

SPRUSON&FERGUSON

Australia

Patents Act 1990

Notice Of Entitlement

I, John David O'Connor, of 31 Market Street, Sydney, New South Wales, 2000, Australia, Patent Attorney for the Applicant/Nominated Person in respect of Application No. 25374/95, state the following:-

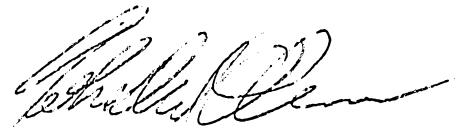
The Applicant/Nominated Person has entitlement from the actual inventors as follows:

The Applicant/Nominated Person is the assignee of the actual inventors.

The Applicant/Nominated Person is the applicant of the application listed in the Declaration under Article 8 of the PCT.

The basic application listed on the Declaration under Article 8 of the PCT is the first application made in a Convention country in respect of the invention.

DATED 15 March 1996



John David O'Connor



AU9525374

(12) PATENT ABRIDGMENT (11) Document No. AU-B-25374/95
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 693896

- (54) Title
FLAVOURING COMPOSITION AND PROCESS
- (51)⁶ International Patent Classification(s)
A23L 001/23 A23D 007/015 A23D 009/013 A23L 001/226
A23L 001/231
- (21) Application No. : **25374/95** (22) Application Date : **13.06.95**
- (87) PCT Publication Number : **WO95/34222**
- (30) Priority Data
- (31) Number (32) Date (33) Country
1899/94 16.06.94 CH SWITZERLAND
- (43) Publication Date : **05.01.96**
- (44) Publication Date of Accepted Application : **09.07.98**
- (71) Applicant(s)
FIRMENICH S.A.
- (72) Inventor(s)
GODEFRIDUS VAN DEN OUWELAND; SINA DOROTHEA ESCHER; FRANCOIS BENZI; CLAUDE VENRIETVELDE
- (74) Attorney or Agent
SPRUSON & FERGUSON , GPO Box 3898, SYDNEY NSW 2001
- (56) Prior Art Documents
AU 19783/88
US 3653921
US 2794743
- (57) Claim

1. Process for the preparation of a flavoring composition, characterized in that there is added to a flavoring ingredient, solvent or adjuvant of current use the diglyceride fraction of a hydrolysate of an animal or vegetable fat, said hydrolysate being obtained by enzymatic hydrolysis of said fat.

7. Process for the preparation of a flavoring composition, characterized in that there is added to a hydrolysate of an animal or vegetable fat which is obtained by enzymatic hydrolysis of said fat, at a temperature and during an amount of time sufficient to ensure a degree of hydrolysis of at least about 30% and which hydrolysate contains at least 30% by weight of diglycerides and not more than 2% by weight of monoglycerides, relative to the weight of the hydrolysate, at least one compound selected from the group consisting of butyric acid, decanoic acid, hexanoic acid, octanoic acid, dec-9-enoic acid, 4-methylnonanoic acid, 4-methyloctanoic acid, 2-methylheptanoic acid, oleic acid, hexadecanoic acid, pentadecanoic acid, 2-methylhexanoic acid, 2-methylbutanoic acid, heptadecanol, hexadecanol and 2-tetradecanone.

OPI DATE 05/01/96 APPLN. ID 25374/95
AOJP DATE 15/02/96 PCT NUMBER PCT/IB95/00478



AU9525374

DE.

IS (PCT)

<p>(51) Classification internationale des brevets ⁶ : A23L 1/23, 1/231, 1/226, A23D 7/015, 9/013</p>	<p>A1</p>	<p>(11) Numéro de publication internationale: WO 95/34222 (43) Date de publication internationale: 21 décembre 1995 (21.12.95)</p>
<p>(21) Numéro de la demande internationale: PCT/IB95/00478 (22) Date de dépôt international: 13 juin 1995 (13.06.95) (30) Données relatives à la priorité: 1899/94-7 16 juin 1994 (16.06.94) CH (71) Déposant (pour tous les Etats désignés sauf US): FIRMENICH S.A. [CH/CH]; 1, route des Jeunes, Case postale 239, CH- 1211 Genève 8 (CH). (72) Inventeurs; et (75) Inventeurs/Déposants (US seulement): VAN DEN OUWE- LAND, Godefridus [NL/CH]; 7, chemin de Chaumont, CH- 1232 Confignon (CH). ESCHER, Sina, Dorothea [CH/CH]; 12, rampe de Chavant, CH-1232 Confignon (CH). BENZI, François [CH/CH]; 4, rue du Vicaire-Savoyard, CH-1203 Genève (CH). VENRIETVELDE, Claude [FR/FR]; Les Jardins de l'Atrium, 6, avenue Ternier, F-74160 Saint- Julien-en-Genevois (FR). (74) Mandataires: SALVADORI, Giuseppe etc.; Firmenich S.A., Case postale 239, CH-1211 Genève 8 (CH).</p>	<p>(81) Etats désignés: AU, BR, CA, HU, JP, MX, PL, US, brevet européen (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Publiée <i>Avec rapport de recherche internationale. Avant l'expiration du délai prévu pour la modification des revendications, sera republiée si de telles modifications sont reçues.</i></p> <p style="text-align: center;">693396</p>	
<p>(54) Title: FLAVOURING COMPOSITION AND PROCESS</p>		
<p>(54) Titre: PROCEDE D'AROMATISATION ET COMPOSITION AROMATISANTE</p>		
<p>(57) Abstract</p>		
<p>The flavouring composition of the invention contains the diglyceridic fraction of a hydrolysate of plant or animal fat, optionally in combination with other substances susceptible of improving the impact and mouthfeel of said composition and of the food products wherein the composition is incorporated.</p>		
<p>(57) Abrégé</p>		
<p>La composition aromatisante selon l'invention contient la fraction diglycéridique d'un hydrolysate d'une graisse animale ou végétale, éventuellement en combinaison avec d'autres substances susceptibles d'améliorer l'impact et la sensation en bouche ("mouthfeel") de ladite composition et des aliments dans lesquels elle est incorporée.</p>		

Flavoring composition and process

Technical Field

Flavoring food products which have a low content in fats, i.e. the so-called "light" or low-calorie foods, presents particular difficulties. Whereas it is possible to compensate
5 more or less adequately the gustative or taste notes characteristic of said fats, through addition of appropriate flavoring ingredients, there remains the problem related to the difficulty in reconstituting or reproducing, in the light or defatted product, the feeling in the mouth or "mouthfeel" and the creamy-type consistency or texture which are precisely imparted by said fat materials. This problem is particularly acute in dairy products and
10 light margarines, as well as in mayonnaises and ice-creams.

It is the aim of the present invention to provide an original solution to this problem. We have discovered that the mouthfeel of a food product, namely of a product having a low fat content, can be improved by adding to this product a particular flavoring composition.

Description of the Invention

15 It is therefore one object of the invention to provide a process for the preparation of a flavoring composition, characterized in that there is added to a flavoring ingredient, solvent or adjuvant of current use the diglyceride fraction of a hydrolysate of an animal or vegetable fat, said hydrolysate being obtained by enzymatic hydrolysis of said fat.

20 According to the invention, the animal or vegetable fat or oil can be formed by butter, milk cream or fat, fish oil, beef fat, chicken fat, pork fat, mutton or lamb fat, olive oil or peanut oil, for example.

In the following description, the terms fat and oil will be used interchangeably to designate the fat material or animal or vegetable origin which, once hydrolysed, provides
25 the diglyceride fraction serving to prepare the flavoring compositions according to the invention.

According to a preferred embodiment of the process of the invention, the hydrolysate of animal or vegetable fat is a butter or milk hydrolysate.

It has been known to use butter hydrolysates, obtained by enzymatic hydrolysis of
30 butter oil or fat, to impart creamy and rich notes to dairy products in particular. However, we have now surprisingly discovered that it is possible to improve the mouthfeel of flavoring compositions intended for use in



defatted or low-fat products by adding to said compositions certain ingredients, present in butter hydrolysate or in the hydrolysates of other animal or vegetable fats, carefully selected for their enhanced mouthfeel effect, established on the basis of organoleptic evaluations carried out by expert flavorists.

