

DESCRIPTION

TITLE OF THE INVENTION: BEER-TASTE BEVERAGE

5 TECHNICAL FIELD

[0001] The present invention relates to a beer-taste beverage.

BACKGROUND ART

10 [0002] In beer-taste beverages, hops or a hop extract may be blended for
the purpose of giving a proper bitterness or aroma, and an iso- α -acid,
which is a bitterness ingredient contained in hops has been known to show
bitterness that is likely to linger in mouth (lingering bitter taste), so that
there might have led to some disadvantages in the aspect of design for
market products. In order to overcome such disadvantages, it has been
15 tried to mask the lingering bitter taste from an iso- α -acid by blending
neotame as a masking agent (Patent Publication 1).

RELATED ART REFERENCES

PATENT PUBLICATIONS

20 [0003] Patent Publication 1: Japanese Patent Laid-Open No. 2012-244971

SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

25 [0004] However, the neotame used in Patent Publication 1 itself has a
strong sweet flavor, which may undesirably give some influences to tastes

and aromas of beverages, thereby posing some limitations in the designs for market products. Therefore, a method of lowering a lingering bitter taste without greatly changing the tastes and aromas of the beer-taste beverage containing an iso- α -acid has been desired.

- 5 [0005] An object of the present invention is to provide a beer-taste beverage with a lowered lingering bitter taste while containing an iso- α -acid.

MEANS TO SOLVE THE PROBLEMS

- 10 [0006] The present invention relates to a beer-taste beverage containing anserine and an iso- α -acid, wherein the content of the anserine is from 280 to 600 ppm.

EFFECTS OF THE INVENTION

- 15 [0007] According to the present invention, a beer-taste beverage with a lowered lingering bitter taste while containing an iso- α -acid can be provided.

MODES FOR CARRYING OUT THE INVENTION

- 20 [0008] As a result of intensive studies in view of the above object, the inventors of the present invention have found out that a beer-taste beverage having a lowered lingering bitter taste is obtained by containing anserine in a specified amount, and the present invention has been perfected thereby.
- 25 [0009] The beer-taste beverage of the present invention contains anserine

and an iso- α -acid.

[0010] Anserine (β -alanyl-1-methyl-L-histidine) is an imidazole dipeptide in which β -alanine and 1-methyl-L-histidine are bound, and the anserine has been known to have various functions such as anti-fatigue effects, active oxygen eliminating ability, hypotensive action, anti-inflammatory action, and uric acid value lowering action. The anserine in the beer-taste beverage of the present invention may be blended in the form of an extract from muscles of animals or fish, or a commercially available anserine preparation may be blended. As a means of extracting anserine, a known technique can be used without particular limitations, and the anserine can also be optionally purified. In addition, one or more members of the above can be used in combination. The commercially available anserine preparations include, for example, L-anserine nitrate (FUJIFILM Wako Pure Chemical Corporation) and Marine Active (YAIZU SUISANKAGAKU INDUSTRY CO., LTD.), and the like. When an extract or an anserine preparation is used, an excipient such as a dextrin may be optionally blended, but it is preferable that the excipient contained in the extract or preparation is adjusted so as not to influence the flavors of the beer-taste beverage.

[0011] The content of the anserine in the beer-taste beverage of the present invention is 280 ppm or more, more preferably 290 ppm or more, and even more preferably 300 ppm or more, from the viewpoint of lowering a lingering bitter taste originated from the iso- α -acid. In addition, while the anserine is tasteless, since the anserine is a kind of amino acids which is assumed to contribute to increase in body or thickness, the content is

600 ppm or less, and preferably 550 ppm or less, from the viewpoint of balancing the tastes of the beer-taste beverage. Also, the content may be within the range of any of the combinations mentioned above. The content of the anserine in the beer-taste beverage of the present invention as used
5 herein is measured by high-performance liquid chromatography (HPLC).

