

DESCRIPTION**TITLE OF INVENTION**

JELLY DRINK, METHOD FOR MANUFACTURING JELLY DRINK AND METHOD
FOR IMPROVING SEPARATION PROPERTY OF JELLY DRINK

TECHNICAL FIELD

[0001] The present invention relates to a jelly drink, a method for manufacturing a jelly drink, and a method for improving a separation property of a jelly drink.

BACKGROUND ART

[0002] Consumers' taste for foods and drinks has been diversified in recent years, and various types of products have been developed in order to satisfy the diversified taste of consumers. In the field of a type of jelly drink which consumers drink after shaking jelly packed in a container to crush the jelly, too, various jelly drinks have been proposed from multiple viewpoints from taste preference to nutritional functions and physical shapes.

For example, the following techniques have been proposed for this type of jelly drink.

[0003] Patent Literature 1 discloses a method for manufacturing a two-layered jelly food including a mousse layer and a jelly layer which are separated from each other in a container. The method is characterized in that: the method includes: filling the container with a single liquid obtained by mixing a jelly liquid and cream which includes oil/fat as its chief ingredient and which is kept emulsified stably by protein and an emulsifier; and separating the mousse layer and the jelly layer utilizing a difference in specific gravity between the two layers by counteracting the emulsifying effects of the protein and the emulsifier.

[0004] Meanwhile, Patent Literature 2 discloses a layered jelly including: a jelly matrix made of a gelling agent and other additives; and a creamy oil-in-water type emulsified fat made

of old/fat, an emulsifier, protein and other additives, the layered jelly produced by: heating and melting the jelly matrix; thereafter mixing the creamy oil-in-water type emulsified fat with the melted jelly matrix; and separating a cream layer as an upper layer of the mixture, followed by solidifying. The layered jelly is characterized in that: either or both of sucrose fatty acid ester and polyglycerol fatty acid ester, or what is obtained by adding organic acid monoglyceride to either or both of them is used as the emulsifier: after mixed with the jelly matrix, the creamy oil-in-water type emulsified fat containing the emulsifier exists as the cream layer above a jelly layer within a range which does not allow oil to separate such that the volume of the cream layer is 40% or less of the volume of the entire layered jelly.

CITATION LIST

Patent Literature

[0005] Patent Literature 1: Japanese Patent Application Publication No. JPH07289176

Patent Literature 2: Japanese Patent Application Publication No. JPH08242786

SUMMARY OF INVENTION

Technical Problem

[0006] The technique of Patent Literature 1 and the technique of Patent literature 2 each produce the gelatinous jelly as a whole although separating the gelatinous jelly into the two layers, that is to say, the mousse layer (the cream layer) and the jelly layer. Thus, when a consumer drinks or eats the gelatinous jelly after crushing the gelatinous jelly to mix the mousse layer and the jelly layer together, the consumer can indeed feel flavors which are different between the mousse layer and the jelly layer, but cannot feel texture change between the two layers since each layer has gelatinous texture.

[0007] The present inventor has carried out a development

of a jelly drink with a liquid portion and a jelly portion (in the form of a gel) having mutually different textures using a single liquid filling method, and has found out in the process of carrying out the development that the liquid portion and the jelly portion of the liquid portion are hard to clearly separate from each other.

For example, the present inventor has experienced, for example, situations where although they produced trial products of the jelly drink hoping that the trial products would have a liquid portion in white and a jelly portion in a dark color, they only found out through the trial products that: the liquid portion and the jelly portion were not clearly separated from each other; and it was difficult to form a clear contrast in color tone between the liquid portion and the jelly portion.

[0008] In response to the above issue, it is an object of the present invention to provide a jelly drink in which a liquid portion and a gelatinous jelly portion are clearly separated from each other, a method for manufacturing a jelly drink, and a method for improving a separation property of a jelly drink.

Solution to Issue

[0009] The above object can be achieved by the following means.

(1) A jelly drink including a liquid portion and a gelatinous jelly portion, and containing locust bean gum, carrageenan, xanthan gum, magnesium, and emulsified oil/fat.

(2) The jelly drink according to the above 1, wherein the magnesium has a content of from 0.03 g/L to 0.5 g/L both inclusive.

(3) The jelly drink according to the above 1 or 2, wherein the liquid portion has a content of 8.5% by mass or more.

(4) A method for manufacturing a jelly drink including a liquid portion and a gelatinous jelly portion including: preparing a liquid composition by mixing materials, including

locust bean gum, carrageenan, xanthan gum, magnesium, and emulsified oil/fat; filling a container with the liquid composition; and sterilizing the liquid composition, which is filled in the container by heating.

(5) The method for manufacturing a jelly drink according to the above 4, wherein the liquid composition, which is to be filled in the container, has a temperature of from 50 °C to 85 °C both inclusive.

(6) A method for improving a separation property of a jelly drink and clearly separating the jelly drink into a liquid portion and a gelatinous jelly portion, including: preparing a liquid composition by mixing materials, including locust bean gum, carrageenan, xanthan gum, magnesium, and emulsified oil/fat; filling a container with the liquid composition; and sterilizing the liquid composition, which is filled in the container, by heating.

Advantageous Effects of Invention

[0010] The jelly drink according to the present invention can be appropriately separated into the liquid portion and the gelatinous jelly portion, since the jelly drink includes locust bean gum, carrageenan, xanthan gum, magnesium, and emulsified oil/fat.

[0011] The method for manufacturing a jelly drink according to the present invention can manufacture the jelly drink in which the liquid portion and the gelatinous jelly portion are appropriately separated from each other, since the liquid composition is prepared by mixing the materials, including locust bean gum, carrageenan, xanthan gum, magnesium, and emulsified oil/fat.

In addition, the method for manufacturing a jelly drink according to the present invention is a so-called single liquid filling method. Therefore, the method for manufacturing a jelly drink not only can shorten the manufacturing process, but

also does not include a gel-forming step before the filling of the container with the liquid composition. Because of not including the gel-forming step, the method for manufacturing a jelly drink does not include maintenance of a manufacturing apparatus which would be included if the liquid composition would be formed into a gel and do things such as adhering to pipes and the like in the manufacturing apparatus. Accordingly, the method for manufacturing a jelly drink is very excellent in the production optimization.

[0012] The method for improving a separation property of a jelly drink according to the present invention can improve the separation property of the jelly drink, since the liquid composition is prepared by mixing the materials, including locust bean gum, carrageenan, xanthan gum, magnesium, and emulsified oil/fat.

BRIEF DESCRIPTION OF DRAWINGS

[0013] FIG. 1 is a flowchart for explaining contents of a method for manufacturing a jelly drink according to one or more embodiments of the invention.

DESCRIPTION OF EMBODIMENTS

[0014] Hereinafter, descriptions will be provided for a mode (an embodiment) for carrying out a jelly drink, a method for manufacturing a jelly drink and a method for improving a separation property of a jelly drink according to the present invention.