5 Butter hydrolysate is conventionally obtained through the action of an enzyme such as a lipase on butter oil or fat. This oil or fat is typically the residue obtained from melted and centrifuged butter once the water has been eliminated. Alternatively, one can also carry out the hydrolysis of the melted butter and then separate the aqueous layer from the neutral and acid parts, which form the hydrolysate.

10 The latter thus comprises an acid phase or fraction which contains the fatty acids released through the hydrolysis of the butter oil, and a neutral phase comprising the glycerides. The latter include triglycerides, diglycerides and monoglycerides derived from the butter fatty acids. As is described further on, these three glyceride fractions can be separated from each other and their individual organoleptic properties evaluated. As a
15 result of such evaluations, it has been established that it is the diglyceride fraction which best possesses the organoleptic properties commonly associated with fats and that, as a result, it can be advantageously used to improve the mouthfeel of the products into which it is incorporated.

According to a further embodiment of the invention, there is provided a process for
20 the preparation of a flavoring composition, characterized in that there is added to a hydrolysate of an animal or vegetable fat which is obtained by enzymatic hydrolysis of said fat, at a temperature and during an amount of time sufficient to ensure a degree of hydrolysis of at least about 30% and which hydrolysate contains at least 30% by weight of diglycerides and not more than 2% by weight of monoglycerides, relative to the weight
25 of the hydrolysate, at least one compound selected from the group consisting of butyric acid, decanoic acid, hexanoic acid, octanoic acid, dec-9-enoic acid, 4-methylnonanoic acid, 4-methyloctanoic acid, 2-methylheptanoic acid, oleic acid, hexadecanoic acid, pentadecanoic acid, 2-methylhexanoic acid, 2-methylbutanoic acid, heptadecanol, hexadecanol and 2-tetradecanone.

30 According to a preferred embodiment of the process of the invention, said process further comprises adding one or several compounds selected from the group consisting of butyric acid, decanoic acid, hexanoic acid, octanoic acid, dec-9-enoic acid, 4-methylnonanoic acid, 4-methyloctanoic acid, 2-methylheptanoic acid, oleic acid, hexadecanoic acid, pentadecanoic acid, 2-methylhexanoic acid, 2-methylbutanoic acid,
35 heptadecanol, hexadecanol and 2-tetradecanone. We observed that the addition of the above-mentioned compounds reinforced the rich, creamy and full taste feeling of the composition and that the foods flavoured by means of said composition were preferred in the evaluation tests described further on. In particular, the flavoring compositions obtained through addition of a mixture of oleic, palmitic, 4-methylnonanoic, 4-



2A

methyloctanoic, 4-methylheptanoic, 2-methylhexanoic and 2-methylbutanoic acids provided much appreciated results.

As is apparent from the examples presented further on, the flavoring compositions obtained by adding to the diglyceride fraction of a butter hydrolysate, or of a hydrolysate
5 of any other of the mentioned fats, a



mixture of butyric acid, decanoic acid, hexanoic acid, octanoic acid, dec-9-enoic acid, 4-methylnonanoic acid, 4-methyloctanoic acid, 2-methylheptanoic acid, oleic acid, palmitic acid, pentadecanoic acid, 2-methylhexanoic acid, 2-methylbutanoic acid, heptadecanol, hexadecanol and 2-tetradecanone, turned out to be particularly efficient in emulating the
5 texture and mouthfeel of the fat materials present in butter or milk for example.

According to an embodiment of the invention, there is obtained a flavoring composition by adding to a hydrolysate of an animal or vegetable fat or oil, in particular to a butter hydrolysate, at least one compound selected from the group consisting of butyric acid, decanoic acid, hexanoic acid, octanoic acid, dec-9-enoic acid, 4-
10 methylnonanoic acid, 4-methyloctanoic acid, 2-methylheptanoic acid, oleic acid, palmitic acid, pentadecanoic acid, 2-methylhexanoic acid, 2-methylbutanoic acid, heptadecanol, hexadecanol and 2-tetradecanone. This variant of the composition according to the invention is a result of the fact that we have discovered that adding the above-mentioned compounds enhanced the organoleptic effect of the butter hydrolysate already known, as
15 well as that of other animal or vegetable fat hydrolysates, rendering the flavoring composition more natural and creamy, as well as with a fuller body, such that the low-fat foods into which this composition was incorporated produced a feeling in the mouth which was judged comparable to that of the non-defatted food.

According to a preferred embodiment of this variant, there is added to the animal or
20 vegetable fat hydrolysate, or more particularly to the butter hydrolysate, a mixture of all of the above-mentioned compounds. According to another embodiment, a mixture of oleic, palmitic, 4-methylnonanoic, 4-methyloctanoic, 2-methylheptanoic, 2-methylhexanoic and 2-methylbutanoic acids is added thereto.

Moreover, particularly useful results, from an organoleptic point of view, were also
25 found to be obtained when the hydrolysate of an animal or vegetable fat, to which the above-mentioned compounds were added, contained at least about 30% by weight of diglycerides and not more than 2% by weight of monoglycerides, relative to the weight of the hydrolysate.

Such hydrolysates are obtained by subjecting the starting fat or oil to enzymatic
30 hydrolysis under the particular conditions described further on and for an amount of time sufficient to obtain an enrichment of the hydrolysate in diglyceride fraction.

It has in fact been established that when one or more of the above-mentioned compounds were added to a hydrolysate such as described above,



there were obtained particularly effective flavoring compositions. Their organoleptic effect enhancing the mouthfeel of the foods into which these flavoring compositions were incorporated was even more marked when said hydrolysate contained 50% or more by weight of diglycerides.

5 The flavoring composition resulting from the process of the invention is also an object of the latter and can be used to improve or enhance the mouthfeel of a great variety of edible products. One can cite, by way of example, light or low-fat margarines and butters, yoghurts, ice-creams and frozen desserts, cheeses, milk and dairy products, including milk-based or
10 derived drinks, as well as foodstuffs such as ready-to-eat cooked meals, mayonnaises, soups, sauces, sweet or savory biscuits, snacks, namely potato chips, or yet desserts.

In a general manner, all the low-calorie or light foods can be improved, as regards their taste, texture and mouthfeel, by means of the
15 flavoring composition according to the invention.

It goes without saying that, even if the flavoring composition of the invention is particularly useful for flavoring low-fat products, it is clear that it can also be used for flavoring normal foods, with the usual fat content, to which one may wish to impart a fuller and creamier texture, or enhance the
20 organoleptic qualities thereof associated with the presence of fats. Such is the case for example of meat type preparations, wherein the flavoring compositions of the invention based on mutton, beef or pork fat hydrolysates revealed themselves particularly useful and efficient for the desired aim.

The concentration in which this composition can be added to the varied foods above-mentioned is of course dependent on the nature of the
25 latter and on the flavoring effect that one desires to achieve. This concentration can therefore vary in a wide range of values. By way of example, concentrations of the order of 0.001 to 1.0% by weight, relative to the weight of the foodstuff or beverage to which the composition is added, can be cited.

30 The flavoring composition of the invention can be added to the foods either alone or in admixture with other flavoring ingredients of current use, the function of which is to affect the taste of the food rather than its texture or mouthfeel.

35 As it has already been cited, hydrolysates from animal or vegetable fats, and more particularly butter hydrolysate, used either as a constituent of the flavoring composition according to the invention, or as the starting product for preparing the diglyceride fraction which is a component of said composition, is obtained by enzymatic hydrolysis of the animal or vegetable



fat, namely of butter oil. Such an hydrolysis generates an acid fraction, composed by the fatty acids in a free state, and a neutral fraction containing said acids in a bonded state, in the form of triglycerides, diglycerides and monoglycerides, which fractions can be separated from each other. Depending
5 on the hydrolysis conditions, the relative weight proportion of the acid and neutral fractions, as well as that of the three types of glycerides within said neutral fraction, can vary somewhat. It can be observed, in fact, that parameters such as the hydrolysis duration or time and the nature of the enzyme used can have an effect on these proportions and can therefore be
10 used to influence the content of the hydrolysate in the diglyceride fraction which is particularly useful to confer a creamy texture to the flavored products, whereas the monoglyceride and the triglyceride fractions have far less impact in this respect. This is even more the case for the monoglyceride fraction, and the hydrolysates used according to the invention will preferably
15 contain less than 2% by weight of the latter.

