



NAGASE Group

HAYASHIBARA CO., LTD.

Nihon-Seimei Okayama Bldg. II Shinkan
1-1-3 Shimoishii, Kita-ku, Okayama
700-0907, JAPAN
TEL:+81-86-224-4311 FAX:+81-86-224-8492

<https://www.hayashibara.co.jp/en/>



Pave the way for a future with biotechnology



NAGASE Group



研。

Research & Polish

Quite simply, polishing swords is very much like Hayashibara's biotechnology.

Swords are created and brought to life by sword smiths. To bring out the beauty of a sword, expert sword polishers with sophisticated skills devote themselves to slowly sharpening each blade with extreme precision and polishing it up like a gleaming mirror.

The same goes for research and development of biotechnology at Hayashibara.

Researchers devote themselves to their daily work, giving their complete attention to their research materials and tasks.

Though they may appear to be doing the same thing over and over, these constant efforts move them forward steadily, step by step.

We believe this will lead to greater health and happiness for all and a better tomorrow.

Pave the way for a future with biotechnology
Hayashibara continues to innovate new and original materials
with our advanced biotechnology.

Long sword signed Yoshifusa [National treasure] / Owned by the Hayashibara Museum of Art

Hon'ami Koshu, the 18th generation of the Hon'ami Koi line [a holder of a nationally designated Important Intangible Cultural Property]

Food Ingredients

Improve the taste and quality of food products.
Achieve a rich and varied diet with Hayashibara's functional food ingredients.

A wide variety of enzymes produced by microorganisms have interesting and highly useful functions. For example, when enzymes act on starch, they can break down or bind glucose molecules and generate functional food ingredients.

These ingredients are used to make food products tasty or improve their quality to foster our fulfilled life.



Hayashibara's food ingredients are used in various foods, such as processed foods, snacks, beverages and food services including restaurants, catering, and delis.



■ TREHA™

TREHA can keep freshness of food and highly improve flavor and quality. These beneficial characteristics are used worldwide by many companies to maintain or improve pleasant taste of their products.



■ SUNMALT™

SUNMALT is valued for its functional versatility that can be incorporated into various processed foods. It helps to prevent starch retrogradation, resulting in better mouth-feel and improved shelf life.



■ PULLULAN

PULLULAN can strongly bind food materials due to its high adhesive property. It also has excellent film forming and coating abilities that are simple to use for creating edible films and providing luster to the surface of food products.



Hayashibara contributes to people's health by utilizing its technology developed over the years.

Enzyme technologies of Hayashibara have been developed for more than a century. Hayashibara has been using these technologies to transform health-promoting substances into several health food ingredients. These ingredients are also used in "Food for Specified Health Uses (FOSHU)" and "Food with Function Claims."



Research presentation/The society for the study of Hesperidin
We conduct research on the physiological function of ingredients in collaboration with external research institutions.



Health Food Ingredients



■ HAYASHIBARA HESPERIDIN™S

Hesperidin is widely known as an active ingredient in herbal medicines. Glucose is enzymatically bound to hesperidin, which increases the water solubility by more than 100,000 times. HAYASHIBARA HESPERIDIN S is increasing its applications in FOSHU and Food with Function Claims.



■ Fibryxa™

Fibryxa is an isomaltodextrin. It can be used in a wide variety of food and beverage applications because of its high water solubility, stability in aqueous solutions and little flavor. It is also used as an ingredient for Food with Function Claims.



■ Ascofresh™

Ascofresh is produced by the enzymatic binding of glucose to vitamin C. This chemical structure features greater stability of vitamin C in a product even when used with other functional ingredients.

Cosmetics Ingredients

Hayashibara's high quality cosmetic ingredients support those who want to maintain young-looking, beautiful skin at all times.

Hayashibara develops cosmetic ingredients for skin whitening and blood circulation stimulation, using its own enzyme technologies. These technologies can transform unstable and insoluble substances into cosmetic ingredients that have greater stability and increased solubility in order to support those who want to maintain young-looking, beautiful skin at all times.



The in-cosmetics Asia/NAGASE Group booth
We deliver our ingredients in Japan and overseas in collaboration with NAGASE Group branches.



