

DESCRIPTION

Title of Invention: HEATED SOY SAUCE/SUGAR MIXTURE AND FAT-AND-OIL FOOD PRODUCT

Technical Field

[0001]

This invention relates to a heated soy sauce/sugar mixture and a fat and oil food product. More particularly, it relates to a heated mixture that is obtained by heating a mixed aqueous solution of soy sauce and a sugar and is useful as a substitute for an emulsifier or a surfactant and to a fat and oil food product that is obtained by using the heated mixture and does not undergo phase separation to release fat or oil over a prolonged time period (the phase separation to release fat or oil will hereinafter be sometimes referred to as oiling-off).

Background Art

[0002]

Emulsified fat and oil food products having fats and oils uniformly dispersed in an aqueous phase have conventionally been produced by mechanically dispersing fat and oil in, e.g., a homogenizer using, e.g., a synthetic emulsifier. From the viewpoints of flavor, nutrition, safety, and the like, it is desirable to minimize use of a synthetic emulsifier. Methods for stably dispersing fat and oil using natural emulsifiers and the like have been sought for.

[0003]

In the detergent and cosmetic industries, surfactants are used to dissolve, disperse, or emulsify fats and oils in an aqueous phase. On uniformly dispersing fat and oil in an aqueous phase, the aqueous solution turns milky, after which the phenomenon is called "emulsification". When the dispersed fat and oil droplets are sufficiently small, the system becomes clear as if the fat and oil have partially dissolved. So, this phenomenon is referred to as "solubilization". Although a surfactant is indispensable to solubilization of fat and oil, it is considered difficult to apply a surfactant to food products from the standpoint of flavor, nutrition, and safety.

[0004]

The present inventors previously studied to develop a technique for obtaining a fat and oil food product that does not separate out without the help of an emulsifier or a surfactant and found that a combination of (1) an extract containing a water soluble protein as a main ingredient that is obtained by extracting, for example, meat with hot water and (2) a sugar exhibits extremely potential fat and oil solubilizing properties under a specific condition. Based on this finding, they established a method for solubilizing fat and oil by the use of a combination of the water soluble protein obtained by hot water extraction of meat and a sugar to provide a fat and oil food product that does not undergo oiling-off for an extended period of time (see, e.g., patent literature 1 below).

[0005]

To use a protein-polysaccharide complex obtained through the browning reaction that can occur spontaneously or on heating between food proteins and sugars, namely Maillard reaction has been proposed in several reports. However, the so far proposed methods are not satisfactory. For example, methods using a complex formed between a polysaccharide and an animal- or plant-derived protein (e.g., milk, egg white, or wheat), such as disclosed in patent literatures 2 through 4 below, are largely dependent on the properties of the protein, and the solubilizing or emulsifying action on fats and oils is weakened with a pH change or by heat and is markedly reduced in the presence of an inorganic salt.

[0006]

It has therefore been demanded to develop a method for obtaining a fat and oil food product having a fat and oil stably solubilized or emulsified in its aqueous phase, in which method the emulsifying action does not reduce with pH change or by heat.

[0007]

Fat and oil food products of emulsion type are exemplified by salad dressings. A method of preparing a salad dressing comprising soy sauce boiled down together with a sugar (hereinafter referred to as boiled-down soy sauce) is known from, e.g., patent literature 5 below. The objects of using boiled-down soy sauce in the method is to

eliminate drawbacks that arise when soy sauce is compounded into condiments, such as salad dressing, in an ordinary manner: One is that the sharp taste unique to soy sauce would show up, and another is that a mutual action between soy sauce and subsidiary materials would hinder development of a well-matured taste. In preparing an emulsion type dressing using boiled-down soy sauce, an emulsifier is essentially needed as is conventional in the art. It is unknown that fat and oil can be emulsified or solubilized in an aqueous phase without addition of an emulsifier by using a heated soy sauce/sugar mixture obtained by heating a mixed aqueous solution of soy sauce and a sugar.

Citation List

Patent Literature

[0008]

Patent literature 1: JP 55-1780B

Patent literature 2: JP 7-258292A

Patent literature 3: JP 2005-187401A

Patent literature 4: JP 2008-29231A

Patent literature 5: JP 2000-69934A

Summary of Invention

Technical Problem

[0009]

An object of the invention is to provide a fat and oil food product having fat and oil emulsified or dissolved in an aqueous phase that does not undergo separation or oiling-off, particularly a fat and oil food product which is obtained with no use of a synthetic emulsifier or surfactant and in which the emulsifying action does not reduce with pH change or by heat.

Solution to Problem

[0010]

As a result of extensive investigations to solve the above problem, the present inventors have found that a heated mixture obtained by heating a mixed aqueous solution of soy sauce and a sugar until the absorbance of a 0.1 w/w% aqueous dilution

of the mixed aqueous solution at 430 nm increases to 0.05 to 0.40 exhibits excellent emulsifying properties. They have ascertained that an emulsion type fat and oil food product obtained by adding fat and oil to the heated mixture followed by emulsification maintains the uniform dispersed state of the fat and oil for an extended period of time and that, when admixed with another aqueous solution (e.g., water or a flavored aqueous liquid preparation), the emulsifying properties are stably retained. Further investigations have shown that in the presence of a specific concentration of a sugar, the heated mixture solubilizes fat and oil, allows fat and oil to be dispersed stably even when mixed with a high concentration of other seasonings and that the fat and oil solubilizing properties are resistant to pH change or heat and are not impaired even in the presence of a high concentration of an inorganic salt.

[0011]

Based on these findings, the invention provides the following:

- (1) A heated soy sauce/sugar mixture obtained by heating a mixed aqueous solution of soy sauce and a sugar and having an absorbance of 0.05 to 0.40 at 430 nm measured as a 0.1 w/w% aqueous dilution.
- (2) The heated soy sauce/sugar mixture of (1) above, wherein the mixed aqueous solution is a mixture of one part by weight of soy sauce having a total nitrogen content of 1.0 to 4.5 w/v% and 0.5 to 2.0 parts by weight of a sugar, and the heating is carried out at a liquid temperature of 70° to 95°C for 9 to 66 hours.
- (3) A fat and oil food product obtained by adding fat and oil to the heated soy sauce/sugar mixture of (1) or (2) above and emulsifying or dissolving the fat and oil in the heated soy sauce/sugar mixture.
- (4) The fat and oil food product of (3) above, which is obtained by mixing the heated soy sauce/sugar mixture with water or a flavored aqueous liquid preparation to prepare an emulsifying base having a Brix of 50 w/w% or less, adding 0.02 to 1.0 part by weight of the fat and oil to one part by weight of the emulsifying base, and emulsifying the fat and oil in the emulsifying base.
- (5) The fat and oil food product of (3) above, which is obtained by mixing the heated soy sauce/sugar mixture with a sugar to prepare a solubilizing base having a Brix of 30 w/w% or more, adding 0.02 to 4.0 parts by weight of the fat and oil to one part by weight of the solubilizing base, and dissolving the fat and oil in the solubilizing base.
- (6) The fat and oil food product of (5) above, wherein the concentration of the

heated soy sauce/sugar mixture in the solubilizing base is 2 to 70 w/w%.

