reduction of fat, rejuvenation of the skin, and recovery of immunity. Furthermore, Patent Document 2 discloses that since fermented milk produced by fermentation using the *Lactobacillus helveticus* CM4 strain has (a) a function of expressing anti-oxidative enzymes, (b) a function of expressing heatshock proteins, and (c) a function of inhibiting neutrophil chemotaxis and tissue invasion, it is effective in suppressing delayed onset muscle soreness.

However, these are promotion of hormone secretion and alleviation of muscle soreness after exercise by substances produced by lactobacillus fermentation, and not promotion of the increase of brain-gut interaction-mediated activity.

[Prior Art Documents]

[Patent Document]

[Patent Document 1] JP-A (*Kokai*) 2004-269361

[Patent Document 2] WO2007/023896

[Non-Patent Document]

[Non-Patent Document 1] Aziz Q, Thompson DG., Gastroenterology 1998;114:559-578

Summary of the Invention

[Problems to be Solved by the Invention]

The present invention was achieved in view of the above circumstances. An objective of the present invention is to provide an agent for promoting physical activity containing, as an active ingredient, lactobacilli derived from human intestines, and/or a treatment product thereof, or food compositions that comprise this agent for promoting physical activity.

[Means for Solving the Problems]

As a result of dedicated research to solve the above-mentioned problems, the present invention led to the novel discovery that the administration of dead *Lactobacillus gasseri* OLL2809 to mice is effective to increase the amount of locomotor activity and also muscle mass (Fig. 1 and Fig. 2).

That is, the present inventors discovered that physical activity is promoted, or more specifically, the amount of activity is increased and muscle mass is increased by ingesting *Lactobacillus gasseri* OLL2809 or a fermentation product or treatment product thereof, and thereby completed the present invention.

Specifically, the present ~~invention~~ disclosure relates to the ~~invention~~ embodiments of [1]-[11] below:

[1] an agent for promoting physical activity, comprising *Lactobacillus gasseri* as an active ingredient;

[2] an agent for promoting physical activity comprising, as an active ingredient, at least one treatment product of *Lactobacillus gasseri* selected from a culture, concentrate, paste, spray-dried product, freeze-dried product, vacuum-dried product, drum-dried product, liquid,

diluted product, and crushed product of the lactobacillus;

[3] the agent for promoting physical activity of [1]or [2], wherein the promotion of physical activity is an increase in the amount of activity of a subject;

[4] the agent for promoting physical activity of [1] or [2], wherein the promotion of physical activity is an increase of muscle mass in a subject;

[5] the agent for promoting physical activity of any one of [1] to [4], wherein the *Lactobacillus gasseri* is *Lactobacillus gasseri* OLL2809 deposited under the accession number NITE BP-72;

[6] a food composition for promoting physical activity, comprising an effective amount of the agent for promoting physical activity of any one of [1] to [5];

[7] use of the agent for promoting physical activity of any one of [1] to [5] in the production of a food composition for promoting physical activity;

[8] the use of [7], wherein the food composition for promoting physical activity is: an infant formula, food for young children such as powdered milk, food for breastfeeding women such as powdered milk, health-promoting food, food for sick people, or fermented milk;

[9] a method for promoting physical activity, comprising administering *Lactobacillus gasseri* or a treatment product thereof;

[10] a method for producing a food composition for promoting physical activity, comprising using *Lactobacillus gasseri* or at least one treatment product selected from a culture, concentrate, paste, spray-dried product, freeze-dried product, vacuum-dried product, drum-dried product, liquid, diluted product, and crushed product thereof; and

[11] *Lactobacillus gasseri* or a treatment product thereof which is at least one selected from: a culture, concentrate, paste, spray-dried product, freeze-dried product, vacuum-dried product, drum-dried product, liquid, diluted product, and crushed product, for use in a method for promoting physical activity.

In an aspect, there is provided the use of *Lactobacillus gasseri* in a non-therapeutic method for promoting physical activity.

In another aspect, there is provided the use of at least one treatment product of *Lactobacillus gasseri* selected from a culture, concentrate, paste, spray-dried product, freeze-dried product, vacuum-dried product, drum-dried product, liquid, diluted product, and crushed product of the lactobacillus in a non-therapeutic method for promoting physical activity.

In yet another aspect, there is provided a non-therapeutic method for promoting physical activity, comprising administering *Lactobacillus gasseri* to a subject in need thereof.

In still another aspect, there is provided a non-therapeutic method for promoting physical activity, comprising administering at least one treatment product of *Lactobacillus gasseri* selected from a culture, concentrate, paste, spray-dried product, freeze-dried product, vacuum-dried product, drum-dried product, liquid, diluted product, and crushed product of the lactobacillus to a subject in need thereof.

Brief Description of the Drawings

Fig. 1 depicts the rate of change in the amount of locomotor activity of mice from week 2 to week 3 of administration of *Lactobacillus gasseri* OLL2809 (Accession Number: NITE BP-72). Regarding week 2 (average of two measurements) and week 3 (average of two measurements) of administration, the water-administered group and the lactobacilli-administered group were compared for the rate of change (%) in the measured values at week 2 of administration and week 3 of administration.

Fig. 2 shows the values obtained by dividing the gastrocnemius muscle mass by body weight. *Lactobacillus gasseri* OLL2809 (Accession Number: NITE BP-72) was administered for 26 days and the mouse gastrocnemius muscle was removed.

