

Notice

This translation is machine-generated. It cannot be guaranteed that it is intelligible, accurate, complete, reliable or fit for specific purposes. Critical decisions, such as commercially relevant or financial decisions, should not be based on machine-translation output.

DESCRIPTION JP2003274896A

[0001]

¹³ [Technical field of the invention] The present invention relates to an agent for reducing bitterness of amino acids exhibiting bitterness and uses thereof, and more particularly, to an agent for reducing bitterness of amino acids exhibiting bitterness and uses thereof, which contains α, α -trehalose as an active ingredient.

[0002]

²⁰ [Prior art] Amino acids are not only contained in many general foods and beverages, but also are incorporated in many health-oriented foods and beverages, cosmetics, quasi-drugs, and pharmaceuticals.

²³ Amino acids or compositions containing the same have limited long-term productization and quality retention due to the generation of animal odors specific to amino acids during processing, sterilization, and storage, and browning due to Maelard reaction, and thus the content of amino acids and the blending with other components have been limited. To solve these problems, Japanese Patent Laid-Open No. 10-66540 discloses a method for enhancing the umami taste of amino acids by α, α -trehalose, Japanese Patent Laid-Open No. 2000-4836 discloses a method for maintaining the flavor of amino acid-containing foods by a method for suppressing the animal odor of amino acids using α, α -trehalose, and Japanese Patent Laid-Open No. 6-70718 discloses a nutritional composition in which α, α -trehalose is added to suppress the Malard reaction ability. On the other hand, it is known that amino acids have bitter taste. When orally taking amino acids exhibiting such bitterness or compositions containing the same, the bitterness hinders the taste of foods and beverages, and even pain is caused in taking pharmaceuticals. Nevertheless, the publication does not describe or suggest any influence of α, α -trehalose on amino acids exhibiting bitter taste. WO 00/24273 describes a composition containing sucralose and trehalose as high-intensity sweeteners, and

further describes an oral composition containing sucralose in an effective amount for masking the unpleasant taste of amino acids.

[0003]

⁴³ [Problem to be solved by the invention] The present invention has a first object to provide an agent for reducing the bitterness of an amino acid for improving the taste of an amino acid when orally ingested by reducing the bitterness of an amino acid itself when orally using an amino acid exhibiting bitterness or a composition containing the same, and a second object to provide a method for reducing the bitterness of an amino acid exhibiting bitterness by using the agent for reducing the bitterness, and a third object to provide a composition having a reduced bitterness of an amino acid exhibiting bitterness.

[0004]

⁵³ [Means to solve the problem] In order to solve the above problems, the present inventors have conducted intensive studies focusing on the use of saccharides, particularly α, α -trehalose.

⁵⁵ As a result, the present inventors have newly found that the bitter taste of an amino acid itself can be reduced by incorporating α, α -trehalose into an amino acid exhibiting bitter taste or a composition containing the amino acid, and have further studied based on the finding to complete the present invention.

⁵⁹ That is, the present invention is a method for reducing bitterness of an amino acid exhibiting bitterness and improving palatability by including an agent for reducing bitterness of an amino acid exhibiting bitterness and an agent for reducing bitterness of an amino acid exhibiting bitterness as an active ingredient in an amino acid exhibiting bitterness or a composition containing the same, thereby improving discomfort and pain at the time of oral ingestion.

[0005]

⁶⁸ In the present invention, the amino acid exhibiting bitterness includes all amino acids that feel bitter when orally ingested, and specifically, is selected from 1 or 2 or more of L-valine, L-leucine, L-isoleucine, L-phenylalanine, L-tryptophan, L-arginine, L-lysine, L-tyrosine, L-asparagine, L-methionine, and L-histidine.

⁷² The amino acid-containing composition means a composition containing 1 or 2 or more amino acids exhibiting these bitter tastes, and as long as the bitter taste of the amino acid is observed, the amino acid may be in a free state, a salt, a composition, or other existing forms, and may be derived from a natural product or may be artificially synthesized.