(7) An emulsion type food product comprising a mixture of the fat and oil food product according to any one of (3) to (6) above and a flavored aqueous liquid preparation.

(8) The emulsion type food product of (7) above, which is (a) a flavored liquid preparation used to make a rice cracker, (b) a salad dressing, (c) a sauce, or (d) a soup.

Advantageous Effects of Invention

[0012]

(1) The invention provides a heated soy sauce/sugar mixture having excellent emulsifying or solubilizing properties and useful as a substitute for an emulsifier or a surfactant. Using the heated soy sauce/sugar mixture allows for easy preparation of a fat and oil food product that has a fat and oil uniformly emulsified or dissolved in its aqueous phase and does not undergo oiling-off for an extended period of time without using a synthetic emulsifier, a surfactant, or a protein of animal or plant origin.

(2) The fat and oil food product of the invention is obtained from basic nutritious seasoning components of foods, such as soy sauce, sugars, and edible fats and oils. Hence, it does not affect the flavor of foods even when used frequently or in a large quantity and will thus find broad applications.

(3) The fat and oil food product is uniformly emulsifiable in any amount of a flavored aqueous liquid preparation to provide a stable emulsion type food product with a high degree of emulsification. The flavored aqueous liquid preparation to be used is not limited so that a wide variety of emulsion type food products, such as salad dressings and grilled meat sauces, are provided.

(4) The emulsion type food product of the invention does not undergo phase separation due to, for example, thermal denaturation even when heated for cooking or sterilization. The emulsion type food product has very high applicability to food processing because the dispersed oil droplets are extremely stable even in the presence of a high concentration of a salt. That is, even in applications to salt-containing liquid condiments, such as soy sauce and Worcestershire sauce, or other various foodstuffs that become food products through a heating step, the oil droplets are stably dispersed in the emulsion type food product, so that various problems associated with conventional food processing industries will be settled down.

Description of Embodiments

[0013]

The heated soy sauce/sugar mixture of the invention will be described in detail with reference to its preferred embodiments.

The heated soy sauce/sugar mixture of the invention is obtained by carrying out the following first and second steps.

[0014]

First step:

In the first step soy sauce and a sugar are mixed to prepare a mixed aqueous solution (hereinafter referred to as a soy sauce/sugar mixed aqueous solution). The soy sauce to be used in the first step may be conventional soy sauce, such as Koikuchi (dark color), Usukuchi (light color), Tamari, Saishikomi, and their varieties, such as low-salt soy sauce and membrane-concentrated soy sauce. Preferred of these types is soy sauce having a total nitrogen content of 1.0 to 4.5 w/v%, more preferably 2.0 to 2.5 w/v%. With the recited total nitrogen content, it is easy to obtain a heated mixture having an absorbance as specified in the invention, and the resulting heated mixture exhibits high emulsifying properties and solubilizing properties. The emulsifying properties and solubilizing properties will hereinafter be sometimes inclusively referred to as emulsifying properties. It is particularly preferred to use membrane-concentrated Koikuchi or Usukuchi soy sauce or Tamari soy sauce each having the above recited total nitrogen content.

[0015]

The membrane-concentrated soy sauce has controlled concentrations of its ingredients by membrane concentration. Membrane concentration allows for total nitrogen content adjustment. Membrane-concentrated soy sauce may be obtained by, for example, a method in which soy sauce or pasteurized soy sauce lees is subjected to membrane separation using a molecular sieve membrane, such as a reverse osmosis membrane, nanofiltration or loose RO membrane, or an ultrafiltration membrane, and collecting the retentate (see JP 10-234332A and Japanese Patent 3530753) or a method comprising filtering pasteurized soy sauce lees in a usual manner (using Celite or a microfiltration membrane) and concentrating the filtrate using a reverse osmosis membrane (see JP 4-197154A). Membrane-concentrated soy sauce with a total

nitrogen content ranging from 2.0 to 2.5 w/v% will be obtained by these methods.

[0016]

The sugar that can be used in the invention is a reducing sugar. Examples of useful reducing sugars include monosaccharides, such as glucose, fructose, and glyceraldehyde; oligosaccharides, such as maltose, lactose, and arabinose; and water-soluble saccharides, such as dextrin and malt syrup. These sugars may be used either individually or in combination thereof. The sugar may be used in the form of an isomerized sugar, such as high-fructose corn syrup. Preferred of them are glucose and malt syrup for their inexpensiveness and availability.

[0017]

The amount of a sugar to be mixed with soy sauce is preferably 0.5 to 2.0 parts, more preferably 0.5 to 1.5 parts, even more preferably 0.7 to 1.2 parts, by weight per part by weight of soy sauce. With less than 0.5 parts of a sugar, the resulting heated soy sauce/sugar mixture can have weak emulsifying properties. With more than 2 parts of a sugar, on the other hand, the resulting heated soy sauce/sugar mixture tends to be too viscous to handle easily.

[0018]

In the preparation of a solution type fat and oil food product using the heated soy sauce/sugar mixture of the invention, a sugar may be added to the heated soy sauce/sugar mixture to make a solubilizing base having further stabilized solubilizing properties as hereinafter described. In that embodiment, the solubilizing base may be obtained by mixing soy sauce with a somewhat increased amount (e.g., more than 1.2 parts by weight) of the sugar in the first step. Addition of more than 2 parts of the sugar results in an increased viscosity to cause such problems as difficult handling during the subsequent heating step. To avoid these problems, addition of an excess of the sugar is preferably preceded by the heating to once obtain a heated soy sauce/sugar mixture.

[0019]

Second Step:

In the second step, the soy sauce/sugar mixed aqueous solution obtained in the first step is heated until the absorbance of a 0.1 w/w% aqueous dilution of the mixed aqueous solution at 430 nm increases to 0.05 to 0.40, preferably 0.10 to 0.40, more preferably 0.30 to 0.40 thereby to yield the heated soy sauce/sugar mixture of the invention. The absorbance control is of very high significance in the invention. If the absorbance is less than 0.05, the object of the invention is not achieved. That is, the heated mixture would have low fat and oil emulsifying properties only to provide a fat and oil food product from which the fat and oil rapidly separate and float on the top of the product (i.e., oiling-off). The absorbance increases with the progress of Maillard reaction by heating, and excellent fat and oil emulsifying properties are observed with the absorbance being in the range of from 0.05 to 0.40. On the other hand, if the reaction is allowed to proceed excessively, the object of the invention is not achieved, either. That is, the heated soy sauce/sugar mixture would suffer from precipitation of insoluble matter and reduction in fat and oil emulsifying properties only to provide a fat and oil food product from which the fat and oil separate and float. In the second step, it is necessary to heat the soy sauce/sugar mixed aqueous solution obtained in the first step with care to avoid precipitation of insoluble matter.

