

DESCRIPTION

TITLE OF THE INVENTION: BEER-FLAVORED BEVERAGE

5 TECHNICAL FIELD

[0001] The present invention relates to a beer-taste beverage and a method of producing the same.

BACKGROUND ART

10 [0002] With the diversification of the inclinations of the consumers in the recent years, the development of beer-taste beverages having fruit-like flavor characteristics has been desired. For example, Patent Publication 1 proposes a beer-taste beverage using grapes and the like as a raw material.

15 RELATED ART REFERENCES

PATENT PUBLICATIONS

[0003] Patent Publication 1: Japanese Patent Laid-Open No. 2020-48502

SUMMARY OF THE INVENTION

20 PROBLEMS TO BE SOLVED BY THE INVENTION

[0004] However, since grapes and the like are not usually used as a raw material in the production of a beer-taste beverage in general, further improvement is desired.

[0005] The first embodiment of the present invention relates to the
25 provision of a novel beer-taste beverage having a matured fruit-like flavor

characteristic and a method of producing the same.

The second embodiment of the present invention relates to the provision of a novel beer-taste beverage having a fresh fruit-like flavor characteristic and a method of producing the same.

5 The third embodiment of the present invention relates to the provision of a novel beer-taste beverage having a thick and rich fruit-like flavor characteristic and a method of producing the same.

MEANS TO SOLVE THE PROBLEMS

10 [0006] The present invention relates to the following [1] to [9].

[1] A beer-taste beverage having the content of 2,2,4-trimethyl-1,3-dioxolane of 400 $\mu\text{g/L}$ or more.

[2] A beer-taste beverage having the content of propyl acetate of 150 $\mu\text{g/L}$ or more and 600 $\mu\text{g/L}$ or less.

15 [3] A beer-taste beverage having the content of D-glutamic acid of 2.00 $\mu\text{g/mL}$ or more and the content of propyl acetate of 150 $\mu\text{g/L}$ or more.

[4] A method of producing a beer-taste beverage including making the content of 2,2,4-trimethyl-1,3-dioxolane in the beer-taste beverage 400 $\mu\text{g/L}$ or more.

20 [5] A method of giving a matured fruit-like flavor including making the content of 2,2,4-trimethyl-1,3-dioxolane in a beer-taste beverage 400 $\mu\text{g/L}$ or more.

[6] A method of producing a beer-taste beverage including making the content of propyl acetate in the beer-taste beverage 150 $\mu\text{g/L}$ or more and
25 600 $\mu\text{g/L}$ or less.

[7] A method of giving a fresh fruit-like flavor including making the content of propyl acetate in a beer-taste beverage 150 µg/L or more and 600 µg/L or less.

[8] A method of producing a beer-taste beverage including making the content of D-glutamic acid in the beer-taste beverage 2.00 µg/mL or more and the content of propyl acetate 150 µg/L or more.

[9] A method of giving a thick and rich fruit-like flavor including making the content of D-glutamic acid in a beer-taste beverage 2.00 µg/mL or more and the content of propyl acetate 150 µg/L or more.

EFFECTS OF THE INVENTION

[0007] According to the first embodiment of the present invention, a novel beer-taste beverage having a matured fruit-like flavor characteristic and a method of producing the same can be provided.

According to the second embodiment of the present invention, a novel beer-taste beverage having a fresh fruit-like flavor characteristic and a method of producing the same can be provided.

According to the third embodiment of the present invention, a novel beer-taste beverage having a thick and rich fruit-like flavor characteristic and a method of producing the same can be provided.

MODES FOR CARRYING OUT THE INVENTION

[0008] As a result of intensively studying the problems, the inventors of the present invention have newly found that a matured fruit-like flavor characteristic can be obtained by setting the content of 2,2,4-trimethyl-1,3-

dioxolane in a beer-taste beverage within the specific range (First Embodiment). Although this mechanism is not clear, it is thought to be derived from metabolites by plural microorganisms and passing a long-term liquor storage period.

- 5 [0009] A beer-taste beverage of the first embodiment contains 2,2,4-trimethyl-1,3-dioxolane. 2,2,4-trimethyl-1,3-dioxolane is a component derived from microbial metabolism, and the content can be adjusted depending on the kind of microorganisms used, temperature at a time of fermentation, fermentation period, and liquor storage period. The content
- 10 of 2,2,4-trimethyl-1,3-dioxolane in the beer-taste beverage of the present embodiment is, from the viewpoint of giving a matured fruit-like flavor, 400 $\mu\text{g/L}$ or more, preferably 500 $\mu\text{g/L}$ or more, more preferably 600 $\mu\text{g/L}$ or more, even more preferably 700 $\mu\text{g/L}$ or more, even more preferably 800 $\mu\text{g/L}$ or more, even more preferably 900 $\mu\text{g/L}$ or more, even more
- 15 preferably 1000 $\mu\text{g/L}$ or more, even more preferably 1100 $\mu\text{g/L}$ or more, even more preferably 1200 $\mu\text{g/L}$ or more, even more preferably 1300 $\mu\text{g/L}$ or more, even more preferably 1400 $\mu\text{g/L}$ or more, even more preferably 1500 $\mu\text{g/L}$ or more, even more preferably 1600 $\mu\text{g/L}$ or more, even more
- 20 preferably 1700 $\mu\text{g/L}$ or more, even more preferably 2000 $\mu\text{g/L}$ or more, even more preferably 2200 $\mu\text{g/L}$ or more, even more preferably 2400 $\mu\text{g/L}$ or more, and even more preferably 2500 $\mu\text{g/L}$ or more. In addition, the content of 2,2,4-trimethyl-1,3-dioxolane is, from the viewpoint of sharpness of aftertaste, preferably 5000 $\mu\text{g/L}$ or less, more preferably 4900
- 25 $\mu\text{g/L}$ or less, even more preferably 4800 $\mu\text{g/L}$ or less, even more preferably 4700 $\mu\text{g/L}$ or less, even more preferably 4600 $\mu\text{g/L}$ or less, even

more preferably 4500 µg/L or less, even more preferably 4000 µg/L or less, even more preferably 3500 µg/L or less, and even more preferably 3000 µg/L or less. In the present specification, the content of 2,2,4-trimethyl-1,3-dioxolane is measured by extracting a sample using dichloromethane, concentrating by 100 times, and thereafter GC/MS (SIM method).

[0010] As a result of intensively studying the problems, the inventors of the present invention have newly found that a fresh fruit-like flavor characteristic can be obtained by setting the content of propyl acetate in a beer-taste beverage within the specific range (Second Embodiment).

Although this mechanism is not clear, it is thought to be derived from metabolites by plural microorganisms and passing a long-term liquor storage period.

[0011] A beer-taste beverage of the second embodiment contains propyl acetate. Propyl acetate is a component derived from microbial metabolism and a chemical reaction, and the content can be adjusted depending on the kind of microorganisms used, temperature at a time of fermentation, fermentation period, and liquor storage period. The content of propyl acetate in the beer-taste beverage of the present embodiment is, from the viewpoint of giving a fresh fruit-like flavor, 150 µg/L or more, preferably 160 µg/L or more, more preferably 170 µg/L or more, even more preferably 180 µg/L or more, even more preferably 190 µg/L or more, even more preferably 200 µg/L or more, even more preferably 210 µg/L or more, even more preferably 220 µg/L or more, even more preferably 230 µg/L or more, even more preferably 240 µg/L or more, even more preferably 250 µg/L or more, even more preferably 300 µg/L or more,

even more preferably 310 $\mu\text{g/L}$ or more, even more preferably 320 $\mu\text{g/L}$ or more, even more preferably 330 $\mu\text{g/L}$ or more, even more preferably 340 $\mu\text{g/L}$ or more, even more preferably 350 $\mu\text{g/L}$ or more, even more preferably 360 $\mu\text{g/L}$ or more, even more preferably 370 $\mu\text{g/L}$ or more, even more preferably 380 $\mu\text{g/L}$ or more, even more preferably 400 $\mu\text{g/L}$ or more, and even more preferably 420 $\mu\text{g/L}$ or more. The content of propyl acetate is, from the viewpoint of appropriate sweetness quality, preferably 600 $\mu\text{g/L}$ or less, more preferably 590 $\mu\text{g/L}$ or less, even more preferably 580 $\mu\text{g/L}$ or less, even more preferably 570 $\mu\text{g/L}$ or less, even more preferably 560 $\mu\text{g/L}$ or less, even more preferably 550 $\mu\text{g/L}$ or less, even more preferably 520 $\mu\text{g/L}$ or less, and even more preferably 500 $\mu\text{g/L}$ or less. In the present specification, the content of propyl acetate is measured by extracting a sample using dichloromethane, concentrating by 100 times, and thereafter GC/MS (SIM method).

[0012] As a result of intensively studying the problems, the inventors of the present invention have newly found that a thick and rich fruit-like flavor characteristic can be obtained by setting the content of D-glutamic acid and propyl acetate in a beer-taste beverage within the specific range (Third Embodiment). Although this mechanism is not clear, it is thought to be derived from metabolites by plural microorganisms such as lactic acid bacteria having a racemase activity and a chemical reaction in a long-term liquor storage period.

[0013] A beer-taste beverage of the third embodiment contains D-glutamic acid and propyl acetate.

[0014] D-glutamic acid is a component derived from microbial metabolism,

and the content can be adjusted depending on the kind of microorganisms used, temperature at a time of fermentation, fermentation period, and liquor storage period after finishing fermentation. The content of D-glutamic acid in the beer-taste beverage of the present embodiment is, from the viewpoint of giving a thick and rich fruit-like flavor, 2.00 $\mu\text{g/mL}$ or more, preferably 2.10 $\mu\text{g/mL}$ or more, more preferably 2.20 $\mu\text{g/mL}$ or more, even more preferably 2.30 $\mu\text{g/mL}$ or more, even more preferably 2.40 $\mu\text{g/mL}$ or more, even more preferably 2.50 $\mu\text{g/mL}$ or more, even more preferably 2.60 $\mu\text{g/mL}$ or more, even more preferably 2.70 $\mu\text{g/mL}$ or more, even more preferably 2.80 $\mu\text{g/mL}$ or more, and even more preferably 2.90 $\mu\text{g/mL}$ or more. In addition, the content of D-glutamic acid is, from the viewpoint of inhibiting sticky sweetness, preferably 8.00 $\mu\text{g/mL}$ or less, more preferably 7.50 $\mu\text{g/mL}$ or less, even more preferably 7.00 $\mu\text{g/mL}$ or less, even more preferably 6.90 $\mu\text{g/mL}$ or less, even more preferably 6.80 $\mu\text{g/mL}$ or less, even more preferably 6.70 $\mu\text{g/mL}$ or less, and even more preferably 6.60 $\mu\text{g/mL}$ or less. In the present specification, the content of D-glutamic acid is measured by extracting a sample using dichloromethane, concentrating by 100 times, and thereafter GC/MS (SIM method).

[0015] The content of propyl acetate in the beer-taste beverage of the present embodiment is, from the viewpoint of giving a thick and rich fruit-like flavor, 150 $\mu\text{g/L}$ or more, preferably 160 $\mu\text{g/L}$ or more, more preferably 170 $\mu\text{g/L}$ or more, even more preferably 180 $\mu\text{g/L}$ or more, even more preferably 190 $\mu\text{g/L}$ or more, even more preferably 200 $\mu\text{g/L}$ or more, even more preferably 210 $\mu\text{g/L}$ or more, even more preferably 220

μg/L or more, even more preferably 230 μg/L or more, even more preferably 240 μg/L or more, even more preferably 250 μg/L or more, even more preferably 300 μg/L or more, even more preferably 310 μg/L or more, even more preferably 320 μg/L or more, even more preferably 330 μg/L or more, even more preferably 340 μg/L or more, even more preferably 350 μg/L or more, even more preferably 360 μg/L or more, even more preferably 370 μg/L or more, even more preferably 380 μg/L or more, even more preferably 400 μg/L or more, and even more preferably 420 μg/L or more. In addition, the content of propyl acetate is, from the viewpoint of appropriate sweetness quality, preferably 600 μg/L or less, more preferably 590 μg/L or less, even more preferably 580 μg/L or less, even more preferably 570 μg/L or less, even more preferably 560 μg/L or less, even more preferably 550 μg/L or less, even more preferably 520 μg/L or less, and even more preferably 500 μg/L or less.

[0016] Each embodiment mentioned above can be optionally combined. Hereinafter, components and the like of the present invention are explained.

