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(71) Applicant (for AL, AM, AT, AZ, BA, BE, BF, BG, BJ, BR, BY, CF, CG, CH, CI, CM, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, FR, GA, GE, GN, GQ, GR, GW, HR, HU, ID, IS, IT, JP, KG, KM, KP, KR, KZ, LR, LT, LU, LV, MA, MC, MD, MG, MK, ML, MR, MX, MZ, NE, NI, NL, NO, PH, PL, PT, RO, RU, SE, SI, SK, SM, SN, SY, TD, TG, TJ, TM, TN, TR, UA, UZ, VN, YU only): UNILEVER N.V. [NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL).

(71) Applicant (for AE, AG, AU, BB, BW, BZ, CA, CY, EG, GB, GD, GH, GM, IE, IL, KE, KN, LC, LK, LS, LY, MN, MW, NA, NG, NZ, OM, PG, SC, SD, SG, SL, SZ, TT, TZ, UG, VC, ZA, ZM, ZW only): UNILEVER PLC [GB/GB]; Unilever House, Blackfriars, London Greater London EC4P 4BQ (GB).

(71) Applicant (for IN only): HINDUSTAN LEVER LIMITED [IN/IN]; Hindustan Lever House, 165/166 Backbay Reclamation, Maharashtra, Mumbai 400 020 (IN).

(72) Inventors; and

(75) Inventors/Applicants (for US only): BREE, Angelika, De [NL/NL]; Unilever R & D Vlaardingen, Olivier van Noortlaan 120, NL-3133 AT Vlaardingen (NL). GERHARDT, Cinderella, Christina [NL/NL]; Unilever R & D Vlaardingen, Olivier van Noortlaan 120, NL-3133 AT Vlaardingen (NL).

(74) Agent: JOPPE, Hermina, Laura, Petr; Unilever Patent Group, Olivier van Noortlaan 120, NL-3133 AT Vlaardingen (NL).

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(54) Title: COMPOSITION COMPRISING PEPTIDE

(57) Abstract: Composition comprising one or more peptide and one or more B-vitamins. Preferably the ACE inhibiting peptides are chosen from tripeptides and/or dipeptides, more preferably from VPP, IPP, LPP, VY, VF, IW, HLPLP, VAP, AW, LW, HLP, IY, FY, PPL, YP, TPP, and MPP.

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**Composition comprising peptide****Field of the invention**

The invention relates to a composition comprising blood  
5 pressure lowering peptide, in particular ACE-inhibiting  
peptide, in particular ACE-inhibiting tripeptide and/or  
dipeptide.

**Background to the invention**

10 Hypertension or high blood pressure is considered to be one of  
the main risk factors for Cardio Vascular Diseases (CVD). One  
of the mechanisms which regulates blood pressure is the renin-  
angiotensin system. This is a cascade of reactions leading to  
the formation of angiotensin II, which has a strong  
15 vasoconstrictive and hence blood pressure increasing effect.  
Inhibition of one of the key enzymes in this cascade:  
Angiotensin I Converting Enzyme (ACE) reduces formation of  
angiotensin II and thus has a blood pressure lowering effect.  
Long term human intervention studies have shown regular intake  
20 of low amounts of ACE inhibitors reduces CVD by 25% (Gerstein  
et al. (2000), The Lancet 355, 253-259).

ACE-inhibitors in food products are well known. Such food  
products have for instance been prepared by fermentation of  
25 milk or milk products. In a placebo-controlled study, the blood  
pressure lowering effect of sour milk containing the ACE-  
inhibiting peptides VPP and IPP was shown in hypertensive  
humans (Hata, Y et al. (1996), American Journal of Clinical  
Nutrition 64, 767-771).

30

A commercially available fermented milk product, which claims  
to be "suitable for those with mild hypertension" is Calpis  
sour milk, fermented with *Lactobacillus helveticus* and

Saccharomyces cerevisiae, produced by Calpis Food Industry, Japan. Another commercially available fermented milk product is Evolus produced by Valio, Finland. These fermented milk products are fermented with Lactobacillus helveticus (Lb. 5 helveticus) strains. The products contain tripeptides (VPP and IPP) responsible for in vitro ACE inhibition.

