



(51) International Patent Classification:

A23P 30/20 (2016.01) A23L 29/00 (2016.01)
A23L 27/10 (2016.01) A23L 29/269 (2016.01)
A23L 23/10 (2016.01)

(21) International Application Number:

PCT/EP2018/067458

(22) International Filing Date:

28 June 2018 (28.06.2018)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

17181929.5 18 July 2017 (18.07.2017) EP

(71) Applicant (for all designated States except AE, AG, AU, BB, BH, BN, BW, BZ, CA, CY, EG, GB, GD, GH, GM, IE, IL, IN, JO, KE, KN, KW, LC, LK, LS, MT, MW, MY, NA, NG, NZ, OM, PG, QA, RW, SA, SC, SD, SG, SL, SZ, TT, TZ, UG, US, VC, ZA, ZM, ZW): **UNILEVER N.V.** [NL/NL]; Weena 455, 3013 AL Rotterdam (NL).

(71) Applicant (for AE, AG, AU, BB, BH, BN, BW, BZ, CA, CY, EG, GB, GD, GH, GM, IE, IL, IN, JO, KE, KN, KW, LC,

LK, LS, MT, MW, MY, NA, NG, NZ, OM, PG, QA, RW, SA, SC, SD, SG, SL, SZ, TT, TZ, UG, VC, ZA, ZM, ZW only): **UNILEVER PLC** [GB/GB]; a company registered in England and Wales under company no. 41424 of Unilever House, 100 Victoria Embankment, London Greater London EC4Y 0DY (GB).

(71) Applicant (for US only): **CONOPCO, INC., D/B/A UNILEVER** [US/US]; 700 Sylvan Avenue (A4), Englewood Cliffs, New Jersey 07632 (US).

(72) Inventors: **BLIJDENSTEIN, Theodorus, Berend, Jan**; Unilever R&D Vlaardingen B.V., Olivier van Noortlaan 120, 3133 AT Vlaardingen (NL). **KELDER, Jasper, David, Hidde**; Unilever R & D Vlaardingen, Olivier van Noortlaan 120, 3133 AT Vlaardingen (NL).

(74) Agent: **TJON, Hon, Kong, Guno**; Olivier van Noortlaan 120, 3133 AT Vlaardingen (NL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,

(54) Title: SHAPED SAVOURY CONCENTRATE

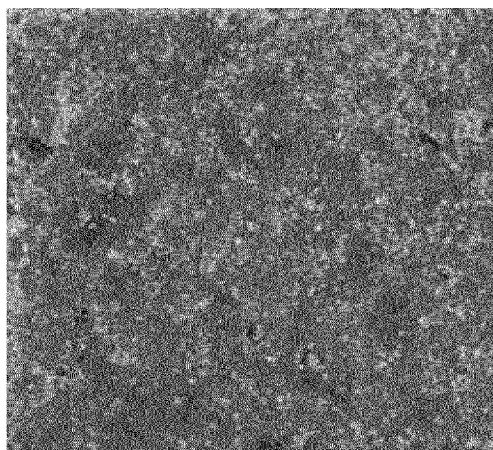


Fig. 2

(57) Abstract: The present invention relates to a shaped edible savoury concentrate, comprising a plurality of discrete strands of a savoury base, said savoury base comprising, by weight of the savoury base, 10 to 50 wt.% fat, 20 to 85 wt.% of an edible salt selected from sodium chloride, potassium chloride and combinations thereof, 1 to 40 wt.% savoury taste giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof, wherein the concentrate has a weight in the range of 2 to 100 g and a hardness in the range of 10 to 100 N.. The invention also relates a method for preparing such a concentrate and to the use of such a concentrate for preparing bouillon, soups, sauces, gravies or for use as a seasoning.



KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*
- *of inventorship (Rule 4.17(iv))*

Published:

- *with international search report (Art. 21(3))*

SHAPED SAVOURY CONCENTRATE

Field of the invention

The present invention relates to a shaped edible savoury concentrate. It further
5 relates to a process to prepare such a shaped savoury concentrate. It further relates to
the use of a shaped edible savoury concentrate for preparing bouillon, soups, sauces,
gravies or for use as a seasoning.

Background of the invention

10 Savoury concentrates are well known in the food industry and are used, for
instance, to prepare a sauce, soup or bouillon. Savoury concentrates typically comprise
one or more of salt, taste enhancer, fat, herbs, spices, flavourants, starch, and other
components. Such concentrates can be in the form of a loose powder than can be added
e.g. by spooning or sprinkling into a cooking liquid, or in the form of a cube or tablet that
15 can be added in one go or by crumbling into a cooking liquid.

A typical bouillon cube comprises salts, taste enhancing compounds like
monosodium glutamate (MSG), sugars, starch (like flour), and fat, flavouring
components like vegetables, meat extracts, spices, and colorants. The amounts of the
respective compounds may vary depending on the specific purpose of the product, the
20 market or taste of the consumer that is aimed at.

