

Specification

[Title]

Supplemental liquid comprising dietary fiber

[Technical Field]

[0001]

The present invention relates to a supplemental liquid for use in enteral feeding.

[Background Art]

[0002]

Nutrition therapy is used for supplying nutrients to patients, infants, the elderly and those who require nursing care in whom functions of the digestive system deteriorate, when their dietary intake is insufficient or impossible. Nutrition therapy involves enteral feeding and intravenous feeding, and enteral feeding is widely used as safer and lower-cost nutrition therapy compared to intravenous feeding. In addition, since nutrient is not fed through the digestive tract in the intravenous feeding, the following problems occur: metabolic complications such as disorder of glucose metabolism, complications in the digestive system such as atrophy of mucosa of the digestive tract, and infections attributable to catheter. Accordingly, in recent years, a general rule to select enteral feeding rather than intravenous feeding when the digestive system is in function has been gradually established.

[0003]

In commercially available fluid diet for enteral feeding, in general, its formulation is designed from the viewpoint of required energy content (calorie) and concentrations of various nutrients. In the medical field and nursing-care field, depending on the condition of a subject who actually ingests a

fluid diet, one serving of energy content, water content, and sodium chloride equivalent (amount of sodium) should be adjusted. For example, although there have been attempts of a fluid diet in which dietary fiber is added to an enteral nutritional composition (Patent Documents 1 to 3), at present in general commercial products, those having predetermined composition, in particular predetermined values of only energy content, water content and sodium chloride equivalent are prepared so that a majority of subjects can utilize them. However, depending on the condition of a subject who actually ingests the fluid diet, necessary values of energy content, water content and sodium chloride equivalent etc. prescribed by a physician may vary widely; and therefore it is necessary to calculate required amounts of these components and to supplement the shortage amounts to the fluid diet.

[0004]

For example, in the medical field and nursing-care field in general, in order to supplement the shortage of water content in a fluid diet, the container of the fluid diet is opened and cooled boiled water is directly added to the container and mixed. Furthermore, in order to supplement the shortage of salt, salt is dissolved in cooled boiled water to prepare a saline solution, which is administered after administration of the fluid diet; or, salt is dissolved in cooled boiled water to prepare a saline solution, which is injected to a feeding tube using a syringe.

[0005]

To date, regarding nutritional compositions of fluid diet which can be used in enteral feeding, in accordance with the needs of medical field and nursing-care field, the applicants have provided the following: for example, a nutritional composition

in which energy content, water content, sodium chloride equivalent (amount of sodium) can be easily adjusted (Patent Documents 4 and 5), a nutritional composition which can effectively provide copper and zinc to prevent and treat decubitus of bedridden patients (Patent Document 6). Furthermore, regarding a diluent used with nutritional compositions, the applicants have provided a diluent for flowable food composition which can dilute the concentration of an energy-source component without diluting, for example, mineral components or vitamin components (Patent Document 7).

[Prior Art Documents]

[Patent Documents]

[0006]

[Patent Document 1] JP A 2009-213367

[Patent Document 2] JP A 06-298650

[Patent Document 3] JP A 2011-4702

[Patent Document 4] JP B 5160569

[Patent Document 5] JP B 5404558

[Patent Document 6] JP B 3871262

[Patent Document 7] JP B 5449783

[Summary of the Invention]

[Problems to Be Solved by the Invention]

[0007]

In conducting intensive research in the art, the present inventors have paid attention to the fact that many of subjects actually ingesting fluid diet experience side effects such as diarrhea and constipation; in order to improve this situation, the present inventors have arrived at the idea that it is significantly useful in terms of both convenience and safety to provide a supplemental liquid which can contribute to such

improvement.

Accordingly, the present invention aims to provide a novel supplemental liquid for enteral feeding, which can easily and rapidly supplement water content and salt as a supplemental liquid of fluid diet in enteral feeding, and at the same time, which can reduce side effects such as diarrhea and constipation.

