(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
22 May 2008 (22.05.2008)

PCT

(10) International Publication Number
WO 2008/058892 A1

(51) International Patent Classification:
A23D 7/005 (2006.01) *A23L 1/29* (2006.01)
A23L 1/30 (2006.01) *A23L 1/22* (2006.01)
A23L 2/52 (2006.01)

(21) International Application Number:
PCT/EP2007/062063

(22) International Filing Date:
8 November 2007 (08.11.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

06124127.9	15 November 2006 (15.11.2006)	EP
06124754.0	24 November 2006 (24.11.2006)	EP
06124751.6	24 November 2006 (24.11.2006)	EP
06124753.2	24 November 2006 (24.11.2006)	EP
07102615.7	19 February 2007 (19.02.2007)	EP

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(54) **Title:** EDIBLE EMULSIONS WITH POTASSIUM

(57) **Abstract:** Edible emulsion comprising potassium salt, 0.1 to 1 wt% polyglycerol polyricinoleate, and 15 to 85 wt% fat, wherein the potassium salt is present in an amount that gives an undesired flavour in the emulsion without the polyglycerol polyricinoleate.

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Edible emulsions with potassium

Field of the invention

The invention relates to an edible emulsion comprising potassium and polyglycerol polyricinoleate.

Background to the invention

Potassium is an essential mineral that helps maintain blood pressure in part by counteracting the negative effects of sodium. A diet low in sodium and high in potassium may help to reduce the risk of high blood pressure and stroke. High blood pressure, or hypertension, is one of the significant risk factors for heart disease.

Potassium is found in many foods, but usually in relatively small amounts. In contrast the recommended daily amount of potassium is quite high. So, it is important to incorporate many potassium-containing foods into your diet.

Edible emulsions are used in a variety of ways, e.g. spreadable products, frying products, baking ingredients, drinks, diary type products. They are therefore suitable vehicles for incorporation of potassium.

Unfortunately potassium has a bitter taste and the amount of potassium salt needed in food products to fortify in order to obtain a beneficial effect from it gives the food product a bitter taste which is not liked by consumers.

One option is to encapsulate the potassium to prevent the contact of the potassium with the mouth. A drawback of the encapsulation is that a suitable encapsulate should be found

that works well in the food product. Furthermore encapsulates are often more expensive than the potassium salt it self.

Another way of masking the bad taste of potassium is to add another taste that overtakes the bitter taste. However often a lot of the masking taste should be added to mask the undesired taste and not much flexibility in taste is left, and another strong taste is left, which leaves out neutral tasting food products.

Polyglycerol polyricinoleate (PGPR) is a strong water-in-oil emulsifier and has been used in many spread and margarine applications and is commonly used for chocolate compositions. Examples are WO 03/51135, WO 01/91570, EP 0997074, and WO 02/49443 however in none of the applications an emulsion with potassium is disclosed.

WO 03/049548 discloses water-continuous emulsified food compositions comprising water-soluble tastants among which potassium chloride. The compositions of WO 03/049548 are W1/O/W2 duplex emulsions wherein water phases W1 (dispersed water phase) and W2 (continuous water phase) comprise at least one water-soluble tastant in both of the water phases and are substanstially isotonic for the tastant. These duplex emulsions give a reduced taste impression of the tastant when compared to single water-continuous emulsions. Unfortunately duplex emulsions are inherently more complex than single emulsions. Furthermore at least 2 waterphases need to be prepared each containing the tastant and being isotonic for the tastant. In addition, only water-continuous emulsions are disclosed. The internal emulsion (W1/O) is stabilised by an emulsifier with hydrophobic lipophilic balance (HLB) of less than or equal to 6. An example of such an emulsifier is polyglycerol

polyricinoleate. Example 4 contains potassium sorbate, but in a very low amount (0.021% Potassium sorbate; 0.0054% of potassium ion; for 30g spread: 1.62 mg of potassium ion) i.e. below the threshold to be able to taste it.