■ AA2G™

AA2G is produced by the enzymatic binding of glucose to vitamin C. When applied to skin, AA2G is degraded by a natural enzyme to release vitamin C. It is used in a variety of skin-care cosmetic products including skin whitening cosmetic products around the world.



■ MG-60

MG-60 features maltooligosyl glucoside, which combines short chains of glucose molecules with a trehalose terminal end. This product is used in skin care products to help preserve moisture. MG-60 is also used in cleansing products due to its ability to maintain a rich, creamy lather.



■ ALPHA GLUCOSYL HESPERIDIN

The glycosylated form of ALPHA GLUCOSYL HESPERIDIN features dramatically improved water solubility. This product can improve skin tone and color, helping to combat dull and puffy looking skin and other skin conditions by stimulating blood circulation.

Pharmaceutical Ingredients



Hayashibara provides necessary pharmaceutical ingredients used in medical practice, such as infusions, injections, and tablets.

Hayashibara provides high quality and unique functional carbohydrates and dyes as active pharmaceutical ingredients or excipients. In addition, some of our ingredients can be used in a variety of applications including cryoprotection of frozen cells during storage, vaccine stabilizers, and regenerative medicine.

Okayama Plant II/Manufacturing maltose for medical use
Excipients, quasi-drugs, etc. are manufactured here.



■ MALTOSE PH

Maltose is a disaccharide containing two glucose molecules. MALTOSE PH is highly purified maltose hydrate and has a low endotoxin making it particularly suitable for injection and infusion.



■ TREHALOSE SG

TREHALOSE SG is a low endotoxin product for injection. Stable under heat and acidity, this product stabilizes higher order protein structures during dehydration and freezing by replacing water molecules.



■ Lumin™ A

Active ingredients of Lumin A are functional dyes effective against acute suppurative disease, peripheral neurogenic disease, etc. Lumin A has been marketed as an OTC drug for more than 60 years in Japan.

Functional Dyes



Hayashibara, as a specialist in organic synthesis, develops a wide variety of functional dyes.

Functional dyes, which have varied applications, play an indispensable role in today's information technology. Hayashibara possesses a library of more than 10,000 organic functional dyes, and continues to update the library with new materials.

Fujita Plant/Synthesis process of functional dyes
Diversified small-quantity manufacturing is available.



■ Dyes for information displays

In liquid crystal display (LCD), functional dyes align with liquid crystal molecules in response to changes in voltage, which can either increase or decrease light transmittance to create images. Hayashibara develops new applications utilizing the function of dichroic dyes.



■ Dyes for information recording

Some of our functional dyes efficiently absorb specific wavelength light and transfer this to other energy. This property is utilized in photographic and X-ray films, and can also be used on computer-to-plate (CTP) technology that creates a printing plate directly from a computer.



■ Dyes for life science use

Certain functional dyes are known to be medicinal and/or bioactive. Some dyes are used in cell staining and have fluorescent properties. Hayashibara is exploring new applications utilizing these properties and developing new materials for application in the medical and pharmaceutical fields.

Hayashibara's commitment to ensure quality and safety in manufacturing

Hayashibara strives continuously to provide customers with quality assurance, safety and security through continuous improvement of production and quality control.

The technical department and each manufacturing plant work together and strive to gain the trust and satisfaction of customers at all times by improving manufacturing technology and implementing appropriate operation of quality control system.

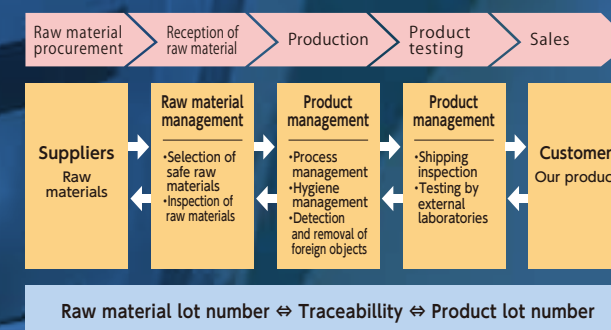


Okayama Plant I



Since it industrialized the enzymatic production method of glucose from starch in 1959 for the first time in the world, Hayashibara has been manufacturing various carbohydrates using enzymes or microorganisms. Hayashibara manufactures its original range of products in an efficient way using a wealth of experience and manufacturing know-how, accumulated over the years. Fujita Plant, where functional dyes are manufactured, produces a wide variety of fine chemical ingredients specifically catering to customer's needs using synthesis technology developed through manufacturing photographic sensitizing dyes for over 70 years.