[Means of Solving the Problems]

[0008]

The present inventors have found that, in order to solve the above problems, by using a conventional supplemental liquid for fluid diet consisting of mineral components such as salt and water to which dietary fiber is further added, a novel supplemental liquid that can not only supplement mineral content such as sodium content and water content, but also very easily and safely reduce side effects such as diarrhea and constipation without requiring administration of laxatives, can be provided. As a result of further investigation, the present inventors have completed the present invention.

[0009]

Namely, the present invention relates to the following.

[1] A supplemental liquid for enteral feeding, consisting of mineral components, water and dietary fiber.

[2] The supplemental liquid according to [1], wherein the mineral components comprise sodium.

[3] The supplemental liquid according to [1] or [2], further comprising a vitamin component.

[4] The supplemental liquid according to any one of [1] to [3], wherein the sodium content is 0.3–26 g/100 mL in terms of sodium chloride equivalent.

[5] The supplemental liquid according to any one of [1] to [4],

wherein the sum of the weight of sodium ions and the weight of chloride ions relative to the weight of the total mineral components is 80-100 wt%.

[6] The supplemental liquid according to any one of [1] to [5], wherein the weight of sodium ions relative to the weight of chloride ions is 60-200 wt%.

[7] A supplemental liquid in container, wherein the container holding the supplemental liquid according to any one of [1] to [6] is heat sterilized.

[8] The supplemental liquid in container according to [7], wherein the container is airtight.

[9] The supplemental liquid in container according to [7] or [8], wherein the container is provided with one or more narrow-mouthed parts for outflowing and/or mixing.

[10] A production method of the supplemental liquid according to any one of [1] to [9], comprising:

a mixing step of mixing mineral components and dietary fiber in water,

a filling step of filling the water mixed with the mineral components and dietary fiber obtained in said mixing step into a container, and

a heat sterilization step of heat sterilizing the water mixed with the mineral components and dietary fiber obtained in said filling step.

[0010]

In addition, the present invention relates to the following.

[11] A use of a supplemental liquid consisting solely of mineral components, water and dietary fiber in enteral feeding.

[12] The use according to [11], wherein the mineral components

of the supplemental liquid comprise sodium.

[13] The use according to [11] or [12], wherein the supplemental liquid further comprises a vitamin component.

[14] The use according to any one of [11] to [13], wherein the sodium content of the supplemental liquid is 0.3–26 g/100 mL in terms of sodium chloride equivalent.

[15] The use according to any one of [11] to [14], wherein the sum of the weight of sodium ions and the weight of chloride ions relative to the weight of the total mineral components in the supplemental liquid is 80–100 wt%.

[16] The use according to any one of [11] to [15], wherein the weight of sodium ions relative to the weight of chloride ions in the supplemental liquid is 60–200 wt%.

[17] The use according to any one of [11] to [16], wherein the supplemental liquid is held in a container, and the container holding the supplemental liquid is heat sterilized.

[18] The use according to [17], wherein the container is airtight.

[19] The use according to [17] or [18], wherein the container is provided with one or more narrow-mouthed parts for outflowing and/or mixing.

[Advantageous Effects of the Invention]

[0011]

According to the present invention, in enteral feeding, necessary mineral components can be supplemented to each of subjects in accordance with their respective prescription, and improvement in symptoms such as constipation of the subjects can be achieved without using additional laxative. In addition, since mineral components and dietary fiber are already integrated in a supplemental liquid, it is not necessary to perform a complicated and non-hygienic procedure of preparing a saline

solution by diluting salt in cooled boiled water, and adding said solution to the composition for enteral feeding, as required conventionally; moreover, it is not necessary to supplement mineral components and dietary fiber in a separate procedure. Thus, the number of times to supplement for the subject can be set to be one, and therefore, in performing enteral feeding, mineral components and dietary fiber can be hygienically supplemented, while greatly reducing the possibility of contamination by microorganisms, and achieving labor-saving in the work.

