MPa or more. In the case of the ultrasonic treatment, the treatment can be performed, for example, by irradiation at a frequency of from 100 KHz to 2 MHz with an output of from 100 to 1000 W. In the case of the electrolysis treatment, for example, an aqueous protein solution may be treated by application of a voltage of from 100 mV to 1000 mV. In a specific embodiment, the treatment for decomposing and/or denaturing a protein is selected from the denaturant treatment, the heating treatment, and combinations thereof.

[0023]

The conditions of the treatment for adjusting molecular weight distribution of a protein, for example, the type of filter medium, a carrier for gel filtration chromatography, and the number of revolutions, electric current, and time in centrifugation can be appropriately determined by those skilled in the art. Examples of the filter medium include filter paper, filter cloth, diatomaceous earth, ceramics, glass, and membranes. Examples of the carrier for gel filtration chromatography include polyacrylamide and agarose. Examples of the conditions of centrifugation include conditions of from 1000 to 3000 × g for 5 to 20 minutes.

[0024]

Dietary Fiber

The egg substitute of the present invention can further contain dietary fiber.

Examples of the dietary fiber of the present invention include bean curd refuse of legumes such as soybean, chitosan, cellulose, crystalline cellulose, hemicellulose, sodium carboxymethylcellulose, lignin, wheat bran, wheat germ, oat fiber, corn fiber, oatmeal, corn meal, sesame seed powder, and yeast cell wall. The dietary fiber is preferably oat fiber or sesame seed powder.

The content of the dietary fiber in the egg substitute is, relative to 100 mass% of a total amount of water, the protein material, the oil and/or fat, a total amount of the gelling agents (A) and (B), and the dietary fiber, from 0.1 to 10 mass%, preferably from 0.3 to 8 mass%, more preferably from 0.5 to 6 mass%, and may be still more preferably from 0.5 to 5 mass%, from 0.5 to 4 mass%, from 0.5 to 3 mass%, or from 0.5 to 2 mass%.

When the egg substitute contains the dietary fiber, the egg substitute contains, relative to 100 mass% of a total amount of water, the protein material, the oil and/or fat, a total amount of the gelling agents (A) and (B), and the dietary fiber, from 0.01 to 5 mass% of the protein material, from 5 to 30 mass% of the oil and/or fat, and from 1 to 10 mass% of the gelling agents (A) and (B).

[0025]

Other Raw Materials

Various raw materials can be incorporated in the egg substitute of the present invention as necessary.

Examples thereof include sugars, sugar alcohols, starch, water-soluble polysaccharides such as water-soluble soybean polysaccharides and water-soluble pea polysaccharides, thickening polysaccharides, dextrin, emulsifiers, salts, flavors, sweeteners, colorants, preservatives, pH adjusters, stabilizers, seasonings, and spices.

Hereinafter, the present invention is described by way of examples. Note that, in the examples, all parts and percentages are by mass unless otherwise specified.

[0036]

Preparation of Protein Materials

The following protein materials were obtained or prepared. The protein contents of these vegetable protein materials were all 80 mass% or more.

Vegetable protein material A-1: a product obtained by subjecting a soybean protein isolate to a decomposition/denaturation and molecular weight distribution adjustment treatment (a test product of FUJI OIL CO., LTD.; the raw material soybean protein isolate was Fujipro F (a commercially available product from FUJI OIL CO., LTD.); molecular weight distribution: 2000 or more and less than 20000 - 64%/20000 or more - 14%, NSI 98.1)

Vegetable protein material A-2: a product obtained by subjecting a soybean protein isolate to a decomposition/denaturation treatment (a test product of FUJI OIL CO., LTD.; the raw material soybean protein isolate was Fujipro F (a commercially available product from FUJI OIL CO., LTD.); molecular weight distribution: 2000 or more and less than 20000 - 38%/20000 or more - 55%, NSI 98.4)

Vegetable protein material A-3: a product obtained by subjecting a pea protein isolate to a denaturation and molecular weight distribution adjustment treatment (a test product of FUJI OIL CO., LTD.; the raw material pea protein isolate was Empro E 86HV (a commercially available product from Emsland Group); molecular weight distribution: 2000 or more and less than 20000 - 68%/20000 or more - 12%, NSI 100.1)

Vegetable protein material B: a soybean protein isolate (Fujipro F, a commercially available product from FUJI OIL CO., LTD.)

Vegetable protein material C: an enzyme-treated soybean protein isolate (Fujipro-CLE, a commercially available product from FUJI OIL CO., LTD.)

Vegetable protein material D: a pea protein isolate (Empro E 86HV, a commercially available product from Emsland Group)

[0037]

Examples 1 to 4 and Comparative Examples 1 to 3

According to the formulation specified in Table 1, a 20% aqueous solution of the vegetable protein material A-1 was used as an aqueous phase portion, and high-oleic sunflower oil (High-Ol 75B manufactured by FUJI OIL CO., LTD.) was used as an oil phase portion. The aqueous phase portion was added to a cutter blade mixer (Robot Coupe R-3D manufactured by FMI Corporation), and stirred for 10 seconds. Then, the oil phase portion was gradually added with stirring, and the materials were stirred for 2 minutes to prepare an oil-in-water emulsion 1 having an oil and/or fat content of 85%.

Next, curdlan (Curdlan preparation CD-ES manufactured by Mitsubishi Corporation Life Sciences Limited), methylcellulose (METOLOSE MCE-4000 manufactured by Shin-Etsu Chemical Co., Ltd.), gellan gum (KELCOGEL HM manufactured by DSP Gokyo Food &