Jelly Drink

[0015] The jelly drink according to embodiments includes a liquid portion and a gelatinous jelly portion, and includes locust bean gum, carrageenan, xanthan gum, magnesium, and emulsified oil/fat.

Gelling Agents: Locust Bean Gum, Carrageenan, Xanthan Gum

[0016] The jelly drink according to embodiments includes three gelling agents: locust bean gum, carrageenan, and xanthan

gum.

As a result of experiments using many gelling agents, the present inventor has found out that the use of these three gelling agents in combination makes it possible to appropriately separate the jelly drink into the liquid portion and the jelly portion. Specifically, in a case where the three gelling agents is used in combination, it is surprising that the liquid portion be appropriately separated from the jelly portion to be formed into a gel so that the jelly drink comes to have both the liquid state and the gel state, just by: preparing a liquid composition by mixing materials, including the gelling agents (at a temperature of 50 °C or less, 40 °C or less, or 30 °C or less); filling a container with the liquid composition; sterilizing the liquid composition, as filled in the container, by heating; and cooling the liquid composition therein. In other words, the jelly drink according to embodiments not only can be manufactured just using a so-called single liquid filling method (a method using a single liquid composition instead of multiple liquid compositions), but also does not include a step of forming the liquid composition into a gel by separately heat-treating the liquid composition before the filling of the container with the liquid composition. Thus, the jelly drink according to embodiments not only can shorten the manufacturing process, but also does not include maintenance of the manufacturing apparatus which would be included if the liquid composition would be formed into a gel and do things such as adhering to pipes and the like in the manufacturing apparatus. Accordingly, it can be said that the jelly drink according to embodiments is very excellent in the production optimization.

[0017] When used in combination with the other two gelling agents, locust bean gum appropriately separates the liquid portion and the gelatinous jelly portion from each other as

discussed above, and affects the firmness of the jelly portion.

[0018] In some embodiments, a content of locust bean gum is 0.50 g/L or more, 0.55 g/L or more, 0.60 g/L or more, or 0.65 g/L or more. In the case where the content of locust bean gum is the predetermined amount or more, locust bean gum can separate the liquid portion and the jelly portion from each other more appropriately, and can make the jelly portion firmer.

Meanwhile, in some embodiments, the content of locust bean gum is 3.00 g/L or less, 2.50 g/L or less, 1.00 g/L or less, or 0.90 g/L or less. In the case where the content of locust bean gum exceeds the predetermined amount, the jelly portion becomes too firm to separate into the two layers.

[0019] When used in combination with the other two gelling agents, carrageenan appropriately separates the liquid portion and the gelatinous jelly portion from each other as discussed above, and affects the firmness of the jelly portion. Incidentally, any one of κ -carrageenan, ι -carrageenan and λ -carrageenan may be used as the carrageenan. From a viewpoint of securing the firmness of the jelly portion, κ -carrageenan may be used.

[0020] In some embodiments, a content of carrageenan is 0.10 g/L or more, 0.20 g/L or more, 0.30 g/L or more, or 0.35 g/L or more. In the case where the content of carrageenan is the predetermined amount or more, carrageenan can separate the liquid portion and the jelly portion from each other more appropriately, and can make the jelly portion firmer.

Meanwhile, in some embodiments, the content of carrageenan is 0.75 g/L or less, 0.60 g/L or less, 0.55 g/L or less, or 0.50 g/L or less. In the case where the content of carrageenan exceeds the predetermined amount, the jelly portion becomes too firm to separate into the two layers.

[0021] When used in combination with the other two gelling agents, xanthan gum appropriately separates the liquid portion

and the gelatinous jelly portion from each other as discussed above, and affects the water separation rate (the rate of the liquid portion in the jelly drink).

[0022] In some embodiments, a content of xanthan gum is 0.10 g/L or more, 0.20 g/L or more, 0.25 g/L or more, or 0.30 g/L or more. In the case where the content of xanthan gum is the predetermined amount or more, xanthan gum can separate the liquid portion and the jelly portion from each other more appropriately, and makes it possible to avoid too high a water separation rate.

Meanwhile, in some embodiments, the content of xanthan gum is 0.75 g/L or less, 0.60 g/L or less, 0.50 g/L or less, or 0.45 g/L or less. In the case where the content of xanthan gum is the predetermined amount or less, xanthan gum makes it possible to avoid too high a water separation rate.

[0023] Note that: a total content of the three gelling agents, that is to say, locust bean gum, carrageenan, xanthan gum, is not specifically limited; and in some embodiments, the total content is 0.70 g/L or more, 1.00 g/L or more, and 1.30 g/L or more, from a viewpoint of separating the liquid portion and the gelatinous jelly portion more clearly, as well as from a viewpoint of enhancing the food texture (the food texture which is obtained by making the jelly portion firmer). Meanwhile, in some embodiments, the total content of the three gelling agents, that is to say, locust bean gum, carrageenan, xanthan gum, is 4.50 g/L or less, 4.00 g/L or less, and 3.00 g/L or less, from a viewpoint of preventing the jelly portion from becoming too firm to separate into the two layers.

Liquid Portion

[0024] The liquid portion is a part of the jelly drink which remains in the form of water after the above-mentioned gelling agents form the other part of the jelly drink into a gel. In other words, the liquid portion is the part obtained by

separating water from the gelatinous jelly portion, and containing mainly emulsified oil/fat and the like which have not been formed into a gel. Incidentally, the gelatinous jelly portion also includes some of oil/fat derived from the emulsified oil/fat, and the liquid portion does not contain all the oil/fat derived from the emulsified oil/fat. Nevertheless, the liquid portion may contain as much emulsified oil/fat as possible.

In some embodiments, the proportion of the liquid portion (the proportion of the liquid portion to the entire jelly drink: also referred to as a content rate or the water separation rate) is 3% by mass or more, 8.5% by mass or more, 10% by mass or more, or 11% by mass or more. A proportion of the liquid portion which is the predetermined value or more enables a consumer to feel not only the gelatinous portion but also the liquid portion sufficiently.

Meanwhile, in some embodiments, the proportion of the liquid portion is 35% by mass or less, 30% by mass or less, 25% by mass or less, or 20% by mass or less. A proportion of the liquid portion which is the predetermined value or less makes it possible to avoid the jelly drink becoming unsuitable as a beverage product due to too large a liquid portion.

Note that in the jelly drink according to one or more embodiments of the present invention, the liquid portion containing the oil/fat, for example, plays a role of liquid cream in coffee jelly.

