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(54) **Meat composition containing textured vegetable protein, process for the preparation thereof, and meat substitute.**

(57) The present invention relates to meat compositions which are based on a combination of meat and vegetable protein and are particularly suitable as a substitute for conventional meat or meat products (e.g. minced meat) . The meat composition according to the invention comprises from 1 wt.% to 50 wt.% textured wheat protein (component (A)), from 0.1 wt.% to 10 wt.% of a particular mixture (component (B)) and from 40 wt.% to 98.9 wt.% meat (component (C)). The particular mixture preferably comprises from 15 wt.% to 88 wt.% meat powder, from 10 wt.% to 60 wt.% beetroot extract and/or paprika powder, from 1 wt.% to 10 wt.% caramel and from 1 wt.% to 15 wt.% rosemary extract. In addition, conventional additives and/or auxiliary substances can optionally be present. The present invention relates also to processes for the preparation of the meat compositions according to the invention.

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Meat composition containing textured vegetable protein, process for the preparation thereof, and meat substitute

The present invention relates to compositions which are suitable as a substitute for conventional meat or meat products, and to processes for the preparation thereof. In particular, the present invention relates to meat compositions which are based on a combination of meat and vegetable protein, and to processes for the preparation thereof.

1. Prior art

Healthy eating is and remains an important trend in modern society. The trend is towards food that is based more on vegetable products. An important aspect for many consumers who do not wish to give up eating meat or other animal products completely is to reduce their consumption of meat so as to reduce their intake of animal fats and cholesterol and at the same time obtain valuable vegetable proteins as a source of protein.

Meat substitutes from vegetable products, such as soya, wheat gluten, etc., and meat substitutes based on animal proteins, such as whey (US 2004/0161519 A1), have been known for a relatively long time. In order to increase the acceptance of such products by consumers it is important that such products imitate the organoleptic properties of meat, that is to say properties such as odour, taste, appearance, colour and consistency (feel in the mouth). It is critical, inter alia, to imitate the fibrous structure of meat. This can be achieved, for example, by the use of extruded vegetable protein, such as soya.

A process for the preparation of structured or textured protein which can be used as a meat substitute is described, for example, in WO 2008/124620 A1. In that process, vegetable protein material is subjected to an extrusion process. In the extruded protein material so obtained, the protein filaments are aligned more or less parallel to one another in a manner comparable to natural meat, a meat consistency thus being imitated.

In addition, however, the colour of the meat substitute that is produced is also important. That is all the more the case if the meat substitute is to be mixed with conventional meat or meat products and is accordingly to correspond to the natural colour of meat. The problem here is that meat changes colour when it is fried or boiled, and the meat substitute is also to exhibit this colour change. In addition to the conventional colouring agents known in the prior art, there is known from EP 1 180 332 B1 a composition for colouring foodstuffs and protein material that is particularly suitable for imitating the above-described colour change. The composition can contain inter alia betanin, a red colouring from beetroot, or beetroot extract directly, as a thermally unstable colouring component. This component imparts the colour of raw meat to the meat substitute. When this component decomposes on frying, the red colour also disappears and a brown colouring appears, which is obtained, for example, by the use of caramel colouring. The composition can also contain a reducing sugar as browning agent, which is reacted under the action of heat with amino acids in a so-called Maillard reaction.

Meat compositions which consist of a combination of natural meat or meat products, such as minced meat, etc., and a structured or textured vegetable protein are known. For example, WO 2007/137125 A2 describes a meat combination consisting of a combination of extruded and coloured vegetable protein and natural meat. In addition

to soya, a number of types of cereal, such as maize, wheat, barley, oats, rye, millet, can be used as the source of vegetable protein. The meat used in the composition can be, inter alia, pork or beef. In order to prepare the meat composition, the extruded protein material is hydrated, coloured and mixed with meat and finally processed further to form the desired foodstuffs.

It is also known to add further additives, such as flavourings, spices, antioxidants, to the protein materials and/or to the meat compositions containing them.

Despite the large number of meat compositions already known, it remains an important aim to provide further improved meat compositions which are improved further in terms of their organoleptic properties and which, in addition, are valuable in terms of nutritional physiology, in order further to increase acceptance by consumers. In particular, the invention is to make it possible to provide an improved meat composition in which the use of flavourings can be dispensed with completely and which nevertheless gives to the consumer, for example, an impression corresponding to that of natural meat (e.g. in terms of consistency, colour, taste and odour).

2. Description of the invention

It has been found that a meat composition according to claims 1 to 3 and a preparation process according to claim 6 are particularly suitable for achieving that object. The dependent claims relate to advantageous further developments of the invention.

The meat composition according to the invention comprises the following components:

(A) textured vegetable protein, in particular wheat protein,

(B) a mixture consisting of

(b1) meat powder, e.g. beef and/or pork powder,
(b2) beetroot extract,
(b3) caramel and/or paprika extract,
(b4) rosemary extract,
(C) meat, in particular minced meat,
(D) water,
(E) optionally conventional additives or auxiliary substances and mixtures thereof, but preferably no artificial or natural flavourings.

It has been found that outstanding properties can be achieved with the meat composition according to the invention, so that it is aimed in particular at consumers who, in a combination product of natural meat (such as, for example, minced meat) with vegetable protein, do not wish to give up the usual overall impression of natural meat. In a particularly advantageous manner, such an impression can be achieved with the invention even without artificial flavourings and/or natural flavourings.

With regard to the content of component (D), that is to say water, it is to be noted that this content does not include the water contents already present in components (A), (B) and (C) and optionally (E) that are used. A textured wheat protein prepared, for example, in a manner known per se by an extrusion process typically has a certain water content (e.g. from 1 wt.% to 10 wt.%). Such a water content in the wheat protein used therefore contributes in terms of weight to component (A) and not to component (D). The same is also true of any water contents in components (b1) to (b4), which together give component (B). And in particular, it is also true of the water contents of component (C), that is to say the meat, which are typically considerable. Meat typically contains approximately from 50 to 70 wt.% water.

A textured wheat protein within the scope of the present invention is to be understood as being a wheat

protein that has a meat-like texture or consistency. That is to say, the protein fibres of the wheat protein are oriented relative to one another in a manner comparable to natural meat. Such textured wheat proteins and processes for the preparation thereof, for example by means of extrusion, are known.

The textured wheat proteins are preferably textured wheat gluten, in particular prepared by means of extrusion and in particular having a moisture content of not more than 10 %. Gluten is a protein mixture contained in cereal grains and accordingly in flours prepared therefrom. Within the scope of the present invention, it is advantageously possible, for example, to use commercially available textured wheat proteins, in particular textured wheat gluten.