[0020]

The temperature and time of heating the soy sauce/sugar mixed aqueous solution are selected appropriately from the conditions that afford a heated soy sauce/sugar mixture having the above specified absorbance. For example, the heating temperature, in terms of liquid temperature, is preferably 70° to 95°C, more preferably 75° to 85°C, and the heating time is preferably 9 to 66 hours, more preferably 18 to 60 hours. To obtain a heated mixture having the above specified absorbance, it is preferred to extend the heating time when the liquid temperature is low or to shorten the heating time when the liquid temperature is high. When both the heating temperature and time are less than the above-described respective lower limits, the emulsifying and solubilizing properties reduce. When both the heating temperature and time exceed the respective upper limits, the reaction proceeds excessively to cause precipitation of insoluble matter, resulting in reduction of emulsifying and solubilizing properties.

[0021]

The heated soy sauce/sugar mixture of the invention exhibits excellent

emulsifying properties and may be used as a natural emulsifier as it is. The heated soy sauce/sugar mixture of the invention is capable of emulsifying or solubilizing a large amount of fat and oil in water or a flavored aqueous liquid preparation uniformly and stably maintains the emulsifying or solubilizing action for a prolonged period of time. The heated soy sauce/sugar mixture of the invention is also useful in other applications, such as blackening (as a substitute for a caramel color) and flavor enhancement.

[0022]

The fat and oil food product according to the invention will then be described. The fat and oil food product of the invention contains the heated soy sauce/sugar mixture of the invention and fat and oil and, if desired, other ingredients, like an aqueous solution. It is chiefly used as an intermediate in the manufacture of emulsion type food products (finished products) hereinafter described.

[0023]

The content of the heated soy sauce/sugar mixture of the invention in the fat and oil food product of the invention preferably ranges from 2 to 45 w/w%, more preferably 6 to 30 w/w%, while varying according to the content of the fat and oil. At a content of less than 2%, the stability of the emulsifying and solubilizing properties tend to decrease. Even when the content is more than 45%, the stability of the emulsifying and solubilizing properties are not largely enhanced.

[0024]

The content of the fat and oil in the fat and oil food product of the invention is decided as appropriate to the kind of the intended emulsion type food product (finished product). It is chosen from, for example, the range of from 1 to 80 w/w%. At a content exceeding 80%, the stability of the emulsifying and solubilizing properties tend to decrease. In view of stability of fat and oil in the emulsion type food product, the fat and oil content in the fat and oil food product is preferably 30% to 70%.

[0025]

Any edible fats and oils may be used in the invention, including vegetable fats and oils, such as cotton seed oil, sesame oil, rapeseed oil, soybean oil, palm oil, coconut

oil, and olive oil; animal fats and oils, such as lard, beef tallow, chicken fat, whale oil, and fish oil; essential oils, such as orange oil, lemon oil, citrus oil, and paprika oil; and spice oils, such as mustard oil. These fats and oils may be used either individually or in combination thereof. In using a fat that is solid at room temperature, such as lard or beef tallow, the fat should be used at temperatures above its melting temperature.

[0026]

Examples of the aqueous solutions include various ingredients, such as soy sauce, Worcestershire sauce, Mirin (sweet cooking sake), alcoholic beverages, vinegar, fruit juices, vegetable juices, fruit pastes (e.g., jams), ketchup, edible salt, sugars, organic acids, amino acids, tasty nucleic acids, dried and fermented fish extracts, animal or plant extracts, flavors, spices, colorings, nutrient enhancers (e.g., vitamins), preservatives, and thickeners. In the case when the ingredient is in the form of an aqueous solution, it can be used as such. In the case when the ingredient is not in the form of an aqueous solution, it may be added to water or an ingredient of aqueous solution form in an appropriate concentration. The aqueous solutions may be used either individually or as a mixture of two or more thereof. In using the aqueous solution in the preparation of the fat and oil food product of the invention, the aqueous solution may be added to the heated soy sauce/sugar mixture of the invention.

[0027]

The fat and oil food product of the invention is obtained by adding the fat and/or oil to the heated soy sauce/sugar mixture of the invention and emulsifying or dissolving the fat and oil therein. In what follows, fat and oil food products having fat and oil in an emulsified state (hereinafter referred to as fat and oil products of emulsion form) and those having fat and oil in a solubilized state (hereinafter referred to as fat and oil products of solution form), both of which are fat and oil food products according to the invention, will be described sequentially with particular reference to preferred methods of preparation.

[0028]

The fat and oil food product of the invention which is obtained by adding and emulsifying fat and oil to and in the heated soy sauce/sugar mixture of the invention

will be described based on a preferred method of preparing the same.

In the step of adding fat and oil to the heated soy sauce/sugar mixture of the invention, the fat and oil may be added directly to the heated soy sauce/sugar mixture. In the cases where the heated soy sauce/sugar mixture has so high viscosity that it is difficult to handle in the step of addition, the viscosity of the heated soy sauce/sugar mixture may be lowered by the addition of water beforehand to once prepare an emulsifying base. The aforementioned aqueous solution may be used in place of, or in addition to, water. The amount of water and/or the aqueous solution to be added is decided appropriately so that the emulsifying base may have a Brix (solids content) of 50 w/w% or less, preferably 20 to 50 w/w%, more preferably 30 to 50 w/w%. The content of the heated soy sauce/sugar mixture in the emulsifying base is preferably 35 to 90 w/w%. In the cases where fat and oil is added directly to the heated soy sauce/sugar mixture of the invention, it is preferred for the heated soy sauce/sugar mixture per se has a Brix in the range recited.

[0029]

Fat and oil are then added to the emulsifying base preferably in an amount of 0.02 to 1.0 part by weight per part by weight of the emulsifying base, and emulsified therein. The fat and oil food product having an emulsion form preferably contains 2 to 50 wt%, more preferably 5 to 30 wt%, of the heated soy sauce/sugar mixture, and 20 to 80 wt%, more preferably 30 to 70 wt%, of fat and oil based on the total weight of the fat and oil food product. The fat and oil food product having such a composition exhibits further improved stability of the emulsion state.