[0012]

Furthermore, since constituents of the supplemental liquid of the present invention are basically three kinds, i.e., mineral components, water and dietary fiber, depending on the respective condition of a subject who actually ingests the supplemental liquid, only required amounts of necessary constituents of the supplemental liquid can be supplied to the subject. Therefore, sodium and dietary fiber alone, which tend to be insufficient in many of subjects who actually ingest fluid diet such as the elderly, can be supplied easily, rapidly and safely to the subject in a versatile manner, without supplying excessive amounts of other unnecessary components.

[0013]

In addition, for example, when utilizing a commercially available beverage containing dietary fiber as the supplemental liquid, the following problem exists: that is, said beverage is usually formulated with nutrients unnecessary to the subject in relation to taste, etc., or formulated with low salt concentration and the amount of water becomes excessive in order to obtain a desired amount of sodium. However, according to the present

invention, the supplemental liquid can be the one that can appropriately supplement a sufficient amount of sodium.

[Modes for Carrying out the Invention]

[0014]

The supplemental liquid of the present invention refers to a liquid for administration in order to supplement insufficient amounts of components to a subject receiving fluid diet, etc. In principle, it refers to a liquid in which only components to be administered (namely, components that are insufficient in the subject receiving the administration) are blended in a solvent such as water. The supplemental liquid of the invention is clearly distinguished from a fluid diet that is designed to incorporate various components for the purpose of supplying overall nutrient, or from a diluent that is used to dilute a specific component in a fluid diet to a certain concentration.

[0015]

The enteral feeding in the present invention includes oral feeding wherein a subject ingests the supplemental liquid from the mouth, and tube feeding wherein the supplemental liquid is administered to a subject using a tube. Typically, tube feeding is preferred. It is to be noted that tube feeding includes oral method, nasal method and fistula method.

[0016]

The state of a supplemental liquid to be used in enteral feeding according to the present invention is liquid, fluid (thickened state), jelly, or paste, and typically, a liquid or fluid state is preferred. Here, a supplemental liquid to be used in enteral feeding may be concentrated and/or dried to prepare a powder state (solid state), etc., then when performing the enteral feeding, water, etc. may be added to prepare a liquid state

or fluid state. In addition, supplemental liquids to be used in enteral feeding are classified as elemental diet, digested-state fluid diet or digested-state nutrient, semi-digested-state fluid diet or semi-digested-state nutrient, or naturally thickened fluid diet; typically, digested-state fluid diet or digested-state nutrient, or semi-digested-state fluid diet or semi-digested-state nutrient is preferable, and digested-state nutrient or semi-digested-state nutrient is more preferable.

[0017]

The supplemental liquid of the present invention is a supplemental liquid to be used in enteral feeding, and in its one embodiment, it consists of only three kinds of components, i.e., mineral components, water, and dietary fiber.

Here, mineral components include sodium, calcium, iron, phosphorus, magnesium, potassium, copper, zinc, chromium, selenium, manganese, molybdenum, iodine and the like; and sodium, calcium, magnesium, and potassium are preferable; and sodium and calcium are more preferable; and sodium is furthermore preferable.

[0018]

Examples of mineral components as a sodium source include salt (sodium chloride), sodium acetate, sodium citrate, sodium hydroxide, sodium carbonate, sodium hydrogen carbonate, monosodium dihydrogen phosphate, disodium monohydrogen phosphate, sodium metaphosphate, sodium pyrophosphate and sodium tripolyphosphate and the like; and salt, sodium acetate and sodium citrate are preferable; and salt is more preferable. It is also possible to use one or more of these sodium sources.

[0019]

When the supplemental liquid of the invention comprises sodium, its content may be, in terms of sodium chloride equivalent,

for example 0.3-26 g/100 mL, preferably 0.3-10 g/100 mL, and more preferably 0.3-2 g/100 mL. In the present invention, sodium chloride equivalent is a numerical value of the amount of sodium contained in a nutritional composition converted to the amount of sodium chloride (salt).