WO 02/089594 discloses all vegetable emulsions wherein the aqueous phase comprises a protein containing cereal base and the fat phase comprises a fractionated vegetable oil. The examples show comparative spreads with polyglycerol polyricinoleate (PGPR). The spreads were tested by a taste panel. The results show that spreads with fractionated oat oil have better taste feel for salt and sourness in comparison with spread without oat oil but with PGPR. There is however no difference tasted in spreads for rancid, old, metallic and bitterness taste. Furthermore spreads with PGPR and with oat base had a more salty taste than spread without PGPR and without oat base and the same sourness taste for both. No mention of potassium salt is made.

US2003/0108591 discloses ingestable products for lowering blood total cholesterol including isoflavone, soy protein and phytosterol. Spreads are mentioned as a beneficial form for ingestion. Furthermore, polyglycerol polyricinoleate is described as an advantageous emulsifier. Example VIII describes a low fat spread with potassium sorbate, however in a low amount (0.11% on spread; 0.028% of K ion 8.5 mg in 30 g spread) but no PGPR.

In WO 00/64276 discloses water-in-oil spreads including phytoestrogens and calcium salts. The spreads have good taste despite the presence of often-bitter tasting isoflavones. Polyglycerol polyricinoleate is disclosed as an optional ingredient. No examples are disclosed containing polyglycerol

polyricinoleate. Potassium sorbate is used in very low amounts for preservative purposes (0.11wt%; 0.028wt% K, 8.5 mg per 30 g spread).

WO 00/64268 discloses water in oil emulsions with a variegate composition having a pronounced sweet taste. The variegate composition can be based on vegetable extracts or fruit extracts. Polyglycerol polyricinoleate is mentioned in a long list of emulsifiers. No examples are disclosed containing polyglycerol polyricinoleate. Potassium sorbate is used in very low amounts for preservative purposes (0.11wt%; 0.028wt% K, 8.5 mg per 30 g spread).

WO 2005/004642 discloses fat continuous low fat products with polyglycerol polyricinoleate and potassium sorbate. However the level of potassium sorbate of 0.05% and 0.1% (i.e. 0.013% and 0.026 % of potassium ion) is so low that the bitter taste of the potassium is not tasted in an emulsion without polyglycerol polyricinoleate.

WO 2006/037847 discloses emulsified food products comprising water and 0 to 5 wt% of triglycerides, 0.5 to 60 wt% of plant sterol and/or stanol fatty esters, and optionally one or more emulsifiers. A low energy spread is disclosed with 0.2 wt% of polyglycerol polyricinoleate and an unknown amount of potassium sorbate, however the spread does not contain fat.

It is therefore an object of the current invention to provide a food product which comprises potassium. In addition, it is an object of the present invention to provide a food product which comprises potassium in an amount that gives a health effect. Furthermore an object of the invention is to provide a food product with potassium wherein the bitter taste of potassium is

not noticed by consumers. Another object of the invention is to provide a food product which is stable under storage at ambient and higher temperatures. Further food products with good organoleptic properties are envisioned with the current invention.

Summary of the invention

One or more of the above objects are attained by an edible emulsion comprising potassium salt, 0.1 to 1 wt% polyglycerol polyricinoleate, and 15 to 85 wt% fat, wherein the potassium is present in an amount that gives an undesired flavour in the emulsion without the polyglycerol polyricinoleate.

It was surprisingly found that emulsions with potassium salt do not have the flavour or taste of the potassium salt if polyglycerol polyricinoleate (PGPR) is used in the emulsion.

Detailed description of the invention

The present invention relates edible emulsion comprising potassium salt wherein the potassium is present in an amount that gives an undesired flavour in the emulsion without the polyglycerol polyricinoleate. Flavour is the sensory impression of a food or other substance, and is determined mainly by the chemical senses of taste and smell. Potassium salts are known to give a bitter, metallic taste or flavour when present in substantial amounts. The flavour of the tasty ingredient may be determined by a sensory panel.