Hayashibara strives to improve the quality of its products, by implementing ISO 9001, to enhance customer satisfaction, which is the basis for company-wide quality control. FSSC 22000 certification, a certification scheme recognized by the Global Food Safety Initiative (GFSI), has been obtained for Hayashibara's signature product, TREHA, manufactured at Okayama Functional Saccharide Plant. Hayashibara is committed to quality control at other food plants, which is also in compliance with FSSC 22000. Operations at Okayama Plant II and Fujita Pharmaceutical Plant, where pharmaceutical products and excipients are manufactured, are in compliance with GMP standards.



Hayashibara has a system that allows it to immediately check the history of information ranging from raw materials to its manufacturing to its logistics. Reinforcement of the quality assurance system for the entire supply chain is assured by conducting various inspections at each process, controlling the work environment, and reviewing and strengthening work regulations thoroughly.



Hayashibara ensures necessary approvals and licenses are obtained and comply with laws and regulations in each country/region for overseas expansion. To cater to the needs of customers at home and abroad, we have obtained Kosher and Halal certifications, and other certifications related to natural and organic ingredients, such as COSMOS certification.

Hayashibara's commitment to provide solutions to customers

When Hayashibara introduces its original ingredients to customers, it provides them with technical know-how using various data to ensure its effective usage. Hayashibara is engaged in manufacturing ingredients on a daily basis that helps customers resolve their issues and leads to improving product appeal.



Hayashibara hosts lectures conducted by top experts invited from various fields as well as technical seminars serviced by Hayashibara technical staff members at many different locations. Hayashibara has eight sales offices in Japan and has a system that allows it to carefully respond to the demands of customers.



Hayashibara assigns its sales staff to major overseas regions. Hayashibara, in collaboration with overseas subsidiaries of the NAGASE Group, provides customers with technical support and information by focusing on market research that helps to cater to the dietary culture of each region.



Hayashibara implements application development and trial production using its own products, also works on developing recipes and solving technical issues. In addition, Hayashibara has laboratories for trial production in two prefectures, Okayama and Tokyo, and provides customers with opportunities to observe trial productions and participate in tastings, and provide feedback.



Hayashibara provides a wide range of information by creating a website for our products, a dedicated website for our signature product TREHA, collection of various recipes, guidebook, etc. Also, Hayashibara has an e-shop where consumers can buy its products directly.



Food Ingredients web (Japanese)



TREHA™ web (Japanese)

Introduction to NAGASE Group

NAGASE & CO., LTD. is a chemical trading firm, founded in Kyoto, Japan in 1832. The NAGASE Group began as a specialized sales agent securing exclusive contracts to sell industry-leading products from around the world in Japan. Over the years, we have leveraged our technology and information gathering expertise-as well as our global network-to transform our business into a hybrid model offering superior manufacturing, processing, and R&D functions as well as trading company services.

Today, Nagase owns about 100 group companies around the globe distributing valuable products such as resins, functional polymers, plastic products, electronic materials, functional food and pharmaceutical ingredients, and intermediates.