[0012] The beer-taste beverage of the present invention contains an iso- α -acid. The iso- α -acid is an ingredient in which an α -acid is isomerized, and gives a bitterness ingredient originated from hops which are raw materials used in the beer production. The bitterness of the iso- α -acid contributes to
10 give a beer-like taste of the beverage. The iso- α acid in the beer-taste beverage of the present invention may be originated from hops as raw materials, or an extract from hops may be blended, or a commercially available iso- α -acid preparation may be blended. As an extraction means of hops, the means can be used without any limitations so long as it is a
15 known technique, and the iso- α -acid can also be optionally purified. In addition, those mentioned above can be used alone or in a combination of two or more members. The iso- α -acid preparation includes, for example, Isohop (BARTH-HAAS GROUP), and the like.

[0013] The content of the iso- α -acid in the beer-taste beverage of the
20 present invention is preferably 5 ppm or more, and more preferably 10 ppm or more, from the viewpoint of giving the beer-like bitterness, and the content is preferably 40 ppm or less, and more preferably 30 ppm or less, from the viewpoint of not giving excess bitterness, and the content may be within the range of any of the combinations mentioned above. The
25 content of the iso- α -acid in the beer-taste beverage of the present invention

as used herein is measured in accordance with Method 7.7 of “Analytica-EBC” of the analytical method published by the EBC (European Brewery Convention).

[0014] The beer-taste beverage of the present invention can be produced in the same manner as a known beer-taste beverage containing an iso- α -acid, except for adding anserine thereto. Here, the beer-taste beverage may be a beer-taste beverage containing an alcohol, or a nonalcoholic beer-taste beverage. Since anserine is a kind of amino acids which is assumed to contribute to the increase in body or thickness, it is preferable that the contained extract concentration is optionally adjusted, from the viewpoint of balancing the tastes such as refreshing feel. The original extract concentration showing the extract concentration of the beer-taste beverage is preferably 10.0°P or less, and more preferably 8.0°P or less. The original extract concentration influences the body or the lightness or heaviness of the taste of the beer-taste beverage, and the original extract concentration serves as an index for the beer concentration, which is measured by Alcolyzer (Anton-Paar). The methods for production in each of the cases are exemplified hereinbelow, without intending to limit the present invention to these embodiments.

[0015] One embodiment of the beer-taste beverage according to the present invention includes a beer-taste beverage containing an alcohol, which can be produced in the same manner as a general beer-taste beverage containing an iso- α -acid, except for adding anserine during the production steps for a beer-taste beverage. In addition, the alcohol as used herein refers to ethanol, and the ethanol content, in terms of a volume ratio, is, but

not particularly limited to, preferably from 1% to 5%. Further, the origin of the alcohol content contained in the beer-taste beverage is not limited to fermentation and non-fermentation. A general production process for a beer-taste beverage will be shown hereinbelow. A general beer-taste beverage is one in which malts are used or not used as raw materials, which can be produced in the following manner.

[0016] As to the beer-taste beverage containing an alcohol produced using malts as raw materials, first, to a mixture containing raw materials such as wheat such as malts, optionally other grains, starches, sugars, and a bittering agent, or a colorant, and water is added an enzyme such as amylase optionally to carry out gelatinization or saccharification, and the mixture is then filtered, to provide a saccharified liquid. Hops, a bittering agent or the like is optionally added to the saccharified liquid, and a mixture is boiled, to remove solid contents such as coagulated proteins in a clearing tank. As a substitute for this saccharified liquid, hops may be added to a hot water added with a malt extract, and the mixture may be boiled. The hops may be mixed at any stage from the beginning of boiling to before the termination of boiling. As the conditions in the saccharification step, the boiling step, the solid content removal step, and the like, known conditions may be used. As the conditions in the fermentation and storage (stored liquor) steps, known conditions may be used. The fermentation liquid obtained is filtered, and a carbon dioxide gas is added to a filtrate obtained. Thereafter, a vessel is filled, and subjected to a sterilizing step, to obtain an intended beer-taste beverage. In each of the above steps, the anserine may be added in any steps up to

filling.