[0006]

⁷⁹ The α, α -trehalose (α -D-glucopyranosyl- α -D-glucopyranoside), which is an active ingredient

of the agent for reducing the bitterness of an amino acid of the present invention, may be any one that can reduce the bitterness of an amino acid exhibiting bitterness, and the origin, properties, production method, and the like thereof are not limited.

83 For example, water-containing crystals α, α -trehalose and α, α -trehalose-containing syrup derived from starch by an enzymatic saccharification method disclosed in JP-A-7-213283, JP-A-8-336363, and the like, anhydrous crystals α, α -trehalose disclosed in JP-A-6-170221, and the like can be used.

[0007]

90 As the bitter taste reducing agent for amino acids exhibiting bitter taste of the present invention, α, α -trehalose can be used alone.

92 If necessary, the sugar may be used in admixture with other sweeteners such as powdered honey, glucose, maltose, maltotetraose, sucrose, isomerized sugar, honey, maple sugar, isomaltose, maltooligosaccharides such as panose, galactooligosaccharides, fructooligosaccharides, various oligosaccharides such as lactosucrose, cyclo{ $\rightarrow 6$ }- α -D-glucopyranosyl-(1 $\rightarrow$ 3)- α -D-glucopyranosyl-(1 $\rightarrow$ 6)- α -D-glucopyranosyl-(1 $\rightarrow$ 3)- α -D-glucopyranosyl-(1 $\rightarrow$ }, cyclic saccharides such as cyclodextrin, thickening polysaccharides such as pullulan and gum arabic, various sugar alcohols such as erythritol, sorbitol, maltitol, lactitol and xylitol, dihydrochalcones, stevioside, glycosyltransferase stevioside, rebaudioside, glycosyltransferase, glycyrrhizin, glycosyltransferase, L-aspartyl-L-phenylalanine methyl ester, sucrose, lactose, lactose, or starch, or lactose, or starch. In particular, a high-intensity sweetener can be advantageously used because it enhances the effect of reducing the bitterness of amino acids exhibiting bitterness by α, α -trehalose.

[0008]

107 In addition, as the bitter taste reducing agent for amino acids exhibiting bitter taste of the present invention, α, α -trehalose is used as a powder or a crystalline product, or optionally mixed with an extender, an excipient, a binder, or the like, and molded into various shapes such as granules, spheres, short bars, plates, cubes, tablets, and the like, and further, syrup containing α, α -trehalose may be used.

[0009]

115 The bitter taste reducing agent for amino acids exhibiting bitter taste of the present invention is a composition for oral ingestion which can feel bitter taste of amino acids exhibiting bitter taste or 1 or 2 or more kinds thereof, and can be used for reducing bitter taste of any of orally ingested amino acids, raw materials thereof, and intermediate processed products thereof.

120 For example, the composition can be used for liquid, paste, solid food and drink, health functional food, cosmetics, quasi-pharmaceuticals, pharmaceuticals, feeds, and feeds

including seasonings, confectionaries, agricultural products, livestock meat products, marine products, alcoholic beverages, soft beverages, extracts derived from animals and plants, and herbal medicines.

¹²⁵ The bitter taste reducing agent for amino acids exhibiting bitter taste of the present invention is a cosmetic, quasi-pharmaceutical, or pharmaceutical product such as lotion, cream, shampoo, rinse, lipstick, lip cream, nasal drop, eye drop, and the like containing amino acids exhibiting bitter taste, and can be advantageously used for a portion close to the mouth such as the face or scalp of nose, eyes, eyebrows, lips, or the like, or can be advantageously used for a method for reducing bitter taste indicated by amino acids of a composition containing amino acids exhibiting bitter taste by entering the mouth indirectly by adhering to hands, clothing, or the like.

[0010]

¹³⁶ In addition, the composition can also be used as a bitter taste reducing agent for a composition containing amino acids exhibiting various bitter tastes such as various solid materials such as toothpaste, powder, tablet, troche, mouth freshener, and gargle, paste, syrup, internal liquid, drink, and liquid.

