Health and Nutrition

Basic Approach

We offer health and nutrition by developing and selling products that combine functionality and good taste "For Ever Brighter Smiles."

Morinaga Milk recognizes that its core business is the development and sale of products that contribute to health and nutrition for prolonging healthy life expectancy and the healthy development of infants. Achieving corporate principles is a goal of health and nutrition, while the guiding principles set out the actions that each and every employee must take.

Health and nutrition are closely tied to Morinaga Milk's commitment to contribute to people's happy life filled with healthy "smiles." Over the years, Morinaga Milk has explored the benefits and possibilities with research into proprietary nutritious and functional food ingredients such as bifidobacteria and lactoferrin, which began with in-house research on the role that breastmilk plays in babies' health.

Morinaga Milk's various products, from infant and toddler milk to specialty milk as well as yogurt, nursing care food and liquid diets, have helped to improve health and bring smiles to people.

Looking ahead, the corporate goal is to contribute to people's health and nutrition not only in Japan, but around the world as well. Morinaga Milk will continue to tackle challenges toward this end.

System

Morinaga Milk CSR Committee meetings, which are chaired by the president, are held twice a year for monitoring and reporting on the progress of KPIs. In addition, Morinaga Milk implements PDCA (Plan–Do–Check–Act) cycles, with the general managers of the relevant divisions responsible for "Priority Issue: Health and Nutrition" and the general managers of the relevant departments responsible for promoting KPIs.

Based on the recognition that health and nutrition represent our core business, company research institutes, Marketing Department, Sales Department, and Manufacturing Department work together as a team to promote our initiatives in health and nutrition.

KPIs

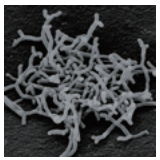
Direction of activities	KPI
Contribute to the extension of healthy lifespans	Bring products incorporating nutritious functional ingredients onto the market
	Share information on nutritious and functional ingredients that help to maintain health
Contribute to the healthy growth of babies and infants	Provide Bifidobacterium breve M-16V; continue to provide in over 120 facilities in Japan and overseas

Morinaga Milk's Nutritious and Functional Ingredients

Morinaga Milk has been researching ingredients for maintaining health for over 50 years.

As a result, these ingredients were found to improve the health of people from all generations, from babies to the elderly.

Bifidobacteria



Morinaga Milk's research into bifidobacteria began in 1969, progressing from maintaining babies' health to identifying applications for Bifidus and even providing a supplies of the bacterial strains worldwide.

In 1977, the company released *Morinaga Bifidus*, a milk-based drink containing bifidobacteria. In the 21st century, under the concept of probiotics, much research is being conducted into the detailed effects and action mechanisms of lactobacillus and bifidobacteria. As one of the first to focus on bifidobacteria, Morinaga Milk has conducted various research on Bifidobacterium longum BB536 and other probiotic organisms, making the company a pioneer in Japan in this field.

Bifidobacteria Powder, a powdered form of several types of dried bifidobacteria, is used in a large number of supplements and other products. Its production requires technological know-how for making live bacteria into powder and keeping it stable for long periods of time at room temperature, and this know-how remains a major strength of Morinaga Milk even today.

Currently, Morinaga Milk's bifidobacterium strains are being used around the world, including in the US, Europe, and Southeast Asia. From babies to the elderly, the aim is to contribute to the health of people around the world.

◆Main bifidobacteria

Bifidobacterium longum BB536 can be used by people of all ages for various health benefits such as excellent regulation of intestinal function by improving intestinal flora.

Bifidobacterium breve B-3 is a bifidobacterium that Morinaga Milk discovered after focusing on obesity prevention.

Bifidobacterium breve M-16V has the ability to promote normalization of intestinal flora in infants. Administering it to low birth weight babies, who tend to have under-developed intestinal function, speeds up colonization of bifidobacteria and promotes normal development of the intestines.

Bifidobacterium breve A1 has the potential to improve cognitive function in people with suspected mild cognitive impairment, and now Morinaga Milk is conducting in-depth research on this strain.

WEB Morinaga Milk's Bifidobacteria Research
▶ https://www.morinagamilk.co.jp/english/research/r_and_d/bifidobacteria/

Lactoferrin

Morinaga Milk began researching lactoferrin in the early 1960s. Lactoferrin is a protein compound of iron (ferrin) found in milk (lacto). It is found in particularly large quantities when a mother first begins producing breastmilk and believed to offer protective benefits to newborns.