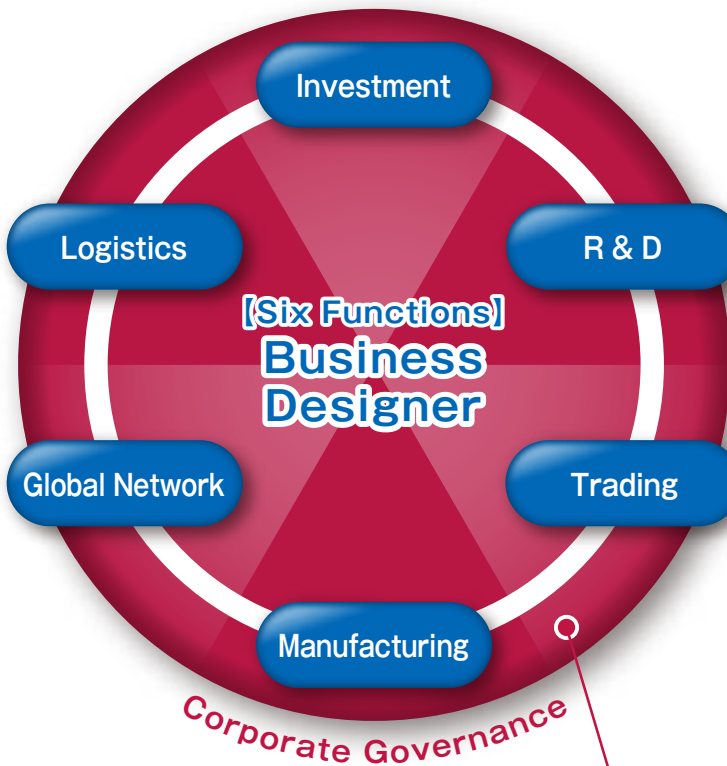
In partnership with their customers, the NAGASE Group will realize a sustainable world where people live with peace of mind, each of us embodies our value proposition, Identify, Develop and Expand through daily activities.



A Unique Business Model that Extends Beyond the Traditional Trading Firm Framework

While trading is the historical foundation of NAGASE, today it is part of a team that interactively functions with production, research and development, global networking, logistics, and investments. United as a whole, NAGASE Group aspires to create and share the new value with the world.

We contribute to creating a sustainable world where people live with peace of mind.

