, and roller compaction. The granulation process
25 generates granules having a length or diameter of between 0.5 to 5 mm. As mentioned above, granules that are too large or too small are problematic.

30 Preferably, the granulation method uses high shear granulators, high speed mixer granulators, extruders or fluidized bed granulators. In other words, the granulation method is preferably a wet granulation method. The skilled person is aware of the technique of wet-granulation. During wet-granulation, ingredients are partly dissolved in the added water. The resulting moisty mixture is shaped by pressing it through a sieve, and the resulting granules are dried.

35 Preferably, the invention relates to a process, wherein the granulation is conducted by

a low pressure radial extrusion system such as a basket extruder of. During drying, the partly dissolved ingredients re-crystallize, in this way resulting in binding of the ingredients and therefore coherency and texture of the granule. granulation, the resulting granules may have the shape of small sticks.

5

Optionally, the process of the present invention further comprises a milling step. Preferably, the milling step is conducted after drying step.

The processes described above may be carried out at ambient temperatures. Typically,
10 the temperature for milling, mixing and/or granulating is in the range from -10 to 65 °C, preferably from -5 to 60 °C, more preferably -5 to 20 °C.

Preferably, the granular savoury composition is subjected to a drying step. The drying conditions are not critical, but must enable the water content in the finished product to
15 be reduced. Drying is preferably done up to a water activity (A_w) of lower than 0.87, preferably of between 0.2 and 0.5, most preferably of between 0.2 and 0.3.

The drying temperature can vary within a suitable range. For example, if the drying temperature is relatively high, the drying duration should be relatively short so that the
20 temperature inside the granules will not adversely affect the taste of the composition. Excessive drying below about 0.5 % may be detrimental to flavour and cause texture degradation. Conventional drying techniques including air drying, air convection drying, fluidized bed drying, vacuum drying, freeze drying, solar drying and the like. Although the process can be carried out in batch form, it is preferred that the process be
25 continuous so that, as is customary in production facilities, speed throughput speed is maximised.

Preferably, the drying step is conducted at a temperature of from 50°C to 160 °C, preferably of from 60°C to 130°C most preferably between 70°C and 100°C.

30

The granular savoury composition according to the invention is preferably packaged. Hence the invention relates to a process according to the invention, wherein the process further comprises a step of packaging the resulting granular savoury composition in a packaging selected from the group consisting of: a jar, a dispenser, a
35 mill, a sachet, a pouch and a container.

The granules of the present invention are preferably used in preparing savoury meals. It has been surprisingly found that granules according to the invention leave less residue (undissolved composition) than those of the prior art.

5

In another aspect, the present invention relates to a method of preparing a savoury dish, wherein 1-10 parts by weight of the savoury composition as defined herein is added to 10-100 parts by weight hot water and stirred for at least 1 minute.

- 10 In a further aspect, the present invention relates to the use of the granular savoury composition of the present invention for the preparation of at least one of the group consisting of: a bouillon, soup, sauce, and a gravy. To this end, the granular savoury composition is diluted in an aqueous solution, preferably hot water. The invention further relates to the use of a savoury composition of the invention as a seasoning. The
- 15 granules of the invention may be sprinkled or poured on a dish or a meal during cooking or before or during consumption.

Examples

20 General methods

Determination of particle size

- A representative puffed maize endosperm sample / savoury taste giving ingredient / plant or vegetal matter sample is sieved on a sieving machine through a series of sieves
- 25 (20cm) assembled according to increasing nominal aperture size from bottom to top, equipped with receiver (bottom) and lid. Commercially available test sieves are used with appropriate nominal aperture size. Suitable nominal aperture sizes are given in DIN ISO 3310-1:1990 or ISO 565:1990. For each measurement, 100 gram of sample material is weighted with an accuracy of 0.1 gram into the sieve at the top of the nest.
- 30 After putting the lid on the nest of the sieves it is transferred onto the laboratory sieving machine (vibratory screening machine) and sieved for 10 minutes (amplitude 2mm; sieving aid: two stainless steel balls). After completion of the 10 minutes, the retained fraction of each sieve is weighed on an analytical balance to an accuracy of 0.1g. Each sieve charge is calculated as percentage of mass to one decimal place by dividing the
- 35 residue (g) by the sample amount (100g) and multiplying by 100.