[0020]

Also, when the supplemental liquid of the invention comprises sodium ions and chloride ions, in this supplemental liquid, the sum of the weight of sodium ions and the weight of chloride ions relative to the total weight of mineral components may be, for example 80-100 wt%, preferably 85-100 wt%, and more preferably 90-100 wt%. Also, the weight of sodium ions relative to the weight of chloride ions may be, for example 60-200 wt%, preferably 60-150 wt%, and more preferably 60-100 wt%.

[0021]

Examples of water used for the supplemental liquid of the invention include tap water, well water, activated carbon water, pure water, ultra-pure water, purified water, ion-exchanged water, etc., and those with a known concentration of all mineral components are preferred. Pure water, ultra-pure water, purified water, and ion-exchanged water are preferred because the concentration of all mineral components can be assumed to be 0, and ion-exchanged water is more preferred.

[0022]

Examples of dietary fiber used for the supplemental liquid of the invention include galactomannan decomposition product, indigestible dextrin, reduced indigestible dextrin, and cellulose, etc., and any water-soluble and water-insoluble dietary fiber can be used. Water-soluble dietary fiber such as galactomannan decomposition product, indigestible dextrin, and

reduced indigestible dextrin are preferable because they are easily dispersed in the supplemental liquid of the invention in a stable and homogeneous manner, and galactomannan decomposition product is more preferable. Examples of galactomannan decomposition product include locust bean gum decomposition product, tara gum decomposition product, guar gum decomposition product, and guar gum hydrolysate, etc.; guar gum decomposition product and guar gum hydrolysate are preferable, and guar gum hydrolysate is more preferable. The content of dietary fiber used in the supplemental liquid of the present invention may be, for example 0.5-15 wt%, preferably 1-12 wt%, and more preferably 2-10 wt%.

[0023]

The supplemental liquid of the present invention consists of mineral components, water and dietary fiber; by using the supplemental liquid of the invention, in accordance with the condition of a subject who actually ingests the supplemental liquid, necessary amounts of water, mineral components and dietary fiber can be easily and rapidly supplied to the subject. Thus, the present invention relates to a supplemental liquid comprising only water, mineral components and dietary fiber, without other components such as proteins and lipids. Furthermore, because the present invention is a supplemental liquid comprising only water, mineral components and dietary fiber, its energy content is very small; therefore, unlike nutritional compositions such as ordinary fluid diets, the energy content may be less than 1 kcal/mL, preferably less than 0.5 kcal/mL, and more preferably less than 0.2 kcal/mL.

[0024]

Regarding the supplemental liquid of the present invention,

vitamin components may be included as constituents in addition to mineral components, water and dietary fiber. With this embodiment, in addition to mineral components, water and dietary fiber, vitamin components can be easily and rapidly supplemented to a subject. Here, examples of vitamin components include vitamin B1, vitamin B2, niacin, pantothenic acid, vitamin B6, biotin, folic acid, vitamin B12, vitamin C, vitamin A, vitamin D, vitamin E, and vitamin K, etc.

[0025]

The supplemental liquid of the present invention can be produced by a production method comprising a mixing step of mixing mineral components and dietary fiber in water, a filling step of filling the water mixed with the mineral components and dietary fiber obtained in said mixing step into a container, and a heat sterilization step of heat sterilizing the water mixed with the mineral components and dietary fiber obtained in said filling step.

In the mixing step, predetermined amounts of mineral components and dietary fiber are mixed in water to prepare a liquid composition. In this case, vitamin components may also be mixed. In addition, by heating and stirring as necessary, it is possible to sufficiently dissolve each of the components. Therefore, the components in the liquid composition are dissolved, dispersed or suspended after mixing. In the filling step, the liquid composition is filled in a retort pouch or soft bag. In the heat sterilization step, the liquid composition is heat sterilized so that it may be ingested by (administered to) a subject in a sanitary manner, and contamination by microorganisms etc. is suppressed or prevented to a necessary extent.