The known products have a blood pressure lowering effect, which effect results in a reduction of risk of CVD.

10

Protein hydrolysates or fermentates may contain particular peptides that decrease blood pressure, probably by their inhibitory activity on ACE. The observed blood pressure lowering effects are usually modest. This invention comprises 15 the combination of peptides with additional dietary, bioactive ingredients, in order to obtain a synergistic increase in the blood pressure lowering effect.

#### **Summary of the invention**

20 It is an object of the invention to provide a composition providing further reduction of CVD, compared to the known products comprising VPP and/or IPP. Another object is to provide a food product that has a blood pressure lowering effect. It is another object to provide such food products 25 having a good taste. One or more of these objects is attained according to the invention, which provides a composition comprising one or more peptides and one or more B-vitamins.

In particular the invention relates to a food product 30 comprising one or more peptides and one or more B-vitamins, wherein the peptides are chosen from the group consisting of: VPP, IPP, LPP, VY, VF, IW, VAP, AW, LW, HLP, IY, FY, PPL, YP, TPP, MPP; and

(1) wherein the amount of folic acid in the food product is from 0.02 $\mu$ g to 5,000 $\mu$ g, more preferably from 30 $\mu$ g to 1,000 $\mu$ g, especially from 60 $\mu$ g to 400 $\mu$ g; and/or

(2) wherein the amount of vitamin B2 in the food composition is  
5 from 0.2 mg to 40 mg, more preferably from 0.24 mg to 8 mg, especially from 0.5 mg to 3.2 mg; and/or

(3) wherein the amount of vitamin B6 in the food composition is from 0.2 mg to 50 mg, more preferably from 0.3 mg to 10 mg, especially from 0.6 mg to 4 mg; and/or

10 (4) wherein the amount of vitamin B12 in the food composition is from 0.00001  $\mu$ g to 25  $\mu$ g, more preferably from 0.15 $\mu$ g to 5 $\mu$ g, especially from 0.3 $\mu$ g to 2 $\mu$ g.

#### **Detailed description of the invention**

15 The composition according to the invention comprises one or more peptides. Peptide is herein a peptide having 2-10 amino acids. Preferably the peptide is a blood pressure lowering peptide. More preferably the peptide(s) are chosen from tripeptides and/or dipeptides. Even more preferably the ACE  
20 inhibiting peptide(s) are chosen from the list: VPP, IPP, LPP, VY, VF, IW, VAP, AW, LW, HLP, IY, FY, PPL, YP, TPP, MPP. More preferably the peptide is one or more of tripeptides VPP, IPP, LPP.

25 The usual one letter code of aminoacids is used herein for the description of peptides unless otherwise indicated.

The peptides mentioned herein have an ACE inhibiting effect as mentioned in table 1.

Preferable the peptides are stable in the human intestinal tract, and more preferably also absorbed by human enterocytes.

- WO01/681115 discloses (page 24, table 4) a yeast hydrolysate  
5 comprising VPP or IPP tripeptides. Although these hydrolysates may -accidentally- contain minor amounts of vitamin B, this document does not disclose the specific levels of folic acid or vitamin B2, or vitamin B6 or vitamin B12 as currently claimed.
- 10 Similarly WO01/82836 discloses (pag 12, table 3) a fermented milk product comprising VPP or IPP tripeptides. This document also does not specify the specific levels of folic acid, vitamin B2, vitamin B6 or vitamin B12 as currently claimed.
- 15 US04/043942 discloses (example 39, preparation IV) a dietary composition comprising folic acid in combination with the peptide H-Gly-Gly-OH. The specific di- or tripeptides according to the current invention do not seem to be disclosed.
- 20 Patent application EP1568707 discloses in example 6 a combination of an anti-hypertensive composition an vitamin B. Again this document does not seem to disclose the specific peptides as currently claimed.