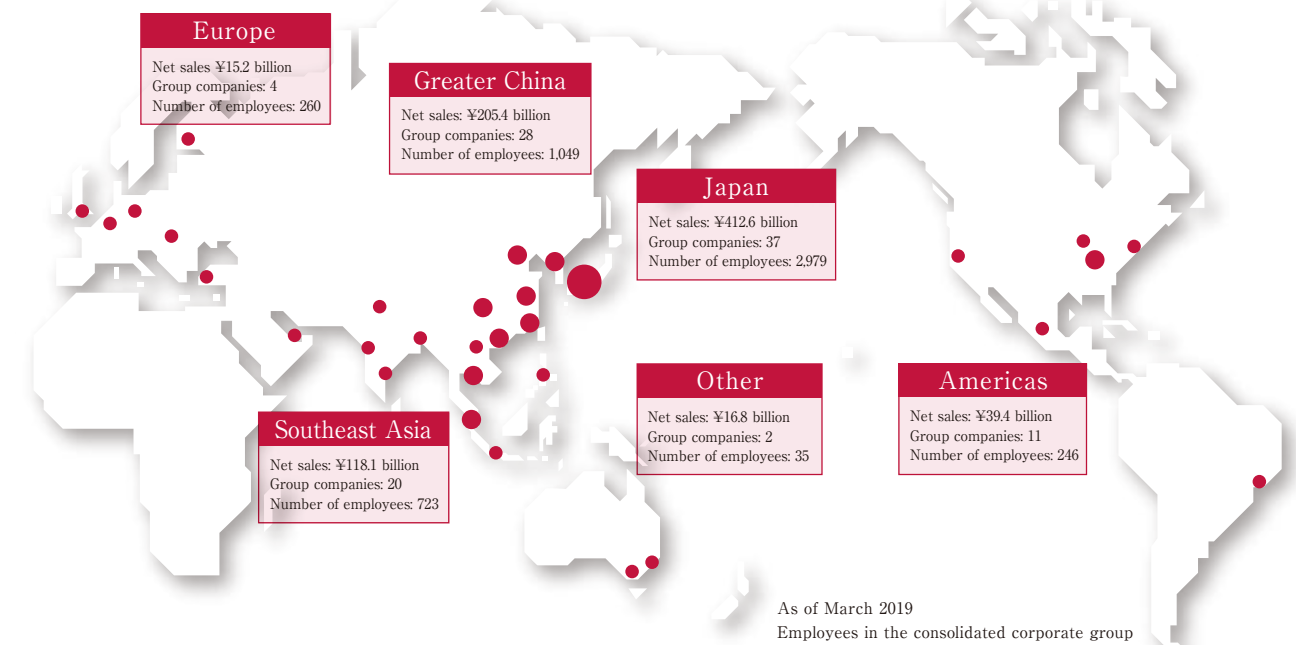


5 segments of NAGASE Group

<div style="border: 1px solid black; padding: 5px; background-color: #0056b3; color: white; font-weight: bold; margin-bottom: 5px;">Functional Materials</div> <ul style="list-style-type: none"> ● Performance Chemicals ● Speciality Chemicals 	<div style="border: 1px solid black; padding: 5px; background-color: #0056b3; color: white; font-weight: bold; margin-bottom: 5px;">Advanced Materials & Processing</div> <ul style="list-style-type: none"> ● Colors & Advanced Processing ● Polymer Global Account 	<div style="border: 1px solid black; padding: 5px; background-color: #0056b3; color: white; font-weight: bold; margin-bottom: 5px;">Electronics</div> <ul style="list-style-type: none"> ● Electronics
<div style="border: 1px solid black; padding: 5px; background-color: #0056b3; color: white; font-weight: bold; margin-bottom: 5px;">Mobility & Energy</div> <ul style="list-style-type: none"> ● Mobility Solutions ● Energy 	<div style="border: 1px solid black; padding: 5px; background-color: #0056b3; color: white; font-weight: bold; margin-bottom: 5px;">Life & Healthcare</div> <ul style="list-style-type: none"> ● Life & Healthcare Products ● Beauty Care Products 	

NAGASE Group Network

NAGASE Group owns about 100 manufacturing, processing, and sales facilities in Japan and around the world. Our network works closely with customers to meet their needs.



NAGASE & CO., LTD.

Founded	June 18, 1832	Capital	¥9,699 million
Established	December 9, 1917	Net Sales	¥807.7 billion (2019/3)
Representative	Representative Director and President Kenji Asakura	Number of Employees	851 (Consolidated: 6,143)
Tokyo Head Office	5-1, Nihonbashi-Kobunacho, Chuo-ku, Tokyo 103-8355 TEL : +81-3 (3665) 3021	Main Business	Import/export and domestic sales of dyestuffs, chemicals, plastics, machinery, electronics materials, cosmetics and health foods
Osaka Head Office	1-1-17 Shinmachi, Nishi-ku, Osaka City, Osaka 550-8668 TEL : +81-6 (6535) 2114	Stock Exchange Listings	First Sections of the Tokyo Stock Exchange

<https://www.nagase.co.jp/english/>



(As of March 31, 2019)

Hayashibara's Vision

Hayashibara continues to innovate new and original materials with our advanced biotechnology.

Hayashibara continues to be a challenger who pursues infinite possibilities of enzymes and microorganisms, which are "gifts" from the earth.

Each day, we make endless and repetitive efforts believing that our technology will enrich everyday life for all.

Under NAGASE Group's management philosophy, which is "to maintain good and fair business practices,"

Hayashibara will continue to develop its business on a global scale.

Representative Director and President Naoki Yasuba



NAGASE Management Philosophy

We recognize our responsibility to society and offer beneficial products and services while maintaining the highest standards of integrity. Through our growth, we will contribute to society and enrich the lives of our employees.

Hayashibara's Goals

Technology	Through our continuous efforts to exceed our own unique expertise, we aim to become a world leader in carbohydrate chemistry in the area of biotechnology.
Market	We will flourish together with our customers by providing high functional carbohydrates that accommodates demands and trends in the market.
People	We will provide a place to realize dreams and ideals and contribute to the health and well-being of people around the world.