In general two types of bouillon cubes can be distinguished in the art, the pressed
and the extruded type. Pressed cube are typically pressed from powder, resulting in a
relatively hard and dense cube, by a rotating press, as commercially available from e.g.
Bonals (trademark). The extruded cube, which is softer and where fat typically forms the
25 continuous phase, is typically but not necessarily prepared by extruding a pasty mass in
commercially available machines from e.g. Corazza or Benhill (trademarks). In order to
shape the bouillon concentrate into a relatively quick dissolving stable cube by
compression or extrusion, a binding compound is highly advantageous. In most cases,
a certain amount of fat is used for this purpose. Shaping towards the pasty cube, using
30 extrusion, in general requires a higher fat content than using compression. Hence,
extruded cubes in general have a higher fat content than pressed cubes.

WO 2006/045404 discloses a granular cooking aid (e.g. granulates,
agglomerates or extrudates) comprising 70-99.95% (wt.%) of a matrix material and 0.05-

30% (wt.%) of microbial capsules comprising an active. The word "granular" encompasses granules, agglomerates, extrudates or similar forms of particles comprising a multitude of smaller particles, powder or crystals. Also described is a process for making such a granular cooking aid, as well as cubes or tablets prepared containing such granular cooking aid. Example 2 discloses a seasoning cube comprising a granular seasoning comprising salt (50 wt.%), MSG (19 wt.%), fat flakes (8 wt.%), sugar (4 wt.%) and corn starch (4 wt.%). The granule containing seasoning mixture was pressed using a Frewitt-Bonals press. Such bouillon cubes have a solid, dusty appearance that is not visually appealing to the consumer.

EP 0 981 970 discloses a process for producing stock cubes by mixing the customary constituents comprising salt, fat, extract, and, if appropriate, water and other customary additives, which is characterized in the mixing is performed by continuous addition of the constituents one after the other in an extruder, an amount of fat which is reduced in comparison with customary formulations of 4-30%, in particular 5-25%, preferably 8-12%, based on the total mixture, the mixture continuously processed in the extruder being extruded through a shaping die to form a dimensionally stable extrudate having a density of 1.0-2.0 g/cm³, preferably 1.2-1.7 g/cm³, and the extrudate being portioned to the individual pieces which are packaged. Example 3 discloses a composition of salt (56 wt.%), MSG (21 wt.%), seasonings (3 wt.%), liquid meat extract (9 wt.%) and liquid fat (10 wt.%). Such stock cubes have a solid, greasy appearance that is not visually appealing to the consumer.

There are increasing regulatory pressures to reduce the amount of salt and additives such as starch in shaped savoury concentrates. However, a shaped savoury concentrate having a reduced salt and/or starch concentration must still conform to standard packaging requirements and have the desired crumbling and dissolution characteristics that the consumer expects for it to be acceptable to the consumer.

It is therefore an object of the present invention to provide a shaped savoury concentrate that is visually appealing to the consumer.

It is another object of the present invention to provide a shaped savoury concentrate that is easy to crumble and dissolve but that has reduced salt and/or starch amounts than conventional shaped savoury concentrates.

Summary of the invention

The inventors have found that a shaped edible savoury concentrate that comprises discrete strands of a savoury base offers a number of advantages over the prior art. Accordingly, in a first aspect the present invention relates to a shaped edible savoury concentrate comprising a plurality of discrete strands of a savoury base, said savoury base comprising, by weight of the savoury base:

- 10 to 50 wt.% fat,
- 20 to 85 wt.% edible salt selected from sodium chloride, potassium chloride and combinations thereof,
- 1 to 40 wt.% savoury taste giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof, wherein the concentrate has a weight in the range of 2 to 100 g and a hardness in the range of 10 to 100 N

The discrete strands of savoury base in the concentrate impart an appealing appearance to the product. The strands give the consumer the impression of a wholesome, fibrous product rather than the typical grainy, gritty, sand-like appearance of the conventional granular bouillon cubes to which the consumer is accustomed. The concentrate of the invention can be rapidly dissolved in hot aqueous liquid to form a soup, sauce or bouillon etc. as the water can quickly enter the spaces between the strands. Finally, the presence of discrete strands in the savoury concentrate facilitates crumbling of the product.

In a second aspect, the invention relates to a method for preparing a shaped edible savoury concentrate comprising the steps of:

- i) providing a savoury base comprising:
 - 10 to 50 wt.% fat,
 - 20 to 85 wt.% edible salt selected from sodium chloride, potassium chloride and combinations thereof,
 - 1 to 40 wt.% savoury taste giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof,
- ii) extruding the savoury base to provide a plurality of discrete strands,

- iii) combining the strands obtained in step b) and shaping the combined strands to provide a shaped edible savoury concentrate.

In a third aspect, the invention relates to the use of a concentrate as defined herein for preparing bouillon, soups, sauces, gravies or for use as a seasoning.

5 These and other aspects, features and advantages will become apparent to those of ordinary skill in the art from a reading of the following detailed description and the appended claims.