[0026]

In the production method of the supplemental liquid of the

present invention, it is possible to first heat sterilize the liquid composition (ultra-high temperature (UHT) sterilization, high temperature short time (HTST) sterilization, etc.), then aseptically fill it into a predetermined container (aseptic packaging, etc.), or, to first fill the liquid composition into a predetermined container, then heat sterilize the container (retort sterilization (such as autoclave)). At this time, it is preferable that the liquid composition is first filled into a retort pouch or soft bag, which is then sterilized by retort sterilization, because liquid compositions can be produced aseptically and easily.

[0027]

Here, as the heat sterilization method, indirect heat sterilization method (plate type sterilizing machine (heat exchanger), tube type sterilizing machine (heat exchanger), etc.), direct heat sterilization method (steam injection type sterilizing machine, steam infusion type sterilizing machine, etc.), current-applied heat sterilization method (Joule type sterilizing machine, etc.), and retort sterilizing machine may be used. At this time, the use of retort sterilizing machine is preferable because liquid compositions can be produced aseptically and easily.

[0028]

As a container holding the supplemental liquid of the present invention, airtight containers (closed pack) are preferred, because they can effectively block the supplemental liquid as a content from the outside. Examples of a form of container include, typically, paper pack, retort pouch, soft bag, formed container and cans etc.; paper pack, retort pouch, and soft bag are preferable, and retort pouch and soft bag are more

preferable. Examples of a material of container include, typically, paper, plastic, glass, and metal, etc.; paper and plastic are preferable, and plastic is more preferable.

[0029]

Also, as a container holding the supplemental liquid of the present invention, an airtight paper container made of paper material which is laminated with aluminum foil and a synthetic resin (such as polyethylene), and an airtight plastic container made of soft synthetic resin material (plasticized vinyl chloride resin, polyurethane resin, polyethylene resin, ethylene-vinyl acetate copolymer, polyolefins such as ethylene- α -olefin copolymer, polyfluorocarbon, polyimide, etc.) are preferable, and an airtight plastic container is more preferable. In this case, a soft container which can be heat sterilized (sterilization) after holding the supplemental liquid of the present invention is preferred.

[0030]

Also, in the container holding the supplemental liquid of the present invention, it is preferable that one or more narrow-mouthed parts for outflowing and/or mixing are equipped, and it is more preferable that said narrow-mouthed parts are sealed prior to carrying out enteral feeding, and the container has a mechanism that can be connected directly to a tube or a narrow-mouthed part of other container upon carrying out the enteral feeding. In this case, by using the above-mentioned airtight container, a nutritional composition can be added to the supplemental liquid of the present invention without largely opening the container, or with opening only the narrow-mouthed part as a minimum opening of the container, thereby effectively reducing the contact between the supplemental liquid as a content

with the outside, and suppressing and preventing the contamination by microorganisms to a necessary extent.

[0031]

In one embodiment, the present invention relates to a use of the above supplemental liquid in enteral feeding.

As is convenient in said use, in the supplemental liquid of the present invention, the contents of mineral components, water, and dietary fiber as the constituents can be an integral multiple content of a predetermined content. By combining two or more kinds of supplemental liquids having different contents of at least one component selected from mineral components, water, and dietary fiber, the contents of mineral components, water, and dietary fiber in the supplemental liquid after the combination can be freely designed and simultaneously adjusted. In this case, calculation of required amounts of mineral components, water, and dietary fiber in accordance with the prescription based on the condition of a subject ingesting a supplemental liquid of the present invention, and addition of the calculated amounts separately, can be omitted, which is labor-saving.

[0032]

In the above embodiment of the supplemental liquid of the present invention, "combining" means combining a single supplemental liquid of the present invention with another single supplemental liquid, or combining a part of the supplemental liquid (wherein two or more single supplemental liquids are combined/mixed) with a single supplemental liquid and/or with a part of another supplemental liquid (wherein two or more single supplemental liquids are combined/mixed). Regarding the supplemental liquid wherein its contents of mineral components, water, and dietary fiber are adjusted by combining two or more

kinds of supplemental liquids of the present invention, each single supplemental liquid to be combined may be administered per serving, or, the whole or a part of the supplemental liquid after combination of two or more kinds of supplemental liquids may be administered as a single unit.