The taste or flavour of an ingredient is dependent on the concentration of the ingredient. Therefore the present invention relates to an emulsion with potassium in an amount that gives an undesired flavour in the emulsion without polyglycerol polyricinoleate. The emulsion with potassium salt

is tested by a sensory panel that evaluates the flavour of the emulsions with and without polyglycerol polyricinoleate. The amounts of potassium salts that show a different in taste or flavour between emulsions with and without polyglycerol polyricinoleate are envisioned by the present invention.

Sensory panels consist of trained human assessors that qualify and quantify sensory properties of foods. The responses made by the sensory panels are recorded and may be analysed by statistical methods e.g. ANOVA, multivariate or univariate data analyses. Within food research, sensory panels are commonly used to qualify and quantify sensory properties, such as taste, odour or smell, flavour, mouthfeel, and other organoleptic properties. The type of sensory panel will depend on the taste of the product and the product format, however these consideration are all within the skills of a skilled person.

Preferably the edible emulsion of the present invention has a good melting behaviour. Melting behaviour influences the organoleptic properties of an emulsion. If the emulsion doesn't melt fast enough a waxy mouthfeel becomes present and this is not appreciated by consumers.

In addition, suitably the edible emulsion of the present invention has overall a good taste impression, suitable for the product, despite the presence of potassium in an amount that gives normally an undesired flavour. The emulsion preferably has a good melting behaviour in the mouth and a creamy and/or dairy taste is appreciated.

The present invention is especially suited for potassium salt in an amount needed to obtain a health benefit. High doses are necessary to provide a health benefit, the so-called effective

amount. The present invention is specifically suited for potassium salts in effective amounts.

Preferably the effective amount of potassium is such that it would give a health benefit in a daily serving size of the food product. The daily serving size is the amount of a food product typically eaten in a day. The daily serving size need not to be taken in 1 go, i.e. it may be divided up in several portions a day. Different food products have different daily serving sizes. Margarine for example has a daily serving size of about 10 to 30 g per day, which may be divided up in 4 portions, together giving the daily serving size.

In a suitable embodiment of the present invention, the health effect is selected from the group comprising reduction of risk for cardiovascular disease, reduction of blood pressure, increased resistance to disease, improved immune response, improved blood flow, lowering plasma triglycerides, anti-inflammatory effect, inhibition of platelet aggregation, antithrombotic effect and healthy growth for children.

The present invention is especially suitable for non-encapsulated potassium salt. The use of polyglycerol polyricinoleate in the edible emulsion of the present invention circumvents the need for encapsulation of the potassium salt with an undesired flavour. A preferred embodiment of the present invention provides for an edible emulsion with a potassium salt that is not encapsulated.

The present invention is also very suitable for edible emulsions with potassium and another tasty ingredient. Even though a taste or flavour of an ingredient might be acceptable to a food product, the addition of another tasting ingredient

might give a combination of flavours that is not desired, e.g. a chocolate flavour with an onion flavour. Because the edible emulsion with polyglycerol polyricinoleate somehow masks the taste of a tasty ingredient, 2 or more tasty ingredients with different taste would still give a food product with an acceptable taste when applying the present invention. A preferred embodiment of the present invention provides for an edible emulsion with potassium and at least one other tasty ingredient. Even more preferred the present invention provides for an edible emulsion with potassium and at least one other tasty ingredient wherein at least one other ingredient gives a health benefit.

Another suitable embodiment of the present invention is an emulsion comprising potassium with a neutral taste. The present invention avoids the need of the addition of another flavour to mask the taste, thereby providing an ability to have neutral tasting products. The neutral taste of a food product may be assessed by a sensory panel.

The amount of potassium salt depends on the amount needed for an effect to be obtained and on the quantity of a serving size and on the emulsion type and can be determined by the skilled person. Furthermore the amount of salt depends on the type of potassium salt as it is the amount of potassium ion which is the determining factor for establishing the daily recommended amount.