[0017] As to the beer-taste beverage containing an alcohol produced without using malts as raw materials, a liquid sugar containing a carbon source, a nitrogen source as an amino acid-containing material other than wheat or malts, hops, a pigment, and the like are mixed together with a hot water, to provide a liquid sugar-containing solution. The liquid sugar-containing solution is boiled. When hops are used as raw materials, the hops may be mixed with the liquid sugar-containing solution during boiling, not before the beginning of boiling. As a substitute for this saccharified liquid, hops may be added to a hot water added with an extract using raw materials other than malts, and a mixture may be boiled. The hops may be mixed at any stage from the beginning of boiling to before the termination of boiling. As the conditions in the fermentation and storage (stored liquor) steps, known conditions may be used. The fermentation liquid obtained is filtered, and a carbon dioxide gas is added to a filtrate obtained. Thereafter, a vessel is filled, and subjected to a sterilizing step, to obtain an intended beer-taste beverage. In each of the above steps, the anserine may be added in any steps up to filling.

[0018] As to the beer-taste beverage which is non-fermented and contains an alcohol, the beer-taste beverage may be one in which an alcohol content of a final manufactured product is adjusted by adding an alcohol for raw materials and the like, irrespective of malts being used or unused. The alcohol for raw materials may be added in any steps from the saccharification step to the filling step. In each of the above steps, the anserine may be added in any steps up to filling.

[0019] One embodiment of the beer-taste beverage according to the present invention includes nonalcoholic beer-taste beverages, which can be produced in the same manner as a general nonalcoholic beer-taste beverage containing an iso- α -acid, except that anserine is added during the production steps of the beer-taste beverage. The general production steps for a non-fermented nonalcoholic beer-taste beverage will be shown as follows. A nonalcoholic beer-taste beverage such as a nonalcoholic beer can be easily produced by a method not having a fermentation step with an yeast. General non-fermented nonalcoholic beer-taste beverages are ones produced using malts as raw materials or ones without using them, and each can be produced as follows.

[0020] As to the nonalcoholic beer-taste beverage produced by using malts as raw materials, first, to a mixture containing raw materials such as wheat such as malts, optionally other grains, starches, and sugars, and a bittering agent, or a colorant, and water is added an enzyme such as amylase optionally to carry out gelatinization or saccharification, and the mixture is then filtered, to provide a saccharified liquid. Hops, a bittering agent or the like is optionally added to the saccharified liquid, and a mixture is boiled, to remove solid contents such as coagulated proteins in a clearing tank. As a substitute for this saccharified liquid, hops may be added to a hot water added with a malt extract, and a mixture may be boiled. The hops may be mixed at any stage from the beginning of boiling to before the termination of boiling. As the conditions in the saccharification step, the boiling step, the solid content removal step, and the like, known conditions may be used. After boiling, the wort obtained is filtered, and a

carbon dioxide gas is added to a filtrate obtained. Thereafter, a vessel is filled, and subjected to a sterilizing step, to obtain an intended nonalcoholic beer-taste beverage. In each of the above steps, the anserine may be added in any steps up to filling.

5 **[0021]** In the case of producing a nonalcoholic beer-taste beverage without using malts as raw materials, first, a liquid sugar containing a carbon source, a nitrogen source as an amino acid-containing material other than wheat or malts, hops, a pigment, and the like are mixed together with a hot water, to provide a liquid sugar-containing solution. The liquid sugar-
10 containing solution is boiled. When hops are used as raw materials, the hops may be mixed with the liquid sugar-containing solution during boiling, not before the beginning of boiling. A carbon dioxide gas is added to the liquid sugar-containing solution after boiling. Thereafter, a vessel is filled, and subjected to a sterilizing step, to obtain an intended
15 nonalcoholic beer-taste beverage. In each of the above steps, the anserine may be added in any steps up to filling.

[0022] The term “beer-taste beverage” as used herein refers to a carbonated beverage having a beer-like flavor. In other words, the beer-taste beverage of the present specification embraces all the carbonated beverages having a
20 beer flavor, unless specified otherwise. Among them, the term “nonalcoholic beer-taste beverage” refers to a beer-taste beverage having an alcoholicity of less than 1%, and preferably does not substantially contain an alcohol. The beverage of the embodiment that substantially does not contain an alcohol does not intend to exclude a beverage
25 containing a very small amount of alcohol to an extent that is undetectable.

A beverage of which alcoholicity would be rounded off to 0.0%, and especially a beverage of which alcoholicity is rounded off to 0.00%, is embraced in the nonalcoholic beer-taste beverage. The kinds of the beer-taste beverage of the present invention include, for example, nonalcoholic beer-taste beverages, beer-taste refreshing beverages, and the like. Here, the term “alcoholicity (alcohol content)” as used herein means the content of ethanol, but an aliphatic alcohol is not included therein.