[0033]

In the above embodiment of the supplemental liquid of the present invention, the number of other one or more supplemental liquids to be combined is, from the viewpoint of application of the resulting combined supplemental liquid to a variety of prescriptions, for example, 1-5; in consideration of easiness in calculation and a decrease in work load of preparation, preferably 1-4, and more preferably 1-3.

[0034]

In the above embodiment of the supplemental liquid of the present invention, the content of mineral components is, from the viewpoints of application of the content of the mineral components of the combined supplemental liquid to a variety of prescriptions, as well as easiness in the calculation of the content of mineral components, preferably an integer multiple of 1 g, 5 g, 10 g, or 20 g in terms of sodium chloride equivalent that is the amount of sodium converted to the amount of sodium chloride (salt); and from the viewpoint of reducing the number of kinds, more preferably an integer multiple of 1 g, 5 g, or 10 g, and particularly preferably an integer multiple of 1 g or 5 g.

[0035]

In the above embodiment of the supplemental liquid of the present invention, the water content is, from the viewpoints of application of the water content of the combined supplemental liquid to a variety of prescriptions, as well as easiness in the

calculation of water content, preferably an integer multiple of 10 mL, 25 mL, 50 mL, or 100 mL; and from the viewpoint of reducing the number of kinds, more preferably an integer multiple of 25 mL, 50 mL or 100 mL, and particularly preferably an integer multiple of 50 mL or 100 mL.

[0036]

In the above embodiment of the supplemental liquid of the present invention, the content of dietary fiber is, from the viewpoints of application of the content of dietary fiber of the combined supplemental liquid to a variety of prescriptions, as well as easiness in the calculation of the content of dietary fiber, preferably an integer multiple of 1 g, 5 g, 10 g, or 20 g; and from the viewpoint of reducing the number of kinds, more preferably an integer multiple of 1 g, 5 g, or 10 g, and particularly preferably an integer multiple of 5 g or 10 g.

[0037]

In the above embodiment of the supplemental liquid of the present invention, specific examples of formulation of mineral components, water and dietary fiber include the following, from the viewpoints of application of the contents of the mineral components, water and dietary fiber of the combined supplemental liquid to a variety of prescriptions, easiness in the calculation, and reducing the number of kinds: for example, in terms of sodium chloride equivalent (the amount of sodium converted to the amount of salt) as the content of mineral components, water content, and the content of dietary fiber, a supplemental liquid having 1 g, 200 mL and 5 g, respectively; 1 g, 300 mL and 5 g; 1 g, 200 mL and 10 g; 2 g, 200 mL and 10 g; 2 g, 300 mL and 10 g; 2 g, 200 mL and 5 g; and the like. Preferably, examples include, in terms of sodium chloride equivalent (the amount of sodium converted to

the amount of salt) as the content of mineral components, water content, and the content of dietary fiber, a supplemental liquid having 1 g, 200 mL and 5 g; and 2 g, 200 mL and 10 g, respectively.
[0038]

Hereinafter, the present invention will be described in further detail based on examples; however, the present invention is not limited to these examples, and various modifications are possible without departing from the technical idea of the present invention.

[Examples]

[0039]

(Example 1) Formulation example of liquid composition (supplemental liquid) (1)

In 200 mL of hot water (60°C), 2 g of salt and 10 g of dietary fiber (galactomannan decomposition product, "Sunfiber R" (from Taiyo Kagaku Co., Ltd.)) were blended (added) to prepare a liquid composition (1a). 200 mL of this liquid composition (1a) was placed (filled) in a soft container made of polyethylene resin, then subjected to autoclave treatment (retort sterilization (120°C, 10 min)) to prepare a liquid composition (1b). Here, the sodium (Na) concentration was 400 mg/100 mL, and the chlorine (Cl) concentration was 600 mg/100 mL.