A preferred amount of potassium ion in a daily doses is 100 to 2000 mg, more preferably 200 mg to 1200 mg, even more preferably 300 to 1000 and most preferably 500 to 600 mg. It is stressed that these amounts are amounts on potassium ion and not for a potassium salt. Depending on the counter-ion the

amount of potassium salt will be different. For example 1.2 g of potassium gluconate will provide 200 mg of potassium. Other examples, 500 mg of potassium can be provided by 3 g of potassium gluconate, 1.6 g of potassium lactate, 0.9 g of potassium chloride, 1.4 g of potassium tartrate, 1 g of potassium pyrophosphate or 0.8 g of potassium sorbate. Combinations of potassium salts are also envisioned by the current invention, see also the examples. It is within the skills or an ordinary skilled person to calculate the amount of potassium salt needed for a desired amount of potassium.

Suitable daily amount are 10 to 50 g, more preferably about 20 g to 40 g for spreads. Suitably 1 to 5 servings are consumed to provide the daily dosage of the potassium.

Suitably the emulsion of the invention comprises 0.25 to 10 wt% of potassium ion, preferably 0.5 to 5 wt%, more preferably 1 to 4 wt% of potassium ion, most preferably 2 to 3 wt% of potassium ion. It is stressed that these amounts are amounts on potassium ion and not for a potassium salt. Depending on the counter-ion the amount of potassium salt will be different. For example 6 wt% of potassium gluconate will provide 1 wt% of potassium. Other examples, 2 wt% of potassium can be provided by 12 wt% of potassium gluconate, 6.6 wt% of potassium lactate, 3.8 wt% of potassium chloride, 5.7 wt% of potassium tartrate, 4.2 wt% of potassium pyrophosphate or 7.7 wt% of potassium sorbate. Combinations of potassium salts are also envisioned by the current invention, see also the examples. It is within the skills or an ordinary skilled person to calculate the amount of potassium salt needed for a desired amount of potassium.

Preferred potassium salts are potassium gluconate, potassium lactate, potassium chloride, potassium tartrate, potassium pyrophosphate and potassium sorbate.

Suitably the potassium is provided by a combination of potassium salts.

Products according to the invention comprise polyglycerol polyricinoleate which is commercially available amongst others under the name PGPR 90 ex Danisco, and under the name of Admul WOL ex Kerry. This ingredient is generally known to be excellent water-in-oil emulsifier.

The amount of polyglycerol polyricinoleate in the products of the invention is from 0.1 to 1% wt% on total product weight. Higher amounts lead to products which do not easily de-emulsify in the mouth upon consumption and will hence not show the desired organoleptic properties. Preferably the amount of polyglycerol polyricinoleate in food products according to the invention is from 0.2 to 0.4 wt%.

The emulsion of the invention may comprise thickeners. For stability reasons it may be useful to include thickeners in the emulsion, for example very low spreads, with 20 to 30 wt% of fat, often improve by addition of thickeners. Whether or not a thickener should be added and in what amount depends on factors as stability and application and may be determined by the skilled person.

Thickener may be any known thickener and are preferably selected from the group comprising gums, like xanthan, guar, and locust bean, carrageenan, polysaccharides, alginate, pectin, starch, and gelatine.

In preferred food products according to the invention, the aqueous phase comprises a native or a modified fully gelatinised starch which may be cook-up or pre-gelled, selected from any of the main starch groups: wheat, potato, rice, maize, waxy rice or waxy maize.

Examples of suitable starches include Remyrice™, Resistamyl™, Merigel™, Purity LFS™.

The amount of starch in the food product according to the invention depends somewhat on the type of chosen starch and is preferably from 0.2 to 5 wt%, more preferred from 0.7 to 3 wt%, most preferred from 1 to 2 wt%.

In a preferred embodiment the emulsion is fat continuous. In another preferred embodiment the emulsion is not a duplex emulsion. Even more preferred the emulsion is a single emulsion. A preferred embodiment of the present invention is a spread. Preferably the emulsion of the present invention is not chocolate or a chocolate containing emulsion.