[0017] The content of acetic acid in the beer-taste beverage of the present invention is, from the viewpoint of balancing a feeling of stimulation appropriate for beer and a vinegar-like aroma inappropriate for beer, preferably 100 mg/L or more, more preferably 300 mg/L or more, even more preferably 500 mg/L or more, even more preferably 700 mg/L or more, even more preferably 900 mg/L or more, even more preferably 1000 mg/L or more, even more preferably 1100 mg/L or more, even more preferably 1200 mg/L or more, even more preferably 1300 mg/L or more,

even more preferably 1400 mg/L or more, even more preferably 1500 mg/L or more, even more preferably 1600 mg/L or more, even more preferably 1700 mg/L or more, even more preferably 1800 mg/L or more, even more preferably 1900 mg/L or more, even more preferably 2000 mg/L or more, even more preferably 2100 mg/L or more, even more preferably 2200 mg/L or more, even more preferably 2300 mg/L or more, even more preferably 2400 mg/L or more, even more preferably 2500 mg/L or more, even more preferably 2600 mg/L or more, even more preferably 2700 mg/L or more, even more preferably 2800 mg/L or more and even more preferably 2900 mg/L or more. In addition, the content of acetic acid is preferably 7500 mg/L or less, more preferably 7000 mg/L or less, even more preferably 6900 mg/L or less, even more preferably 6800 mg/L or less, even more preferably 6700 mg/L or less, even more preferably 6600 mg/L or less, even more preferably 6500 mg/L or less, even more preferably 6400 mg/L or less, even more preferably 6300 mg/L or less, even more preferably 6200 mg/L or less, even more preferably 6100 mg/L or less, even more preferably 6000 mg/L or less, even more preferably 5900 mg/L or less, even more preferably 5800 mg/L or less, even more preferably 5700 mg/L or less, even more preferably 5600 mg/L or less, even more preferably 5500 mg/L or less, even more preferably 5400 mg/L or less, even more preferably 5300 mg/L or less, even more preferably 5200 mg/L or less, even more preferably 5100 mg/L or less, even more preferably 5000 mg/L or less, even more preferably 4900 mg/L or less, even more preferably 4800 mg/L or less, even more preferably 4700 mg/L or less, even more preferably 4600 mg/L or less, even more

preferably 4500 mg/L or less, even more preferably 4400 mg/L or less,
even more preferably 4300 mg/L or less, even more preferably 4200 mg/L
or less, even more preferably 4100 mg/L or less, even more preferably
4000 mg/L or less, even more preferably 3900 mg/L or less, even more
5 preferably 3800 mg/L or less, even more preferably 3700 mg/L or less,
even more preferably 3600 mg/L or less, even more preferably 3500 mg/L
or less, even more preferably 3400 mg/L or less, even more preferably
3300 mg/L or less, even more preferably 3200 mg/L or less, even more
preferably 3100 mg/L or less, and even more preferably 3000 mg/L or less.

10 The beer-taste beverage of the present invention can contain acetate such
as sodium acetate. The content of acetic acid in the case where acetate is
contained is a total amount of acetic acid and acetate. In the present
specification, the content of acetic acid is measured by a high-performance
liquid chromatography. The content of acetic acid can be adjusted by a
15 generation by fermentation of microorganisms during a production step or
addition of acetic acid or materials containing acetic acid.

[0018] The content of lactic acid in the beer-taste beverage of the present
invention is, from the viewpoint of balancing an aftertaste appropriate for
beer and a dairy product-like aroma inappropriate for beer, preferably 200
20 mg/L or more, more preferably 800 mg/L or more, even more preferably
1000 mg/L or more, even more preferably 1200 mg/L or more, even more
preferably 1400 mg/L or more, even more preferably 1600 mg/L or more,
even more preferably 1800 mg/L or more, even more preferably 2000
mg/L or more, even more preferably 2200 mg/L or more, even more
25 preferably 2400 mg/L or more, even more preferably 2600 mg/L or more,

even more preferably 2800 mg/L or more, even more preferably 3000 mg/L or more, even more preferably 3100 mg/L or more, even more preferably 3200 mg/L or more, even more preferably 3300 mg/L or more, even more preferably 3400 mg/L or more, even more preferably 3500 mg/L or more, even more preferably 3600 mg/L or more, even more preferably 3700 mg/L or more, even more preferably 3800 mg/L or more, even more preferably 3900 mg/L or more, even more preferably 4000 mg/L or more, even more preferably 4100 mg/L or more, even more preferably 4200 mg/L or more, even more preferably 4300 mg/L or more, even more preferably 4400 mg/L or more, even more preferably 4500 mg/L or more, even more preferably 4600 mg/L or more, even more preferably 4700 mg/L or more, even more preferably 4800 mg/L or more or even more preferably 4900 mg/L or more. In addition, the content of lactic acid is preferably 25000 mg/L or less, more preferably 24000 mg/L or less, even more preferably 23000 mg/L or less, even more preferably 22500 mg/L or less, even more preferably 22000 mg/L or less, even more preferably 21500 mg/L or less, even more preferably 21000 mg/L or less, even more preferably 20500 mg/L or less, even more preferably 20000 mg/L or less, even more preferably 19500 mg/L or less, even more preferably 19000 mg/L or less, even more preferably 18500 mg/L or less, even more preferably 18000 mg/L or less, even more preferably 17500 mg/L or less, even more preferably 17000 mg/L or less, even more preferably 16500 mg/L or less, even more preferably 16000 mg/L or less, even more preferably 15500 mg/L or less, even more preferably 15000 mg/L or less, even more preferably 14500 mg/L or less, even more

preferably 14000 mg/L or less, even more preferably 13500 mg/L or less,
even more preferably 13000 mg/L or less, even more preferably 12500
mg/L or less, even more preferably 12000 mg/L or less, even more
preferably 11500 mg/L or less, even more preferably 11000 mg/L or less,
5 even more preferably 10500 mg/L or less, even more preferably 10000
mg/L or less, even more preferably 9900 mg/L or less, even more
preferably 9800 mg/L or less, even more preferably 9700 mg/L or less,
even more preferably 9600 mg/L or less, even more preferably 9500 mg/L
or less, even more preferably 9400 mg/L or less, even more preferably
10 9300 mg/L or less, even more preferably 9200 mg/L or less, even more
preferably 9100 mg/L or less, even more preferably 9000 mg/L or less,
even more preferably 8900 mg/L or less, even more preferably 8800 mg/L
or less, even more preferably 8700 mg/L or less, even more preferably
8600 mg/L or less, even more preferably 8500 mg/L or less, even more
15 preferably 8400 mg/L or less, even more preferably 8300 mg/L or less,
even more preferably 8200 mg/L or less, even more preferably 8100 mg/L
or less, even more preferably 8000 mg/L or less, even more preferably
7900 mg/L or less, even more preferably 7800 mg/L or less, even more
preferably 7700 mg/L or less, even more preferably 7600 mg/L or less,
20 even more preferably 7500 mg/L or less, even more preferably 7400 mg/L
or less, even more preferably 7300 mg/L or less, even more preferably
7200 mg/L or less, even more preferably 7100 mg/L or less, even more
preferably 7000 mg/L or less, even more preferably 6900 mg/L or less,
even more preferably 6800 mg/L or less, even more preferably 6700 mg/L
25 or less, even more preferably 6600 mg/L or less, even more preferably

6500 mg/L or less, even more preferably 6400 mg/L or less, even more preferably 6300 mg/L or less, even more preferably 6200 mg/L or less, even more preferably 6100 mg/L or less, even more preferably 6000 mg/L or less, even more preferably 5900 mg/L or less, even more preferably 5800 mg/L or less, even more preferably 5700 mg/L or less, even more preferably 5600 mg/L or less, even more preferably 5500 mg/L or less, even more preferably 5400 mg/L or less, even more preferably 5300 mg/L or less, even more preferably 5200 mg/L or less, and even more preferably 5100 mg/L or less. In the present specification, the content of lactic acid is measured by a high-performance liquid chromatography. The content of lactic acid can be adjusted by a generation by fermentation of microorganisms during a production step or addition of lactic acid or materials containing lactic acid.

[0019] The mass ratio of the content of acetic acid to the content of lactic acid (acetic acid/lactic acid) in the beer-taste beverage of the present invention is, from the viewpoint of balancing a feeling of stimulation and an aftertaste, preferably 0.05 or more, preferably 0.08 or more, more preferably 0.11 or more, even more preferably 0.14 or more, even more preferably 0.17 or more, even more preferably 0.2 or more, even more preferably 0.23 or more, even more preferably 0.26 or more, even more preferably 0.29 or more, even more preferably 0.32 or more, even more preferably 0.35 or more, even more preferably 0.38 or more, even more preferably 0.41 or more, even more preferably 0.44 or more, even more preferably 0.47 or more, even more preferably 0.5 or more, even more preferably 0.53 or more, even more preferably 0.56 or more or even more

preferably 0.59 or more. In addition, the mass ratio is 5.0 or less, preferably 4.5 or less, more preferably 4.0 or less, even more preferably 3.5 or less, even more preferably 3.0 or less, even more preferably 2.5 or less, even more preferably 2.0 or less, even more preferably 1.5 or less, even more preferably 1.0 or less, even more preferably 0.98 or less, even more preferably 0.95 or less, even more preferably 0.92 or less, even more preferably 0.89 or less, even more preferably 0.86 or less, even more preferably 0.83 or less, even more preferably 0.8 or less, even more preferably 0.77 or less, even more preferably 0.74 or less, even more preferably 0.71 or less, even more preferably 0.68 or less, even more preferably 0.65 or less, and even more preferably 0.62 or less.

[0020] In the beer-taste beverage of the present invention, from the viewpoint of inhibiting a phenolic medicine-like flavor characteristic, the content of 4-ethyl-2,6-dimethoxyphenol is preferably 40 $\mu\text{g/L}$ or less, more preferably 35 $\mu\text{g/L}$ or less, even more preferably 30 $\mu\text{g/L}$ or less, even more preferably 25 $\mu\text{g/L}$ or less, even more preferably 20 $\mu\text{g/L}$ or less, even more preferably 15 $\mu\text{g/L}$ or less, even more preferably 10 $\mu\text{g/L}$ or less, even more preferably 5 $\mu\text{g/L}$ or less, and the lower limit value can be, for example, 0 $\mu\text{g/L}$ or more, 1 $\mu\text{g/L}$ or more and the like. The content of 4-ethyl-2,6-dimethoxyphenol can be reduced by not using *Brettanomyces* and the like other than a beer yeast in the fermentation process, or selecting a strain less generating them among *Brettanomyces*, or shortening the fermentation period by *Brettanomyces* and the like as much as possible. In the present specification, the content of 4-ethyl-2,6-dimethoxyphenol is measured by extracting a sample using

dichloromethane, concentrating by 100 times, and thereafter GC/MS (SIM method).

[0021] The “beer-taste beverage” as used herein refers to an alcoholic or non-alcoholic 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 beer flavor, unless specified otherwise. In the present specification, the “beer-taste alcoholic beverage” is a beer-taste beverage having an alcoholicity of 1 v/v % or more, and the “non-alcoholic beer-taste beverage” is a beer-taste beverage having an alcoholicity of less than 1 v/v %. The beer-taste beverage of the present invention may be a fermented beer-taste beverage which goes through a fermentation process using a yeast, and may also be a non-fermented beer-taste beverage which does not go through a fermentation process. The fermented beer-taste beverage may be a top-fermented beer-taste beverage which has been brewed through a fermentation process using a top-fermenting yeast, and may be a bottom-fermented beer-taste beverage which has been brewed through a fermentation process using a bottom-fermenting yeast, and may be a blend of these beer-taste beverages. In fermentation, a yeast (*Saccharomyces*) or a wild yeast (such as *Brettanomyces*) generating alcohol may be used, and a yeast (such as *Saccharomyces*) or a wild yeast (such as *Brettanomyces*) not producing alcohol, or a bacteria carrying out a lactic acid fermentation or a gluconic acid fermentation may be used. In a case of a fermented non-alcoholic beer-taste beverage, the non-alcoholic beer-taste beverage may be produced by a method in which a yeast is added and fermentation is

stopped so as to have an alcoholicity of less than 1 v/v %, or a method in which the fermented product is subjected to a dealcoholization step to have an alcoholicity of less than 1 v/v %.