On the other hand, and in spite of the presence of a great variety of fatty acids in butter for example [see, for example, H. O. Goff and A. R. Hill, Dairy Science & Technology Handbook, ed. Y. H. Hui, VCH, Publishers Inc., N.Y., vol. 1, page 19 (1993)], and thus in a free state in the acid fraction of the
20 butter hydrolysate, we have surprisingly discovered that only some of these acids seem to have a definite function in the rich and creamy impact imparted to the compositions to which they are added, and that the addition of these specific acids, either to the hydrolysate itself or to the diglyceride fraction thereof, presented clear advantages relative to the prior known use of said
25 hydrolysate when not enriched in said acids.

Moreover, the addition of other acids having a shorter chain, namely branched, not previously identified in these fats or which are present but in very weak concentrations, as well as of hexadecanol, heptadecanol or 2-tetradecanone, proved to be just as advantageous and made it possible to
30 improve the mouthfeel of foods flavored by way of the thus obtained compositions.

In the enzymatic hydrolysis of the animal or vegetable fat or oil, there can be used any lipase strain of current use in this type of reaction. Specific examples are cited further on, but the skilled person in the art is
35 perfectly able to select said strain amongst those available to this effect.

One can thus cite by way of example, the enzymes obtained from yeasts of the genus *Candida* and *Torulopsis*, funguses of the genus *Rhizomucor*, *Rhizopus*, *Mucor*, *Penicillium*, *Aspergillus*, *Geotrichum* and

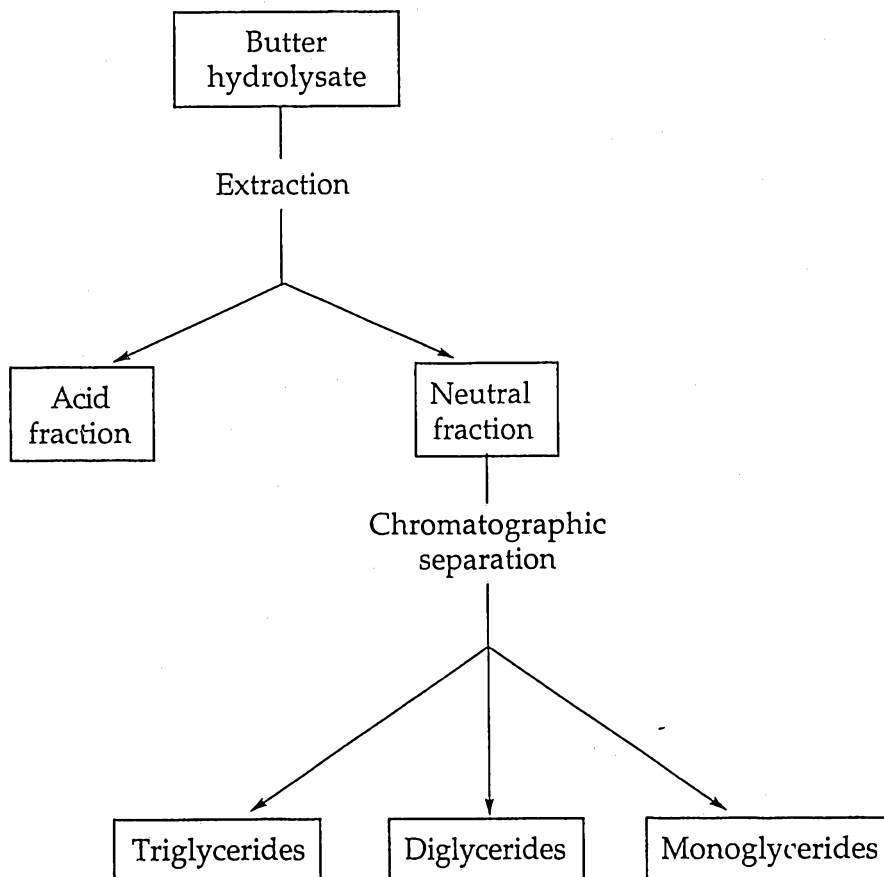


bacterae of the type *Pseudomonas*, *Achromobacter* and others. Appropriate lipases can be found on the market, such as for example Lipase Type XII (Sigma Corp.), Lipase (Boheringer), Enzo Lipase 1000 (EDC), Lipase preparation 7051 L (Rohm Tech.), Palatase (Novo Lab.), Lipase preparation 2212 F (Rohm Tech.), Flavor Age (Genencor), Biolipase (Biocon), Lipase (Chem. Dynamic Corp.), Lipomod (Biocatalysts).

In a general manner, the lipase is added to the molten fat material, the mixture homogenized and then incubated at an appropriate temperature, for an amount of time sufficient to allow a degree of hydrolysis of the order of at least 25 to 30%. The hydrolysate thus obtained can be used as such, or it can be emulsified to form a homogeneous paste. Alternatively, it can be spray-dried by means of encapsulation materials of current use (proteins, gelatines, caseinates, hydrocolloïdes, dextrans, starch and modified starch, maltodextrans, sugars, etc ...) and following current encapsulation methods.

On the other hand, the diglyceride fraction of these hydrolysates can be prepared according to the process schematically described hereinafter for butter hydrolysate and which is used in a general manner :



SCHEME

5 The detailed conditions of these methods are described in the examples presented further on.

Diglyceride fractions of the other animal or vegetable fats above-mentioned can be obtained in a similar manner to that described herebelow for butter.

10 The fatty acids and other varied compounds mentioned above, which can be added to the hydrolysates and/or to the diglyceride fraction of said hydrolysates, are commercial products.

It is to be noted that the invention thus provides flavoring compositions capable of improving or imparting the organoleptic characters generally associated with the presence of fatty materials or fats, namely the creamy texture and the enhanced and more voluminous mouthfeel. Therefore, the compositions according to the invention are able to replace, totally or partially, said fat materials in a great variety of light or low-calorie foodstuffs, but they can also serve to enhance the organoleptic properties thereof in the foodstuffs which already contain said fat materials. The

15

20



foodstuffs which comprise the flavoring compositions according to the invention have an enhanced impact and a longer-lasting taste in the mouth, as well as better mouthfeel, than the corresponding foods not flavored according to the invention.

5

Preparation of the hydrolysates

Example 1

10 Preparation of a butter hydrolysate

In a 500 ml flask there were mixed 100 g of butter fat, 50 g of demineralized water and 1 g of enzyme of type Lipomod[®] 29 (lipase ; origin : Biocatalysts Ltd., Great Britain). The mixture was well homogenized and stirred for 17 h at 40-
15 45°C. The temperature was increased to 90-95°C and the mixture stirred during 15 min. The oily and aqueous layers were then separated by centrifuging. The oily phase was diluted with 1 part of Neobee M 5 (triglyceride of capric/caprylic acid ; origin : PVO Int. Inc., NY, USA) and the solution was partially
20 deodorized by distilling twice through a distillation apparatus of the Leybold type ("flash-distillation") at 60 and 80°C and a pressure of 13 Pa.

The thus obtained hydrolysate was used as such in the applications described further on.

The oily phase directly obtained from the hydrolysis possessed a very marked cheese-like organoleptic character and proved useful as such to improve the
25 mouthfeel of cheese flavors and foodstuffs containing them.

Example 2

30 Preparation of a diglyceride fraction of a butter hydrolysate

A butter hydrolysate (5.0 g) obtained as is described in example 1 was dissolved in diethyl ether (200 ml). The acid fraction was extracted with 5 portions of 20 ml each of a 1 N aqueous solution of sodium hydroxide. The aqueous
35 phases were balanced with a new portion of 100 ml of ether. The combined ether phases were washed twice with a solution saturated in sodium chloride, dried over magnesium sulfate and concentrated to constant weight (2.97 g). This neutral fraction represented about 60% by weight of the hydrolysate.