[0030]

The fat and oil food product of emulsion form is obtained by adding a fat or an oil to the heated soy sauce/sugar mixture of the invention or an aqueous solution thereof (i.e., the emulsifying base), followed by carrying out an emulsification treatment. The emulsification treatment may be carried out in a usual manner, for example, by high speed agitation using a high speed agitator, such as a homogenizer. The high speed agitator may be any of those commonly used in the manufacture of various foodstuffs and capable of agitating the heated soy sauce/sugar mixture or an aqueous solution thereof and fat and oil at high speed. Agitation is preferably performed at a speed of 10,000 rpm or higher using a high speed agitator capable of agitation at that speed for a

sufficient time to homogeneously disperse the fat and oil. More preferably, agitation is conducted at a speed of 14,000 to 20,000 rpm for 5 to 60 seconds. For example, fat and oil would be dispersed and emulsified homogeneously by carrying out agitation at 16,000 rpm for 30 seconds.

[0031]

The fat and oil food product of emulsion form according to the invention that does not oil-off during long term storage is thus obtained.

[0032]

The fat and oil food product of the invention which is obtained by adding and dissolving fat and oil to and in the heated soy sauce/sugar mixture of the invention will be described based on a preferred method of preparing the same.

In the step of adding fat and oil to the heated soy sauce/sugar mixture of the invention, the fat and oil may be added directly to the heated soy sauce/sugar mixture. In order to solubilize and disperse the fat and oil more stably, a sugar may be added to the heated soy sauce/sugar mixture of the invention to once prepare a solubilizing base. The resulting solubilizing base preferably has a Brix of 30 w/w% or more, more preferably 30 to 70 w/w%. The amount of the sugar to be added is decided as appropriate to the sugar to soy sauce ratio and the heating condition used in the preparation of the heated soy sauce/sugar mixture of the invention.

In the cases where the heated soy sauce/sugar mixture or the solubilizing base has a high viscosity, water may be added thereto to facilitate stirring. The amount of water to be added is preferably such as to result in a Brix in the same range as recited above. In the cases where fat and oil is added directly to the heated soy sauce/sugar mixture of the invention, it is preferred for the heated soy sauce/sugar mixture per se has a Brix in the range recited.

[0033]

The sugar to be added to the heated soy sauce/sugar mixture is preferably glucose, dextrin, or malt syrup. Other sugars previously listed as the sugar to be admixed with soy sauce in the preparation of the heated soy sauce/sugar mixture of the invention are also useful. The sugar may be added to the heated soy sauce/sugar

mixture in the form of its aqueous solution. One of the main purposes of adding a sugar to the heated mixture is to thicken and stabilize the heated mixture, which is different from the purpose of obtaining a heated soy sauce/sugar mixture. Hence, the sugar to be added to the heated soy sauce/sugar mixture is more preferably selected from dextrin, malt syrup, and their aqueous solutions.

[0034]

The content of the heated soy sauce/sugar mixture of the invention in the solubilizing base is decided appropriately so as to give a Brix of 30 w/w% or more. For example, the content of the heated soy sauce/sugar mixture of the invention in the solubilizing base is preferably in the range of from 2 to 70 w/w%. When the amount of the heated soy sauce/sugar mixture is small to result in a low Brix, the Brix should be properly adjusted by the addition of an increased amount of a sugar. In view of the stability of fat and oil in a dissolved state, the amount of the heated soy sauce/sugar mixture is more preferably 3% to 40%, even more preferably 3% to 30%. The solubilizing base containing less than 2% of the heated soy sauce/sugar mixture exhibits insufficient solubilizing properties, achieving a solubilization ratio of no more than 30%. With the heated mixture content falling within the range of from 3% to 40%, the solubilization ratio increases generally in proportion to the concentration of the heated mixture in the solubilizing base and reaches about 80% at the maximum. It is difficult to achieve a solubilization ratio of more than 80% even with a heated mixture content exceeding 40%. Moreover, such a high heated mixture content may provide a fat and oil food product with too strong soy sauce flavor that can produce bitterness and therefore lacking broad applicability to various foods. As used herein, the term "solubilization ratio" denotes the weight percent concentration (w/w) of the maximum amount of fat and oil that can be dissolved in the solubilizing base based on the weight of the fat and oil food product.

[0035]

Fat or oil is then added to the solubilizing base preferably in an amount of 0.02 to 4.0 parts by weight per part of the solubilizing base and dissolved therein. When 4.0 parts of fat/oil is added to one part of the solubilizing base, the solubilization ratio is 80%, which is substantially equal to the maximum solubilization ratio. In other words, if more than 4.0 parts of fat and oil is added, the excess over the upper limit (4.0 parts)

will not be solubilized.

[0036]

Dissolving the fat or oil in the solubilizing base may be accomplished through manual stirring using a spoon or a stirring rod or gentle mechanical stirring using a common simple stirring device, such as a commercially available versatile stirring mixer or a steam-jacketed kneader. There is no need to use a highly sophisticated emulsifying means conventionally required in the manufacture of emulsion type food products, such as a high speed agitator and an electrical dispersing apparatus. In this sense, the fat and oil product of solution form (i.e., having fat and oil in a dissolved state) is obtained economically. In the case of mechanical stirring, the stirring speed is preferably 1000 rpm or less. To achieve more uniform mixing of the fat and oil, the stirring speed is more preferably 600 rpm or less. Within the recited range of stirring speed, the stirring is carried out for a sufficient time to uniformly disperse the fat and oil. While the stirring time is not particularly limited, the fat and oil will be dispersed uniformly by stirring at a speed within the recited range for at least one minute. Such a gentle stirring operation produces the fat and oil food product of solution form of the invention very easily. To use a highly sophisticated emulsifying apparatus commonly required in the manufacture of emulsion type food products, such as a high speed agitator, like a homogenizer, would be rather unsuitable because of the high viscosity of the solubilizing base.

[0037]

The fat and oil food product of the invention that does undergo oiling-off during long-term storage is thus obtained.

[0038]

The fat and oil food product may be served as an emulsion type food product (finished product), such as a salad dressing, a flavored liquid preparation for making rice crackers, or a sauce, by properly adjusting the contents of the heated soy sauce/sugar mixture of the invention, the fat and oil, water, the aqueous solution, and the sugar. Nevertheless, in order to provide an emulsion type food product having a fat and oil in a more stably emulsified or dissolved state, it is desirable that the heated

soy sauce/sugar mixture be once formulated into a fat and oil food product of the invention as an intermediate product and then the fat and oil food product be mixed with a flavored aqueous liquid preparation appropriately to provide a desired emulsion type food product.