[0022] The original wort extract (O-Ex) concentration (original extract concentration) in the beer-taste alcoholic beverage of the present invention can be preferably 0.1 w/w % or more and 35.0 w/w % or less, and preferably 35.0 w/w % or less, more preferably 34.5 w/w % or less, even more preferably 34.0 w/w % or less, even more preferably 33.5 w/w % or less, even more preferably 33.0 w/w % or less, even more preferably 32.5 w/w % or less, even more preferably 32.0 w/w % or less, even more preferably 31.5 w/w % or less, even more preferably 31.0 w/w % or less, even more preferably 30.5 w/w % or less, even more preferably 30.0 w/w % or less, even more preferably 29.5 w/w % or less, even more preferably 29.0 w/w % or less, even more preferably 28.5 w/w % or less, even more preferably 28.0 w/w % or less, even more preferably 27.5 w/w % or less, even more preferably 27.0 w/w % or less, even more preferably 26.5 w/w % or less, even more preferably 26.0 w/w % or less, even more preferably 25.5 w/w % or less, even more preferably 25.0 w/w % or less, even more preferably 24.5 w/w % or less, even more preferably 24.0 w/w % or less, even more preferably 23.5 w/w % or less, even more preferably 23.0 w/w % or less, even more preferably 22.5 w/w % or less, even more preferably 22.0 w/w % or less, even more preferably 21.5 w/w % or less, even more preferably 21.0 w/w % or less, even more preferably 20.5 w/w % or less, even more preferably 20.0 w/w % or less, even more preferably 19.5 w/w % or less, even more

preferably 19.0 w/w % or less, even more preferably 18.5 w/w % or less, even more preferably 18.0 w/w % or less, even more preferably 17.5 w/w % or less, even more preferably 17.0 w/w % or less, even more preferably 16.5 w/w % or less, and even more preferably 16.0 w/w % or less. In addition, the O-Ex concentration is preferably 0.1 w/w % or more, more preferably 1.0 w/w % or more, even more preferably 2.0 w/w % or more, even more preferably 3.0 w/w % or more, even more preferably 4.0 w/w % or more, even more preferably 5.0 w/w % or more, even more preferably 6.0 w/w % or more, even more preferably 7.0 w/w % or more, even more preferably 8.0 w/w % or more, even more preferably 9.0 w/w % or more, even more preferably 10.0 w/w % or more, even more preferably 11.0 w/w % or more, even more preferably 12.0 w/w % or more, even more preferably 13.0 w/w % or more, even more preferably 14.0 w/w % or more, even more preferably 14.5 w/w % or more, even more preferably 15.0 w/w % or more, and even more preferably 15.5 w/w % or more. In the present specification, the original wort extract (O-Ex) concentration is measured according to the method described in the revised BCOJ Beer Analysis Method (issued by Public Interest Incorporated Foundation, Brewing Society of Japan, edited by Brewers Association of Japan, Brewery Convention of Japan [Analysis Committee], revised and supplemented in 2013). The adjustment of the original wort extract (O-Ex) concentration can be carried out by appropriately setting the addition of diluting water or carbonated water, kinds of raw materials (a malt, corn grits, a liquid sugar or the like), an amount of raw materials, the filtration time of wort, pH of a wort filtrate, boiling time, boiling temperature or the

like.

[0023] The apparent extract (A-Ex) concentration (apparent extract concentration) in the beer-taste nonalcoholic beverage of the present invention is preferably 0.32 w/w % or more and 0.40 w/w % or less, and preferably 0.40 w/w % or less, more preferably 0.395 w/w % or less, even more preferably 0.390 w/w % or less, even more preferably 0.385 w/w % or less, even more preferably 0.380 w/w % or less, even more preferably 0.375 w/w % or less, even more preferably 0.370 w/w % or less, even more preferably 0.365 w/w % or less, and even more preferably 0.360 w/w % or less. In addition, the A-Ex concentration is preferably 0.320 w/w % or more, more preferably 0.325 w/w % or more, even more preferably 0.330 w/w % or more, even more preferably 0.335 w/w % or more, even more preferably 0.340 w/w % or more, even more preferably 0.345 w/w % or more, even more preferably 0.350 w/w % or more, and even more preferably 0.355 w/w % or more. In the present specification, the apparent extract (A-Ex) concentration is measured according to the method described in the revised BCOJ Beer Analysis Method (issued by Public Interest Incorporated Foundation, Brewing Society of Japan, edited by Brewers Association of Japan, Brewery Convention of Japan [Analysis Committee], revised and supplemented in 2013). The adjustment of the apparent extract (A-Ex) concentration can be carried out by appropriately setting the addition of diluting water or carbonated water, kinds of raw materials (a malt, corn grits, a liquid sugar or the like), an amount of raw materials, the filtration time of wort, pH of a wort filtrate, boiling time, boiling temperature or the like.

[0024] The apparent attenuation (AA) in the beer-taste beverage of the present invention can be 120.0% or less, 119.0% or less, 118.0% or less, 117.0% or less, 116.0% or less, 115.0% or less, 114.0% or less, 113.0% or less, 112.0% or less, 111.0% or less, 110.0% or less, 109.0% or less, 108.0% or less, 107.0% or less, 106.0% or less, 105.0% or less, 104.0% or less, 103.0% or less, 102.8% or less, 102.6% or less, 102.4% or less, 102.2% or less, 102.0% or less, 101.8% or less, 101.6% or less, 101.4% or less, 101.2% or less, 101.0% or less, 100.8% or less, 100.6% or less, 100.4% or less, 100.2% or less, 100.0% or less, 99.8% or less, 99.6% or less, 99.4% or less, 99.2% or less, 99.0% or less, 98.8% or less, 98.6% or less, 98.4% or less, 98.2% or less, 98.0% or less, 97.8% or less, 97.6% or less, 97.4% or less, 97.2% or less, 97.0% or less, 96.8% or less, 96.6% or less, 96.4% or less, 96.2% or less, 96.0% or less, 95.8% or less, 95.6% or less, 95.4% or less, 95.2% or less, 95.0% or less, 94.8% or less, 94.6% or less, 94.4% or less, 94.2% or less, 94.0% or less, 93.8% or less, 93.6% or less, 93.4% or less, 93.2% or less, 93.0% or less, 92.8% or less, 92.6% or less, 92.4% or less, 92.2% or less, 92.0% or less, 91.8% or less, 91.6% or less, 91.4% or less, 91.2% or less, 90.8% or less, 90.6% or less, 90.4% or less, 90.2% or less, 90.0% or less, 89.8% or less, 89.6% or less, 89.4% or less, 89.2% or less, 89.0% or less, 88.8% or less, 88.6% or less, 88.4% or less, 88.2% or less, 88.0% or less, 87.8% or less, 87.6% or less, 87.4% or less, 87.2% or less, 87.0% or less, 86.8% or less, 86.6% or less, 86.4% or less, 86.2% or less, 86.0% or less, 85.8% or less, 85.6% or less, 85.4% or less, 85.2% or less, 85.0% or less, 84.8% or less, 84.6% or less, 84.4% or less, 84.2% or less, 84.0% or less, 83.8% or less, 83.6% or less, 83.4% or

less, 83.2% or less, 83.0% or less, 82.8% or less, 82.6% or less, 82.4% or less, 82.2% or less, 82.0% or less, 81.8% or less, 81.6% or less, 81.4% or less, 81.2% or less, 81.0% or less, 80.8% or less, 80.6% or less, 80.4% or less, 80.2% or less, 80.0% or less, 79.8% or less, 79.6% or less, 79.4% or less, 79.2% or less, 79.0% or less, 78.8% or less, 78.6% or less, 78.4% or less, 78.2% or less, 78.0% or less, 77.8% or less, 77.6% or less, 77.4% or less, 77.2% or less, 77.0% or less, 76.8% or less, 76.6% or less, 76.4% or less, 76.2% or less, 76.0% or less, 75.5% or less, 75.0% or less, 74.5% or less, 74.0% or less, 73.5% or less, 73.0% or less, 72.5% or less and 72.0% or less. In addition, the AA can be 20.0% or more, 25.0% or more, 30.0% or more, 35.0% or more, 40.0% or more, 45.0% or more, 50.0% or more, 55.0% or more, 60.0% or more, 65.0% or more or 70.0% or more. In the present specification, the apparent attenuation (AA) is measured according to the method described in the revised BCOJ Beer Analysis Method (issued by Public Interest Incorporated Foundation, Brewing Society of Japan, edited by Brewers Association of Japan, Brewery Convention of Japan [Analysis Committee], revised and supplemented in 2013). The adjustment of the apparent attenuation (AA) can be carried out by appropriately setting kinds of raw materials (a malt, corn grits, a liquid sugar or the like), an amount of raw materials, kinds of enzymes, an added amount of enzymes (including carbohydrate degrading enzyme and isomerase), a timing of addition of enzymes, saccharification time, pH at a time of saccharification, pH in the mashing process (a process for producing a wort from supplying malts and before addition of yeast), the filtration time of wort, setting temperature, maintaining time or the like of

each temperature region upon producing a wort (including a time of saccharification), a concentration of original extract of pre-fermentation liquid, a concentration of original extract at a fermentation process, fermentation condition (oxygen concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature, fermentation time, setting of pressure, carbon dioxide concentration, or the like), or the like.

[0025] The alcoholicity (alcohol content) of the beer-taste beverage of the present invention is preferably 1.0 v/v % or more and 20.0 v/v % or less, and the alcoholicity can be, for example, 1.0 v/v % or more, 2.0 v/v % or more, 2.5 v/v % or more, 3.0 v/v % or more, 3.5 v/v % or more, 4.0 v/v % or more, 4.1 v/v % or more, 4.2 v/v % or more, 4.3 v/v % or more, 4.4 v/v % or more, 4.5 v/v % or more, 4.6 v/v % or more, 4.7 v/v % or more, 4.8 v/v % or more, 4.9 v/v % or more, 5.0 v/v % or more, 5.1 v/v % or more, 5.2 v/v % or more, 5.3 v/v % or more, 5.4 v/v % or more, 5.5 v/v % or more, 5.6 v/v % or more, 5.7 v/v % or more, 5.8 v/v % or more, 5.9 v/v % or more, 6.0 v/v % or more, 6.1 v/v % or more, 6.2 v/v % or more, 6.3 v/v % or more, 6.4 v/v % or more, 6.5 v/v % or more, 6.6 v/v % or more, 6.7 v/v % or more, 6.8 v/v % or more, 6.9 v/v % or more, 7.0 v/v % or more, 7.1 v/v % or more, 7.2 v/v % or more, 7.3 v/v % or more, 7.4 v/v % or more, 7.5 v/v % or more, 7.6 v/v % or more, 7.7 v/v % or more, 7.8 v/v % or more, 7.9 v/v % or more, 8.0 v/v % or more, 8.1 v/v % or more, 8.2 v/v % or more, 8.3 v/v % or more, 8.4 v/v % or more, 8.5 v/v % or more, 8.6 v/v % or more, 8.7 v/v % or more, 8.8 v/v % or more, and 8.9

v/v % or more. The alcoholicity can be 20.0 v/v % or less, 19.5 v/v % or less, 19.0 v/v % or less, 18.5 v/v % or less, 18.0 v/v % or less, 17.5 v/v % or less, 17.0 v/v % or less, 16.9 v/v % or less, 16.8 v/v % or less, 16.7 v/v % or less, 16.6 v/v % or less, 16.5 v/v % or less, 16.4 v/v % or less, 16.3 v/v % or less, 16.2 v/v % or less, 16.1 v/v % or less, 16.0 v/v % or less, 15.9 v/v % or less, 15.8 v/v % or less, 15.7 v/v % or less, 15.6 v/v % or less, 15.5 v/v % or less, 15.4 v/v % or less, 15.3 v/v % or less, 15.2 v/v % or less, 15.1 v/v % or less, 15.0 v/v % or less, 14.9 v/v % or less, 14.8 v/v % or less, 14.7 v/v % or less, 14.6 v/v % or less, 14.5 v/v % or less, 14.4 v/v % or less, 14.3 v/v % or less, 14.2 v/v % or less, 14.1 v/v % or less, 14.0 v/v % or less, 13.9 v/v % or less, 13.8 v/v % or less, 13.7 v/v % or less, 13.6 v/v % or less, 13.5 v/v % or less, 13.4 v/v % or less, 13.3 v/v % or less, 13.2 v/v % or less, 13.1 v/v % or less, 13.0 v/v % or less, 12.9 v/v % or less, 12.8 v/v % or less, 12.7 v/v % or less, 12.6 v/v % or less, 12.5 v/v % or less, 12.4 v/v % or less, 12.3 v/v % or less, 12.2 v/v % or less, 12.1 v/v % or less, 12.0 v/v % or less, 11.9 v/v % or less, 11.8 v/v % or less, 11.7 v/v % or less, 11.6 v/v % or less, 11.5 v/v % or less, 11.4 v/v % or less, 11.3 v/v % or less, 11.2 v/v % or less, 11.1 v/v % or less, 11.0 v/v % or less, 10.9 v/v % or less, 10.8 v/v % or less, 10.7 v/v % or less, 10.6 v/v % or less, 10.5 v/v % or less, 10.4 v/v % or less, 10.3 v/v % or less, 10.2 v/v % or less, 10.1 v/v % or less, 10.0 v/v % or less, 9.9 v/v % or less, 9.8 v/v % or less, 9.7 v/v % or less, 9.6 v/v % or less, 9.5 v/v % or less, 9.4 v/v % or less, 9.3 v/v % or less, 9.2 v/v % or less, 9.1 v/v % or less, or 9.0 v/v % or less. The alcoholicity (alcohol content) in the beer-taste beverage of the present invention is preferably

less than 0.0050 v/v %. In the present specification, the alcoholicity (alcohol content) is measured according to a method described in the revised BCOJ Beer Analysis Method (issued by Public Interest Incorporated Foundation, Brewing Society of Japan, edited by Brewers Association of Japan, Brewery Convention of Japan [Analysis Committee],
5 revised and supplemented in 2013).