Determination of dry matter content

The water content and corresponding dry matter content of the savoury composition used herein was determined by the following method, wherein the dry matter content is the residual mass after drying the sample expressed as %. For each measurement, 5 g (with 0.1 mg accuracy) of sample material is weighed into a pre-dried, tared pan containing about 60g of pre-dried sea sand and mixed well. The pan with the sample is dried for 6 hours in a vacuum oven at 0.1 bar and 72°C. After 6 hours the pan is placed in a desiccator and allowed to cool down to ambient temperature (30–45 min). Then, it is weighed (with 0.1 mg accuracy). Duplicate determinations of each sample are carried out. Water content, given in percent with two decimal places, is calculated by dividing the measured amount of water (mg) by the sample amount (mg) and multiplying by 100. The lower limit of quantification is 0.01g / 100g for homogeneous samples. The method uncertainty (95%, k=2) for the determination of the water content of is 1,2% relative.

Bulk density determination:

The bulk density of the particles was measured according to method DIN ISO 697:1981-03. Measurement equipment "Schüttdichtemessgerät SMG 697" (Powtec Maschinen und Engineering GmbH, Remscheid, Germany).

Example 1**Preparation of particles of puffed maize endosperm**

Puffed maize was obtained from Pesika Körnergut GmbH (Germany). The puffed maize was comminuted by milling to a particle size of < 3mm using a Solia Type M 30 (screen 334) and subjecting the thus milled puffed maize to a milling process using a Bauermeister: Probat Baumeisternühle ULD – VA. mill with different screen sizes (0,5mm, 0,8mm, 1,0mm, 1,5mm)

Particle size of puffed maize endosperm calculation

The resulting powder was analysed on particle size distribution by the following method: 25 gram aliquots through a stack of stainless steel sieves (apertures 1.0 mm, 0.8, 0.5, 0.25 0.125 and 1.5 mm respectively), using a vibratory sieve shaker (type AS200 digit,

- 16 -

Retsch GmbH & Co., Haan, Germany) pre-set at 60 Hz for 5 minutes. The powder fraction on each sieve was determined.

The average particle size was calculated as the sum of the results of mean value of diameters (of sieve pore) multiplied by the corresponding percentage of fraction as shown in equation 1 below:

$$\frac{\sum(X_n * Y_n)}{100\%} \quad (1)$$

The average particle size calculated from table 1 below is 0.407 mm.

Table one shows particle distribution of a sample generated by above mentioned milling process while using 0.5mm sieve in Bauermeister mill.

Table 1

Sieve Analyses ¹	mean value of diameters		Bauermeister <0.5mm Average -Fraction size [%]	
	Xn	mm	Yn	%
DESCRIPTION [mm]	Xn	mm	Yn	%
1.00 >= 0.80 mm	X4	0.9	Y4	3.7%
0.80 >= 0.50 mm	X3	0.65	Y3	18%
0.50 >= 0.25 mm	X2	0.375	Y2	63.6%
0.25 > 0 mm	X1	0.125	Y1	14.7%

¹ISO 2591-1:1988

Example 2

A compacted asparagus soup was prepared according to the recipe in Table 2. The soup according to A was also prepared with puffed maize endosperm particles (see Table 3). Briefly, the dry ingredients were mixed and combined with the liquid ingredients to provide a wet powder mix. The wet powder mix was compacted using a Bepex Roller Compactor. The screw speed was 40 rpm, the drum speed was 1- rpm and the pressure was 20 kN.

Table 2

Ingredient	A (parts by weight; g)
Roux	37.36
Savoury cream (Fat 74%)	19.04
HF Starch (Dry)	12.45
Salt, iodized	7.76
Asparagus, while AD powder	7.18
Savoury cream veg fat	5.71
Rice flour	4.19
Yeast Extract	2.49
Sweetcorn RD powder	2.49
Sugar white	1.32

50 g of soup product (comparative example A and samples 1-4), were added to 500 mL cold water, heated up to boiling (1.5 minutes) and simmered for 2.5 minutes. The samples were stirred with a whisk 5 times, each time for 30 seconds. The soup was passed over a sieve and the amount of residue in the sieve weighed.

Table 3

Sample	Wt.% puffed maize endosperm particles	Amount of non-dissolved product (grams)
A	0	17
1	1	11
2	3	10
3	5	9
4	7	9.5

10 Particles pass sieve having 1.5 mm mesh

Example 3

15 Compacted tomato soups were prepared according to the base recipe in Table 4. For samples 5 and 6, 1 and 3 wt.% puffed maize endosperm particles were added to the base mix respectively. Comparative example (B) did not contain puffed maize endosperm particles.

The soup according to B was also prepared with puffed maize endosperm particles (see Table 3). Briefly, the dry ingredients were mixed and combined with the liquid ingredients to provide a wet powder mix. The wet powder mix was compacted using a Bepex Roller Compactor. The screw speed was 40 rpm, the drum speed was 1- rpm and the pressure was 20 kN.