Emulsified Oil/Fat

[0025] The emulsified oil/fat is oil/fat emulsified by an emulsifier. Emulsified vegetable oil/fat (vegetable-based emulsified oil/fat) and emulsified animal oil/fat (animal-based emulsified oil/fat) may be used as the emulsified oil/fat. In addition, the jelly drink containing the emulsified oil/fat is good at forming the liquid portion by

appropriately separating the oil/fat from the jelly portion, and at temporal stability of keeping the liquid portion and the jelly portion separated from each other for long time.

Emulsified vegetable oil/fat is obtained by emulsifying vegetable-derived oil/fat. Examples of the emulsified vegetable oil/fat include oil/fat obtained by emulsifying rapeseed oil, oil/fat obtained by emulsifying rice-bran oil, oil/fat obtained by emulsifying soybean oil, oil/fat obtained by emulsifying safflower oil, and oil/fat obtained by emulsifying sunflower oil.

Emulsified animal oil/fat is obtained by emulsifying animal-derived oil/fat. Examples of the emulsified animal oil/fat include butter, fresh cream, lard and the like which are emulsified in advance by an emulsifier.

Note that a comparison between the emulsified vegetable oil/fat and the emulsified animal oil/fat shows that a jelly drink using the emulsified vegetable oil/fat tends to form a larger liquid portion than a jelly portion using the emulsified animal oil/fat. The emulsified vegetable oil/fat and the emulsified animal oil/fat, therefore, may be selected depending on needs for a jelly drink.

[0026] A content of the emulsified oil/fat in the entire jelly drink is not specifically limited. Nevertheless, for example, the content of the emulsified oil/fat (a 50-percent oil/fat content) is 10 to 60 g/L, 12 to 45 g/L, or 15 to 40 g/L. Additionally, in some embodiments, the content of the oil/fat to be contained as the emulsified oil/fat in the entire jelly drink is 5 to 30 g/L, 6 to 22.5 g/L, or 7.5 to 20 g/L.

[0027] The emulsifier to be used for the emulsified oil/fat is not specifically limited. A smaller amount of emulsifier derived from milk protein may be used. This is because a larger amount of emulsifier derived from milk protein makes the oil/fat, although expected to serve as the liquid portion, hard to

separate from the jelly portion, and allows much oil/fat to be contained in the jelly portion.

Note, however, that the use of the emulsifier derived from milk protein is not excluded.

Gelatinous Jelly Portion

[0028] The gelatinous jelly portion is a gelatinous (solidified or semi-solidified) part of the jelly drink which the above-mentioned gelling agents form into a gel.

In addition, the gelatinous jelly portion is one of variously flavored beverages formed in a gel. Examples of the gelatinous jelly portion include coffee, matcha, black tea, banana-flavored beverage, almond-flavored beverage, strawberry-flavored beverage (fruit-flavored beverage), cheese-flavored beverage, beverage flavored with sweet red-bean soup (red-bean soup), tomato-flavored beverage (vegetable-flavored beverage), and soup.

A content of the jelly portion is defined as a content of a part of the jelly drink excluding the above-discussed liquid portion, below-discussed solid substances (ingredients) and the like, and is not specifically limited.

Magnesium

[0029] Magnesium is a substance which can strengthen contrast in color tone very much between the liquid portion and the jelly portion (the substantially white color of the liquid portion and a non-white color of the jelly portion) by: more clearly separating the liquid portion (separating water) from the gelatinous jelly portion; and making more of the emulsified oil/fat into the liquid portion as the water. Magnesium is also a substance (gelling aid) which plays a role of helping the gelling agents to form the gel.

Furthermore, magnesium can clearly separate the liquid portion and the jelly portion of the finally-obtained jelly drink even if after the preparation of the liquid composition

by mixing the materials, temperature load (such as predetermined heat load before the filling of the container with the liquid composition) is applied to the liquid composition, and/or even if mechanical stress (such as pressure load caused by a pump during the line manufacturing) is applied to the liquid composition from a step of heating the liquid composition through a step of filling the container with the liquid composition. In other words, magnesium can enhance resistance of the jelly drink, in the state of being the liquid composition, against the temperature load and the mechanical stress, and can accordingly manufacture the desired jelly drink in which the liquid portion and the jelly portion are clearly separated from each other.

[0030] In some embodiments, a content of magnesium is 0.03 g/L or more, 0.05 g/L or more, or 0.1 g/L or more. The content of magnesium which is the predetermined value or more can strengthen the contrast in color tone between the liquid portion and the jelly portion to a larger extent, and can enhance the resistance of the liquid composition against the temperature load and the mechanical stress.

Moreover, in some embodiments, the content of magnesium is 0.5 g/L or less, or 0.4 g/L or less, from a viewpoint of saturating the above-discussed effects, and from a viewpoint of making the flavor unsuitable (making the acridness stronger).

[0031] Examples of the source of magnesium include magnesium sulfate, magnesium chloride, magnesium L-glutamate, and magnesium gluconate.

pH

[0032] In some embodiments, the pH of the jelly drink according to some embodiments is 5.0 or more, 5.5 or more, or 6.0 or more.

A pH of the jelly drink which is the predetermined value

or more makes it possible to avoid the jelly portion being too soft, or not becoming solid.

The upper limit of the pH of the jelly drink according to one or more embodiments is not specifically limited, but is set at, for example, 7.5.

Incidentally, the value of the pH of the jelly drink represents the pH of the jelly drink product, and specifically represents the pH of the jelly drink in the state where the liquid portion and the jelly portion are mixed together by the shaking of the jelly drink. In addition, the pH value may be measured with a commercially-available pH meter.

Temperature

[0033] The jelly drink according to one or more embodiments has likelihood that a continuing high temperature melts the jelly portion. The jelly drink may be treated as a product to be stored and preserved at normal temperature. In other words, the jelly drink may be treated as a cold product, but not as a hot product.

Alcohol

[0034] The jelly drink according to one or more embodiments may contain alcohol.

No specific limitation is imposed on a type, manufacturing method, materials and so on of the alcohol, as long as the alcohol is a drinkable alcohol and is contained within a range that does not adversely affect the desired effects of the present invention. The alcohol may be a distilled alcoholic drink or a brewed alcoholic drink. Examples of the distilled alcoholic drink include: various spirits such as shochu, brandy, vodka, whisky, rum; and raw material alcohol. They may be used singly or in combination. Examples of the brewed alcoholic drink include beer, low-malt beer, fruit wine, sweet fruit wine, and rice wine. They may be used singly or in combination. Furthermore, soaking liquor obtained by soaking fruit or the

like in one of the above-mentioned various alcoholic drinks may be used.

Incidentally, the alcohol discussed in this specification is ethanol unless otherwise specified.

Others

[0035] As discussed above, the jelly drink according to one or more embodiments may contain one of various beverages (or their general ingredients/materials) as a material(s) of the jelly portion (and part of the liquid portion). Examples of such beverages include coffee, matcha, black tea, banana-flavored beverage, almond-flavored beverage, strawberry-flavored beverage (fruit-flavored beverage), cheese-flavored beverage, beverage flavored with sweet red-bean soup (red-bean soup), tomato-flavored beverage (vegetable-flavored beverage), and soup.