10 **Detailed description of the invention**

Accordingly, in a first aspect the present invention relates to a shaped edible savoury concentrate, comprising a plurality of discrete strands of a savoury base, said savoury base comprising, by weight of the savoury base:

- 10 to 50 wt.% fat,
- 15 • 20 to 85 wt.% edible salt selected from sodium chloride, potassium chloride and combinations thereof,
- 1 to 40 wt.% savoury taste giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof, wherein the concentrate has a weight in the range of 2 to 100 g and a
- 20 hardness in the range of 10 to 100 N

The terms "oil" and "fat", unless indicated otherwise, are deemed to be synonyms and refer to a glyceride selected from triglycerides, diglycerides and mixtures thereof.

The term "comprising a plurality of discrete strands" means that the concentrate comprises several elongated structures that can be distinguished from each another by the naked eye. In other words, these elongated structures are visible to the naked eye.

The words "comprising" and "containing" as used herein are intended to mean "including", and should not be construed as "consisting of". In other words, if preceded by the word "comprising" or "containing", the listed steps or options are not exhaustive.

All percentages are weight/weight percentages unless otherwise indicated.

30

Strands

The term "comprises a plurality of discrete strands" means the shaped edible savoury concentrate has a stranded appearance. Preferably, the outer surface of the

concentrate exhibits a stranded structure. In other words, the discrete strands of savoury base preferably constitute at least 70 vol.%, more preferably at least 80 vol.% and even more preferably at least 90 vol.%, of the concentrate, based on the total volume of the concentrate.

5 Preferably, the concentrate contains at least 70 vol.%, based on the total volume of the concentrate, of the plurality of discrete strands and the strands preferably have a average width in the range of 1 to 10 mm.

In a preferred embodiment, the strands have a length:average width ratio of at least 3:1, wherein the length is in the range of 1.5 to 50 mm, and the average width is in
10 the range of 1 to 10 mm.

The term "length" means the dimension of the longest side of a strand.

In a preferred embodiment, the length is in the range of 2 to 50 mm, preferably in the range of 4 to 40 mm, more preferably in the range of 6 to 30 mm, and most preferably in the range of 8 to 25 mm.

15 The term "average width" means the average dimension of the shortest side of a strand, wherein the shortest side and longest side of the strand are in the same plane.

In certain embodiments, the term "average width" means the average diameter of the strand.

Preferably, the average width is in the range of 1 to 10 mm, more preferably in
20 the range of 2 to 9 mm, more preferably in the range 3 to 7 mm.

Preferably the strands have a length:average width ratio of at least 3:1, more preferably at least 3.5:1, even more preferably 4:1.

In a preferred embodiment, at least 70 vol.%, based on the total volume of the concentrate, more preferably at least 80 vol.%, and even more preferably at least 90
25 vol.% of the strands have a length:average width ratio of at least 3:1, wherein the length is in the range of 1.5 to 50 mm, and the average width is in the range of 1 to 10 mm.

The volume occupied by the strands and the dimensions of the strands may suitably be determined by using X-ray microtomography (micro-CT). Suitable micro-CT images for quantitative (2D/3D) analysis can be obtained by using a laboratory micro-CT
30 system with a 100kV X-ray source with spot size < 5µm, power settings of 95kV and 104µA, an aluminium and copper beam filter (Al 1mm, and Cu 0.05mm), step size of 0.2° over 360 degrees frame averaging of 3 and scan with pixel size of 4 µm or lower.

The porosity, also referred to as the air between strands, can be measured by microCT as known to the person skilled in the art.

Besides the strands of savoury base, the concentrate may contain other edible components that are located between the strands. Examples of such other components include particulate ingredients (e.g. herbs or spices) as well as components having a semi-solid consistency (e.g. fat or gels).

Fat

The concentrate of the present invention comprises 10 to 50 wt.% fat. Preferably, the strands comprise 15 to 50 wt.% fat, preferably 20 to 40 wt.% and more preferably 25 to 35 wt.% fat, by weight of the savoury base.

Fat in the present invention include oils and fats that are solid or liquid between 20 and 70 °C. The proportion of solid fat present is given by the N-value. The N-value N_t equals the solid fat content of a fat at a temperature of 10°C as measured by means of ISO 8292 2008- Animal and vegetable fats and oils - Determination of solid fat content - Pulsed nuclear magnetic resonance method.

The total fat, preferably present in an amount as indicated in the paragraph here above, preferably has a solid fat content at 20 °C (N_{20}) of 5 to 80 wt.%, preferably 10 to 45 wt.%, more preferably 20 to 40 wt.%, based on the weight of the fat. The total fat preferably has a solid fat content at 30 °C (N_{30}) of 1 to 60 wt.%, more 3 to 55 wt.%, even more preferably 10 to 50 wt.%, based on the weight of the fat.

The concentrate 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 (N_{20}), based on the weight of the savoury base.

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%.

In a preferred embodiment, the fat is selected from the group consisting of beef fat, chicken fat, palm oil, olive oil, sesame oil, sun flower oil, rape seed oil, palm kernel oil, corn oil, cottonseed cake oil, soybean oil, coconut oil, milk fat (also called butter fat), derivatives thereof, fractions thereof, and mixtures thereof.

The concentrate 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%.

5

Salt

The concentrate comprises 20 to 85 wt.% edible salt selected from sodium chloride, potassium chloride and combinations thereof, based on the weight of the savoury base. Preferably the concentrate comprises 30 to 75 wt.%, more preferably 40
10 to 60 wt.%, edible salt, based on the weight of the savoury base.