Table 1: ACE inhibition (IC<sub>50</sub> values) and preferred amounts of peptides

Peptide	IC <sub>50</sub> value (ACE inhibition according to Matsui as described herein)	Preferred amount (µg)
VPP	2.5µM	0.5 - 75
IPP	2µM	0.5 - 50
LPP	5µM	0.5 - 100
VY	5µM	0.5 - 100
VF	10µM	1 - 200
IW	0.075µM	0.01 - 50
HLPLP	17µM	1 - 200
VAP	1µM	0.1 - 100
AW	5µM	0.5 - 100
LW	5µM	0.5 - 100
HLP	>100µM	1 - 200
IY	0.5µM	0.1 - 100
FY	10µM	1 - 200
IPPL	50µM	1 - 200
YP	185µM	1 - 200
TPP	15µM	1 - 200
MPP	7µM	0.5 - 200

5

The peptides may be made by any method known in the art, including synthesis. Preferably the peptides are made by (enzymatic) hydrolysis or fermentation of any one or more protein substrates containing the fragments one or more of the  
10 fragments VPP, IPP, LPP, VY, VF, IW, HLPLP, VAP, AW, LW, HLP, IY, FY, PPL, YP, TPP, and MPP.

Advantageously the protein substrate contains mor than one, preferably two or more, even more preferably three or more of most preferably four or more of the fragments VPP, IPP, LPP, VY, VF, IW, HLPLP, VAP, AW, LW, HLP, IY, FY, PPL, YP, TPP, and  
5 MPP.

Through optimisation of the fermentation or hydrolysis conditions, the production of the biologically active peptides as described before may be maximised. The skilled person trying  
10 to maximise the production will know how to adjust the process parameters, such as hydrolysis time, hydrolysis temperature, enzyme type and concentration etc.

When above mentioned peptides are generated by fermentation or  
15 enzymatic hydrolysatation, highly complex mixtures of hundreds to thousands of peptides arise. Although a large portion of these peptides may show little or no ACE inhibitory activity, their presence may be important to the overall blood pressure lowering effect of the hydrolysate/fermentate e.g. by  
20 increasing the bioavailability of the ACE inhibitory peptides.

The composition according to the invention further comprises one or more B-vitamins. The B-vitamin is preferably one or more of folic acid, Vitamin B2, Vitamin B6, and Vitamin B12.  
25 Preferably the composition comprises all of the B-vitamins folic acid, Vitamin B2, Vitamin B6, and Vitamin B12.

Folic acid is the synthetic, stable form of naturally occurring folates. Folic acid is known to participate in the metabolism  
30 of homocysteine. Herein the term folic acid also includes folates. For a number of years, high homocysteine levels have been correlated to high incidence of cardiovascular disease. It

is thought that lowering homocysteine may reduce the risk of cardiovascular disease.

Folic acid, vitamins B2, B6 and B12 are important for the  
5 degradation of homocysteine. There are indications that  
supplementation with folic acid (with or without additional  
vitamin B6) is associated with a blood pressure lowering  
effect. This blood pressure lowering effect could be due to the  
lowering effect on homocysteine levels, or to a direct  
10 beneficial effect of B- vitamins on blood pressure.

The compositions according to the invention comprising peptide  
and one or more of vitamin B6 and vitamin B12 and folic acid  
have a strong and in combination with peptide(s) synergistic  
15 effect on lowering blood pressure.

The B vitamins are preferably selected from folic acid, vitamin  
B2, vitamin B6, vitamin B12 and mixtures thereof. The total  
amount of vitamin B in a food product or food supplement is  
20 preferably from 0.01% to 2,500%, more preferably from 15% to  
500%, still more preferably from 30% to 200% from the Reference  
Labeling Values from the Scientific Committee on Food of the  
European Committee as of the date of filing of this  
application, namely folic acid: 200µg, vitamin B2: 1.6mg,  
25 vitamin B6: 2 mg, vitamin B12: 1µg. The following preferred  
ranges of B vitamin inclusion levels are based on the  
assumption that the particular B vitamin in question is  
included in the combination. Preferably, the daily intake of  
folic acid from the food product is from 0.02µg to 5,000µg,  
30 more preferably from 30µg to 1,000µg, especially from 60µg to  
400µg. The intake of vitamin B2 in such a food product is  
preferably from 0.2 mg to 40 mg, more preferably from 0.24 mg  
to 8 mg, especially from 0.5 mg to 3.2 mg. The intake of