[0026] The pH in the beer-taste beverage of the present invention is preferably 2.5 or more and 5.0 or less, and the pH may be 2.6 or more, 2.7 or more, 2.8 or more, 2.9 or more, 2.95 or more, 3.0 or more, 3.05 or more,
10 3.1 or more, 3.15 or more, 3.2 or more, 3.25 or more, 3.3 or more or 3.35 or more. The pH may be 4.9 or less, 4.8 or less, 4.7 or less, 4.6 or less, 4.55 or less, 4.5 or less, 4.45 or less, 4.4 or less, 4.35 or less, 4.3 or less, 4.25 or less, 4.2 or less, 4.15 or less, 4.1 or less, 4.05 or less, 4.0 or less, 3.95 or less, 3.9 or less, 3.85 or less, 3.8 or less, 3.75 or less, 3.7 or less,
15 3.65 or less, 3.6 or less, 3.55 or less, 3.5 or less, 3.45 or less or 3.4 or less. The adjustment of pH can be carried out by appropriately setting an added amount of acetic acid or lactic acid, an added amount of diluting water or carbonated water, or the like. Further, the adjustment of pH can be carried out by appropriately setting kinds of raw materials (malts, corn grits, liquid
20 sugar and the like), an amount of raw materials, kinds of enzymes, an added amount of enzymes, a timing of addition of enzymes, saccharification time in a mash tank, proteolysis time in a mash tank, pH in a mash tank, pH in the mashing process (a process for producing a wort from supplying malts and before addition of yeast), kinds of acid used
25 upon adjusting pH (acetic acid, lactic acid, phosphoric acid, malic acid,

tartaric acid, citric acid or the like), an added amount of acid used upon adjusting pH, timing of adjusting pH (at a time of mashing, at a time of fermentation, at a time of completion of fermentation, before filtration of beer, after filtration of beer, or the like), setting temperature and maintaining time of each temperature region upon producing a wort (including a time of saccharification), a concentration of original extract of pre-fermentation liquid, a concentration of original extract at a fermentation process, fermentation condition (oxygen concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature, fermentation time, setting of pressure, carbon dioxide concentration, or the like), or the like. In the present specification, the pH of the beer-taste beverage is measured according to the method described in section 8.7 pH of the revised BCOJ Beer Analysis Method (issued by Public Interest Incorporated Foundation, Brewing Society of Japan, edited by Brewers Association of Japan, Brewery Convention of Japan [Analysis Committee], revised and supplemented in 2013).

[0027] The chromaticity in the beer-taste beverage of the present invention is preferably 0.5 EBC or more and 70 EBC or less, but the chromaticity may be, for example, 5 EBC or more, 10 EBC or more, 15 EBC or more, 20 EBC or more, 25 EBC or more, 30 EBC or more or 35 EBC or more, and the chromaticity may be 65 EBC or less or 60 EBC or less. In the present specification, chromaticity is measured according to the method described in Section 8.8 Chromaticity of the revised BCOJ Beer Analysis Method (issued by Public Interest Incorporated Foundation, Brewing

Society of Japan, edited by Brewers Association of Japan, Brewery Convention of Japan [Analysis Committee], revised and supplemented in 2013). The adjustment of chromaticity can be carried out by appropriately setting addition of diluting water or carbonated water, kinds of raw materials (malts, corn grits, liquid sugar and the like), an amount of raw materials, temperature at a time of mashing, pH at a time of mashing, time of mashing, time of filtration of wort, pH of a wort filtrate, boiling time, boiling temperature, an amount of coloring ingredients such as caramel pigment, manner of filtration of beer (diatomite filtration, various membrane filtration, or the like), a filtrated amount of filtration of beer, or the like.

[0028] The bitterness unit in the beer-taste beverage of the present invention may be, for example, 0.5 BUs or more, 1 BUs or more, 1.5 BUs or more, 2 BUs or more, 2.5 BUs or more, 3 BUs or more, 3.5 BUs or more, 4 BUs or more, 4.5 BUs or more, 5 BUs or more, 5.5 BUs or more, 6.0 BUs or more, 6.5 BUs or more, 7.0 BUs or more, 7.5 BUs or more or 8.0 BUs or more, and also the bitterness unit may be 30 BUs or less, 25 BUs or less, 20 BUs or less, 15 BUs or less, 14 BUs or less, 13 BUs or less, 12 BUs or less, 11 BUs or less, 10 BUs or less, 9 BUs or less or 8.5 BUs or less. In the present specification, the bitterness unit is measured according to the method described in “Section 8.15 Bitterness Unit of BCOJ Beer Analysis Method (revised on November 1, 2004).” Specifically, an acid is added to a degassed sample before extraction with isooctane, an absorbance of the obtained isooctane layer is measured at 275 nm using isooctane as a control, and the absorbance is multiplied by a

factor, thereby being able to obtain a bitterness unit (BU). The bitterness unit depends on the content of iso- α acid contained in a beverage. An iso- α acid is obtained by isomerizing α acid contained in a hop. The amount of the iso- α acid can be controlled by species of hops, a used amount of hop, a timing of addition of a hop, temperature at an addition of a hop and maintaining time at the temperature zone, pH at a time of addition of a hop, a concentration of an original extract of pre-fermentation liquid, a concentration of an original extract in the fermentation process, fermentation conditions (oxygen concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature, fermentation time, setting of pressure, carbon dioxide concentration, and the like) or the like, the condition of filtration of beer, addition of diluting water, addition of carbonated water, or the like. In addition, the bitterness unit can be adjusted by a commercially available hop-processed product (iso- α acid or the like) or the like, and the bitterness unit can be adjusted by amount, kinds or timing of addition of the hop-processed product, temperature at the time of addition and maintaining time at the temperature zone, pH at the time of addition, a concentration of an original extract of pre-fermentation liquid, a concentration of an original extract at the fermentation process, fermentation conditions (oxygen concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature, fermentation time, setting of pressure, carbon dioxide concentration, and the like), or the like, the condition of filtration

of beer, addition of diluting water, addition of carbonated water, or the like. A pellet hop in which a hop is pelleted, a hop extract in which a hop is extracted, or a hop bract may be used as a hop. The hop or hop-processed product may be used alone or in combination.

5 [0029] The total nitrogen amount in the beer-taste beverage of the present invention may be, for example, 1 mg/100 mL or more, 5 mg/100 mL or more, 10 mg/100 mL or more, 15 mg/100 mL or more, 20 mg/100 mL or more, 25 mg/100 mL or more, 30 mg/100 mL or more, 35 mg/100 mL or more, 40 mg/100 mL or more, 45 mg/100 mL or more, 50 mg/100 mL or more, 55 mg/100 mL or more, 60 mg/100 mL or more, 65 mg/100 mL or more, 70 mg/100 mL or more, 75 mg/100 mL or more, 80 mg/100 mL or more, 85 mg/100 mL or more, 90 mg/100 mL or more, 95 mg/100 mL or more, 100 mg/100 mL or more, 105 mg/100 mL or more, 110 mg/100 mL or more, 115 mg/100 mL or more or 120 mg/100 mL or more. The total
10 nitrogen amount may be 300 mg/100 mL or less, 275 mg/100 mL or less, 250 mg/100 mL or less, 225 mg/100 mL or less, 200 mg/100 mL or less, 175 mg/100 mL or less, 170 mg/100 mL or less, 160 mg/100 mL or less, 150 mg/100 mL or less, 140 mg/100 mL or less, 130 mg/100 mL or less, 125 mg/100 mL or less, 120 mg/100 mL or less, 115 mg/100 mL or less, 110 mg/100 mL or less, 105 mg/100 mL or less, 100 mg/100 mL or less, 95 mg/100 mL or less, 90 mg/100 mL or less, 85 mg/100 mL or less, 80 mg/100 mL or less or 75 mg/100 mL or less. The total nitrogen amount is a total amount of all nitrogen compounds such as proteins or amino acids. In the present specification, the total nitrogen amount is measured
15 according to the method described in Section 8.9 Total Nitrogen of the

revised BCOJ Beer Analysis Method (issued by Public Interest Incorporated Foundation, Brewing Society of Japan, edited by Brewers Association of Japan, Brewery Convention of Japan [Analysis Committee], revised and supplemented in 2013). The adjustment of total nitrogen amount can be carried out by appropriately setting a condition of filtration of beer such as addition of diluting water or carbonated water, kinds of raw materials (malts, corn grits, liquid sugar and the like), an amount of raw materials, kinds of enzymes, an added amount of enzymes (including proteolysis enzyme and the like), temperature upon enzymatic reaction, timing of the addition of enzymes, proteolysis time in a mash tank, pH in a mash tank, temperature in a mash tank, pH in the mashing process (a process for producing a wort from supplying malts and before addition of yeast), temperature at the mashing process, temperature upon filtration of wort, time of filtration of wort, pH at the time of filtration of a wort, an amount of sparging water used upon filtration of a wort, setting temperature and maintaining time of each temperature region upon producing a wort, boiling time and pH at boiling process, a concentration of an original extract of pre-fermentation liquid, a concentration of an original extract at the fermentation process, fermentation conditions (oxygen concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature, fermentation time, setting of pressure, carbon dioxide concentration, and the like).

[0030] The total polyphenol amount in the beer-taste beverage of the present invention can be, for example, 10 ppm by mass or more, 20 ppm

by mass or more, 30 ppm by mass or more, 40 ppm by mass or more, 50 ppm by mass or more, 60 ppm by mass or more, 70 ppm by mass or more, 80 ppm by mass or more, 90 ppm by mass or more, 100 ppm by mass or more, 110 ppm by mass or more, 120 ppm by mass or more, 130 ppm by mass or more, 140 ppm by mass or more, 150 ppm by mass or more, 160 ppm by mass or more or 170 ppm by mass or more, and 400 ppm by mass or less, 380 ppm by mass or less, 360 ppm by mass or less, 340 ppm by mass or less, 320 ppm by mass or less, 300 ppm by mass or less, 280 ppm by mass or less, 260 ppm by mass or less, 240 ppm by mass or less, 220 ppm by mass or less, 210 ppm by mass or less, 200 ppm by mass or less, 190 ppm by mass or less or 180 ppm by mass or less. In the present specification, the total polyphenol amount is measured according to the method described in Section 8.19 Total Polyphenol of the revised BCOJ Beer Analysis Method (issued by Public Interest Incorporated Foundation, Brewing Society of Japan, edited by Brewers Association of Japan, Brewery Convention of Japan [Analysis Committee], revised and supplemented in 2013). The adjustment of the total polyphenol amount can be carried out by appropriately setting addition of diluting water or carbonated water, kinds of raw materials (raw materials containing polyphenol such as a malt), an amount of raw materials, kinds of enzymes, an added amount of enzymes, timing of addition of enzymes, pH in a mash tank, pH in the mashing process (a process for producing a wort from supplying malts and before addition of yeast), time of filtration of a wort, setting temperature and maintaining time of each temperature region upon producing a wort (including a time of saccharification), a concentration of

an original extract of pre-fermentation liquid, a concentration of an original extract in the fermentation process, fermentation conditions (oxygen concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature, fermentation time, setting of pressure, carbon dioxide concentration, and the like) or the like. In addition, the total polyphenol amount of the beer-taste beverage of the present invention can be controlled by adjusting, for example, a used amount of raw materials having a large polyphenol content such as a barley malt or a husk (hull) of a malt. Specifically, the total polyphenol amount can be increased by increasing a used amount of raw materials having a large polyphenol content such as a malt.