Savoury taste giving ingredients

The concentrate comprises 1 to 40 wt.% savoury taste giving ingredients selected from the group consisting of glutamate, 5'-ribonucleotides, sucrose, glucose, fructose,
15 lactic acid, citric acid and combinations thereof, based on the weight of the savoury base.

Sucrose, glucose and fructose are preferably present in the savoury concentrate in a 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 base.

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

Preferably, edible acids selected from the group of lactic acid, citric acid and combinations thereof, are present in the concentrate 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 of the
25 savoury base.

The savoury taste ingredients may be added as such or as part of a complex ingredient mixture. In a preferred embodiment, one or more of the savoury taste giving ingredients are provided by ingredients selected from the group consisting of yeast extract, hydrolysed vegetable protein, dry meat extract, dry spices, herbs and mixtures
30 thereof.

The savoury concentrate 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 weight of the savoury base.

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

5 The total amount of edible salt and savoury taste giving ingredients in the savoury concentrate 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 base. It is especially preferred that the total amount edible salt and savoury taste giving ingredients in the savoury concentrate is higher than that of the other non-fat ingredients, like fillers, flavour
10 ingredients and water.

Other ingredients

In a preferred embodiment, the savoury concentrate comprises 1 to 10 wt.% water, by weight of the savoury base. Preferably the savoury concentrate comprises 1
15 to 8 wt.%, more preferably 2 to 6 wt.% water, by weight of the savoury base.

In another preferred embodiment, the savoury concentrate comprises 0 to 20 wt.%, by weight of the savoury base, of a filler selected from the group consisting of starch, flour, xanthan gum, Locust bean gum, guar gum, gellan gum, carboxymethylcellulose and mixtures thereof.

20 In the context of the present invention a filler is a polysaccharide that acts as a bulking agent and / or structurant. Preferably, the starch is any commercially available starch as commonly used in shaped food concentrates. Typical examples of starches commonly used in savoury concentrates include native potato starch, corn starch, tapioca starch, rice starch.

25 The filler is typically present in the savoury concentrate in a concentration of 0 to 20 wt.%, more preferably 1 to 15 wt.%, even more preferably 2 to 12 wt.%, most preferably 5 to 10 wt.%, by weight of the savoury base.

The total amount of amorphous powdery ingredients in the savoury concentrate is preferably lower than 30 wt.%, more preferably lower than 25 wt.%, most preferably
30 lower than 20 wt.%, by weight of the savoury base.

In a preferred embodiment of the present invention, the combination of components a), b) and c) constitutes at least 80 wt.% of the savoury base. Preferably,

the combination of components a), b) and c) constitutes at least 85 wt.%, more preferably at least 90 wt.%, and even more preferably at least 95 wt.% of the savoury base.

In a preferred embodiment, the shaped edible savoury concentrate comprises, by weight of the savoury base:

- 5 a) 10-25 wt.% fat,
 - b) 20-45 wt.% edible salt selected from sodium chloride, potassium chloride and combinations thereof,
 - c) 5-27 wt.% savoury taste giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof.
- 10

Shaped edible savoury concentrate

The shaped edible savoury concentrate of the present invention is preferably a compressed concentrate.

- 15 Preferably the concentrate has a density of 0.8 to 1.6 kg/l, at 20°C. In a preferred embodiment, 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.

It is preferred that the concentrate has a weight of 2 g to 100 g, preferably 4 g to 75 g, more preferably 6 g to 50 g, more preferably 8 g to 25 g.

- 20 The shape of the concentrate is preferably regular. The shape is for example a sphere, a pyramid, a cylinder, an oval cylinder, a truncated cone, a cube or an oblong. In a preferred embodiment, the concentrate has a cubic, cuboid or cylindrical shape.

- The hardness of the concentrate of the invention can be expressed as the maximum force required to penetrate the product for until it breaks. This technique is common in the art, and typically performed by a penetrometer, such as available from Stable Micro Systems TM, using the instructions of the manufacturer. The force to penetrate a cylinder of 12 mm diameter over a distance of 5 mm into the product at a temperature of 20 °C using a penetrometer (cylindrical geometry) is preferably lower than 100 N. The force is preferably higher than 10 N, preferably higher than 12 N, more preferably higher than 15 N, even more preferably higher than 20 N, more preferably of higher than 25 N or preferably higher than 30 N. The force is preferably 10 to 100 N, more preferably 15 to 90 N, even more preferably 20 to 85 N, most preferably 25 to 70.
- 25
- 30

The shaped edible savoury concentrate of the present invention is preferably obtainable, more preferably obtained by a process as defined herein below:

In a second aspect, the present invention relates to a method for preparing a
5 shaped edible savoury concentrate comprising the steps of:

- i) providing a savoury base comprising:
 - 10 to 50 wt.% fat,
 - 20 to 85 wt.% edible salt selected from sodium chloride, potassium chloride and combinations thereof,
 - 10 • 1 to 40 wt.% savoury taste giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof,
- ii) extruding the savoury base to provide a plurality of discrete strands,
- iii) combining the strands obtained in step ii) and shaping the combined strands to
15 provide a shaped edible savoury concentrate.