[0023] The alcoholicity of the beer-taste beverage according to the present invention means a content (v/v%) of an alcoholic content of the beverage, and the alcoholicity can be measured by any of known methods. For example, the alcoholicity can be measured with an oscillating densitometer. Specifically, a sample in which a carbon dioxide gas is degassed from a beverage by filtration or ultrasonication is prepared, and the sample is distilled with direct flame, and a density of the distilled solution obtained is measured at 15°C, and the alcoholicity can be converted and obtained from “Table 2 Alcoholic Content and Density (15°C) and Specific Gravity (15/15°C) Conversion Table” which is an annex to Internal Revenue Bureau, Specified Analysis Method (2007 Internal Revenue Bureau Order No. 6, revised June 22, 2007). In a case of a low concentration with an alcoholicity of less than 1.0%, a commercially available alcohol measurement instrument or gas chromatography may be used.

[0024] An aliphatic alcohol may be added to the beer-taste beverage according to the present invention, from the viewpoint of giving a liquor-taste. The aliphatic alcohol is not particularly limited so long as it is a known one, and an aliphatic alcohol having 4 to 5 carbon atoms is

preferred. In the present invention, preferred aliphatic alcohols include aliphatic alcohols having 4 carbon atoms such as 2-methyl-1-propanol and 1-butanol; and aliphatic alcohols having 5 carbon atoms such as 3-methyl-1-butanol, 1-pentanol, and 2-pentanol. These aliphatic alcohols can be used alone or in a combination of two or more kinds. The content of the aliphatic alcohol having 4 to 5 carbon atoms is preferably from 0.0002 to 0.0007% by mass, and more preferably from 0.0003 to 0.0006% by mass. In the present specification, the content of the aliphatic alcohol can be measured by using a headspace gas chromatography.

[0025] (Calories)

Among the beer-taste beverages according to the present invention, it is desired that the nonalcoholic beer-taste beverage is low in calories, matching in the favor of low-calorie diets in the recent years. Therefore, the beer-taste beverage according to the present invention has the number of calories of preferably less than 20 kcal/100 mL.

[0026] The number of calories included in the beer-taste beverage according to the present invention is basically calculated in accordance with “Method and the like for Analyzing Nutrient Ingredients etc. in Nutritional Labelling Standards” published in association with the Health Promotion Act. In other words, in principle, the number of calories can be calculated as a total sum of the amount of the various nutrient ingredients quantified multiplied by an energy conversion coefficient of each ingredient (protein: 4 kcal/g, fat: 9 kcal/g, saccharide: 4 kcal/g, dietary fibers: 2 kcal/g, alcohol: 7 kcal/g, or organic acid: 3 kcal/g). For details, see “Method and the like for Analyzing Nutrient Ingredients etc. in

Nutritional Labelling Standards.”

[0027] Specific measurement methods for the amounts of each of nutrient ingredients contained in the beer-taste beverage according to the present invention may be carried out in accordance with various methods of analyses described in the Health Promotion Act, “Method and the like for Analyzing Nutrient Ingredients etc. in Nutritional Labelling Standards.” Alternatively, if requested to Incorporated Foundation, Japan Food Research Laboratories, one can know the calories and/or each of amounts of nutrient ingredients.

[0028] (Saccharides)

The saccharides contained in the beer-taste beverage according to the present invention refer to saccharides based on the Nutritional Labelling Standards for Foods (2003 Ministry of Health, Labour, and Welfare, Announcement No. 176). Specifically, the saccharides refer to a group of foods from which proteins, fats, dietary fibers, ashes, alcohols, and water are excluded. In addition, the amount of saccharides in the foods is calculated by deduction of the amounts of proteins, fats, dietary fibers, ashes, and water from the weight of the above foods. In this case, the amounts of proteins, fats, dietary fibers, ashes, and water are measured by a method set out in the Nutrition Labelling Standards. Specifically, the amount of proteins is measured by nitrogen quantification conversion method; the amount of fats is measured by an ether extraction method, a chloroform-methanol liquid mixture extraction method, a Gerber method, an acid decomposition method or a Roese-Gottlieb method; the amount of dietary fibers is measured by high-performance liquid chromatography or

Prosky method; the amount of ashes is measured by a method of ashing with magnesium acetate, a direct ashing method, or a method of ashing with sulfuric acid; and the amount of water is measured by Karl-Fischer method, a method using a drying aid, a vacuum thermal drying method, an atmospheric thermal drying method, or a plastic film method.