[0031] The content of pyroglutamic acid in the beer-taste beverage of the present invention is preferably 5 ppm by mass or more and 500 ppm by mass or less, and the content of pyroglutamic acid can be, for example, 5 ppm by mass or more, 25 ppm by mass or more, 45 ppm by mass or more, 65 ppm by mass or more, 85 ppm by mass or more, 100 ppm by mass or more, 120 ppm by mass or more, 140 ppm by mass or more, 160 ppm by mass or more or 180 ppm by mass or more or 200 ppm by mass or more. In addition, the content of pyroglutamic acid can be 500 ppm by mass or less, 480 ppm by mass or less, 460 ppm by mass or less, 440 ppm by mass or less, 420 ppm by mass or less, 400 ppm by mass or less, 380 ppm by mass or less, 360 ppm by mass or less, 340 ppm by mass or less, 320 ppm by mass or less, 300 ppm by mass or less, 280 ppm by mass or less, 260 ppm by mass or less, 240 ppm by mass or less or 220 ppm by mass or less.

In the present specification, the content of pyroglutamic acid can be adjusted by fermentation condition and the like, and can be measured by a high-performance liquid chromatography.

[0032] The content of free amino nitrogen (FAN) in the beer-taste beverage of the present invention can be 1.0 mg/100 mL or more, 2.0 mg/100 mL or more, 3.0 mg/100 mL or more, 4.0 mg/100 mL or more, 5.0 mg/100 mL or more, 6.0 mg/100 mL or more, 7.0 mg/100 mL or more, 8.0 mg/100 mL or more, 9.0 mg/100 mL or more, 10.0 mg/100 mL or more, 11.0 mg/100 mL or more, 12.0 mg/100 mL or more, 13.0 mg/100 mL or more, 14.0 mg/100 mL or more, 15.0 mg/100 mL or more, 16.0 mg/100 mL or more, 17.0 mg/100 mL or more, 18.0 mg/100 mL or more, 19.0 mg/100 mL or more or 20.0 mg/100 mL or more. In addition, the content of FAN can be 30.0 mg/100 mL or less, 25.0 mg/100 mL or less, 24.0 mg/100 mL or less, 23.0 mg/100 mL or less, 22.0 mg/100 mL or less or 21.0 mg/100 mL or less. In the present specification, the content of FAN is measured by the method described in Section 8.18 Free Amino Nitrogen of the revised BCOJ Beer Analysis Method (issued by Public Interest Incorporated Foundation, Brewing Society of Japan, edited by Brewers Association of Japan, Brewery Convention of Japan [Analysis Committee], revised and supplemented in 2013). The adjustment of the content of FAN can be carried out by appropriately setting addition of diluting water or carbonated water, kinds of raw materials (malts, corn grits, liquid sugar and the like), an amount of raw materials, kinds of enzymes, an added amount of enzymes (including proteolysis enzyme or the like), timing of addition of enzymes, proteolysis time in a mash tank, pH in a mash tank,

pH in the mashing process (a process for producing a wort from supplying malts and before addition of yeast), time of filtration of a wort, setting temperature and maintaining time of each temperature region upon producing a wort, boiling time and pH in the boiling process, a
 5 concentration of an original extract of pre-fermentation liquid, a concentration of an original extract in the fermentation process, fermentation conditions (oxygen concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature,
 10 fermentation time, setting of pressure, carbon dioxide concentration, and the like) or the like.

[0033] The content of iso- α acid in the beer-taste beverage of the present invention is preferably 0.02 ppm by mass or more, more preferably 0.03 ppm by mass or more, even more preferably 0.04 ppm by mass or more,
 15 even more preferably 0.05 ppm by mass or more, even more preferably 0.06 ppm by mass or more, even more preferably 0.07 ppm by mass or more, even more preferably 0.08 ppm by mass or more, even more preferably 0.09 ppm by mass or more, even more preferably 0.10 ppm by mass or more, even more preferably 0.11 ppm by mass or more, even more
 20 preferably 0.12 ppm by mass or more, even more preferably 0.13 ppm by mass or more, even more preferably 0.14 ppm by mass or more, even more preferably 0.15 ppm by mass or more, even more preferably 0.16 ppm by mass or more, even more preferably 0.17 ppm by mass or more, even more preferably 0.18 ppm by mass or more, even more preferably 0.19 ppm by
 25 mass or more, even more preferably 0.20 ppm by mass or more, even more

preferably 0.21 ppm by mass or more, even more preferably 0.22 ppm by mass or more, even more preferably 0.23 ppm by mass or more, even more preferably 0.24 ppm by mass or more, even more preferably 0.25 ppm by mass or more, even more preferably 0.26 ppm by mass or more, even more preferably 0.27 ppm by mass or more, even more preferably 0.28 ppm by mass or more, even more preferably 0.29 ppm by mass or more, even more preferably 0.30 ppm by mass or more, even more preferably 0.31 ppm by mass or more, even more preferably 0.32 ppm by mass or more, even more preferably 0.33 ppm by mass or more, even more preferably 0.34 ppm by mass or more, even more preferably 0.35 ppm by mass or more, even more preferably 0.36 ppm by mass or more, even more preferably 0.37 ppm by mass or more, even more preferably 0.38 ppm by mass or more, even more preferably 0.39 ppm by mass or more, even more preferably 0.40 ppm by mass or more, even more preferably 0.41 ppm by mass or more, even more preferably 0.42 ppm by mass or more, even more preferably 0.43 ppm by mass or more, even more preferably 0.44 ppm by mass or more, even more preferably 0.45 ppm by mass or more, even more preferably 0.46 ppm by mass or more, even more preferably 0.47 ppm by mass or more, even more preferably 0.48 ppm by mass or more, even more preferably 0.49 ppm by mass or more, even more preferably 0.50 ppm by mass or more, even more preferably 0.51 ppm by mass or more, even more preferably 0.52 ppm by mass or more, even more preferably 0.53 ppm by mass or more, even more preferably 0.54 ppm by mass or more, even more preferably 0.55 ppm by mass or more, even more preferably 0.56 ppm by mass or more, even more preferably 0.57 ppm by mass or more, even more preferably 0.58 ppm by

mass or more, even more preferably 0.59 ppm by mass or more, even more preferably 0.60 ppm by mass or more, even more preferably 0.65 ppm by mass or more, even more preferably 0.70 ppm by mass or more, even more preferably 0.75 ppm by mass or more, even more preferably 0.80 ppm by mass or more, even more preferably 0.85 ppm by mass or more, even more preferably 0.90 ppm by mass or more, even more preferably 0.95 ppm by mass or more, even more preferably 1.00 ppm by mass or more, even more preferably 2.00 ppm by mass or more, even more preferably 3.00 ppm by mass or more, even more preferably 4.00 ppm by mass or more, even more preferably 5.00 ppm by mass or more, even more preferably 6.00 ppm by mass or more, even more preferably 7.00 ppm by mass or more, even more preferably 8.00 ppm by mass or more, even more preferably 9.00 ppm by mass or more, even more preferably 10.00 ppm by mass or more, even more preferably 11.00 ppm by mass or more, even more preferably 12.00 ppm by mass or more, even more preferably 13.00 ppm by mass or more, even more preferably 14.00 ppm by mass or more, even more preferably 15.00 ppm by mass or more, even more preferably 16.00 ppm by mass or more, even more preferably 17.00 ppm by mass or more, even more preferably 18.00 ppm by mass or more, even more preferably 19.00 ppm by mass or more or even more preferably 20.00 ppm by mass or more. In addition, the content of iso- α acid is preferably 50.00 ppm by mass or less, more preferably 49.00 ppm by mass or less, even more preferably 48.00 ppm by mass or less, even more preferably 47.00 ppm by mass or less, even more preferably 46.00 ppm by mass or less, even more preferably 45.00 ppm by mass or less, even more preferably 44.00 ppm by mass or

less, even more preferably 43.00 ppm by mass or less, even more preferably 42.00 ppm by mass or less, even more preferably 41.00 ppm by mass or less, even more preferably 40.00 ppm by mass or less, even more preferably 39.00 ppm by mass or less, even more preferably 38.00 ppm by mass or less, even more preferably 37.00 ppm by mass or less, even more preferably 36.00 ppm by mass or less, even more preferably 35.00 ppm by mass or less, even more preferably 34.00 ppm by mass or less, even more preferably 33.00 ppm by mass or less, even more preferably 32.00 ppm by mass or less, even more preferably 31.00 ppm by mass or less, even more preferably 30.00 ppm by mass or less, even more preferably 29.00 ppm by mass or less, even more preferably 28.00 ppm by mass or less, even more preferably 27.00 ppm by mass or less, even more preferably 26.00 ppm by mass or less, even more preferably 25.00 ppm by mass or less, even more preferably 24.00 ppm by mass or less, even more preferably 23.00 ppm by mass or less, even more preferably 22.00 ppm by mass or less, even more preferably 21.00 ppm by mass or less or even more preferably 20.00 ppm by mass or less. In the present specification, the content of iso- α acid is measured according to the method described in Comprehensive Sensomics Analysis of Hop-Derived Bitter Compounds during Storage of Beer (D. Intelmann, 2011). The content of iso- α acid can be adjusted by species of hops, a used amount of a hop, a timing of addition of a hop, the temperature upon addition of a hop and maintaining time at the temperature zone, pH upon addition of a hop, a concentration of an original extract of pre-fermentation liquid, a concentration of an original extract in the fermentation process, fermentation conditions (oxygen

concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature, fermentation time, setting of pressure, carbon dioxide concentration, and the like) or the like, a condition of filtration of beer, addition of diluting water, addition of carbonated water, or the like. In addition, the content can be adjusted by a commercially available hop-processed product (iso- α acid or the like) or the like, and the content can be adjusted by amount, kinds or timing of addition, temperature upon addition and maintaining time at the temperature zone, pH at the time of addition, a concentration of an original extract of pre-fermentation liquid, a concentration of an original extract in the fermentation process, fermentation conditions (oxygen concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature, fermentation time, setting of pressure, carbon dioxide concentration, and the like) or the like, the condition of filtration of beer, addition of diluting water, addition of carbonated water, or the like. A pellet hop in which a hop is pelleted, a hop extract in which a hop is extracted, or a hop bract may be used as a hop. The hop and hop-processed product may be used alone or in combination.

[0034] The content of isoamyl acetate in the beer-taste beverage of the present invention can be, for example, 1 ppm by mass or more, 2 ppm by mass or more, 3 ppm by mass or more, 4 ppm by mass or more, 5 ppm by mass or more, 7 ppm by mass or more, 9 ppm by mass or more, 10 ppm by mass or more, 20 ppm by mass or more, 30 ppm by mass or more, 40 ppm

by mass or more, 50 ppm by mass or more, 60 ppm by mass or more, 70 ppm by mass or more, 80 ppm by mass or more, 90 ppm by mass or more or 100 ppm by mass or more, and can be 200 ppm by mass or less, 190 ppm by mass or less, 180 ppm by mass or less, 170 ppm by mass or less, 160 ppm by mass or less, 150 ppm by mass or less, 140 ppm by mass or less, 130 ppm by mass or less, 120 ppm by mass or less or 110 ppm by mass or less. In the present specification, the content of isoamyl acetate is measured by a gas chromatography. The adjustment of the content of isoamyl acetate can be carried out by appropriately setting addition of diluting water or carbonated water, addition of isoamyl acetate-containing flavor, an amount of isoamyl acetate-containing flavor, an amount of isoamyl acetate-containing raw materials, addition of isoamyl acetate-containing raw materials, kinds of raw materials containing isoamyl acetate, an amount of a substrate of isoamyl acetate, an amount of raw materials which are a substrate of isoamyl acetate, an amount of raw materials, kinds of raw materials, kinds of enzymes, an added amount of enzymes, the timing of addition of enzymes, saccharification time in a mash tank, proteolysis time in a mash tank, pH in a mash tank, pH in the mashing process (a process for producing a wort from supplying malts and before addition of yeast), an added amount of acid used upon adjusting pH, timing of adjusting pH (at a time of mashing, at a time of fermentation, at a time of completion of fermentation, before filtration of beer, after filtration of beer, or the like), setting temperature and maintaining time of each temperature region upon producing a wort (including a time of saccharification), a concentration of an original extract of pre-fermentation

liquid, a concentration of an original extract in the fermentation process, fermentation conditions (oxygen concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature, fermentation time, setting of pressure, carbon dioxide concentration, and the like) or the like.

