Decision on Opposition

Opposition No. 2018-700901

Patentee	Nestec Societe Anonyme
Patent Attorney	HASEGAWA, Yoshiki
Patent Attorney	KUROKAWA, Tomoya
Patent Attorney	SHIMIZU, Yoshinori
Patent Attorney	IKEDA, Naruto
Patent Attorney	SAKAMAKI, Junichiro
Patent Attorney	TOTSU, Yosuke
Patent Attorney	ABE, Hiroshi
Opponent	YAMAZAKI, Koichiro

The case of opposition against the patented invention in Japanese Patent No. 6321376, entitled "PET FOOD PREPARATIONS CONTAINING PROBIOTIC MICRO-ORGANISMS", has resulted in the following decision.

Conclusion

The patent for Claims 3 to 11 in Patent No. 6321376 is revoked.

The patent for Claims 1 and 2 of Japanese Patent No. 6321376 is maintained.

Reasons

No. 1 History of the procedures

The application on the inventions according to Claims 1 to 11 of Japanese Patent No. 6321376 of the case was filed having an international filing date of November 2, 2011 (priority claimed under the Paris Convention, November 5, 2010, European Patent

Application No. 10190118), on which the establishment of the patent right was registered on April, 13, 2018 and the Gazette containing the Patent was published on May 9, 2018.

Thereafter, the written opposition to a granted patent (hereinafter, referred to "the written opposition") was filed by the patent opponent Koichiro Yamazaki (hereinafter referred to as "the Opponent"), and opposition against the patented invention according to Claims 1 to 11 was made.

Regarding the patent, the reason for revocation was notified on February 6, 2019 (dispatch date), giving the patentee the opportunity to submit a written opinion for a specified period of time. However, no response was received from the patentee.

No. 2 The Invention

Inventions according to Claims 1 to 11 of the present patent (hereinafter, referred to as "Invention 1," etc.) are as specified by the matters defined in Claims 1 to 11 in the scope of the claims.

"[Claim 1]

A method for producing a pet food composition for use in the prevention or treatment of inflammatory disorders,

the pet food composition comprising non-replicating probiotic micro-organisms in an amount corresponding to about 10^6 to 10^{12} cfu per serving, wherein

the method comprises rendering the probiotic micro-organisms non-replicating by a heat treatment,

the heat treatment is a high temperature treatment at about 90 to 150°C for about 5 to 30 seconds,

the probiotic micro-organisms are selected from the group consisting of Bifidobacterium longum, Bifidobacterium lactis, Bifidobacterium breve, Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus paracasei, Lactobacillus rhamnosus, Lactococcus lactis, Streptococcus thermophilics, Lactobacillus bulgaricus, Escherichia coli, and combinations thereof.c

[Claim 2]

The method according to Claim 1, wherein the probiotic micro-organisms are selected from the group consisting of Bifidobacterium longum NCC 3001, Bifidobacterium longum NCC 2705, Bifidobacterium breve NCC 2950, Bifidobacterium lactis NCC 2818, Lactobacillus paracasei NCC 2461, Lactobacillus rhamnosus NCC 4007, Streptococcus thermophilus NCC 2019, Streptococcus thermophilus NCC 2059,

Lactobacillus casei NCC 4006, Lactobacillus acidophilus NCC 3009, Lactobacillus casei ACA-DC 6002 (NCC 1825), Escherichia coli Nissle, Lactobacillus bulgaricus NCC 15, Lactococcus lactis NCC 2287, and combinations thereof.

[Claim 3]

A method for producing a pet food composition for the prevention or treatment of disorders related to a compromised immune defense, wherein

the pet food composition comprises non-replicating probiotic micro-organisms in an amount corresponding to about 10^6 to 10^{12} cfu per serving,

the method comprises rendering the probiotic micro-organisms non-replicating by a heat treatment,

the heat treatment is carried out in the temperature range of about 80 to 90°C for about 20 to 40 minutes, and

the probiotic micro-organism is selected from the group consisting of Bifidobacterium longum, Bifidobacterium lactis, Bifidobacterium breve, Lactobacillus paracasei, Lactobacillus rhamnosus, and combinations thereof.

[Claim 4]

The method according to Claim 3, wherein the probiotic micro-organism is selected from Bifidobacterium longum NCC3001, Bifidobacterium breve NCC2950, Bifidobacterium lactis NCC2818, Lactobacillus paracasei NCC2461, Lactobacillus rhamnosus) NCC4007, and combinations thereof.

[Claim 5]

The method according to any one of Claims 1 to 4, wherein the pet food composition comprises about 4 to 40 weight% dry weight fat, about 12 to 70 weight% dry weight carbohydrates, and about 12 to 50 weight% dry weight proteins.

[Claim 6]

The method according to Claim 5, wherein the pet food composition comprises about 10 to 20 weight% dry weight fat, about 30 to 60 weight% dry weight carbohydrates, and about 20 to about 35 weight% dry weight proteins.

[Claim 7]

The method according to any one of Claims 1 to 6, wherein the pet food composition further comprises

about 0.5 to 40 weight% dry weight dietary fiber.

[Claim 8]

The method according to any one of Claims 1 to 7, wherein the pet food composition is selected from the group consisting of pet foods, nutritional diets for pets, supplements for pets, treats for pets, and food toys for pets such as chewable and consumable toys.

[Claim 9]

The method according to any one of Claims 1 to 8, wherein the pet food composition further comprising prebiotics, such as oligofructose and inulin.

[Claim 10]

The method according to any one of Claims 1 to 9, wherein at least 90% of the probiotics in the pet food composition are non-replicating.

[Claim 11]

The method according to any one of Claims 1 to 10, wherein the pet food composition comprises about 0.005 mg to 1000 mg non-replicating micro-organisms per daily dose.

No.3 Summary of reasons for revocation

The gist of the reasons for revocation notified by the body to the patent for Claims 3 to 11 is as follows:

1 The inventions recited in Claims 3, 4, and 8 to 11 of the Patent are those disclosed in Evidence A No. 7 (International Publication No. WO 2010/130660), which was distributed before the application of the Patent, and fall under Article 29(1) (iii) of the Patent Act. Therefore, the patent for the inventions should be revoked.

2 The inventions recited in Claims 3, 4, and 8 to 11 of the Patent could have been easily made by a person having ordinary skill in the art to which the invention pertains, on the basis of the inventions disclosed in Evidence A No. 7 (International Publication No. WO 2010/130660) distributed before the application of the Patent. Therefore, a patent should not be granted for the inventions under the provisions of Article 29(2) of the Patent Act and thus the patent for the inventions should be revoked.

3 The inventions recited in Claims 5 to 11 of the Patent could have been easily made by a person having ordinary skill in the art to which the invention pertains, on the basis of the inventions disclosed in Evidence A No. 7 (International Publication No. WO 2010/130660) distributed before the application of the Patent and the well-known arts stated in Documents 1 to 3 (National Publication of International Patent Application No. 2007-523634, Japanese Unexamined Publication No. 2009-159856, and Japanese Unexamined Publication No. 6-62763). Therefore, a patent should not be granted for the inventions under the provisions of Article 29(2) of the Patent Act and thus the patent for the inventions should be revoked.

4 The inventions recited in Claims 3 and 8 to 11 of the Patent could have been easily made by a person having ordinary skill in the art to which the invention pertains, on the basis of the inventions disclosed in Evidence A No. 2 (Japanese Unexamined Publication No.2008-245569) as well as the well-known arts stated in Evidence A No. 5 ("Anti-allergic effects of lactic acid bacteria and a possibility of utilization of lactic acid bacteria as pet food materials for reducing allergy," Keisuke Tobita) and Document 1 (National Publication of International Patent Application No. 2007-523634) distributed before the application of the Patent and before the priority date thereof. Therefore, a patent should not be granted for the inventions under the provisions of Article 29(2) of the Patent Act and thus the patent for the inventions should be revoked.

5 The inventions recited in Claims 5 to 11 of the Patent could have been easily made by a person having ordinary skill in the art to which the invention pertains, on the basis of the inventions disclosed in Evidence A No. 2 (Japanese Unexamined Publication No.2008-245569) as well as the well-known arts stated in Evidence A No. 5 ("Anti-allergic effects of lactic acid bacteria and a possibility of utilization of lactic acid bacteria as pet food materials for reducing allergy," Keisuke Tobita) and the well-known arts stated in Documents 1 to 3 (National Publication of International Patent Application No. 2007-523634, Japanese Unexamined Publication No. 2009-159856, and Japanese Unexamined Publication No. 6-62763) distributed before the application of the Patent and before the priority date thereof. Therefore, a patent should not be granted for the inventions under the provisions of Article 29(2) of the Patent Act and thus the patent for the inventions should be revoked.

No.4 Evidences

1 Evidences submitted by the opponent, etc.

Evidences submitted together with the written opposition by the opponent and other evidences are as follows:

(1) Evidence A No. 1: International Publication No. WO2006/028164 (internationally published on March 16, 2006)

(2) Evidence A No. 2: Japanese Unexamined Publication No.2008-245569 (published on October 16, 2008)

(3) Evidence A No. 3: "Anti-inflammatory activity of probiotic Bifidobacterium: Enhancement of IL-10 production in peripheral blood mononuclear cells from ulcerative colitis patients and inhibition of IL-8 secretion in HT-29 cells" (Imaoka A. et.al., World Journal of Gastroenterology, 2008, Vol. 14, No. 16, pages 2511-2516)

(4) Evidence A No. 4: "In Vitro Th1 Cytokine-Independent Th2 Suppressive Effects of Bifidobacteria" (Iwabuchi N. et. al., Microbiology and Immunology, 2007, Vol. 51, No. 7, pages 649-660)

(5) Evidence A No. 5: "Anti-allergic effects of lactic acid bacteria and a possibility of utilization of lactic acid bacteria as pet food materials for reducing allergy" (Keisuke Tobita, et. al., Milk Science, vol. 59, No. 1, pages 49 to 57, 2010, Japanese Dairy Science Association, published on April 10, 2010.

(6) Evidence A No. 6: "Heat-Treated Lactobacillus crispatus KT Strains Reduce Allergic Symptoms in Mice" (Tobita K. et. al., Journal of Agricultural and Food Chemistry, 2009, Vol. 57, pages 5586-5590)

(7) Evidence A No. 7: International Publication No. WO2010/130660 (internationally published on November 18, 2010)

(8) Evidence A No. 8: the priority certificate attached to the International publication PCT/EP 2010/056287 (International Publication No. WO2010/130660),the European Patent Office

(9) Evidence A No. 9: "Suppressive Effects of Bifidobacterium breve Strain M-16V on T-Helper Type 2 Immune Responses in a Murine Model" (Inoue Y. et. al., Biological and Pharmaceutical Bulletin, 2009, Vol. 32, No. 4, pages 760-763)

(10) Document 1: National Publication of International Patent Application No. 2007-523634 (published on August 23, 2007)

(11) Document 2: Japanese Unexamined Publication No. 2009-159856 (published on July 23, 2009)

(13) Document 3: Japanese Unexamined Publication No. 6-62763 (published on March 8, 1996)

(14) Reference Material 1: National Publication of International Patent Application No. 2012-526749 (Publication of Japanese Translation of PCT International Application corresponding to Evidence A No. 7)

2. Matters described in Evidences

(1) Evidence A No. 1

Evidence A No. 1 is a publication distributed before the filing date of the Patent and before the priority date thereof.

A Descriptions in Evidence A No. 1

In Evidence A No. 1, the following items are described with drawings. The paragraph numbers are enclosed in square brackets and in each paragraph a line break is inserted between the paragraph number and the text.

(A) Technical Field

"[0001]

The present invention relates to a method for stabilizing an antiallergic activity of lactic acid bacteria against a high temperature treatment, a composition for the stabilization of an antiallergic activity of lactic acid bacteria against a high temperature treatment, and foods and drinks such as drinks having a stabilized antiallergic activity of lactic acid bacteria, and a method for producing the same.

(B) Background Art

" .... (Omitted) ....
[0007]

On the other hand, it is known that the enhancement of Th1 immunity by lactic acid bacteria means the activation of cellular immunity of macrophages, killer T cells, and NK cells through the production of IL-12, IFN·gamma, etc., and that this leads to resistance to viral or bacterial infection or the development of cancer. Specifically, IL-12 produced by macrophages contributes to the acquirement of resistance to foreign bodies, cancers, through the differentiation of undifferentiated helper T cells into Th1 cells, and the activation of monocytes, macrophages, and NK cells. Therefore, it is suggested that a lactic acid strain capable of inducing strong IL-12 production can be used as an immunostimulator (Cancer Immunology Immunotherapy, vol. 49, p. 157, 2000; Japanese Unexamined Publication No. 7-228536, Japanese Unexamined Publication No. 2002-80364).
.... (Omitted) ....
[0011]

However, with regard to most foods and drinks including packed drinks which have been distributed recently, high-temperature heating treatments are conducted in the process of their production, distribution, or when they are taken. Therefore, there is a problem that physical properties of lactic acid bacterial cells are changed at the time of the high-temperature heating treatments, so that the antiallergic effect is affected. Consequently, there has been a conventional problem that in relation to foods and drinks for which high-temperature heating treatments are conducted, the utilization of antiallergic activity of lactic acid bacteria is limited. However, neither the presence of the problem thus described, nor the effect of high-temperature heating treatment on the antiallergic ability of lactic acid bacteria has been discussed, and the antiallergic activity of lactic acid bacteria has not been utilized conventionally in relation to foods and drinks for which high-temperature heating treatments are conducted.

(C) Problem to be solved by the invention and Means for solving the problem
"A Problem to be Solved by the Invention
[0014]
The object of the present invention is to provide a method for stabilizing an antiallergic activity of lactic acid bacteria against a high temperature treatment, and a composition for the stabilization of an antiallergic activity of lactic acid bacteria against a high temperature treatment, which can be applied to foods and drinks for which high-temperature heating treatments are conducted in the process of their production,

distribution, or when they are taken, and also to foods and drinks to be stored at room temperature after the high temperature treatments; in other words, which can maintain an antiallergic activity of lactic acid bacteria against a high temperature treatment, and foods and drinks such as drinks having a stabilized antiallergic activity of lactic acid bacteria, and a method for producing the same.

Means for Solving the Problem

[0015]

In the process of an intensive study for an antiallergic activity of lactic acid bacteria in foods and drinks for which high temperature treatments are conducted, the present inventors have found that the antiallergic activity of lactic acid bacteria can be maintained stably by making the lactic acid bacteria and polyphenols coexist, even when high temperature treatments are conducted, and the present invention has thus been completed."

(D) Example 1

"Example 1

[0041]

Extraction was conducted to 100 g of green tea leaves (mainly comprising kabuse-cha (shade-grown tea) and gyokuro (refined green tea)) for about 6 minutes with 3.5 kg of hot water at 80°C in which 3 g of ascorbic acid had been dissolved. The extract solution was filtered through a mesh to remove tea leaves, and then centrifugated. To the supernatant of the centrifugate, 5 g of sodium hydrogen carbonate and 3 g of ascorbic acid were added, and water was added to make the resultant solution 12 kg in total. This green tea solution was designated as the basic green tea (1). A solution prepared by adding 8 g of polyphenon 70A (Mitsui Norin Co., Ltd.) to (1) was designated as the basic green tea + polyphenon 70A (2), a solution in which twice as much supernatant of the extract solution after centrifugation as (1) was used was designated as the green tea with double amount of tea-leaf extract solution (3), and a solution in which the supernatant used was prepared by adding 18 g of PVPP to the extract solution before centrifugation in (1), then stirring and centrifuging the resultant solution, was designated as the PVPP-treated green tea (4).

[0042]

The pHs of (1) to (4) were 6.0 to 7.0, and the total polyphenol amounts in (1) to (4) were quantitated by iron tartrate method using ethyl gallate as a standard solution (Reference: Tea Research Journal 71 (1990), Method of Tea Analysis: Colorimetric Determination of Tannin Level). The quantitation results are shown in Table 1.

[0043]

[Table 1]

Sample	Total polyphenol amount (mg/100 ml)
Basic green tea (1)	57.5
Basic green tea + polyphenon 70A (2)	122
Green tea with double amount of tea-leaf extract solution (3)	111
PVPP-treated green tea (4)	9.93

[0044]

To the above-mentioned green teas (1) to (4), 0.02% of dried bacterial cells of lactic acid bacterium Lactobacillus paracasei strain KW3110 (heat-killed bacterium: obtained from Functional Food Division, Kirin Brewery Co., Ltd.) were added and UHT sterilization was conducted. The sterilization was conducted under the conditions of 135°C for 30 seconds and 137°C for 30 seconds, and each tea was hot-pack filled into a 500 ml PET bottle. From 25 ml of green tea after sterilization, precipitate of lactic acid bacteria was obtained by centrifugation at 8000 rpm for 10 minutes. The precipitate was washed with PBS (-), and then centrifuged again, and the resultant precipitate was suspended in 5 ml of PBS (-).

[0045]

The antiallergic activity of lactic acid bacteria in vitro was determined by measuring the amount of IL-12 released into a medium when mixed culture with mouse spleen lymphocytes was conducted. To BALB/c mice (Charles River Laboratories), 7 to 10 weeks of age, 1 mg of ovalbumin (OVA) was intraperitoneally injected together with 2 mg of aluminum hydroxide, which is an adjuvant, on day 0 and day 6. The mice were dissected on day 13, the spleens were isolated, and lymphocytes were prepared. The spleen lymphocytes were suspended at a cell concentration of 2.5×10^6 cells/ml in RPM11640 (SIGMA) medium to which FCS (Roche) and OVA were added to the final concentrations of 10% and 1 mg/ml, respectively. The lactic acid bacteria were added to the medium to the concentration of 0.25 μg/ml, and cultured for one week at 37°C and CO_2 concentration of 5%. Culture supernatant was collected by centrifugation, and the amount of IL-12 produced was measured with the use of Opt EIA ELISA Set (Becton Dickinson).