The combined acid extracts were acidified to pH 1 by means of 50% aqueous H_2SO_4 and extracted again twice with 100 ml of ether. The ethereal layer was washed twice, with a solution saturated with sodium chloride, dried over magnesium sulfate and concentrated to constant weight (1.98 g). The thus

5 obtained acid fraction represented about 40% by weight of the hydrolysate.

The neutral fraction (2.95 g) was passed through a silica gel column of the Lobar type (dimension B; origin: Merck) and the components were successively eluted with hexane/ethyl acetate mixtures, 75:25 (400 ml), 50:50 (300 ml), 25:75 (200 ml), and ethyl acetate alone (150 ml). A thin layer

10 chromatography was carried out on precoated silica gel plates (Merck), using a 70:30 hexane/ethyl acetate mixture as eluting agent. The separation of the triglyceride, diglyceride and monoglyceride phases was visualized by observing the respective spots in an atmosphere of iodine.

15 The r_f values of these three phases, measured by thin layer chromatography, were as follows :

	triglycerides	r_f	=	0.7
	diglycerides	r_f	=	0.2 - 0.4
20	monoglycerides	r_f	=	0.08

The three fractions were recovered in separate containers and their composition confirmed by nuclear magnetic resonance spectroscopy (NMR).

The weight proportions of these fractions were the following :

25

	triglycerides	59.3%
	diglycerides	37.3%
	monoglycerides	3%

30 The diglyceride fraction was used as such in the applications described hereinafter.

The method above was used with other butter hydrolysates obtained by enzymatic hydrolysis carried out under the conditions described in example 1,

35 but using other lipases. The weight proportions of the various fractions obtained in these cases are indicated in the following table, as well as the nature of the lipase :



TABLE

Hydrolysate	Lipase	Acid fraction %	Neutral fraction %	Triglycerides %	Diglycerides %	Monoglycerides %
2	Palatase [®] M ¹⁾	33	64	70	27	1

1) origin : Novo Nordisk, Denmark

5

Example 3Preparation of butter hydrolysates

10

Several butter hydrolysates were prepared according to the following general method.

GENERAL METHOD

15

A 3 neck flask of 250 ml, equipped with a magnetic stirrer and heated by means of an oil bath to a temperature of about 40-50°C, was charged with a mixture of 100 g of molten butter and with an emulsifier in the desired amount (0.1 to 0.2% by weight), this mixture having been well homogenized beforehand in

20 TURRAX[®] type apparatus. A homogenized mixture of water (amount required to obtain a good homogenate but, in any case not more than 5% by weight, relative to the weight of fat) and the desired amount of enzyme indicated in the table hereinafter. The mixture was allowed to react without stirring and samples of the hydrolysate were collected to measure the

25 corresponding acid value (Acid value - A.V.) and thus obtain an estimation of the degree of hydrolysis. The sample is thus first heated for 15 min at 90°C to stop the hydrolysis and then the acid value is established according to the standard method described in "IUPAC - Standard Methods for the Analysis of Oils, Fats and Derivatives, Pergamon Press, 5th ed., pages 52 and following

30 (1979)". We observed in this manner that butter hydrolysates having the desired organoleptic properties could be obtained after about 7 to 8 h of hydrolysis, their composition varying nevertheless as a function of the nature of the enzyme used, as well as of its weight concentration relative to the weight of molten butter. The composition of the hydrolysates thus obtained was established by high pressure liquid chromatography (HPLC).



A diol-column of the Nucleosil 7 type (length 25 cm approx., i.d. 4 mm), i. e. wherein silica is bonded to $-(\text{CH}_2)_3\text{-O-CH(OH)-CH}_2\text{OH}$ in normal-phase mode, and the following conditions :

Solvent A : hexane

5 Solvent B : 2-propanol

Elution : 1.0 ml/min, % B=8%

Detection : UV (diode array detector - DAD) at 230 nm

Injection : 20 mg (20 μl full loop)

10 Each time, the column is calibrated beforehand with the fat having served to provide the hydrolysate, in the present case melted butter.

This method made it possible to directly obtain the concentration of the butter hydrolysate in triglycerides and monoglycerides, the elution of these two types of glycerides being well separated in time. We established in this manner that
15 the hydrolysates obtained as described above all contained less than 2% by weight of monoglycerides.

Following this method, the elution of the diglycerides is superimposed on that of the free fatty acids formed during the hydrolysis. Therefore, either the free
20 fatty acids are first separated from the hydrolysate to obtain the exact concentration of diglycerides in the latter, or the concentration of these diglycerides is estimated from the global content of the hydrolysate in diglycerides and free fatty acids, which content is obtained by HPLC. In fact, since it is known that there is practically no formation of monoglycerides, the
25 diglycerides and the free fatty acids are present in the hydrolysate in equimolar amounts. Consequently, the concentration of diglycerides can be calculated from the ratio between the molecular weight of the diglyceride and the molecular weight of (diglyceride + fatty acid), which ratio has an average value of about 0.69 for the various diglycerides and corresponding fatty acids
30 characteristic of fats such as butter, mutton fat, chicken fat, pork fat, olive oil, etc ... (for example, such ratios are, for oleine : 0.688 ; capreine : 0.699 ; stearine : 0.688 ; palmitine : 0.689 ; caproine : 0.713). Thus, for example, in a butter hydrolysate having a measured content in triglycerides of 60%, the concentration in diglycerides was estimated to be of about
35 $(100-60) \times 0.69 = 27.6\%$.

The contents in diglycerides cited in the Table presented hereafter were calculated this way.



According to the general method described here-above, there were prepared the butter hydrolysates mentioned in the Table here-below (emulsifier : 0.2 g of DIMODAN PV, origin : Grindsted Products A/S, Denmark). These hydrolysates possessed the appropriate organoleptic properties required for the aim of the invention.

TABLE

ENZYME OR YEAST		Hydrolysis time h	HYDROLYSATE			
Nature	Concentration a)		Acid value (A.V.)	COMPOSITION b)		N°
				Triglycerides %	Diglycerides %	
<i>Candida Cilindracea</i> *	0.2	7	95	20	55	1
<i>Candida Cilindracea</i> *	0.1	7	70	41	41	2
<i>Candida Cilindracea</i> *	0.05	7	37	59	28	3
Lipomod 187 P *	0.2	7	49	42	40	4
<i>Pseudomonas Fluorescens</i> *	0.2	7	66	18	57	5

- 10 a) % by weight, relative to the weight of melted butter
 b) % by weight, relative to the weight of hydrolysate
 * origin : Biocatalysts Ltd.

15

Example 4Preparation of mutton fat hydrolysates

Mutton fat hydrolysates were prepared according to the general method described in Example 3 and replacing the butter with mutton fat. The Table hereafter summarizes the characteristics of the obtained hydrolysates, using as emulsifier DIMODAN PV (0.1 or 0.2%), which hydrolysates revealed themselves useful for preparing the flavoring compositions according to the invention.

25



TABLE

ENZYME OR YEAST		Hydrolysis time h	HYDROLYSATE			
Nature	Concentration a)		Acid value (A.V.)	COMPOSITION b)		N°
				Triglycerides %	Diglycerides %	
Palatase M 1000 *	2.0	8	37	49	35	1
Palatase M 1000 *	8.0	8	-	47	37	2 c)
<i>Pseudomonas Fluorescens</i> **	0.15	8	62	29	49	3
<i>Candida Cilindracea</i> **	0.20	8	69	22	54	4
Lipomod 187 P **	0.20	8	43	43	38	5
<i>Mucor Michi</i> **	0.45	8	53	42	40	6
Sigma L 3126 ***	0.30	8	32	52	33	7
Palatase M 1050 *	4.0	24	-	61	27	8 c)
Lipomod 187 P **	1.0					
Palatase M 1000 *	6.0	8	-	12	61	9 c)
Lipomod 187 P **	1.5					

a) % by weight, relative to the weight of mutton fat

b) % by weight, relative to the weight of hydrolysate

c) concentration of the emulsifier : 0.1% by weight

* origin : Novo Nordisk

** origin : Biocatalysts Ltd.

*** origin : Sigma Corp.

Example 5

Preparation of hydrolysates from animal or vegetable fats

Several hydrolysates of a variety of fats were prepared following the general method described in Example 3, under the conditions indicated in the Table hereafter. Unless otherwise indicated, there was used as emulsifier DIMODAN PV at 0.1% by weight.