In addition, the jelly drink according to one or more embodiments includes the jelly portion obtained by forming one of the various flavored beverages into a gel as discussed above, may include solid substances (ingredients) suitable for the flavor of the jelly portion. For example, in a case where the jelly portion is obtained by forming matcha or the beverage flavored with sweet red-bean soup into a gel, the jelly portion may contain rice-flour dumplings, while konjac-flour dumplings, red beans or the like. In a case where the jelly portion is obtained by forming the fruit-flavored beverage or the vegetable-flavored beverage into a gel, the jelly portion may contain pieces of fruit or pieces of vegetable.

[0036] Moreover, sweetener, high-intensity sweetener, antioxidant, flavoring, acidulant, salt, dietary fiber, defoamer, colorant and the like (hereinafter referred to as "additives" depending on the necessity), which are usually mixed into beverages, may be added to the jelly drink according to one or more embodiments within a range which does not allow

the additives to inhibit the desired effects of the present invention. Examples of the usable sweetener include fructose glucose liquid sugar, glucose, galactose, mannose, fructose, lactose, sucrose, maltose, glycogen, and starch. Examples of the usable high-intensity sweetener include neotame, acesulfame potassium, sucralose, saccharin, saccharin sodium, disodium glycyrrhizinate, sodium cyclamate, dulcin, stevia, glycyrrhizin, thaumatin, monellin, aspartame, and alitame. Examples of the usable antioxidant include vitamin C, vitamin E, and polyphenol. Examples of the usable acidulant include adipic acid, citric acid, trisodium citrate, glucono delta-lactone, gluconic acid, potassium gluconate, sodium gluconate, succinic acid, monosodium succinate, disodium succinate, sodium acetate, DL-tartaric acid, L-tartaric acid, sodium DL-tartrate, sodium L-tartrate, carbon dioxide, lactic acid, sodium lactate, glacial acetic acid, fumaric acid, monosodium fumarate, DL-malic acid, sodium DL-malate, and phosphoric acid. Examples of the usable salt include table salt, acid potassium phosphate, acid calcium phosphate, ammonium phosphate, magnesium sulfate, calcium sulfate, potassium metabisulfite, calcium chloride, magnesium chloride, potassium nitrate, and ammonium sulfate. Examples of the usable dietary fiber include indigestible dextrin, pectin, polydextrose, and partially-hydrolyzed guar gum. Examples of the usable defoamer include emulsifier, silicon emulsifier, and liquid oil. Examples of the usable colorant include caramel color, anthocyanin, gardenia pigment, fruit juice pigment, vegetable pigment, and synthetic dye.

In addition, the above-mentioned usable materials may be commercially-available ones.

Jelly Drink Packed in Container

[0037] The jelly drink according to one or more embodiments can be served by being packed in one of various types of

containers. The packing of the jelly drink in one of various types of containers makes it possible to properly prevent the quality of the jelly drink from deteriorating due to its storage for long time.

Note that a so-called can container made of metal (aluminum, steel or the like), a barrel container, a glass container, a pouch container or the like may be used as long as the container is a hermetically closable container. The volume of the container is not specifically limited. Any currently commercially-available type of container may be used. Incidentally, a metal-made container may be used from a viewpoint of keeping the quality of the jelly drink stable at normal temperature for a long time by blocking gas, moisture and light completely.

Method for Manufacturing Jelly Drink

[0038] Next, descriptions will be provided for a method for manufacturing a jelly drink according to embodiments.

The method for manufacturing a jelly drink according to embodiments includes a preparation step S1, a filling step S2 and a heat sterilization step S3.

[0039] In the preparation step S1, the liquid composition is produced by putting one of the various types of beverages such as coffee (or the materials of one of the various types of beverages), water, the gelling agents, the oil/fat materials of the emulsified oil/fat or the like, the magnesium source, alcohol, sodium bicarbonate for controlling the pH, additives and the like into a mixing tank depending on the necessity.

Note that in the preparation step S1, the liquid portion and the jelly portion are more appropriately separated from each other by independently mixing the magnesium source last than by mixing the magnesium source and the other materials together at the same time. In the preparation step S1, therefore, the magnesium source is mixed last. In other words, the magnesium

source (magnesium) may be mixed into the liquid composition prepared in the preparation step S1.

In the preparation step S1, the preparation of the liquid composition may be performed by mixing the materials together such that the amount of each of the materials falls within the above-mentioned, corresponding, predetermined range.

[0040] In the filling step S2, the liquid composition obtained in the preparation step S1 is filled into the container.

The filling step S2 may be performed using one of publicly-known filling methods such as hot pack filling and aseptic filling. The filling of the container with the liquid composition is preferably after the heating of the liquid composition up to 50 to 85 °C, more preferably up to 60 to 85 °C, and further preferably up to 60 to 70 °C.

In the case where the temperature at which to heat the liquid composition during the filling is 50 °C or more, oxygen remaining in the liquid composition can be appropriately removed from the liquid composition, and a filling method for filling the container with the liquid composition under negative pressure is appropriately applicable to the resultant liquid composition. Meanwhile, in the case where the temperature at which to heat the liquid composition during the filling is 85 °C or less, the liquid composition can be prevented from gelling. This makes unnecessary maintenance of the manufacturing apparatus which would be included if the liquid composition would do things such as adhering to pipes and the like in the manufacturing apparatus.

Note that the jelly drink according to embodiments, in the state of being the liquid composition, has good resistance against the temperature load. This means that the filling method at temperature of 50 to 85 °C is used in some embodiments.

Furthermore, the filling step S2 does not necessarily

include homogenization. For a viewpoint of gel strength, no homogenization may be performed.

[0041] In the heat sterilization step S3, the liquid composition, which is filled in the container, is sterilized by heating (for example, through the retort sterilization process). The heating temperature is not specifically limited as long as, for example, the heating temperature satisfies the sterilization value of $F_0=4$ or more (for example, approximately 35). The temperature may be 110 °C or more. The heating temperature is preferably 121 to 125 °C. The heating time may be, for example, 10 to 30 minutes.

The heat treatment in the heat sterilization step S3 melts the gelling agents in the liquid composition. Furthermore, after the heat sterilization step S3, the liquid composition as filled in the container is separated into the liquid portion and the gelatinous jelly portion in the process where the temperature of the liquid composition becomes lower.

Note that the thus-manufactured jelly drink is such that: the gelatinous jelly portion is formed in the lower part of the inside of the container; and the liquid portion is formed above the jelly portion. This enables the consumer to crush the jelly portion into pieces in desirable sizes by shaking the container before the consumer eats the jelly drink.

