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(71) Applicant(s)
Mars, Incorporated

(72) Inventor(s)
Johannes Schlebusch; Siegfried Schmidt; Siegfried Waigand; John Hemus

(74) Agent/Attorney
WATERMARK PATENT and TRADEMARK ATTORNEYS, Locked Bag 5, HAWTHORN VIC 3122

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~~GMBH (DE/DE); Eitzer Landstrasse 215, D-27283 Ver-~~
~~den/Aller (DE).~~

(72) Erfinder; und

(75) Erfinder/Anmelder (nur für US): SCHLEBUSCH, Johannes
[DE/DE]; Joseph-Haydn-Strasse 8, D-28209 Bremen
(DE). SCHMIDT, Siegfried [DE/DE]; Weizenmüllerstrasse
96, D-27283 Verden/Aller (DE). WAIGAND, Siegfried
[DE/DE]; Mühlenberg 20B, D-27283 Verden/Aller (DE).
HEMUS, John [GB/DE]; Eitzer Ziegelei 19, D-27283
Verden/Aller (DE).(74) Anwalt: GODDAR, Heinz; Boehmert & Boehmert, Hollerallee
32, D-28209 Bremen (DE).(71) Mars Incorporated; 6885 Elm Street,
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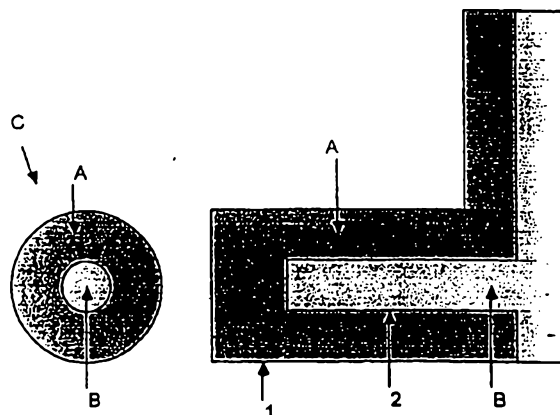
Vor Ablauf der für Änderungen der Ansprüche zugelassenen
Frist; Veröffentlichung wird wiederholt falls Änderungen
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(54) Title: CHUNKY PRODUCT USED IN ANIMAL FOOD COMPOSITIONS AND PROCESS FOR PRODUCING THE SAME

(54) Bezeichnung: STÜCKIGES PRODUKT IN TIERNÄHRUNGSMITTELZUSAMMENSETZUNGEN SOWIE EIN VERFAHREN
ZUR HERSTELLUNG DESSELBEN

(57) Abstract

The invention relates to a chunky product which is suitable for addition to or as an only component of animal food compositions. The product comprises proteins, one or more water-binding components, water and salt. It further consists of at least one phase in which the proteins form a matrix which as a result of a suitable denaturation step is characterized by high stability. Said matrix withstands processes such as sterilization and storage over several years without any noticeable loss of stability. The inventive product is also characterized in that the proteins are derived from concentrated blood plasma and/or blood plasma powder and/or ovalbumin powder and/or gluten and/or soy bean proteins. The water-binding components are derived either from the group consisting of flour/starch/waxy maize starch or from the group consisting of silicic acid/physiologically acceptable metal oxides/other non-toxic, inert, water-absorbing substances, or from the group consisting of cellulose powder/plant fibers, or from a combination of substances of the various groups. The texture of the chunky product is determined solely by the kind and amount of proteins and water-binding components chosen.



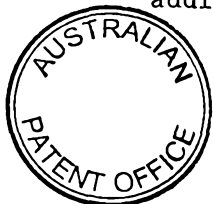
The present invention relates to a lumpy product in animal food compositions and to a process for the production thereof.

Although nowadays there are numerous different animal foods in the most varied forms, they can be subdivided into two groups; on the one hand conventional instant animal foods, comprising a solid and a liquid phase, i.e. generally pieces of meat and a sauce or gravy around said pieces; and dry foods, in the form of specially shaped pellets, which result from a strong water abstraction, e.g. complete baking of a semifluid paste.

