Patent Literature 2: Japanese Patent Application Publication No. Sho 52-71390

Patent Literature 3: Japanese Patent Application Publication No. Hei 6-245700

Summary ~~of Invention~~

In a first aspect of the present disclosure, there is provided a method for producing a powdered oil and/or fat composition containing an oil and/or fat component that includes one or more XXX-type triglycerides with a fatty acid residue X having x carbon atoms at positions 1 to 3 of glycerin, wherein the number of carbon atoms, x, is an integer selected from 16 to 20, and the oil and/or fat component includes a β-type oil and/or fat, and the powdered oil and/or fat composition has a loose bulk density of 0.05 to 0.6 g/cm^3,

the method for producing a powdered oil and/or fat composition comprising the following steps:

(a) preparing a solid oil and/or fat composition raw material containing XXX-type triglycerides;

(b) heating the solid oil and/or fat composition raw material obtained in the step (a) at a temperature below a melting point thereof to transform the oil and/or fat component in the solid oil and/or fat composition raw material into β-type oil and/or fat without melting the raw material, thereby obtaining a β-type oil and/or fat-containing composition raw material; and

(c) pulverizing the β-type oil and/or fat-containing composition raw material obtained in the step (b) by collision among the raw materials without mechanical pulverization, thereby obtaining a powdered oil and/or fat composition.

One object of the present ~~invention~~ disclosure may be to provide a method for producing a powdered oil and/or fat composition that includes an oil and/or fat component containing an XXX-type triglyceride.

Another object of the present ~~invention~~ disclosure may be to provide a method for producing a powdered oil and/or fat composition that contains a β-type oil and/or fat as an oil and/or fat component, and has specific loose bulk density and the like.

Means for solution of the problems

To achieve the above objects, the present inventors have found that it is possible to provide a powdered oil and/or fat composition that has a specific loose bulk density and the like as well as novel characteristics, such as improved fluidity, by the steps of transforming a solid oil and/or fat composition raw material into a β-type oil and/or fat using a specific method and pulverizing a β-type oil and/or fat-containing composition raw material, having the resulting β-type oil and/or fat as a main component, using a specific method. This led to the present invention. Specifically, the present invention may include the following aspects.

[A]

A method for producing a powdered oil and/or fat composition containing an oil and/or fat component that includes one or more XXX-type triglycerides with a fatty acid residue X having x carbon atoms at positions 1 to 3 of glycerin, wherein the number of carbon atoms, x, is an integer selected from 16 to 20, and the oil and/or fat component includes a β-type oil and/or fat, and the powdered oil and/or fat composition has a loose bulk density of 0.05 to 0.6 g/cm^3,

the method for producing a powdered oil and/or fat composition comprising the following steps:

(a) preparing a solid oil and/or fat composition raw material containing XXX-type triglycerides;

From Table 9, when each powdered oil and/or fat composition was stored at 40°C for 5 days, the powdered oil and/or fat compositions of Production Example 1 and Production Comparative Example 4, which are β-type oils and/or fats, showed no changes in appearance (Figs. 8 and 10), but the powdered oil and/or fat composition of Production Comparative Example 1, containing α-type and β-type oils and/or fats (Fig. 9), experienced blocking (aggregation of powder), resulting in large lumps.

Also, when each powdered oil and/or fat composition was stored at 20°C for 5 months (long-term storage), the powdered oil and/or fat compositions of Production Example 1 and Production Comparative Example 4, which are β-type oils and/or fats, showed no changes in appearance, but the powdered oil and/or fat composition of Production Comparative Example 1, containing α-type and β-type oils and/or fats, experienced some blocking (aggregation of powder).

From the above, the powdered oil and/or fat composition of Production Comparative Example 1, containing α-type and β-type oils and/or fats, was considered to have no commercial value as it showed poor storage stability at both 40°C for 5 days and 20°C for 5 months.

[Repose Angle Relative Value Test]

Tables 10 to 12 show the repose angle relative values for powdered potato starch added with 1% by mass of the powdered oil and/or fat compositions from Production Examples 1 to 4 and Production Comparative Examples 1 to 9.