[0035] The content of isoamyl alcohol in the beer-taste beverage of the present invention can be 1.0 ppm by mass or more, 2.0 ppm by mass or more, 3.0 ppm by mass or more, 4.0 ppm by mass or more, 5.0 ppm by mass or more, 6.0 ppm by mass or more, 7.0 ppm by mass or more, 8.0 ppm by mass or more, 9.0 ppm by mass or more, 10.0 ppm by mass or more, 15.0 ppm by mass or more, 20.0 ppm by mass or more, 30.0 ppm by mass or more, 40.0 ppm by mass or more, 50.0 ppm by mass or more, 60.0 ppm by mass or more, 70.0 ppm by mass or more, 80.0 ppm by mass or more, 85.0 ppm by mass or more, 90.0 ppm by mass or more, 95.0 ppm by mass or more, 100.0 ppm by mass or more, 105.0 ppm by mass or more, 110.0 ppm by mass or more, 115.0 ppm by mass or more or 120.0 ppm by mass or more. In addition, the content of isoamyl alcohol can be 300.0 ppm by mass or less, 250.0 ppm by mass or less, 200.0 ppm by mass or less, 190.0 ppm by mass or less, 180.0 ppm by mass or less, 170.0 ppm by mass or less, 160.0 ppm by mass or less, 150.0 ppm by mass or less, 140.0 ppm by mass or less or 130.0 ppm by mass or less. In the present specification, the content of isoamyl alcohol is measured by a gas chromatography. The adjustment of the content of isoamyl alcohol can be carried out by appropriately setting addition of diluting water or

carbonated water, addition of isoamyl alcohol-containing flavor, an amount of isoamyl alcohol-containing flavor, an amount of isoamyl alcohol-containing raw materials, addition of isoamyl alcohol-containing raw materials, kinds of raw materials containing isoamyl alcohol, an amount of a substrate of isoamyl alcohol, an amount of raw materials which are a substrate of isoamyl alcohol, an amount of raw materials, kinds of raw materials, kinds of enzymes, an added amount of enzymes, the timing of addition of enzymes, saccharification time in a mash tank, proteolysis time in a mash tank, pH in a mash tank, pH in the mashing process (a process for producing a wort from supplying malts and before addition of yeast), an added amount of acid used upon adjusting pH, timing of adjusting pH (at a time of mashing, at a time of fermentation, at a time of completion of fermentation, before filtration of beer, after filtration of beer, or the like), setting temperature and maintaining time of each temperature region upon producing a wort (including a time of saccharification), a concentration of an original extract of pre-fermentation liquid, a concentration of an original extract in the fermentation process, fermentation conditions (oxygen concentration, ventilation condition, species of yeasts, an added amount of yeasts, the number of yeasts which proliferated, timing of removal of yeasts, fermentation temperature, fermentation time, setting of pressure, carbon dioxide concentration, and the like) or the like.

[0036] As a main raw material in the beer-taste beverage of the present invention, a malt may be used together with water, and a malt may not be used. Further, a hop may be used, and besides, a preservative, a sweetener,

a water-soluble dietary fiber, a bittering agent or a bitterness giving agent, an antioxidant, a flavor, an acidulant, salts, spirits, or the like may be used.

[0037] The malt refers to ones obtained by germinating, drying and root-removing the seeds of barley, wheat, rye, common wild oat, oat, Job's tears or *Avena sativa*, and the origin or variety thereof may not be limited, and a barley malt is preferable. The barley malt is one of malts most commonly used as a raw material of a beer-taste beverage in Japan. The barley has varieties such as two-row barley and six-row barley, and either of them may be used. Further, besides the normal malts, colored malts can be used. Incidentally, when the colored malts are used, colored malts in different varieties may be appropriately combined and used, or one kind of colored malt may be used.

[0038] In addition, grains other than malts, a protein, a yeast extract, a liquid sugar and the like may be used together with malts. The grains include, for example, barley, wheat, rye, common wild oat, oat, Job's tears, *Avena sativa* and the like not falling under malts, rice (white rice, brown rice and the like), maize (corn grits and the like), *Sorghum bicolor* (*Kaoliang*), potatoes, bean (soybean, green pea and the like), buckwheat, sorghum, foxtail millet, Japanese barnyard millet, and a starch obtained therefrom, an extract of the above, and the like. Among them, maize (corn grits and the like) is preferably used. In addition, the protein includes a soybean protein, a green pea protein, a yeast extract, a degraded product thereof, and the like.

[0039] Incidentally, when malts are not used, the beer-taste beverage includes a beer-taste beverage obtained by using a liquid sugar containing

a carbon source, and a nitrogen source as an amino acid-containing material (for example, a soybean protein and the like) such as the grains mentioned above other than malts.

[0040] The hop includes, for example, a pellet hop, a powder hop, a hop extract and the like. In addition, a hop processed product such as an isomerized hop and a reduced hop may be used as a hop.

[0041] The preservative includes, for example, benzoic acid; benzoate such as sodium benzoate; benzoic acid ester such as paraoxy propyl benzoate or paraoxy butyl benzoate; dimethyl bicarbonate, and the like. In addition, as a preservative, a commercially available formulation such as Strong Sanpreser (manufactured by San-Ei Gen F. F. I. Inc., a mixture of sodium benzoate and butyl benzoate) may be used. These preservatives may be used alone or used in combination of two or more kinds. The formulated amount of the preservative is preferably 5 ppm by mass or more and 1,200 ppm by mass or less, more preferably 10 ppm by mass or more and 1,100 ppm by mass or less, even more preferably 15 ppm by mass or more and 1,000 ppm by mass or less, and even more preferably 20 ppm by mass or more and 900 ppm by mass or less.

[0042] The sweetener includes a commercially available saccharified liquid in which a starch derived from a grain is degraded by an acid or an enzyme, a saccharide such as a commercially available starch syrup, a trisaccharide or more sugar, a sugar alcohol, a natural sweetener such as stevia, an artificial sweetener, and the like. The formation of these saccharides may be a liquid such as a solution or a solid such as a powder. In addition, the kinds of raw material grains of a starch, a purification method of a starch,

and a treatment condition such as hydrolysis by an enzyme or an acid are not particularly limited. For example, a saccharide of which a ratio of maltose is enhanced may be used by appropriately setting a condition of hydrolysis by an enzyme or an acid. Besides them, sucrose, fructose, glucose, maltose, trehalose, maltotriose, a solution thereof (liquid sugar), and the like also can be used. An isomerized sugar such as isomaltose or isomaltotriose, and the like also can be used. In addition, the artificial sweetener includes, for example, aspartame, acesulfam sodium (acesulfam K), sucralose, neotame and the like. The sweetener may be used alone or used in combination of two or more kinds.

[0043] The water-soluble dietary fiber includes, for example, indigestible dextrin, polydextrose, soybean dietary fiber, guar gum degraded product, pectin, glucomannan, alginic acid, laminarin, fucoidin, carrageenan, and the like, and indigestible dextrin or polydextrose is preferable from a viewpoint of versatility such as stability or safety.

[0044] The bittering agent or bitterness giving agent includes, without particularly limiting to, for example, rosemary, litchi, caraway, juniper berry, sage, *meitetsukou*, reishi mushroom, laurel, quassin, a citrus extract, a bitterwood extract, a coffee extract, a tea extract, a bitter gourd extract, a lotus germ extract, a krantz aloe extract, a rosemary extract, a litchi extract, a laurel extract, a sage extract, a caraway extract, naringin, absinthin, wormwood, wormwood extract, and the like, besides a hop.

[0045] The antioxidant is not particularly limited, and the antioxidant used in the usual beer or *happoushu* (low-malt beer) can be used, and the antioxidant includes, for example, ascorbic acid, erythorbic acid,

tocopherols such as vitamin E, catechin, and the like.

[0046] The flavor is not particularly limited, and an usual flavor can be used, and a component other than a substance contained in beers can be used. The flavor is used to give a beer-like flavor, and the flavor includes a component contained in raw materials such as malt, hop, corn grits, liquid sugar, rice and the like, and a component which occurs or converts during the production step (a step from pulverization of raw materials, supplying to fermentation) and the like, and a component other than these can also be used so long as the component is used to give a flavor. The flavor includes a beer flavor (a flavor eliciting a beer-like aroma) and the like containing esters, higher alcohols or lactones, for example, isoamyl acetate, ethyl acetate, n-propanol (1-propanol and the like), isobutanol, acetaldehyde, ethyl caproate, ethyl capriate, isoamyl propionate, linalool, geraniol, citral, 4-vinyl guaiacol (4-VG), 4-methyl-3-pentenoic acid, 2-methyl-2-pentenoic acid, 1,4-cineol, 1,8-cineol, 2,3-diethyl-5-methylpyrazine, γ -decanolactone, γ -undecylactone, ethyl hexanoate, 2-methyl ethyl lactate, n-ethyl lactate, myrcene, citral, limonene, maltol, ethyl maltol, phenyl acetate, furaneol, furfural, methional, 3-methyl-2-butene-1-thiol, 3-methyl-2-butanethiol, diacetyl, ferulic acid, geranic acid, geranyl acetate, ethyl butyrate, octanoic acid, decanoic acid, 9-decenoic acid, nonanoic acid, tetradecanoic acid, propanoic acid, 2-methylpropanoic acid, γ -butyrolactone, 2-aminoacetophenone, ethyl 3-phenylpropionate, 2-ethyl-4-hydroxy-5-methyl-3(2H)-furanone, dimethyl sulfone, 3-methylcyclopentane-1,2-dione, 2-methylbutanal, 3-methylbutanal, 2-methyltetrahydrofuran-3-one, 2-acetylfuran, 2-methyltetrahydrofuran-3-

one, hexanal, hexanol, cis-3-hexenal, 1-octen-3-ol, β -eudesmol, 4-mercapto-4-methylpentan-2-one, β -caryophyllene, β -myrcene, furfuryl alcohol, 2-ethylpyrazine, 2,3-dimethylpyrazine, 2-methylbutanol acetate, isoamyl alcohol, 5-hydroxymethylfurfural, phenylacetaldehyde, 1-phenyl-3-buten-1-one, trans-2-hexenal, nonanal, phenethyl alcohol, nerol, citronellol, methyl p-toluate, 1,2,3,5-tetramethylbenzene, triethyl citrate, tributyl citrate, diethyl tartrate, dibutyl malate, perillaldehyde, methylheptenone, lemon myrtle, cinnamaldehyde, and the like.

[0047] The acidulant is not particularly limited, as long as the acidulant is a substance having acidity, and the acidulant includes, for example, tartaric acid, phosphoric acid, citric acid, gluconic acid, lactic acid, malic acid, phytic acid, acetic acid, succinic acid, glucono-delta-lactone or a salt thereof. Among these acidulant, tartaric acid, phosphoric acid, citric acid, gluconic acid, lactic acid, malic acid, phytic acid, acetic acid, succinic acid or a salt thereof is preferable, and tartaric acid, phosphoric acid, citric acid, lactic acid, acetic acid or a salt thereof is more preferable. These acidulants may be used alone or used in combination of two or more kinds.

[0048] In the present specification, the spirit means liquors obtained by using grains such as wheat, rice, buckwheat or maize as a raw material, saccharifying the grains using a malt or optionally enzymatic agent, fermenting the saccharified product with a yeast, and further distilling the fermented product. Wheat is preferable as the grains which are used as a raw material of a spirit.

[0049] One embodiment of the beer-taste beverage of the present invention includes an embodiment of a bottled beverage. The examples of a

container include a glass bottle, a PET-bottle, a can or a barrel, and a can, a glass bottle and a PET-bottle are preferable from a viewpoint of being particularly easy to transport. Incidentally, when a colorless and transparent glass bottle or PET-bottle is used, contents therein become exposed to sunlight or a light of a fluorescent, so that a colored glass bottle, a colored PET-bottle, a can or a barrel is preferable.

[0050] The malt ratio of the beer-taste beverage of the present invention can be 20% by mass or more, 25% by mass or more, 30% by mass or more, 35% by mass or more, 40% by mass or more, 42% by mass or more, 44% by mass or more, 45% by mass or more, 46% by mass or more, 47% by mass or more, 48% by mass or more, 49% by mass or more or 50% by mass or more. In addition, the malt ratio can be 100% by mass or less, 95% by mass or less, 90% by mass or less, 89% by mass or less, 88% by mass or less, 87% by mass or less, 86% by mass or less, 85% by mass or less, 84% by mass or less, 83% by mass or less, 82% by mass or less, 81% by mass or less, 80% by mass or less, 79% by mass or less, 78% by mass or less, 77% by mass or less, 76% by mass or less, 75% by mass or less, 70% by mass or less, 65% by mass or less, 60% by mass or less, 59% by mass or less, 58% by mass or less, 57% by mass or less, 56% by mass or less, 55% by mass or less, 54% by mass or less, 53% by mass or less, 52% by mass or less or 51% by mass or less. In the present specification, the malt ratio means a value calculated according to Interpretation Notices for Liquor Tax Law and Administrative Regulations Related to Alcoholic Beverages enforced on April 1, 2016.

