Morinaga Milk's *B. longum* BB536 Probiotic May Prevent Intestinal Disorders Induced by Animal-based Diet

TOKYO (FEBRUARY 11, 2016) — Morinaga Milk Industry Co., Ltd. (TOKYO:2264), a leading dairy product company in Japan, today unveiled new research showing that daily consumption of yogurt fortified with the company's proprietary probiotic *Bifidobacterium longum* BB536 prevents the intestinal bacterial imbalance induced by an animal-based diet. BB536 maintained healthy levels of beneficial bacteria, while preventing increases of harmful levels of bacteria such as *Bilophila*.

Recently, studies have demonstrated the importance of maintaining balanced intestinal flora to overall health. However, the modern, fast-paced lifestyle — with its lack of sleep and exercise, irregular dietary habits and continual stress — threatens bacterial balance. Eating an animal-based diet in particular has been shown to cause an increase in harmful bacteria, a condition known as dysbiosis. This problem is not confined to the United States. Due to Westernization, animal-based diets are growing in popularity in countries across the world.

The effect of animal products on bacterial balance is strong and immediate. In fact, a 2014 study published in the scientific journal *Nature* showed that consumption of an animal-based diet composed entirely of meat and eggs for *just one day* caused negative changes in the composition and function of intestinal flora, including dysbiosis.[1] However, consumption of BB536-fortified yogurt prevented these harmful changes, as shown in Morinaga's new research.

"Consumption of BB536-fortified yogurt prevented the GI deterioration caused by an animal-based diet, which indicates it may be able to prevent various intestinal disorders caused by eating a poor diet — just by adding one BB536 yogurt to the daily diet per day," Dr. Jin-zhong Xiao, General Manager of Morinaga's Next Generation Science Institute, explained.

"Importantly, probiotics are not interchangeable." Dr. Xiao points out that "Probiotics are all strain-specific, as each strain has different indications and characteristics. *Bifidobacterium longum* is one of the predominant bacteria in the human intestine, and it is clinically confirmed that yogurt containing BB536 is more efficacious for eliminating harmful substances and modulating intestinal microflora compared to conventional yogurt."

Study Design

In the study, 31 healthy adults were randomly classified into 3 groups (A, B and C). After an observation period of 7 days, the subjects consumed an animal-based diet consisting entirely of meat and eggs for 5 days (the animal-based diet period) followed by a balanced diet (the recovery period) for 14 days. Group A consumed no BB536 yogurt during the whole study period, while group B consumed 100g of BB536 yogurt twice a day during the recovery period only, and group C consumed 100g of BB536 yogurt twice a day during both the animal-based diet period and the recovery period. Throughout the study, fecal samples were collected, and intestinal bacterial flora was analyzed before and after the animal-based diet period and after the recovery period (Fig. 1).

BB536 Yogurt Prevents Decrease in Beneficial Bifidobacteria (Fig.2 Left)

Bifidobacteria counts in the feces decreased significantly during the animal-based diet period in both groups A and B. However, this decrease was not observed in subjects in group C, who consumed BB536 yogurt together with the animal-based diet. Moreover, the *Bifidobacteria* tended to decrease further during the recovery period in group A, which ate no BB536 yogurt, while it tended to increase in group B, getting close to the original condition before starting the animal-based diet. These findings demonstrate the potential of *Bifidobacterium longum* BB536 not only to prevent diet-related gut flora disorders, but also to aid in their recovery.