Furthermore, Table 13 shows the repose angle relative values for powdered potato starch added with 1% by mass of the powdered oil and/or fat compositions from Production Example 1 and Production Comparative Example 14, after being stored for 5 months at 20°C.

What is claimed is:

1. A method for producing a powdered oil and/or fat composition containing an oil and/or fat component that includes one or more XXX-type triglycerides with a fatty acid residue X having x carbon atoms at positions 1 to 3 of glycerin, wherein the number of carbon atoms, x, is an integer selected from 16 to 20, and the oil and/or fat component includes a β-type oil and/or fat, and the powdered oil and/or fat composition has a loose bulk density of 0.05 to 0.6 g/cm^3,

the method for producing a powdered oil and/or fat composition comprising the following steps:

(a) preparing a solid oil and/or fat composition raw material containing XXX-type triglycerides;

(b) heating the solid oil and/or fat composition raw material obtained in the step (a) at a temperature below a melting point thereof to transform the oil and/or fat component in the solid oil and/or fat composition raw material into β-type oil and/or fat without melting the raw material, thereby obtaining a β-type oil and/or fat-containing composition raw material; and

(c) pulverizing the β-type oil and/or fat-containing composition raw material obtained in the step (b) by collision among the raw materials without mechanical pulverization, thereby obtaining a powdered oil and/or fat composition.

2. The method for producing a powdered oil and/or fat composition according to claim 1, containing 50% by mass or more of the XXX-type triglycerides in the powdered oil and/or fat composition when a total mass of the powdered oil and/or fat composition is set to 100% by mass.

3. The method for producing a powdered oil and/or fat composition according to claim 1 or 2, wherein the temperature below the melting point in the step (b) is lower by 1 to 30°C than the melting point of the solid oil and/or fat composition raw material.

4. The method for producing a powdered oil and/or fat composition according to any one

of claims 1 to 3, wherein the step (b) is performed while the solid oil and/or fat composition raw material is left standing.

5. The method for producing a powdered oil and/or fat composition according to any one of claims 1 to 3, wherein the step (b) is performed while the solid oil and/or fat composition raw material is left non-standing.

6. The method for producing a powdered oil and/or fat composition according to claim 5, wherein the non-standing state is a state of stirring the solid oil and/or fat composition raw material.

7. The method for producing a powdered oil and/or fat composition according to any one of claims 1 to 6, wherein the pulverization by collision among the raw materials in the step (c) is pulverization using an airflow pulverizer without mechanical pulverization.

8. The method for producing a powdered oil and/or fat composition according to any one of claims 1 to 7, wherein the solid oil and/or fat composition raw material containing the XXX-type triglycerides is rapeseed extremely hardened oil.

~~9. A powdered oil and/or fat composition produced by the method for producing a powdered oil and/or fat composition according to any one of claims 1 to 8.~~

~~10. The powdered oil and/or fat composition according to claim 9, including at least one of the following characteristics:~~

~~(i) in an X-ray diffraction peak of the oil and/or fat component, an intensity ratio of a peak around 4.6 Å, which is characteristic of the β type, and a peak around 4.2 Å, which is characteristic of the α type: [peak intensity around 4.6 Å/(peak intensity around 4.6 Å+peak intensity around 4.2 Å)] is 0.6 to 1;~~

~~(ii) an aggregation degree of the powdered oil and/or fat composition is 60% or less;~~

~~(iii) the loose bulk density of the powdered oil and/or fat composition is 0.05 to 0.6 g/cm^3;~~

~~(iv) a repose angle relative value calculated by formula (I) is 90% or less:~~

~~Repose angle relative value=[Repose angle of the mixed powder of the powdered oil and/or fat composition and powdered starch]/[Repose angle of the powdered starch only, without the powdered oil and/or fat composition] × 100 (I)~~

~~(in formula (I), "mixed powder" contains 1% by mass of the powdered oil and/or fat composition based on the total mass of the mixed powder); and~~

~~(v) the powdered oil and/or fat composition has a form of flake-containing particles possessing multiple flakes on the surface.~~