vitamin B6 in the food product is preferably from 0.2 mg to 50 mg, more preferably from 0.3 mg to 10 mg, especially from 0.6 mg to 4 mg. The intake of vitamin B12 from the food product is preferably from 0.00001 µg to 25 µg, more preferably from  
5 0.15µg to 5µg, especially from 0.3µg to 2µg. These amounts apply per food product in its common dosage form, portion or form wherein the product is commercialised (e.g. tub, bottle etc).

10 Food products according to the invention are defined as products, suitable for human consumption.

The food products according to the invention are preferably made according to a process involving the following steps:

- 15 (a) enzymatic hydrolysis of a protein substrate comprising hydrolysed protein product;  
(b) separation from the hydrolysed protein product of a fraction rich in ACE inhibiting peptide;  
(c) concentration and/or drying of the fraction from step  
20 b) to obtain a concentrate rich ACE inhibiting peptide;  
(d) using the concentrate prepared in step c) as an ingredient in the preparation of the food product.

The enzymatic hydrolysis step (a) may be any enzymatic  
25 treatment of a protein substrate leading to hydrolysis of the substrate resulting in liberation of one or more of peptides VPP, IPP, LPP, VY, VF, IW, HLPLP, VAP, AW, LW, HLP, IY, FY, PPL, YP, TPP, and MPP.

30 Examples of suitable substrates include whole milk, skimmed milk, acid casein, rennet casein, acid whey products or cheese whey products, collagen based animal proteins such as gelatine as well as bones or fish-bones. Also, vegetable substrates like

wheat gluten, milled barley and protein fractions obtained from, for example, soy, rice or corn are suitable substrates. Mixtures of these may also be used as substrate.

5 Preferably the substrate is milk or a milk product.

Most preferably the protein substrate is casein. The following caseins are especially suitable as substrate: casein, casein powder, casein powder concentrates, casein powder isolates, or  
10 beta-casein, or alpha-s2-casein. Preferably a substrate that has a high content of casein, such as casein protein isolate (CPI).

The enzyme may be any enzyme that is able to hydrolyse protein  
15 substrate resulting in the liberation of one or more of. VPP, IPP, LPP, VY, VF, IW, HLPLP, VAP, AW, LW, HLP, IY, FY, PPL, YP, TPP, and MPP.

A suitable hydrolysate containing ACE inhibiting peptides  
20 according to the invention may be obtained by hydrolysis with an endo-protease and a tri-peptidase as described in WO03/102905.

The separation step (b) (or concentration step (c)) may be  
25 executed in any way known to the skilled person, e.g. by precipitation, filtration, centrifugation, extraction or chromatography and combinations thereof. Preferably the separation step (b) is executed using an ultrafiltration (UF) and/or nanofiltration (NF) techniques. The pore size of the  
30 membranes used in the filtration step, as well as the charge of the membrane may be used to control the separation of the ACE inhibiting peptides. The fractionation of casein protein hydrolysates using charged UF/NF membranes is described in Y.

Poilot et al, Journal of Membrane Science 158 (1999) 105-114.  
Electrodialysis is for instance described in W000/42066.

Most preferably the separation is executed using acid  
5 precipitation.

The concentration/drying step (c) involves drying the fraction  
from step b) to obtain a solid rich in ACE inhibiting peptide.  
This step may be done in a conventional way, e.g. by spray  
10 drying or freeze drying.

In a preferred embodiment the product of the separation step is  
dried until a concentrated solution of hydrolysed protein,  
having a low  $A_w$  is obtained. In such way the formation of off-  
15 flavour through Maillard reactions may be avoided.

The fraction rich in peptides prepared in step (b) is hereafter  
designated as ACE-fraction and the solid prepared in step (c)  
is hereafter designated as ACE-solid. The ACE-fraction and/or  
20 the ACE-solid may advantageously be used as an ingredient in a  
food product.