BB536 Yogurt Also Prevents Increase in Harmful Bilophila (Fig.2 Right)

Consistent with the results of the above-mentioned *Nature* study, the present study found that an animal-based diet increased a genus of harmful bacteria called *Bilophila*. *Bilophila* is thought to induce inflammation in the intestines by producing the harmful substance hydrogen sulfide, which damages the intestinal mucous membrane[2] and has been reported to be elevated in patients with appendicitis.[3] However, no significant increase of this harmful bacterial genus was observed in group C subjects. *B. longum* BB536 showed superior results in regulating intestinal function, had a protective effect against the enteropathogenic *Escherichia coli* O-157[4] and helped eradicate the enterotoxigenic *Bacteroides fragilis* (ETBF), which is associated with the development of colorectal cancer.[5]

About Bifidobacterium longum BB536

BB536 is one of the strains of Human Residential Bifidobacteria, which naturally reside in human intestines and are natural parts of human digestive systems. It is one of the most thoroughly researched probiotic strains in the world. Morinaga has conducted research and development on BB536 for over 40 years and achieved GRAS status in the U.S. in 2009. Supported by over 110 published studies, BB536's beneficial effects have been confirmed in such clinical areas as intestinal health, immunity, infection, and allergy.

About Morinaga

Morinaga Milk Industry Co., Ltd. is one of the major dairy product companies in Japan. Founded in 1917 and employing over 3,000 people, Morinaga excels in innovative technology and offers dairy products and other beneficial functional ingredients to customers around the world. For more information, visit us at http://www.morinagamilk.co.jp/english/.

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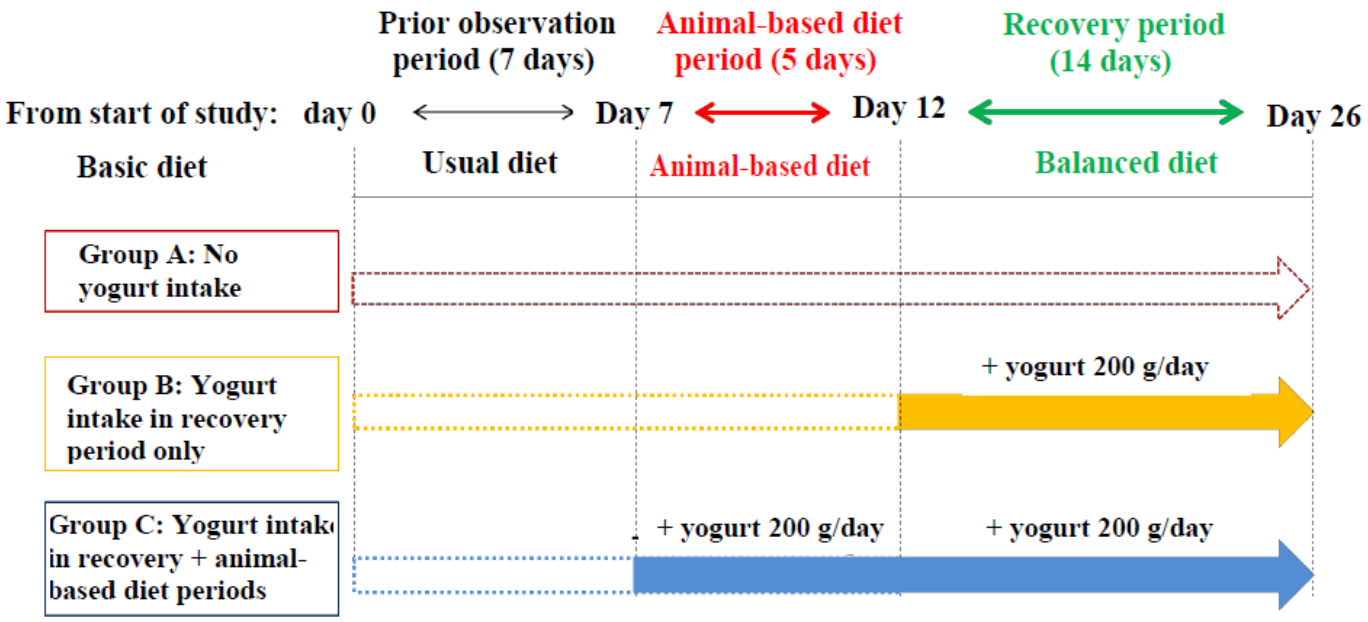
(Fig.1) Study Protocol



(Fig.2) Study Results