The emulsion according to the invention comprises from 15 to 85 wt% of a fat, preferably from 20 to 70 wt% more preferably from 25 to 60 wt%, most preferably from 30 to 40 wt% fat. The fat consists predominantly of triglycerides. The fat can be a single fat or a combination of fats.

The fat or fat blend may comprise vegetable or animal fats which may be hydrogenated, interesterified or fractionated and combinations thereof. Suitable animal fats may consist of butterfat or tallow. Suitable vegetable fats can for example be selected from the group comprising bean oil, sunflower oil,

palm kernel oil, coconut oil, palm oil, rapeseed oil, cotton seed oil, maize oil, or their fractions, or a combination thereof. Interesterified fat blends of these fats or optionally with other fats are also encompassed in the invention.

Advantageously, long chain poly unsaturated fatty acids (LC-PUFA), e.g. omega-3 and omega-6 fatty acids are incorporated in the edible emulsion of the present invention. Suitably these LC-PUFAs come from sources like fish oil and/or algae oil.

To ensure homogeneous distribution of the aqueous phase in the continuous fat phase, the droplet size distribution $D_{3,3}$ of the dispersed aqueous phase is preferably less than 8 µm, more preferably from 4 to 8 µm, more preferred even lower than 4 µm. The method to determine $D_{3,3}$ is illustrated in the examples. It will be appreciated that the droplet size can be controlled by adjusting the processing conditions in the unit operations: e.g. higher rotational speed in a scraped surface heat exchanger will produce correspondingly smaller water droplet size distributions.

In addition to the water-in-oil emulsifier polyglycerol polyricinoleate, the food product according to the invention comprises another emulsifier, the co-emulsifier. This co-emulsifier is preferably also a water-in-oil emulsifier. More preferably this co-emulsifier is selected from the group comprising distilled monoglycerides, citric acid esters of monoglycerides, di-acetyl acetic acid esters of monoglycerides, lactic acid esters of monoglyceride, mono-diglycerides, polyglycerol esters of fatty acids or sorbitan esters of fatty acids.

The most preferred co-emulsifier is a distilled monoglyceride. Even more preferred are monoglycerides with unsaturated fatty acids or combinations of a monoglyceride comprising a saturated fatty acid residue and a monoglyceride comprising an unsaturated fatty acid residue.

The amount of co-emulsifier depends on the type and effectiveness of the emulsifier selected and can be determined by the person skilled in the art. Other factors influencing the amount of emulsifier that is required to obtain storage stable products are the amount of fat and the amount of polyglycerol polyricinoleate.
As a general guidance the amount of emulsifier is preferably from 0.05 to 1.5 wt%, more preferred from 0.1 to 0.7 wt%, most preferred from 0.15 to 0.5 wt%.

The pH of the aqueous phase can be set to the desired value, among others to influence acidic or basic taste impression and to influence microbial stability. Preferably the pH of the aqueous phase in food products according to the invention is from 4.3 to 5.5.

Optionally some protein is added to the product according to the invention. Protein may be added to beneficially influence the taste, flavour and nutritional value of the food product and also may be added to increase browning of food stuff when the current composition is used as a medium for shallow frying. Preferably the protein source is selected from the group comprising milk powders such as skim milk powder, butter milk powder, sodium caseinate, sour whey, denatured whey, or a combination thereof.

Preferably at least 0.3 wt% of protein is present in the emulsion, more preferably from 0.3 to 1 wt%. In a preferred embodiment the emulsion according to the invention does not comprise a protein containing oat base such that the protein content of the emulsion is 0.01-0.2% by weight. In another preferred embodiment the emulsion is not a water-in-oil spread comprising isoflavones, soy protein, and phytosterols.

The emulsion according to the invention optionally contain other ingredients such as preservatives, vitamins, taste and flavour components, colorants such as beta-carotene, anti-oxidants.

The emulsion according to the invention can be prepared by any suitable process to prepare such products. A preferred process is a so-called inversion process; a fat phase containing polyglycerol polyricinoleate and a waterphase are provided and mixed to obtain a water-continuous pre-mix containing the potassium. The water-continuous premix is later inverted to a fat-continuous emulsion.