TABLE

ENZYME OR YEAST		Hydro- lysis time	HYDROLYSATE				
Nature	Concen- tration a)		Type of fat	Acid value (A.V.)	COMPOSITION b)		N°
					Triglyderides %	Diglycerides %	
Palatase M 1000 *	2.0	8	butter	-	53	32	1
Palatase M 1000 *	8.0	8	butter	-	52	33	2 c)
Palatase M 1000 *	8.0	8	butter	-	49	35	3 d)
Palatase M 1000 *	8.0	24	butter	-	26	51	4 d)
Palatase M 1000 *	8.0	8	butter	-	31	48	5
Palatase M 1000 *	8.0	24	butter	-	19	56	6
Palatase M 1000 *	2.0	24	butter	-	47	37	7
Lipomod 187 P **	0.5						
Palatase M 1000 *	4.0	8	butter	-	36	44	8
Lipomod 187 P **	1.0						
Palatase M 1000 *	6.0	8	butter	-	12	61	9
Lipomod 187 P **	1.5						
<i>Candida Cilindracea</i> **	0.2	8	olive oil	94	24	51	10
<i>Candida Cilindracea</i> **	0.2	8	peanut oil	92.6	35	45	11
<i>Candida Cilindracea</i> **	0.2	8	chicken	99.0	20	55	12
<i>Candida Cilindracea</i> **	0.2	8	cocoa butter	88.0	21	55	13
Palatase M 1000 *	8.0	8	olive oil	-	41	41	14
Palatase M 1000 *	8.0	8	olive oil	-	45	38	15 d)



Table (cont.)

ENZYME OR YEAST		Hydro- lysis time	HYDROLYSATE				
Nature	Concen- tration a)		Type of fat	Acid value (A.V.)	COMPOSITION b)		N°
				Triglyderides %	Diglycerides %		
Palatase M 1000 *	6.0	8	olive oil	-	40	41	16
Lipomod 187 P **	1.5						
Palatase M 1000 *	8.0	8	chicken	-	46	37	17 d)
Palatase M 1000 *	8.0	8	chicken	-	33	46	18
Palatase M 1000 .	4.0	8	chicken	-	24	52	19
Lipomod 187 P **	1.0						
Palatase M 1000 *	6.0	8	chicken	-	15	59	20
Lipomod 187 P **	1.0						
Palatase M 1000 *	8.0	8	beef	-	38	43	21
Palatase M 1000	6.0	8	beef	-	45	38	22
Lipomod 187 P **	1.5						
Palatase M 1000 *	8.0	8	pork	-	59	28	23 d)
Palatase M 1000 *	8.0	8	pork	-	37	43	24
Palatase M 1000 *	8.0	8	pork	-	42	40	25 e)
Palatase M 1000 *	4.0	8	pork	-	27	50	26
Lipomod 187 P **	1.0						
Palatase M 1000 *	6.0	8	pork	-	25	52	27
Lipomod 187 P **	1.5						

a) % by weight, relative to the weight of fat

b) % by weight, relative to the weight of hydrolysate

5 c) emulsifier : 2% by weight of butter protein

d) emulsifier : 0.1% by weight of lecithin

e) emulsifier : 0.1% by weight of TRIODAN ; origin : Grinsted Products

* origin : Novo Nordisk

** origin : Biocatalysts Ltd.



The hydrolysates cited in this table are useful for imparting the required creamy, fatty and mouthfeel characters to the flavoring compositions according to the invention.

5

The invention will now be described in a more detailed manner by way of the following examples.

10 Embodiments of the inventionExample 615 Flavoring compositions

A base flavoring composition of the butter type was prepared with the following ingredients :

20	Ingredients	Parts by weight
	Acetylmethylcarbinol	40
	Redist butyric acid	20
	Redist. hexanoic acid	30
	Redist. decanoic acid	15
25	5-Decanolide	80
	Diacetyl	50
	Neobee M 5	765
	Total	<hr/> 1000

30

This base composition (130 ppm), and the ingredients indicated in the Table below, were added in the cited proportions to salty aqueous solutions having 0.5% NaCl, for evaluation.

35



TABLE

Ingredients	Solutions (ppm)							
	A	B	C	D	E	F	G	H
Base composition	100	100	100	100	100	100	100	100
Butter hydrolysate ¹⁾ (BH)	30	-	23	23	23	-	-	15
Diglyceride fraction of BH ²⁾	-	30	7	-	-	15	15	5
1-Hexadecanol	-	-	-	7	-	15	-	5
2-Tetradecanone	-	-	-	-	7	-	15	5

5

- 1) see namely example 1 or example 3, hydrolysate n° 1, or example 5, hydrolysate n° 4 or n° 6.
- 2) see example 2

10

The flavored solutions thus prepared were evaluated on a blind test by a panel of 15 expert flavorists who were asked to judge the organoleptic quality of these solutions, both one relative to the other and with regard to the solution of the base composition.

15

According to the unanimous opinion of the flavorists, the solutions A and B possessed a creamier, more buttery taste than that of the base composition, with a better mouthfeel and a fresher, dairy-like, flavor note. The impact of these compositions in the mouth was also longer-lasting. On the other hand, all the solutions A to H were preferred by a majority of flavorists, relative to

20

the base composition, the solutions C and H having been particularly appreciated. Similar results were obtained when the ingredients cited in the Table were added, in the same proportions, to a margarine having a low fat content (25% ; origin : Migros, Switzerland).

25

Example 7Flavoring of skimmed milk

Unflavored skimmed milk (0% fat ; origin : Valflora[®], Migros, Switzerland) was aromatized by adding thereto the ingredients indicated hereafter, in the proportions cited, to prepare five samples of flavored milk :

5

Ingredients	Samples (ppm)				
	A	B	C	D	E
Diglyceride fraction of BH ¹⁾	500	500	500	500	500
9-Decenoic acid	-	1	-	-	-
4-Methylnonanoic acid	-	-	4	-	-
4-Methyloctanoic acid	-	-	-	2	-
2-Methylheptanoic acid	-	-	-	-	4

1) see example 2

10 Samples A to E thus obtained were compared on a blind test with a sample of unflavored skimmed milk by a panel of twelve flavorists, who had to indicate their preference regarding the mouthfeel and flavor character of the samples.

15 All the flavorists preferred samples A to E to that of the unflavored skimmed milk. In their opinion, said samples had far more impact in the mouth. Samples C, D and E were particularly preferred, their taste having been judged similar, both in character and texture, to the taste of a non-skimmed milk.

20

Example 8

Flavoring of skimmed milk

25

Unflavored skimmed milk (0% fat ; origin : Valflora[®], Migros, Switzerland) was aromatized by adding thereto the ingredients indicated hereafter, in the proportions cited, to prepare five samples of flavored milk :



Ingredients	Samples (ppm)				
	A	B	C	D	E
Diglyceride fraction of BH ¹⁾	500	500	500	500	500
Butyric acid	-	6	-	-	-
Hexanoic acid	-	-	2	-	-
Octanoic acid	-	-	-	4	-
Decanoic acid	-	-	-	-	2

1) see example 2

5 Samples A to E thus obtained were compared on a blind test with a sample of unflavored skimmed milk by a panel of expert flavorists, who had to indicate their preference regarding the mouthfeel and flavor character of the samples.

10 All the flavorists preferred samples A to E to that of the unflavored skimmed milk. Amongst said samples, a marked preference for the samples C, D and E was observed. In the flavorists' opinion, they all possessed a creamy, fresh, milk-like taste and a more natural and less fatty butter note than that of sample B.