In addition to the textured wheat protein, the meat composition according to the invention can also contain further vegetable proteins, animal proteins, proteins of microbial origin and mixtures thereof as component (A). Non-limiting examples are proteins of other types of cereal, such as barley, rye, oats, maize, but also proteins from pulses (Fabaceae), such as, for example, soya or lupins. Animal proteins which can be used are, for example, milk proteins, casein and whey, proteins obtainable from eggs, meat proteins, etc. The content of these additionally used proteins is preferably not more than from 1 wt.% to 50 wt.%, based on component (A).

According to an embodiment according to the invention, however, the meat composition does not contain soya protein and/or whey protein. The wording "does not contain soya protein and/or whey protein" is to be understood within the scope of the present invention as meaning that soya protein and/or whey protein is not added to the meat composition either as a constituent of component (A) or as the optional component (E). Possible residues or contamination of the meat composition by soya

proteins and/or whey proteins which may be present, for example, in the vegetable protein source are not to be excluded.

In a particularly preferred embodiment, the meat composition contains only wheat gluten as the protein component, that is to say as component (A). Further textured vegetable proteins are not used. However, vegetable proteins supplied by the further important and/or essential constituents of the meat composition, such as the rosemary extract, the beetroot extract, the paprika extract, the optional component (E), etc., are not excluded.

The content of component (A) in the meat compositions according to the invention is from 10 wt.% to 40 wt.%, based on the sum of components (A) to (D). Preferably, the content of component (A) is from 10 wt.% to 12 wt.%, 15 wt.%, 20 wt.% or 40 wt.%.

The values or ranges of values indicated above relate to textured proteins having a "natural" moisture content of from 0 to 10 %. As is explained further hereinbelow, the wheat protein used in the preparation of the meat composition according to the invention is to be pre-swelled in water and/or in an aqueous solution (of component (B)) before further processing to the end product takes place (in particular, for example, mixing with component (C), that is to say the meat). During such pre-swelling, considerable amounts of water can pass into the textured wheat protein from the water or aqueous solution used for that purpose. Within the scope of the invention, the water content exceeding the above-mentioned "natural" moisture content of the wheat protein is to be understood as being a content for inclusion in component (D).

Component (A) can be used in any possible grain size or size or form. The textured wheat protein and the proteins optionally used in addition can be used, for

example, in the form of powders, granulated material, in flake form, in the form of "chips" or mixtures thereof. All or some of the textured wheat protein used can also be, for example, of a pasty consistency. Preferably, component (A) and component (C) are used with a comparable grain size or size or form, so as to enable the resulting meat composition to appear homogeneous.

By replacing some of the conventional meat by component (A) in the meat compositions according to the invention it is possible, owing to the lower relative content of meat in the meat composition, to reduce meat consumption and accordingly the intake of animal fats and cholesterol. Moreover, valuable vegetable proteins are made available to the consumer.

However, in order to improve further the organoleptic properties of such a meat composition, and accordingly its acceptance by the consumer, the textured protein (component (A)) must be coloured so that it acquires a meat-like colouring. In addition, the vegetable or non-meat-typical protein odour must be masked. It has been found that the mixture present as component (B) in the meat composition is particularly suitable for that purpose.

The content of component (B) in the meat compositions according to the invention is from 0.5 wt.% to 10 wt.%, preferably from 0.6 wt.% to 0.8 wt.%, 1 wt.%, 2 wt.% or 4 wt.%.

Component (B) used according to the invention is a mixture consisting of from at least 35 wt.% to not more than 90 wt.% meat powder, from 5 wt.% to 60 wt.% beetroot extract, from 0.1 wt.% to 10 wt.% caramel and/or paprika extract (e.g. paprika powder) and from 3 wt.% to 16 wt.% rosemary extract.

The meat powder used can be, for example, spray-dried meat. According to a preferred embodiment, the meat powder

used is obtained from meat that has been minced and then freeze-dried and finally ground.

The meat powder can be composed of one or more types of meat. Advantageously, the composition of the meat powder in terms of type can be chosen in conformity with the composition of the meat provided as component (C) in terms of type. If, for example, only one type of meat (e.g. pork) is used as component (C), it is possible to use in particular a meat powder that has likewise been prepared for the most part or substantially completely from the same type of meat. If component (C) is composed of different types of meat, it can be provided, in conformity therewith, that the meat powder contains at least one type that is also present in the meat used. In particular, the meat powder in that case can contain amounts of all the types of meat contained in component (C).

If component (C) is beef or pork or a mixture thereof, beef and/or pork powder can particularly advantageously be used as component (b1), preferably in an amount of from 35 wt.% to 75 wt.%, 80 wt.% or 85 wt.%. Meat powders suitable for the invention are available commercially. By using the meat powder(s) in the described amounts, the vegetable or non-meat-typical protein odour of component (A) is masked. In addition, the natural odour of conventional meat is supported in a more positive manner. Accordingly, the odour of the meat compositions according to the invention is improved and adapted to the odour of natural meat or meat products.

Caramel and paprika extract also have a positive effect on the properties (in particular e.g. the colour) of the meat composition. Moreover, the caramel and the paprika extract, in combination with the beetroot extract, act as a colouring for imparting a meat-like colour to component (A). Accordingly, the meat compositions according to the invention are adapted to a conventional

meat or meat product visually as well as in terms of odour. Caramel produces a brownish colour, while a reddish tone is obtained with paprika extract.

In a preferred embodiment which is particularly valuable when beef or pork or a mixture thereof is used as component (C), component (b3) consists of at least 90 wt.% paprika extract and accordingly not more than 10 wt.% caramel. According to a particular advantageous embodiment, beef or pork or a mixture thereof in the form of minced meat is used as component (C), and component (b3) consists of paprika extract.

According to the invention, caramel and/or paprika extract (e.g. paprika powder) is used in an amount of from 0.1 wt.%, in particular 1 wt.%, to 10 wt.%, based on component (B). Preferably, the amount is from 0.1 wt.%, 0.5 wt.%, 1 wt.% or 2 wt.% to 7.5 wt.%, 8.0 wt.%, 8.5 wt.%, 9.0 wt.% or 9.5 wt.%. The lower and upper limits given above for the amount of component (b3) are preferred in particular for the case where beef or pork or a mixture thereof is used as component (C) and/or where component (b3) consists solely of paprika extract, for example in powder form.

The caramel that is optionally used can in particular be sucrose or another non-reduced sugar. Caramel imparts to component (A), and accordingly also to the meat composition, a more or less brown tone depending on the degree of caramelisation.

The beetroot extract is used according to the invention in an amount of from 5 wt.% to 60 wt.%, based on component (B). Preferably, the amount of beetroot extract is from 5 wt.% or 10 wt.% to 30 wt.%, 35 wt.%, 40 wt.% or 60 wt.%.

The beetroot extract is a powder, a granulated material, a liquid or mixtures thereof. Processes for the preparation of beetroot extracts are known. In addition, beetroot extracts suitable for the invention are available

commercially. The beetroot extract imparts a red colour to component (A), and accordingly also to the meat composition.