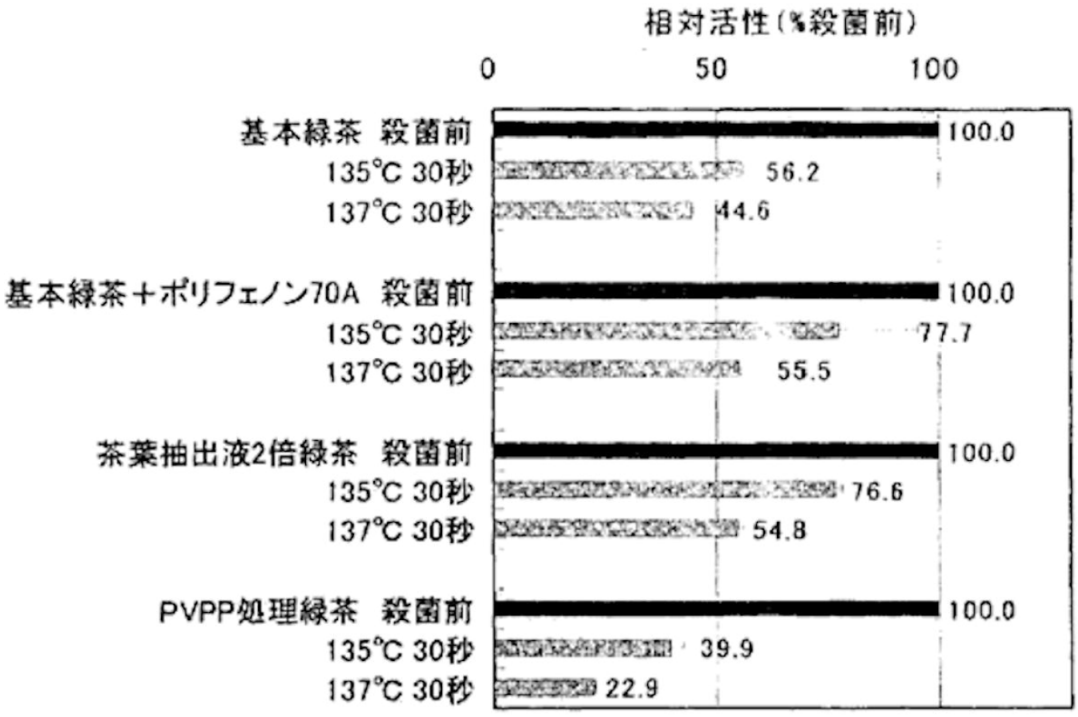
[0046]

The changes in the antiallergic activity caused by the UHT sterilization when the lactic acid bacteria were mixed with each green tea are shown in Fig. 4. The relative antiallergic activity after the UHT sterilization in comparison to that before the

sterilization is shown. The results show that, in both sterilization conditions, remaining activities after the UHT sterilization of the basic green tea + polyphenon 70A (2) and the green tea with double amount of tea-leaf extract solution were 10 to 20% higher than that of the basic green tea (1). Moreover, the remaining antiallergic activity of the PVPP-treated green tea (4) was 10 to 20% lower than that of the basic green tea (1). It was considered that there was correlation between the levels of the remaining antiallergic activity and the polyphenol contents (tannin contents) shown in Table 1."

(E) Illustration of Fig. 4

Fig. 4 illustrates the following chart.



相対活性（％殺菌前）	Relative activity (% before sterilization)
基本緑茶	Basic green tea
殺菌前	before sterilization
３０秒	30 seconds
基本緑茶＋ポリフェノン７０Ａ	Basic green tea + polyphenon 70A
茶葉抽出液２倍緑茶	Green tea with double amount of tea-leaf extract solution

ＰＶＰＰ処理緑茶　　PVPP-treated green tea

It can be seen from the illustration of FIG. 4 above that the heat treatment at 135°C for 30 seconds causes the relative activity in terms of the released amount of IL-12 to decrease to 39.9 when the bacterial cells are mixed with the PVPP-treated green tea (4), as compared with 100 before sterilization, while the relative activity can be maintained at 56.2 to 77.7 when mixing the bacterial cells with the basic green tea (1), the basic green tea + polyphenon 70A (2), or the green tea with double amount of tea-leaf extract solution (3).

B　Finding of the invention disclosed in Evidence A No. 1

In view of the above "A," it is recognized that Evidence A No. 1 discloses the following invention (hereinafter, referred to as "Invention A-1").

"A method for stabilizing an antiallergic activity of lactic acid bacteria against a high temperature treatment, and foods and drinks such as drinks having a stabilized antiallergic activity of lactic acid bacteria, and a method for producing the same, wherein

when the lactic acid bacteria Lactobacillus paracasei strain KW3110 capable of inducing strong IL-12 production and that can be used as an immunostimulator is subjected to a high temperature heat sterilization at 135°C for 30 seconds,

the residual activity after heat sterilization is reduced to 39.9, as compared with the antiallergic activity of 100 before heat sterilization as observed by the released amount of IL-12 in heat sterilization with PVPP-treated green tea (4), which is prepared by PVPP treatment to give a polyphenol amount of 9.93 mg per 100 ml, whereas

mixing the polyphenol amount with 57.5 mg to 122 mg of the basic green tea (1), the basic green tea + polyphenon 70A (2), or the green tea with double amount of tea-leaf extract solution (3) per 100 ml causes the residual activity after heat sterilization to be maintained at 56.2 to 77.7, as compared with the antiallergic activity of 100 before heat sterilization as observed by the released amount of IL-12."

(2) Evidence A No. 2

Evidence A No. 2 is a publication distributed before the filing date of the Patent and before the priority date thereof.

A　Descriptions in Evidence A No. 2

In Evidence A No. 2, the following items are described with drawings.

(A)

"[Scope of Claims]

[Claim 1]

A method for producing a heat-treated bacterial cell of Lactobacillus paracasei KW3110 strain or its mutant strain having a high antiallergic activity, wherein a heat treatment is conducted to Lactobacillus paracasei KW3110 strain or its mutant strain at a temperature of 60°C or more and less than 100°C, for a time period of 10 minutes or more and less than 60 minutes.

[Claim 2]

The method for producing a heat-treated bacterial cell of Lactobacillus paracasei KW3110 strain or its mutant strain having a high antiallergic activity according to Claim 1, wherein the heat treatment to Lactobacillus paracasei KW3110 strain or its mutant strain is conducted after culturing Lactobacillus paracasei KW3110 strain or its mutant strain, and removing a medium component by conducting washing treatment on the cultured bacterial cell.

[Claim 3]

A heat-treated bacterial cell of Lactobacillus paracasei KW3110 strain or its mutant strain produced by the production method of Claim 1 or 2.

[Claim 4l

An antiallergic composition comprising the heat-treated bacterial cell of Lactobacillus paracasei KW3110 strain or its mutant strain produced by the production method of Claim 1 or 2 as an active ingredient.

(B)

"[Detailed Description of the Invention]

[Technical Field]

[0001]

The present invention relates to a lactic acid bacterium composition with high antiallergic activity, a method for producing the lactic acid bacterium, particularly, a method for producing a lactic acid bacterial cell with high antiallergic activity, comprising heat treating a lactic acid bacterium with excellent antiallergic activity, Lactobacillus paracasei KW3110 strain or its mutant strain, to confer a high antiallergic activity and to confer a stable antiallergic activity, and to an antiallergic composition comprising the lactic acid bacterial cell with high antiallergic activity as an active ingredient."

(C)
"[0007]

On the other hand, it is known that the enhancement of Th1 immunity by the lactic acid bacteria and the like relates to the activation of cellular immunity such as macrophage, killer T cells, and NK cells through the production of IL12, IFN-γ, and it is known that this leads to the resistance to viral or bacterial infection, or development of cancer. Specifically, IL-12 produced by macrophage, leads to the resistance against foreign bodies, cancer through differentiation of the naive helper T cells to Th1 cells, and activation of monocytes, macrophage, or NK cells. Therefore, it is suggested that the lactic acid bacteria strain being able to induce strong IL-12 production can be used as immunoadjuvant (Cancer Immunology Immunotherapy, vol. 49, p. 157, 2000; Japanese Unexamined Publication No. H7-228536, Japanese Unexamined Publication No. 2002-80364).

(D)
"[Problem to be solved by the invention]
[0015]

The object of the present invention is to enhance the antiallergic activity of the active ingredient when using lactic acid bacteria having an antiallergic activity in various product forms and in various uses, and to provide a lactic acid bacterium having a more stable antiallergic activity, in order to further enhance its effectiveness.
[Means for solving the problem]
[0016]

The present inventors conducted a keen study to solve the above object on active ingredients having a high antiallergic activity consisting of lactic acid bacteria. They found that by conducting a heat treatment on the lactic acid bacterium having an excellent antiallergic activity, Lactobacillus paracasei KW3110 strain or its mutant strain, within a particular temperature range and for a particular time period, the antiallergic activity can be significantly increased, and by stopping the activity of the lactic acid bacterium itself, and preventing as much as possible the denaturation of the bacterium itself by heat treatment, an active ingredient having a stable and high antiallergic activity can be obtained. The present invention has thus been completed."

(E)
"[0026]

(Antiallergic activity of the lactic acid bacteria produced by the present invention)

When IgE antibodies are generated in response to antigenic stimulation, the IgE antibodies bind to Fc receptors on the surface of the mast cells in the tissues or on the surface of basophils in blood, then, recognized by IgE antibodies, bond on the surface of mast cells or on the basophils surface upon the secondary antigenic stimulation (re-invasion of allergen), and crosslinking is formed between the IgE antibodies, and when mast cells or basophils release vast amounts of chemical mediators with this stimulation as a trigger, various symptoms of allergy appear. Therefore, it is necessary to suppress IgE for treating and preventing allergy, and for that purpose, to enhance Th1 immunity to suppress Th2 immunity. The lactic acid bacteria of the present invention strongly induce interleukin 12 (IL-12) production being the index of Th1 immunity, and at the same time, strongly suppress the interleukin 4 (IL-4) production being the index of Th2 immunity, in an in vitro system using mouse lymphocytes. Therefore, the lactic acid bacteria of the present invention have effects for treating and preventing allergy based on the acting mechanism that the production of IgE antibody is suppressed by enhancing Th1 immunity and suppressing Th2 immunity.

[0027]

(Heat treatment of the present invention)

In the present invention, L. paracasei KW3110 strain or its mutant strain is subjected to a heat treatment at a certain temperature for a certain time period, so as to increase its antiallergic activity. As heating temperature, a temperature of 60°C or more and less than 100°C is used, and as heating time, a time of 10 minutes or more and less than 60 minutes is applied. Particularly, a temperature of 60 to 85°C is preferred, and more preferable is a temperature of around 85°C, and a heating time period of 10 minutes or more and less than 60 minutes. The heat treatment of the present invention comprises heat treating a cultured lactic acid bacterial cell in a suspended condition at a certain temperature for a certain time period. As for the heating means herein, a commonly used means can be used without particular limitation. For example, a bacterial cell suspended in a tank may be heated with a heat exchanger. In the present invention, when conducting a heat treatment to a lactic acid bacterial cell, it is particularly preferred to subject a cultured bacterial cell to washing treatment by using, for example, a centrifuge or ceramic film to remove medium components, and to conduct a heat treatment to a concentrated bacterial cell in a suspension state, in order to obtain an effective heat-treatment effect. For the washing treatment using a centrifuge or ceramic film, a commonly used centrifuge or filtering system can be used.

[0028]

(Antiallergic composition of the present invention)

The antiallergic composition of lactic acid bacterium produced by the present invention has a high antiallergic activity that has been significantly increased and a stable and high antiallergic activity, and can be used effectively by application in various product forms and in various uses. For example, in lactic acid bacteria having undergone heat treatment of the present invention, the activity of the lactic acid bacteria itself has been stopped by the particular heat treatment of the present invention. Therefore, when adding the bacterium to various foods or drinks as an antiallergic composition, it is possible to reduce as much as possible the influence of the bioactivity of the lactic acid bacterium on the original flavor of the foods or drinks. Further, when the antiallergic composition is formulated into various dosage forms, a stable activity can be maintained as an active ingredient."

(F)

"[0033]

(Use by compounding into foods or drinks)

The antiallergic composition of lactic acid bacteria produced by the present invention can be used as foods or drinks with antiallergic function by compounding into foods or drinks. To use the antiallergic composition of lactic acid bacteria produced by the present invention by compounding into foods or drinks, the effective dose of the active ingredients is added and compounded during the stage of manufacturing raw material or after the product is manufactured and the like. Here, the term "effective dose of the active ingredients" relates to the content wherein the active ingredients are ingested within the following range, when the amount generally consumed for each food and drink is ingested.

[0034]

In other words, as for the dosage or intake of the effective dose of the active ingredients of the present invention to foods or drinks, it can be determined depending on the recipient, the age and body weight of the recipient, symptoms, administered time, dosage form, administering method, the combination of agents, and the like. For example, when the active ingredients of the present invention are administered as medicine, they can be administered 1 to 3 times per day within the range of: 0.1 to 100 mg/kg body weight (preferably 1 to 10 mg/kg body weight) when administered orally, and 0.01 to 10 mg/kg body weight (preferably 0.1 to 1 mg/kg body weight) when administered parenterally. The agents having other acting mechanisms used by

combining with the active ingredients of the present invention can be also determined appropriately by using the dosage used clinically as standard. When the dosage or intake of the effective dose of the active ingredients of the present invention to foods or drinks is indicated by the number of the lactic acid bacteria, it is preferable that the intake is 5×10^9 or more per day, more preferably 1×10^{10} or more per day, most preferably 5×10^{10} or more per day. Therefore, the number of the lactic acid bacteria to be contained per each food is determined according to the amount of foods or drinks generally ingested per day.

[0035]

In the present invention, the active ingredients of the antiallergic composition of lactic acid bacteria produced by the present invention can be compounded by themselves or in a form of formulation described above to foods or drinks. More concretely, the foods or drinks of the present invention can take various forms of usage, by compounding the active ingredients of the present invention with base materials appropriately, and preparing as foods or drinks by themselves, or by further compounding various proteins, sugars, fats, trace elements, vitamins, and the like, or prepared in a liquid, semi-liquid, or solid form, or further added or compounded to general foods or drinks, or the like."

(G)

"[0041]

(Compounding to foods)

Moreover, in the present invention, it is possible to prepare foods with antiallergic function by compounding the lactic acid bacteria with high antiallergic activity produced by the present invention to foods. Examples of these foods or drinks include various kinds of foods: sweets such as cream caramel, cookie, cracker, potato chips, biscuit, bread, cake, chocolate, donuts, and jelly; Japanese cakes such as rice cracker, faded black, daifuku (rice cake filled with sweet jam paste), bean cake, and other steamed bean-jam bun, and sponge cake; breads and snacks such as cold desserts (candy and the like) and chewing gum; noodles such as wheat noodle, buckwheat noodle, and kishimen (flat wheat noodle); fish cakes such as steamed fish paste, ham and fish meat sausage; meat products such as ham, sausage, hamburger, and canned beef; seasonings such as salt, pepper, soybean paste (miso), soybean sauce, sauce, dressing, mayonnaise, ketchup, sweetener, and pungent seasonings; grilled foods such as akashiyaki (soft octopus ball), takoyaki (octopus ball), monjayaki (doughy crape-like pancake), okonomiyaki (savory pancake), fried noodles and fried wheat noodles; dairy products such as cheese and hard type yogurt; various prepared foods such as fermented soybeans, pressed tofu, tofu, yam paste, rice

dumpling, pickles, fish boiled in soy sauce, gyoza, shao mai, croquette, sandwich, pizza, hamburger and salad; various powders (meat products such as beef, pork, and chicken; fishery products such as shrimp, scallop, freshwater clam, and dried tangle; vegetables and fruits, plants, yeast, and algae); powdered solid products of fat and flavoring ingredients (vanilla, citrus, bonito, and the like); and powdered foods or drinks (instant coffee, instant tea, instant milk, instant soup, miso soup, and the like), but the invention is not limited to these.

[0042]

(Compounding to beverages)

As for the composition with high antiallergic activity of lactic acid bacteria produced by the present invention, particularly by using it in form of beverage, it is possible to provide a beverage with antiallergic function that can be ingested every day continuously, with antiallergic function that becomes effective with the amount possible to ingest continuously. When compounding the lactic acid bacteria with high antiallergic activity produced by the present invention to beverage, the content of the lactic acid bacteria can be determined appropriately, but generally the amount to be compounded is applied such that the antiallergic activity of the lactic acid bacteria can be effective in an ingestible amount continuously as beverage is applied. When the dosage or intake of the effective dose of the active ingredients of the present invention to foods or drinks is expressed by the number of the lactic acid bacteria, it is preferable that the intake is 5×10^9 or more cells per day, more preferably 1×10^{10} or more cells per day, most preferably 5×10^{10} or more cells per day. Therefore, the number of the lactic acid bacteria strain to be contained per each beverage is determined, with the index mentioned above, according to the amount of drinks generally ingested per day. For example, if 100 g of beverage is ingested per day, it is preferable to add 10^9 or more of bacteria per 100 g of beverage. On the other hand, when considering a range that does not damage the flavor or the appearance of the beverage by adding the lactic acid bacteria, 10^{11} or fewer cells is preferred. Moreover, 5×10^{10} or fewer cells is more preferred. Therefore, as for the concentration of the lactic acid bacteria having high antiallergic function, and being stabilized, having good taste, and good storage ability, it is most preferred to be within 10^9 to 10^{11} cells per 100 g of beverage. Meanwhile, as for the relationship between the number of the lactic acid bacteria and the weight of dried bacteria, for example, for L. paracasei KW3110 strain, the number of strain 10^{12} bacteria corresponds to 1 g weight of dried strain.

(H)

"[Example 1]

[0049]

<1. Method for measuring antiallergic activity>

The antiallergic activity of lactic acid bacteria in vitro was measured by measuring IL-12 levels released in the medium when culturing the bacterium in combination with mouse spleen lymphocytes. Seven- to ten-week-old BALB/c mice (Charles River) were intraperitoneally injected with 1 mg of ovalbumin (OVA) at day 0 and day 6 with 2 mg of aluminum hydroxide serving as an adjuvant. The animals were dissected on day 13, to isolate the spleen and to prepare lymphocytes. Spleen lymphocytes were suspended in RPMI 1640 (SIGMA) medium supplemented with FCS (Rosche) and OVA so that the final concentrations become 10% and 1 mg/ml, respectively in order to obtain a cell concentration of 2.5×10^6 cells/ml. Then, lactic acid bacteria were added to the above medium to obtain 0.25 μg/ml, and cultured for 1 week at 37°C with a CO_2 concentration of 5%. The cultured supernatant was recovered by centrifugation, and IL-12 was measured by using OptEIA ELISA (Becton Dickinson).

[0050]

(Indication of experiment results)

IL-12 production levels of the sample were compared with those of the control, L. paracasei KW3110 strain, and the relative levels are shown.

[0051]

(Preparation of the control bacterium)

Bacteria which had undergone static culture using MRS medium at 37°C for 48 hours were washed 3 times with sterilized water, suspended in the sterilized water, and then treated at 100°C for 30 minutes for sterilization. The resultant suspension was lyophilized and suspended in PBS.