15

Example 9

Flavoring of skimmed milk

20 Unflavored skimmed milk (0% fat ; origin : Valflora[®], Migros, Switzerland) was aromatized by adding thereto the ingredients indicated hereafter, in the proportions cited, to prepare five samples of flavored milk :

Ingredients	Samples (ppm)				
	A	B	C	D	E
Diglyceride fraction of BH ¹⁾	500	500	500	500	500
2-Methylhexanoic acid	-	2	-	-	-



(cont.)

Ingredients	Samples (ppm)				
	A	B	C	D	E
2-Methylbutanoic acid	-	-	3	-	-
9-Decenoic acid	-	-	-	0.1	-
Dimethylacrylic acid	-	-	-	-	2

1) see example 2

5

These samples were evaluated under the conditions described in the preceding examples. Once again, all the samples A to E were preferred to that of the unflavored skimmed milk. In their opinion, samples B and C in particular had a very creamy taste, giving a very marked sensation of fullness and

10

volume in the mouth.

Example 1015 Flavoring of skimmed milk

Three flavoring mixtures were prepared by way of the following ingredients, added in the proportions indicated (parts by weight) :

20	Ingredients	Mixtures		
		A	B	C
	2-Tetradecanone	30	50	-
	Redist. butyric acid	30	30	-
	Redist. hexanoic acid	20	20	-
25	Redist. octanoic acid	40	20	-
	Redist. decanoic acid	20	20	-
	9-Decenoic acid	40 *	40 *	-
	4-Methyloctanoic acid	20 *	20 **	20 **
	4-Methylnonanoic acid	40 *	40 **	40 **
30	2-Methylheptanoic acid	40	30	30
	Oleic acid	500	490	100
	Pentadecanoic acid	40	40	40



	Hexadecanoic acid	40	40	-
	Hexadecanol	60	60	-
	Heptadecanol	30	50	-
	2-Methylhexanoic acid	20	20	20
5	2-Methylbutanoic acid	30	30	30
	Neobee M 5	-	-	720
	Total	1000	1000	1000

10 * 10% solution in Neobee M 5

** 1% solution in Neobee M 5

15 With these mixtures and the ingredients cited hereafter, there were prepared samples of flavored skimmed milk, by adding to an unflavored skimmed milk (0% fat ; origin : Migros, Switzerland) the following ingredients, in the proportions indicated (ppm) :

Ingredients	Samples											
	1	2	3	4	5	6	7	8	9	10	11	12
Butter hydrolysate (BH) 1)	2000	-	2000	-	2000	2000	2000	-	-	-	2000	-
Diglyceride fraction of BH 2)	-	2000	-	2000	-	-	-	2000	2000	2000	-	2000
Mixture A	-	-	100	100	-	-	-	-	-	-	-	-
Mixture B	-	-	-	-	30	60	100	30	60	100	-	-
Mixture C	-	-	-	-	-	-	-	-	-	-	30	100

1) see namely the hydrolysates cited in example 6

20 2) see example 2

In a first evaluation on a blind test, a panel of expert flavorists compared samples 1 to 4 among themselves and with a sample of unflavored skimmed milk.

25 The general opinion of the flavorists was that the four samples were better than that of the unflavored skimmed milk, from the point of view of the mouthfeel and the imparted creamy feeling.

Although samples 3 and 4 were preferred for their mouthfeel, their taste was judged to have a cheese character which was too pronounced for a milk



sample, and as a result, the flavor note of samples 1 and 2 was preferred by a majority of flavorists.

The panel subsequently evaluated on a blind test samples 5 to 12, comparing them to each other and to an unflavored sample. Once again, the flavorists
 5 judged that all the samples possessed a far creamier and fuller texture, and more volume, than the unflavored milk, and were therefore preferred to the latter. Furthermore, samples 5 and 10-12, were particularly preferred, their taste, as regards mouthfeel, having been judged comparable to that of a non-skimmed milk.

10

Example 11

Flavoring of margarine

15

To a commercial "low-fat" margarine (40% of fat; origin: Migros, Switzerland) there were added 0.2% of a flavoring composition according to the invention containing the following ingredients, in the proportions indicated (parts by weight):

20

Ingredients	Compositions			
	W	X	Y	Z
Butter type flavor ¹⁾	910	910	910	910
Butter hydrolysate (BH) ²⁾	90	-	88.6	-
25 Diglyceride fraction of BH ³⁾	-	90	-	85.5
Mixture B or C ⁴⁾	-	-	1.4	4.5
Total	1000	1000	1000	1000

- 30 1) 700051.05 P ; origin : Firmenich SA, Geneva, Switzerland
 2) see example 6
 3) see example 2
 4) see example 10

35 - 4 Samples of flavored margarine were therefore obtained, which were then evaluated on a blind test by a panel of twelve flavorists and compared to the commercial margarine.



The results of these evaluations showed that the samples flavored according to the invention were systematically preferred to the commercial margarine, with a clear preference for the samples containing compositions Y and Z. According to the flavorists' opinion, the latter possessed a far creamier and rounded butter taste and a mouthfeel similar to that of a normal non-defatted margarine.

Example 12

Flavoring of mayonnaise

To a commercial mayonnaise (33% of fat ; origin : Migros, Switzerland) there were added 0.2% by weight of four flavoring compositions according to the invention containing the following ingredients (parts by weight) :

Ingredients	Compositions			
	W	X	Y	Z
Mayonnaise type flavor ¹⁾	850	850	850	850
Butter hydrolysate (BH) ²⁾	150	-	147.7	142.5
Diglyceride fraction of BH ³⁾	-	150	-	-
Mixture B or C ⁴⁾	-	-	2.3	7.5
Total	1000	1000	1000	1000

- 1) 588 560 SPM ; origin : Firmenich SA, Geneva, Switzerland
- 2) see example 6
- 3) see example 2
- 4) see example 10

The four mayonnaise samples were judged on a blind test by a panel of expert flavorists who unanimously chose these samples relative to the commercial mayonnaise. In their opinion, the flavored mayonnaises were creamier and more natural than the latter, and the improvement in the texture and mouthfeel of the product was particularly remarkable in the samples flavored by means of compositions Y and Z.



These effects were also observed, but even more markedly, with a 0% fat mayonnaise, conventionally prepared by means of the following ingredients :

	Ingredients	%
5	Water	78.00
	Skimmed milk powder	4.00
	Vinegar	5.74
	Gums	3.70
	Sugar	3.00
10	Modified potato starch	3.00
	Salt	1.50
	Mustard	0.75
	Lactic acid	0.13
	Citric acid	0.14
15	Sodium benzoate	0.02
	Potassium sorbate	0.02
	Total	100.00

20 When there were added to the mayonnaise thus obtained 0.3% by weight of the flavoring compositions analogous to those cited above, but wherein the the mayonnaise type flavor was present at a rate of 40% by weight and the total of the other ingredients at a rate of 60% by weight, the relative weight ratio of said ingredients being identical, it was observed that the flavored
 25 mayonnaises, in particular those flavored with the compositions of type Y and Z, had a perfectly natural taste and a texture comparable to that of a non-defatted mayonnaise, and therefore had enhanced impact in the mouth. The flavoring compositions were thus able to successfully replace, as regards the flavor properties, the fats in the mayonnaise, without altering the other
 30 organoleptic qualities of the product.

Example 13

35 Flavoring of potato chips

Potato chips were prepared, in a conventional manner, by means of the following ingredients :



	Ingredients	Weight (g)
	Potato powder	100.0
	Butter oil	50.0
	Sugar	30.0
5	Salt	7.5
	Lecithin	3.0
	Corn starch	30.0
	Powder yeast	25.0
	Modified potato starch	200.0
10	Water	400.0
	Total	845.5

15 The chips thus obtained, which contained less than 4% moist and which content in fats was not above 10%, were flavored with 4% by weight of four flavoring compositions prepared in an analogous manner to that described in the preceding example but using a flavoring mixture prepared with the following ingredients :

20	Ingredients	Parts by weight
	Potato flavor ¹⁾	0.25
	Maltodextrine	49.75
	Salt	40.00
	Fat flavor ²⁾	7.50
25	Others *	2.50
	Total	100.00

30 * ingredients other than the flavor, such as cited in the preceding example, in the same relative proportions.