It has been found that in the case of instant animal food consisting of pieces of meat and gravy, the solid constituents of the food can easily stick to the teeth of the animal and consequently contribute to a much worse oral hygiene. In addition, due to the pasty or very soft consistency of the food the latter, instead of being chewed, is swallowed. No adequate comminution of the food takes place in the mouth, so that digestion is transferred to the gastrointestinal tract. As a result of an increased eating rate and the gulping of the food by the animal, no adequate salivation occurs and consequently the mouth is inadequately cleaned with respect to bacteria.

Dry foods must be mechanically comminuted in chewing-intensive manner, so that as a result of chewing dental plaque is reduced and the gums have a better blood flow. Compared with moist foods, dry foods are not eaten as readily and can even be refused by the animal.

Tests have been carried out for the production of a lumpy animal food without using meat lumps. Thus, DE 2 728 512 A1 and DE 2 650 800 A1 disclose a wet food for pets, which has as a constituent heat-stable, meat-like blood-based lumps and give for said lumps a formulation, which is characterized by the presence of blood constituents and rubber. In both documents the strength of the lumps is determined by the addition of a given rubber quantity. Optionally, as a further ingredient, use can be made of an additional protein source, which can comprise animal or vegetable protein or mixtures thereof. However, the strength is solely determined by the addition of a suitable rubber. A graded setting of the strength and



texture of the lump is not possible.

The object of the invention was to combine the positive aspects of the two animal food types, i.e. the health-encouraging aspect of dry food with the comparatively higher consumption attractiveness of the two-component instant food.

A further object of the invention is to provide a chunk in which the texture and strength can be adjusted in a graded manner, together with a process for the production thereof.

According to the invention this object is achieved by a lumpy product or chunk, which is suitable for admixing in or as the sole constituent of animal food compositions and which contains proteins, one or more water-binding components, water and salt, characterized in that it comprises at least one phase, in which the proteins as a result of a suitable denaturing stage form a matrix characterized by high strength and which is able to withstand processes such as sterilization and storage for several years without significant losses and further characterized in that the proteins come from concentrated blood plasma and/or blood plasma powder and/or egg albumin powder and/or wheat gluten and/or soybean proteins, that the water-binding components are either obtained from the group flour/starch/waxy maize starch or the group silica/physiologically unobjectionable metal oxides/other atoxic, inert, water-absorbing substances or the group cellulose powder/plant fibres or a combination of substances from the different groups and that solely through the choice of the nature and quantity of the proteins and water-binding components the texture of the chunk is defined.

It has been found that such a lumpy product, hereinafter called chunk for short, has a much greater strength than conventional meat pieces in a two-component instant food, so that the animals are forced to intensively chew the food, which leads to a reduction of dental plaque and a chunk according to the invention is gladly consumed by animals. Simultaneously through the planned choice of ingredients, it is possible to vary and adjust the texture of the chunks from brittle to elastic in accordance with



individual needs or the planned use of the animal food. The ingestion of the chunks according to the invention takes place as a result of intensive chewing instead of gulping and for animals would appear to be more interesting than the consumption of conventional animal foods.

For solving the set problem importance is attached to the particular choice of functional proteins, alone or combined with other constituents having a cereal base, e.g. wheat flour, in order to obtain the desired texture characteristics. The desired texture results from the fact that the specifically chosen combination of proteins is coagulated, the released water is absorbed by the wheat flour, which is thereby pasted. Optionally a further water-binding component can be added, whose choice with regards to nature and quantity also has a decisive influence on the texture of the chunk. Thus, a chunk is provided, whose texture can be adjusted according to needs.

In order to ensure an increased strength of the protein matrix, it is in particular provided that the fat/oil proportion in the solid phase of the chunks according to the invention represent below 5% and preferably below 2%. The proteins of the chunks emanate from concentrated blood plasma and/or blood plasma powder and/or egg albumin powder and/or wheat gluten and/or soy proteins.