In some cases to obtain a health effect, the effective amount of the potassium salt is so large that a fat-continuous mix of all the ingredients is too thick and the pressure in the system is too high. It was surprisingly found that first a water-continuous premix could be made that did not have the high pressure issues. Polyglycerol polyricinoleate is a very strong water-in-oil emulsifier (HLB ~1) and it was not expected that a water-continuous premix would not have the pressure problems.

Preferably the emulsion is a food product.

Experimental:

Storage stability test

Food product was stored in a plastic container at 10, 20, 30, 35 and 40°C for up to 26 weeks. After storage the amount of phase separation was determined by visual examination of the product surface. Storage stable products show a phase separation of less than 5 wt% upon storage at 35 °C for at least 10 weeks, preferably at least 26 weeks. Preferably the phase separation is less than 5 wt% upon storage at 40 °C.

D3,3 value measurements and E-sigma:

Samples were filled to a height of 15 mm in NMR tubes of 10 mm diameter, and thermally equilibrated for 30 min at 20 °C. A restricted diffusion-based droplet size was obtained by means of pfg-NMR using a Bruker Minispec MQ20. The details of the technique are discussed by Goudappel et al (Journal of Colloid and Interface Science 239, (2001) 535-542). A measurement yields values for the volume weighted geometric mean diameter $d_{3,3}$ and the width of the droplet size distribution when plotted as a function of the logarithm of the diameter σ (E-sigma). Measurements were carried out in triplicate and results are expressed in terms of average $d_{3,3}$ values. Definitions of droplet sizes are given by Alderliesten (Particle and Particle Systems Characterization 7 (1990) 233-241, and ibid 8 (1991) 237-241).

Example 1-3 and comparative example A and B

Ingredients are listed in table 1

Table 1; ingredients in wt%

Ingredient	**Ex 1**	**Ex 2**	**Ex 3**	**Comp A**	**Comp B**
fat	28.6	28.6	28.6	29	29
Plant sterols	12.7	12.7	12.7	12.7	12.7
Fish oil concentrate	0.7	0.7	0.7	0.7	0.7
PGPR	0.4	0.4	0.4	0	0
Dimodan HP	0.2	0.2	0.2	0.2	0.2
Beta carotene synthetic	0.1	0.1	0.1	0.1	0.1
flavour	0.3	0.3	0.3	0.3	0.3
Sunlec Z	0.1	0.1	0.1	0.1	0.1
Potassium gluconate	10	5	12.5	10	5
Potassium lactate	0	0	0	0	4.6
Potassium chloride	0	1.6	0	0	0
Potassium sorbate	0.26	0.26	0.26	0.26	0.26
BMP	0.2	0.2	0.2	0.2	0.2
sucralose	0.003	0.003	0	0.003	0.003
Acesulfame-K	0.002	0.002	0	0.002	0.002
Tapioca starch	2.75	2.75	2.75	2.75	2.75
Water	Up to 100	Up to 100	Up to 100	Up to 100	Up to 100
pH	4.5	4.7	4.5	5.0	5.0
$\%K^+$	1.6	1.6	2.0	1.6	2.2
Taste score	1-2	2	1-2	5	4
D3.3 /e-sigma	3.9 / 1.9	4.2/ 2.2	3.8 / 2.0	5.5 / 2.8	5.2 / 2.3

Processing

In a vessel a mixture was prepared of the fat, monoglyceride, PGPR, antioxidant, and colorant at a temperature of about 60 °C. In another, separate vessel a mixture was made of starch and water which was heated to a temperature of 92 °C for 25 minutes. This mixture was cooled to 60 °C and completed with all the other water soluble ingredients, such as salt, protein, etc. and subsequently mixed with the oil phase in a pre-mix tank at 60 °C as a water-continuous emulsion, followed by cooling and shearing in a series of A- and C-units™ where the dimensions and energy requirements are suitable to deliver a fat-continuous end product and achieve a plastic structure

which could be easily packed at around 10 °C in a suitable packaging material.