[0052]

<2. Preparation of the sample L. paracasei W3110 strain: culture>

A medium containing similar level of nitrogen source, carbon source, and inorganic materials as MRS medium was put in a 50 L-tank, and was steam-pasteurized at 120°C for 20 minutes. To this, lactic acid bacterial cell proliferated appropriately in MRS medium were added, and cultured at 32°C, 60 rpm, by adjusting pH to 5.5 with sodium hydroxide, for 48 hours. The prepared culture solution was taken, and washed by centrifugation to obtain a bacterial cell suspension.

[0053]

<3. Heat treatment>

The bacterial cell suspension obtained in the above 2. was heated in a warm bath adjusted to each temperature, and samples were recovered at each time period, when the bacterial cell suspension attained each temperature. The recovered samples were lyophilized, and subjected to the IL-12 production activity evaluation.

[0054]

<4. Experiment results>

The above experiment results are shown in Fig. 1 and Table 1. In the present experiment, experiments were repeated once for the test group at 85°C, twice for the test group at 60°C, and 3 times for other test groups, and the average levels are shown. "Non-heated" denotes bacteria that have been lyophilized after washing the culture solution.

Fig. 1 shows the ratio of IL-12 production level (ratio with respect to the control) for each heating condition. Table 1 shows the IL-12 production activity level (relative level with respect to control (%)) for each heating condition."

(I)

Table 1 shows that the average IL-12 production activity level of the "Non-heated" samples is "11.33," whereas the average IL-12 production activity level of the samples heated at "85°C" for "30 min." is as high as "140.81."

B Finding of the invention disclosed in Evidence A No. 2

In view of the above "A," it is recognized that Evidence A No. 2 discloses the following invention (hereinafter, referred to as "Invention A-2").

"A method for producing a lactic acid bacterium composition with high antiallergic activity,

the method comprising subjecting, as a lactic acid bacterium that is capable of inducing strong IL-12 production and that can be used as an immunostimulant, Lactobacillus paracasei KW3110 strain or its mutant strain to heat treatment at a temperature in a predetermined range for a predetermined time to suppress the activity of the lactic acid bacteria and enhance the antiallergic activity thereof, wherein

the produced antiallergic composition of the lactic acid bacterium is compounded into foods and drinks to obtain foods and drinks having an antiallergic function;

as for the dosage or intake of the effective dose of the active ingredients to foods or drinks, it can be determined depending on the recipient, the age and body weight of the recipient, symptoms, administering method, and the like, and it can be administered

in 1 to 3 doses per day, preferably within the range of 1 to 10 mg/kg body weight of an adult human (for L. paracasei KW3110 strain, 10^{12} bacteria corresponds to 1 g of the dried bacteria) when administered, for example, orally;

the foods and drinks can be used in various forms, such as those further compounding various proteins, sugars, and fats; and

one of the suitable heating conditions for the L. paracasei KW3110 strain is at 85°C for 30 minutes."

(3) Evidence A No. 3

Evidence A No. 3 is a publication distributed before the filing date of the Patent and before the priority date thereof.

A Descriptions in Evidence A No. 3

In Evidence A No. 3, the following items are described with drawings. After each of the English sentences, a provisional translation based on the translation attached to the written opposition was added in parentheses.

(A) Page 2511, title

"Anti-inflammatory activity of probiotic Bifidobacterium: Enhancement of IL-10 production in peripheral blood mononuclear cells from ulcerative colitis patients and inhibition of IL-8 secretion in HT-29 cells"

(B) Page 2512, left column, lines 26 to 32

"MATERIALS AND METHODS

Bacteria and related preparations

Bifidobacterium bifidum strain Yakult (BbiY) and Bifidobacterium breve strain Yakult (BbrY) were grown in MRS broth (Becton, Dickinson and Company, Sparks, MD). Heat-killed BbiY or BbrY was prepared by heating bacteria resuspended in distilled water at 100°C for 30 min, and then lyophilized."

(C) Page 2512, left column, lines 5 to 1

"Peripheral blood mononuclear cells

Peripheral blood mononuclear cells (PBMNC) were isolated from peripheral blood of UC patients by Ficoll-Conray (Lymphosepar I; Immuno-Biological Laboratories, Takasaki, Japan) density gradient centrifugation."

(D) Page 2513, the description of Fig. 1

"Figure 1 Effects of probiotic bifidobacteria on IL-10 production in PBMNC. PBMNC were isolated from 9 ulcerative-colitis patients and incubated with heat-killed probiotic BbiY or BbrY (10 μg/mL), or LPS. At forty-eight hours after incubation, the IL-10 concentration was determined by ELISA (mean ± SD, n=3)."

B Finding of the invention disclosed in Evidence A No. 3

In view of the above "A," it is recognized that Evidence A No. 3 discloses the following invention (hereinafter, referred to as "Invention A-3").

"A method for enhancing IL-10 production in peripheral blood mononuclear cells of a patient with ulcerative colitis

by using heat-sterilized Bifidobacterium bifidum strain Yakult (BbiY) or Bifidobacterium breve strain Yakult (BbrY) prepared by heating at 100°C for 30 minutes."

(4) Evidence A No. 4

Evidence A No.4 is a publication distributed before the filing date of the Patent and before the priority date thereof.

In Evidence A No. 4, the following items are described with drawings. After each of the English sentences, a provisional translation based on the translation attached to the written opposition was added in parentheses.

(A) Page 650, right column, lines 27 to 39

"Microorganisms. All strains used in this study are listed in Fig. 1, and were obtained from the Morinaga Culture Collection (MCC, Morinaga Milk Industry Co., Ltd., Zama, Japan) and the American Type Culture Collection (ATCC; Manassas, Va, U.S.A.). These microorganisms were cultured for 16 hrs at 37°C in Lactobacilli-MRS broth (DIFCO, Detroit, Mich., U.S.A.). Microorganisms were collected by centrifugation and were washed twice with phosphate-buffered saline (PBS), and then were washed twice with sterile distilled water. The organisms were lyophilized and suspended in PBS, and were killed by heating at 100°C for 30 min. This stock suspension was stored at -80°C until use."

(B) Page 652, the description of Fig. 1

"Fig. 1. Production of IL-12p70 by murine splenic cells cultured with various microorganisms. Splenic cells from BALB/c mice were cultured with heat-killed microorganisms (1μg/ml) for 2 days. The levels of IL-12p70 in supernatants were measured using ELISA. Data are shown as mean ±SD of three independent experiments.

Statistical analyses (Mann-Whitney U tests) indicated significant difference (P=0.0006) in IL-12 production between strains of bifidobacteria and those of the others."

(C) Page 653, the description of Fig. 2

"Fig. 2. Effect of heat-killed microorganism on OVA-induced total IgE, IL-4, IL-12p70, and IFN-γ production by OVA-sensitized BALB/c splenic cells. Splenic cells from OVA-sensitized mice were cultured with 100 μg/ml OVA in the absence (control) or presence of heat-killed bacterial cells (0.1-100 μg/ml). The levels of total IgE in supernatants on day 14 and cytokines on day 7 were measured using ELISA. Data are shown as mean ±SD of three independent experiments. Significant differences compared to control (*P<0.05, **P<0.01) and significant differences between BB536 and the other bacterial species at 1 μg/ml (#P<0.05, ##P<0.01) were tested by ANOVA followed by Bonferroni multiple comparison test."

(5) Evidence A No. 5

Evidence A No. 5 is a publication distributed before the filing date of the Patent and before the priority date thereof.

In Evidence A No. 5, the following items are described with drawings.

(A) Page 49, title

"Anti-allergic effects of lactic acid bacteria and a possibility of utilization of lactic acid bacteria as pet food materials for reducing allergy"

(B) Page 53, left column, line 6 from the bottom to page 54, left column, line 1

"The authors observed that, as shown in Fig. 2, when the heat-treated L. crispatus strain KT-11 capable of inducing a Th1 immune response more strongly than the standard strains of Lactobacillus (L.) acidophilus and L. crispatus in a mouse spleen cell culture system was orally administered to NC/Nga mice that developed atopic dermatitis symptoms by means of continuous intradermal administration of Dermatophagoides farinae extract, it caused a reduction in allergic symptoms, a decrease in serum anti-Dermatophagoids mite-specific IgE levels, and an increase in ratio of IFN-γ^+CD4^+/IL-4^+CD4^+ spleen cells, as compared with untreated mice35). As shown in Fig. 3, the authors also observed that the gene expression levels of TLR2, NOD1, and NOD2 increased significantly in a mouse Peyer's patch cell culture system added with L. crispatus strain KT-11, as compared with the case of no addition35). These results suggest that L.crispatus strain KT-11 ingested from Peyer's patches of the intestinal tract enhances Th1 immune response by stimulating TLR2, NOD1, or NOD2 to reduce allergic

symptoms through improving Th1/Th2 balance and is thus highly expected to be used as a pet food material with anti-allergic action for pets suffering from allergic dermatitis."

(6) Evidence A No. 6

Evidence A No. 6 is a publication distributed before the filing date of the Patent and before the priority date thereof.

In Evidence A No. 6, the following items are described with drawings. After each of the English sentences, a provisional translation based on the translation attached to the written opposition was added in parentheses.

(A) Page 5586, title

"Heat-Treated Lactobacillus crispatus KT Strains Reduce Allergic Symptoms in Mice"

(7) Evidence A No.7

Evidence A No.7 was published internationally at a date between the priority date of the Patent and the actual filing date thereof and made available to the public.

A Descriptions in Evidence A No. 7

In Evidence A No. 7, the following items are described with drawings (the underlines are added by the body, and the same shall apply hereinafter). In addition, as a corresponding Japanese translation, the Japanese text in Reference Material 1 is shown in parentheses with the paragraph number in Reference Material 1.

(A) Specification, page 1, lines 1 to 11

Non-replicating micro-organisms and their immune boosting effect

[0001]

The present invention generally relates to the field of micro-organisms, in particular to food grade bacteria. One embodiment of the present invention concerns non-replicating probiotics belonging to genera such as Lactobacillus, Bifidobacterium, or combinations thereof, for example the species Lactobacillus paracasei, Lactobacillus rhamnosus, Bifidobacterium longum, Bifidobacterium lactis, Bifidobacterium breve, or combinations thereof, and applications of these bacteria. One embodiment of the present invention relates to non-replicating probiotics and their use to prepare a composition to treat or prevent disorders that are related to a compromised immune defense.

(B) Specification, page 2, line 16 to page 3, line 15

[0007]

A compromised immune defense may have many negative effects on a subject's health and well-being. It may, for example, result in a greater risk for infections and/or in an increased severity of infections. It may also promote or reinforce immune deficiency related disorders, or lead to allergy.

[0008]

Strengthening the immune defense is therefore important for all subjects at all age groups to protect the body. In particular, this is important for those subjects whose immune systems are compromised or transiently depressed such as the neonates, the elderly, subjects submitted to high stress conditions, patients taking immunosuppressive drugs, patients under radiotherapy or chemotherapy, or subjects developing allergic diseases.

[0009]

Natural defenses against infections and immune deficiency related diseases imply, among others, that the host is able to mount efficient and rapid innate immune defenses that include activation of macrophages and natural killer cells, for example. In addition, efficient immune defenses also imply that the host is able to downregulate an overreaction of the immune system such as that occurring in allergy.

[0010]

The killing activity of macrophages in response to phagocytosis of pathogens is usually accompanied by a transient boost in pro-inflammatory cytokines such as TNF-α, IL-6, IL-1 , and IL-12 (Shoda, L., et al., 2000, Infection and Immunity 68:5139- 5145). IL-12 produced by antigen presenting cells including macrophages activates natural killer cells to produce IFN-γ and promotes the development of acquired immune responses through the differentiation of IFN-γ-producing T helper cells. In addition, TNF-α and IFM-γ acting in an autocrine loop stimulate the killing activity of phagocytic cells (Soehnlein, O., et al., 2008, Journal of Clinical Investigation 118:3491-3502). By contrast, IL-10 produced by many immune cell types inhibits the production of pro-inflammatory cytokines produced by macrophages and dendritic cells such as IL-1, IL-6, IL-12, and TNF-α (Mosser, D., and Zhang, X., 2008, Immunological Reviews 226:205-218). Specific live probiotic strains are known to stimulate pro-inflammatory cytokines

in vitro such as IL-12 and TNF-α, which is linked to an enhanced phagocytosis activity of rat peritoneal macrophages (Ishida-Fujii, K., 2007, Biosc. Biotechnol. Biochem 71:866-873).

(C) Specification, page 4, lines 7 to the last

[0015]

The prior art generally teaches that heat treatment of probiotics leads to a partial or complete loss of their health beneficial properties. Only in exceptional cases were some tested health benefits maintained (Verdu et al., 2004, Gastroenterology, 127, p. 826 ff., Rousseaux, 2007, Nature Medicine, 13, p. 35ff; Kamiya et al., 2006, Gut, 55, 191 ff.).

[0016]

The present inventors were now surprised to see that the ability of probiotic strains to stimulate, for example, the production of pro-inflammatory cytokines by human cells can be enhanced after heat treatment. This effect has been observed for several lactobacilli and bifidobacteria.

[0017]

Non-replicating probiotic micro-organisms have the advantage that they are far easier to handle than their live counterparts. Additionally, they are far more stable in storage and need less stringent packaging conditions.

[0018]

Non-replicating probiotic micro-organisms would allow development of a large variety of functional foods which by their nature do not allow the addition of live probiotics without additional measures to protect them. This plays a role, for example, in the provision of cereal bars, fruit juices, UHT-drinks, shelf stable drinks, etc.

[0019]

Further, for example, in immuno-compromised customers, the use of live probiotics might be limited due to a potential risk to develop bacteremia. Here the inventors present a method to generate non-viable bacteria with an in vitro immune boosting profile regardless of their initial immune profiles. Bacteria with no immune boosting profile when they are alive may be provided with an immune boosting profile; and bacteria with an immune boosting profile when they are alive may be provided with an enhanced immune boosting profile.

(D) Specification, page 6, line 4 to page 6, line 10

[0028]

For example, bifidobacteria such as Bifidobacterium longum, Bifidobacterium lactis, and Bifidobacterium breve, or lactobacilli, such as Lactobacillus paracasei or Lactobacillus rhamnosus, may be rendered non-replicating by heat treatment, in particular by low temperature/long time heat treatment.

[0029]

At least 95 weight %, preferably at least 97.5 weight %, even more preferred at least 99 weight % of the biomass of probiotics are non-replicating, and most preferred all probiotics are non-replicating.

(E) Specification, page 6, line 17 to page 7, line 8

[0032]

The probiotic may be selected from the group consisting of the genera lactobacilli, bifidobacteria, or combinations thereof, such as the species Lactobacillus paracasei, Lactobacillus rhamnosus, Bifidobacterium longum, Bifidobacterium lactis, Bifidobacterium breve, or combinations thereof, for example the strains Lactobacillus paracasei NCC2461, Lactobacillus rhamnosus NCC4007, Bifidobacterium longum NCC3001, Bifidobacterium lactis NCC2818, Bifidobacterium breve NCC2950, or combinations thereof.

[0033]

Bifidobacterium longum NCC3001 was deposited under the Budapest Treaty as ATCC BAA-999 and may be obtained, e.g., from Morinaga Milk Industry Co. Ltd. of Japan under the trademark BB536.

[0034]

Bifidobacterium lactis NCC2818 was deposited under the Budapest Treaty as CNCM I-3446.

[0035]

Lactobacillus rhamnosus NCC4007 was deposited under the Budapest Treaty as CGMCC 1.3724.

[0036]

Lactobacillus paracasei NCC2461 was deposited under the Budapest Treaty as CNCM I-2116.

[0037]

Bifidobacterium breve NCC2950 (strain A) was deposited under the Budapest Treaty as CNCM I-3865.

(F) Specification, page 7, line 3 from the bottom to page 8, line 10

[0040]

Allergic diseases have steadily increased over the past decades and they are currently considered epidemics by WHO. In a general way, allergy is considered to result from an imbalance between the Th1 and Th2 responses of the immune system leading to a strong bias towards the production of Th2 mediators. Therefore, allergy can be mitigated, down-regulated, or prevented by restoring an appropriate balance between the Th1 and Th2 arms of the immune system. This implies the necessity to reduce the Th2 responses or to enhance, at least transiently, the Th1 responses. The latter would be characteristic of an immune boost response, often accompanied by, for example, higher levels of IFNγ, TNF-α, and IL-12. (Kekkonen et al., 2008, World Journal oi Gastroenterology, 14, 1192-1203; Viljanen M. et al., 2005, Allergy, 60, 494-500)

[0041]

The present invention allows treatment or prevention of disorders that are related to a compromised immune defense.

(G) Specification, page 8, line 22 to page 9, line 4

[0045]

Likewise, the kind of composition that is prepared by the use of the present invention is not particularly limited. For example, it may be a pharmaceutical composition, a nutraceutical, a food additive, a pet food, a food product, or a drink.

[0046]

The composition of the present invention may be any kind of composition. The composition may be to be administered orally, enterally, parenterally (subcutaneously or intramuscularly), topically, or ocularly, for example.

[0047]

For example, it may be a composition selected from the group consisting of food compositions, food products including pet foods, drinks, nutritional formulas, feeding formulas, nutraceuticals, food additives, pharmaceutical compositions, cosmetical compositions, and medicaments.

(H) Specification, page 10, lines 1 to 23

[0053]

Prebiotics may be added. Prebiotics may support the growth of a probiotic before it is rendered non-replicating or, in case of ingestion, stimulate the growth of beneficial micro-organisms in the intestines. Prebiotics may also act synergistically with viable probiotic bacteria that are present in the composition and/or that may be added.

[0054]

"Prebiotic" means non-digestible food substances that promote the growth of health beneficial micro-organisms and/or probiotics in the intestines. They are not broken down in the stomach and/or upper intestine or absorbed in the GI tract of the person ingesting them, but they are fermented by the gastrointestinal microbiota and/or by probiotics. Prebiotics are, for example, defined by Glenn R. Gibson and Marcel B. Roberfroid, Dietary Modulation of the Human Colonic Microbiota: Introducing the Concept of Prebiotics, J. Nutr. 1995 125: 1401-1412.

[0055]

The prebiotics that may be used in accordance with the present invention are not particularly limited and include all food substances that promote the growth of probiotics and/or health beneficial bacteria in the intestines. Preferably, they may be selected from the group consisting of oligosaccharides, optionally containing fructose, galactose, or mannose; dietary fibers, in particular soluble fibers, soy fibers; inulin; or mixtures thereof. Preferred prebiotics are fructo-oligosaccharides (FOS), galacto-oligosaccharides (GOS), isomalto-oligosaccharides (IMO), xylo-oligosaccharides (XOS), arabino-xylo oligosaccharides (AXOS), mannan oligosaccharides (MOS), oligosaccharides of soy, glycosylsucrose (GS), lactosucrose (LS), lactulose (LA), palatinose-oligosaccharides (PAO), malto-oligosaccharides, gums and/or hydrolysates thereof, pectins, starches, and/or hydrolysates thereof.