A preferred embodiment is characterized in that the water-binding components come either from the group of flour/starch/wax corn starch or the group of silicas/physiologically unobjectionable metal oxides/other non-toxic, inert, water-absorbing substances or the group of cellulose powder/vegetable fibres or a combination of substances from the different groups.

For the production of the chunks according to the invention, it is in particular provided that the weight ratio of the protein-containing ingredients to the water-binding components is in the range 2.5:1 to 0.3:1. In a special embodiment, said weight ratio is 2:1. In another embodiment, said weight ratio is 0.48:1.

It is in particular provided that following the production of the chunks,



the content of proteins represents 10 to 35 wt.%, of flour/starch/wax corn starch 15 to 40 wt.% and of silicas/physiologically unobjectionable metal oxides/other non-toxic, inert, water-absorbing substances or cellulose powder/vegetable fibres 5 to 25 wt.%.

Following production, preferably the ratio of proteins to flour is between 0.6 and 1.4, the moisture content being between 35 and 65%, the carbohydrate content between 10 and 30% and the fat proportion below 5%, preferably below 2%.

In another preferred embodiment, the chunks comprise an inner and an outer phase, the outer phase containing the high strength protein matrix and is at least 10 and preferably at least 18 times more resistant to deformation than the inner phase. The inner phase is formed from cooked or uncooked meat fractions.

In another preferred embodiment, the chunks comprise an inner and an outer phase, the inner phase containing the high strength protein matrix and is at least 10 and preferably 18 times more resistant to deformation than the outer phase, which is an emulsion or a gel or has a soft, easily deformable consistency.

It is stressed that the limitation of the description to chunks comprising only two phases is not to be understood as a restriction. In fact, the invention also covers chunks with three, four or more phases, which differ as regards their strength.

The invention also relates to a process for the production of a lumpy product or chunk, in which for the production of the high strength phase the proteins are dissolved in water, the water-binding substances are then dispersed in the protein solution, the viscosity of the thus obtained suspension is adjusted by an appropriate addition of swellable or water-absorbing substances, the thus obtained phase is shaped into strands of a clearly defined size, the thus obtained strands undergo a denaturing stage and are then cut to an appropriate size and are packed and sterilized alone, or optionally with other components and further characterized in



that the texture of the chunk is solely determined by the choice of the nature and quantity of the proteins and the water-binding component. The proteins are preferably dissolved in water, accompanied by the addition of salt. According to the invention, it is also preferred that the water-binding substances, which are dispersed in the protein/salt solution, belong to the flour/starch/wax corn starch group.

For the purpose of adjusting the viscosity of the suspension, use is preferably made of one or more substances from the group flour/silica/physiologically unobjectionable metal oxides/other non-toxic, inert, water-absorbing substances/cellulose powder/vegetable fibres.

According to a preferred embodiment of the invention, the shaped strands have an average diameter of 10 to 35 mm.

It is particularly preferable for the process according to the invention, that the denaturing stage involves a temperature change or a pH-value change. In a special embodiment of the invention, the temperature is raised to at least 85°C for carrying out the denaturing stage.

Preferably, following the cutting stage, the chunks obtained have a size suitable for consumption.

The invention is described in greater detail hereinafter relative to the following examples and drawings.

Fig. 1 is a cross-section through a nozzle for producing a two-phase chunk and the diagrammatic representation of a two-phase chunk following production.

Fig. 2 is the representation of the force required for breaking open the two phases in a two-phase chunk.



Example 1

Formulations and analytical results of the solid phase of a chunk according to the invention

In order to determine the influence of different ingredients on the biting consistency and texture, experiments were carried out with different formulation compositions according to table 1. It has been found that in particular the absence of silica or the presence of wheat gluten or cellulose powder led to the thus produced chunk having an elastic consistency. The brittle chunks produced with silica only differed slightly from the analytical standpoint from the elastic chunks produced without silica, as can be gathered from table 2. Elastic chunk 3 has the lowest moisture content.