[0051] When corn grits are used for the beer-taste beverage of the present

invention, a bulging taste matching to a beer-taste beverage can be enhanced. When corn grits are used, presence or absence of the usage can be confirmed from a display of raw materials, because corn, corn grits, maize or the like is displayed on a product.

5 **[0052]** The corn grits ratio of the beer-taste beverage of the present invention can be, for example, 0% by mass or more, 5% by mass or more, 7.5% by mass or more, 10% by mass or more, 12.5% by mass or more, 15% by mass or more, 17.5% by mass or more or 20% by mass or more, and 50% by mass or less, 45% by mass or less, 40% by mass or less, 35%
10 by mass or less, 30% by mass or less, 27.5% by mass or less, 25% by mass or less or 22.5% by mass or less. In the present specification, the corn grits ratio means a value calculated according to Interpretation Notices for Liquor Tax Law and Administrative Regulations Related to Alcoholic Beverages enforced on April 1, 2016.

15 **[0053]** When a liquid sugar is used in the present invention, the aftertaste of the beer-taste beverage can be made fresh. The liquid sugar refers to a sugar containing at least one or more kinds of glucose, fructose, maltose, isomaltose, maltotriose, isomaltotriose, maltotetraose, isomaltotetraose, and the liquid sugar may contain two or more kinds of them. From a
20 viewpoint of easiness of handling in the process, a liquid sugar which is a liquid is preferable, but a sugar in a form of pulverized shape (such as powder), solid or the like may be used. When a sugar in a form of pulverized shape (such as powder), solid or the like is used, a sugar containing at least one or more kinds of glucose, fructose, maltose,
25 isomaltose, maltotriose, isomaltotriose, maltotetraose, isomaltotetraose is

also preferable, and two or more kinds of them may be used. When a liquid sugar is used, presence or absence of the usage can be confirmed from a display of raw materials, because a saccharide or the like is displayed on a product.

5 **[0054]** The liquid sugar ratio of the present invention can be, for example, 0% by mass or more, 5% by mass or more, 10% by mass or more, 15% by mass or more, 20% by mass or more, 25% by mass or more, 30% by mass or more, 35% by mass or more, 40% by mass or more, 41% by mass or more, 42% by mass or more, 43% by mass or more, 44% by mass or more, 10 45% by mass or more, 46% by mass or more, 47% by mass or more, 48% by mass or more or 49% by mass or more, and can be 80% by mass or less, 75% by mass or less, 70% by mass or less, 65% by mass or less, 60% by mass or less, 55% by mass or less, 54% by mass or less, 53% by mass or less, 52% by mass or less, 51% by mass or less, 50% by mass or less, 49% 15 by mass or less, 48% by mass or less, 47% by mass or less, 46% by mass or less, 45% by mass or less, 44% by mass or less, 43% by mass or less, 42% by mass or less, 41% by mass or less, 40% by mass or less, 38% by mass or less, 36% by mass or less, 34% by mass or less, 32% by mass or less, 30% by mass or less, 28% by mass or less, 26% by mass or less, 24% 20 by mass or less or 22% by mass or less. In the present specification, the liquid sugar ratio means a value calculated according to Interpretation Notices for Liquor Tax Law and Administrative Regulations Related to Alcoholic Beverages enforced on April 1, 2016.

25 **[0055]** The amount of carbon dioxide gas in the beer-taste beverage of the present invention is presented by a carbon dioxide gas pressure of the

beverage. Typically, the upper limit of the carbon dioxide gas pressure of the beverage is 5.0 kg/cm², 4.5 kg/cm² or 4.0 kg/cm², and the lower limit is 0.20 kg/cm², 0.50 kg/cm² or 1.0 kg/cm², and any of these upper limits and the lower limits may be combined. For example, the carbon dioxide gas pressure of the beverage may be 0.20 kg/cm² or more and 5.0 kg/cm² or less, 0.50 kg/cm² or more and 4.5 kg/cm² or less, or 1.0 kg/cm² or more and 4.0 kg/cm² or less. In the present specification, the gas pressure refers to a gas pressure in a container, except for especial cases. The pressure is measured using a method including immobilizing a sample set to 20°C in a gas internal pressure measuring device, opening a valve of the gas internal pressure measuring device once to degas, closing the valve again, and reading the value at the time when a needle reaches a constant position by shaking the gas internal pressure measuring device, or using a commercially available gas pressure measurement device.

15 **[0056]** The beer-taste beverage of the present invention may optionally contain various additives. The additive includes, for example, a colorant, a foaming agent, a fermentation promoting agent, a yeast extract, a protein-based substance such as a peptide-containing material, an amino acid (glycine, proline, or the like), and a seasoning such as amino acids.

20 **[0057]** The colorant is used to give a beer-like color to a beverage, and caramel pigment and the like can be used.

[0058] The foaming agent is used to form a beer-like foam in a beverage or to maintain a foam of a beverage, and a plant-extracted saponin-based substance such as soybean saponin or quillai saponin, a plant protein such as corn or soybean, a peptide-containing material such as collagen peptide,

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a yeast extract, and the like can be appropriately used.

[0059] The fermentation promoting agent is used to promote fermentation by yeast, and, for example, a yeast extract, a bran ingredient of rice, wheat or the like, vitamins, minerals, or the like can be used alone or in combination.

[0060] The beer-taste beverage of the present invention can be produced in a similar method to those of a general beer-taste beverage, except that the method includes a step of making the content of 2,2,4-trimethyl-1,3-dioxolane 400 $\mu\text{g/L}$ or more (First Embodiment), a step of making the content of propyl acetate 150 $\mu\text{g/L}$ or more and 600 $\mu\text{g/L}$ or less (Second Embodiment), and/or a step of making the content of D-glutamic acid 2.00 $\mu\text{g/mL}$ or more and the content of propyl acetate 150 $\mu\text{g/L}$ or more (Third Embodiment). Hereinafter, as a method of producing a general beer-taste beverage, production methods with or without using a malt as a raw material are shown.

[0061] As to the beer-taste beverage containing alcohol produced by using a malt as a raw material, first, to a mixture containing raw materials such as wheat such as malts, optionally other grains, starches, sugars, a bittering agent or a colorant, and water, an enzyme such as amylase is optionally added, to carry out gelatinization or saccharification, and the mixture is 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 and 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. The fermentation can be carried out using plural bacterias such as plural yeasts (*Saccharomyces*, *Brettanomyces* or the like) and lactic acid (*Lactobacillus* or the like), and as the conditions in the liquor storage step, known conditions may be used, and the liquor storage period can be a long term such as from 1 month to 12 months. The fermentation liquid obtained is filtered, and a carbon dioxide gas is added to the filtrate obtained. Thereafter, a vessel is filled with a product, and subjected to a sterilizing step, to obtain an intended beer-taste beverage. Incidentally, a spirit derived from grains may be added as an alcohol ingredient. The spirit means liquors obtained by using grains such as wheat, rice, buckwheat, maize or the like as a raw material, fermenting the grains with a yeast, and further distilling the fermented product. Wheat is preferable as the grains which are used as a raw material of a spirit.

[0062] As to the beer-taste beverage containing alcohol which is 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 of liquor steps, known conditions may be used. The fermentation liquid obtained is filtered, and a carbon dioxide gas is added to the filtrate obtained. Thereafter, a vessel is filled with a product, and subjected to a sterilizing step, to obtain an intended beer-taste beverage. Incidentally, a spirit derived from grains may be further added as an alcohol ingredient.

10 **[0063]** For the beer-taste beverage which is not fermented and contains alcohol, an alcoholicity of the final product may be adjusted by adding alcohol for raw materials or the like, regardless of using or not using malts. Addition of alcohol for raw materials may be carried out in any steps from saccharification step to filling step. Incidentally, a spirit derived from grains may be further added as an alcohol ingredient.

15 **[0064]** 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, sugars, a bittering agent, or a colorant, and water, an enzyme such as amylase optionally may be added, to carry out gelatinization or saccharification, and the mixture is 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

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mixed at any stage from the beginning of boiling and 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 hop-added product is cooled, and a flavor, an acidulant, a pigment such as a caramel pigment, an antioxidant, a bittering agent, a sweetener, an amino acid raw material, and the like are added to the wort obtained, the mixture is filtrated, and a carbon dioxide gas is added to the filtrate obtained. Thereafter, a vessel is filled with a product, and subjected to a sterilizing step, to obtain an intended nonalcoholic beer-taste beverage.

[0065] In the case of producing a nonalcoholic beer-taste beverage without using malts as raw materials, at 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-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. After boiling, the hop-added product is cooled, and a flavor, an acidulant, a pigment such as a caramel pigment, an antioxidant, a bittering agent, a sweetener, an amino acid raw material, and the like are added to the wort obtained, the mixture is filtrated, and a carbon dioxide gas is added to the liquid sugar-containing solution obtained. Thereafter, a vessel is filled with a product, and subjected to a sterilizing step, to obtain an intended nonalcoholic beer-taste beverage.

[0066] In addition, the beer-taste beverage obtained by the production method of the first embodiment of the present invention can give a matured fruit-like flavor. Therefore, the present invention also provides a method of giving a matured fruit-like flavor including making the content of 2,2,4-trimethyl-1,3-dioxolane in a beer-taste beverage 400 $\mu\text{g/L}$ or more. Further, the beer-taste beverage obtained by the production method of the second embodiment of the present invention can give a fresh fruit-like flavor. Therefore, the present invention also provides a method of giving a fresh fruit-like flavor including making the content of propyl acetate in a beer-taste beverage 150 $\mu\text{g/L}$ or more and 600 $\mu\text{g/L}$ or less. Furthermore, the beer-taste beverage obtained by the production method of the third embodiment of the present invention can give a thick and rich fruit-like flavor. Therefore, the present invention also provides a method of giving a thick and rich fruit-like flavor including making the content of D-glutamic acid 2.00 $\mu\text{g/mL}$ or more and the content of propyl acetate 150 $\mu\text{g/L}$ or more. Here, the details of the steps in these methods are same as above.

EXAMPLES

[0067] Hereinafter, the present invention will be particularly described by showing Examples, without intending to limit the scope of the present invention to the following Examples.

[0068] < Preparation of Beer-taste Beverages >

Comparative Example 1, Examples 1 to 7

Malts and corn grits were supplied to a mash tank containing warm water, then temperature was raised step by step and maintained, a malt lees

was removed by filtration, to obtain a wort. Thereafter, the wort was supplied to a boiling pot, hops were added thereto, and after a boiling treatment, a solid-liquid separation treatment was carried out, the clear wort obtained was cooled, and a pre-fermented liquid before addition of yeast was obtained by carrying out a ventilation with oxygen. A beer yeast (a top-fermenting yeast) was added to thus obtained pre-fermented liquid, and the liquid was fermented at a given fermentation temperature for a given fermentation time. After a further maturation period, the yeast was removed by filtration. After the removal of the yeast by filtration, lactic acid bacteria was added, and the liquid was fermented for 3 weeks. Thereafter, *Brettanomyces* was added, and a fermentation and a liquor storing were carried out for from 4 months up to 24 months while ventilating and stirring. Bacterial cells were removed before the liquid was bottled.

15 [0069] Example 8

Malts and corn grits were supplied to a mash tank containing warm water, then temperature was raised step by step and maintained, a malt lees was removed by filtration, to obtain a wort. Thereafter, the wort was supplied to a boiling pot, hops were added thereto, and after a boiling treatment, a solid-liquid separation treatment was carried out, the clear wort obtained was cooled, and a pre-fermented liquid before addition of yeast was obtained by carrying out a ventilation with oxygen. A beer yeast (a top-fermenting yeast) was added to thus obtained pre-fermented liquid, and the liquid was fermented at a given fermentation temperature for a given fermentation time. After the removal of the yeast by filtration, lactic

acid bacteria was added, and the liquid was fermented for 3 weeks.

Thereafter, *Brettanomyces* was added, and a fermentation and a liquor storing were carried out for 3 months while ventilating and stirring.

Bacterial cells were removed before the liquid was bottled.

5 [0070] Eight specialized panelists tasted the beer-taste beverage of each Example and Comparative Example after cooling to 4°C, and evaluated “matured fruit-like flavor” on the basis of the following basis. The score of 2 or more was considered as passed. The means are shown in Table 1. Before evaluation, samples of which each evaluation basis is 4 were
10 previously prepared, and uniformity of bases was attempted among each panelist.

< Evaluation bases of matured fruit-like flavor >

“1” : Very weak.

“2” : Weak.

15 “3” : Moderate.

“4” : Intense.

“5” : Very intense.