The relative proportions of the caramel or paprika extract used and of the beetroot extract can be adapted to one another depending on the meat used in the meat composition.

According to one embodiment of the invention, pork and/or beef is used in the meat composition according to the invention. Beef has a darker colour than pork.

If the meat composition according to the invention contains only pork, an advantageous content of beetroot extract is preferably from 5 wt.% to 25 wt.%, based on component (B). More preferably, the content of beetroot extract is from 10 wt.%, 12 wt.%, 14 wt.% or 15 wt.% to 17 wt.%, 18 wt.% or 20 wt.%. The content of caramel and/or paprika extract is preferably from 1 wt.% to 10 wt.%, based on component (B). More preferably, that content is from 1.5 wt.%, 2 wt.% or 3 wt.% to 6 wt.%, 7 wt.%, 8 wt.% or 9 wt.%.

If the meat composition according to the invention contains only beef, an advantageous content of beetroot extract is preferably from 20 wt.% to 60 wt.%, based on component (B). More preferably, the content of beetroot extract is from 30 wt.%, 35 wt.%, 40 wt.% or 44 wt.% to 50 wt.%, 52 wt.%, 54 wt.%, 56 wt.% or 58 wt.%. The content of caramel and/or paprika extract is preferably from 1 wt.% to 10 wt.%, based on component (B). More preferably, that content is from 1.5 wt.% or 2 wt.% to 5 wt.%, 6 wt.%, 7 wt.% or 8 wt.%.

If the meat composition according to the invention contains a mixture of pork and beef, the content of beetroot extract is preferably from 10 wt.% to 35 wt.%, based on component (B). More preferably, the content of beetroot extract is from 12 wt.%, 14 wt.%, 16 wt.% or 18 wt.% to 24 wt.%, 26 wt.%, 28 wt.%, 30 wt.%, 32 wt.% or

34 wt.%. The content of caramel and/or paprika extract is preferably from 1 wt.% to 10 wt.%, based on component (B). More preferably, that content is from 1.5 wt.%, 2 wt.%, 4 wt.% or 5 wt.% to 7 wt.%, 8 wt.% or 9 wt.%.

According to a preferred embodiment, no reducing sugar, e.g. as a further colouring, is added to the meat compositions according to the invention either in component (B) or in the optional component (E). The wording "no reducing sugar is added" is to be understood within the scope of the present invention as meaning that no reducing sugar is used as an additional constituent. Reducing sugars that are necessarily supplied by other constituents of the meat composition are not excluded.

Component (B) contains rosemary extract as a further important constituent. This serves to stabilise the colour of the coloured component (A) or of the meat composition. Rosemary extract as an ingredient in foodstuffs technology is known. Extracts suitable for the invention are available commercially. Carnosolic acid, which is present in the rosemary extract, advantageously has antioxidant and deodorising effects.

According to the invention, the content of rosemary extract in component (B) is from 3 wt.% to 16 wt.%. Preferably, the content is from 3 wt.%, 4 wt.%, 5 wt.% to 8.5 wt.%, 9.0 wt.% or 9.5 wt.%.

The content of rosemary extract can vary according to the meat (component (C)) used. If the meat composition according to the invention contains only pork, the content of rosemary extract is preferably from 6 wt.% to 10 wt.%, based on component (B). More preferably, the content is from 6.5 wt.%, 7.0 wt.% or 7.5 wt.% to 8.5 wt.%, 9.0 wt.% or 9.5 wt.%.

If the meat composition according to the invention contains only beef, the content of rosemary extract is preferably from 4 wt.% to 8 wt.%, based on component (B).

More preferably, the content is from 4.5 wt.%, 5.0 wt.% or 5.5 wt.% to 6.5 wt.%, 7.0 wt.% or 7.5 wt.%.

If the meat composition according to the invention contains a mixture of pork and beef, the content of rosemary extract is preferably from 5 wt.% to 9 wt.%, based on component (B). More preferably, the content is from 5.5 wt.%, 6.0 wt.% or 6.5 wt.% to 7.5 wt.%, 8.0 wt.% or 8.5 wt.%.

The combination of the constituents mentioned above in the specified relative amounts to one another in component (B) has been found to be particularly suitable for giving a meat-like colour and flavour to textured protein, preferably vegetable protein, such as wheat gluten. By means of appropriate comparative tests, meat compositions containing relative amounts of the components that were outside the ranges according to the invention or outside ranges that were particularly preferred within the scope of the invention were compared with meat compositions in which the relative amounts specified or preferred according to the invention were present. In particular, the resulting consistency as well as colour, taste and odour properties of the meat compositions were tested.

Within the scope of the preparation of the meat composition according to the invention, component (B) can be provided, for example, in liquid or pasty form, but preferably in the form of a powder. When processing to form the meat composition, however, it is preferred first to prepare an aqueous solution of component (B), which in this case is considered, in terms of amount, in component (D). According to one embodiment, however, not the whole amount of component (D) but only a portion thereof is used to prepare such an aqueous solution of component (B). The remaining water considered in component (D) can be used in particular to dilute still further the aqueous solution prepared previously by dissolving component (B), before

the solution so further diluted is combined or mixed with other components, in particular component (A) and/or component (C). Alternatively or in addition, the remaining water considered in the amount of component (D) can be used to pre-swell the textured wheat protein.

According to a more particular embodiment, the textured wheat protein (for example having a moisture content of from 1 % to 10 %) that is provided is not pre-swelled in pure water but in the above-mentioned aqueous solution of component (B). Such pre-swelling, whether it be with water or with the mentioned aqueous solution, can take place, for example, cold (e.g. at from 5 to 10°C) or in the heated state (e.g. at more than 40°C, in particular more than 60°C). Boiling of the vegetable protein used in water or in the aqueous solution is also possible.

The meat compositions according to the invention contains as component (C) in particular pork or beef or a combination of the two types of meat. In that case in particular, the content of component (C) in the meat composition, based on the sum of components (A) to (D), is preferably from 50 wt.%, 55 wt.%, 60 wt.% or 70 wt.% to 80 wt.%, 85 wt.% or 90 wt.%.

According to one embodiment according to the invention, only pork is used. According to another embodiment according to the invention, only beef is used. According to a further embodiment according to the invention, the meat composition contains a mixture of pork and beef. The relative content of pork in that mixture, based on component (C), is from 90 to 10 wt.%, preferably from 80 to 30 or 20 wt.%, more preferably from 70 to 50 or 40 wt.%. A particularly preferred embodiment contains 60 wt.% pork and 40 wt.% beef as component (C).