(I) Specification, page 12, line 10 to page 13, line 3

[0062]

Those skilled in the art will be able to adjust the therapeutically effective dose and/or the prophylactic effective dose appropriately.

[0063]

In general the composition of the present invention contains non-replicating probiotics in a therapeutically effective dose and/or in a prophylactic effective dose.

[0064]

Typically, the therapeutically effective dose and/or the prophylactic effective dose is a bacterial mass that corresponds to about 10^4 to 10^{12} cfu per daily dose Consequently, the therapeutically effective and/or the prophylactic effective dose may be in the range of about 0.005 mg to 1000 mg non-replicating probiotics per daily dose.

[0065]

In terms of numerical amounts, the non-replicating probiotics may be present in the composition in an amount corresponding to between 102 and 1012 cfu/g of the dry composition. Obviously, non-replicating bacteria do not form colonies; consequently this term is to be understood as the amount of non-replicating bacteria that is obtained from 10^2 and 10^{12} cfu/g replicating bacteria. This includes bacteria that are inactivated or dead or present as fragments such as DNA, cytoplasmic content, or cell wall materials. In other words, the quantity of bacteria which the composition contains is expressed in terms of the colony forming ability of that quantity of bacteria as if all the bacteria were alive irrespective of whether they are, in fact, non-replicating, such as inactivated or dead, fragmented, or a mixture of any or all of these states.

[0066]

Preferably the probiotic is present in an amount equivalent to 10^4 to 10^{10} cfu/g of dry composition, even more preferably in an amount equivalent to 10^5 and 10^9 cfu/g of dry composition.

(J) Specification, page 13, line 14 to page 14, line 19

[0068]

The composition of the present invention may contain at least one protein source, at least one carbohydrate source, and at least one lipid source.

[0069]

Any suitable dietary protein may be used, for example animal proteins (such as milk proteins, meat proteins, and egg proteins); vegetable proteins (such as soy proteins, wheat proteins, rice proteins, and pea proteins); partial or total hydrolysates of these proteins, mixtures of free amino acids; or combinations thereof. If hydrolyzed proteins are required, the hydrolysis process may be carried out as desired and as is known in the art. Milk proteins such as casein and whey, and soy proteins are particularly preferred. As far as whey proteins are concerned, the protein source may be based on acid whey or sweet whey or mixtures thereof and may include alpha-lactalbumin and beta-lactoglobulin in whatever proportions are desired. Preferably however, in particular if the composition is an infant feeding formula, the protein source is based on modified sweet whey.

[0070]

If the composition of the present invention contains a protein source, then the amount of protein or protein equivalent in the composition is typically in the range of 1.6-7.5g/100 kcal of the composition.

[0071]

In particular for nutritional formulas, the protein source should provide that the minimum requirements for essential amino acid content are met.

[0072]

If the composition contains a carbohydrate source, the kind of carbohydrate to be used is not particularly limited. Any suitable carbohydrate may be used, for example sucrose, lactose, glucose, fructose, corn syrup solids, maltodextrins, starch, and mixtures thereof. Combinations of different carbohydrate sources may be used. The carbohydrates may preferably provide 30% to 80% of the energy of the composition. For example, the composition may comprise a carbohydrate source in an amount of 9-18g/100 kcal of the composition.

[0073]

If the composition contains a lipid source, the kind of lipid to be used is not particularly limited. If the composition includes a lipid source, the lipid source may provide 5% to 70% of the energy of the composition. Long chain n-3 and/or n-6

polyunsaturated fatty acids, such as DHA, ARA, and/or EPA, may be added. A suitable fat profile may be obtained using a blend of canola oil, corn oil, high-oleic acid sunflower oil, and medium chain triglyceride oil. The composition may comprise a lipid source in an amount of 1.5-7g/100 kcal of the composition.

[0074]

Dietary fiber may be added as well. The fiber may be soluble or insoluble and in general a blend of the two types is preferred. Suitable sources of dietary fiber include soy, pea, oat, pectin, guar gum, arabic gum, fructo-oligosaccharides, galacto-oligosaccharides, sialyl-lactose, and oligosaccharides derived from animal milks. A preferred fiber blend is a mixture of inulin with shorter chain fructo-oligosaccharides.

(K) Specification, page 17, line 25 to page 21, line 2

[0095]

Further advantages and features of the present invention are apparent from the following Examples and Figures.

[0096]

Figure 1 shows the enhancement of in vitro cytokine secretion from human PBMCs stimulated with heat-treated bacteria.

Figure 2 shows the percentage of diarrhea intensity observed in OVA-sensitized mice challenged with saline (negative control), OVA-sensitized mice challenged with OVA (positive control), and OVA-sensitized mice challenged with OVA and treated with heat-treated or live Bifidobacterium breve NCC2950. Results are displayed as the percentage of diarrhea intensity (Mean ± SEM calculated from 4 independent experiments) with 100% of diarrhea intensity corresponding to the symptoms developed in the positive control (sensitized and challenged by the allergen) group.

Examples:

[0097]

Methodology

Bacterial preparations:

Five probiotic strains were used to investigate the immune boosting properties of non-replicating probiotics: 3 bifidobacteria (B. longum NCC3001, B. lactis NCC2818, B. breve NCC2950) and 2 lactobacilli (L. paracasei NCC2461, L. rhamnosus NCC4007).

[0098]

Bacterial cells were grown on MRS in batch fermentation at 37°C for 16-18h without pH control. Bacterial cells were spun down (5,000 x g, 4°C) and resuspended in phosphate buffer saline prior to be diluted in saline water in order to reach a final concentration of around 10E10 cfu/ml. B. longum NCC3001, B. lactis NCC2818, L. paracasei NCC2461, and L. rhamncsus NCC4007, were heat treated at 85°C for 20 min in a water bath. B. breve NCC2950 was heat treated at 90°C for 30 minutes in a water bath. Heat-treated bacterial suspensions were aliquoted and kept frozen at -80°C until use. Live bacteria were stored at -80°C in PBS-glycerol 15% until use.

[0099]

In vitro immunoprofiling of bacterial preparations

The immune profiles of live and heat-treated bacterial preparations (i.e. the capacity to induce secretion of specific cytokines from human blood cells in vitro) were assessed. Human peripheral blood mononuclear cells (PBMCs) were isolated from blood filters. After separation by cell density gradient, mononuclear cells were collected and washed twice with Hank's balanced salt solution. Cells were then resuspended in Iscove's Modified Dulbecco's Medium (IMDM, Sigma) supplemented with 10% foetal calf serum (Bioconcept, Paris, France), 1% L-glutamine (Sigma), 1% penicillin/streptomycin (Sigma), and 0.1% gentamycin (Sigma). PBMCs (7 x 10^5 cells/well) were then incubated with live and heat-treated bacteria (equivalent 7 x 106 cfu/well) in 48 well plates for 36h. The effects of live and heat-treated bacteria were tested on PBMCs from 8 individual donors split into two separate experiments. After 36h incubation, culture plates were frozen and kept at -20°C until cytokine measurement. Cytokine profiling was performed in parallel (i.e., in the same experiment on the same batch of PBMCs) for live bacteria and their heat-treated counterparts.

[0100]

Levels of cytokines (IFN-γ, IL-12p40, TNF-α and IL-10) in cell culture supernatants after 36h incubation were determined by ELISA (R&D DuoSet Human IL-10, BD OptEIA Human IL12p40, BD OptEIA Human TNF, BD OptEIA Human IFN-γ) following manufacturer's instructions. IFN-γ, IL-12p40, and TNF-α are proinflammatory cytokines, whereas IL-10 is a potent anti-inflammatory mediator. Results are expressed as means (pg/ml) +/- SEM of 4 individual donors and are representative of two individual experiments performed with 4 donors each.

[0101]

In vivo effect of live and heat-treated Bifidobacterium breve NCC2950 in prevention of allergic diarrhea

A mouse model of allergic diarrhea was used to test the Th1 promoting effect of B. breve NCC2950 (Brandt E.B et al. JCI 2003; 112(11): 1666-1667). Following sensitization (2 intraperitoneal injections of Ovalbumin (OVA) and aluminium potassium sulphate at an interval of 14 days; days 0 and 14), male Balb/c mice were orally challenged with OVA for 6 times (days 27, 29, 32, 34, 36, 39), resulting in transient clinical symptoms (diarrhea) and changes of immune parameters (plasma concentration of total IgE, OVA specific IgE, mouse mast cell protease 1; i.e., MMCP-1). Bifidobacterium breve NCC2950 live or heat-treated at 90°C for 30 min was administered by gavage 4 days prior to OVA sensitization (days -3, -2, -1, 0 and days 11, 12, 13, and 14) and during the challenge period (days 23 to 39). A daily bacterial dose of around 109 colony forming units (cfu) or equivalent cfu/mouse was used.

[0102]

Results

Induction of secretion of 'pro-inflammatory' cytokines after heat treatment

The ability of heat-treated bacterial strains to stimulate cytokine secretion by human peripheral blood mononuclear cells (PBMCs) was assessed in vitro. The immune profiles based on four cytokines upon stimulation of PBMCs by heat-treated bacteria were compared to that induced by live bacterial cells in the same in vitro assay.

[0103]

The heat-treated preparations were plated and assessed for the absence of any viable counts. Heat-treated bacterial preparations did not produce colonies after plating.

[0104]

Live probiotics induced different and strain dependent levels of cytokine production when incubated with human PBMCs (Figure 1). Heat treatment of probiotics modified the levels of cytokines produced by PBMCs as compared to their live counterparts. Heat-treated bacteria induced more pro-inflammatory cytokines (TNF-α, IFN-γ, IL-12p40) than their live counterparts do. By contrast, heat-treated bacteria induced similar or lower amounts of IL-10 compared to live cells (Figure 1). These data show that heat-treated bacteria are more able to stimulate the immune system than their

live counterparts and therefore are more able to boost weakened immune defenses. In other words, the in vitro data illustrate an enhanced immune boost effect of bacterial strains after heat treatment.

[0105]

In order to illustrate the enhanced effect of heat-treated B. breve NCC2950 (compared to live cells) on the immune system, both live and heat-treated B. breve NCC2950 were tested in an animal model of allergic diarrhea.

[0106]

As compared to the positive control group, the intensity of diarrhea was significantly and consistently decreased after treatment with heat-treated B. breve NCC2950 (41.1 % ± 4.8), whereas the intensity of diarrhea was lowered by only 20 ± 28.3 % after treatment with live B. breve NCC2950. These results demonstrate that heat-treated B. breve NCC2950 exhibits an enhanced protective effect against allergic diarrhea as compared with its live counterpart (Figure 2).

[0107]

As a consequence, the ability of probiotics to enhance the immune defenses was shown to be improved after heat treatment.

B Technical matters described in Evidence A No. 7

(A)

As is evident from the described matter (K) of the above "A," in Evidence A No. 7, there is described a technical matter that "a method for preparing non-replicating probiotics with improved ability to enhance immune defense by subjecting Bifidobacterium longum NCC3001, Bifidobacterium lactis NCC2818, Lactobacillus paracasei NCC2461, and Lactobacillus rhamnosus NCC4007 to heat treatment at 85°C for 20 minutes or subjecting Bifidobacterium breve NCC2950 to heat treatment at 90°C for 30 minutes."

Note that the contents of the described matter (K) of the above "A" are the same as the contents of the descriptions of [FIG. 8] and [FIG. 9] in paragraph [0117] of the Patent specification and Example 2 in paragraphs [0132] to [0142], except for the difference in writing due to translation.

(B)

As is evident from the described matters (A) and (K) of the above "A", in Evidence A No. 7, there is described a technical matter of a method for preparing the "composition" of a "pet food" as "a composition to treat or prevent disorders that are related to a compromised immune defense."

(C)

As is evident from the described matter (I) of the above "A," in Evidence A No. 7, there is described a technical matter that "those skilled in the art will be able to appropriately adjust the therapeutically effective dose and/or the prophylactic effective dose, preferably in an amount corresponding to between 10^5 and 10^9 cfu/g of the dry composition and in the range of about 0.005 mg to 1000 mg non-replicating probiotics per daily dose."

(D)

As is evident from the described matter (D) of the above "A," in Evidence A No. 7, there is described a technical matter that "at least 95 weight % of probiotics are non-replicating."

As is evident from the described matter (H) of the above "A," in Evidence A No. 7, there is described a technical matter of "adding prebiotics such as oligosaccharides containing fructose or inulin" to the composition.

As is evident from the described matter (J) of the above "A," in Evidence A No. 7, there is described a technical matter of making the composition "contain a protein source, a carbohydrate source, and a lipid source."

Furthermore, as is evident from the described matter (J), in Evidence A No. 7, there is described a technical matter of making the composition contain "dietary fibers."

C Finding of the invention disclosed in Evidence A No. 7

In view of the above A and B, it is recognized that Evidence A No. 7 discloses the following invention (hereinafter, referred to as "Invention A-7").

"A method for preparing a composition as a pet food for treating or preventing disorders that are related to a compromised immune defense by using non-replicating probiotics with improved ability to enhance immune defense, the non-replicating probiotics being prepared by subjecting Bifidobacterium longum NCC3001, Bifidobacterium lactis NCC2818, Lactobacillus paracasei NCC2461, and Lactobacillus rhamnosus NCC4007 to heat treatment at 85°C for 20 minutes or subjecting Bifidobacterium breve NCC2950 to heat treatment at 90°C for 30 minutes, wherein

those skilled in the art are able to appropriately adjust the therapeutically effective dose and/or the prophylactic effective dose, preferably in an amount corresponding to 10^5 to 10^9 cfu/g of the dry composition and in the range of about 0.005 mg to 1000 mg non-replicating probiotics per daily dose;

at least 95 weight % of probiotics are non-replicating;

prebiotics such as oligosaccharides containing fructose or inulin are added to the composition; and

the composition is made to contain a protein source, a carbohydrate source, a lipid source, and dietary fibers."

(8) Evidence A No. 8

Evidence A No. 8 is the priority certificate attached to the international patent application Evidence A No. 7. The first and second pages of Evidence A No. 8 show that the patent application with the filing application No. 9159929 was filed at the European Patent Office on May 11, 2009 (hereinafter referred to as "Patent Application A").

Also, page 3 of Evidence A No. 8 describes that the applicant of the Patent Application A is the same as the patentee and applicant of the Patent. The following pages are attached with the attached specification, claims, and drawings of Patent Application A.

A Descriptions in the attached specification and drawings of the Patent Application A

The attached specification of the Patent Application A includes the same description as the specification of Evidence A No. 7 stated in the above (7)A, except for the following two points.

(A) Among the intermediate part of the above (7)A(E), there is no additional note about the source in Japan after "and may be .."in "Bifidobacterium longum NCC3001 was deposited under the Budapest Treaty as ATCC BAA-999 and may be obtained, e.g., from Morinaga Milk Industry Co. Ltd. of Japan under the trademark BB536."

(B) There is no description of "Bifidobacterium breve NCC2950 (strain A) was deposited under the Budapest Treaty as CNCM I-3865" at the end of the above (7)A(E). The part labeled "Bifidobacterium breve NCC2950" in Evidence A No. 7 is described as "Bifidobacterium breve strain A."

B The invention disclosed in the attached specification of the Patent Application A

The attached specification of the Patent Application A includes the same description as Evidence A No. 7 stated in the above (7), except for two points stated in the above "A." Thus, it is recognized that the attached specification of the Patent Application A discloses the following invention (hereinafter, referred to as the "Patent Application-A Invention").

"A method for preparing a composition as a pet food for treating or preventing disorders that are related to a compromised immune defense by using non-replicating probiotics with improved ability to enhance immune defense, the non-replicating probiotics being prepared by subjecting Bifidobacterium longum NCC3001, Bifidobacterium lactis NCC2818, Lactobacillus paracasei NCC2461, and Lactobacillus rhamnosus NCC4007 to heat treatment at 85°C for 20 minutes or subjecting Bifidobacterium breve strain A to heat treatment at 90°C for 30 minutes, wherein

those skilled in the art are able to appropriately adjust the therapeutically effective dose and/or the prophylactic effective dose, preferably in an amount corresponding to between 10^5 and 10^9 cfu/g of the dry composition and in the range of about 0.005 mg to 1000 mg non-replicating probiotics per daily dose;

at least 95 weight % of probiotics are non-replicating;

prebiotics such as oligosaccharides containing fructose or inulin are added to the composition; and

the composition is made to contain a protein source, a carbohydrate source, a lipid source, and dietary fibers."

(9) Evidence A No.9

Evidence A No.9 is a publication distributed before the filing date of the Patent and before the priority date thereof.

In Evidence A No. 9, the following items are described with drawings. After each of the English sentences, a provisional translation based on the translation attached to the written opposition was added in parentheses.

(A) Page 760, title

"Suppressive Effects of Bifidobacterium breve Strain M-16V on T-Helper Type 2 Immune Responses in a Murine Model"

(B) Page 760, right column, lines 5 to 3 from the bottom

"The organisms were lyophilized and suspended in PBS at 10 mg/ml and then killed by heating the solution to 100°C for 30 min."

(C) Page 762, right column, lines 7 to 16

"Effects of M-16V on Cytokine and IgE Production by OVA-Sensitized Splenocytes in vitro to further investigate the mechanism by which M-16V suppresses the Th2 immune response and IgE production, we studied the effects on cytokines and IgE production when using various concentrations of heat-killed M-16V in vitro. Results indicate that M-16V suppressed the OVA-induced total IgE and IL-4 production and induced secretion of INF-γ and IL-10 in OVA-immunized splenocytes in a dose-dependent manner (Figs. 3a-c,e)."

(10) Document 1

Document 1 is a publication distributed before the filing date of the Patent and before the priority date thereof.

A Descriptions in Document 1

In Document 1, the following items are described with drawings.

(A)

"[0007]

According to the invention there is provided a strain of lactic acid bacteria of the species Bifidobacteria globosum obtainable by isolation from resected and washed canine gastrointestinal tract and having a probiotic activity in animals."