CLAIMS

1. Use of *Lactobacillus gasseri* in a~~A~~ non-therapeutic method for promoting physical activity~~, comprising administering *Lactobacillus gasseri*~~.

2. ~~A non-therapeutic method for promoting physical activity, comprising administering~~ Use of at least one treatment product of *Lactobacillus gasseri* selected from a culture, concentrate, paste, spray-dried product, freeze-dried product, vacuum-dried product, drum-dried product, liquid, diluted product, and crushed product of the lactobacillus in a non-therapeutic method for promoting physical activity.

3. The ~~non-therapeutic method for promoting physical activity~~ use of claim 1, wherein the *Lactobacillus gasseri* is in a form of lactobacillus suspension or a lactobacillus fermentation product.

4. The ~~non-therapeutic method for promoting physical activity~~ use of claim 3, wherein the lactobacillus fermentation product is lactobacillus beverages, sour milk, or yogurt.

5. The ~~non-therapeutic method for promoting physical activity~~ use of claim 1 or 2, wherein the *Lactobacillus gasseri* or the treatment product of *Lactobacillus gasseri* is configured as a food/drink.

6. The ~~non-therapeutic method for promoting physical activity~~ use of claim 5, wherein the food/drink is food for special dietary use or nutrition-promoting food.

7. The ~~non-therapeutic method for promoting physical activity~~ use of claim 1 or 2, wherein the *Lactobacillus gasseri* or the treatment product of *Lactobacillus gasseri* is added to food or drink.

8. The ~~non-therapeutic method for promoting physical activity~~ use of claim 7, wherein the food or drink is selected from the group consisting of milk, processed milk, milk beverages, soft drink, fermented milk, yogurt, cheese, bread, biscuit, cracker, pizza crust, ice cream, candy, gummy candy, gum, formula milk, fluid diet, food for sick people, food for young children, powdered milk, food for breastfeeding women, nutritious food.

9. The ~~non-therapeutic method for promoting physical activity~~ use of any one of claims 1 to 8, wherein the administration is an oral administration.

10. The ~~non-therapeutic method for promoting physical activity~~ use of any one of claims 1 to 9, wherein the promotion of physical activity is an increase in the amount of activity of a subject.

11. The ~~non-therapeutic method for promoting physical activity~~ use of claim 10, wherein the increase in the amount of activity is a rate of change in the amount of locomotor activity of greater than 0%.

12. The ~~non-therapeutic method for promoting physical activity~~ use of claim 10, wherein the increase in the amount of activity is measured by using metabolic equivalents (METs).

13. The ~~non-therapeutic method for promoting physical activity~~ use of any one of claims 1 to 9, wherein the promotion of physical activity is an increase of muscle mass in a subject.

14. The ~~non-therapeutic method of promoting physical activity~~ use of any one of claims 1 to 13, wherein the *Lactobacillus gasseri* is *Lactobacillus gasseri* OLL2809 deposited under the accession number NITE BP-72.

15. A non-therapeutic method for promoting physical activity, comprising administering *Lactobacillus gasseri* to a subject in need thereof.

16. A non-therapeutic method for promoting physical activity, comprising administering at least one treatment product of *Lactobacillus gasseri* selected from a culture, concentrate, paste, spray-dried product, freeze-dried product, vacuum-dried product, drum-dried product, liquid, diluted product, and crushed product of the lactobacillus to a subject in need thereof.

17. The non-therapeutic method for promoting physical activity of claim 15, wherein the *Lactobacillus gasseri* is in a form of lactobacillus suspension or a lactobacillus fermentation product.

18. The non-therapeutic method for promoting physical activity of claim 17, wherein the lactobacillus fermentation product is lactobacillus beverages, sour milk, or yogurt.

19. The non-therapeutic method for promoting physical activity claim 15 or 16, wherein the *Lactobacillus gasseri* or the treatment product of *Lactobacillus gasseri* is configured as a food/drink.

20. The non-therapeutic method for promoting physical activity of claim 19, wherein the food/drink is food for special dietary use or nutrition-promoting food.

21. The non-therapeutic method for promoting physical activity of claim 15 or 16, wherein the *Lactobacillus gasseri* or the treatment product of *Lactobacillus gasseri* is added to food or drink.

22. The non-therapeutic method for promoting physical activity of claim 21, wherein the food or drink is selected from the group consisting of milk, processed milk, milk beverages, soft drink, fermented milk, yogurt, cheese, bread, biscuit, cracker, pizza crust, ice cream, candy, gummy candy, gum, formula milk, fluid diet, food for sick people, food for young children, powdered milk, food for breastfeeding women, nutritious food.

23. The non-therapeutic method for promoting physical activity of any one of claims 15 to 22, wherein the administration is an oral administration.

24. The non-therapeutic method for promoting physical activity of any one of claims 15 to 23, wherein the promotion of physical activity is an increase in the amount of activity of the subject.

25. The non-therapeutic method for promoting physical activity of claim 10, wherein the increase in the amount of activity is a rate of change in the amount of locomotor activity of greater than 0%.

26. The non-therapeutic method for promoting physical activity of claim 24, wherein the increase in the amount of activity is measured by using metabolic equivalents (METs).

27. The non-therapeutic method for promoting physical activity of any one of claims 15 to 23, wherein the promotion of physical activity is an increase of muscle mass in the subject.

28. The non-therapeutic method for promoting physical activity of any one of claims 15 to 27, wherein the *Lactobacillus gasseri* is *Lactobacillus gasseri* OLL2809 deposited under the accession number NITE BP-72.