Meat within the scope of the present invention includes flesh but also further constituents of the animal body that are suitable as foods, such as liver, kidneys, heart, etc. In particular, the meat used according to the

invention can have a specific fat content. For example, the meat can have a fat content of from 5 wt.% to 30 wt.%. Flesh is preferably used. According to a preferred embodiment, the fat content of the meat composition (end product) is less than 25 wt.%, in particular less than 20 wt.%, and/or there is a reduction in the fat content of the meat composition of at least 25 % (as compared with the fat content of component (C) used in the preparation). According to one embodiment, the protein content of the meat composition is at least 15 wt.%.

The meat is present in the meat compositions according to the invention in a comminuted form. For example, it can be used in the form of minced meat, meat paste, meat sausage, etc. and mixtures thereof. Minced meat is preferably used.

The minced meat used according to the invention can particularly advantageously be prepared, for example, by processes known in the prior art. It preferably has an average grain size of from 1 to 15 mm, more preferably from 2 to 10 mm and yet more preferably from 3 to 6 mm. Minced meat having an average grain size of about 5 mm is most preferred.

When such minced meat has been prepared, preferably in the conventional manner, it can be mixed with a meat substitute in order to prepare the end product. In that case, the meat substitute is obtained from the processing of components (A), (B), (D) and optionally (E). The meat substitute can also be pressed through perforated disks, for example, as is conventional for normal minced meat, in order to prepare a minced meat substitute and mix it with the minced meat, for example by stirring it in. It is advantageous in that case for the minced meat and the minced meat substitute to be prepared with an at least approximately identical grain size before they are mixed. In a preferred variant, the preparation of a minced meat composition according to the invention comprises the use

of a perforated disk, through which a mixture of the minced meat and the minced meat substitute is pressed. This can be carried out, for example, in a perforated-disk device, which is used at the end of the preparation process. At the intake of such a perforated-disk device used for minced meat and substitute together, the supplied mixture components can have a larger grain size as compared with the end product obtained at the outlet side and/or grain sizes that differ markedly from one another.

According to the invention, the meat composition also contains water (as component (D)), which is used, for example, for pre-swelling component (A) and/or for dissolving or suspending component (B).

In addition to components (A) to (D), the meat composition according to the invention can contain, as an optional constituent, at least one conventional additive or auxiliary substance, as component (E). Such additives or auxiliary substances are known and are available commercially. They are, for example, herbs, spices, salts, minerals, vitamins, trace elements, preservatives, vegetables, the use of further vegetable proteins, such as soya protein, and/or animal proteins, such as whey, and/or the use of a reducing sugar, even as a constituent of component (E), being excluded according to a preferred embodiment. Amounts of such compounds that occur naturally in other components are not excluded, however. Advantageously, it is possible according to a preferred embodiment to dispense with the use of natural flavourings and/or artificial flavourings as a constituent of component (E), because the advantageous composition of component (B) is already sufficient for flavouring and for masking the non-meat-typical protein odour, such as the vegetable protein odour.

The content of the optional component (E) is preferably from 0 to 20 wt.%. More preferably, the content is from 0 to 10 wt.%.

The meat compositions according to the invention can be processed further into shaped products, such as rissoles, patties, cevapcici, hamburgers, meatballs, meatloaf and any other shaped products based on minced meat or, for example, so-called "granulated material" and can be sold commercially as such in raw or cooked form, fresh or frozen. Alternatively, the meat composition can be divided into portions and packaged as such in raw form for sale.

In a further aspect, the present invention relates to component (B) specified hereinbefore as such and to the use thereof as a colouring and flavouring for meat substitutes based on the vegetable and/or animal and/or microbial proteins specified above.

In a further aspect, the present invention relates to a process for the preparation of the meat substitutes or meat compositions according to the invention.

Within the scope of the process, a textured vegetable protein, in particular wheat protein (component (A)), is provided. As already explained above, component (A), which is provided, for example, by means of extrusion, can have a moisture content of, for example, up to 10 %.

Component (A) can then be swelled in water. On swelling, the protein fibres are separated from one another by the inclusion of water, the meat-like consistency or texture thereby being enhanced or achieved for the first time. Depending on the residual moisture content of component (A) used, the textured protein can be incubated in water for a specific period until the desired effect is achieved. For example, component (A) can be pre-swelled for a period of from 0.25 to 24 hours, preferably from 0.25 or 0.5 or 2 hours to 3 or 12 or 24 hours. Swelling is preferably effected with cold water, for example having a temperature in the range from 1°C to 10°C, for example approximately from 6 to 9°C. Alternatively, swelling and/or incubation are carried out at an elevated

temperature of, for example, more than 40°C, in particular more than 60°C. Boiling for at least 0.25 hour can also be provided.

In the pre-swelling, the ratio of component (A) to water can be, for example, from 1:6 to 6:1, preferably from 1:4 to 4:1 and more preferably from 1:2 to 2:1.

It is possible in principle for component (A) (optionally pre-swelled) then to be mixed with component (B), as specified above, in a ratio of, for example, from 0.1:1 to 500:1 and incubated, for example, for a sufficient period, so that the protein material is coloured and flavoured. This process step preferably takes place at a temperature of from 0°C to +10°C, more preferably from 0°C to +4°C.

According to a particularly preferred embodiment of the preparation process according to the invention, however, an aqueous solution of component (B) is provided, for example by mixing component (B) into water, and the aqueous solution so obtained (it also being possible within the scope of the invention for this "solution" to contain constituents of component (B) suspended therein) is mixed with component (A).

The aqueous solution of component (B) that is prepared can be boiled, for example for at least 5 minutes, preferably before component (A) is added.

Component (A), which is to be mixed into the aqueous solution or into the aqueous solution further diluted with further, for example cold, water (at e.g. from 1 to 10°C), can in particular also be used in the not yet pre-swelled state. This has the advantage, for example, that a separate process step provided solely for the swelling of component (A) is not required, but swelling (and optionally subsequent incubation) is combined in one step with the colouring and flavouring of component (A).

The vegetable protein, in particular textured protein, used as component (A) can then be incubated for a

specific period in the aqueous (and optionally further diluted) solution that is provided until the desired effect is achieved. For example, component (A) can be pre-swelled or incubated for a period of from 0.25 to 24 hours, preferably from 0.25 or 0.5 or 2 hours to 3 or 12 or 24 hours. Swelling preferably takes place in a cold (optionally diluted) aqueous solution of component (B), for example at a temperature in the range from 1°C to 10°C, for example approximately from 6 to 9°C. Alternatively, swelling and/or incubation takes place at an elevated temperature of, for example, more than 40°C, in particular more than 60°C. Boiling for at least 0.25 hour can also be provided within the periods indicated above.

According to a preferred embodiment of the process for the preparation of a meat substitute according to the invention or of a meat composition according to the invention, substantially the whole amount (e.g. at least 90 %) of water that is additionally to be added (component (D)) is used to prepare (and optionally dilute) the mentioned aqueous solution.