[0042] The processes carried out in the preparation step S1, the filling step S2 and the heat sterilization step S3 can be performed in a facility generally used to manufacture various beverages.

Method for Improving Separation Property of Jelly Drink

[0043] Next, descriptions will be provided for a method for improving a separation property of a jelly drink according to embodiments.

The method for improving a separation property of a jelly drink according to embodiments is a method for clearly

separating the liquid portion and the jelly portion of the jelly drink from each other. This method is performed by: preparing the liquid composition by mixing materials, including locust bean gum, carrageenan, xanthan gum, magnesium, and emulsified oil/fat; filling the container with the liquid composition; and sterilizing the liquid composition, which is filled in the container, by heating.

Note that: the steps in the method for improving a separation property of a jelly drink according to embodiments are the same as those discussed in the "method for manufacturing a jelly drink"; and contents of the respective ingredients are the same as those discussed in the "jelly drink."

[0044] As discussed above, the jelly drink (the methods for manufacturing a jelly drink and improving a separation property of a jelly drink) according to embodiments includes locust bean gum, carrageenan, xanthan gum, magnesium, and emulsified oil/fat, and thus clearly separates the liquid portion and the gelatinous jelly portion from each other. Specifically, the jelly drink can strengthen the contrast in color tone between the liquid portion and the gelatinous jelly portion in the jelly drink to a larger extent.

Moreover, the jelly drink (the methods for manufacturing a jelly drink and improving a separation property of a jelly drink) according to embodiments can clearly separate the liquid portion and the jelly portion of the jelly drink from each other even if the temperature load and the mechanical stress are applied to the liquid composition after the liquid composition is prepared by mixing the materials, but until the liquid composition is heated and filled in the container.

[0045] Besides, the jelly drink (the methods for manufacturing a jelly drink and improving a separation property of a jelly drink) according to embodiments is suitable as a jelly drink according to which the consumer to crush the jelly portion

into pieces by shaking the jelly drink before drinking (a beverage which becomes suitable to be drunk when its jelly portion is shaken and crushed into pieces), and allows the consumer to adjust the size of the pieces of the jelly portion depending on the necessity. This crushing work can break the jelly portion into unevenly-shaped and unevenly-sized pieces, and mixes the liquid cream with the crushed pieces of the jelly portion. The jelly drink according to embodiments mixes the liquid portion (the liquid cream) and the crushed pieces of the jelly portion together more steadily than the conventional jelly drink with mousse-like cream just put on the jelly portion, and is very suitable as the jelly drink. In addition, the liquid portion (liquid cream) and the jelly portion are mixed together only after the consumer crushes the jelly portion by shaking, but not until the consumer crushes the jelly portion by shaking. The jelly drink packed in the container, therefor, can make itself look fresh and real as if the consumer had put the liquid cream on the jelly portion immediately before drinking the jelly drink.

[0046] Furthermore, the method for manufacturing a jelly drink according to embodiments is a so-called single liquid filling method, and does not include a step of forming the liquid composition into a gel before the filling of the container with the liquid composition. Thus, the method for manufacturing a jelly drink according to embodiments not only can shorten the manufacturing process, but also does not include maintenance of the manufacturing apparatus which would be included if the liquid composition would be formed into a gel and do things such as adhering to pipes and the like in the manufacturing apparatus. Accordingly, the method for manufacturing a jelly drink is very excellent in the production optimization.

Examples

[0047] Next, descriptions will be provided for the present

invention by showing examples which satisfy the requirements of the present invention and a comparative example which does not the requirement thereof.

Example 1

[0048] First of all, it was checked in Example 1 what effect a heating temperature in the filling step caused on the evaluation.

Preparation of Samples

[0049]

Sample liquids were prepared by: mixing together instant coffee (in the form of powder), granulated sugar, emulsified vegetable oil/fat (emulsified rapeseed oil, the oil/fat content at approximately 50%), locust bean gum, κ -carrageenan, xanthan gum, emulsifier, sodium bicarbonate and water; and mixing magnesium sulfate (one gram of magnesium sulfate includes 0.099 grams of magnesium) or calcium lactate (one gram of calcium lactate includes 0.13 grams of calcium) into the resultant mixture finally, such that their contents were as shown in Table 1. The preparation until this was performed by cold mixing (at temperature of 50 °C or less).

Subsequently, the sample liquids were heated such that their temperatures were as shown in Table 1, and were put into their respective containers (wide-mouth cans). After that, heat sterilization was performed on the containers at 123 °C for 20 minutes. Incidentally, the sample liquids were not homogenized when filled into the containers.

Afterward, the sample liquids were cooled to normal temperature. Then, the containers were shaken several times. After that, the samples liquids in the containers were put into transparent glasses.

Test Contents

Water Separation Rate

[0050] For each sample, only the liquid was collected from

the sample after a content quantity (mass) of the sample was measured, and the amount of separated water (the mass of the liquid portion) was measured. Thereafter, the water separation rate of the sample (= the amount of separated water divided by the content quantity multiplied by 100) was calculated.

[0051] Table 1 shows the specification and evaluation result of each sample.

In the table, a "formulation Bx" represents a Bx value obtained by measuring a sugar content of the sample in a state of being after cold mixing, using a saccharimeter (RX-5000 manufactured by Atago Co., Ltd), and a "formulation pH" represents a pH value obtained by measuring the pH of the sample in the state of being after the cold mixing, using a pH meter (HM-30G manufactured by TKK-Toa Corporation).

In the table, a "post-sterilization Bx" represents a Bx value obtained by, after heat sterilization, measuring the sugar content of the sample in a state where the liquid portion and the jelly portion were mixed together by the shaking of the jelly drink in a gel form at normal temperature, using the saccharimeter. A "post-sterilization Bx (jelly portion)" represents a Bx value of the jelly portion, and a "post-sterilization Bx (liquid portion)" represents a Bx value of the liquid portion.

Furthermore, a "post-sterilization pH" represents a pH value obtained by, after heat sterilization, measuring the pH of the sample in the state in where the liquid portion and the jelly portion were mixed together by the shaking of the jelly drink in a gel form at normal temperature, using the pH meter.

In the table, a symbol "-" represents no measurement or no evaluation.