Table 4

Ingredient	(parts by weight; g)
Tomato, Spray Dried powder	27
Savoury cream veg fat powder	7.4
Sucrose fine 0.1-0.75 mm	8.2

50 g of soup product (comparative example A and samples 1-4), were added to 500 mL cold water, heated up to boiling (1.5 minutes) and simmered for 2.5 minutes. The samples were stirred with a whisk 5 times, each time for 30 seconds. The soup was passed over a sieve and the amount of residue in the sieve weighed.

15 Table 5

Sample	Wt.% puffed maize endosperm particles	Amount of non-dissolved product (grams)
B	0	1.5
5	1	0.9
6	3	0.9

Example 4

The base soup mix of Table 4 was formulated with 10 wt.% puffed maize endosperm particles and 10 wt.% extruded potato starch (Aeromyl - Südstärke GmbH).

Table 6 Comparison of soup comprising puffed maize endosperm vs. extruded potato starch

Sample	Wt.% puffed maize endosperm particles	Wt.% extruded potato starch	Amount of non-dissolved product (grams)
7	10	0	0.5
8	0	10	1.7

Example 5

A granulated chicken soup was prepared with ingredients as show in Table 7. The dry ingredients are mixed with water to give a wet powder mix. The wet powder mix is then granulated and sieved. The process was carried out using BX300 with a 4 arm rotor with a basket temperature of less than 70 °C and a granulation temperature of less than 40 °C. A drum dryer was used at 90-95 °C. After the drum drier the granules passed through a sieve having 3 mm openings.

10

Table 7

Ingredient	Wt.%
Salt iodized 24-42 ppm KIO ₃ Medium	56.37
Sucrose fine 0.1-0.75 mm	21.16
Corn starch 12% max 10 ppm	14.2
Water	2.15
Flavourings ¹	4.9
Chicken fat	1.07

¹ includes chicken flavouring, yeast, herbs & spices

Two samples were prepared using the base recipe of Table 7 – sample 9 did not contain puffed maize endosperm and sample 10 contained 5 wt.%, based on total weight of the sample, puffed maize endosperm.

15

Table 8

Sample	Chicken soup (wt.% sample)	Puffed maize endosperm (wt.% sample)
9	100	0
10	95	5

Sample 9 and 10 were subjected to dissolution and conductivity tests. Dissolution was measured by conductivity measurement during the dissolution of a sample. With the dissolving of ionic constituents of the sample like e.g. NaCl, MSG etc. the conductivity increases until the sample is completely dissolved. At that point no further increase in conductivity can be observed. The results are given in sec.

Sample 9 or 10 (28g) was added to hot de-mineralised water (1000 ml) of 92°C. The conductivity during dissolving of the sample was measured until no further increase was observed. Conductivity measurement were performed with InoLab 740/ Level 3 active multifunction box with standard-conductivity cell TetraCon R 325. Data acquisition and processing are done with help of Software Multilab® Pilot V5.03. The results are shown in Table 9.

Table 9

Sample	Dissolving time 92 °C [s]	Conductivity [μ s/cm]
9	59	11045
10	11	10515

CLAIMS

1. Savoury composition comprising, by weight of dry matter of the total composition:
- 5 a) 0 to 85 wt.% of an edible salt selected from sodium chloride, potassium chloride and combinations thereof;
- b) 1 to 50 wt.% of savoury taste-giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof;
- 10 c) 0 to 10 wt.% of water;
- d) 0.1-20 wt.% puffed maize endosperm, wherein at least 80 wt.% of the particles of the puffed maize endosperm have an average particle size of less than 3.0 mm,
- e) 1 to 45 wt.% of vegetable matter selected from vegetables, herbs, spices and combinations thereof;
- 15 f) 0 to 75 wt.% of starch component selected from flour, native starch, pregelatinised starch, maltodextrin, modified starch and combinations thereof;
- wherein a) to e) together preferably constitute at least 55 wt.% of the savoury composition,
- 20 wherein the savoury composition is a granulate having a mass weighted average diameter in the range of 0.1-5 mm.
2. Savoury composition according to claim 1, wherein the composition comprises
- 25 a fat component.
3. Savoury composition according to claim 1 or 2, wherein savoury composition comprises 1-50 wt.%, preferably 5-45 wt.%, even more preferably 10-40 wt.% fat component.
- 30 4. Savoury composition according to any of the preceding claims, wherein at least 80 wt.% of the particles of the puffed maize endosperm have an average particle size of less than 2.0 mm, preferably wherein the at least 80 wt.% of the particles of the puffed maize endosperm have an average particle size of less than 1.5
- 35 mm.