[0071] Eight specialized panelists tasted the beer-taste beverage of Examples 6 and 8 after cooling to 4°C, and evaluated “phenolic medicine-like flavor” on the basis of the following basis. The means are shown in
20 Table 2.

< Evaluation bases of phenolic medicine-like flavor >

“1” : Very weak.

“2” : Weak.

25 “3” : Moderate.

“4” : Intense.

“5” : Very intense.

[0072]

[Table 1]

Table 1

	2,2,4-trimethyl-1,3-dioxolane (µg/L)	Alcoholicity (v/v%)	Lactic acid (mg/L)	Acetic acid (mg/L)	Matured fruit-like flavor
Comp. Ex. 1	157	3.94	1800	796	1.2
Ex. 1	402	4.50	4141	1883	2.4
Ex. 2	2062	5.79	4955	2983	4.1
Ex. 3	1698	5.37	6034	2735	3.8
Ex. 4	2818	5.48	5797	2680	4.5
Ex. 5	2509	5.31	4767	2919	4.3
Ex. 6	1349	5.35	5353	2756	4.0
Ex. 7	4692	5.34	6004	3282	4.8
Ex. 8	1305	5.10	4771	3424	3.6

5

[0073]

[Table 2]

Table 2

	2,2,4-trimethyl-1,3-dioxolane (µg/L)	4-ethyl-2,6-dimethoxyphenol (µg/L)	Alcoholicity (v/v%)	Lactic acid (mg/L)	Acetic acid (mg/L)	Phenolic medicine-like flavor
Ex. 6	1349	53	5.35	5353	2756	4.0
Ex. 8	1305	3	5.10	4771	3424	1.2

[0074] As shown in Table 1, all of the beer-taste beverages in Examples 1 to 8 in which the content of 2,2,4-trimethyl-1,3-dioxolane is a specific amount or more had an excellent matured fruit-like flavor characteristic.

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In addition, the beer-taste beverage in Example 8 in which the content of 4-ethyl-2,6-dimethoxyphenol is small had a favorable result having less phenolic medicine-like flavor, from the comparison of Examples 6 and 8 in Table 2.

5 [0075] < Preparation of Beer-taste Beverages 2 >

Comparative Example 11, Examples 11 to 17

Malts and corn grits were supplied to a mash tank containing warm water, then temperature was raised step by step and maintained, a malt lees was removed by filtration, to obtain a wort. Thereafter, the wort was
10 supplied to a boiling pot, hops were added thereto, and after a boiling treatment, a solid-liquid separation treatment was carried out, the clear wort obtained was cooled, and a pre-fermented liquid before addition of yeast was obtained by carrying out a ventilation with oxygen. A beer yeast (a top-fermenting yeast) was added to thus obtained pre-fermented liquid,
15 and the liquid was fermented at a given fermentation temperature for a given fermentation time. After a further maturation period, the yeast was removed by filtration. After the removal of the yeast by filtration, lactic acid bacteria was added, and the liquid was fermented for 3 weeks. Thereafter, *Brettanomyces* was added, and a fermentation and a liquor
20 storing were carried out for from 4 months up to 24 months while ventilating and stirring. Bacterial cells were removed before the liquid was bottled.

[0076] Example 18

Malts and corn grits were supplied to a mash tank containing warm
25 water, then temperature was raised step by step and maintained, a malt lees

was removed by filtration, to obtain a wort. Thereafter, the wort was supplied to a boiling pot, hops were added thereto, and after a boiling treatment, a solid-liquid separation treatment was carried out, the clear wort obtained was cooled, and a pre-fermented liquid before addition of yeast was obtained by carrying out a ventilation with oxygen. A beer yeast (a top-fermenting yeast) was added to thus obtained pre-fermented liquid, and the liquid was fermented at a given fermentation temperature for a given fermentation time. After the removal of the yeast by filtration, lactic acid bacteria was added, and the liquid was fermented for 3 weeks. Thereafter, *Brettanomyces* was added, and a fermentation and a liquor storing were carried out for 3 months while ventilating and stirring. Bacterial cells were removed before the liquid was bottled.

[0077] Eight specialized panelists tasted the beer-taste beverage of each Example and Comparative Example after cooling to 4°C, and evaluated “fresh fruit-like flavor” on the basis of the following basis. The score of 2 or more was considered as passed. The means are shown in Table 3. Before evaluation, samples of which each evaluation basis is 4 were previously prepared, and uniformity of bases was attempted among each panelist.

< Evaluation bases of fresh fruit-like flavor >

“1” : Very weak.

“2” : Weak.

“3” : Moderate.

“4” : Intense.

“5” : Very intense.

[0078] Eight specialized panelists tasted the beer-taste beverage of Examples 16 and 18 after cooling to 4°C, and evaluated “phenolic medicine-like flavor” on the basis of the following basis. The means are shown in Table 4.

5 < Evaluation bases of phenolic medicine-like flavor >

“1” : Very weak.

“2” : Weak.

“3” : Moderate.

“4” : Intense.

10 “5” : Very intense.

[0079]

[Table 3]

Table 3

	Propyl Acetate (μg/L)	Alcoholicity (v/v%)	Lactic acid (mg/L)	Acetic acid (mg/L)	Fresh fruit- like flavor
Comp. Ex. 11	75	3.94	1800	796	1.2
Ex. 11	179	4.50	4141	1883	2.8
Ex. 12	335	5.79	4955	2983	3.4
Ex. 13	429	5.37	6034	2735	4.8
Ex. 14	322	5.48	5797	2680	3.5
Ex. 15	388	5.31	4767	2919	3.8
Ex. 16	215	5.35	5353	2756	3.2
Ex. 17	586	5.34	6004	3282	4.5
Ex. 18	371	5.10	4771	3424	3.6

[0080]

15 **[Table 4]**

Table 4

	Propyl acetate (μg/L)	4-ethyl-2,6-dimethoxyphenol (μg/L)	Alcoholicity (v/v%)	Lactic acid (mg/L)	Acetic acid (mg/L)	Phenolic medicine-like flavor
Ex. 16	215	53	5.35	5353	2756	4.0
Ex. 18	371	3	5.10	4771	3424	1.2

[0081] As shown in Table 3, all of the beer-taste beverages in Examples 11 to 18 in which the content of propyl acetate is a specific amount or more had an excellent fresh fruit-like flavor characteristic. In addition, the beer-taste beverage in Example 18 in which the content of 4-ethyl-2,6-dimethoxyphenol is small had a favorable result having less phenolic medicine-like flavor, from the comparison of Examples 16 and 18 in Table 4.

[0082] < Preparation of Beer-taste Beverages 3 >

Comparative Example 21, Examples 21 to 23, 25

Malts and corn grits were supplied to a mash tank containing warm water, then temperature was raised step by step and maintained, a malt lees was removed by filtration, to obtain a wort. Thereafter, the wort was supplied to a boiling pot, hops were added thereto, and after a boiling treatment, a solid-liquid separation treatment was carried out, the clear wort obtained was cooled, and a pre-fermented liquid before addition of yeast was obtained by carrying out a ventilation with oxygen. A beer yeast (a top-fermenting yeast) was added to thus obtained pre-fermented liquid, and the liquid was fermented at a given fermentation temperature for a given fermentation time. After a further maturation period, the yeast was

removed by filtration. After the removal of the yeast by filtration, lactic acid bacteria was added, and the liquid was fermented for 3 weeks.

Thereafter, *Brettanomyces* was added, and a fermentation and a liquor storing were continued for from 4 months up to 24 months while ventilating and stirring. Bacterial cells were removed before the liquid was bottled.

[0083] Example 24

Malts and corn grits were supplied to a mash tank containing warm water, then temperature was raised step by step and maintained, a malt lees was removed by filtration, to obtain a wort. Thereafter, the wort was supplied to a boiling pot, hops were added thereto, and after a boiling treatment, a solid-liquid separation treatment was carried out, the clear wort obtained was cooled, and a pre-fermented liquid before addition of yeast was obtained by carrying out a ventilation with oxygen. A beer yeast (a top-fermenting yeast) was added to thus obtained pre-fermented liquid, and the liquid was fermented at a given fermentation temperature for a given fermentation time. After the removal of the yeast by filtration, lactic acid bacteria was added, and the liquid was fermented for 3 weeks. Thereafter, *Brettanomyces* was added, and a fermentation and a liquor storing were carried out for 3 months while ventilating and stirring. Bacterial cells were removed before the liquid was bottled.

[0084] Eight specialized panelists tasted the beer-taste beverage of each Example and Comparative Example after cooling to 4°C, and evaluated “thick and rich fruit-like flavor” on the basis of the following basis. The score of 2.5 or more was considered as passed. The means are shown in

Table 5. Upon evaluation, samples of which each evaluation basis is 4 were previously prepared, and uniformity of bases was attempted among each panelist.

< Evaluation bases of thick and rich fruit-like flavor >

- 5 “1” : Very weak.
 “2” : Weak.
 “3” : Moderate.
 “4” : Intense.
 “5” : Very intense.

10 [0085]

[Table 5]

Table 5

	D-glutamic acid ($\mu\text{g/mL}$)	Propyl Acetate ($\mu\text{g/L}$)	Alcoholicity (v/v%)	Lactic acid (mg/L)	Acetic acid (mg/L)	Thick and rich fruit-like flavor
Comp. Ex. 21	1.51	75	3.94	1800	796	1.8
Ex. 21	2.30	179	4.50	4141	1883	2.5
Ex. 22	2.16	388	5.31	4767	2919	3.1
Ex. 23	2.98	322	5.48	5797	2680	4.3
Ex. 24	6.55	371	5.10	4771	3424	4.8
Ex. 25	2.85	215	5.35	5353	2756	3.7

[0086] As shown in Table 5, all of the beer-taste beverages in Examples 21 to 25 in which the content of D-glutamic acid and propyl acetate is a specific amount or more had an excellent thick and rich fruit-like flavor characteristic.

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INDUSTRIAL APPLICABILITY

[0087] According to the present invention, a beverage having a novel taste which has a matured fruit-like flavor characteristic, a fresh fruit-like flavor characteristic, and/or a thick and rich fruit-like flavor characteristic can be provided.

CLAIMS

[Claim 1] A beer-taste beverage having the content of 2,2,4-trimethyl-1,3-dioxolane of 400 $\mu\text{g/L}$ or more.

5 [Claim 2] A beer-taste beverage having the content of propyl acetate of 150 $\mu\text{g/L}$ or more and 600 $\mu\text{g/L}$ or less.

[Claim 3] A beer-taste beverage having the content of D-glutamic acid of 2.00 $\mu\text{g/mL}$ or more and the content of propyl acetate of 150 $\mu\text{g/L}$ or more.

10 [Claim 4] The beer-taste beverage according to any one of claims 1 to 3, wherein the content of acetic acid is 100 mg/L or more and 7500 mg/L or less.

[Claim 5] The beer-taste beverage according to any one of claims 1 to 4, wherein the content of lactic acid is 200 mg/L or more and 25000 mg/L or less.

15 [Claim 6] The beer-taste beverage according to any one of claims 1 to 5, wherein the content of 4-ethyl-2,6-dimethoxyphenol is 40 $\mu\text{g/L}$ or less.

[Claim 7] The beer-taste beverage according to any one of claims 1 to 6, wherein an alcoholicity is 1 v/v% or more and 20 v/v% or less.

20 [Claim 8] A method of producing a beer-taste beverage comprising making the content of 2,2,4-trimethyl-1,3-dioxolane in the beer-taste beverage 400 $\mu\text{g/L}$ or more.

[Claim 9] A method of giving a matured fruit-like flavor comprising making the content of 2,2,4-trimethyl-1,3-dioxolane in a beer-taste beverage 400 $\mu\text{g/L}$ or more.

[Claim 10] A method of producing a beer-taste beverage comprising making the content of propyl acetate in the beer-taste beverage 150 $\mu\text{g/L}$ or more and 600 $\mu\text{g/L}$ or less.

[Claim 11] A method of giving a fresh fruit-like flavor comprising making the content of propyl acetate in a beer-taste beverage 150 $\mu\text{g/L}$ or more and 600 $\mu\text{g/L}$ or less.

[Claim 12] A method of producing a beer-taste beverage comprising making the content of D-glutamic acid in the beer-taste beverage 2.00 $\mu\text{g/mL}$ or more and the content of propyl acetate 150 $\mu\text{g/L}$ or more.

[Claim 13] A method of giving a thick and rich fruit-like flavor comprising making the content of D-glutamic acid in a beer-taste beverage 2.00 $\mu\text{g/mL}$ or more and the content of propyl acetate 150 $\mu\text{g/L}$ or more.