[0011]

¹⁴³ In particular, in sports beverages (including jelly beverages), drinks, nutritional supplements, foods and the like containing high amino acids, health functional foods, quasi-pharmaceutical products, pharmaceuticals and the like, α, α -trehalose reduces the bitterness of amino acids exhibiting bitterness, and thus it is possible to advantageously use α, α -trehalose because it is possible to produce a composition having excellent preference even when amino acids exhibiting bitterness at a concentration that has been conventionally impossible are blended.

[0012]

¹⁵² In the use of the bitter taste reducing agent for amino acids exhibiting bitter taste of the present invention, as long as the agent is used so that α, α -trehalose of the active ingredient contained in the reducing agent and the amino acid exhibiting bitter taste of interest come into contact with each other, the amino acid exhibiting bitter taste of interest is in an isolated and purified state, or even in a form such as an association with other components, or even when the agent is contained in a composition, the intended function is exhibited.

¹⁵⁸ Therefore, in any amino acid exhibiting bitterness or a composition containing the same, the bitter taste reducing agent for an amino acid exhibiting bitterness of the present invention can be contained in an appropriate step and process from the stage of the raw material until the composition is orally ingested in consideration of the subject being orally ingested.

[0013]

- 165 As a method for containing, contacting or allowing the bitter taste-reducing agent of the bitter taste-reducing amino acid of the present invention to coexist with the bitter taste-reducing amino acid or the composition containing the bitter taste-reducing agent, known methods such as mixing, kneading, dissolving, melting, dispersing, suspending, emulsifying, permeating, crystallizing, dispersing, applying, adhering, spraying, coating, and injecting are appropriately selected until the target composition is completed or the composition is orally ingested.
- 172 It is also possible to advantageously use 1 or 2 or more high-intensity sweeteners selected from sucralose, acesulfame potassium, and L-aspartyl-L-phenylalanine methyl ester together with α, α -trehalose in the bitter taste reducing agent of the present invention, and it is also optional to contain, contact or coexist α, α -trehalose and 1 or 2 or more of these high-intensity sweeteners as a pre-mixed agent, or to contain, contact or coexist, individually, amino acids exhibiting bitter taste or a composition containing the same, depending on the timing and method appropriately selected.

[0014]

- 182 The amount of the bitter taste-reducing agent for an amino acid exhibiting bitter taste of the present invention contained in the amino acid exhibiting bitter taste or the composition containing the amino acid is not particularly limited as long as the α, α -trehalose, which is an active ingredient thereof, is an amount that exhibits the effect of reducing the bitter taste exhibited by the amino acid exhibiting bitter taste.
- 187 In particular, it is preferable to contain, as uniformly as possible, at least equal weight of α, α -trehalose in terms of anhydride, or at least 5 times weight of α, α -trehalose in terms of anhydride, relative to 1 or 2 or more types of amino acids exhibiting bitterness selected from L-valine, L-leucine, and L-isoleucine, relative to 1 or 2 or more types of amino acids exhibiting bitterness of L-tryptophan, L-phenylalanine, L-arginine, and L-lysine.
- 192 As for the concentration, α, α -trehalose is expressed as 1 to 20% by weight (hereinafter, “ % by weight ” is simply referred to as “ % ” in terms of anhydride with respect to an amino acid exhibiting bitterness or a composition containing the amino acid, unless otherwise specified in the present specification.
- 196 The organic solvent is preferably contained in the composition. In the case of amino acids exhibiting 1 or 2 or more bitter tastes selected from L-valine, L-leucine, and L-isoleucine, the concentration is preferably 2 to 15%, or in the case of amino acids exhibiting 1 or 2 or more bitter tastes selected from L-tryptophan, L-phenylalanine, L-arginine, and L-lysine, the concentration is preferably 5 to 15%. In the case of an aqueous solution containing a high content of α, α -trehalose, there is a concern that the viscosity of the solution may increase or α, α -trehalose may precipitate depending on conditions, and thus, when α, α -trehalose is contained in an aqueous solution containing an amino acid exhibiting bitterness, it is preferable to use the aqueous solution at a concentration of about 20% or less.