The food product according to the invention or food products  
derived therefrom may be pasteurised or sterilised.  
25

The food products according to the invention may be of any food  
type. They may comprise common food ingredients in addition to  
the food product, such as flavour, sugar, fruits, minerals,  
vitamins, stabilisers, thickeners, etc. in appropriate amounts.  
30

Preferably, the food product comprises 50-200 mmol/kg  $K^+$  and/or  
15-60 mmol/kg  $Ca^{2+}$  and/or 6-25 mmol/kg  $Mg^{2+}$  more preferably, 100-  
150 mmol/kg  $K^+$  and/or 30-50 mmol/kg  $Ca^{2+}$  and/or 10-25 mmol/kg

Mg<sup>2+</sup> and most preferably 110-135 mmol/kg K<sup>+</sup> and/or 35-45 mmol/kg Ca<sup>2+</sup> and/or 13-20 mmol/kg Mg<sup>2+</sup>. These cations have a beneficial effect of further lowering blood pressure when incorporated in the food products according to the invention.

5

Preferably, the food product comprises one or more phytosterols, phytostanols and/or analogues or derivatives thereof.

10

Typically, the phytosterols, phytostanols and their analogues and derivatives may be selected from one or more of phytosterols, phytostanols, synthetic analogues of phytosterols and phytostanols and esterified derivatives of any of the  
15 foregoing, and mixtures of any of these. The total amount of such substances in a food product or food supplement is preferably from 0.01% to 20%, more preferably from 0.1% to 15%, still more preferably from 0.2% to 8%, and most preferably from 0.3% to 8% by weight of the food product composition.

20

Preferably, the daily intake of such sterol-type component of the combination is from 0.1g to 3g, more preferably from 1.5g to 2.5g, especially from 2g to 2.25g per day.

25 Phytosterols, also known as plant sterols or vegetable sterols can be classified in three groups, 4-desmethylsterols, 4-monomethylsterols and 4,4'-dimethylsterols. In oils they mainly exists as free sterols and sterol esters of fatty acids although sterol glucosides and acylated sterol glucosides are  
30 also present. There are three major phytosterols namely beta-sitosterol, stigmasterol and campesterol. Schematic drawings of the components meant are as given in "Influence of

Processing on Sterols of Edible Vegetable Oils", S.P. Kochhar;  
Prog. Lipid Res. 22: pp. 161-188.

The phytosterols are the respective 5 $\alpha$ - saturated derivatives  
5 of phytosterols such as sitosterol, campestanol and their  
derivatives.

Synthetic analogues of any of the phytosterols or phytosterols  
(which include chemically modified natural phytosterols or  
10 phytosterols) may be used.

Preferably the phytosterol or phytosterol is selected from the  
group comprising fatty acid ester of  $\beta$ -sitosterol,  $\beta$ -  
sitosterol, campesterol, campestanol, stigmasterol,  
15 stigmasterol and mixtures thereof.

The optional phytosterol or phytosterol materials recited above  
may optionally be provided in the form of one or more fatty  
acid esters thereof. Mixtures of esterified and non-esterified  
20 materials may also be used.

Thus, any of the phytosterols, phytosterols and their synthetic  
analogues used in the present invention are preferably  
esterified with a fatty acid. Preferably, they are esterified  
25 with one or more C<sub>2-22</sub> fatty acids. For the purpose of the  
invention the term C<sub>2-22</sub> fatty acid refers to any molecule  
comprising a C<sub>2-22</sub> main chain and at least one acid group.  
Although not preferred within the present context the  
C<sub>2-22</sub> main chain may contain 1-6 double bonds, be partially  
30 substituted or side chains may be present. Preferably, however  
the C<sub>2-22</sub> fatty acids are linear molecules comprising one or two  
acid group(s) as end group(s). Most preferred are linear C<sub>8-22</sub>  
fatty acids as occur in natural liquid oils.

Suitable examples of any such fatty acids are acetic acid, propionic acid, butyric acid, caproic acid, caprylic acid, capric acid. Other suitable acids are for example citric acid, lactic acid, oxalic acid and maleic acid. Most preferred are  
5 lauric acid, palmitic acid, stearic acid, arachidic acid, behenic acid, oleic acid, cetoleic acid, erucic acid, elaidic acid, linoleic acid and linolenic acid.