[0040]

In this case, when this liquid composition (1b) was stored under predetermined conditions (40°C, 2 months), decomposition or deterioration of flavors did not occur. Furthermore, when the liquid composition (1b) was connected to a tube and flowed therethrough, water, salt, and dietary fiber could be hygienically transported without exposing the liquid composition (1b) to the air.

[0041]

(Example 2) Formulation example of liquid composition (supplemental liquid) (2)

In 200 mL of hot water (60°C), 1 g of salt and 5 g of dietary fiber (galactomannan decomposition product, "Sunfiber R" (from Taiyo Kagaku Co., Ltd.)) were blended (added) to prepare a liquid composition (2a). 200 mL of this liquid composition (2a) was placed (filled) in a soft container made of polyethylene resin, then subjected to autoclave treatment (retort sterilization (120°C, 10 min)) to prepare a liquid composition (2b). Here, the sodium (Na) concentration was 200 mg/100 mL, and the chlorine (Cl) concentration was 300 mg/100 mL.

[0042]

In this case, when this liquid composition (2b) was stored under predetermined conditions (40°C, 2 months), decomposition or deterioration of flavors did not occur. Furthermore, when the liquid composition (2b) was connected to a tube and flowed therethrough, water, salt, and dietary fiber could be hygienically transported without exposing the liquid composition (2b) to the air.

[0043]

(Example 3) Formulation example of liquid composition (supplemental liquid) (3)

In 200 mL of hot water (60°C), 1 g of salt and 10 g of dietary fiber (galactomannan decomposition product, "Sunfiber R" (from Taiyo Kagaku Co., Ltd.)) were blended (added) to prepare a liquid composition (3a). 200 mL of this liquid composition (3a) was placed (filled) in a soft container made of polyethylene resin, then subjected to autoclave treatment (retort sterilization (120°C, 10 min)) to prepare a liquid composition (3b). Here, the

sodium (Na) concentration was 200 mg/100 mL, and the chlorine (Cl) concentration was 300 mg/100 mL.

[0044]

In this case, when this liquid composition (3b) was stored under predetermined conditions (40°C, 2 months), decomposition or deterioration of flavors did not occur. Furthermore, when the liquid composition (3b) was connected to a tube and flowed therethrough, water, salt, and dietary fiber could be hygienically transported without exposing the liquid composition (3b) to the air.

[0045]

(Example 4) Formulation example of liquid composition (supplemental liquid) (4)

In 200 mL of hot water (60°C), 2 g of salt and 5 g of dietary fiber (galactomannan decomposition product, "Sunfiber R" (from Taiyo Kagaku Co., Ltd.)) were blended (added) to prepare a liquid composition (4a). 200 mL of this liquid composition (4a) was placed (filled) in a soft container made of polyethylene resin, then subjected to autoclave treatment (retort sterilization (120°C, 10 min)) to prepare a liquid composition (4b). Here, the sodium (Na) concentration was 400 mg/100 mL, and the chlorine (Cl) concentration was 600 mg/100 mL.

[0046]

In this case, when this liquid composition (4b) was stored under predetermined conditions (40°C, 2 months), decomposition or deterioration of flavors did not occur. Furthermore, when the liquid composition (4b) was connected to a tube and flowed therethrough, water, salt, and dietary fiber could be hygienically transported without exposing the liquid composition (4b) to the air.

[0047]

(Example 5) Formulation example of liquid composition (supplemental liquid) (5)

In 300 mL of hot water (60°C), 1 g of salt and 5 g of dietary fiber (galactomannan decomposition product, "Sunfiber R" (from Taiyo Kagaku Co., Ltd.)) were blended (added) to prepare a liquid composition (5a). 300 mL of this liquid composition (5a) was placed (filled) in a soft container made of polyethylene resin, then subjected to autoclave treatment (retort sterilization (120°C, 10 min)) to prepare a liquid composition (5b). Here, the sodium (Na) concentration was 133 mg/100 mL, and the chlorine (Cl) concentration was 200 mg/100 mL.