In 1986, Morinaga Milk was the first in the world to release an infant and toddler milk containing lactoferrin, called *Morinaga BF-L Lactoferrin Dry Milk*. Today, the company sells lactoferrin products for people of all ages—from infant and toddler milk to lactoferrin yogurt and supplements.

WEB Morinaga Milk's Lactoferrin Research
▶ https://www.morinagamilk.co.jp/english/research/ingredients/

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Topics

MILEI: Manufacturing High Quality Lactoferrin

MILEI GmbH, headquartered in Leutkirch, Germany, has accumulated some 40 years of experience since beginning production in 1975. Currently, MILEI supplies high quality whey protein concentrates and dairy food ingredients such as lactose to multinational food companies in Europe and Asia. In particular, it has the know-how to manufacture high quality and high purity lactoferrin, having established a strong reputation among many users. Going forward, MILEI will establish a system that increases production to expand its supply capacity to play a role as one of the world's largest suppliers in the field.

Peptide

Cow's milk contains good quality protein, and is used in products such as infant and toddler milk. However, it cannot be used for babies with milk allergies. Therefore, Morinaga Milk developed a peptide that has been digested by enzymes (milk protein degradant).

In 1977, Morinaga Milk released *MA-1*, the first milk in Japan containing peptide for babies and infants with allergies. In 1994, the company released another product called *Morinaga Peptide Milk E-Akachan*, which combines more than a half century of Morinaga Milk's technologies, knowledge and experience in the development of infant and toddler milk, especially for the allergenicity of milk.

In recent years, Morinaga Milk was granted a patent for MKP®, a tripeptide of methionine, lysine and proline derived from casein. Clinical trials targeting people with high blood pressure confirmed that MKP® has an effect in lowering blood pressure.

WEB Morinaga Milk's Peptide Research
▶ https://www.morinagamilk.co.jp/english/research/ingredients/

Lactulose

Lactulose is a saccharide made from lactose contained in cow's milk. Morinaga Milk has continued to research the role played by lactulose in increasing bifidobacteria, and released *Morinaga G Dry Milk*, an infant and toddler milk containing lactulose, in 1960.

WEB Morinaga Milk's Lactulose Research
▶ https://www.morinagamilk.co.jp/english/research/ingredients/

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Contributing to Prolonging Healthy Life Expectancy

Morinaga Milk is pursuing product R&D under the theme of prolonging healthy life expectancy for an era when people will commonly live to the age of 100. The company will research and develop products using nutritious and functional ingredients and supply them to consumers so that people can not only live longer, but also have healthier and more active lives.

Triple Yogurt

This yogurt displays three functionalities in lowering and stabilizing blood pressure, blood sugar and triglyceride levels. Tripeptide MKP® lowers higher systolic pressure, while the indigestible dextrin (dietary fiber) stabilizes the blood sugar and triglyceride levels after a meal.

Milk Life

This is a powdered milk product for adults that includes nutritious and functional ingredients such as Bifidobacterium longum BB536, lactoferrin, and LAC-Shield™. It has established a strong reputation for its well-balanced composition of nutrients that can be consumed readily.

Morinaga Milk Supplements

Foods with Function Claims include Bifidobacterium longum BB536, Bifidobacterium breve B-3 and lactoferrin, which can be readily consumed as nutritious and functional ingredients.

Medical Food and Nursing Care Food

The Morinaga Milk Group carefully researches and develops medical foods and nursing care food in terms of taste, nutritional value, safety, and ease of eating, so that the elderly and people with illnesses can maintain their quality of life while experiencing the joy of food.

Using the opinions of medical and nursing care professionals, Clinico Co., Ltd. (a company within the Morinaga Milk Group) and Morinaga Milk's Wellness & Nutritional Science Institute work together to develop and market medical food and nursing care food. This includes liquid diets, nutritional supplement foods, jellies, and pureed foods for patients who have difficulty swallowing.

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Information Dissemination on Nutritious and Functional Ingredients

The Morinaga Milk Group disseminates information, including the results of research on nutritious and functional ingredients, to various stakeholders including customers and suppliers.

Symposiums and exhibitions

(In Japan)

In fiscal 2018, Morinaga Milk made presentations at more than 16 academic societies. Of these, the presentation at the 72nd annual meeting of the Japan Society of Nutrition and Food Science entitled "*Study in novel health function of Aloe vera gel derived phytosterols and application for functional food*" was recognized with the FY2018 JSNFS Award for Achievement in Technological Research.

In addition, in February 2019, Morinaga Milk organized a public symposium called Intestinal Flora Research Seminar at Juntendo University. During the symposium, presentations were made on the relationship between the brain and intestines as well as the relationship between colon diseases and intestinal flora. More than 110 people attended.