Component (C) is then mixed in, preferably in the amounts specified above. The meat or meat mixture should preferably be pre-cooled to a temperature of from -2°C to +2°C in order to prevent contamination of the meat product, for example by microorganisms.

The meat compositions so obtained have organoleptic properties which are comparable with those of conventional meat or meat products.

The meat composition so obtained can be processed further, directly or after intermediate storage, to shaped products or so-called "granulated material" and sold as such, fresh or frozen, in raw or cooked form. Alternatively, the meat composition as such in raw form can be divided into portions and packaged for sale (e.g. as an equivalent, for retail sale, to hitherto conventional "minced meat").

A meat substitute according to the invention, in particular for the preparation of a meat composition by mixing of the meat substitute with meat, in particular for the preparation of a meat composition of the above-described type and/or according to a preparation process of the above-described type, comprises:

(A) from 20 wt.% to 40 wt.% textured wheat protein,
(B) from 2 wt.% to 8 wt.% of a mixture consisting of:
(b1) from 30 wt.% to 80 wt.% meat powder,
(b2) from 10 wt.% to 60 wt.% beetroot extract,
(b3) from 1 wt.% to 10 wt.% caramel and/or paprika extract, and
(b4) from 3 wt.% to 12 wt.% rosemary extract,
the sum of constituents (b1) to (b4) being 100 wt.%, based on component (B),
(D) from 50 wt.% to 75 wt.% water, and
(E) optionally conventional additives or auxiliary substances and mixtures thereof,
the sum of the amounts of components (A), (B) and (D) being 100 wt.% and the amount of the optional component (E) being added in addition.

According to an embodiment for the preparation of a beef substitute or for the preparation of a meat composition by mixing with beef, the meat substitute comprises:

(A) from 25 wt.% to 35 wt.% textured wheat protein,
(B) from 4 wt.% to 8 wt.% of a mixture consisting of:
(b1) from 40 wt.% to 46 wt.% beef powder,
(b2) from 44 wt.% to 50 wt.% beetroot extract,
(b3) from 0.5 wt.% to 4 wt.% paprika extract, and
(b4) from 4 wt.% to 8 wt.% rosemary extract,
the sum of constituents (b1) to (b4) being 100 wt.%, based on component (B),

(D) from 55 wt.% to 70 wt.% water, and
(E) optionally conventional additives or auxiliary substances and mixtures thereof,
the sum of the amounts of components (A), (B) and (D) being 100 wt.% and the amount of the optional component (E) being added in addition.

According to an embodiment for the preparation of a beef and pork substitute or for the preparation of a meat composition by mixing with beef and pork in a ratio of from 40:60 to 50:50, the meat substitute comprises:

(A) from 25 wt.% to 35 wt.% textured wheat protein,
(B) from 2 wt.% to 6 wt.% of a mixture consisting of:
(b1) from 60 wt.% to 68 wt.% beef powder and/or pork powder,
(b2) from 19 wt.% to 25 wt.% beetroot extract,
(b3) from 0.5 wt.% to 4 wt.% paprika extract, and
(b4) from 5 wt.% to 9 wt.% rosemary extract,
the sum of constituents (b1) to (b4) being 100 wt.%, based on component (B),
(D) from 55 wt.% to 70 wt.% water, and
(E) optionally conventional additives or auxiliary substances and mixtures thereof,
the sum of the amounts of components (A), (B) and (D) being 100 wt.% and the amount of the optional component (E) being added in addition.

According to an embodiment for the preparation of a pork substitute or for the preparation of a meat composition by mixing with pork, the meat substitute comprises:

(A) from 25 wt.% to 35 wt.% textured wheat protein,
(B) from 2 wt.% to 6 wt.% of a mixture consisting of:
(b1) from 65 wt.% to 77 wt.% pork powder,

(b2) from 13 wt.% to 19 wt.% beetroot extract,

(b3) from 0.5 wt.% to 4 wt.% paprika extract, and

(b4) from 6 wt.% to 10 wt.% rosemary extract,

the sum of constituents (b1) to (b4) being 100 wt.%, based on component (B),

(D) from 55 wt.% to 70 wt.% water, and

(E) optionally conventional additives or auxiliary substances and mixtures thereof,

the sum of the amounts of components (A), (B) and (D) being 100 wt.% and the amount of the optional component (E) being added in addition.

The present invention is to be explained in greater detail by means of the following examples, without being limited thereto.

Examples

Examples of mixtures for colouring and flavouring (component (B))

	Example 1 Beef	Example 2 Beef and pork	Example 3 Pork
Beef powder Component (b1)	43 wt.%	64 wt.%	-
Pork powder Component (b1)	-	-	71 wt.%
Beetroot powder Component (b2)	47 wt.%	22 wt.%	16 wt.%
Caramel Component (b3)	4 wt.%	7 wt.%	5 wt.%
Rosemary extract Component (b4)	6 wt.%	7 wt.%	8 wt.%

For the preparation of component (B), the individual constituents are mixed together and dissolved in water (optionally also with in some cases only suspended constituents). This aqueous solution, which is optionally briefly boiled, and optionally subsequently diluted further with water, can be used for colouring and flavouring component (A) or the meat composition.

The mixture according to Example 1 is particularly suitable for the preparation of meat compositions which contain only beef. The mixture according to Example 2 is particularly suitable for the preparation of meat compositions which contain a mixture of beef and pork. The mixture according to Example 3 is particularly suitable for the preparation of meat compositions which contain only pork. A possible modification of Examples 1 to 3 consists in replacing the caramel (component (b3)) used therein by paprika extract:

Further examples of mixtures for colouring and flavouring (component (B))

	Example 4 Beef	Example 5 Beef and pork	Example 6 Pork
Beef powder Component (b1)	44 wt.%	68 wt.%	-
Pork powder Component (b1)	-	-	73 wt.%
Beetroot powder Component (b2)	48 wt.%	23 wt.%	17 wt.%
Paprika extract Component (b3)	2 wt.%	2 wt.%	2 wt.%

Rosemary extract Component (b4)	6 wt.%	7 wt.%	8 wt.%

Some examples are given hereinbelow of amounts used when mixing component (B) with component (C) and component (D) in order to obtain a meat composition:

Examples of meat compositions

	Example 7 Beef	Example 8 Beef and pork	Example 9 Pork
Beef Component (C)	21 kg	8.4 kg	-
Pork Component (C)	-	12.6 kg	21 kg
Wheat gluten Component (A)	3 kg	3 kg	3 kg
Component (B)	0.5 kg (according to Example 1 or Example 4)	0.25 kg (according to Example 2 or Example 5)	0.25 kg (according to Example 3 or Example 6)
Water Component (D)	6 kg	6 kg	6 kg

In these examples, the whole amount of component (D) can be introduced into the meat composition according to the invention by swelling of the textured wheat gluten in water and/or the (e.g. boiled) aqueous solution of component (B). In the swelling operation or swelling operations for the introduction of water or the colouring and flavouring mixture (component (B)), the amount of water used (6 kg in the above examples) is used up completely, i.e. no water is discarded after swelling.