[0039]

Since the fat and oil food product of the invention is emulsifiable in a flavored aqueous liquid preparation in any mixing ratio, using the fat and oil food product makes it feasible to manufacture stable emulsion type products (finished products) having a high degree of emulsification or solubilization. The proportion of the fat and oil food product in the emulsion type food product is selected as appropriate to the kind of the finished product and may vary, for example, from 10 to 100 w/w%, with the balance being the flavored aqueous liquid preparation.

[0040]

When the flavored aqueous liquid preparation is used in an increased amount to make a low-fat/oil emulsion type food product, the oil droplets tend to separate and float on account of the specific gravity difference between water and oil. In such cases, it is preferred to previously dissolve a thickening and stabilizing agent, such as xanthan gum or locust bean gum, in the flavored aqueous liquid preparation. There is thus obtained a stable emulsion type food product that does not undergo oiling-off for a prolonged period of time.

[0041]

The manner of mixing the fat and oil food product of the invention and the flavored aqueous liquid preparation is not particularly limited. The mixing is sufficiently accomplished by manual stirring or gentle mechanical stirring. High speed agitation is also employable.

[0042]

Where needed, the resulting emulsion type food product may be heated to adjust the flavor or to sterilize.

[0043]

The flavored aqueous liquid preparation is exemplified by a cooked liquid preparation containing soy sauce as a main ingredient and others, such as Mirin, alcoholic beverages (such as Sake and wine), vinegar, sugar, and spices. Using such a cooked liquid preparation in accordance with the conventional practice of manufacturing emulsion type food products provides emulsion type food products, including liquid preparations for making crackers, salad dressings, sauces (e.g., for grilled meat), and soups (e.g., concentrated or straight-type (non-concentrated) Ramen soup).

[0044]

The invention will now be illustrated in greater detail with reference to nonlimiting Examples. Unless otherwise noted, all the parts are given by weight.

Example 1

[0045]

Examples 1-1 to 1-8 and Comparative Examples 1-1 to 1-7

(1) Preparation of heated soy sauce/sugar mixture:

A soy sauce/sugar mixed aqueous solution was prepared by mixing 500 ml of membrane-concentrated soy sauce (total nitrogen content: 2.0 w/v%) and 500 g (dry basis) of glucose. The membrane-concentrated soy sauce was obtained by concentrating commercially available Koikuchi soy sauce (total nitrogen content: 1.65 w/v%) using a reverse osmosis membrane (NTR-7450, from Nitto Denko Corp.) and collecting the retentate. The resulting mixed aqueous solution was heated at a liquid temperature of 85°C for a heating time varying from 0 up to 96 hours to obtain heated soy sauce/sugar mixtures different in emulsifying properties.

[0046]

(2) Color measurement

The color of each heated soy sauce/sugar mixture prepared above was measured. The color measurement was carried out by determining the absorbance of a 0.1 w/w% aqueous dilution of each heated mixture at 430 nm using Ratio Beam Spectrophotometer Model U-1100 (from Hitachi High-Technologies Corp.). In order to

secure accuracy of the absorbance measurement, the 1,000-fold aqueous dilution of each heated soy sauce/sugar mixture was filtered through a 0.45 μm filter to remove turbidity before the measurement. In the following Examples, the absorbance measurement was carried out in the same manner.

[0047]

(3) Preparation of fat and oil food product of emulsion form

Seven grams of water was mixed into 13 g of each heated soy sauce/sugar mixture obtained above, and 20 g of a fat and oil was added thereto, followed by high-speed agitation (16,000 rpm, 30 seconds) using a homogenizer (DIAx 900, from Hidorph) to obtain a fat and oil food product of emulsion form. After the preparation, the product was allowed to stand for 24 hours to visually observe the dispersed and emulsified state of the oil droplets. In Table 1 below are shown the correlations between the heating time in the preparation of the heated soy sauce/sugar mixture and the absorbance of the resulting heated soy sauce/sugar mixture and the state of the fat and oil food as observed after 24 hours. The pH and Brix of the resulting fat and oil food products of emulsion form are also shown in Table 1.

[0048]

Table 1

	Heating Time (hr)	pH	Brix (%)	O.D. at 430 nm	State after 24 hrs
Comp. Ex. 1-1	0	4.57	66.1	0.02	oiling-off
Comp. Ex. 1-2	0.5	4.47	66.9	0.02	
Comp. Ex. 1-3	3	4.37	67.3	0.03	
Comp. Ex. 1-4	6	4.17	68.7	0.04	
Example 1-1	9	4.01	69.1	0.05	stable emulsion
Example 1-2	12	3.89	69.2	0.09	
Example 1-3	18	3.77	70.7	0.10	extremely stable emulsion
Example 1-4	24	3.65	71.7	0.22	
Example 1-5	36	3.54	75.8	0.28	
Example 1-6	48	3.46	79.0	0.28	
Example 1-7	60	3.40	81.0	0.35	
Example 1-8	66	3.40	81.0	0.40	partial coalescence of oil droplets
Comp. Ex. 1-5	72	3.40	80.0	-	
Comp. Ex. 1-6	84	3.40	75.1	-	
Comp. Ex. 1-7	96	3.40	79.3	-	

[0049]

The heated soy sauce/sugar mixtures of which a 0.1 w/w% aqueous dilution has an absorbance of 0.05 to 0.40, particularly an absorbance of 0.10 to 0.40, at 430 nm exhibit superior emulsifying properties. The fat and oil food products of emulsion form prepared using these heated soy sauce/sugar mixtures continue having the fat and oil uniformly dispersed therein after 24 hours from the preparation, showing high emulsion stability. In contrast, the heated soy sauce/sugar mixtures the absorbance of which is less than 0.05 due to short heating time have low emulsifying properties. When formulated into a fat and oil food product of emulsion form, they fail to maintain the fat and oil stably dispersed in the aqueous phase for a long time, easily causing oiling-off. When the heated soy sauce/sugar aqueous mixture having been heated to have the absorbance of 0.40 is further heated for an additional time, the reaction

proceeds excessively to cause insoluble matter to precipitate in the heated soy sauce/sugar mixture. Such heated soy sauce/sugar mixtures prove to have damaged emulsifying action, allowing part of the oil droplets to coalesce.

[0050]

Example 1-9

Preparation of heated soy sauce/sugar mixture and emulsified fat and oil food product

A soy sauce/sugar mixed aqueous solution was prepared by mixing 500 ml of commercially available Tamari soy sauce (total nitrogen content: 2.2 w/v%) and 500 g (dry basis) of glucose. The resulting mixed aqueous solution was heated at a liquid temperature of 80°C for 48 hours to obtain a heated soy sauce/sugar mixture of which a 0.1 w/w% (1000-fold) aqueous dilution had an absorbance of 0.40 at 430 nm.