[0015]

208 When 1 or 2 or more kinds of high-intensity sweeteners acesulfame potassium, L-aspartyl-L-phenylalanine methyl ester, or sucralose are used in combination with the bitter taste reducing agent for amino acids exhibiting bitter taste of the present invention, the amount of these high-intensity sweeteners used is preferably such that the high-intensity sweeteners enhance the effect of α, α -trehalose, which is an active ingredient, of reducing bitter taste exhibited by amino acids exhibiting bitter taste, and particularly preferably, the high-intensity sweeteners contain about 50 to about 500 times by weight of acesulfame potassium or L-aspartyl-L-phenylalanine methyl ester in terms of anhydride, or about 100 to about 3500 times by weight of sucralose, more preferably about 300 to about 900 times by weight, and most preferably about 450 to about 650 times by weight as uniformly as possible.

219 On the other hand, if the mixing ratio is further increased, the α, α -trehalose by the high-intensity sweetener may fail to exhibit an enhanced effect of reducing the bitterness exhibited by the amino acid exhibiting bitterness. In the case where the high-intensity sweetener is acesulfame potassium or L-aspartyl-L-phenylalanine methyl ester, the concentration of α, α -trehalose in the case of being used in combination with the high-intensity sweetener is 0.2 to 20% by weight, preferably 1.0 to 20%, more preferably 2.5-20% are preferred. When the high-intensity sweetener is sucralose, α, α -trehalose is converted to an anhydride and is added to the mixture at a rate of 0. The content of the organic solvent is preferably 0.2-20%, more preferably 0.2-20%. It is preferred to contain 4 to 20% by weight. 0. When the content is less than 2%, there is a concern that the effect of enhancing the bitterness reduction of the amino acid exhibiting the bitterness of α, α -trehalose by the high-intensity sweetener is not exhibited.

[0016]

234 Hereinafter, the effect of reducing bitterness of an amino acid exhibiting bitterness by α, α -trehalose will be described in detail based on experimental examples.

236 Unless otherwise specified, in the following experimental examples, all amino acids were of the reagent grade (available from Wako Pure Chemical Industries, Ltd.), and α, α -trehalose was of the food grade (available from Ojihara Corporation, trade name “Treh”) as α, α -trehalose. The amount of α, α -trehalose added was expressed in terms of anhydride.

[0017]

243 [Experimental Example 1-1] <Determination of threshold of bitterness of various amino acids>
An experiment of determining the threshold of amino acids was performed as follows.

245 1. 0% L-valine, 1.0% L-leucine, 1.0% L-isoleucine, 0. L-phenylalanine, 0.5 % L-phenylalanine, L-tryptophan, 0.5 % L-tryptophan, 5% L-arginine or 0.5 % L-arginine. Each amino acid was dissolved in deionized water to obtain 5% L-lysine to prepare a test stock solution. The test

stock solution was further diluted with deionized water to give 0.5% and 0.5%; 2%, 0.2%; 1%, 0.1% and 0.1% respectively. A 0.5% solution was prepared as a test solution. Each test solution or test stock solution was evaluated by a panel test with 11 animals, and the lowest concentration of each amino acid at which 10 or more animals felt bitter was determined. The threshold for bitterness was determined by a method starting from a low concentration solution of amino acids and a method starting from a high concentration solution, and the values obtained in both tests were averaged, and the results are shown in Table 1.

[0019]

258 [0019] As is clear from the results in Table 1, the threshold value of bitterness of amino acids exhibiting bitterness varies depending on the type of amino acid, and is 0.1 to 0. It was found to be 5%.

[0020]

264 [Experimental Example 1-2] <Influence of saccharides on bitterness of amino acids exhibiting various bitterness> Using α , α -trehalose, isomerized sugar, or maltitol as saccharides, an experiment in which the influence of these saccharides on bitterness of amino acids exhibiting bitterness was examined was performed as follows.