[0048]

In this case, when this liquid composition (5b) was stored under predetermined conditions (40°C, 2 months), decomposition or deterioration of flavors did not occur. Furthermore, when the liquid composition (5b) was connected to a tube and flowed therethrough, water, salt, and dietary fiber could be hygienically transported without exposing the liquid composition (5b) to the air.

[0049]

By combining two or more liquid compositions (supplemental liquids) of the above Examples 1-5, the contents of mineral components, water and dietary fiber in the combined supplemental liquid could be optimally adjusted, and the combined supplemental liquid was able to quickly and flexibly respond to various prescriptions tailored to patients' cases. Administration methods using conventional nutrient compositions, etc. are shown as Comparative Examples 1-3, and administration methods using a combination of two or more liquid compositions (supplemental

liquids) of the above Examples 1-5 are shown as Examples 6-8. Table 1 shows results of the comparison.

[0050]

[Table 1]

Patient's prescription			Administration method of Comparative Example				Administration method of Example	
Patient	Requisite amount		Administration Example	Amount of blending	Amount added	Amount of administration	Combination Example	Amount of administration
a	Water content	400 mL	Comparative Example 1	400 mL	-	400 mL	Example 6 (Example 1 + Example 3)	400 mL
	Sodium chloride equivalent	3 g		1 g	1 g x 2	3 g		3 g
	Dietary fiber	20 g		3.5 g	5 g x 3	18.5 g		20 g
b	Water content	400 mL	Comparative Example 2	400 mL	-	400 mL	Example 7 (Example 1 + Example 4)	400 mL
	Sodium chloride equivalent	4 g		1 g	1 g x 3	4 g		4 g
	Dietary fiber	15 g		3.5 g	5 g x 2	13.5 g		15 g
c	Water content	500 mL	Comparative Example 3	500 mL	-	500 mL	Example 8 (Example 1 + Example 5)	500 mL
	Sodium chloride equivalent	3 g		1.25 g	1 g x 2	3.25 g		3 g
	Dietary fiber	15 g		4.38 g	5 g x 2	14.38 g		15 g

[0051]

From the results shown in Table 1, in the administration methods of Comparative Examples 1-3, it can be seen that the work of addition of salt and dietary fiber is required considering the administration amount of the nutritional composition per serving that meet the prescription of a patient, and that it is necessary to adjust the amounts of salt and dietary fiber. In addition, when the sodium chloride equivalent and dietary fiber content of a conventional composition have a fraction, it can be seen that there are errors between the requisite amounts of patient's prescription and the administration amounts.

On the other hand, in the administration methods of Examples 6-8, by combining two or more supplemental liquids of Example 1 and Examples 3-5, a nutritional composition which is perfectly adapted to the prescription of a patient can be prepared easily

and quickly.

[Claims]

1. A supplemental liquid for enteral feeding, consisting of mineral components, water and dietary fiber.
2. The supplemental liquid according to Claim 1, wherein the mineral components comprise sodium.
3. The supplemental liquid according to Claim 1 or 2, further comprising a vitamin component.
4. The supplemental liquid according to any one of Claims 1 to 3, wherein the sodium content is 0.3-26 g/100 mL in terms of sodium chloride equivalent.
5. The supplemental liquid according to any one of Claims 1 to 4, wherein the sum of the weight of sodium ions and the weight of chloride ions relative to the weight of the total mineral components is 80-100 wt%.
6. The supplemental liquid according to any one of Claims 1 to 5, wherein the weight of sodium ions relative to the weight of chloride ions is 60-200 wt%.
7. A supplemental liquid in container, wherein the container holding the supplemental liquid according to any one of Claims 1 to 6 is heat sterilized.
8. The supplemental liquid in container according to Claim 7, wherein the container is airtight.

9. The supplemental liquid in container according to Claim 7 or 8, wherein the container is provided with one or more narrow-mouthed parts for outflowing and/or mixing.