Seven grams of water was mixed into 13 g of the heated soy sauce/sugar mixture, and 20 g of fat or oil was added thereto, followed by high-speed agitation (16,000 rpm, 30 seconds) using a homogenizer (DIAX 900, from Hidorph) to obtain a fat and oil food product of emulsion form. After the preparation, the product was allowed to stand for 24 hours to visually observe the dispersed and emulsified state of the oil droplets. As a result, the heated soy sauce/sugar mixture was proved able to uniformly disperse the fat or oil with high emulsion stability.

[0051]

It is seen from the results of Example 1 that the heated soy sauce/sugar mixture of the invention of which a 0.1 w/w% aqueous dilution has an absorbance between 0.05 and 0.40 at 430 nm shows excellent emulsifying action and provides a fat and oil food product of emulsion form having a fat and oil dispersed uniformly with extremely high emulsion stability.

Example 2

[0052]

(1) Preparation of heated soy sauce/sugar mixture

A soy sauce/sugar mixed aqueous solution was prepared by mixing 500 ml of membrane-concentrated soy sauce (total nitrogen content: 2.0 w/v%) and 500 g (dry basis) of glucose. The membrane-concentrated soy sauce was obtained by

concentrating commercially available Koikuchi soy sauce (total nitrogen content: 1.65 w/v%) using a reverse osmosis membrane (NTR-7450, from Nitto Denko Corp.) and collecting the retentate. The resulting mixed aqueous solution was heated at a liquid temperature of 85°C for 48 hours to obtain a heated soy sauce/sugar mixture of which a 0.1 w/w% (1000-fold) aqueous dilution had an absorbance of 0.28 at 430 nm and which had a Brix of 62 w/w%.

[0053]

(2) Preparation of fat and oil food product of emulsion form

Water was added to the heated soy sauce/sugar mixture in the amount shown in Table 2 below to prepare an emulsifying base. To the emulsifying base was added an equivalent amount of fat or oil, followed by high speed agitation (16000 rpm, 30 seconds) using a homogenizer (DIAX 900, from Hidorph) to prepare a fat and oil food product of emulsion form. After the preparation, the product was allowed to stand for 24 hours to visually observe the dispersed and emulsified state of the oil droplets. A predetermined aliquot of the product was added to water, and the mixture was uniformly stirred with a spoon to prepare a 0.1 w/w% aqueous dilution (emulsion). The turbidity of the aqueous dilution was measured using a turbidimeter (UT-11, from Corona Electric Co.). The results obtained are shown in Table 2.

[0054]

Table 2

	Emulsifying Base			Oil (g)	Turbidity	State after 24 hrs
	Heated soy sauce/sugar mixture (g)	Water (g)	Brix (w/w%)			
Example 2-1	20	5	50	25	1800	extremely stable emulsion
Example 2-2	16	9	40	25	1200	
Example 2-3	12	13	30	25	960	
Example 2-4	8	17	20	25	540	stable emulsion

[0055]

As shown in Table 2, it is seen that fat and oil can be stably dispersed and emulsified by using an emulsifying base prepared by adding water to the heated soy sauce/sugar mixture. Particularly high emulsion stability is obtained by using the emulsifying bases with a Brix of 30 to 50 w/w%.

Example 3

[0056]

(1) Preparation of heated soy sauce/sugar mixture

A soy sauce/sugar mixed aqueous solution was prepared by mixing 500 ml of commercially available Koikuchi soy sauce (total nitrogen content: 1.65 w/v%) and 500 g (dry basis) of glucose. The resulting mixed aqueous solution was heated at a liquid temperature of 85°C for 48 hours to obtain a heated soy sauce/sugar mixture of which a 0.1 w/w% aqueous dilution had an absorbance of 0.28 at 430 nm.

[0057]

(2) Preparation of fat and oil food product of emulsion form

To 28 g of the heated soy sauce/sugar mixture was added 22 ml of commercially available Koikuchi soy sauce to adjust the viscosity. To the heated soy sauce/sugar mixture was then added 200 g of salad oil (from Nisshin OilIIO), followed by high speed agitation using a homogenizer to give an fat and oil food product of emulsion form having salad oil uniformly dispersed therein (see Table 3, (1)).

[0058]

(3) Preparation of emulsion type salad dressing

The fat and oil food product of emulsion form and a flavored aqueous liquid preparation shown in Table 3, (2) were mixed and heat sterilized at 80°C for 30 minutes to make an emulsion type salad dressing. When the dressing was left to stand at room temperature for 2 months, the oil droplets remained uniformly dispersed in the dressing without phase separation. The dressing was thus proved to have high emulsion stability. Seeing that the emulsion state was stably maintained for a long period of time, reduction of flavor components due to oxidation or dissipation in air does not occur, so that the dressing had a good flavor even after the 2 months storage.

[0059]

Table 3 – Ingredients

(1) Fat and oil food product of emulsion form

Heated soy sauce/sugar mixture	28 g
Koikuchi soy sauce	22 ml
Salad oil	200 g

(2) Flavored aqueous liquid preparation

Dextrin	60 g
Glucose	50 g
Onion extract	2 g
Ginger extract	2 g
Vinegar	100 ml
Koikuchi soy sauce	300 ml
Water	257 ml

Example 4

[0060]

(1) Preparation of heated soy sauce/sugar mixture

A soy sauce/sugar mixed aqueous solution was prepared by mixing 500 ml of commercially available Tamari soy sauce (total nitrogen content: 2.27 w/v%) and 500 g of glucose. The resulting mixed aqueous solution was heated at a liquid temperature of 80°C for 48 hours to obtain a heated soy sauce/sugar mixture having an absorbance of 0.4 at 430 nm, a pH of 4.8, a Brix of 50, and a total nitrogen content of 1.23 w/v%.

[0061]

(2) Preparation of fat and oil food product of solution form

Malt syrup (Brix: 75%) was mixed into the heated soy sauce/sugar mixture prepared above so as to give the Brix value shown in Table 4, to prepare a series of solubilizing bases. One part of fat or oil was added to one part of each solubilizing base, followed by stirring with a spoon to dissolve. There was thus obtained a fat and oil food product of solution form.

[0062]

The state of each of the resulting fat and oil food products of solution form, i.e., whether or not the fat or oil was dissolved was visually examined based on, as a criterion, whether oiling-off occurred. Additionally, a predetermined aliquot of the product was diluted with water while uniformly stirring with a spoon to prepare a 0.1 w/w% aqueous dilution (emulsion). The turbidity of the aqueous dilution was measured using a turbidimeter (UT-11, from Corona Electric Co.). The results obtained are shown in Table 4. The higher the turbidity, the more uniformly the fat or oil is dispersed, indicating the higher degree of solubilization.