[0052] Table 1:

Sample Number		1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8
Instant Coffee	g/L	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Granulated Sugar	g/L	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Emulsified Vegetable Oil (oil/fat content of 50 %)	g/L	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Gelling Agent	Locust Bean Gum	g/L	0.79	0.79	0.79	0.79	0.79	0.79	0.79
	Carrageenan	g/L	0.46	0.46	0.46	0.46	0.46	0.46	0.46
	Xanthan Gum	g/L	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Magnesium Sulfate	g/L	0.00	0.00	0.00	0.00	2.00	2.00	2.00	2.00
Calcium Lactate	g/L	2.00	2.00	2.00	2.00	0.00	0.00	0.00	0.00
Emulsifier	g/L	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Sodium Bicarbonate	g/L	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Formulation Bx	%	8.90				8.76			
Formulation pH		6.85				6.82			
Temperature when Filling	°C	Not Heated	55	65	75	Not Heated	55	65	75
Post-sterilization pH		6.16	6.24	6.28	6.4	6.25	6.24	6.29	6.38
Content Quantity	g	175.97	172.7	171.68	170.96	171.68	172.35	171.15	169.89
Amount of Separated Water	g	24.65	14.04	13.08	12.84	20.02	18.62	18.78	20.38
Water Separation Rate	%	14%	8%	8%	8%	12%	11%	11%	12%

Result Examination

[0053] It was confirmed that Samples 1-1 to 1-4 containing calcium decreased their water separation rates drastically from 14% to 8% in a case where the sample liquids were heated during their filling. Meanwhile, it was not confirmed that Samples 1-5 to 1-8 containing magnesium decreased their water separation rates drastically even in the case where the sample liquids were heated during their filling.

Thus, it was confirmed that the jelly drinks whose materials included magnesium, in the state of being the sample liquid (liquid composition), had resistance against the temperature load.

Example 2

[0054] Next, it was checked in Example 2 what effect mechanical stress until the filling of a container with a liquid composition caused on the evaluation.

Preparation of Samples

[0055] Sample liquids were prepared by: mixing together instant coffee (in the form of powder), granulated sugar, emulsified vegetable oil/fat (emulsified rapeseed oil, the oil/fat content at approximately 50%), locust bean gum, κ-carrageenan, xanthan gum, emulsifier, sodium bicarbonate and water; and mixing magnesium sulfate (one gram of magnesium sulfate includes 0.099 grams of magnesium) or calcium lactate

(one gram of calcium lactate includes 0.13 grams of calcium) into the resultant mixture finally, such that their contents were as shown in Table 2. The preparation until this was performed by cold mixing (at temperature of 50 °C or less).

Subsequently, the sample liquids were heated such that their temperatures were as shown in Table 2, and were circulated at a flow rate of approximately 6 L/minute in a circulation hose (with a length of approximately 2 meters, and with a pipe inner diameter of 15 millimeters) using a cascade (centrifugal) pump (manufactured by Aichi Pump Co., Ltd., MC-32S4 with a diameter of 32 millimeters). Thereafter, the resultant sample liquids were put into their respective containers (wide-mouth cans). After that, heat sterilization was performed on the containers at 123 °C for 20 minutes. Incidentally, the sample liquids were not homogenized when filled into the containers.

Afterward, the sample liquids were cooled to normal temperature. Then, the containers were shaken several times. After that, the samples liquids in the containers were put into transparent glasses.

Test Contents

[0056] Not only a test concerning the "water separation rate" was carried out like in Example 1, but also the following tests were conducted.

Sensory Evaluations

[0057] For each sample, five trained persons on a professional panel independently evaluated the sample using four scales in terms of the "two-layer separation," the "texture" and the "color tone" according to the following evaluation criteria, and made final evaluations through their discussion.

Note that they evaluated the "two-layer separation" and the "color tone" visually, and the "texture" by drinking.

Two-layer Separation: Evaluation Criteria

[0058] Excellent: the two layers (the liquid portion and the gelatinous jelly portion) were separated from each other very clearly.

Good: the two layers were separated from each other clearly.

Fair: the two layers were separated from each other, but not so clearly.

Poor: the two layers were not separated from each other at all.

Texture: Evaluation Criteria

[0059] Excellent: the gelatinous jelly portion was firm, and a very steady gelatinous texture could be felt.

Good: part of the gelatinous jelly portion was not too soft, and a steady gelatinous texture could be felt.

Fair: although the gelatinous jelly portion was soft, a gelatinous texture could be felt.

Poor: no gelatinous texture could be felt, or the entire sample was formed into a gel.

Color Tone: Evaluation Criteria

[0060] Excellent: the contrast in color between the liquid portion and the jelly portion was very clear.

Good: the contrast in color between the liquid portion and the jelly portion was clear.

Fair: the contrast in color between the liquid portion and the jelly portion was not so clear.

Poor: there was no contrast in color between the liquid portion and the jelly portion.

Check on Color of Liquid Portion

[0061] For each sample, its liquid portion was put into a cylindrical cell with a diameter of 35 millimeters, and the L*, a*, b* and YI values of the liquid portion were obtained by carrying out transparent object color measurement (measurement according to the user's manual of a spectrophotometer ZE6000 manufactured by Nippon Denshoku Industries Co., Ltd.) by use

of the spectrophotometer ZE6000.

Note that: the L^* value represents brightness; and a larger L^* value means greater brightness. In addition, a^* and b^* values each represent chromaticity (hue and saturation) and its color direction. A symbol a^* represents the red direction, while a symbol $-a^*$ represents the green direction. A symbol b^* represents the yellow direction, while a symbol $-b^*$ represents the blue direction. The YI represents yellowness.

Taste Evaluation

[0062] For each sample, the five trained persons on the professional panel independently evaluated the sample using five scales in terms of the "coffee-like taste of the jelly portion," the "creamy taste of the jelly portion," the "coffee-like taste of the liquid portion," the "creamy taste of the liquid portion" and the "difference in taste between the jelly portion and the liquid portion," and made final evaluations through their discussion.

Evaluation of Coffee-like Taste and Creamy Taste: Evaluation Criteria

[0063] 5: very strong
 4: strong
 3: fair
 2: weak
 1: very weak

Evaluation of Difference in Taste: Evaluation Criteria

[0064] 5: very strong
 4: strong
 3: fair
 2: weak
 1: very weak

[0065] Table 2:

Sample Number	2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8	2-9	2-10	2-11	2-12	2-13	2-14	2-15
Instant Coffee	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Granulated Sugar	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Emulsified Vegetable Oil (oil/fat content of 50 %)	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Gelling Agent	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Locust Bean Gum	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Carageenan	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Xanthan Gum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium Sulfate	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Calcium Lactate	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Emulsifier	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Sodium Bicarbonate	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30	8.30
Formulation Bx	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74	6.74
Formulation pH	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68
Pump Circulation	times	times	times	times	times	times	times	times	times	times	times	times	times	times	times
Temperature when Filling	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
Two Layer Separation	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated	Not Heated
Texture	Excellent	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Tone	Excellent	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Post-sterilization Bx (Jelly Portion)	7.3	7.3	8.0	8.5	9.0	7.7	8.1	7.8	7.8	7.8	7.5	7.7	7.8	7.7	7.7
Post-sterilization Bx (Liquid Portion)	11.9	9.8	9.5	10.1	9.9	10.5	12.1	12.3	12.5	12.5	11.3	11.5	11.8	11.7	11.6
Content Quantity	6.13	6.24	6.28	6.32	6.4	6.16	6.26	6.25	6.31	6.37	6.18	6.21	6.23	6.23	6.3
Amount of Separated Water	171.92	175.12	183.78	178.95	179.95	176.5	171.67	179.67	176.77	178.99	179.43	170.34	175.29	175.58	175.25
Water Separation Rate	21.3	12.64	13.7	15.52	18.06	24.98	21.82	25.06	24.3	22.48	24.98	22.51	22.44	23	25.6
Liquid Portion I*	12%	7%	7%	9%	10%	14%	13%	14%	14%	13%	14%	13%	13%	13%	15%
Liquid Portion a*	-	47.16	-	48.06	41.09	-	63.49	-	63.74	62.27	-	64.04	-	63.42	62.38
Liquid Portion b*	-	10.29	-	9.69	11.40	-	6.47	-	6.39	6.36	-	6.13	-	6.24	6.24
Liquid Portion YI	-	31.20	-	30.37	31.91	-	26.75	-	26.69	26.00	-	25.86	-	25.94	25.56
Coffee-like Taste of Jelly Portion	-	94.48	-	91.17	104.80	-	67.18	-	66.80	66.54	-	64.84	-	65.51	65.54
Cream-like Taste of Jelly Portion	-	3	-	3	3	-	4	-	4	4	-	4	-	4	4
Coffee-like Taste of Liquid Portion	-	3	-	3	3	-	2	-	2	2	-	2	-	2	2
Cream-like Taste of Liquid Portion	-	3	-	3	4	-	3	-	3	3	-	3	-	3	3
Difference in Taste between Jelly Portion and Liquid Portion	-	3	-	3	2	-	4	-	4	4	-	4	-	4	4

Result Examination

[0066] Regarding Samples 2-1 to 2-5 containing calcium, the L^* values of their liquid portions were in order of 40, and the white colors of the liquid portions which were derived from the emulsified vegetable oil/fat were not so bright. Regarding Samples 2-6 to 2-15 containing magnesium, the L^* values of their liquid portions were in order of 60, and it was confirmed that the white colors of the liquid portions which were derived from the emulsified vegetable oil/fat were bright and clear. Incidentally, these results substantially agreed with the results of the sensory test of the color tone.

In addition, the jelly portion was felt to have a stronger coffee-like taste and the liquid portion was felt to have a stronger creamy taste in Samples 2-6 to 2-15 containing magnesium than in Samples 2-1 to 2-5 containing calcium. Thus, samples 2-6 to 2-15 containing magnesium enabled the difference in taste between the jelly portion and the liquid portion to be felt more strongly.

Furthermore, Samples 2-6 to 2-15 containing magnesium each not only could obtain preferable results in terms of the L^* value and the difference in taste between the jelly portion and the liquid portion, but also each did not change the results even though the sample liquid was circulated in the pipe using the pump, as shown by the fact that the water separation rate made substantially no change. In other words, it could be confirmed that Samples 2-6 to 2-15 containing magnesium, in the state of being the sample liquids (liquid compositions), had resistance against the mechanical stress.

Example 3

[0067] Next, it was checked in Example 3 what effect a content of magnesium sulfate (magnesium) caused on the evaluation.

Preparation of Samples

[0068] Sample liquids were prepared by: mixing together

instant coffee (in the form of powder), granulated sugar, emulsified vegetable oil/fat (emulsified rapeseed oil, the oil/fat content at approximately 50%), locust bean gum, k-carrageenan, xanthan gum, emulsifier, sodium bicarbonate and water; and mixing magnesium sulfate (one gram of magnesium sulfate includes 0.099 grams of magnesium) or calcium lactate (one gram of calcium lactate includes 0.13 grams of calcium) into the resultant mixture finally, such that their contents were as shown in Table 3. The preparation until this was performed by cold mixing (at temperature of 50 °C or less).

Subsequently, the sample liquids were heated such that their temperatures were as shown in Table 3, and were put into their respective containers (wide-mouth cans). After that, heat sterilization was performed on the containers at 123 °C for 20 minutes. Incidentally, the sample liquids were not homogenized when filled into the containers.

Afterward, the sample liquids were cooled to normal temperature. Then, the containers were shaken several times. After that, the samples liquids in the containers were put into transparent glasses.

Test Contents

[0069] Tests which were the same as those in Example 2 were conducted.

[0070] Table 3:

Sample Number		3-1	3-2	3-3	3-4	3-5	3-6	3-7
Instant Coffee	g/L	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Granulated Sugar	g/L	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Emulsified Vegetable Oil (oil/fat content of 50 %)	g/L	20.00	20.00	20.00	20.00	20.00	20.00	18.00
Gelling Agent	Locust Bean Gum	g/L	0.79	0.79	0.79	0.79	0.79	0.79
	Carrageenan	g/L	0.46	0.46	0.46	0.46	0.46	0.46
	Xanthan Gum	g/L	0.40	0.40	0.40	0.40	0.40	0.40
Magnesium Sulfate (Magnesium Content)	g/L	0.50	1.00	2.00	4.00	5.00	0.00	1.00
	g/L	0.05	0.10	0.20	0.40	0.50	0.00	0.10
Calcium Lactate	g/L	0.00	0.00	0.00	0.00	0.00	2.00	0.00
Emulsifier	g/L	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Sodium Bicarbonate	g/L	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Temperature when Filling	°C	65	65	65	65	65	65	65
Two Layer Separation		Excellent	Excellent	Excellent	Excellent	Excellent	Good	Excellent
Texture		Good	Good	Good	Good	Good	Good	Good
Tone		Excellent	Excellent	Excellent	Excellent	Excellent	Fair	Excellent
Post-sterilization Bx (Liquid Portion)	%	9.9	10.0	9.6	9.5	8.9	8.4	9.4
Content Quantity	g	171.25	169.36	173.18	173.48	175.13	172.05	175.37
Amount of Separated Water	g	22	19.5	18.8	20.8	19.6	15.6	23.83
Water Separation Rate	%	13%	12%	11%	12%	11%	9%	14%
Liquid Portion L*		57.61	57.61	57.07	55.1	55.57	38.00	56.39
Liquid portion a*		8.02	7.88	8.07	8.39	8.42	13.1	8.5
Liquid Portion b*		28.76	28.33	28.6	29.06	29.3	33.89	28.86
Liquid Portion YI		77.04	76.11	77.28	80.18	80.24	115.37	78.85
Coffee-like Taste of Jelly Portion		4	4	4	4	4	3	4
Cream-like Taste of Jelly Portion		2	2	2	2	2	3	2
Coffee-like Taste of Liquid Portion		3	3	3	3	3	3	3
Cream-like Taste of Liquid Portion		4	4	4	4	4	3	4
Difference in Taste between Jelly Portion and Liquid Portion		4	4	4	4	4	3	4

Result Examination

[0071] From their results, it could be confirmed that because of containing magnesium within the predetermined range, Samples 3-1 to 3-6 each met with preferable results in all the sensory evaluations (on the two layer separation, the texture, the color tone, the difference in taste between the jelly portion and the liquid portion, and the like), and each had a high L* value as well as a water separation rate which fell within the preferable range.