268 Deionized water was charged with α , α -trehalose for 2.0% or 5. An aqueous solution is prepared by dissolving the solution so as to be 0%, and an isomerized sugar (commercially available from Nippon Food Chemicals Co., Ltd., trade name "Fudifact H-100") having a sweetness degree identical to that of the aqueous solution is prepared. 9% or 2.25% solution of maltitol, 1.2% solution of maltitol. 12% or 2. A 8% test sugar solution was prepared.

273 Each sugar solution for testing was added to 2.0% L-valine, 2.0% L-leucine, 1.5% L-isoleucine, 1. L-phenylalanine, 0.5% L-phenylalanine, 5% L-tryptophan, 1.0% L-arginine or 0. Each amino acid was dissolved to obtain 5% L-lysine to prepare a test solution. Separately from the test solution, each amino acid was diluted with deionized water so that the same amino acid concentration as the test solution was set as the highest concentration, and the threshold concentration of bitterness of the amino acid (shown in Table 1) was set as the lowest concentration, and the concentration was 10 steps at equal intervals therebetween to prepare a reference solution. The bitterness in the test solution was evaluated by 11 panelists in the same manner as in Experimental Example 1-1, and the amino acid concentration of the reference solution exhibiting the same bitterness as the bitterness of the test solution was determined. For each amino acid, the highest concentration of the reference solution minus the amino acid concentration of the reference solution corresponding to the bitterness of the test solution was divided by the highest concentration of the amino acid of the reference solution to obtain the reduction rate (%) of the bitterness of the amino acid by the saccharide. The results are shown in Table 2.

[0022]

291 [0022) As is clear from the results in Table 2, the bitter taste reducing effect was observed in all of the tested α, α -trehalose, maltitol and isomerized sugar.

293 However, α, α -trehalose effectively reduces the bitterness of all amino acids exhibiting the bitterness used in the experiment, whereas maltitol and isomerized sugar generally have a weak bitter taste reducing effect, and the strength of the reducing effect varies depending on the type of amino acid, and particularly, the bitterness reducing effect is not less than 0. In the case of 9% of the isomerized sugar, the effect of reducing L-leucine on bitterness was hardly observed despite the concentration at which the bitterness of most amino acids exhibiting bitterness was reduced. The effect of reducing the bitterness of amino acids having bitterness by saccharides was high in the order of α, α -trehalose> maltitol>isomerized sugar. Thus, α, α -trehalose was determined to be suitable as an agent for reducing the bitterness of amino acids because it is effective at a concentration of 2% or 5% and exhibits a strong bitter taste reducing effect for any amino acid exhibiting bitterness.

[0023]

307 [Experimental Example 1-3] The effect of α, α -trehalose co-presence on the bitterness of amino acids exhibiting various bitternesss The effect of trehalose on the bitterness of amino acids exhibiting bitternesss was examined as follows.

310 In the same manner as in Experiment 1-2, α, α -trehalose was not added to deionized water, and the amount of the added α, α -trehalose was 0. 5%, 1. 0%, 2. 0%, 5. Aqueous solutions were prepared by adding the aqueous solutions to a concentration of 1.0 % each, and the aqueous solutions of α, α -trehalose at each concentration were added to the aqueous solutions of α, α -trehalose at each concentration. 0% L-valine, 1. 0% L-leucine, 1. 0% L-isoleucine, 0. 2% L-phenylalanine, 0.2 % L-phenylalanine, 2% L-tryptophan, 0.2 % L-tryptophan, 2% L-arginine or 0.2 % L-arginine. Each amino acid was dissolved to 2% L-lysine, and the increase or decrease in bitterness of each amino acid solution was evaluated by a panel test similar to that in Experimental Example 1-1 as compared with the case where α, α -trehalose was not added. The evaluation of the bitter taste reduction effect is shown in Table 3 with 10 or more panelists evaluated as having no or little bitter taste as having a strong effect (++), evaluated as having a bitter taste but a clear reduction in bitter taste as having an effect (+), evaluated as having a reduced bitter taste but a weak effect as having a slight effect ($\pm$), and evaluated as having no reduction in bitter taste as having an effect (-).