Amounts, preferred amounts, ingredients and preferred ingredients *etcetera* as specified for the product apply also for this method, *mutatis mutandis*, unless specified otherwise.

It has been found that by extruding the savoury base as a plurality of strands and
20 subsequently combining and shaping the strands into a shaped concentrate, for example a bouillon cube, a standard savoury concentrate packing unit (e.g. bouillon cube) can be filled with less mass compared to the standard savoury concentrate of the prior art.

The inventors have also found that by extruding the savoury base and combining the extruded stands into a shaped concentrate the strands remain visible giving the final
25 concentrate an appealing fibrous structure.

Step (i)

The savoury base is prepared by mixing together fat, edible salt and savoury taste giving ingredients. The mixing may be carried out in any mixer known in the art. In
30 case the savoury base comprises solid fat, the solid fat is preferably molten before mixing.

In another preferred embodiment, 0.1-10 wt.% water is added in the preparation of the savoury base in the form of aqueous liquid. Preferably the water is added to the

savoury base after addition of the dry ingredients such as salt and taste imparting ingredients.

Step (ii)

5 Extrusion of the savoury base preferably takes place by pushing the savoury base through a die, thereby creating a plurality of strands of savoury base.

Preferably, the savoury base is extruded through a plurality of apertures having a width between 1 and 10 mm. Preferably, the apertures have a width of between 1 and 9 mm, more preferably between 2 and 8 mm, even more preferably between 3 and 7
10 mm, most preferably between 4 and 6 mm.

Preferably the extrusion step ii) is carried out at a temperature between 20 and 45 °C and a pressure of between 1 and 50 bar.

Extrusion is preferably conducted with the help of an extruder that comprises a screw auger.

15 The extruded strands are preferably cut at regular lengths by means of a rotating chopper, located downstream or upstream, preferably upstream, of the extrusion die.

Step (iii)

In a preferred embodiment, the extruded stands are collected and stored prior to
20 shaping into a shaped edible concentrate such as a bouillon cube. In a particularly preferred embodiment, the extruded strands are collected directly into a packing unit and then subsequently shaped in the packaging unit to provide a packaged shaped edible savoury concentrate. This may be achieved, for instance, by making use of a filler machine.

25 The strands of savoury based are shaped into a final product, such as a bouillon cube in such a way that the discrete strands remain visible to the naked eye.

In a third aspect, the present invention relates to the use of a concentrate according to the present invention for preparing bouillon, soups, sauces, gravies or for
30 use as a seasoning.

The concentrate of the invention is preferably a bouillon concentrate, a soup concentrate, a gravy concentrate, a sauce concentrate or a seasoning concentrate.

The use according to the present invention preferably comprises dissolving the concentrate according to the invention, at least part of it, in an aqueous liquid, or mixing it into a dish. The aqueous liquid is preferably water, but can be a sauce base, a soup base etc. The dish can be a vegetable dish, meat, fowl, fish etc.

- 5 The temperature of the aqueous liquid or the dish is preferably between 60 °C and 100 °C, more preferably of between 65 °C and 90 °C, even more preferably of between 70 °C and 85 °C.

Figures

- 10 Figure 1 shows a bouillon cube according to the present invention. Figure 2 shows a comparative example of a standard bouillon cube made according to the prior art.

Examples

- 15 The invention will now be exemplified by the following non-limiting examples:

Example 1 Preparation of shaped edible savoury concentrates

A representative bouillon cube was prepared from a savoury base having the composition that is shown in Table 1.

- 20 Table 1: Composition of savoury base

Savoury base ingredients	Wt.%, based on total ingredients
Salt	42
Glutamate	15
Dry spice mix	11.5
Palm oil, Stearin, Bulk SAV1044556	20
F&O MIX PO/SH/SL (super hardstock fat)	5
Xanthan gum	4.5
Water	2
Total:	100

Dry ingredients (salt, glutamate, dry spice mix) were charged into the bowl of a Kenwood Chef Kitchen blender, equipped with a K-beater type of stirring geometry.

These dry ingredients were mixed together at low speed (setting “min”) until fully homogeneous (2 minutes). In the next step, water was added and the mixture was mixed for another two minutes until the liquid was fully divided over the dry ingredients (setting 1-2). Hereafter, the fats were added in molten form at a temperature of 80°C and the
5 resulting paste was continued to be mixed for another 2 minutes. Finally, xanthan powder was added and mixing continued for another 2 minutes, all at the same speed.

Subsequently, a part of the paste was extruded through a meat cutter add-on of the Kenwood, equipped with fine screen, containing multiple circular apertures with a diameter of 3.2 mm. This process yielded discrete strands of paste with a diameter of
10 ca. 3.2 mm and a length in the range of 5 to 100 mm. The strands were collected in a water tight box for further use. The remaining part of the paste was collected separately in a water tight box.

The strands were weighed on a precision scale to the target weight of 9.0, 9.5 or 10 grams, and dosed in a 20-cavity mould where each cavity had a 10x24x28 mm
15 footprint. The overall contour volume of the tablets was kept constant and the mass and format dosed into this volume was varied.