[0064]

Table 4

Example	4-1	4-2	4-3	4-4	4-5	4-6
Brix of Solubilizing Base (w/w%)	30	40	50	60	70	80
Turbidity	100	200	500	1100	2000	2500
State	dissolved	dissolved	dissolved	dissolved	dissolved	dissolved

[0064]

It is seen from Table 4 that using the solubilizing base containing the heated soy sauce/sugar mixture of the invention allows for preparation of a fat and oil food product in which fat or oil is uniformly dissolved and does not separate to float.

Example 5

[0065]

(1) Preparation of heated soy sauce/sugar mixture

A soy sauce/sugar mixed aqueous solution was prepared by mixing 500 ml of commercially available Tamari soy sauce (total nitrogen content: 2.27 w/v%) and 500 g of glucose. The resulting mixed aqueous solution was heated at a liquid temperature of 80°C for 48 hours to obtain a heated soy sauce/sugar mixture having an absorbance of 0.4 at 430 nm.

[0066]

(2) Preparation of fat and oil food product of solution form

The heated soy sauce/sugar mixture obtained above, malt syrup (Brix: 75%), and water were mixed at the ratio shown in Table 5 to prepare a series of solubilizing bases. To each solubilizing base was added the maximum amount of fat or oil that dissolves therein, followed by stirring with a spoon thereby to give a fat and oil food product of the invention. The addition of water was for facilitating stirring. The solubilization ratio achieved by the fat and oil food product is shown in Table 5.

[0067]

Comparative Example 2

For comparison, 500 ml of commercially available Tamari soy sauce and 500 g of glucose were mixed to prepare a soy sauce/sugar mixed aqueous solution. Twenty grams of the mixed aqueous solution, which was not heated, was mixed with 180 g of malt syrup (Brix: 75%), and 20 g of water, and fat or oil was added thereto, followed by stirring with a spoon to obtain a fat and oil food product. The solubilization ratio of the resulting comparative product is shown in Table 5.

[0068]

Table 5

	Comp. Ex. 2	Example					
		5-1	5-2	5-3	5-4	5-5	5-6
		Amount of Heated Mixture Added (w/w%)					
		2.7	4.5	6.4	9.1	18.2	22.7
Composition (g):							
Malt Syrup (g)	180	194	190	186	180	160	150
Heated soy sauce/sugar mixture (g)	-	6	10	14	20	40	50
Tamari Soy Sauce + Glucose (g)	20	-	-	-	-	-	-
Water (g)	20	20	20	20	20	20	20
Solubilization Ratio (%)	23.0	52.4	63.0	67.0	70.0	75.0	75.5

[0069]

It is seen from Table 5 that the unheated equivalent mixture of *Tamari* soy sauce and glucose exhibits a low ability to solubilize fat and oil (solubilization ratio: 23%), while the heated mixture obtained by heating an equivalent mixture of *Tamari* soy sauce and glucose shows a markedly increased ability to solubilize a fat and oil to achieve a high solubilization ratio. Table 5 also reveals that the solubilizing bases containing more than 2%, preferably more than 3%, of the heated mixture are able to solubilize a large quantity of fat and oil. In other words, even with a small amount of the heated mixture, a large quantity of fat and oil is solubilized to provide a food product containing solubilized fat and oil in a high concentration.

[0070]

As is apparent from the results of Examples 4 and 5, the solubilizing base containing the heated soy sauce/sugar mixture of the invention provides a fat and oil food product having a fat and oil uniformly dissolved therein merely by mixing the fat and oil with the solubilizing base. The solubilizing properties of the solubilizing base

are particularly high with the content of the heated soy sauce/sugar mixture in the base being 3 w/w% or more.

Example 6

[0071]

(1) Preparation of heated soy sauce/sugar mixture

A soy sauce/sugar mixed aqueous solution was prepared by mixing 500 ml of soy sauce (total nitrogen content: 2.0 w/v%) and 500 g (dry basis) of glucose. The soy sauce used here was obtained by concentrating commercially available Koikuchi soy sauce (total nitrogen content: 1.65 w/v%) using a reverse osmosis membrane (NTR-7450, from Nitto Denko Corp.) and collecting the retentate. The resulting mixed aqueous solution was heated at a liquid temperature of 85°C for 48 hours to obtain a heated soy sauce/sugar mixture having a Brix (dry basis) of about 50 w/w%. The heated soy sauce/sugar mixture had an absorbance of 0.28 at 430 nm.

[0072]

(2) Preparation of citrus-flavored, fat and oil food product of solution form

To one part of the heated soy sauce/sugar mixture obtained above was added 0.7 parts of malt syrup (Brix: 75%) to prepare a solubilizing base. To one part of the solubilizing base was slowly added 0.02 parts of Yuzu oil (oil of Citrus junos, from Soda Aromatic Co.) while stirring with a spoon, whereby the oil dissolved to provide a citrus-flavored fat and oil food product. When stored at room temperature for 2 months, the product was stable with no oiling-off.

Example 7

[0073]

Preparation of citrus-flavored tart soy sauce

Citrus-flavored tart soy sauce, which was an emulsion type food product, was made using the citrus-flavored fat and oil food product obtained in Example 6 in accordance with the formulation of Table 6. When the resulting tart soy sauce was stored at room temperature for 2 months, no oiling-off occurred, proving the stability of the emulsion state.

[0074]

Table 6 – Ingredients

Citrus-flavored fat and oil food product	3 g
Soy sauce	360 ml
Vinegar	70 ml
Yuzu (Citrus junos) juice	150 g
Sugar	80 g
Kelp soup broth	10 ml
Sodium glutamate	15 g
Water	320 g

Example 8

[0075]

(1) Preparation of heated soy sauce/sugar mixture

A soy sauce/sugar mixed aqueous solution was prepared by mixing 500 ml of membrane-concentrated soy sauce obtained in the same manner as in Example 6 and 500 g of glucose. The resulting mixed aqueous solution was heated at a liquid temperature of 80°C for 48 hours to obtain a heated soy sauce/sugar mixture. The heated soy sauce/sugar mixture had an absorbance of 0.38 at 430 nm.

[0076]

(2) Preparation of fat and oil food product of solution form and flavored liquid preparation for making rice crackers

Twenty grams of the heated soy sauce/sugar mixture prepared above and 80 g of malt syrup (Brix: 75%) were mixed to prepare a solubilizing base. To 100 g of the solubilizing base was added 100 g of a mixed oil consisting of 9 parts of salad oil (edible vegetable oil) and 1 part of Yuzu oil, and the mixture was stirred with a spoon to prepare a citrus-based fat and oil food product.