(B)

"[0024]

(Bifidobacteria globosum Strains)

The first aspect of the present invention comprises a strain of Bifidobacteria globosum obtainable by isolation from resected and washed canine gastrointestinal tract and having probiotic activity in animals. Probiotics are micro-organisms, either viable or dead, processed compositions of micro-organisms, their constituents such as proteins or carbohydrates, or purified fractions of bacterial ferments that beneficially affect a host. The general use of probiotic bacteria is in the form of viable cells. However, it can be extended to non-viable cells such as killed cultures or compositions containing beneficial factors expressed by the probiotic bacteria. This may include thermally killed micro-organisms, or micro-organisms killed by exposure to altered pH or subjected to pressure. For the purpose of the present invention, 'probiotics' is further intended to include the metabolites generated by the micro-organisms of the present invention during

fermentation, if they are not separately indicated. These metabolites may be released to the medium of fermentation, or they may be stored within the micro-organism. As used herein "probiotic" also includes bacteria, bacterial homogenates, bacterial proteins, bacterial extracts, bacterial ferment supernatants, and mixtures thereof, which perform beneficial functions to the host animal when given at a therapeutic dose."

(C)
"[0045]

The method of use of the Bifidobacteria globosum bacteria of the present invention typically involves oral consumption by the animal. Oral consumption may take place as part of the normal dietary intake, or as a supplement thereto. The oral consumption typically occurs at least once a month, preferably at least once a week, more preferably at least once per day. The Bifidobacteria globosum bacteria of the present invention may be given to the companion animal in a therapeutically effective amount to maintain or improve the health of the animal, preferably a companion animal. As used herein, the term 'therapeutically effective amount' with reference to the lactic acid bacteria, means that amount of the bacteria sufficient to provide the desired effect or benefit to a host animal in need of treatment, yet low enough to avoid adverse effects such as toxicity, irritation, or allergic response, commensurate with a reasonable benefit/risk ratio when used in the manner of the present invention. The specific 'therapeutically effective amount' will vary with such factors as the particular condition being treated, the physical condition of the user, the duration of the treatment, the nature of concurrent therapy (if any), the specific dosage form to be used, the carrier employed, the solubility of the dose form, and the particular dosing regimen.
[0046]

Preferably, the lactic acid bacteria are given to the companion animal at a dose of 1.0E+04 to 1.0E+14 CFU per day, more preferably 1.0E+06 to 1.0E+12 CFU per day. The composition preferably may contain at least 0.001% of 1.0E+04 to 1.0E+12 CFU/g of the Bifidobacteria globosum obtainable by isolation from resected and washed canine GI tract. The Bifidobacteria globosum bacteria can be given to the animal in either viable form, or as killed cells, or distillates, isolates, or other fractions of the fermentation products of the lactic acid bacteria of the present invention, or any mixture thereof.
[0047]

Preferably, the Bifidobacteria globosum bacteria, or a purified or isolated fraction thereof, are used to prepare a composition intended to maintain or improve the health of an animal. As indicated above, the composition may be part of the normal

dietary intake, or a supplement. Where the composition comprises part of the normal dietary intake, the composition may be in the form of a dried animal food such as biscuits or kibbles, a processed grain feed, a wet animal food, yogurts, gravies, chews, treats, and the like.

[0048]

Such compositions may comprise further components. Other components are beneficial for inclusion in the compositions used herein, but are optional for purposes of the invention. For example, food compositions are preferably nutritionally balanced. In one embodiment, the food compositions may comprise, on a dry matter basis, about 20% to about 50% crude protein, preferably about 22% to about 40% crude protein, by weight of the food composition. The crude protein material may comprise any material having a protein content of at least about 15 weight% by weight, non-limiting examples of which include vegetable proteins such as soybean, cotton seed, and peanut, animal proteins such as casein, albumin, and meat tissue. Non-limiting examples of meat tissue useful herein include fresh meat, and dried or rendered meals such as fish meal, poultry meal, meat meal, bone meal, and the like. Other types of suitable crude protein sources include wheat gluten or corn gluten, and proteins extracted from microbial sources such as yeast.

[0049]

Furthermore, the food compositions may comprise, on a dry matter basis, about 5% to about 35% fat, preferably about 10% to about 30% fat, by weight of the food composition. Further still, food compositions comprising the lactic acid bacteria of the present invention may also comprise about 4% to about 25% total dietary fiber. The compositions may also comprise a multiple starch source as described in PCT International Publication No. WO99/51108.

[0050]

The compositions of the present invention may further comprise a source of carbohydrate. Grains or cereals such as rice, corn, milo, sorghum, barley, alfalfa, wheat, and the like are illustrative sources. In addition, the compositions may also contain other materials such as dried whey and other dairy byproducts.

[0051]

The compositions comprising the bacteria of the present invention may also comprise a prebiotic. 'Prebiotic' includes substances or compounds that are fermented by the intestinal flora of the pet and hence promote the growth or development of lactic acid bacteria in the gastrointestinal tract of the pet at the expense of pathogenic bacteria. The result of this fermentation is a release of fatty acids, in particular short-chain fatty

acids in the colon. This has the effect of reducing the pH value in the colon. Non-limiting examples of suitable prebiotics include oligosaccharides, such as inulin and its hydrolysis products commonly known as fructo-oligosaccharides, galacto-oligosaccharides, xylo-oligosaccharides, or oligo derivatives of starch. The prebiotics may be provided in any suitable form. For example, the prebiotic may be provided in the form of plant material which contains the fiber. Suitable plant materials include asparagus, artichokes, onions, wheat, or chicory, or residues of these plant materials. Alternatively, the prebiotic fiber may be provided as an inulin extract, for example extracts from chicory are suitable. Suitable inulin extracts may be obtained from Orafti SA of Tirlemont 3300, Belgium under the trademark 'Raftiline'. For example, the inulin may be provided in the form of Raftiline (g) ST which is a fine white powder which contains about 90 to about 94% by weight of inulin, up to about 4% by weight of glucose and fructose, and about 4 to 9% by weight of sucrose. Alternatively, the fiber may be in the form of a fructo-oligosaccharide such as obtained from Orafti SA of Tirlemont 3300, Belgium under the trademark 'Raftilose'. For example, the inulin may be provided in the form of Raftilose (g) P95. Otherwise, the fructo-oligosaccharides may be obtained by hydrolyzing inulin, by enzymatic methods, or by using micro-organisms."

B Finding of the invention disclosed in Document 1

In view of the above "A," it is recognized that Document 1 discloses the following invention (hereinafter, referred to as the "Document-1 Invention").

"A method for feeding as a food composition a strain of lactic acid bacteria of the species Bifidobacteria globosum having a probiotic activity in the form of non-viable cells or in the form of non-viable cells such as killed cultures or compositions, the food composition being provided as part of the normal dietary intake to an animal or as a supplement thereto, wherein

the lactic acid bacteria are given at a dose of preferably 1.0E+06 to 1.0E+12 CFU per day;

the food composition may be in the form of a dried animal food, a processed grain feed, a wet animal food, chews, treats, and the like;

the food composition is preferably nutritionally balanced and comprises, on a dry matter basis, preferably about 22% to about 40% crude protein, about 10% to about 30% fat, about 4% to about 25% total dietary fiber, by weight of the food composition, and also comprises a carbohydrate source; and

the food composition may comprise a prebiotic such as a fructo-oligosaccharide or inulin."

(11) Document 2

Document 2 is a publication distributed before the filing date of the Patent and before the priority date thereof.

A Descriptions in Document 2

In Document 2, the following items are described with drawings.

(A)

"[0006]

Therefore, an object of the present invention is to provide a pet food with low calories, good taste, and good appearance, due to its low water content and good storability as well as being brittle and not hard despite its low bulk density."

(B)

"[0012]

As described above, the water content of the pet food of the present invention is 20% or less, more preferably 5 to 20%, further preferably 7 to 18%, and particularly preferably 8 to 17% from the viewpoints of enhancing palatability and texture in addition to the storability and the ease of foaming. Further, the water activity is preferably 0.79 or less, further preferably 0.4 to 0.79, particularly preferably 0.45 to 0.75, and more particularly preferably 0.5 to 0.7 from the viewpoints of storage stability and suppressing bacterial growth. Here, the water activity can be measured by measuring 2 g of a sample on a measuring pan and measuring it with a water activity measuring instrument."

(C)

"[0021]

The pet food of the present invention preferably has a crude protein content of 20% or more from the viewpoints of palatability, foaming property, maintaining strength after foaming, and the like. From the same points, the crude protein content is further preferably 22 to 50%, and particularly preferably 25 to 35%. The crude protein content in the pet food was measured using the modified Dumas method. Examples of the crude protein source include animal protein-containing products, vegetable protein-containing products, milk protein-containing products. Examples of the animal protein include: feeder meats and butcher meats, such as those of cows, pigs, sheep, rabbits, and kangaroos, as well as by-products and processed products thereof; the chicken leg meat mentioned above, poultry meats, such as those of turkey and quail, and their by-products and processed products; and fish meats, such those of white and other fishes, and their by-

products and processed products. Examples of the vegetable protein-containing material include soybean protein, wheat protein, wheat gluten, and corn gluten. Examples of the milk protein-containing material include cheese, butter, and processed products thereof. In the pet food of the present invention, it is preferable to use one or a combination of two or more selected from the above protein sources."

(D)
"[0024]

The pet food of the present invention contains preferably 20 to 70%, more preferably 30 to 60%, and particularly preferably 40 to 50% of a carbohydrate source from the viewpoints of enhancing foamability, moldability, and texture. Examples of carbohydrate sources include grains, sugars, dietary fibers, and starches."

(E)
"[0030]

Dietary fibers are materials that are not decomposed by animal digestive enzymes and include water-insoluble dietary fibers and water-soluble dietary fibers. Specific examples of the former include pea fibers, such as those containing cellulose and hemicellulose, chicory root, alfalfa meal, and wheat bran. Specific examples of the latter include guar gum enzymatic degradation product, psyllium seed coat, glucomannan, agar, water-soluble soybean polysaccharide, water-soluble corn fiber, inulin, carboxymethyl cellulose, and alginic acid. Particularly, in the pet food of the present invention, a beet pulp containing both water-insoluble dietary fibers and water-soluble dietary fibers is preferable. The content of dietary fibers in the pet food of the present invention is 0.1 to 10%, preferably 0.3 to 8%, and more preferably 0.5 to 5%."

(F)
"[0034]

The pet food of the present invention preferably contains fats and oils from the viewpoints of enhancing palatability, supplying polyunsaturated fatty acids, and the like. Examples of fats and oils include safflower oil, olive oil, cottonseed oil, corn oil, rapeseed oil, soybean oil, palm oil, sunflower oil, linseed oil, sesame oil, lard, beef tallow, fish oil, and milk fat. The fats and oils are not limited to those that are themselves blended as fats and oils but also include those contained in other plant raw materials or animal raw materials if the fats and oils are contained therein. The fats and oils are contained in the pet food of the present invention in an amount of preferably 1 to 30%, more preferably 2

to 25%, and particularly preferably 3 to 20% from the viewpoints of improvement in palatability, supply of polyunsaturated fatty acid, and ease of foaming. Further, it is preferable to add butter oil for the purpose of enhancing the flavor of milk to further enhance palatability. The blending amount is 0.05% to 5%, preferably 0.1 to 2%, and more preferably 0.1 to 1%.

B Finding of the invention disclosed in Document 2

In view of the above "A," it is recognized that Document 2 discloses the following invention (hereinafter, referred to as "Document 2 Invention").

"A pet food with low calories, good taste, and good appearance, wherein the content of water is 20% or less, the content of crude protein is particularly preferably 25 to 35%, the blending amount of a carbohydrate source is particularly preferably 40 to 50%, the blending amount of dietary fibers is preferably 0.5 to 5%, and the content of fats and oils is preferably 3 to 20% from the viewpoints of enhancing palatability and supplying polyunsaturated fatty acids."

(12) Document 3

Document 3 is a publication distributed before the filing date of the Patent and before the priority date thereof.

A Descriptions in Document 3

In Document 3, the following items are described with drawings.

(A)

"[Detailed Description of the Invention]

[0001]

[Industrial Application Field] This invention relates to a solid animal food product having a structural matrix which promotes oral care and hygiene in animals. In particular, this invention relates to a pet food product having an expanded, striated structural matrix which imparts an improved mechanical dental cleansing benefit to the pet's teeth when chewed by pets such as dogs and cats."

(B)

"[0021]

The extruded food product of the present invention is a solid, uniform, expanded composition having fibrous striations extending transversely through the matrix microstructure. The food product, when chewed by the animal, unlike baked or other extruded products, does not crumble, but instead fractures along the matrix striations and

hence offers the animal the intended teeth cleansing benefits stemming from the mechanical cleansing and other abrasive contacts with the separated matrix layers in the chewed striated product. In addition, as the striated fibrous product does not crumble as the animal chews on the product, the product clings in adhered contact with the teeth for an extended time, thereby prolonging the mechanical dental cleansing action.

[0022]

The expanded, striated product of the present invention has a density of about 10 to about 35 lbs/ft^3 (160 to 561 kg/m^3), and a typical nutritional content as follows:

[0023]

Ingredient	% by Weight
Carbohydrate	about 35 to about 70
Protein	about 10 to about 35
Fat	about 10 to about 20
Fiber	about 10 to about 25
Nutritional balancing agents such as vitamins and minerals	about 0.01 to about 0.40

In preparing the final product, the moisture content of the expanded extrudate is adjusted to the range of about 5 to about 11%. At moisture levels below 5% the product becomes too hard to be easily chewed by the animal and for this reason moisture levels less than 5% in the product are to be avoided. At moisture levels above about 11% the hardness of the product begins to decrease to levels at which the mechanical cleaning efficacy of the striated product begins to be compromised. Maximum mechanical cleaning efficacy of the striated product is achieved at a density preferably of about 20 to about 30 pounds (lbs.) per cubic foot (ft^3) (320 to 481 kg/m^3) and a fiber level preferably of about 15 to about 20% by weight. At these fiber levels the product has the desired degree of striation to achieve the desired degree of self-adhesion and tooth clinging characteristics. To further improve palatability and energy (caloric) levels, the dried, extruded striated product may be coated with about 1 to about 13% additional fat.

B Finding of the invention disclosed in Document 3

In view of the above "A," it is recognized that Document 3 discloses the following invention (hereinafter, referred to as the "Document-3 Invention").

"A pet food product comprising, as a typical nutritional content, about 35 to about 70% by weight of carbohydrate, about 10 to about 35% by weight of protein, about 10 to about 20% by weight of fat, and about 10 to about 25% by weight of fiber, with a moisture content of about 5 to about 11%."

No. 5 Judgment

1 Regarding Invention 1

Reasons for revocation have not been notified for Invention 1. The reasons for patent opposition that were not adopted in the previous notification of reasons for revocation are judged as follows.

(1) Regarding Article 36(4)(i) of the Patent Act

A Regarding the descriptions of allergy in the present specification

In the written opposition, the opponent alleges that Claim 1 reciting the invention relating to inflammatory disorders and Claim 3 reciting the invention relating to disorders related to a compromised immune defense differ from each other in terms of the kinds of micro-organisms and sterilization conditions; and also alleges that the action mechanisms and uses of pet food compositions produced by these methods are also different from each other. Further, the opponent alleges in paragraph [0091] that allergies are involved in subjects of any pet food composition according to the descriptions of the present patent specification: "the inflammatory disorders that can be treated or prevented by the composition of the present invention are not particularly limited. For example, they may be selected from the group consisting of acute inflammations such as sepsis; burns; and chronic inflammation, such as inflammatory bowel disease, e.g., Crohn's disease, ulcerative colitis, pouchitis; necrotizing enterocolitis; skin inflammation, such as UV or chemical-induced skin inflammation, eczema, reactive skin; irritable bowel syndrome; eye inflammation; allergy, asthma; and combinations thereof." and in paragraphs [0099] to [0100] "consequently, the disorders linked to a compromised immune defense that can be treated or prevented by the composition of the present invention are not particularly limited. For example, they may be selected from the group consisting of infections, in particular bacterial, viral, fungal, and/or parasite infections; phagocyte deficiencies; low to severe immunodepression levels such as those induced by stress or immunodepressive drugs, chemotherapy, or radiotherapy; natural states of less immunocompetent immune systems such as those of the neonates; allergies; and combinations thereof." Furthermore, the opponent alleges that, it is unclear which one of the inventions for the respective claims should be implemented if a pet food composition is to be produced for the purpose of treating allergies, and thus the Detailed Description of the Invention in the present specification cannot be said to be clearly and sufficiently described to allow a person having ordinary skill in the art to work the invention (see the written opposition, page 28, line 4 to line 26).

However, Invention 1 is a method for producing a pet food composition "for prevention or treatment of inflammatory disorders," The description in paragraph [0091] of the patent specification asserted by the opponent also indicates "allergy" as one of the examples of "the inflammatory disorders that can be treated or prevented by the composition of the present invention." The description in the paragraph [0091] does not define the term "inflammatory disorders" targeted for treatment or prevention by the pet food composition produced by the method of Invention 1 as "allergy" of any kind. Then, a person having ordinary skill in the art in the technical field to which Invention 1 belongs can clearly understand that, regarding allergy, the method of Invention 1 for producing a pet food composition of "for prevention or treatment of inflammatory disorders" may be adopted when the inflammation of a pet caused by allergy should be prevented or treated.

In this point, regarding Invention 3 of the present invention, which is a method for producing a pet food composition "for prevention or treatment of disorders related to a compromised immune defense," the same applies to paragraphs [0099]-[0100] of the present specification, which describe "allergy" as one of the examples of "the disorders linked to a compromised immune defense that can be treated or prevented by the composition of the present invention."

Therefore, regarding the description of allergy in the Detailed Description of the Invention, a method for producing a pet food composition "for prevention or treatment of inflammatory disorders" according to Invention 1 cannot be said to have defects that cannot be implemented. The opponent's allegation is contrary to this and cannot be adopted.

B Empirical basis for heat treatment conditions

In the written opposition, the opponent alleges that Invention 1 and Invention 3 both include the heat treatment of probiotics;
for Invention 1, only a heat treatment for 15 seconds is provided as an empirical basis;
for Invention 3, only a heat treatment of 85°C for 20 minutes or 90°C for 30 minutes is provided as an empirical basis;
from these data alone, it cannot be understood from the Detailed Description of the Invention in the Patent Specification whether they are effective in preventing or treating the target disorders under the conditions defined in the claims; the Detailed Description of the Invention in the present specification does not mean that Invention 1 is clear and sufficient in such a manner as to enable any person having ordinary skill in the art to which the invention pertains to work the invention (see the written opposition, page 28 , last line to page 29, line 7),

However, Invention 1 specifies that heat treatment is "a high temperature treatment at about 90 to 150°C for about 5 to 30 seconds". The probiotic micro-organisms targeted for the heat treatment are also specified. For high temperature treatment, therefore, even though the specification only mentions the experimental data obtained when the heating time is 15 seconds among the heating time of "about 5 to 30 seconds," there is no obstacle at all to the implementation of a method for producing a pet food composition comprising subjecting probiotic micro-organisms specified by "a high temperature treatment at about 90 to 150°C for about 5 to 30 seconds" in Invention 1.