Three bouillon cubes (Sample 1, 2 and 3) were prepared by dosing 10 g, 9.5 g and 9 g of strands respectively in a mould where each cavity had a 10x24x28 mm footprint and pushing rectangular pistons to a constant final tablet height of
20 approximately 11.5 mm using an Instron 5567K6574 press having a load cell of 30 kN.

Example 2 Comparative example

A bouillon cube made using known methods was prepared by weighing portions of 10 g into the mould and pushing rectangular pistons to a constant final tablet height of
25 approximately 11.5 mm using an Instron 5567K6574 press having a load cell of 30 kN.

Example 3 Hardness measurement

The hardness of the bouillon cubes was measured using a Texture analyser (TA XT Plus ex Stable Microsystems) equipped with a cylindrical probe having a diameter of
30 ½ inch. A bouillon cube (dimensions 11.5x 24x28 mm) was positioned horizontally under the probe, with the centre of the cube in the horizontal plane coinciding with the center of the probe. The cube was compressed by lowering the probe at a constant speed of 0.5 mm/s over a distance of 3 mm after touching the top surface. During compression,

the force experience by the probe is measured. The hardness is defined as the maximum force that is encountered, expressed in Newton (N). Measurements are carried out tenfold. The results shown in table 2 is the average hardness measured

5

Example 4 Dissolution time

The dissolution speed of the bouillon cubes was measured by a dynamic conductivity measurement. A portion of 1 l demineralised water in a 2 litre beaker glass with a diameter of 12.7cm is brought at a temperature of 92 +/- 1°C and one cube is dissolved under continuous stirring using a triangular stirring bar with a length of 8 cm at a constant stirring speed of 170 rpm.

The conductivity of the water was monitored in time using a Mettler Toledo Seven Compact conductivity meter at 90±3°C. The conductivity rises due to dissolution of the salts from the formulation into the water, until all salt is dissolved and a maximum is reached. The dissolution time is defined as the time at which the conductivity has reached 90% of the final plateau conductivity value. Measurements are carried out in threefold. The results shown in table 2 is the average dissolution time measured.

Table 2: analysis of shaped concentrates in the form of bouillon cubes according to the invention (samples 1, 2 &3) vs. a standard bouillon cube (comparative example)

Sample	Hardness (N)	Dissolution time (s)	Crumbability
Comparative example	108 ± 7	34 ± 2	Pasty – does not crumble
1 (according to invention)	62 ± 4	30 ± 0.4	Easily crumbled
2 (according to invention)	50 ± 6	28 ± 2	Easily crumbled
3 (according to invention)	49 ± 4	26 ± 0.4	Easily crumbled

The difference in visual appearance between the comparative example and sample 3 cubes is shown in Figs. 1 (sample 3) and 2 (comparative).

25

The results demonstrate that the transformation from massive paste loading to strand-loading of tablets provides a higher crumbability and lower hardness. Moreover, there is a significant favourable effect on cube dissolution time.

5

Experiment 5 Porosity and density measurement

Samples were imaged using a Skyscan 1172 desktop micro-CT system with a 100kV X-ray source (10W, 20-100kV, 0-250 μ A, < 5 μ spot size) and a 10 Mp X-ray detector (4000 * 2664 pixels). Power settings of 95kV and 104 μ A were used. Images were acquired using an aluminium and copper beam filter (Al 1mm, and Cu 0.05mm), step size of 0.20° over 360 degrees and frame averaging of 3. Scans with pixel sizes of 6.7 μ m were made. The total scanning time (1800 images) was 10:12 hours/scan. The samples were scanned using 2 scans, connected in the vertical direction to increase the axial field-of-view (oversized scan) and subsequently merged together during the reconstruction. A stack of ~4500 horizontal cross sections with a pixel size of 4000 x 4000 was obtained after tomographic reconstruction of the projection images. A beam hardening correction of 40%, ring artefact correction of 20 and smoothing of 4 were selected.

The total cube was weighed and inserted in a plastic tube with an inner diameter of 27mm. The piece was fixed in the tube using Styrofoam. The tube was mounted on a special made base and inserted in the micro-CT system.

For 3D visualisation the AvizoFire 9.3.0 software (Visualization Sciences Group) was used. The original image was subsampled with a factor 2 and a binary mask was generated of the total cube including internal and external pores. This was done by thresholding and binary filling. From this binary mask a virtual wrapper was made by using a 3D convex hull. The pore space within the mask was obtained by thresholding followed by the removal of small features (222 pixels in 3D = 100 μ m), filtering (3D binary smoothing with a size of 3 pixels) and analysing using "BubbleSize-Avizo8c-modified-jan2014.scro" script with a separation factor of 6.

The volume of the sample (V) was calculated from the number of pixels in the 3D convex hull (V_1 = virtual wrapper). The densities ρ_1 and ρ_2 of the sample were calculated from its mass and the total volumes ($\rho_1 = m / V_1$ & $\rho_2 = m / V_2$).