[0029] It is desired that the beer-taste beverage according to the present invention is low in saccharides, matching in the favor of the low carbohydrate diet in the recent year. Therefore, the content of the saccharides of the beer-taste beverage according to the present invention is preferably less than 2.5 g/100 mL. In addition, the lower limit of the content is not particularly set.

[0030] (Acidulant)

As the acidulant used in the beer-taste beverage according to the present invention, it is preferable to use one or more acids selected from the group consisting of citric acid, lactic acid, phosphoric acid, and malic acid. In addition, in the present invention, as an acid other than the above acids, succinic acid, tartaric acid, fumaric acid, glacial acetic acid or the like can be used. These acidulants can be used without limitations so long as the acidulants are accepted to be added to foods. In the present invention, it is preferable to use a combination of lactic acid from the viewpoint of appropriately giving a moderate sour taste, and phosphoric acid from the viewpoint of appropriately giving an sour taste with a slightly stimulating taste.

[0031] The content of the acidulant in the beer-taste beverage according to the present invention, calculated in terms of citric acid, is preferably

200 ppm or more, more preferably 550 ppm or more, and even more preferably 700 ppm or more, from the viewpoint of providing a beer-taste feel, and the content is preferably 15000 ppm or less, more preferably 5500 ppm or less, and even more preferably 2000 ppm or less, from the viewpoint of acidity. Therefore, in the present invention, the content of the acidulant, calculated in terms of citric acid, includes preferred ranges such as from 200 ppm to 15000 ppm, preferably from 550 ppm to 5500 ppm, and more preferably from 700 ppm to 1500 ppm. Here, the amount calculated in terms of citric acid as used herein refers to an amount converted from an acidity of each of the acidulants on the basis of the acidity of citric acid. For example, the amount which is equivalent to 100 ppm of lactic acid, calculated in terms of citric acid, is 120 ppm, the amount which is equivalent to 100 ppm of phosphoric acid, calculated in terms of citric acid, is 200 ppm, and the amount which is equivalent to 100 ppm of malic acid, calculated in terms of citric acid, is 125 ppm.

[0032] The content of the acidulant in the beer-taste beverage refers to those calculated by analyzing with high-performance liquid chromatography (HPLC) or the like.

[0033] (Hops)

In the beer-taste beverage according to the present invention, hops can be used as a part of the raw materials. Since the flavor tends to resemble beer, it is desired that hops are used in a part of the raw materials. When hops are used, usual pellet hops, powder hops or a hop extract used in the production of beer and the like can be appropriately selected and used in accordance with a desired flavor. In addition, hop processed

products such as isomerized hops and reduced hops may be used. The hops used in the beer-taste beverage according to the present invention embrace those products. Also, the amount of the hops is, but not particularly limited to, typically from 0.0001 to 1% by weight or so, based on the entire amount of the beverage.

[0034] (Other Raw Materials)

In the beer-taste beverage according to present invention, other raw materials may be optionally used within the range that would not inhibit the effects of the present invention. For example, a sweetener (including a high-intensity sweetener), a bittering agent, a flavor (aromatic), an yeast extract, a colorant such as a caramel pigment, vegetable extracted saponin-based material such as soybean saponin or quillai saponin, a vegetable protein such as maize or soybeans, and a peptide-containing product, a proteinaceous material such as bovine serum albumin, dietary fibers, a seasoning such as amino acids, or an antioxidant such as ascorbic acid can optionally be used within the range that would not inhibit the effects of the present invention.

[0035] Thus, a beer-taste beverage according to the present invention is obtained. The pH of the beer-taste beverage according to the present invention is from 3.0 to 5.0, preferably from 3.0 to 4.5, and more preferably 3.0 to 4.0, from the viewpoint of making the flavor of the beverage favorable.