The textured wheat gluten, for example having a moisture content of about 10 %, is in the form of grains (grain size approximately from 1 to 10 mm). The wheat gluten is swelled for at least 0.25 hour (e.g. about 0.5 hour), preferably in an aqueous solution of component (B). The mixture so obtained can be incubated for a further 1 to 24 hours, for example cooled, in particular to below 5°C, e.g. at approximately 0°C, in order to achieve adequate colouring and flavouring of the vegetable protein. According to a particularly preferred embodiment of the preparation process according to the invention, a mixture of the textured wheat protein, component (B) and water is brought to a temperature below 1°C, e.g. from +1°C to -1°C, before the mixture is combined with component (C). Therefore, if the mixture was previously prepared, for example, at a higher temperature or was previously brought to an elevated temperature, the mentioned cooling must take place according to this embodiment at the latest immediately prior to the addition of component (C).

Minced meat having an average grain size in the range from 1 to 15 mm, for example 5 mm, is used as component (C). It is prepared by a conventional process and cooled to below 1°C, for example to -1°C.

The minced meat so obtained is then mixed with the swelled, coloured and flavoured wheat gluten ("meat substitute") by stirring and, together therewith, is passed through a so-called angel hair machine, divided into portions and finally packaged.

All working steps are carried out as far as possible under germ-free conditions, in order to prevent contamination of the meat composition. The meat composition so obtained has organoleptic properties comparable to those of conventional minced meat.

CONCLUSIES

1. Vleessamenstelling, omvattende:

(A) 10 gew.% tot 40 gew.% getextureerd tarwe-eiwit,

(B) 1 gew.% tot 10 gew.% van een mengsel dat bestaat uit:

(b1) 35 gew.% tot 60 gew.% rundvleespoeder,

(b2) 35 gew.% tot 60 gew.% rodebietenextract,

(b3) 0,1 gew.% tot 10 gew.% karamel en/of paprika-extract, en

(b4) 3 gew.% tot 12 gew.% rozemarijnextract,

waarbij de som van de bestanddelen (b1) tot (b4) 100 gew.% is, betrokken op component (B).

(C) 50 gew.% tot 90 gew.% rundvlees,

(D) 10 gew.% tot 30 gew.% water, en

(E) eventueel gebruikelijke additieven of hulpstoffen en mengsels daarvan,

waarbij de som van de hoeveelheden van componenten (A) tot (D) 100 gew.% is en de hoeveelheid van de eventuele component (E) extra wordt toegevoegd.

2. Vleessamenstelling, omvattende:

(A) 10 gew.% tot 40 gew.% getextureerd tarwe-eiwit,

(B) 0,5 gew.% tot 8 gew.% van een mengsel dat bestaat uit:

(b1) 50 gew.% tot 70 gew.% rundvleespoeder en/of

varkensvleespoeder,

(b2) 10 gew.% tot 30 gew.% rodebietenextract,

(b3) 0,1 gew.% tot 10 gew.% karamel en/of paprika-extract, en

(b4) 4 gew.% tot 14 gew.% rozemarijnextract,

waarbij de som van bestanddelen (b1) tot (b4) 100 gew.% is, betrokken op component (B),

(C) 50 gew.% tot 90 gew.% rundvlees en varkensvlees, bij voorkeur in een verhouding van 30:70 tot 50:50,

(D) 10 gew.% tot 30 gew.% water, en

(E) eventueel gebruikelijke additieven of hulpstoffen en mengsels daarvan,

waarbij de som van de hoeveelheden van de componenten (A) tot (D) 100 gew.% is en de hoeveelheid van de eventuele component (E) extra wordt toegevoegd.

3. Vleessamenstelling, omvattende:

(A) 10 gew.% tot 40 gew.% getextureerd tarwe-eiwit,

(B) 0,5 gew.% tot 8 gew.% van een mengsel dat bestaat uit:

(b1) 50 gew.% tot 90 gew.% varkensvleespoeder,

(b2) 5 gew.% tot 25 gew.% rodebietenextract,

(b3) 0,1 gew.% tot 10 gew.% karamel en/of paprika-extract, en

(b4) 4 gew.% tot 16 gew.% rozemarijnextract,

waarbij de som van bestanddelen (b1) tot (b4) 100 gew.% is, betrokken op component (B),

(C) 50 gew.% tot 90 gew,% varkensvlees,

(D) 10 gew.% tot 30 gew.% water, en

(E) eventueel gebruikelijke additieven of hulpstoffen en mengsels daarvan,

waarbij de som van de hoeveelheden van componenten (A) tot (D) 100 gew.% is en de hoeveelheid van de eventuele component (E) extra wordt toegevoegd.

4. Vleessamenstelling volgens een der voorgaande conclusies, waarbij het getextureerde tarwe-eiwit tarwegluten is.

5. Vleessamenstelling volgens een der voorgaande conclusies, waarbij gehakt vlees met een gemiddelde korrelgrootte van 1 tot 15 mm, bij voorkeur 2 tot 10 mm, als component (C) wordt gebruikt.

6. Werkwijze voor de bereiding van een vleessamenstelling, die de volgende stappen omvat:

a) het verschaffen van een getextureerd tarwe-eiwit, bij voorkeur met een vochtgehalte van 1 tot 10 %,

b) het verschaffen van een waterige oplossing van een kleur- en smaakmengsel omvattende:
0,1 gew.% tot 88 gew.% vleespoeder,
0,1 gew.% tot 60 gew.% rodebietenextract,
0,1 gew.% tot 10 gew.% karamel en/of paprika-extract, en
0,1 gew.% tot 15 gew.% rozemarijnextract,

c) het mengen van het in stap a) verschafte getextureerde tarwe-eiwit met de in stap b) verschafte oplossing, en eventueel het incuberen van het aldus verkregen mengsel,

d) het verschaffen van vlees, en

e) het mengen van het in stap c) verkregen mengsel met het in stap d) verschafte vlees,

zodanig, dat een vleessamenstelling volgens een der voorgaande conclusies wordt verkregen.

7. Werkwijze volgens conclusie 6, waarbij in stap a) het verschaffen van getextureerd tarwe-eiwit het laten zwellen van tarwe-eiwit, bij voorkeur tarwegluten, in water gedurende een tijdsduur van ten minste 0,25 uur, in het bijzonder bij een temperatuur van minder dan 10°C omvat.

8. Werkwijze volgens conclusie 6 of 7, waarbij de in stap b) verschafte waterige oplossing eerst wordt verdund met extra water voordat de aldus verdunde oplossing in stap c) met het verschafte tarwe-eiwit wordt gemengd.