5

Sample	3D convex wrapped cube	
	Porosity % air	density kg/m ³
1 (according to invention)	18.9	1165
2 (according to invention)	21.0	1168
3 (according to invention)	19.0	1194
average	19.6	1176
Standard deviation.	1.2	16

Claims

1. Shaped edible savoury concentrate comprising a plurality of discrete strands of a savoury base, said savoury base comprising, by weight of the savoury base:
 - a) 10 to 50 wt.% fat,
 - b) 20 to 85 wt.% edible salt selected from sodium chloride, potassium chloride and combinations thereof,
 - c) 1 to 40 wt.% savoury taste giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof,wherein the concentrate has a weight in the range of 2 to 100 g and a hardness in the range of 10 to 100 N.
2. Shaped edible savoury concentrate according to claim 1, wherein the outer surface of the concentrate exhibits a stranded structure.
3. Shaped edible savoury concentrate according to claim 1 or 2, wherein the concentrate contains at least 70 vol.%, by volume of the concentrate, of the plurality of discrete strands and the strands preferably have an average width in the range of 1 to 10 mm.
4. Shaped edible savoury concentrate according to any one of the preceding claims, wherein the strands have a length:average width ratio of at least 3:1, wherein the length is in the range of 1.5 to 50 mm, and the average width is in the range of 1 to 10 mm.
5. Shaped edible savoury concentrate according to any one of the preceding claims, wherein the strands comprise 15 to 50 wt.% fat, preferably 20 to 40 wt.%, by weight of the savoury base.
6. Shaped edible savoury concentrate according to any one of the preceding claims, wherein the strands comprise 1 to 10 wt.% water, by weight of the savoury base.

7. Shaped edible savoury concentrate according to any one of the preceding claims, wherein the strands comprise 0 to 20 wt.%, by weight of the savoury base, of a filler selected from the group consisting of starch, flour, xanthan gum, Locust bean gum, guar gum, gellan gum, carboxymethylcellulose and mixtures thereof.
8. Shaped edible savoury concentrate according to any one of the preceding claims, wherein the concentrate has a density of 0.8 to 1.6 kg/l, at 20°C.
9. Shaped edible savoury concentrate according to any one of the preceding claims, wherein the concentrate has a cubic, cuboid or cylindrical shape.
10. Shaped edible savoury concentrate according to any one of the preceding claims, the combination of components a), b) and c) constitutes at least 80 wt.% of the savoury base.
11. Shaped edible savoury concentrate according to any one of the preceding claims, obtainable by a process comprising the steps of:
 - i) providing a mixture comprising fat, edible salt and savoury taste giving ingredients,
 - ii) extruding the mixture to provide a plurality of discrete strands,
 - iii) combining the strands, and shaping the combined strands to provide a shaped edible concentrate.
12. Method for preparing a shaped edible savoury concentrate comprising the steps of:
 - a. providing a savoury base comprising, by weight of the savoury base:
 - i. 10 to 50 wt.% fat,
 - ii. 20 to 85 wt.% edible salt selected from sodium chloride, potassium chloride and combinations thereof,
 - iii. 1 to 40 wt.% savoury taste giving ingredients selected from glutamate, 5'-ribonucleotides, sucrose, glucose, fructose, lactic acid, citric acid and combinations thereof,

- b. extruding the savoury base to provide a plurality of discrete strands, preferably the savoury base is extruded through a plurality of apertures having a width between 1 and 10 mm,
 - c. combining the strands obtained in step ii) and shaping the combined strands to provide a shaped edible savoury concentrate.
13. Method according to claim 12, wherein 0.1-10 wt.% water, by weight of the savoury base, is added in the form of aqueous liquid.
14. Method according to any one of claims 12 to 13, wherein the extrusion step ii) is carried out at a temperature between 20 and 45 °C and a pressure of between 1 and 50 bar.
15. Use of a concentrate according to any one of claims 1-11 for preparing bouillon, soups, sauces, gravies or for use as a seasoning.