Corporate Profile

(As of April 1, 2019)

Company Name	Hayashibara Co., Ltd.	Capital	¥500 million
Founded	1883	Net Sales	¥25.4 billion (2019/3)
Established	July 10, 1932	Shareholder	NAGASE & CO., LTD. 100%
Representative	Representative Director and President Naoki Yasuba	Number of employees	652
Headquarters	Nihon-Seimei Okayama Bldg. II Shinkan 1-1-3 Shimoishii, Kita-ku, Okayama 700-0907, JAPAN	Main Business	Development, manufacture and sales of food, pharmaceutical, cosmetic and health food ingredients, and functional dyes.

◎Sales Offices

Tokyo Branch

Nagase Sangyo Tokyo Honsha East Bldg. 2F
12-15 Nihonbashi-Kobunacho, Chuo-ku,
Tokyo 103-0024, JAPAN
TEL:+81-3-6661-7203 FAX:+81-3-6661-7204

Osaka Branch

Nagase Sangyo Bldg. 6F
1-1-17 Shinmachi, Nishi-ku, Osaka
550-8668, JAPAN
TEL:+81-6-6537-9003 FAX:+81-6-6537-9006

Sapporo Sales Office

Sapporo Aoba Bldg. 7F
6-15-1 Minami-1 jo nishi, Chuo-ku,
Sapporo 060-0061, JAPAN
TEL:+81-11-271-2372 FAX:+81-11-271-1973

Sendai Sales Office

Mitsui Sumitomo Insurance Bldg. 3F
2-5-27, Ichibancho, Aoba-ku, Sendai
980-0811, JAPAN
TEL:+81-22-266-3939 FAX:+81-22-266-3959

Niigata Sales Office

Toshin Niigata Bldg. 5F
1-1-22 Benten, Chuo-ku, Niigata
950-0901, JAPAN
TEL:+81-25-246-6090 FAX:+81-25-246-6085

Nagoya Sales Office

Nagase Sangyo Bldg. 5F
3-14-18 Marunouchi, Naka-ku, Nagoya
460-0002, JAPAN
TEL:+81-52-963-5656 FAX:+81-52-963-5657

Okayama Sales Office

525-3 Kuwano, Naka-ku, Okayama
702-8002, JAPAN
TEL:+81-86-274-7301 FAX:+81-86-274-7302

Fukuoka Sales Office

GSI Hakataekihigashi Bldg. 7F
3-1-10 Hakataeki-higashi, Hakata-ku,
Fukuoka 812-0013, JAPAN.
TEL:+81-92-473-8693 FAX:+81-92-441-3484

We contribute to community culture by supporting operation of the Hayashibara Museum of Art.

Hayashibara Museum of Art website



Hayashibara Museum of Art

Nearly 9,000 oriental antiques and furnishings from the Okayama Han Ikeda clan were collected by Ichiro Hayashibara.

The Hayashibara Museum of Art's inventory includes priceless swords, arms, armor, paintings, writings, Noh masks and costumes, lacquerware, mother-of-pearl, gold lacquer, ceramics, and metalwork. These historically significant objects were collected from the Okayama Han Ikeda Clan, and private collection of late Ichiro Hayashibara, a businessman in Okayama, Japan. The museum uses these items for its themed exhibits, and also holds special showings of art from other museums.



Entrance of the museum

Main collection



Set of bridal furniture with colored shellfish from the Okayama Clan 17th century (Important Cultural Properties)



Portrait of Ikeda Tsuneoki 18th century



Armor owned by Ikeda Tsunamasa 17th-18th century

Dagger (Tanto), (Meibutsu:Kuki Masamune) by Daimyo Kuki Clan (National Treasure) 14th century

◎R & D Facilities



Fujisaki Institute



Functional Dyes Unit



Okayama Laboratory, L'Plaza



Tokyo Laboratory, L'Plaza

◎Manufacturing Facilities



Okayama Plant I



Okayama Plant II



Okayama Functional Saccharide Plant



Fujita Plant



Fujita Pharmaceutical Plant

TREHA, SUNMALT, Ascofresh, AA2G, Tornare, HALLODEX, Coupling Sugar, LUMIN and Fibryxa are registered trademarks or trademarks of Hayashibara.

Picture of Hon'ami Kosu (P1): provided by TV-Setouchi Create Co., Ltd.