[0025]

327 As is clear from the results in Table 3, L-valine, L-leucine, and L-isoleucine required equal to or more than the equivalent weight of their amino acids in terms of anhydride in order to clearly recognize the reduction in bitterness exhibited by them.

330 In addition, for L-tryptophan, L-phenylalanine, L-arginine, and L-lysine, in order to recognize that the bitterness exhibited by them was significantly reduced, α, α -trehalose was required

to be 5 times or more of the weight of the amino acid in terms of anhydride. As described above, although there is a certain difference depending on the type of amino acid exhibiting bitterness, the bitterness exhibited by the amino acid exhibiting bitterness to which trehalose was added was significantly reduced as compared with the case of the amino acid without addition. On the other hand, the reduction in bitterness exhibited by amino acids exhibiting bitterness depends on the concentration of α, α -trehalose, and the lowest concentration of α, α -trehalose evaluated as “effective (+)” is converted to anhydride, and in each of the amino acids, the decrease in bitterness is 1. The content was 0%. Furthermore, the “strong effect (++)” was evaluated by the α, α -trehalose concentration (in terms of anhydride) of 2% or more in the case where the amino acid exhibiting bitterness is L-valine, L-leucine, or L-isoleucine, or 5% or more in the case of L-tryptophan, L-phenylalanine, L-arginine, or L-lysine.

[0026]

347 [Experimental Example 1-4] <Effect of the combination of α, α -trehalose and a high-intensity sweetener on the bitterness of an aromatic amino acid> A test for confirming the effect on the bitterness of an aromatic amino acid when α, α -trehalose and a high-intensity sweetener were used in combination was performed as follows.

351 The same 2% or 5% aqueous solution of α, α -trehalose as that used in Experimental Example 1-2 was used, and sucralose (available from Sanisha-Eu-Ef-I Co., Ltd.) was used in an amount of 0.0015% aqueous solution or 0.15% aqueous solution. A 0.00375% aqueous solution, acesulfam potassium (available from Taida Chemical Industry Co., Ltd., trade name “Sannet”), and L-aspartyl-L-phenylalanine methyl ester (available from Ajinomoto Co., Ltd., trade name “Aaspartome”) were used. 0.0045% aqueous solution or 0. An aqueous solution of 0.1125% was prepared, and an aqueous solution of α, α -trehalose and an aqueous solution of a high-intensity sweetener were mixed in equal amounts. To a mixture of these α, α -trehalose and a high-intensity sweetener, a mixture of the α, α -trehalose and a high-intensity sweetener was added at a concentration of 0.5% L-tryptophan or 1. The results of evaluation by 11 panelists using any amino acid dissolved to 5% L-phenylalanine to prepare a test solution and the rate of reduction in bitterness thereof as in the method of Experimental Example 1-1 are shown in Table 4. In addition, the mixture was added to a 2% or 5% aqueous solution of α, α -trehalose in an amount of 0.5% L-tryptophan or 1. A test solution was prepared by dissolving any amino acid so as to obtain 5% L-phenylalanine. The results of evaluating the reduction rate of bitterness of these test solutions by 11 panelists by the same panel test as in Experimental Example 1-1 are shown in Table 4.

[0028]

371 [0028] As is clear from the results in Table 4, it was found that the bitterness of L-tryptophan and L-phenylalanine was reduced as compared with the case of only α, α -trehalose by using α, α -trehalose and a high-intensity sweetener in combination, and the high-intensity

sweetener enhanced the effect of reducing the bitterness exhibited by the amino acid itself exhibiting the bitterness due to α, α -trehalose.

376 The mixing ratio of α, α -trehalose and the high-intensity sweetener at this time was 444 times the weight of α, α -trehalose in terms of anhydride with respect to acesulfame potassium and aspartame, and 1333 times the weight of sucralose.

[0029]

382 [Experimental Example 1-5] <Effect of the mixing ratio of α, α -trehalose and sucralose on the bitterness of amino acids exhibiting bitterness> A test for confirming how the mixing concentration of both when α, α -trehalose and sucralose were used in combination affects the reduction of the bitterness of amino acids was performed as follows using a commercially available amino acid preparation.