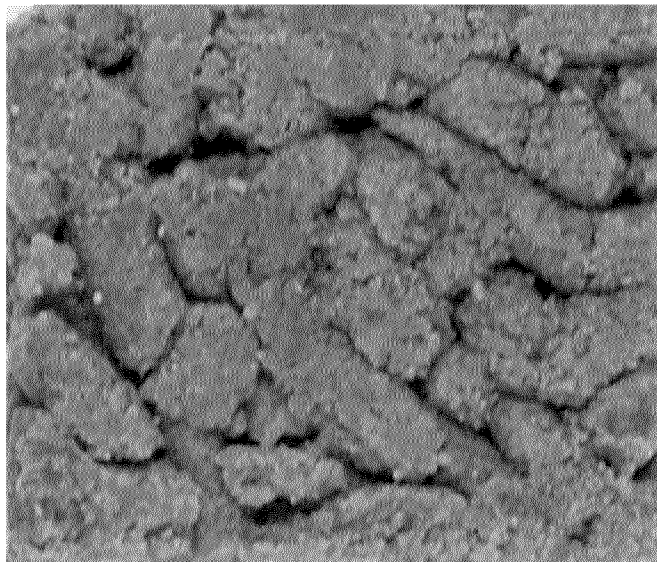


Fig.1

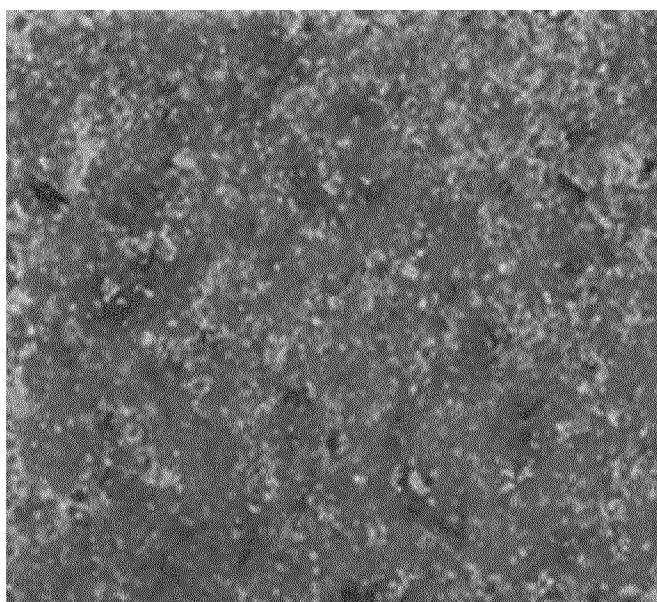


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/067458

A. CLASSIFICATION OF SUBJECT MATTER INV. A23P30/20 A23L27/10 A23L23/10 A23L29/00 A23L29/269 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) A23P A23L		
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, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 060 645 A (RISLER PIERRE ET AL) 29 November 1977 (1977-11-29) column 1, line 1 - line 37 column 2, line 25 - line 29; claims 1,3-6; figure 1; examples 1-4 -----	1-15
A	WO 2008/086918 A1 (UNILEVER NV [NL]; UNILEVER PLC [GB]; UNILEVER HINDUSTAN [IN]; KOHLUS R) 24 July 2008 (2008-07-24) example 1 -----	1-15
A	GB 2 509 315 A (PREMIER FOODS GROUP LTD [GB]) 2 July 2014 (2014-07-02) page 1, line 1 - line 7; figures 2,6; examples 1,2 ----- -/-	1-15
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 23 August 2018		Date of mailing of the international search report 30/08/2018
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Kirchhoff, Eva

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2018/067458

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2017/021069 A1 (UNILEVER NV [NL]; UNILEVER PLC [GB]; CONOPCO INC D/B/A UNILEVER [US]) 9 February 2017 (2017-02-09) page 1, line 1 - line 27 page 10, line 39 - page 11, line 2; example 3; tables 3,4 -----	1-15
A	US 2008/166459 A1 (ACHTERKAMP GEORG [DE] ET AL) 10 July 2008 (2008-07-10) the whole document -----	1-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2018/067458

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4060645	A	29-11-1977	AT 347762 B 10-01-1979
		AU 500432 B2 24-05-1979	
		BE 835655 A 17-05-1976	
		CA 1067744 A 11-12-1979	
		CH 600802 A5 30-06-1978	
		DE 2549391 A1 24-06-1976	
		DK 571675 A 18-06-1976	
		ES 443508 A1 01-05-1977	
		FI 753542 A 18-06-1976	
		FR 2294653 A1 16-07-1976	
		GB 1498120 A 18-01-1978	
		IT 1054664 B 30-11-1981	
		JP S5186148 A 28-07-1976	
		JP S5940422 B2 29-09-1984	
		NL 7514458 A 21-06-1976	
		SE 422737 B 29-03-1982	
		US 4060645 A 29-11-1977	
		ZA 7507414 B 24-11-1976	
WO 2008086918	A1	24-07-2008	AT 500746 T 15-03-2011
		BR PI0719623 A2 17-12-2013	
		CN 101594787 A 02-12-2009	
		EP 2104435 A1 30-09-2009	
		WO 2008086918 A1 24-07-2008	
GB 2509315	A	02-07-2014	NONE
WO 2017021069	A1	09-02-2017	AR 105516 A1 11-10-2017
		EP 3328217 A1 06-06-2018	
		PH 12018500113 A1 23-07-2018	
		US 2018199604 A1 19-07-2018	
		WO 2017021069 A1 09-02-2017	
US 2008166459	A1	10-07-2008	AR 044847 A1 05-10-2005
		AT 347276 T 15-12-2006	
		AT 454825 T 15-01-2010	
		AU 2004248894 A1 29-12-2004	
		BR PI0411206 A 18-07-2006	
		CA 2525341 A1 29-12-2004	
		DE 60310215 T2 13-09-2007	
		DE 202004009834 U1 02-09-2004	
		EP 1491101 A1 29-12-2004	
		EP 1635653 A1 22-03-2006	
		ES 2277023 T3 01-07-2007	
		MX PA05013271 A 09-03-2006	
		PT 1491101 E 28-02-2007	
		PT 1635653 E 01-04-2010	
		US 2008166459 A1 10-07-2008	
		WO 2004112513 A1 29-12-2004	
		ZA 200508979 B 31-01-2007	