Furthermore, as stated above, the opponent alleges that "it cannot be understood from the Detailed Description of the Invention in the Patent Specification whether they are effective in preventing or treating the target disorders." This opponent's allegation may seem to be one for support requirements. Considering in view of the effects of heat treatment, the heat treatment in Invention 1 for the production of a pet food "for prevention or treatment of inflammatory disorders" is "a high temperature treatment at about 90 to 150°C for about 5 to 30 seconds," whereas the heat treatment in Invention 3 for the production of a pet food "for prevention or treatment of disorders related to a compromised immune defense is "at about 80 to 90°C for about 20 to 40 minutes." Thus, these heating conditions are significantly different from each other in terms of heating time. Furthermore, the empirical data in the present specification show that a heating time of 15 seconds is effective for the prevention or treatment of inflammatory disorders in the former high temperature treatment (Example 1). In addition, in the latter heat treatment, the empirical data show that an effect suitable for prevention or treatment of a compromised immune defense is obtained by heating at 85°C for 20 minutes or at 90°C for 30 minutes (Example 2). Thus, of the heating time of "about 5 to 30 seconds" in high temperature treatment of Invention 1, empirical data of heating time is shown only for 15 seconds. However, it is noted that the heating time range of "about 5 to 30 seconds" of Invention 1 is a range of adjacent times including such 15 seconds and is a time range apart from the heating time of "about 20 minutes" in Example 2. Therefore, there is no reason to consider that the characteristics of probiotic micro-organisms subjected to high temperature treatment differ significantly at heating times other than 15 seconds, for which no empirical data have been specified. From the description in the Detailed Description of the Invention in the present patent specification, therefore, it can be understood that, even if the proof data of heating time for Invention 1 are shown only for 15 seconds, the heating time range of "about 5 to 30 seconds" in Invention 1 can be

expected to exert the same effect as the case of 15 seconds by which the empirical data are shown.

Accordingly, the fact that the Detailed Description of the Invention in the present specification only shows empirical data of heating for 15 seconds as a specific example regarding the heating time in the "high temperature treatment" in Invention 1 cannot be said to cause a defect to the extent that a method for producing a pet food composition including high temperature treatment according to Invention 1 cannot be carried out. Therefore, the opponent's allegation contrary to this fact cannot be adopted.

(2) Regarding Article 36(6)(ii) of the Patent Act

A Technical significance of inflammatory disorders

In the written opposition, the opponent alleges that the technical significance of the inflammatory disorders recited in Claim 1 is unclear because the term "inflammatory disorders" is recited in Claim 1, the term "disorders related to a compromised immune defense" is recited in Claim 3, whereas allergy belongs to either of these disorders as described in the patent specification. The opponent also alleges that the technical significance of the inflammatory disorders recited in Claim 1, which are related to a compromised immune defense recited in Claim 3, is also unclear (the written opposition, page 29, lines 8 to 12).

However, as pointed out in the above (1)A, the description in paragraph [0091] regarding allergy in the patent specification can be understood such that it includes allergy as one of those that exemplify "the inflammatory disorders that can be treated or prevented by the composition of the present invention" when it is necessary to prevent or treat inflammation of pets caused by the allergy. Similarly, the description in paragraphs [0099] to [0100] regarding allergy in the patent specification can be understood such that it includes allergy as one of those that exemplify "the disorders linked to a compromised immune defense that can be treated or prevented by the composition of the present invention" when it is necessary to prevent or treat disorders related to a compromised immune defense caused by allergy in pets. For that reason, in the patent specification, allergies are illustrated both in the description of inflammatory disorders and in the description of a compromised immune defense-related disorders. However, this does not obscure the meaning of "inflammatory disorders" recited in Claim 1. The same applies to "disorders related to a compromised immune defense" recited in Claim 3.

The meaning of "inflammatory disorders" stated in Claim 1 is clear in itself.

Therefore, Invention 1 has no ambiguity as the opponent alleges for "inflammatory disorders." The opponent's allegation is contrary to this fact and cannot be adopted.

B Numeric range boundaries

Further, the opponent alleges that Claim 1 is not clear because it recites the words "about 10^6 to 10^{12} cfu" and "about 90 to 150 °C for about 5 to 30 seconds" and the word "about" blurs the boundaries of the numerical range that immediately follow the word "about" (the written opposition, page 29, lines 13 to 20).

However, the wording of "comprising non-replicating probiotic micro-organisms in an amount corresponding to about 10^6 to 10^{12} cfu per serving" in Claim 1 describes the amount of non-replicating probiotic micro-organisms contained in that amount of pet food in the unit of "cfu" with a number of digits in the range of 10^6, based on the amount of pet food called "per serving" that can vary depending on the pet. Therefore, the addition of the word "about" does not make the amount of non-replicating probiotic micro-organisms unclear such that the interests of a third party are unduly harmed. Regarding a heating condition of "about 90 to 150°C for about 5 to 30 seconds," considering that slight temperature unevenness and temperature error may occur in "high temperature treatment " of Invention 1 at the beginning and end of heating, the addition of the word "about" does not obscure the amount of non-replicating probiotic micro-organisms to the extent that it may unduly harm the interests of a third party.

Therefore, in Invention 1, the existence of the word "about" does not make the invention unclear. The opponent's allegation is contrary to this fact and cannot be adopted.

(3) Regarding Article 29(2) of the Patent Act

In the written opposition, the opponent alleges that Invention 1 could have been easily made by a person skilled in the art based on Invention A-1 or based on Invention A-1 and matters described in Evidence A No. 3, Evidence A No. 5, and Evidence A No. 9 or based on Invention A-3 and matters described in Evidence A No 1, Evidence A No. 5, and Evidence A No. 9.

Then, the inventive step of Invention 1 will be examined below in the case where Invention A-1 is the main cited invention and in the case in which Exhibit A3 is the main cited invention.

A Invention A-1 as main cited invention

(A) Comparison

Invention 1 is compared with Invention A-1.

The "lactic acid bacterium Lactobacillus paracasei strain KW3110" in Invention A-1 corresponds to the "probiotic micro-organisms" and "Lactobacillus paracasei (Lactobacillus paracasei)" in Invention 1.

The treatment with "heat" in "high temperature heat sterilization at 135°C for 30 seconds" in Invention A-1 corresponds to "heat treatment" of "a high temperature treatment at about 90 to 150°C for about 5 to 30 seconds" in Invention 1. Furthermore, a portion in which the "heat sterilization" performs "sterilization" by "heating" in invention A-1 corresponds to "the probiotic micro-organisms are rendered non-replicating by a heat treatment" in Invention 1.

A method for producing "foods and drinks such as drinks having a stabilized antiallergic activity of lactic acid bacteria" using "lactic acid bacterium Lactobacillus paracasei strain KW3110" subjected to "heat sterilization" in Invention A-1 and a method for "producing a pet food composition for prevention or treatment of inflammatory disorders" "comprising non-replicating probiotic micro-organisms in an amount corresponding to about 10^6 to 10^{12} cfu per serving" in Invention 1 are common in that each of these methods is "a method for producing a composition for foods and drinks" "comprising non-replicating probiotic micro-organisms", in consideration that foods and drinks are made up of the composition of foods and drinks.

Therefore, Invention 1 corresponds to Invention A-1 in the following feature.

" A method for producing a food or drink composition, wherein

the food or drink composition comprises non-replicating probiotic micro-organisms,

the method comprises rendering the probiotic micro-organisms non-replicating by a heat treatment,

the heat treatment is a high temperature treatment at about 90-150°C for about 5-30 seconds, and

the probiotic micro-organisms are Lactobacillus paracasei."

On the other hand, Invention A-1 and Invention 1 are different from each other in the following features.

<Different Feature 1>

Regarding the effects to be imparted to products,

Invention 1 produces a food or drink composition "for prevention or treatment of inflammatory disorders," whereas

Invention A-1 produces a food or drink composition that "maintains" the "antiallergic activity" in terms of "the released amount of IL-12," "which is capable of inducing strong IL-12 production and can be used as an immunostimulator," as a "remaining activity" "after the heat sterilization" by mixing with polyphenol.

<Different Feature 2>

Regarding the produced food or drink composition and the content of non-replicating probiotic micro-organisms,

Invention 1 specifies the produced food or drink composition as a "pet food composition" and further specifies it as one "comprising non-replicating probiotic micro-organisms in an amount corresponding to about 10^6 to 10^{12} cfu per serving," whereas

Invention A-1 does not specify the produced food or drink composition as a "pet food" and does not specify the content of non-replicating probiotic micro-organisms per serving" if it is specified as a pet food.

(B) Judgment

Different Feature 1 will be examined below.

Regarding "the prevention or treatment of inflammatory disorders" related to Different Feature 1, the following descriptions are given in paragraphs [0124], [0126], and [0128] of the patent specification.

"[0124] ... (Omitted) ... IFN-γ, IL-12p40, and TNF-α are pro-inflammatory cytokines, whereas IL-10 is a potent anti-inflammatory mediator. ... (Omitted) ...."

"[0126] ... (Omitted) ... Indeed, UHT-like treated strains (140°C, 15 sec) induced fewer pro-inflammatory cytokines (TNF-α, IFN-γ, IL-12p40) while maintaining or inducing additional IL-10 production (as compared to live counterparts). ... (Omitted) .... By contrast, bacteria heat treated at 85°C for 20 min induced more pro-inflammatory cytokines and less IL-10 than did live cells, resulting in higher IL-12p40/IL-10 ratios (Figure 7)."

"[0128] ... (Omitted) ... As shown in Figure 1, the IL-12p40/IL-10 ratios of UHT-like treated Bifidobacterium strains were lower than those from the live counterparts, thus showing improved anti-inflammatory profiles of UHT-like treated samples. ... (Omitted) ...."

From the above descriptions, it is understood that the characteristic of "prevention or treatment of inflammatory disorders" related to Different Feature 1 in Invention 1 is maintained by allowing the heat treatment for a short time at high temperature to induce or maintain the production of IL-10, which is an anti-inflammatory

mediator, and allowing the level of IL-12p40, which is an inflammatory cytokine, to be decreased to thereby increase the IL-12p40/IL-10 ratio.

On the other hand, Invention A-1 intends to maintain "antiallergic activity" in the sense of "which is capable of inducing strong IL-12 production and can be used as an immunostimulator" even after heat sterilization at high temperature and to prevent, by mixing with polyphenol, a decrease in "the released amount of IL-12" after heat sterilization. Therefore, Invention A-1 has the purpose opposite that of Invention 1 originally and has no motive to lower IL-12 in Invention A-1.

For comparison, furthermore, Invention A-1 includes a comparative example in which lactic acid bacteria are mixed with the PVPP-treated green tea (4) having a reduced polyphenol content and then subjected to heat sterilization at high temperature for a short time. However, the comparative example is positioned such that it does not achieve the purpose and effect of Invention A-1 of maintaining the production of IL-12. Other parts of Evidence A No. 1 include no description of the fate of ingredients other than IL-12 when lactic acid bacteria are mixed with the PVPP-treated green tea (4) and subjected to heat treatment at high temperature for a short time to cause a decrease in IL-12 production. Therefore, there is no suggestion that the comparative example has any advantage.

In Invention A-1, therefore, there is no motivation for producing a food or drink "for prevention or treatment of inflammatory disorders" using lactic acid bacteria heated at high temperature for a short time to achieve the configuration according to Different Feature 1.

On this point, Evidence A No. 3 discloses Invention A-3 recognized in the above IV2(3)B. Invention A-3 is configured to enhance IL-10 production by using heat-sterilized bacteria. Invention A-3 utilizes heating conditions and bacteria which are different from those of Invention A-1. As stated above, there is no motivation to combine Invention A-1 with Invention A-3. Even if Invention A-3 is considered in Invention A-1, a person skilled in the art could not have easily conceived of the configuration of Invention 1 responsible for Different Feature 1.

In addition, Evidence A No. 5 describes the matters added to the above IV2(5) and describes that Lactobacillus crispatus strain KT-11 subjected to a heat treatment is used to relieve allergic dermatitis and used as pet food. However, in Evidence A No. 5, the heating conditions are unknown and the bacteria used are different from those of Invention A-1. Furthermore, as stated above, there is no motivation to combine Invention A-1 with the matters described in Evidence A No. 5, even if the matters described in Evidence A No. 5 are considered in Invention A-1, a person skilled in the art

could not have easily conceived of the configuration of Invention 1 responsible for Different Feature 1.

Evidence A No. 9 describes the matters added to the above IV2(9) and describes that the secretion of IL-10 was induced by the Bifidobacterium breve strain M-16V subjected to a heat treatment. However, in Evidence A No. 9, the heating conditions and the bacteria used are different from those of Invention A-1. Furthermore, as stated above, there is no motivation to combine Invention A-1 with Invention A-3. Even if the matters described in Evidence A No. 9 are considered in Invention A-1, a person skilled in the art could not have easily conceived of the configuration of Invention 1 responsible for Different Feature 1.

As stated above, therefore, a person skilled in the art could not easily conceive of the configuration of Invention 1 responsible for Different Feature 1 in Invention A-1 even if Invention A-3, matters described in Evidence A No. 5, and matters described in Evidence A No. 9 are considered.

Therefore, it is not necessary to consider Different Feature 2. A person skilled in the art could not have easily conceived of the configuration of Invention 1 based on Invention A-1 and Invention A-3, the matters described in Evidence A No. 5, and the matters described in Evidence A No. 9.

B Invention A-3 as the main cited invention

(A) Comparison

Invention 1 is compared with Invention A-3.

"Bifidobacterium breve strain Yakult (BbrY)" in Invention A-3 corresponds to "probiotic micro-organisms" and "Bifidobacterium breve" in Invention 1.

The wording of subjecting "Bifidobacterium breve strain Yakult (BbrY)" to "heat sterilization" "by heating at 100°C for 30 minutes" in Invention A-3 and the wording of "comprises rendering the probiotic micro-organisms non-replicating by a heat treatment, the heat treatment is a high temperature treatment at about 90-150°C for about 5-30 seconds" in Invention 1 are common in that "the probiotic micro-organisms are rendered non-replicating by a heat treatment."

A method "for enhancing IL-10 production in peripheral blood mononuclear cells of a patient with ulcerative colitis" in Invention A-3 and "a method for producing a pet food composition for use in the prevention or treatment of inflammatory disorders" in Invention 1 are common in that each of these methods is "a method for producing a composition for prevention or treatment of inflammatory disorders."

Therefore, Invention 1 corresponds to Invention A-3 in the following feature.
"A method for producing a composition for prevention or treatment of inflammatory disorders, wherein

the composition comprises non-replicating probiotic micro-organisms,
the method comprises rendering the probiotic micro-organisms non-replicating by a heat treatment,
the heat treatment is a high temperature treatment at a temperature of about 90 to 150°C, and
the probiotic micro-organisms are Bifidobacterium breve."

On the other hand, Invention A-3 and Invention 1 are different from each other in the following features.
<Different Feature 3>

The heat treatment is "a high temperature treatment at about 90 to 150°C for about 5 to 30 seconds" in Invention 1, whereas it is 30 minutes at 100°C in Invention A-3.

<Different Feature 4>

Regarding composition to be produced and the content of non- replicating probiotic micro-organisms

Invention 1 specifies the composition as "a pet food composition" and further specifies it as one "comprising non-replicating probiotic micro-organisms in an amount corresponding to about 10^6 to 10^{12} cfu per serving," whereas

Invention A-3 does not specify the produced food or drink composition as a "pet food" and does not specify the content of non-replicating probiotic micro-organisms per serving if it is specified as a pet food.

(B) Judgment

The above Different Feature 3 will be examined.

Invention A-1 is configured to subject lactic acid bacterium Lactobacillus paracasei strain KW3110, which is capable of inducing strong IL-12 production and can be used as an immunostimulator, to a high temperature/short time heating treatment at 135°C for 30 seconds. Regarding the temperature and time of a heat treatment for bacteria, Invention A-1 has a constituent feature corresponding to that of Invention 1 responsible for Different Feature 3.

However, Invention A-1 and Invention A-3 are different from each other in the target bacteria for heat treatment. In addition, Invention A-1 originally intends to allow lactic acid bacterium Lactobacillus paracasei strain KW3110, which is capable of inducing strong IL-12 production and can be used as an immunostimulator, to be mixed with polyphenols even after a high temperature/short time heating treatment to maintain potent IL-12 production. Thus, the original objects of Invention A-1 and Invention A-3 are different from each other. Furthermore, Evidence A No.3 does not mention or suggest a change in heating conditions of 100°C for 30 minutes. Even in Evidence A No. 1, there is no description about the amount of IL-10 in the heat treatment at 135°C for 30 seconds in Invention A-1. Therefore, a person skilled in the art starting from Invention A-3 cannot conceive of replacing the heating condition in Invention A-3 with the heating condition in Invention A-1 even if Invention A-1 is considered.

Therefore, a person skilled in the art could not have easily conceived of the configuration of Invention 1 responsible for Different Feature 3 in Invention A-3 even if Invention A-1 is considered.

Evidence A No. 5 and Evidence A No. 9 describe the matters added to the above IV (2) (5) and (9), respectively. Neither of the evidences describes the heating condition of Invention 1 responsible for Different Feature 3 and suggests changing the heating condition of Invention A-3 to the heating condition of Invention A-1.

Thus, a person skilled in the art could not have easily conceived of the configuration of Invention 1 responsible for Different Feature 3 in Invention A-3 even if Invention A-1, matters described in Evidence A No. 5, and matters described in Evidence A No. 9 are considered.

Therefore, it is not necessary to consider Different Feature 4. A person skilled in the art could not have easily conceived of Invention 1 based on Invention A-1 and Invention A-3 and the matters described in Evidence A No. 5 as well as the matters described in Evidence A No. 9.

2 Regarding Invention 2

Invention 2 has not been notified of reasons for revocation. The reasons for patent opposition that were not adopted in the previous notification of reasons for revocation are judged as follows.

(1) Regarding Article 36(4) (i) of the Patent Act

The opponent states in the written opposition that the Detailed Description of the Invention in the patent specification is not clearly and sufficiently described to the extent that Invention 1 can be implemented and that the same applies to Invention 2 (see the written opposition, page 28, line 4 to page 29, line 7 and page 30, lines 6 to 9).

However, as pointed out in the above 1 (1), the Detailed Description of the Invention in the present specification does not have any inadequacy about Invention 1 stated by the opponent. Therefore, even with Invention 2, there are no inadequate descriptions that the opponent states. The opponent's allegation is contrary to this fact and cannot be adopted.