Separately, the ingredients shown in Table 7 were mixed up to prepare a flavored aqueous liquid preparation weighing about 760 g. Eighty grams of the citrus-based fat and oil food product and the prepared flavored aqueous liquid preparation were mixed to give a flavored liquid preparation for making rice crackers,

which was an emulsion type food product. When the resulting liquid condiment was stored at room temperature for 2 months, it still had a rich citrus flavor and was stable with no oiling-off.

[0077]

Table 7 - Ingredients of flavored aqueous liquid preparation

Soy sauce	150 ml
Sugar	150 g
Dextrin	200 g
Mirin	50 ml
Food acidulant	20 g
Edible salt	30 g
Water	160 ml

Example 9

[0078]

Preparation of rice crackers with rich citrus flavor

Pieces of sheeted and baked rice dough were made in a conventional manner. The baked rice dough was dipped in the flavored liquid preparation obtained in Example 8, raised, lightly shaken to remove excess liquid, and dry-heated at 80°C in a conventional manner, whereby the water content of the liquid preparation was evaporated to provide rice crackers having a rich citrus flavor.

Example 10

[0079]

Preparation of Wasabi-based fat and oil food product of emulsion form and flavored liquid preparation for making rice crackers

A Wasabi-based fat and oil food product was obtained in the same manner as in Example 8 (preparation of citrus-based fat and oil food product), except for replacing 100 g of the mixed oil consisting of 9 parts of salad oil (edible vegetable oil) and 1 part of Yuzu oil with 111 g of a mixed oil consisting of 10 parts of salad oil (edible vegetable

oil), 10 parts of mustard oil, and 11 parts of Wasabi flavor.

Separately, the ingredients shown in Table 8 were mixed up to prepare a flavored aqueous liquid preparation weighing about 70 g. Thirty grams of the Wasabi-based fat and oil food product and the prepared flavored aqueous liquid preparation were mixed to give a flavored liquid preparation for making rice crackers, which was an emulsion type food product. When the resulting liquid preparation was stored at room temperature for 2 months, it still had a rich Wasabi flavor and was stable with no oiling-off.

[0080]

Table 8 - Ingredients of flavored aqueous liquid preparation

Soy sauce	100 ml
Sugar	10 g
Dextrin	40 g

Example 11

[0081]

Making of richly Wasabi-flavored Kakimoto snack (spicy rice crackers having the shape of persimmon seeds)

Shaped and baked pieces of rice dough were made in a conventional manner. The baked pieces were put in a rotating pot, and the flavored liquid preparation for rice crackers obtained in Example 10 was added thereto in small portions to be uniformly applied to the surface of the baked pieces. The coated pieces were dried in hot air at 80°C to remove water from the liquid preparation in a conventional manner thereby to make richly Wasabi-flavored Kakimoto snack.

Example 12

[0082]

(1) Preparation of heated soy sauce/sugar mixture

A soy sauce/sugar mixed aqueous solution was prepared by mixing 500 ml of membrane-concentrated soy sauce obtained in the same manner as in Example 6 and

500 g of glucose. The resulting mixed aqueous solution was heated at a liquid temperature of 80°C for 48 hours to obtain a heated soy sauce/sugar mixture. The heated soy sauce/sugar mixture had an absorbance of 0.38 at 430 nm.

[0083]

(2) Preparation of fat and oil food product of solution form and emulsion type Ramen soup

Malt syrup was slowly added to the heated soy sauce/sugar mixture while gently stirring to prepare a solubilizing base. Salad oil and lard were added thereto in small portions while gently stirring to dissolve to obtain a fat and oil food product. A flavored aqueous liquid preparation was then added to the fat and oil food product, followed by heating to prepare a thick Ramen soup to be diluted on use. The mixing ratios of the ingredients are shown in Table 9.

After the thick Ramen soup was stored for 2 months, it was diluted with hot water to provide Ramen soup in which the fat and oil were stably dispersed and emulsified in an aqueous phase without oiling-off. It is seen that the fat and oil food product of solution form obtained by using the heated soy sauce/sugar mixture does not undergo separation of the oily phase when heated and maintains its ability to stably disperse and emulsify the fat and oil in the aqueous phase even after long term storage.

[0084]

Table 9 - Formulation of ingredients

(1) Fat and oil food product of solution form

Solubilizing base:

Heated soy sauce/sugar mixture	60 g
Malt syrup	152 g
Salad oil	280 g
Lard	20 g

(2) Flavored aqueous liquid preparation

Edible salt	35 g
Koikuchi soy sauce	150 g
Sodium glutamate	10 g
Grated ginger	20 g
Grated garlic	20 g
Red pepper S-50	2 g

Hot water	251 g
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CLAIMS

1. A heated soy sauce/sugar mixture obtained by heating a mixed aqueous solution of soy sauce and a sugar and having an absorbance of 0.05 to 0.40 at 430 nm measured as a 0.1 w/w% aqueous dilution.
2. The heated soy sauce/sugar mixture according to claim 1, wherein the mixed aqueous solution is a mixture of one part by weight of soy sauce having a total nitrogen content of 1.0 to 4.5 w/v% and 0.5 to 2.0 parts by weight of a sugar, and the heating is carried out at a liquid temperature of 70° to 95°C for 9 to 66 hours.
3. A fat and oil food product obtained by adding fat and/or oil to the heated soy sauce/sugar mixture according to claim 1 or 2 and emulsifying or dissolving the fat and oil in the heated soy sauce/sugar mixture.
4. The fat and oil food product according to claim 3, which is obtained by mixing the heated soy sauce/sugar mixture with water or a flavored aqueous liquid preparation to prepare an emulsifying base having a Brix of 50 w/w% or less, adding 0.02 to 1.0 part by weight of the fat and/or oil to one part by weight of the emulsifying base, and emulsifying the fat and/or oil in the emulsifying base.
5. The fat and oil food product according to claim 3, which is obtained by mixing the heated soy sauce/sugar mixture with a sugar to prepare a solubilizing base having a Brix of 30 w/w% or more, adding 0.02 to 4.0 parts by weight of the fat and/or oil to one part by weight of the solubilizing base, and dissolving the fat and oil in the solubilizing base.
6. The fat and oil food product according to claim 5, wherein the concentration of the heated soy sauce/sugar mixture in the solubilizing base is 2 to 70 w/w%.
7. An emulsion type food product comprising a mixture of the fat and oil food product according to any one of claims 3 to 6 and a flavored aqueous liquid preparation.

8. The emulsion type food product according to claim 7, which is (a) a flavored aqueous liquid preparation used to make a rice cracker, (b) a salad dressing, (c) a sauce, or (d) a soup.