387 Aqueous solution containing 4% α, α -trehalose and 0. An aqueous solution containing 0.00300% sucralose or an aqueous solution containing $\pm 10\%$ α, α -trehalose. A solution containing α, α -trehalose and/or sucralose was prepared so that an aqueous solution containing 0.0750% sucralose was prepared, a mixing ratio (liquid amount) of the α -trehalose aqueous solution and the sucralose aqueous solution was 10:0, 9:1, 8:2, 7:3, 6:4, 5:5, 4:6, 3:7, 2:8, 1:9, or 0:10, and the solution and a commercially available basic solution for high calorie infusion containing 18 types of amino acids having a composition shown below were mixed in equal amounts with an amino acid mixed solution diluted with deionized water so that the amino acid concentration thereof became 6% to prepare a test solution, and the reduction rate of bitterness of the amino acid mixed solution exhibiting bitterness according to the mixing ratio of α, α -trehalose and sucralose was evaluated by 11 panelists in the same manner as in Experimental Example 1-1, and the results are shown in Table 5. The results were compared by the mixing ratio (weight ratio) of α, α -trehalose and sucralose in the test solution.

[0030]

404 <Amino acid composition> L-isoleucine 0.80 g L-leucine 1.40 g L-Lysine acetate (as L-Lysine) 1.05 g L-methionine 39.39 g L-Phenylalanine 70.70 g L-threonine 57 g L-tryptophan 0.5 0.20 g L-valine 0.80 g L-Histidine 50 g L-arginine 1.05 g L-alanine 0.80 g L-aspartic acid 0.10 g L-glutamic acid 0.10 g of aminoacetic acid 59.59 g L-Proline 0.50 g L-serine 0.30 g L-tyrosine 0.5 g L-cysteine 10 g total amino acid content 10 g/100 ml

[0032]

412 [0032] As is clear from the results in Table 5, the bitterness of the amino acid mixture was reduced even when α, α -trehalose or sucralose alone was used, and the effect was enhanced by using both in combination.

415 This enhancing effect by sucralose was observed when 148 to 3110 times the weight of

α, α -trehalose in terms of anhydride was used in combination with sucralose, and was further enhanced at 333 to 888 times the weight, and the maximum enhancement was observed at 571 times the weight.

[0033]

422 Hereinafter, the present invention will be described in more detail with reference to Examples, but the present invention is not limited to these Examples.

424 In the following Examples, α, α -trehalose of food grade (available from Ohara Corporation, trade name “ treha ”) was used for all α, α -trehalose.

426 The addition amount of α, α -trehalose was expressed in terms of anhydride in the same manner as in the experimental example.

[0034]

431 [Example A-1] 50 parts by weight of powdered maltitol (available from Ohara Corporation, trade name "Mabit") was mixed with 50 parts by weight of the bitter taste reducing agent of the (α, α -trehalose) to obtain a powder mixture.

434 The present product can be used as an agent for reducing the bitterness of amino acids, such as food and drink, nutritional functional food, cosmetics, quasi-pharmaceutical products, pharmaceuticals, feeds, feeds, raw materials thereof, or processed intermediates thereof, containing amino acids exhibiting bitterness.

[0035]

441 [Example A-2] A agent for reducing bitterness of amino acids (α, α -trehalose 99. To a weight of 0.4 parts by weight, acesulfam potassium (available from Takeda Chemical Industry Co., Ltd., trade name “ Sannet ”) was added. 6 parts by weight were mixed to obtain a powder mixture.

445 The present product can be used as an agent for reducing bitterness of amino acids, such as amino acids exhibiting bitterness or foods and beverages, nutritional functional foods, cosmetics, quasi-pharmaceutical products, pharmaceuticals, feeds, feeds, raw materials or processed intermediates thereof, containing the same.