(2) Regarding Article 36(6) (ii) of the Patent Act

In the written opposition, the opponent alleges that Invention 1 is not clear and the same applies to Invention 2 (see the written opposition, page 29, lines 8 to 20 and page 30, lines 10 to 13)

However, as pointed out in the above 1(2), Invention 1 is not as ambiguous as the opponent allges. Therefore, Invention 2 has no ambiguity as alleged by the opponent. The opponent's allegation is contrary to this fact and cannot be adopted.

(3) Regarding Article 29 (2) of the Patent Act

In the written opposition, the opponent alleges that Invention 2 limits probiotic micro-organisms in Invention 1 to specific strains, and there is no particular difficulty in simply arbitrarily selecting a strain from strains belonging to the bacterial species. The opponent alleges that Invention 1 could have been easily invented by a person skilled in the art based on Invention A-1 or based on Invention A-1 and the matters described in Evidence A No. 3, Evidence A No. 5, and Evidence A No. 9 or based on Invention A-3 and the matters described in Evidence A No. 1, Evidence A No. 5, and Evidence A No. 9, and, similarly, Invention 2 could have been easily invented by a person skilled in the art (the written opposition, page 23, line 4 from the bottom to page 24, line 4).

However, as discussed in the above 1 (3) above, Invention 1 could not have been easily invented by a person skilled in the art based on Invention 1, or based on Invention A-1 and Invention A-3 and the matters described in Evidence A No. 5 and Evidence A No. 9. Invention 2, which includes all the constituent elements of Invention 1 and is further limited, could not have been easily invented by a person skilled in the art based on the evidence shown by the opponent.

3. Regarding Invention 3

(1) Priority claim

A History of priority claim

The application of the Patent was filed by the patent holder on November 2, 2011, as an international patent application claiming priority under the Paris Convention based on Patent Application No. 10190118(hereinafter referred to as "Patent Application B"), which was separately filed to the European Patent Office on November 5, 2010, after Patent Application A was filed to the European Patent Office on May 11, 2009 by the same person as the patent holder.

The priority stipulated in the Paris Convention only arises on the basis of the first application filed in a country of the Union of the Paris Convention. Therefore, regarding the matters described in the specification of the above Patent Application A, Patent Application B is not recognized as the "first application" as stipulated in Article 4C (2) of the Paris Convention.

Then, the opponent alleges that Invention 3 is described in the specification of Patent Application A filed earlier than Patent Application B by the patent holder, and, since Patent Application A is the "first application," a priority claim to Patent Application B is not accepted. Accordingly, whether the priority claim is accepted will be examined below.

The specification of Patent Application A describes the Patent Application-A Invention recognized in the above IV2(8)B.

B Judgment

Invention 3 is compared with the Patent Application-A Invention.

"A method for preparing a composition as a pet food for treating or preventing disorders that are related to a compromised immune defense" in the Patent Application-A Invention corresponds to "a method for producing a composition as a pet food for prevention or treatment of disorders that are related to a compromised immune defense " in Invention 3.

The Patent Application-A Invention sets the dose of non-replicating probiotics included in the composition to one defined such that "those skilled in the art are able to appropriately adjust the therapeutically effective dose and/or the prophylactic effective dose, preferably in an amount corresponding to between 10^5 and 10^9 cfu/g of the dry composition and in the range of about 0.005 mg to 1000 mg non-replicating probiotics per daily dose." Such a defined dose corresponds to "an amount corresponding to about 10^6 to 10^{12} cfu per serving," which is the content of non-replicating probiotics in the pet food composition in Invention 3.

The Patent Application-A Invention includes the constituent feature of "preparing non-replicating probiotics with improved ability to enhance immune defense by subjecting Bifidobacterium longum NCC3001, Bifidobacterium lactis NCC2818, Lactobacillus paracasei NCC2461, and Lactobacillus rhamnosus NCC4007 to heat treatment at 85°C for 20 minutes or subjecting Bifidobacterium breve strain A to heat treatment at 90°C for 30 minutes." Such a configuration corresponds to "the method comprises rendering the probiotic micro-organisms non-replicating by a heat treatment, the heat treatment is carried out in the temperature range of about 80 to 90°C for about 20 to 40 minutes, and the probiotic micro-organism is selected from the group consisting of Bifidobacterium longum, Bifidobacterium lactis, Bifidobacterium breve, Lactobacillus paracasei, Lactobacillus rhamnosus, or combinations thereof" in Invention 3.

Therefore, Invention 3 is identical to the Patent Application-A Invention.

C Summary

Invention 3 is an invention disclosed in the specification of Patent Application A. Regarding Invention 3, therefore, Patent Application B filed after Patent Application A is not recognized as the "first application" as stipulated in Article 4.C(2) of the Paris Convention.

Regarding Patent 3, therefore, priority claim to Patent Application B cannot be acceptable.

(2) Novelty and inventive step in light of the documents that were made public before the filing date of the present application

A Comparison / Judgment of Invention A-7

As stated in the above (1), regarding Patent 3, priority claim to Patent Application B cannot be acceptable. The reference date for the novelty and inventive step of Invention 3 is November 2, 2011 (hereinafter referred to as "the filing date of the present application"), which is the actual international filing date of the Patent.

Evidence A No. 7, which is a publication distributed before the filing date of the present application, discloses Invention A-7 stated in the above 4-2 (7) C. As stated in the above (1)B, the Patent Application-A Invention, which is identical to Invention A-7, is identical with Invention A-7, except for the notation of the strain "Bifidobacterium breve." In addition, Invention 3 does not specify the strain of "Bifidobacterium breve."

Therefore, Invention 3 is identical to Invention A-7.

Further, even if there is a slight difference between Invention 3 and Invention A-7, the difference is almost a design matter. Therefore, Invention 3 could have been easily invented by a person skilled in the art based on Invention A-7.

B Summary

Accordingly, Invention 3 is identical to Invention A-7 and falls under Article 29(1)(iii) of the Patent Act and thus the patent for Invention 3 violates the provision of Article 29(1) of the Patent Act.

Furthermore, Invention 3 could have been easily invented by a person skilled in the art based on Invention A-7 before the filing date of the present application and thus the patent for Invention 3 violates the provision of Article 29(2) of the Patent Act.

(2) In light of the documents that were made public before the filing date of the present application and before the date of priority claim thereof,

A Comparison with Invention A-2

Evidence A No. 2, which was made public before the filing date of the present application and before the date of priority claim thereof, discloses Invention A-2 stated in the above IV2(2)B.

Invention 3 is compared with Invention A-2.

Allowing "a lactic acid bacterium that is capable of inducing strong IL-12 production and can be used as an immunostimulant" to "enhance the antiallergic activity thereof," followed by allowing "the antiallergic composition of lactic acid bacteria produced" to be "compounded into foods and drinks" to give "foods and drinks having an antiallergic function" in Invention A-2 and "a method for producing a pet food composition for the prevention or treatment of disorders related to a compromised immune defense" in Invention 3 are common in that each of them is "a method for producing a food composition for prevention or treatment of disorders related to a compromised immune defense."

"Subjecting Lactobacillus paracasei KW3110 strain or its mutant strain to heat treatment at a temperature in a predetermined range for a predetermined time to suppress the activity of the lactic acid bacteria" in Invention A-2 corresponds to "probiotic micro-organisms" "Lactobacillus paracasei (Lactobacillus paracasei) to be "rendered non-replicating by a heat treatment" in Invention 3.

In addition, the wording "one of the heating conditions is at 85°C for 30 minutes" in Invention A-2 corresponds to the wording "the heat treatment is carried out in the temperature range of about 80 to 90°C for about 20 to 40 minutes" in Invention 3.

Furthermore, the wording "as for the dosage or intake of the effective dose of the active ingredients to foods or drinks, it can be determined depending on the recipient, the age and body weight of the recipient, symptoms, administering method, and the like, and it can be administered in 1 to 3 doses per day preferably within the range of 1 to 10 mg/kg body weight of an adult human (for L. paracasei KW3110 strain, 10^{12} bacteria corresponds to 1g of the dried bacteria) when administered, for example, orally" in Invention A-2 and the wording " the pet food composition comprises non-replicating probiotic micro-organisms in an amount corresponding to about 10^6 to 10^{12} cfu per serving" in Invention 3 are common in that "a food composition comprising non-replicating probiotic micro-organisms in an amount corresponding to about 10^6 to 10^{12} cfu per serving."

The above matters can be summarized as follows:

Invention 3 and Invention A-2 are common in that,

"A method for producing a food composition for prevention or treatment of disorders related to a compromised immune defense, wherein

the food composition comprises non-replicating probiotic micro-organisms in an amount corresponding to about 10^6 to 10^{12} cfu per serving,

the method comprises rendering the probiotic micro-organisms non-replicating by a heat treatment,

the heat treatment is carried out in the temperature range of about 80-90°C for about 20-40 minutes, and

the probiotic micro-organisms are selected from Lactobacillus paracasei."

The differences between the two are as follows.

<Different Feature 5>

The composition in Invention 3 is "a pet food composition", whereas any of "foods and drinks" blended with an antiallergic composition using lactic acid bacteria in Invention A-2 is not "a pet food."

B Judgment

The above Different Feature 5 will be examined.

Evidence A No. 5 stated in the above IV2(5) describes that Lactobacillus crispatus strain KT-11 subjected to a heat treatment is used as a material in a pet food to reduce allergic symptoms, whereas the Document-1 Invention stated in the above IV2(10)B is configured to comprise "feeding as a food composition a strain of lactic acid

bacteria of the species Bifidobacteria globosum having a probiotic activity in the form of viable cells or in the form of non-viable cells such as killed cultures or compositions sterilized by heat, the food composition being provided as part of the normal dietary intake to an animal or as a supplement thereto." However, these features were well-known in the art before the filing date of the present application and before the date of priority claim thereof.

A person skilled in the art could have easily conceived of attaining the configuration of Different Feature 5 in Invention 3 by providing Invention A-2 with matters in which pet foods are adopted as foods and drinks blended with an antiallergic composition using lactic acid bacteria and pets are the subject of application of the composition components, based on the well-known arts described in Evidence A No. 5 or Document 1.

At that time, it is almost a design matter that the dose per meal is determined according to the weight and symptoms of a pet and the number of feedings per day and the dose given to the pet is also kept within the dose included in the above-corresponded invention; for example, in the Document-1 Invention, the dose given to the pet is "1.0E + 06 to 1.0E12CFU per day."

C Summary

Therefore, Invention 3 could have been easily invented by a person skilled in the art based on Invention A-2 and the well-known arts described in Evidence A No. 5 or Document 1 before the filing date of the present application and before the date of priority claim thereof and thus the patent for Invention 3 was made in violation of the provisions of Article 29(2) of the Patent Act.

4 Regarding Invention 4

(1) Priority claim

Invention 4 limits the strain of probiotic micro-organisms used in Invention 3. Except for the strain "NCC2950" of "Bifidobacterium breve," probiotics in Patent Application-A Invention are the same as those of Invention 4, including the strain used.

"Bifidobacterium breve" is recited as "strain A" in the Patent Application-A Invention. In Evidence A No.7 filed with a priority claim to the Patent Application A , as pointed out in the above IV2(8) A (B), "Bifidobacterium breve NCC2950 (strain A) was deposited under the Budapest Treaty as CNCM I-3865" was additionally described. In addition, "Bifidobacterium breve strain A" (Bifidobacterium breve strain A) in the specification of Patent Application A is described as "Bifidobacterium breve NCC2950"

in Evidence A No. 7. From these facts, "Bifidobacterium breve strain A" in the Patent Application-A Invention and the strain "NCC2950" of "Bifidobacterium breve" in Invention 4 are the same strain.

Therefore, Invention 4 is identical to the Patent Application-A Invention.

Invention 4 is an invention disclosed in the specification of Patent Application A. Regarding Invention 4, therefore, Patent Application B filed after Patent Application A is not recognized as the "first application" as stipulated in Article 4.C(2) of the Paris Convention.

Regarding Patent 4, therefore, priority claim to Patent Application B cannot be acceptable.

(2) Novelty and inventive step

A Comparison / Judgment of Invention A-7

As stated in the above (1), regarding Invention 4, priority claim to Patent Application B cannot be acceptable. The reference date for the novelty and inventive step of Invention 4 is the filing date of the present application.

Evidence A No. 7, which is a publication distributed before the filing date of the present application, discloses Invention A-7 stated in the above IV2(7)C. As stated in the above (1), the Patent Application-A Invention, Invention A-7, and Invention 4 are identical, except for the notation of the strain "Bifidobacterium breve." In addition, Invention A-7 is identical with Invention 4, including the notation of the strain "Bifidobacterium breve."

Therefore, Invention 4 is identical with Invention A-7.

Further, even if there is a slight difference between Invention 4 and Invention A-7, the difference is almost a design matter. Therefore, Invention 4 could have been easily invented by a person skilled in the art based on Invention A-7.

B Summary

Accordingly, Invention 4 is identical to Invention A-7 and falls under Article 29(1)(iii) of the Patent Act and thus the patent for Invention 3 was made in violation of the provisions of Article 29(1) of the Patent Act.

Therefore, Invention 4 could have been easily invented by a person skilled in the art based on Invention A-7 before the filing date of the present application. Thus, the patent for Invention 4 was made in violation of the provisions of Article 29(2) of the Patent Act.

5. Regarding Invention 5

(1) Priority claim

Invention 5 which depends from Invention 3 is configured by limiting Invention 3 with the limitation of "the pet food composition comprises about 4 to 40 weight% dry weight fat, about 12 to 70 weight% dry weight carbohydrates, and about 12 to about 50 weight% dry weight proteins."

The Patent Application-A Invention is configured such that a composition as a pet food "is made contain a protein source, a carbohydrate source, a lipid source, and dietary fibers." Thus, Invention 5 additionally specifies the contents of the protein source, carbohydrate source, lipid source, and dietary fibers in the Patent Application-A Invention.

Here, as will be examined in (2)A below, the contents of these components in Invention 5 are not particularly different from component ratio in pet foods described in Documents 1 and 3, which were well known before the filing dates of Patent Application A and Patent Application B. Thus, additional description of the component ratio has no technical creativity and does not deny the application utility of Invention 5 and the Patent Application-A Invention.

For the entire configuration of Invention 5 in which the component ratio is added to the configuration of Invention 3, Patent Application B cannot be recognized as "the first application" set forth in Article 4 of the Paris Convention. Therefore, a priority claim to Patent Application B is not accepted (see Tokyo High Court Judgment on June 22, 1993, case No. (Gyo-Ke) 115, 1989).

(2) Inventive step

A Comparison / Judgment

As stated in the above (1), regarding Invention 5, priority claim to Patent Application B cannot be acceptable. The reference date for the novelty and inventive step of Invention 5 is the filing date of the present application.

Invention 5, which directly or indirectly depends from Invention 3, is configured by limiting Invention 3 or 4 with the limitation of "the pet food composition comprises about 4 to 40 weight% dry weight fat, about 12 to 70 weight% dry weight carbohydrates, and about 12 to about 50 weight% dry weight proteins."

As stated in the above IV2(10)B, the Document-1 Invention that was made public before the filing date of the present application and before the date of priority claim thereof is configured such that a "food composition" as an "animal food" "is preferably

nutritionally balanced and comprises, on a dry matter basis, preferably about 22% to about 40% crude protein, about 10% to about 30% fat, and about 4% to about 25% total dietary fiber, by weight of the food composition, and also comprises a carbohydrate source." Similarly, the Document 2 Invention stated in the above IV2(11)B, is configured as a "pet food" such that "the water content of the pet food of the present invention is 20% or less, the content of crude protein is particularly preferably 25 to 35%, the blending amount of a carbohydrate source is particularly preferably 40 to 50%, the blending amount of dietary fibers is preferably 0.5 to 5%, and the content of fats and oils is preferably 3 to 20% from the viewpoints of enhancing palatability and supplying polyunsaturated fatty acids." Similarly, furthermore, the Document 3 Invention stated in the above IV2(12)B is configured as "a pet food product" such that "as a typical nutritional content, about 35 to about 70% by weight of carbohydrate, about 10 to about 35% by weight of protein, about 10 to about 20% by weight of fat, and about 10 to about 25% by weight of fiber, with a moisture content of about 5 to about 11%." At the time of the filing date of the present application and the date of claiming priority of the present application, setting the blending ratio of fat, carbohydrate, and protein in the pet food composition to a level that is additionally specified in Invention 5 was a matter of selecting a well-known blending ratio and was a matter of design.

Among the constituent elements of Invention 5, those corresponding to the constituent elements of Invention 3 or Invention 4 are as pointed out in the above 3 and 4.

B Summary

Accordingly, Invention 5 could have been easily invented by a person skilled in the art based on Invention A-7 and the well-known arts also described in Documents 1 to 3 before the filing date of the present application. Thus, the patent for Invention 5 was made in violation of the provisions of Article 29(2) of the Patent Act.

Furthermore, Invention 5 could have been easily invented by a person skilled in the art based on Invention A-2 and the well-known arts described in Evidence A No. 5 and Documents 1 to 3 before the filing date of the present application and the date of claiming priority of the present application. Thus, the patent for Invention 5 was made in violation of the provisions of Article 29(2) of the Patent Act.

6 Regarding Invention 6

(1) Priority claim

Invention 6 is configured by limiting Invention 5 with the limitation of "the pet food composition comprises about 10 to 20 weight% dry weight fat, about 30 to 60 weight% dry weight carbohydrates, and about 20 to about 35 weight% dry weight proteins."

The Patent Application-A Invention is configured such that a composition as a pet food "is made contain a protein source, a carbohydrate source, a lipid source, and dietary fibers." Thus, Invention 5 additionally specifies the contents of the protein source, carbohydrate source, lipid source, and dietary fibers in the Patent Application-A Invention.

Here, as examined in the above 5(2)A, the contents of these components in Invention 6 are not particularly different from component ratio in pet foods described in Documents 1 and 3, which were well known before the filing dates of Patent Application A and Patent Application B. Thus, additional description of the component ratio has no technical creativity and does not deny the application utility of Invention 6 and the Patent Application-A Invention.

Accordingly, for the entire configuration of Invention 6 in which the component ratio specified in Invention 5 or 6 is added to the configuration of Invention 3, Patent Application B cannot be recognized as "the first application" set forth in Article 4 of the Paris Convention. Therefore, a priority claim to Patent Application B is not accepted.

(2) Inventive step

A Comparison / Judgment

As stated in the above (1), regarding Invention 6, priority claim to Patent Application B cannot be acceptable. The reference date for the novelty and inventive step of Invention 6 is the filing date of the present application.