Table 1: Formulations for the solid phase of an inventive chunk
(values in wt.%).

Formulation No.	1	2	3	4	5
Silica	10.5	13	---	11	---
Conc. blood plasma	67	---	---	---	---
Albumin powder	---	18	26	17.5	17.5
Wheat flour	22	25	25	25	25
Wheat gluten	---	---	8.5	---	---
Cellulose powder	---	---	---	---	11
Salt	0.5	0.5	0.5	0.5	0.5
Water		43.5	40	46	46
Total	100	100	100	100	100
Texture	brittle	brittle	elastic	brittle	elastic



Table 2: Analytical results of the chunks produced according to table 1
(values in wt.%).

Product	1	2	3	4	5
Moisture	54	48	45	50	50
Protein	15	18	32	18	18
Fat	0.6	0.8	1.3	0.8	0.8
Carbohydrates	14	17	17	17	17

Example 2

Production of chunks having brittle characteristics

The mixed, dry formulation components of formulation 1 are continuously dosed into a suitable mixer and mixed there with a corresponding amount of water. The viscous paste is shaped by means of nozzles on a steam tunnel to strands and completely baked. The chunks are cut and sterilized in cans.

Example 3

Production of chunks characterized by elastic characteristics

The mixed, dry formulation components of formulation 3 are continuously dosed in a double-shaft mixer and mixed there with a corresponding amount of water. The viscous phase is shaped by means of nozzles on a steam tunnel to strands and completely baked. The chunks are cut and sterilized in cans.

Example 4

Production of a two-phase chunk with an outer, solid and an inner, soft phase

The ingredients of formulation 3 are mixed in the following way. Firstly the albumin powder is dissolved, accompanied by the addition of salt in an



apparatus and then the wheat flour and wheat gluten are incorporated into the suspension. Phase A obtained is pumped into the outer tube 1 of a nozzle, which is constructed from two concentrically arranged tubes of different diameters (28 and 16 mm) (cf. also fig. 1). A conventional phase B, i.e. comprising cooked meat pieces, is pumped through the inner tube 2. The concentric double strand is baked in a steam tunnel and then cut up.

The resulting chunks C are very similar to marrow bone and also have a very firm texture in the outer sleeve and a soft core.

Example 5

Analytical results of a two-phase chunk following sterilization

The chunks produced according to example 4 were analyzed in phase-specific manner and the results summarized in table 3 were obtained.

Table 3: Analytical results in a two-phase chunk after sterilization.

	Solid phase	Soft phase
	[%]	[%]
Moisture	65.3	67.6
Protein	14.5	9.9
Fat/Oil	0.3	9.5
Ash	9.3	2.6

Fig. 1 is a cross-section through a nozzle for the production of two-phase chunks. An outer tube 1 and an inner tube 2 with different diameters are arranged concentrically and two different phases A and B are pumped through the outer/inner tubes. This leads to an approximately tubular strand, comprising a core phase and a covering phase. The resulting strand is fixed by heat action on a steam tunnel/gas oven and then cut to chunks C of the correct size.

Fig. 2 represents the force required for the breaking open of the two phases in a two-phase chunk. Deformation takes place by means of a mortar



or ram and the force is given in Newtons as a function of the deformation path in mm. The two different phase strengths corresponding to the two-stage deformation of the chunks can be seen.

The features of the invention given in the description, claims, tables and drawings can be essential to the implementation of the different embodiments of the invention, both singly and in random combination.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Chunk, which is suitable for admixing to or as the sole constituent of animal food compositions and which contains proteins, one or more water-binding components, water and sale, characterised in that it comprises at least one phase, defined by a denatured protein matrix, which is able to withstand processes such as sterilization and storage for several years without any significant strength losses and further characterized in that the proteins come from concentrated blood plasma and/or blood plasm powder and/or egg albumin powder and/or wheat gluten and/or soybean proteins, that the water-binding components are either obtained from the group flour/starch/waxy maize starch or the group silica/physiologically unobjectionable metal oxides/other atoxic, inert, water-absorbing substances or the group cellulose powder/plant fibres or a combination of substances from the different groups and that solely through the choice of the nature and quantity of the proteins and water-binding components the texture of the chunk is defined.