When desired a mixture of fatty acids may be used for  
10 esterification of the sterols. For example, it is possible to use a naturally occurring fat or oil as a source of the fatty acid and to carry out the esterification via an interesterification reaction. Use of a natural source nearly always results in a mixture of fatty acids.

15

In a particular embodiment, the fatty acid mixture contains a high amount (>50%, preferably >70%, further preferred >80%) of unsaturates, being either monounsaturated fatty acids (MUFA) and/or polyunsaturated fatty acids (PUFA). This does not only  
20 provide the advantage of e.g. PUFA itself having good blood cholesterol lowering capacity, but also of the sterols esters prepared with such fatty acids.

Preferably fatty acid mixtures of sunflower, safflower,  
25 rapeseed, linseed, olive oil, linola and/or soybean are used. These are typical sources of high PUFA and/or low SAFA. Suitable esterification conditions are for example described in WO 92/19640.

The above described food ingredients, contributing to  
30 increasing cardiovascular health, K<sup>+</sup>, Ca<sup>2+</sup> and Mg<sup>2+</sup>, B-vitamins (folic acid, Vitamin B2, B6, B12) and phytosterols, phytosterols and/or analogues or derivatives thereof are herein collectively referred to as heart health ingredients.

Preferably the food products according to the invention are drinks, more preferably fruit juice products or dairy drinks optionally with added fruit juice, dairy type products, frozen confectionary products or spreads/margarines. These preferred 5 types of food products are described in some detail below and in the examples.

- Fruit juice products

Examples of fruit juice products according to the invention are 10 juices derived from citrus fruit like orange and grapefruit, tropical fruits, banana, peach, pear, strawberry, to which ACE-solid and/or ACE-fraction and optionally one or more heart health ingredients are added.

- 15 • Dairy type products

Examples of dairy products according to the invention are milk, dairy spreads, cream cheese, milk type drinks and yoghurt, to which ACE-solid and/or ACE-fraction and optionally one or more heart health ingredients are added.

20 The food product may be used as such as a milk type drink. alternatively flavour or other additives may be added. A dairy type product may also be made by adding ACE-solid and/or ACE-fraction to water or to a dairy product.

25 An example of a composition for a yoghurt type product is about 50-80 wt.% water, 0.1-15 wt.% ACE-solid and optionally one or more heart health ingredients, 0-15 wt.% whey powder, 0-15 wt.% sugar (e.g. sucrose), 0.01-1 wt.% yoghurt culture, 0-20 wt.% fruit, 0.05-5 wt.% vitamins and minerals, 0-2 wt.% flavour, 0-5 30 wt.% stabilizer (thickener or gelling agent). To the yoghurt, fruit may be added.

A typical serving size for a yoghurt type product could be from 50 to 250 g, generally from 80 to 200 g.

- Frozen Confectionery Products

5 For the purpose of the invention the term frozen confectionery product includes milk containing frozen confections such as ice-cream, frozen yoghurt, sherbet, sorbet, ice milk and frozen custard, water-ices, granitas and frozen fruit purees.

10 Preferably the level of solids in the frozen confection (e.g. sugar, fat, flavouring etc) is more than 3 wt.%, more preferred from 10 to 70 wt.%, for example 40 to 70 wt.%.

Ice cream will typically comprise 0 to 20 wt.% of fat, 0.1 to 20  
15 wt.% ACE-solid and optionally one or more heart health ingredients, sweeteners, 0 to 10 wt.% of non-fat milk components and optional components such as emulsifiers, stabilisers, preservatives, flavouring ingredients, vitamins, minerals, etc, the balance being water. Typically ice cream will be aerated  
20 e.g. to an overrun of 20 to 400 %, more specific 40 to 200 % and frozen to a temperature of from -2 to -200 °C, more specific -10 to -30 °C. Ice cream normally comprises calcium at a level of about 0.1 wt%.