The public symposium in session

(Outside Japan)

Every year, Morinaga Milk actively participates in around 20 symposiums or exhibitions outside of Japan in cooperation with overseas business partners to promote health and functional ingredients.

From February 11 to 15, 2019, Morinaga Milk participated in the Probiota conference in Denmark, which brought together pioneering probiotics companies to present their latest research results. Morinaga Milk presented its research on the bifidobacteria that are normally present in the human gut.

At Vitafoods, an exhibition for disseminating food and functional ingredients and innovative technologies held every year in Europe and Asia, Morinaga Milk presented information about bifidobacteria.

In November 2018, Morinaga Milk held a symposium on lactoferrin for pediatricians in collaboration with P.T. Sanghiang Perkasa, its local partner company in Indonesia.

At the symposium, Dr. Aman Bhakti Pulungan, President of the Indonesian Pediatric Society and organizer of the symposium, pointed out the expectation that lactoferrin will play a significant role against infectious diseases, which is a serious issue in Indonesia.

Contributing to the Healthy Growth of Infants

Morinaga Milk began researching and developing infant and toddler milk in the 1920s with the commitment to contribute to the healthy growth and development of infants. Over the years, the company engaged in research of infant and toddler milk that combines lactoferrin, etc. with nutritional elements such as protein, fats, carbohydrates, vitamins, and minerals in order to provide products as close to mother's milk as possible.

In recent years, Morinaga Milk has developed its infant and toddler milk business mainly in Asia in order to contribute to children's nutrition not only in Japan, but around the world.

Looking ahead, Morinaga Milk will continue its long-standing research and development on the nurturing and protective powers of breastmilk.

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Contributions to Building Nutritional Infrastructure in Asia

Emerging countries mainly in Southeast Asia are experiencing rapid population growth and urbanization. The more population concentrates in cities, the more important it is to build nutritional infrastructure to supply safe and high-quality foods. Playing an active role in solving this issue represents the social mission of Morinaga Milk as a food company.

Morinaga Milk considers the supply of infant and toddler milk as part of this nutritional infrastructure. The company manufactures infant and toddler milk at product bases in Japan and overseas, including Indonesia, and supplies products to markets in Indonesia, Pakistan, Malaysia, Vietnam, etc. Morinaga Milk aims to create an environment in which children around the world can grow healthily.

Overseas Launch of Infant and Toddler Milk

Provision of Bifidobacterium Breve M-16V to Low Birth Weight Babies

Normally, the intestinal flora of babies is composed of more than 90% bifidobacteria. However, very low birth weight babies or super low birth weight babies with a birth weight of less than 1,500 g have an underdeveloped intestinal tract. This condition delays the proliferation of bifidobacteria, resulting in an increase in E. coli and S. aureus. Morinaga Milk is now pursuing joint research with university hospitals in the field. By administering our proprietarily developed Bifidobacterium breve M-16V to very low birth weight babies or super low birth weight babies, it was found that intestinal flora good for bifidobacteria form more quickly, preventing dangerous health conditions in newborns such as necrotizing enterocolitis and septicemia.

Currently, Morinaga Milk provides M-16V to more than 120 facilities nationwide in Japan, including newborn intensive care units (NICUs) and pediatric wards, supporting the sound development of countless babies. In addition, the effects of Bifidobacterium breve M-16V on low birth weight babies have been reported overseas through academic societies and papers, and it has been used in NICUs in Australia since 2012. Furthermore, in recent years, use has begun at NICUs in New Zealand and Singapore. Morinaga Milk will continue to support the healthy growth of babies and children around the world.

Provision of Bifidobacterium Breve M-16V

= 1 packet

	2014	2015	2016	2017	2018
Japan (packets)	116,000	152,000	171,000	197,000	210,000
Overseas (packets)	26,000	31,000	43,000	62,000	75,000

Specialty Milk

As a company that manufactures infant and toddler milk, Morinaga Milk offers in Japan infant and toddler milk that can be consumed safely by children with milk allergies, as well as specialty milk designed individually for children with congenital metabolic disorders.

Commercially available specialty milk

Morinaga Milk supplies specialty milk for milk allergies, lactose intolerance, gastro-esophageal reflux and low birth weight babies.