5. Savoury composition according to any of the preceding claims, wherein the savoury composition is a dry savoury composition selected from the group consisting of compacted soups, granulated soups, instant soup and, granulated bouillon, powdered bouillon.
6. Savoury composition according to any of the preceding claims, wherein the composition is a granulate preferably having a mass weighted average diameter in the range of 0.2-2 mm, most preferably in the range of 0.25-1.5 mm.
7. Savoury composition according to any of the preceding claims, wherein the composition comprises 5-60 wt.%, preferably 10-50 wt.% starch component.
8. Savoury composition according to any of claims 1 to 6, wherein the composition comprises 0-5 wt.% starch component, preferably 0-2 wt.% starch component.
9. Savoury composition according to any of the preceding claims, wherein a) to e) together preferably constitute at least 65 wt.% of the savoury composition, more preferably 75 wt.% of the savoury composition.
10. Savoury composition according to any one of the preceding claims, wherein the composition comprises:
- a) 10 to 65 wt.% of an edible salt selected from sodium chloride, potassium chloride and combinations thereof;
 - b) 3 to 25 wt.% of savoury taste-giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof;
 - c) 1 to 8 wt.% of water;
 - d) 0.1-20 wt.% puffed maize endosperm, wherein at least 80 wt.% of the particles of the puffed maize endosperm have an average particle size of less than 3.0 mm,
 - e) 1 to 20 wt.% of vegetable matter selected from vegetables, herbs, spices and combinations thereof;

- f) 5 to 20 wt.% of starch component selected from flour, native starch, pregelatinised starch, maltodextrin, modified starch and combinations thereof.

- 5 11. Method of preparing a savoury composition according to any one of the preceding claims, comprising the steps of:
- i) providing particles of puffed maize endosperm preferably having an average particle size of less than 3 mm and preferably having a bulk density of 30 – 100 g/L;
- 10 ii) combining puffed maize endosperm with savoury taste-giving ingredients, vegetable matter and optionally other food ingredients to provide a particulate savoury composition mix,
- iii) granulating the savoury composition mix to provide a granulate, savoury composition.
- 15
12. Method according to claim 10, wherein the granulating step is carried out by a method selected from the group consisting of sifting, high shear granulation, fluidized bed granulation, extrusion-spheronization granulation, spray drying granulation, tablet compression, and roller compaction.
- 20
13. Method according to claim 10 or 11, wherein the puffed maize endosperm has an average particle size of less than 2, preferably less than 1.5 mm.
14. Method according to any of claims 10-12, comprising iv) a drying step,
- 25 preferably wherein the drying step is conducted at a temperature of from 50°C to 160 °C, preferably of from 60°C to 130°C most preferably between 70°C and 100°C.
15. Method of preparing a savoury dish, wherein 1-10 parts by weight of the savoury composition according to any of claims 1-10 is added to 10-100 parts by weight hot water and stirred for at least 1 minute.
- 30
16. Use of a composition according to any of claims 1-9 for preparing a soup or bouillon.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2019/084522

A. CLASSIFICATION OF SUBJECT MATTER

INV. A23L29/212 A23L23/10 A23P10/20 A23P10/28
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A23L A23P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 2018/192753 A1 (UNILEVER NV) 25 October 2018 (2018-10-25) page 2, line 26 - page 3, line 2; claims 1,5,9,10,12,13,15; example 4;3.3; table 2B page 7, line 2 page 8, lines 25-27 page 10, line 28 - page 12, line 5 page 12, line 16 - page 15, line 3 page 7, lines 2-4 page 17, lines 30-31 -----	1-9,13, 15,16 14
X A	WO 2010/046038 A1 (CARGILL INC) 29 April 2010 (2010-04-29) page 3, lines 3-28 page 7, lines 1-2 page 8, lines 1-4,6-10,25-29,30-32 page 9, lines 15-17; claims 1,4,6,9,10; example 3 ----- -/-	1-6,8-16 7



Further documents are listed in the continuation of Box C.



See patent family annex.

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INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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A	page 2, lines 1-10 - page 4, lines 8-11; claims 1,4,7,12-15 page 6, line 21 - page 7, line 19 page 7, lines 26-31 page 9, lines 14-26; example 3; tables 1,8 -----	14
X	WO 2017/171553 A1 (GRANUPURE BV) 5 October 2017 (2017-10-05)	1,5-16
A	page 2, lines 25-29; claims 18,19,22; figure 4; example 4 page 7, lines 30-36 page 9, lines 7-33 page 21, lines 32-34 page 23, lines 2-28 page 24, line 15 - page 25, line 2 -----	2-4
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