2. Chunk according to claim 1, characterized in that the solid phase has a fat/oil proportion below 5%.

3. Chunk according to claim 2, characterized in that the solid phase has a fat/oil proportion below 2%.

4. Chunk according to any one of the claims 1 to 3, characterized in that for the production thereof, the weight ratio of the protein-containing ingredients to the water-binding components is in the range 2.5:1 to 0.3:1.

5. Chunk according to any one of the claims 1 to 3, characterized in that, following the production thereof, the content of proteins is 10 to 35 wt.%, of flour/starch/waxy maize starch 15 to 40wt.% and of silicas/physiologically unobjectionable metal oxides/other atoxic inert, water-absorbing substances or cellulose powder/vegetable fibres 5 to 25 wt.%.



6. Chunk according to claim 5, characterized in that, following its production, the ratio of proteins to flour is between 0.6 and 1.4.

7. chunk according to any one of the claims 5 and 6, characterized in that, following the production thereof, the moisture content is between 35 and 65%, the carbohydrate content between 10 and 30% and the fat proportion below 5%.

8. Chunk according to any one of the claims 5 to 7, characterized in that, following its production, the fat proportion is below 2%.

9. Chunk according to any one of the preceding claims, characterized in that it comprises an inner and an outer phase, the outer phase having a composition according to claims 1 to 8 and is at least 10 and preferably 18 times more deformation-resistant than the inner phase.

10. Chunk according to claim 9, characterized in that the inner phase is a phase comprising cooked or uncooked meat pieces.

11. Chunk according to any one of the claims 1 to 8, characterized in that it comprises an inner and an outer phase, the inner phase having a composition according to one of the claims 1 to 8 and is at least 10 and preferably 18 times more deformation-resistant than the outer phase.

12. Chunk according to claim 11, characterized in that the outer phase is an emulsion or a gel or has a soft, easily deformation consistency.

13. Process for the production of a chunk according to any one of the preceding claims, characterized in that for the production of the denatured protein matrix the proteins are dissolved in water, water-binding substances are then dispersed in the protein solution, the viscosity of the resulting suspension is adjusted by an appropriate addition of swellable or water-absorbing substances, the resulting phase is shaped to strands having a clearly defined size, the resulting strands undergo a denaturing stage, are then cut to a suitable size and are packed and sterilized alone or optionally with other components and also



characterized in that the texture of the chunk is determined solely by the choice of the nature and quantity of the proteins and the water-binding component.

14. Process according to claim 13, characterized in that the proteins are dissolved in water, accompanied by the addition of salt.

15. Process according to any one of the claims 13 and 14, characterized in that the water-binding substances dispersed in the protein/salt solution belong to the flour/starch/waxy maize starch group.

16. Process according to any one of the claims 13 to 15, characterized in that for adjusting the viscosity of the suspension, one or more substances of the group flour/silica/physiologically unobjectionable metal oxides/other atoxic inert, water-absorbing substances, cellulose powder/vegetable fibres are used.

17. Process according to any one of the claims 13 to 16, characterized in that the shaped strands have an average diameter of 10 to 35 mm.

18. Process according to any one of the claims 13 to 17, characterized in that the denaturing stage involves a temperature change or a pH-value change.

19. Process according to claim 18, characterized in that the temperature is raised to at least 85°C for performing the denaturing stage.

20. Process according to any one of the claims 13 to 19, characterized in that the pieces obtained following the cutting stage have a size appropriate for consumption.

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MASTERFOODS GMBH

WATERMARK PATENT & TRADE MARK ATTORNEYS
290 BURWOOD ROAD
HAWTHORN VICTORIA 3122
AUSTRALIA