1) 709001.10 THP 05.93 ; origin : Firmenich SA, Geneva, Switzerland

2) 92180.04 TP 06.93 ; origin : Firmenich SA, Geneva, Switzerland

35 Upon the evaluation tests of the four samples of the potato chips flavored with compositions of the W, X, Y and Z type, it was observed that these chips had a rounder, more natural taste and more similar to the taste of potato chips having a normal fat content (~ 30%), than the unflavored chips. They presented the further advantage of not being fatty when touched, while



having the same organoleptic qualities as the commercially available non-defatted potato chips.

5

Example 14

Flavoring of sable biscuits

Sable biscuits having a low content in fats (24% by weight) were flavored by adding thereto 0.20% by weight of four butter type flavoring compositions, analogous to the compositions described in example 11, but which contained about 98% of butter flavor and 2% of total weight of the other ingredients, present in the same relative proportions.

The panel of twelve flavorists which evaluated on a blind test these four samples of flavored biscuits, relative to the unflavored sample, showed a unanimous preference for the former. In particular, the biscuits flavored by way of the compositions of X, Y and Z type were judged very tasty, with a full and soft taste, which could not be distinguished from that of the sable biscuits prepared with butter.

20

Example 15

Flavoring of vanilla and chocolate puddings

25

A vanilla or chocolate pudding having 0% fat was prepared, in a conventional manner, by means of the following ingredients :

	Ingredients	Weight (g)
30	Fine granulated sugar	69.10
	Dariloid® QH 1)	3.00
	Powder tetrasodium pyrophosphate	1.30
	Calcium sulfate, dihydrate	0.70
	Salt	0.40
35	Food coloring	0.47
	Vanilline	0.03
	Vanilla or chocolate flavor 2)	0.60
	Total	<hr/> 75.60



- 1) alginate ; origin : Kelco International GmbH, Germany
- 2) Vanilla 54.286 BP0551 or chocolate 503.313 AP0551 ;
origin : Firmenich SA, Geneva, Switzerland

5 To this already flavored pudding there was added, at a rate of 0.3%, a flavoring composition according to the invention containing the following ingredients (parts by weight) :

	Ingredients	Parts by weight
10	Vanilla or chocolate flavor 1)	983.0
	BH component 2)	16.4
	Mixture B or C 3)	0.6
	Total	1000.0

15

- 1) see above
- 2) butter hydrolysate or diglyceride fraction, or a mixture of both in equal proportions
- 3) see example 10

20

Upon a blind evaluation of the puddings by a panel of six flavorists. the latter unanimously preferred the pudding containing the flavoring composition according to the invention, having judged it creamier, with an enhanced consistency and a richer and rounder taste, which was also longer lasting in the mouth.

25

Example 16

30 Frozen dessert

A frozen dessert was prepared by means of the following ingredients :

	Ingredients	% by weight
35	Skimmed milk (0% fat)	71.527
	Litesse® 1)	11.000
	Sorbex® RS 2)	6.000
	Powder skimmed milk	5.000



	Glucidex® 12 ³⁾	4.000
	Paselli® SA ₂ ⁴⁾	2.000
	Meyprogen® IC 304 ⁵⁾	0.400
	Aspartame® ⁶⁾	0.073
5		<hr/>
	Total	100.000

- 1) sugar substitute ; origin : Pfizer AG, Zürich, Switzerland
- 2) sorbitol ; origin : Hefti AG, Zürich, Switzerland
- 10 3) maltodextrine ; origin : Roquette Frères, Lestrem, France
- 4) modified starch ; origin : Avebe International, Foxhol, Holland
- 5) emulsifier ; origin : Meyhall Chemical AG, Kreuzlingen, Switzerland
- 6) origin : Nutrasweet AG, Zug, Switzerland

15 These ingredients were mixed and the dessert was frozen according to current methods. At the same time, a dessert flavored according to the invention was prepared by adding to the dessert above-mentioned, before freezing, 0.3% of the flavoring composition according to the invention described in the preceding example.

20 The two frozen desserts were then evaluated on a blind test by a panel of expert flavorists, who showed unanimous preference for the dessert flavored according to the invention. In their opinion, its taste had an enhanced impact in the mouth and it was also longer lasting and creamier, with an improved mouthfeel.

25

Example 17

Cheese from fresh cow milk

30

A base cheese from cow milk was prepared with the following ingredients, according to current methods :

	Ingredients	Weight
35	Milk	961.0
	Calcium chloride	38.0
	Rennet 1/15000	1.0
		<hr/>
	Total	1000.0



At the same time, cheeses flavored according to the invention were prepared by adding to said base cheese 0.1% of a flavoring composition prepared by means of the following ingredients (parts by weight) :

5	Ingredients	Cheeses	
		A	B
	Mozzarella type flavor ¹⁾	65	65
	BH component ²⁾	35	33
	Mixture B or C ³⁾	-	2
10	Total	100	100

1) 588 537 SPM ; origin : Firmenich SA, Geneva, Switzerland

2) see example 15

15 3) see example 10

Cheeses A and B, as well as the base cheese, were then evaluated on a blind test by a panel of flavorists. In the opinion of the latter, cheeses A and B were distinctly better, from a taste point of view, than the base cheese. They had a richer and creamier texture and better impact and mouthfeel.

Example 18

25

Flavoring of a chocolate drink

A base chocolate drink was prepared by mixing in a conventional manner the following ingredients :

30

35	Ingredients	%
	Partially skimmed milk	85.60
	Sweetened condensed milk	3.00
	Sugar	8.00
	Dark chocolate crumb	1.30
	Cocoa powder having 10% fat	1.20
	Grinsted P-Fibre 150-F ¹⁾	0.40
	Subi SC-2 ²⁾	0.30



Lygomme F447 ³⁾	0.10
Vanilline	0.10
Total	<hr/> 100.00

5

- 1) origin : Grinsted Products A/S, Brabrand, Denmark
- 2) emulsifier ; origin : Dr. Otto Suwelack, Billerbeck, Germany
- 3) stabiliser ; origin : Sanofi Bio Industries, Paris, France

10 This base drink was flavored by means of a flavoring composition containing the following ingredients :

Ingredients	Parts by weight
Chocolate flavor ¹⁾	986.0
BH component ²⁾	13.5
Mixture B or C ³⁾	0.5
Total	<hr/> 1000.0

15

- 20 1) chocolate 503.313 AP0551 ; origin : Firmenich SA, Geneva, Switzerland
- 2) see example 15
- 3) see example 10

25

Upon adding 0.35% by weight of this flavoring composition to the base drink, a new beverage was obtained, the taste of which had far greater impact in the mouth and a better mouthfeel.

Example 19

30

Flavoring of meat type bouillons

Base bouillons of the chicken, mutton, pork and beef type, were prepared using appropriate commercial origin cubes .

35

These base stocks or bouillons were then used to prepare flavored bouillons, through addition of the following ingredients, in the proportions indicated.



Ingredients	Flavored bouillons (type)							
	CHICKEN (parts by weight)		MUTTON (parts by weight)		BEEF (parts by weight)		PORC (parts by weight)	
	A	B	C	D	E	F	G	H
Base bouillon	99.70	99.70	99.70	99.70	99.70	99.70	99.70	99.70
Appropriate flavor *	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Appropriate fat hydrolysate **	-	0.27	-	0.27	-	0.27	-	0.27

- * Chicken bouillon : chicken type flavor n° 569 257 TH ;
origin : Firmenich SA, Geneva, Switzerland
Mutton bouillon : mutton type flavor n° 700042.50 SPM ;
5 origin : Firmenich SA, Geneva, Switzerland
Beef bouillon : beef type flavor n° 700138.01 SPM ;
origin : Firmenich SA, Geneva, Switzerland
Pork bouillon : ham type flavor n° 700158.02 TH ;
origin : Firmenich SA, Geneva, Switzerland
- 10 ** Chicken bouillon : for example, hydrolysate n° 18, example 5
Mutton bouillon : for example, hydrolysate n° 1, 4 or 9, example 4
Beef bouillon : for example, hydrolysate n° 22, example 5
Pork bouillon : for example, hydrolysate n° 25 or 29, example 5
- 15 The flavored bouillons thus prepared were evaluated on a blind test, two by two, by meat type, by a panel of expert flavorists. The results of these evaluations showed a unanimous preference of the flavorists for bouillons B, D, F and H, with regard respectively to bouillons A, C, E and G.
According to the flavorists' opinion, the preferred bouillons possessed a
20 markedly enhanced roundness and volume, relative to those of the less preferred bouillons, and their flavor note was far creamier and velvety, giving a richer and fuller feeling in the mouth.