[0036]

452 [Example B-1] <Decrease of Bitterness of A seasoning> 95.1% aqueous solution of beer yeast extract powder (available from Asahi Beer Food Co., Ltd.). To a weight of 0.4 parts by weight of L-valine. 0.2 parts by weight of L-leucine. 0.2 parts by weight of L-tryptophan. To a mixture of 2 parts by weight, 4.2 parts by weight of α, α -trehalose was added. 0 parts by weight was added and dissolved.

457 The yeast extract to which α, α -trehalose was added had a reduced bitterness exhibited by

the amino acid itself as compared with the yeast extract to which α, α -trehalose was not added. In addition, the strong yeast odor unique to beer yeast is also suppressed, and α, α -trehalose is suitable as an agent for reducing the bitterness exhibited by the amino acid itself in the seasoning.

[0037]

465 [Example B-2] A mixture of 4 parts by weight of isoleucine, 6 parts by weight of leucine, 8 parts by weight of lysine, 8 parts by weight of phenylalanine, 1 part by weight of tyrosine, 12 parts by weight of tryptophan, 8 parts by weight of valine, 1 part by weight of aspartic acid, 1 part by weight of serine, 8 parts by weight of aminoacetic acid, 8 parts by weight of alanine, 2 parts by weight of histidine, 8 parts by weight of arginine, 2 parts by weight of threonine, and 1 part by weight of methionine was prepared as a <amino acid beverage> amino acid mixture, dissolved in water to prepare a 1% solution, and after addition of orange fruit juice to the mixture, a bitter taste reducing agent prepared in Example A-1 was added to the mixture to give 11%.

474 This amino acid-containing beverage is a flavory beverage in which the bitterness exhibited by the amino acid itself is reduced and the taste is improved as compared with a beverage in which a bitter taste reducing agent is not added.

[0038]

480 [Example B-3]: To 93 parts by weight of a <amino acid beverage> amino acid mixed aqueous solution (1% aqueous solution of the same amino acid mixture as in Example B-2), 7 parts by weight of the bitter taste reducing agent prepared in Example A-2 was added, and the can was filled at 85 ° C and sterilized at that temperature for 20 minutes, and then cooled to room temperature to prepare an amino acid-containing beverage.

485 This amino acid-containing beverage is a beverage that has a reduced bitterness exhibited by the amino acid itself and is easy to drink.

[0039]

490 [Example B-4] The following components were uniformly dispersed and mixed to obtain a powdered nutritional composition.

492 When the composition is orally ingested, it is preferably used in a concentration of about 5 to about 20% with water or a slightly warm water. The present product can also be dissolved in water or warm water and directly administered into the intestine using a tube as in the case of oral ingestion.

[0040]

499 α, α -trehalose 100. 0 gL-isoleucine 1. 0 gL-leucine 1. 0.0 gL-Lysine 1. 0.0 gL-methionine 8

gL-Phenylalanine 1.0 gL-threonine 1.0 gL-tryptophan 2 gL-valine 1.0 gL-Histidine 5 gL-arginine 1.0 gL-alanine 1.0 gL-aspartic acid 0.0 gL-glutamine 1.0 gL-glycine 0.5 gL-proline 0.8 gL-serine 0.5 gL-tyrosine 0.1 g of sodium citrate 0.8 g of potassium chloride 2 g calcium glycerophosphate 1.0 mg iron gluconate 20.0 mg thiamine hydrochloride 2.2 mg potassium iodide 24.0 μ g of riboflavin phosphate 3 mg cyanocobalamin 1.0 μ g of the resulting product.

[0041]

509 When the composition of Example B-4 using α, α -trehalose was dissolved in water and tested, the bitterness exhibited by the amino acid itself was reduced as compared with a solution without separately prepared α, α -trehalose, and the solution was a good and easy-to-drink solution per mouth.

513 In addition, the product also had reduced unpleasant tastes such as vitamin odor and metal taste.

[0042]

518 [Effect of the invention] According to the present invention, the bitterness exhibited by 1 type or 2 or more types of amino acids or the amino acids themselves of the composition containing the same is reduced, and the discomfort and pain when orally ingested are greatly improved, and the preference is improved.