Taste scores were determined by a test panel of 10 persons; scores were given at a scale of 1 - 5.

1 indicates a good tasting score

3 is not acceptable for a consumer ready spread

5 is regarded as very bitter and a fully unacceptable product to offer to consumers.

Claims

1. Edible emulsion comprising potassium salt, 0.1 to 1 wt% polyglycerol polyricinoleate, and 15 to 85 wt% fat, wherein the potassium salt is present in an amount that gives an undesired flavour in the emulsion without the polyglycerol polyricinoleate.

2. Edible emulsion according to claim 1 wherein the amount of polyglycerol polyricinoleate is from 0.2 to 0.4 wt%.

3. Edible emulsion according to claim 1 or 2 wherein the potassium salt is present in an effective amount.

4. Edible emulsion according to any of claims 1 to 3 wherein the potassium salt is selected from the group comprising potassium gluconate, potassium lactate, potassium chloride, potassium tartrate, potassium pyrophosphate and potassium sorbate or any combination thereof.

5. Edible emulsion according to any of claims 1 to 4 wherein the amount of potassium ion in a daily doses is 100 to 2000 mg, more preferably 200 mg to 1200 mg, even more preferably 300 to 1000 and most preferably 500 to 600 mg.

6. Edible emulsion according to any of claims 1 to 4 wherein the amount of potassium is 0.25 to 10 wt% of potassium ion, preferably 0.5 to 5 wt%, more preferably 1 to 4 wt% of potassium ion, most preferably 2 to 3 wt%.

7. Edible emulsion according to any of claims 1 or 6 wherein the emulsion is fat continuous having a dispersed aqueous phase.

8. Edible emulsion according to any of claims 1 to 7 wherein the amount of fat is between 20 and 70 wt% and wherein the emulsion is a spread.

9. Edible emulsion according to any of claims 1 to 8 wherein the amount of fat is from 25 to 60 wt%, preferably from 30 to 40 wt%.

10. Edible emulsion according to any of claims 7 to 9 wherein the droplet size distribution D3,3 of the dispersed aqueous phase is less than 20 µm, preferably less than 8 µm, more preferably less than 4 µm.

11. Edible emulsion according to any of claims 1 to 10 also comprising a sweetner.

12. Use of 0.1 to 1 wt% polyglycerol polyricinoleate in an edible emulsion comprising 15 to 85 wt% fat and a potassium salt in an amount that gives an undesired flavour in the emulsion without polyglycerol polyricinoleate to mask the undesired flavour.

13. Use of polyglycerol polyricinoleate in an emulsion according to claim 1 to 11 to mask the undesired flavour of potassium salt.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/062063

A. CLASSIFICATION OF SUBJECT MATTER
INV. A23D7/005 A23L1/30 A23L2/52 A23L1/29 A23L1/22

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)
A23D A23L

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, FSTA, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/049548 A (UNILEVER NV [NL]; UNILEVER PLC [GB]; LEVER HINDUSTAN LTD [IN]; APPELQV) 19 June 2003 (2003-06-19) claims 1-3,17,18; example 4	1-9,11
X	WO 02/089594 A (CARLSHAMN MEJERI AB [SE]; LINGERUD CECILIA [SE]; SVAERD RIGMOR [SE]; M) 14 November 2002 (2002-11-14) claims 1-15; example 1	1-9, 11-13
X	WO 2005/004642 A (KERRY GROUP SERVICES LTD [IE]; BOURKE NEIL JOSEPH [NL]) 20 January 2005 (2005-01-20) claims 1-21; examples 1-3	1-9,11
X	WO 2006/037847 A (RAISIO BENECOL OY [FI]; EKBLOM JARI [FI]; LAHTINEN RITVA [FI]; KOPONEN) 13 April 2006 (2006-04-13) claims 1-43; examples 3-5	1-9,11

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
14 February 2008	22/02/2008

Name and mailing address of the ISA/	Authorized officer
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	Adechy, Miriam

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2007/062063

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