25

Example 20Flavoring compositions of the vegetable oil type

Flavoring compositions of the peanut and olive oil type were prepared by mixing the following ingredients, in the proportions indicated :

Ingredients	Flavoring compositions (type)			
	peanut oil (parts by weight)		olive oil (parts by weight)	
	A	B	C	D
Appropriate commercial oil	80	-	90	-
Appropriate flavor *	20	20	10	10
Appropriate hydrolysate **	-	80	-	90

- 5 * peanut oil type flavor : n° 502923 AH ; origin : Firmenich SA, Geneva, Switzerland
olive oil type flavor : n° 502809 T ; origin : Firmenich SA, Geneva, Switzerland
- 10 ** Hydrolysate n° 11, example 5, for the peanut oil type compositions
Hydrolysate n° 10, example 5, for the olive oil type compositions

The flavoring compositions thus prepared were evaluated on a blind test by a panel of expert flavorists, in aqueous salt solutions having 0.5% of NaCl, to which had been added compositions of the peanut oil type, at the rate of 600 ppm, and olive oil type compositions at the rate of 500 ppm.

15 In the flavorists' unanimous opinion, the solution containing composition B was preferred to that of composition A, as a result of its rounder and richer taste, which had clearly more impact on the mouth. Likewise, the flavor of composition D was clearly preferred to that of composition C, the impact of which in the mouth was distinctly less satisfactory.

20



The claims defining the invention are as follows:

1. Process for the preparation of a flavoring composition, characterized in that there is added to a flavoring ingredient, solvent or adjuvant of current use the diglyceride fraction of a hydrolysate of an animal or vegetable fat, said hydrolysate being obtained by enzymatic hydrolysis of said fat.

2. Process according to claim 1, characterized in that said hydrolysate is a butter or milk hydrolysate, or a hydrolysate of mutton, beef, pork, lamb or chicken fat, or of fish, olive or peanut oil.

3. Process according to claim 1 or 2, characterized in that there is further added one or more compounds selected for the group consisting of butyric acid, decanoic acid, hexanoic acid, octanoic acid, dec-9-enoic acid, 4-methylnonanoic acid, 4-methyloctanoic acid, 2-methylheptanoic acid, oleic acid, hexadecanoic acid, pentadecanoic acid, 2-methylhexanoic acid, 2-methylbutanoic acid, heptadecanol, hexadecanol and 2-tetradecanone.

4. Process according to claim 3, characterized in that there is added a mixture formed by all the compounds of said group.

5. Process according to claim 3, characterized in that there is added a mixture formed by oleic, hexadecanoic, 4-methylnonanoic, 4-methyloctanoic, 2-methylheptanoic, 2-methylhexanoic and 2-methylbutanoic acids.

6. Process according to any one of claims 1 to 5, characterised in that there is further added a hydrolysate of an animal or vegetable fat.

7. Process for the preparation of a flavoring composition, characterized in that there is added to a hydrolysate of an animal or vegetable fat which is obtained by enzymatic hydrolysis of said fat, at a temperature and during an amount of time sufficient to ensure a degree of hydrolysis of at least about 30% and which hydrolysate contains at least 30% by weight of diglycerides and not more than 2% by weight of monoglycerides, relative to the weight of the hydrolysate, at least one compound selected from the group consisting of butyric acid, decanoic acid, hexanoic acid, octanoic acid, dec-9-enoic acid, 4-methylnonanoic acid, 4-methyloctanoic acid, 2-methylheptanoic acid, oleic acid, hexadecanoic acid, pentadecanoic acid, 2-methylhexanoic acid, 2-methylbutanoic acid, heptadecanol, hexadecanol and 2-tetradecanone.

8. Process according to claim 7, characterised in that said hydrolysate contains 50% or more weight of diglycerides.

9. Process according to claim 7 or claim 8, characterized in that there is added a mixture formed by all the compounds of said group.

10. Process according to claim 9, characterized in that there is added a mixture constituted by oleic, palmitic, 4-methylnonanoic, 4-methyloctanoic, 2-methylheptanoic, 2-methylhexanoic and 2-methylbutanoic acids.



11. Process according to claim 7, characterized in that the hydrolysate of an animal fat is a butter or milk hydrolysate, or a hydrolysate of mutton, beef, pork, lamb or chicken fat, or of fish, olive or peanut oil.

12. Process according to any one of claims 7 to 11, characterized in that there is further added a diglyceride fraction of a hydrolysate of an animal or vegetable fat.

13. Process according to claim 12, characterized in that the hydrolysate of an animal fat is a butter or milk hydrolysate, or a hydrolysate of mutton, beef, pork, lamb or chicken fat.

14. Flavoring composition, substantially as hereinbefore described with reference to any one of the Examples.

15. Flavoring composition resulting from the process according to any one of claims 1 to 13.

16. Process to impart, improve or enhance the mouthfeel of a foodstuff or beverage, characterized in that there is added to said foodstuff or beverage a flavoring composition according to claim 15.

17. Foodstuff or beverage comprising a flavoring composition according to claim 15.

18. Foodstuff according to claim 17, in the form of butter or margarine, a dairy product, a mayonnaise, a soup, a sauce, a ready-to-eat cooked meal, a sweet or savory biscuit, or a dessert.

Dated 21 May, 1998
Firmenich SA

Patent Attorneys for the Applicant/Nominated Person
SPRUSON & FERGUSON



ABSTRACT

The flavoring composition of the invention contains the diglyceridic fraction of a hydrolysate of vegetable or animal fat, optionally in
5 combination with other substances susceptible of improving the impact and mouthfeel of said composition and of the food products wherein the composition is incorporated.



INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 95/00478

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A23L1/23 A23L1/231 A23L1/226 A23D7/015 A23D9/013

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)
IPC 6 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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,5 092 964 (CAMPBELL SOUP COMPANY) 3 March 1992 see column 2-3; claim 1; example 1 ---	1,2, 15-18
A	US,A,4 284 655 (SCM CORPORATION) 18 August 1981 see column 2-4; claims 1,4 ---	1,2,11, 16-18
A	WO,A,92 00678 (UNION LAITIÈRE NORMANDE) 23 January 1992 see page 1-3; claims 1-9,14 ---	1,2,6, 13,15, 17,18
A	EP,A,0 074 140 (THE PROCTER & GAMBLE COMPANY) 16 March 1983 see claims 1-14; examples ---	3,4,7,8, 15,17,18
	-/--	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

9 November 1995

Date of mailing of the international search report

21. 11. 95

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

Kanbier, D

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 95/00478

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP,A,0 059 997 (THE PROCTER & GAMBLE COMPANY) 15 September 1982 see claims 1,8,9,11; examples ----	3,4,7,8, 15,17,18
A	US,A,4 414 229 (CUMBERLAND PACKING CORP.) 8 November 1983 see column 3; claims 1,3,7 -----	2,6,13, 15,17,18

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/IB 95/00478

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-5092964	03-03-92	NONE	
US-A-4284655	18-08-81	CA-A- 1174898 US-E- RE31754	25-09-84 04-12-84
WO-A-9200678	23-01-92	FR-A- 2664288 AU-B- 8198991	10-01-92 04-02-92
EP-A-74140	16-03-83	CA-A- 1182686 US-A- 4411924	19-02-85 25-10-83
EP-A-59997	15-09-82	US-A- 4384008 CA-A- 1181984 JP-C- 1703741 JP-B- 3061403 JP-A- 58005139	17-05-83 05-02-85 14-10-92 19-09-91 12-01-83
US-A-4414229	08-11-83	NONE	