Invention 6 is configured by limiting Invention 5 with the limitation of "the pet food composition comprises about 10 to 20 weight% dry weight fat, about 30 to 60 weight% dry weight carbohydrates, and about 20 to about 35 weight% dry weight proteins."

In the same way as the examination of the additionally specified component ratio of Invention 5 in the above 5(2)A, the component ratio in Invention 6 of the present invention in which the component ratio is slightly limited is also a matter of selecting a well-known blending ratio and was a matter of design at the time of the filing date of the present application and the date of claiming priority thereof.

Among the constituent elements of Invention 6, those corresponding to the constituent elements of Invention 5 are as pointed out in the above 5(2).

B Summary

Accordingly, Invention 6 could have been easily invented by a person skilled in the art based on Invention A-7 and the well-known arts also described in Documents 1 to 3 before the filing date of the present application. Thus, the patent for Invention 6 was made in violation of the provisions of Article 29(2) of the Patent Act.

Furthermore, Invention 6 could have been easily invented by a person skilled in the art based on Invention A-2 and the well-known arts described in Documents 1 to 3 before the filing date of the present application and before the date of priority claim thereof. Thus, the patent for Invention 6 was made in violation of the provisions of Article 29(2) of the Patent Act.

7. Regarding Invention 7

(1) Priority claim

Invention 7 which depends from Invention 3 is configured by limiting Invention 3 with the limitation of "the pet food composition further comprises about 0.5 to 40 weight% dry weight dietary fiber."

The Patent Application-A Invention is configured such that a composition as a pet food "is made to contain a protein source, a carbohydrate source, a lipid source, and dietary fibers." Thus, Invention 5 additionally specifies the contents of the protein source, carbohydrate source, lipid source, and dietary fibers in the Patent Application-A Invention.

Here, as examined in the above 5(2)A, the contents of these components in Invention 7 are not particularly different from component ratio in pet foods described in Documents 1 and 3, which were well known before the filing dates of Patent Application A and Patent Application B. Thus, additional description of the component ratio has no technical creativity and does not deny the application utility of Invention 7 and the Patent Application-A Invention.

For the entire configuration of Invention 7 in which the component ratio is added to the configuration of Invention 3, Patent Application B cannot be recognized as "the first application" set forth in Article 4 of the Paris Convention. Therefore, a priority claim to Patent Application B is not accepted.

(2) Inventive step

A Comparison / Judgment

As stated in the above (1), regarding Invention 7, priority claim to Patent Application B cannot be acceptable. The reference date for the novelty and inventive step of Invention 7 is the filing date of the present application.

Invention 7, which directly or indirectly depends from Invention 3, is configured by limiting any one of Inventions 3 to 6 with the limitation of "the pet food composition further comprises about 0.5 to 40 weight% dry weight dietary fiber."

As stated in the above IV2(10)B, the Document-1 Invention that was made public before the filing date of the present application and before the date of priority claim thereof is configured such that a "food composition" as a "animal food" "is preferably nutritionally balanced and comprises, on a dry matter basis, preferably about 22% to about 40% crude protein, about 10% to about 30% fat, and about 4% to about 25% total dietary fiber, by weight of the food composition, and also comprises a carbohydrate source." Similarly, the Document 2 Invention stated in the above IV2(11)B, is configured as a "pet food" such that "the water content of the pet food of the present invention is 20% or less, the content of crude protein is particularly preferably 25 to 35%, the blending amount of a carbohydrate source is particularly preferably 40 to 50%, the blending amount of dietary fibers is preferably 0.5 to 5%, and the content of fats and oils is preferably 3 to 20% from the viewpoints of enhancing palatability and supplying polyunsaturated fatty acids." Similarly, furthermore, the Document 3 Invention stated in the above IV2(12)B is configured as "a pet food product" such that "as a typical nutritional content, about 35 to about 70% by weight of carbohydrate, about 10 to about 35% by weight of protein, about 10 to about 20% by weight of fat, and about 10 to about 25% by weight of fiber, with a moisture content of about 5 to about 11%." At the time of the filing date of the present application and the date of claiming priority of the present application, setting the blending amount of dietary fibers to a level that is additionally specified in Invention 7 was a matter of selecting a well-known blending amount and was a matter of design.

Among the constituent elements of Invention 7, those corresponding to the constituent elements of Inventions 3 to 6 are as pointed out in the above 3 to 6, respectively.

B Summary

Accordingly, Invention 7 could have been easily invented by a person skilled in the art based on Invention A-7 and the well-known arts described in Documents 1 to 3 before the filing date of the present application. Thus, the patent for Invention 7 was made in violation of the provisions of Article 29(2) of the Patent Act.

Furthermore, Invention 7 could have been easily invented by a person skilled in the art based on Invention A-2 and the well-known arts described in Evidence A No. 5 and Documents 1 to 3 before the filing date of the present application and before the date of priority claim thereof. Thus, the patent for Invention 7 was made in violation of the provisions of Article 29(2) of the Patent Act.

8 Regarding Invention 8

(1) Priority claim

Invention 8, which depends from Invention 3, is configured to be limited such that "the pet food composition is selected from the group consisting of pet foods, nutritional diets for pets, supplements for pets, treats for pets, and food toys for pets such as chewable and consumable toys." Such a limited configuration of Invention 8 corresponds to the "composition" as a "pet food" in the Patent Application-A Invention.

Therefore, Invention 8 is identical to the Patent Application-A Invention.

Invention 8 is an invention disclosed in the specification of Patent Application A. Regarding Invention 8, therefore, Patent Application B filed after Patent Application A is not recognized as the "first application" as stipulated in Article 4.C(2) of the Paris Convention.

Regarding the Patent 8, therefore, priority claim to Patent Application B cannot be acceptable.

(2) Novelty and inventive step

A Comparison / Judgment

As stated in the above (1), regarding Invention 8, priority claim to Patent Application B cannot be acceptable. The reference date for the novelty and inventive step of Invention 8 is the filing date of the present application.

Invention 8, which directly or indirectly depends from Invention 3, is configured by limiting any one of Inventions 3 to 7 with the limitation of "the pet food composition is selected from the group consisting of pet foods, nutritional diets for pets, supplements for pets, treats for pets, and food toys for pets such as chewable and consumable toys."

Among the constituent elements of Invention 8, those corresponding to the constituent elements of Inventions 3 to 7 are as pointed out in the above 3 to 7, respectively.

The "composition" as a "pet food" in Invention A-7 corresponds to the point that the "pet food composition" in the limited configuration is a "pet food." Thus, Invention 8 is identical to Invention A-7.

As stated in the above IV2(10)B, the Document-1 Invention, which was made public before the filing date of the present application and before the date of priority claim thereof, has an option of "feeding" probiotics "as part of the normal dietary intake to an animal or as a supplement thereto" and an option of "the food composition may be in the form of a dried animal food, a processed grain feed, a wet animal food, chews, treats and the like." Thus, among options additionally specified by Invention 8, options other than the "pet food" were well-known arts before the filing date of the present application and before the date of priority claim thereof. Therefore, in Invention A-7 or Invention A-2, a person skilled in the art could easily conceive of choosing an option among the options other than the "pet food" that Invention 8 additionally specifies based on the well-known art.

B Summary

Accordingly, Invention 8 is identical to Invention A-7 and falls under Article 29(1)(iii) of the Patent Act and thus the patent for Invention 8 was made in violation of the provisions of Article 29(1) of the Patent Act.

Invention 8 could have been easily invented by a person skilled in the art based on Invention A-7 or based on Invention A-7 and the well-known arts described in Documents 1 to 3 before the filing date of the present application. Thus, the patent for Invention 8 was made in violation of the provisions of Article 29(2) of the Patent Act.

Furthermore, Invention 8 could have been easily invented by a person skilled in the art based on Invention A-2 and the well-known arts described in Evidence A No. 5 and Documents 1 to 3 before the filing date of the present application and before the date of priority claim thereof. Thus, the patent for Invention 8 was made in violation of the provisions of Article 29(2) of the Patent Act.

9 Regarding Invention 9

(1) Priority claim

Invention 9, which depends from Invention 3, is configured by limiting Invention 3 with the limitation of "the food composition further comprising prebiotics, for example oligofructose and inulin." Thus, the constituent element of "prebiotics such oligosaccharides containing fructose or inulin are added to the composition" in the Patent Application-A Invention corresponds to one of the above limited constituent features.

Therefore, Invention 9 is identical to Patent Application-A Invention.

Invention 9 is an invention disclosed in the specification of Patent Application A. Regarding Invention 9, therefore, Patent Application B filed after Patent Application A is not recognized as the "first application" as stipulated in Article 4C(2) of the Paris Convention.

Regarding Invention 9, therefore, priority claim to Patent Application B cannot be acceptable.

(2) Novelty and inventive step

A Comparison / Judgment

As stated in the above (1), regarding Invention 9, priority claim to Patent Application B cannot be acceptable. The reference date for the novelty and inventive step of Invention 9 is the filing date of the present application.

Invention 9 is configured by limiting any one of Inventions 3 to 8 with the limitation of "the pet food composition further comprising prebiotics, for example oligofructose and inulin."

Among the constituent elements of Invention 9, those corresponding to the constituent elements of Inventions 3 to 8 are as pointed out in the above 3 to 8, respectively.

Since the constituent element of "prebiotics such as oligosaccharides containing fructose or inulin are added to the composition" in Invention A-7 corresponds to one of the above limited constituent features, Invention 9 is identical to Invention A-7.

As stated in the above IV(2)(10)B, for allowing the Document-1 Invention, which was made public before the filing date of the present application and before the date of priority claim thereof, to be configured such that "the food composition may comprise a prebiotic such as a fructo-oligosaccharide or inulin" when feeding animals with probiotics, an additional specific matter in Invention 9 was a matter of well-known art before the filing date of the present application and before the date of priority claim thereof. Therefore, a person skilled in the art could have easily conceived of allowing Invention A-2 to be configured to have the additional specific matter in Invention 9 based on the well-known art.

B Summary

Accordingly, Invention 9 is identical to Invention A-7 and falls under Article 29(1)(iii) of the Patent Act and thus the patent for Invention 9 was made in violation of the provisions of Article 29(1) of the Patent Act.

Invention 9 could have been easily invented by a person skilled in the art based on Invention A-7 or the well-known arts described in Invention A-7 and Documents 1 to 3 before the filing date of the present application. Thus, the patent for Invention 9 was made in violation of the provisions of Article 29(2) of the Patent Act.

Furthermore, Invention 9 could have been easily invented by a person skilled in the art based on Invention A-2 and the well-known arts described in Evidence A No. 5 and Documents 1 to 3 before the filing date of the present application and before the date of priority claim thereof. Thus, the patent for Invention 9 was made in violation of the provisions of Article 29(2) of the Patent Act.

10 Regarding Invention 10

(1) Priority claim

Invention 10, which depends from Invention 3, is configured by limiting Invention 3 with the limitation of "at least 90% of the probiotics in the pet food composition are non-replicating." Then, the constituent element of "at least 95 weight % of the probiotics are non-replicating." in the Patent Application-A Invention corresponds to one of the above limited constituent features.

Therefore, Invention 10 is identical to the Patent Application-A Invention.

Invention 10 is an invention disclosed in the specification of Patent Application A. Regarding Invention 10, therefore, Patent Application B filed after Patent Application A is not recognized as the "first application" as stipulated in Article C(2) of the Paris Convention.

Regarding Invention 10, therefore, priority claim to Patent Application B cannot be acceptable.

(2) Novelty and inventive step

A Comparison / Judgment

As stated in the above (1), regarding Invention 10, priority claim to Patent Application B cannot be acceptable. The reference date for the novelty and inventive step of Invention 10 is the filing date of the present application.

Invention 10, which directly or indirectly depends from Invention 3, is configured by limiting any one of Inventions 3 to 9 with the limitation of "at least 90% of the probiotics in the pet food composition are non-replicating."

Among the constituent elements of Invention 10, those corresponding to the constituent elements of Inventions 3 to 9 are as pointed out in the above 3 to 9, respectively.

Then, the constituent element of "at least 95 weight % of the probiotics are non-replicating." in Invention A-7 corresponds to one of the above limited constituent features. Therefore, Invention 10 is identical to the Invention A-7.

Furthermore, in Invention A-2, "Lactobacillus paracasei strain KW3110" subjected to a heat treatment at "85 °C for 30 minutes" to "suppress the activity of the lactic acid bacteria" can be considered as bacteria in which the activity of almost all of them is suppressed. Thus, the additional limitation in Invention 10 is not a new different feature. Alternatively, even if it is a new different feature, such a different feature is almost a design matter.

B Summary

Accordingly, Invention 10 is identical to Invention A-7 and falls under Article 29(1)(iii) of the Patent Act and thus the patent for Invention 10 was made in violation of the provisions of Article 29(1) of the Patent Act.

Invention 10 could have been easily invented by a person skilled in the art based on Invention A-7 or the well-known arts described in Invention A-7 and Documents 1 to 3 before the filing date of the present application. Thus, the patent for Invention 10 was made in violation of the provisions of Article 29(2) of the Patent Act.

Furthermore, Invention 10 could have been easily invented by a person skilled in the art based on Invention A-2 and the well-known arts described in Evidence A No. 5 and Documents 1 to 3 before the filing date of the present application and before the date of priority claim thereof. Thus, the patent for Invention 10 was made in violation of the provisions of Article 29(2) of the Patent Act.

11. Regarding Invention 11

(1) Priority claim

Invention 11, which depends from Invention 3, is configured to limit Invention 3 with the limitation of "the pet food composition comprises about 0.005 mg to 1000 mg non-replicating micro-organisms per daily dose." Thus, the constituent feature of "in the range of about 0.005 mg to 1000 mg non-replicating probiotics per daily dose" in the

Patent Application-A Invention corresponds to one of the above limited constituent features.

Therefore, Invention 11 is identical to the Patent Application-A Invention.

Invention 11 is an invention disclosed in the specification of Patent Application A. Regarding Invention 11, therefore, Patent Application B filed after Patent Application A is not recognized as the "first application" as stipulated in Article 4.C(2) of the Paris Convention.

Regarding Patent 11, therefore, priority claim to Patent Application B cannot be acceptable.

(2) Novelty and inventive step

A Comparison / Judgment

As stated in the above (1), regarding Invention 11, priority claim to Patent Application B cannot be acceptable. The reference date for the novelty and inventive step of Invention 11 is the filing date of the present application.

Invention 11 is configured by limiting any one of Inventions 3 to 10 with the limitation of "at least 90% of the probiotics in the pet food composition are non-replicating."

Among the constituent elements of Invention 11, those corresponding to the constituent elements of Inventions 3 to 10 are as pointed out in the above 3 to 10, respectively.

Then, the constituent element of "in the range of about 0.005 mg to 1000 mg non-replicating probiotics per daily dose" in Invention A-7 corresponds to one of the above limited constituent features. Therefore, Invention 11 is identical to the Invention A-7.

Furthermore, in Invention A-2, the dose defined such that "it can be administered in 1 to 3 doses per day preferably within the range of 1 to 10 mg/kg body weight of an adult human (for L. paracasei KW3110 strain, 10^{12} bacteria corresponds to 1 g of the dried bacteria)" is likely to fall within the additional specific scope of Invention 11 even when it is converted into another dose so as to fit to a pet. Thus, the additional limitation in Invention 11 is not a new different feature. Alternatively, even if it is a new different feature, such a different feature is almost a design matter.

B Summary

Accordingly, Invention 11 is identical to Invention A-7 and falls under Article 29(1)(iii) of the Patent Act and thus the patent for Invention 11 was made in violation of the provisions of Article 29(1) of the Patent Act.

Invention 11 could have been easily invented by a person skilled in the art based on Invention A-7 or the well-known arts described in Invention A-7 and Documents 1 to 3 before the filing date of the present application. Thus, the patent for Invention 11 was made in violation of the provisions of Article 29(2) of the Patent Act.

Furthermore, Invention 11 could have been easily invented by a person skilled in the art based on Invention A-2 and the well-known arts described in Evidence A No. 5 and Documents 1 to 3 before the filing date of the present application and before the date of priority claim thereof. Thus, the patent for Invention 11 was made in violation of the provisions of Article 29(2) of the Patent Act.

No. 6 Closing

As stated above, the patents for Invention 1 and Invention 2 cannot be revoked by the reasons for patent opposition stated in the written opposition to a granted patent. In addition, no other reason for revoking patents for Inventions 1 and 2 can be found.

Invention 3 is identical to Invention A-7 and falls under Article 29(1)(iii) of the Patent Act. In addition, Invention 3 could have been easily invented by a person skilled in the art based on Invention A-7 before the filing date of the present application. Furthermore, Invention 3 could have been easily invented by a person skilled in the art based on Invention A-2 and the well-known art described in Evidence A No. 5 or Document 1 before the filing date of the present application and before the date of priority claim thereof. Therefore, the patent for Invention 3 was made in violation of the provisions of Article 29(2) of the Patent Act.

Invention 4 is identical to Invention A-7 and corresponds to Article 29(1)(iii) of the Patent Act. In addition, Invention 4 could have been easily invented by a person skilled in the art based on Invention A-7 before the filing date of the present application. Therefore, the patent for Invention 4 was made in violation of the provisions of Article 29(2) of the Patent Act.

Inventions 5 to 7 could have been easily invented by a person skilled in the art based on Invention A-7 and also the well-known arts described in Documents 1 to 3 before the filing date of the present application and could have been invented based on Invention A-2 and Evidence A No. 5 and the well-known arts described in Documents 1 to 3 before the filing date of the present application and before the date of priority claim

thereof. Therefore, patents for Inventions 5 to 7 were made in violation of the provisions of Article 29(2) of the Patent Act.

Each of Inventions 8 to 11 is identical to Invention A-7 and falls under Article 29(1)(iii) of the Patent Act. In addition, Inventions 8 to 11 could have been easily invented by a person skilled in the art based on Invention A-7 or based on Invention A-7 and the well-known arts described in Documents 1 to 3 before the filing date of the present application and could have been easily invented by a person skilled in the art based on Invention A-2 and the well-known arts described in Evidence A No. 5 and Documents 1 to 3 before the filing date of the present application and before the date of priority claim thereof. Therefore, Patents for Inventions 8 to 11 were made in violation of the provisions of Article 29(2) of the Patent act.

Accordingly, patents for Inventions 3 to 11 fall under Article 113(2) of the Patent Act and shall be revoked.

Therefore, the decision shall be made as described in the conclusion.

June 6, 2019

Chief administrative judge: AKITA, Masayuki
Administrative judge: ARIIE, Hideo
Administrative judge: NISHIDA, Hidehiko