9. Werkwijze volgens een der conclusies 6 tot 8, waarbij de in stap b) verschafte waterige oplossing ten minste 50 gew.% water bevat.

10. Werkwijze volgens een der conclusies 6 tot 9, waarbij in stap c) incuberen plaats heeft gedurende 0,25 tot 24 uur, in het bijzonder bij een temperatuur van 0°C tot 4°C.

11. Werkwijze volgens een der conclusies 6 tot 10, waarbij in stap d) het vlees wordt verschaft in een vorm van gehakt vlees met een gemiddelde korrelgrootte van 1 tot 10 mm.

12. Werkwijze volgens een der conclusies 6 tot 11, die verder de volgende stap omvat:

f) het persen van het in stap e) verkregen mengsel door een inrichting met geperforeerde schijf, bij voorkeur een inrichting met geperforeerde schijf met een gatdiameter in het traject van 1 tot 15 mm, meer in het bijzonder in het traject van 3 tot 6 mm.

Agentschap NL
Ministerie van Economische Zaken, Landbouw en Innovatie

RAPPORT BETREFFENDE HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK

Octrooiaanvrage 2004960

Classificatie van het onderwerp[1]: A23L1/314, A23L1/317, A23J3/22, A23J3/18	Onderzochte gebieden van de techniek[1]: A23L, A23J
Computerbestanden: EPODOC, WPI	Omvang van het onderzoek: Volledig
Indien gewijzigde conclusies; indieningsdatum van deze conclusies:	Niet onderzochte conclusies[2]:

Van belang zijnde literatuur

Categorie[3]	Vermelding van literatuur met aanduiding, voor zover nodig, van speciaal van belang zijnde tekstgedeelten of figuren.	Van belang voor conclusie(s) nr.:
X	US 2008/260913 A1 (SOLAE LLC) 23 oktober 2008 * het gehele document *	1-15
	- - -	
A	US 2005/008758 A1 (D. D. GREX, G. T. HOWSE, K. SIDHU) 13 januari 2005 * het gehele document *	15
	- - -	
A	WO 01/65948 A2 (CAMPINA MELKUNIE BV) 13 september 2001 * het gehele document *	1-15
	- - -	
A	US 4818557 A (CONRAD ERNST) 4 april 1989 * het gehele document *	1-15
	- - -	
A	US 4238515 A (PEDCO PROTEINS & ENCYMES DEV) 9 december 1980 * het gehele document *	15
	- - - - -	

Datum waarop het onderzoek werd voltooid: 1 juni 2011	De bevoegde ambtenaar: Mw. Dr. Ing. L. Bechger **NL Octrooicentrum**

[1] Gedefinieerd volgens International Patent Classification (IPC).
[2] Voor motivering zie toelichting in de schriftelijke opinie.
[3] Verklaring van de categorie-aanduiding: zie apart blad.

Categorie van de vermelde literatuur:

X: op zichzelf van bijzonder belang zijnde stand van de techniek
Y: in samenhang met andere geciteerde literatuur van bijzonder belang zijnde stand van de techniek
A: niet tot de categorie X of Y behorende van belang zijnde stand van de techniek
O: verwijzend naar niet op schrift gestelde stand van de techniek
P: literatuur gepubliceerd tussen voorrangs- en indieningsdatum
T: niet tijdig gepubliceerde literatuur over theorie of principe ten grondslag liggend aan de uitvinding
E: octrooiliteratuur gepubliceerd op of na de indieningsdatum van de onderhavige aanvrage en waarvan de indieningsdatum of de voorrangsdatum ligt voor de indieningsdatum van de onderhavige aanvrage.
D: in de aanvrage genoemd
L: om andere redenen vermelde literatuur
&: lid van dezelfde octrooifamilie; corresponderende literatuur

AANHANGSEL BEHORENDE BIJ HET RAPPORT BETREFFENDE HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK, UITGEVOERD IN OCTROOIAANVRAGE NR. 2004960

Het aanhangsel bevat een opgave van elders gepubliceerde octrooiaanvragen of octrooien (zogenaamde leden van dezelfde octrooifamilie), die overeenkomen met octrooigeschriften genoemd in het rapport. De opgave is samengesteld aan de hand van gegevens uit het computerbestand van het Europees Octrooibureau per **5 juli 2011**

De juistheid en volledigheid van deze opgave wordt noch door het Europees Octrooibureau, noch door NL Octrooicentrum gegarandeerd; de gegevens worden verstrekt voor informatiedoeleinden.

In het rapport genoemd octrooi-geschrift		datum van publicatie	overeenkomend(e) geschrift(en)		datum van publicatie
US2008260913	A	2008-10-23			
US2005008758	A	2005-01-13			
WO0165948	A	2001-09-13			
			AU5618601	A	2001-09-17
			EP1263296	A	2002-12-11
US4818557	A	1989-04-04			
			IE52050	B	1987-05-27
			FI812476	A	1982-02-13
			SE8005667	A	1982-02-13
			NO812729	A	1982-02-15
			AU7380881	A	1982-02-18
			EP0049695	AB	1982-04-14
			CA1175707	A	1984-10-09
			NZ197947	A	1985-07-31
			AU549868B	B	1986-02-20
US4238515	A	1980-12-09			
			EP0003912	AB	1979-09-05
			JP54122751	A	1979-09-22
			ZA7900599	A	1980-02-27
			IL54096	A	1981-07-31
			RO76855	A	1982-03-24
			CA1126262	A	1982-06-22
			JP2242642	A	1990-09-27

SCHRIFTELIJKE OPINIE

Octrooiaanvrage 2004960

Indieningsdatum: 24 juni 2010	Voorrangsdatum: 29 maart 2010
Classificatie van het onderwerp[1]: A23L1/314, A23L1/317, A23J3/22, A23J3/18	Aanvrager: Vion N.V.

Deze schriftelijke opinie bevat een toelichting op de volgende onderdelen:

☑ Onderdeel I	Basis van de schriftelijke opinie
☑ Onderdeel II	Voorrang
☐ Onderdeel III	Vaststelling nieuwheid, inventiviteit en industriële toepasbaarheid niet mogelijk
☐ Onderdeel IV	De aanvraag heeft betrekking op meer dan één uitvinding
☑ Onderdeel V	Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid
☐ Onderdeel VI	Andere geciteerde documenten
☐ Onderdeel VII	Overige gebreken
☑ Onderdeel VIII	Overige opmerkingen

De bevoegde ambtenaar:

Mw. Dr. Ing. L. Bechger

NL Octrooicentrum

[1] Gedefinieerd volgens International Patent Classification (IPC).

Schriftelijke Opinie

Octrooiaanvrage **2004960**

Onderdeel I Basis van de schriftelijke opinie

Deze schriftelijke opinie is opgesteld op basis van de meest recente conclusies ingediend voor aanvang van het onderzoek.