[0036] (Container-Packed Beverage)

The beer-taste beverage according to the present invention can be packed into a container. The shapes of the containers are not limited in

any manners, and the beer-taste beverage can be packed into a tightly sealed container such as a glass bottle, a can, a barrel, or a plastic bottle, whereby a beverage contained in a container can be provided.

5 EXAMPLES

[0037] The present invention will be specifically described hereinbelow by the Examples, without intending to limit the scope of the present invention to the following Examples.

[0038] < Production of Beer-Taste Beverages >

10 Examples 1 and 2 and Comparative Example 1

 To a commercially available alcohol-containing beer-taste beverage containing 23.4 ppm of an iso- α -acid (original extract: 12.5°P) was added anserine (L-anserine nitrate, purity of anserine: 78.1%, manufactured by FUJIFILM Wako Pure Chemical Corporation) in an amount listed in Table 1, to produce a beer-taste beverage.

[0039] Examples 3 and 4 and Comparative Example 2

 To a commercially available alcohol-containing beer-taste beverage containing 17.7 ppm of an iso- α -acid (original extract: 7.2°P) was added anserine (L-anserine nitrate, purity of anserine: 78.1%, manufactured by FUJIFILM Wako Pure Chemical Corporation) in an amount listed in Table 2, to produce a beer-taste beverage.

[0040] Examples 5 and 6 and Comparative Example 3

 To a commercially available nonalcoholic beer-taste beverage containing 15.9 ppm of an iso- α -acid was added anserine (L-anserine nitrate, purity of anserine: 78.1%, manufactured by FUJIFILM Wako Pure

Chemical Corporation) in an amount listed in Table 3, to produce a beer-taste beverage.

[0041] With respect to the beer-taste beverages obtained, the lingering bitter taste was evaluated by five specialized panelists on the bases of the following evaluation criteria, and a mean score of the evaluation scores was calculated. The results are shown in Tables 1 to 3.

(Evaluation of Lingering Bitter Taste)

1: Not tasted.

2: Faintly tasted.

3: Tasted to a certain level.

4: Distinctively tasted.

5: Strongly tasted.

[0042] [Table 1]

Table 1

	Iso- α -acid Concentration, ppm	Anserine Concentration, ppm	Evaluation of Lingering Bitter Taste
Comp. Ex. 1	23.4	0	3.0
Ex. 1		300	2.6
Ex. 2		500	2.4

[0043] [Table 2]

Table 2

	Iso- α -acid Concentration, ppm	Anserine Concentration, ppm	Evaluation of Lingering Bitter Taste
Comp. Ex. 2	17.7	0	3.0
Ex. 3		300	2.5
Ex. 4		500	2.1

[0044] [Table 3]

Table 3

	Iso- α -acid Concentration, ppm	Anserine Concentration, ppm	Evaluation of Lingering Bitter Taste
Comp. Ex. 3	15.9	0	3.0
Ex. 5		300	2.0
Ex. 6		500	1.7

[0045] As shown in Tables 1 to 3, the beer-taste beverages of Examples 1 to 6 in which anserine was added in an amount of 300 ppm or more showed a lowered lingering bitter taste, as compared to the beer-taste beverages of Comparative Examples 1 to 3 each in which anserine was not added. In addition, the beer-taste beverages of Examples 1 to 6 did not greatly undergo changes in tastes and aroma of the beer-taste beverages before the addition by addition of anserine, but Examples 3 to 6 in which anserine was added to a beer-taste beverage of which original extract concentration was adjusted to 7.2°P, or added to a nonalcoholic beer-taste beverage tended to have more excellent balance in tastes, than Examples 1

and 2 in which anserine was added to a beer-taste beverage of which original extract concentration was adjusted to 12.5°P.

INDUSTRIAL APPLICABILITY

- 5 **[0046]** According to the present invention, a beverage having an excellent flavor while including an iso- α -acid can be provided.

CLAIMS

[Claim 1] A beer-taste beverage comprising anserine and an iso- α -acid,
wherein the content of the anserine is from 280 to 600 ppm.

5 [Claim 2] The beer-taste beverage according to claim 1, wherein the original
extract concentration is 8.0°P or less.

[Claim 3] The beer-taste beverage according to claim 1, which is a
nonalcoholic beer-taste beverage.