25 • Other food products

Other food product according to the invention can be prepared by the skilled person based on common general knowledge, protein hydrolysate and optionally one or more heart health ingredients in suitable amounts. Examples of such food products  
30 are baked goods, dairy type foods, snacks, etc.

Advantageously the food product is an oil and water containing emulsion, for instance a spread. Oil and water emulsion is herein defined as an emulsion comprising oil and water and includes oil in water (O/W) emulsions and water in oil emulsions (W/O) and more complex emulsions for instance water-in-oil-in-water (W/O/W/O/W) emulsions. Oil is herein defined as including fat. Preferably the food product is a spread, frozen confection, or sauce. Preferably a spread according to the invention comprises 30-90 wt.% vegetable oil. Advantageously a spread has a pH of 4.2-6.0.

**Claims**

1. Food product comprising one or more peptides and one or more B-vitamins, wherein the peptides are chosen from the group consisting of: VPP, IPP, LPP, VY, VF, IW, VAP, AW, LW, HLP, IY, FY, PPL, YP, TPP, MPP; and
  - (1) wherein the amount of folic acid in the food product is from 0.02 $\mu$ g to 5,000 $\mu$ g, more preferably from 30 $\mu$ g to 1,000 $\mu$ g, especially from 60 $\mu$ g to 400 $\mu$ g; and/or
  - (2) wherein the amount of vitamin B2 in the food composition is from 0.2 mg to 40 mg, more preferably from 0.24 mg to 8 mg, especially from 0.5 mg to 3.2 mg; and/or
  - (3) wherein the amount of vitamin B6 in the food composition is from 0.2 mg to 50 mg, more preferably from 0.3 mg to 10 mg, especially from 0.6 mg to 4 mg; and/or
  - (4) wherein the amount of vitamin B12 in the food composition is from 0.00001  $\mu$ g to 25  $\mu$ g, more preferably from 0.15 $\mu$ g to 5 $\mu$ g, especially from 0.3 $\mu$ g to 2 $\mu$ g.
2. Food product according to claim 1, comprising one or more of VPP, IPP, and LPP.
3. Food product according to any of claims 1-2, wherein the food product is a functional food product.
4. Food product according to any of claims 1-3, being a food product capable of angiotensin-converting enzyme inhibition, said product comprising an amount of 0.1 mg/kg or more of VPP, IPP, LPP, VY, VF, IW, HLPLP, VAP, AW, LW, HLP, IY, FY, PPL, YP, TPP, MPP and one or more of the B-vitamins folic acid, Vitamin B2, Vitamin B6 and Vitamin B12.

5. Food product according to claim 4, wherein the amount of peptide is 0.5 mg/kg or more.
6. Food product according to claim 5, wherein the amount of peptide is 1 mg/kg or more.
7. Food product according to any of claims 1-6, further comprising 50-200 mmol/kg  $K^+$  and/or 15-60 mmol/kg  $Ca^{2+}$  and/or 6-25 mmol/kg  $Mg^{2+}$ .
8. Food product according to claim 7, comprising 110-135 mmol/kg  $K^+$  and/or 35-45 mmol/kg  $Ca^{2+}$  and/or 13-20 mmol/kg  $Mg^{2+}$ .
9. Food product according to any of claims 1-8, comprising 3 to 25 wt% sterol, more preferably from 7 to 15 wt% sterol.
10. Food product according to any of claims 1-9 being selected from the group of drinks, preferably fruit juice products or dairy drinks, dairy products, frozen confectionery products and spreads or margarines.

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/EP2006/000501

**A. CLASSIFICATION OF SUBJECT MATTER**  
 A23C9/13      A23L1/30      A61K31/21      A23L1/305      A61K38/01  
 A61K38/05      A61K38/06      A61K31/525

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)  
 A23C A23L A61K

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 practical, search terms used)  
 EPO-Internal, WPI Data, FSTA, PAJ, BIOSIS

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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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
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- "O" document referring to an oral disclosure, use, exhibition or other means
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Date of the actual completion of the international search  23 March 2006	Date of mailing of the international search report  04/04/2006
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Popa, M
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## INTERNATIONAL SEARCH REPORT

International application No  
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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International application No

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