Onderdeel II Voorrang

Deze schriftelijke opinie is opgesteld onder de aanname dat eventueel ingeroepen voorrang geldig is, tenzij hieronder anders is aangegeven. Controleren van de voorrang maakt geen deel uit van het reguliere onderzoek naar de stand van de techniek.

Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid

1. Verklaring

Nieuwheid	Ja:	Conclusies	1-15
	Nee:	Conclusies	
Inventiviteit	Ja:	Conclusies	
	Nee:	Conclusies	1-15
Industriële toepasbaarheid	Ja:	Conclusies	1-15
	Nee:	Conclusies	

2. Literatuur en toelichting

D1 = US 2008/260913
D2 = US 2005/008758
D3 = WO 01/65948
D4 = US 4818557
D5 = US 4238515

Nieuwheid

D1 openbaart een vleessamenstelling omvattende
(A) 1 gew. % tot 20 gew. % getextureerd eiwit ('structured protein') waarvan 30% tot 45% tarwe ('wheat gluten' and 'wheat starch', zie paragraaf [0053]), zodat 0,3 gew. % tot 9 gew. % getextureerd tarwe-eiwit is;
(B) bestanddelen, gekozen uit

(b1) vleespoeder ('animal meat flavor' zie paragraaf [0131])

(b2) rode bietenextract ('beet juice' zie paragraaf [0048])

(b3) caramel- of paprika-extract (zie paragrafen [0048] en [0131])

(b4) rozemarijnextract (zie paragraaf [0131]),

waarbij de ingrediënten b1 en b4 in een range van 0,01 gew. % tot 10 gew.% en de ingrediënten b2 en b3 in een range van 0,001 gew.% tot 5 gew.% aanwezig zijn, betrokken op de totale samenstelling;

(C) 50 gew. % tot 80 gew. % vlees (zie paragraaf [0151]);

(D) 11,03 gew. % tot 48,291 gew.% water (zie tabellen 2, 3, 5, 6); en desgewenst

(E) gebruikelijke additieven en hulpstoffen.

Conclusie 1 van de onderhavige aanvrage verschilt nu daarin van D1, dat de specifieke combinatie van de bestanddelen genoemd onder (B) (b1 t/m b4) wordt toegepast (als mengsel) in de vleessamenstelling. Conclusie 1 van de onderhavige aanvrage en de daarvan afhankelijke conclusies 2 t/m 7 zijn daarmee (letterlijk) nieuw. Ook de werkwijze conclusies 8 t/m 14 om deze vleessamenstellingen te bereiden zijn nieuw in het licht van D1.

Tevens verschilt conclusie 15, betreffende een vleesvervangingsproduct, in het bjizonder als bestanddeel van een vleessamenstelling, daarin van D1 dat de specifieke combinatie van de bestanddelen b1 t/m b4 wordt toegepast (als mengsel). Ook conclusie 15 is dus nieuw ten opzichte van D1.

Inventiviteit

D1 wordt gezien als de meeste nabije stand van de techniek. Hoewel de materie van conclusie 1 nieuw is ten opzichte van D1, wordt de materie van deze conclusie niet inventief bevonden. De specifieke combinatie van ingrediënten genoemd onder component (B) in conclusie 1 van de onderhavige aanvrage valt binnen het bereik van de vakman; al deze ingrediënten worden in D1 geopenbaard en het als mengsel toepassen van deze bekende en met naam genoemde kleur/smaakstoffen vergt geen inventieve arbeid. Ook blijkt niet uit experimenteel materiaal uit de onderhavige aanvrage dat juist de keuze en combinatie van deze ingrediënten als mengsel een (onverwacht) voordeel oplevert ten opzichte van D1, behalve de algemene opmerking op pagina 3 dat de organoleptische eigenschappen verbeterd zijn. De conclusies 1 en 2 zijn daarmee niet inventief.

D1 openbaart ook vleesvervangingsproducten (zie o.a. paragrafen [0020] en [0170]). Derhalve gaat eenzelfde redenering op voor de onafhankelijke conclusie 15, betreffende een vleesvervangingsproduct in het bijzonder als bestanddeel van een vleessamenstelling. Ook deze conclusie is niet inventief in het licht van D1.

In de vleessamenstellingen van D1 is component (C) (het vlees) gehakt tot een gemiddelde korrelgrootte van o.a. 3 mm (zie paragraaf [0186]) of 9,5 mm (zie paragraaf [0193]) en wordt het vlees gekozen uit rundvlees, varkensvlees, lamsvlees, vlees van gevogelte en kalfsvlees (zie conclusie 11 en voorbeelden 4, 6, 7, 8). Daarmee zijn tevens de maatregelen van conclusies 3 t/m 7 niet inventief.

Ook de conclusies 8 t/m 14, betreffende de werkwijze voor de bereiding van de vleessamenstellingen volgens conclusies 1 t/m 7, berusten niet op uitvinderswerkzaamheid. In paragraaf [0157] van D1 wordt aangegeven dat het (tarwe) eiwit gemengd kan worden met de smaak-/kleurstoffen (de componenten van mengsel (B)) alvorens te mengen met het vlees (zie paragraaf [0157]) en dat men het getextureerde eiwit

laat opzwellen ('rehydrate with water', zie paragraaf [0148], 'allow the contents to hydrate for about 60 minutes', zie paragraaf [0182]). Conclusies 8, 9 en 13 zijn derhalve niet inventief.
De maatregelen van conclusies 10, 11 en 12 betreffen niet meer dan triviale, tot de vakkennis van de vakman behorende, (o.a. verdunnings)stappen en deze maatregelen kunnen daarom geen inventiviteit verschaffen aan deze conclusies.
Conclusie 14 betreft het persen van de uiteindelijk verkregen vleessamenstelling door een inrichting met een geperforeerde schijf. Hoewel deze maatregel niet expliciet bekend is uit D1 wordt er in paragraaf [0160] vermeld dat het uiteindelijk verkregen vleesproduct vermalen kan worden ('...chunked, or shredded'). Dat deze vermaling met een geperforeerde schijf plaats kan vinden vergt geen inventieve arbeid en derhalve is ook deze conclusie niet inventief.

D2 t/m D5 betreffen secundaire stand van de techniek en behoeven hier geen nadere bespreking.

Onderdeel VIII Overige opmerkingen

De volgende opmerkingen met betrekking tot de duidelijkheid van de conclusies, beschrijving, en figuren, of met betrekking tot de vraag of de conclusies nawerkbaar zijn, worden gemaakt:

De woorden "eventueel" in conclusies 1, 5, 6, 7, 8 en 15, "bij voorkeur" in conclusie 8, 9 en 14, "in het bijzonder" in conclusies 9 en 12, "meer in het bijzonder" in conclusie 14, "in bijzonder" in conclusie 15 zijn niet beperkend en de zinsneden achter deze woorden kunnen daarom worden weggedacht.