Note that although containing the emulsified vegetable oil/fat whose content was different from those of the other samples, Samples 3-7 each met with preferable results in all the sensory evaluations (on the two layer separation, the texture, the color tone, the difference in taste between the jelly portion and the liquid portion, and the like), and each had a high L* value as well as a water separation rate which fell within the preferable range, because of containing magnesium within the predetermined range.

Example 4

[0072] Next, it was checked in Example 4 whether the present

invention was applicable to types of beverages which were different from coffee.

Preparation of Samples

[0073] Sample liquids were prepared by: mixing together matcha extract (manufactured by Nagaoka Co., Ltd.), granulated sugar, emulsified vegetable oil/fat (emulsified rapeseed oil, the oil/fat content at approximately 50%), locust bean gum, κ -carrageenan, xanthan gum, emulsifier, sodium bicarbonate, potassium chloride (KCl) and water; and mixing magnesium sulfate (one gram of magnesium sulfate includes 0.099 grams of magnesium) or calcium lactate (one gram of calcium lactate includes 0.13 grams of calcium) into the resultant mixture finally, such that their contents were as shown in Table 4. The preparation until this was performed by cold mixing (at temperature of 50 °C or less).

Subsequently, the sample liquids were heated such that their temperatures were as shown in Table 4, and were put into their respective containers (wide-mouth cans). After that, heat sterilization was performed on the containers at 123 °C for 20 minutes. Incidentally, the sample liquids were not homogenized when filled into the containers.

Afterward, the sample liquids were cooled to normal temperature. Then, the containers were shaken several times. After that, the samples liquids in the containers were put into transparent glasses.

Test Contents

[0074] Tests which were the same as those in Example 2 were conducted.

[0075] Table 4:

Sample Number		4-1	4-2	4-3	4-4	4-5	4-6
Matcha Extract	g/L	4.00	4.00	4.00	4.00	4.00	3.00
Granulated Sugar	g/L	45.00	45.00	45.00	45.00	45.00	45.00
Emulsified Vegetable Oil (oil/fat content of 50 %)	g/L	20.00	20.00	20.00	20.00	20.00	15.30
Gelling Agent	Locust Bean Gum	g/L	0.79	0.79	0.79	0.79	0.66
	Carrageenan	g/L	0.46	0.46	0.46	0.46	0.39
	Xanthan Gum	g/L	0.40	0.40	0.40	0.40	0.33
Magnesium Sulfate	g/L	0.50	1.00	2.00	4.00	5.00	1.00
Calcium Lactate	g/L	0.00	0.00	0.00	0.00	0.00	0.00
Emulsifier	g/L	0.90	0.90	0.90	0.90	0.90	0.90
Sodium Bicarbonate	g/L	0.30	0.30	0.30	0.30	0.30	0.30
KCI	g/L	1.00	1.00	1.00	1.00	1.00	1.00
Temperature when Filling	°C	65	65	65	65	65	65
Two Layer Separation		Good	Good	Good	Good	Good	Good
Texture		Good	Good	Good	Good	Good	Good
Tone		Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Post-sterilization Bx (Liquid Portion)	%	9.5	9.7	9.8	9.3	9.0	7.95
Content Quantity	g	171.6	178.3	171.98	169.02	171.85	183.11
Amount of Separated Water	g	21.7	23.8	21.1	21.8	20.9	31.18
Water Separation Rate	%	13%	13%	12%	13%	12%	17%
Liquid Portion L*		79.17	78.72	78.49	77.96	78.82	71.14
Liquid portion a*		-9.06	-9.1	-9.11	-10.73	-10.62	-10.04
Liquid Portion b*		17.83	17.63	17.54	17.47	17.94	21
Liquid Portion YI		28.43	28.16	28.04	26.62	27.36	35.74
Matcha-like Taste of Jelly Portion		4	4	4	4	4	4
Cream-like Taste of Jelly Portion		2	2	2	2	2	2
Matcha-like Taste of Liquid Portion		3	3	3	3	3	3
Cream-like Taste of Liquid Portion		4	4	4	4	4	4
Difference in Taste between Jelly Portion and Liquid Portion		4	4	4	4	4	4

Result Examination

[0076] From results of Samples 4-1 to 4-5, it could be confirmed that because of containing magnesium within the predetermined range, even the types of beverages which were different from coffee each met with preferable results in substantially all the sensory evaluations (on the two layer separation, the texture, the color tone, the difference in taste between the jelly portion and the liquid portion, and the like), and each had a high L* value as well as a water separation rate which fell within the preferable range.

Note that although containing the matcha extract, emulsified vegetable oil/fat and gelling agents whose contents were different from those of the other samples, Samples 4-6 each met with preferable results in all the sensory evaluations (on the two layer separation, the texture, the color tone, the difference in taste between the jelly portion and the liquid portion, and the like), and each had a high L* value as well as a water separation rate which fell within the preferable range, because of containing magnesium within the predetermined

range.

Reference Signs List

- [0077]** S1 Preparation step
 S2 Filling step
 S3 Heat sterilization step

CLAIMS

1. A jelly drink comprising:
a liquid portion; and
a gelatinous jelly portion,
wherein the jelly drink includes locust bean gum,
carrageenan, xanthan gum, magnesium, and emulsified oil/fat.
2. The jelly drink according to claim 1, wherein the
magnesium has a content of from 0.03 g/L to 0.5 g/L both
inclusive.
3. The jelly drink according to claim 1 or 2, wherein the
liquid portion has a content of 8.5% by mass or more.
4. A method for manufacturing a jelly drink including a
liquid portion and a gelatinous jelly portion, the method
comprising:
preparing a liquid composition by mixing materials
including locust bean gum, carrageenan, xanthan gum, magnesium,
and emulsified oil/fat;
filling the liquid composition in a container; and
sterilizing the liquid composition, which is filled in
the container, by heating.
5. The method for manufacturing a jelly drink according to
claim 4, wherein the liquid composition, which is to be filled
in the container, has a temperature of from 50 °C to 85 °C both
inclusive.
6. A method for improving a separation property of a jelly
drink and clearly separating the jelly drink into a liquid
portion and a gelatinous jelly portion, the method comprising:

preparing a liquid composition by mixing materials including locust bean gum, carrageenan, xanthan gum, magnesium, and emulsified oil/fat;

filling the liquid composition in a container; and

sterilizing the liquid composition, which is filled in the container, by heating.