Commercially Available Specialty Milk

Product Name	Characteristics
Morinaga New-MA-1	Milk for milk allergy with highly enzymatically digested proteins
Morinaga MA-mi	Milk for milk allergies with improved nutritional balance, flavor and solubility with reduced allergenicity
Morinaga Non-Lactose	Lactose-free milk for children with lactose intolerance and diarrhea
Morinaga AR Milk	Milk for children prone to gastroesophageal reflux disease with a higher milk viscosity using a naturally derived thickening ingredient (locust bean gum)
Morinaga GP-P	Milk for low birth weight babies

Milk for children with congenital metabolic disorders or other diseases

Morinaga Milk supplies medical institutions, under the guidance of the Safety Development Committee*, with specialty milk that is a vital nutritional supplement for children with congenital metabolic disorders, etc.

Congenital metabolic disorders are a serious health condition. If identified in newborn babies at an early stage and food therapy is initiated, most children will grow properly. Therefore, milk for children with such conditions needs special processing, such as removing protein or reducing phosphorous concentration based on the individual child's needs. Such specialty milk requires advanced manufacturing technologies, so the knowledge and experience of infant nutrition that Morinaga Milk has developed over many years is applied. In fiscal 2018, Morinaga Milk supplied 5,500 cans.

* Safety Development Committee
The Special Milk Joint Safety Development Project was launched in 1980 under the guidance of the (then) Ministry of Health and Welfare with public funding in order to develop and improve, and provide a steady supply of specialty milk to treat children with congenital metabolic disorders. This project defines the specific criteria for specialty milk and its quality, ingredients, and method of use, as well as implements the development, improvement, and steady supply of the specialty milk. At the same time, a Safety Development Committee was established, consisting of academic experts and directors of dairy companies to ensure the smooth operation of the project.

Types of Specialty Milk for Children with Congenital Metabolic Disorders and Other Diseases

Category	Main indications	Symbol	Name
Protein and amino acid metabolism disorders	Phenylketonuria	MP-11	Low phenylalanine peptide powder
Electrolyte metabolism disorders	Adrenocortical hypofunction	MM-2	Low potassium milk
	Heart and kidney diseases	MP-2	Low protein, low sodium milk
	Idiopathic hypercalcemia	MM-4	Low calcium milk
	・Hypoparathyroidism ・Pseudohypoparathyroidism ・Kidney disease	MM-5	Low phosphorus milk
Malabsorption	Deficiency in lipid absorption	ML-1	Low fat milk
Other	・Cystic fibrosis ・Citrin deficiency	ML-3	Proteolytic MCT milk

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Breastmilk Additive Powder

Breastmilk additive powder is intended to reinforce the nutritional elements of breastmilk for very low birth weight babies. Morinaga Milk provides *HMS-1* and *HMS-2*.

Small babies who weigh less than 1,500 g tend to have complications such as underdeveloped physical functions for digestion and absorption. Therefore, they need to increase their weight quickly through adequate nutritional intake to develop their body's functions. However, breastmilk alone is relatively lacking in calories or various nutritional elements for such babies. As such, *HMS-1* and *2* reinforce protein and trace elements such as calcium and phosphorous, which cannot be sufficiently provided by mother's breastmilk alone. These products also provide increased calorific value, promoting faster development in babies. In fiscal 2018, Morinaga Milk sold around 15,000 boxes of *HMS-1* and around 12,000 boxes of *HMS-2*, for a total of 27,000 boxes.

* *HMS-1* is sold in 100 packets/box and *HMS-2* in 60 packets/box

Enhancing Public Health

Contributing to Health with *PURESTER*

PURESTER, a slightly acidic electrolyzed water generator, is a hygiene control apparatus developed by Morinaga Milk aiming for high anti-bacterial effect and safety. *PURESTER* was first sold around 20 years ago, more than 6,000 units have been sold as of March 31, 2019.

Slightly acidic electrolyzed water generator
PURESTER μ-Clean II

Unlike the alcohol disinfectants and sodium hypochlorite commonly used for sterilization, the slightly acidic electrolytic water generated by *PURESTER* has been confirmed to have minimum effect on the skin and to be safe even if it accidentally enters the mouth. It has been verified as effective at killing a range of viruses, bacteria that cause food poisoning, and pathogenic micro-organisms, making it effective in various situations, such as food processing, which require strict hygiene management.

Can be used for a variety of purposes, including equipment cleaning

Customers who are already using *PURESTER* have provided highly positive feedback explaining that *PURESTER* water can be used easily in the same way as municipal water despite being a disinfectant, making *PURESTER* indispensable for on-site hygiene management.

Morinaga Milk is committed to providing its long-standing hygiene management technology to society to help protect the healthy lives of people. Continuing efforts are made to develop new and innovative ways to realize this commitment.