



# Lallemand Health Ingredients

## Product Portfolio and Main Applications





## Lallemand Health Ingredients (LHI)

At LHI we specialize in value-added precision fermentation, to create ingredients and solutions for use in the dietary supplements market. Our yeast products are from *Saccharomyces cerevisiae*, also known as baker's yeast. They include whole cell yeast products such as Lalmin® vitamin and mineral enriched yeast which are naturally abundant in protein, fiber, choline and B-vitamins.

We also offer M-Gard® yeast beta-glucan, Gastro-AD® fermented soy postbiotic for heartburn, Veri-te™ resveratrol, and other molecules from fermentation which have proven health benefits. We continue to expand our product portfolio to bring new market solutions in collaboration with our partners.

## Environment, Social & Governance (ESG)

At Lallemand, we believe that microbial solutions can contribute towards several of the most pressing challenges we collectively face today, including enjoying a healthier life, developing sustainable energy sources, ensuring biodiversity, feeding the planet, and tackling climate change.

Furthermore, we are strongly convinced that our core focus on microorganisms will become even more relevant as our contribution to these objectives increases over time.

We are in an industry of the future, one whose possibilities seem endless. Indeed, the indispensable role of microbes in the production of food and alcohol continues to fascinate and attract interest, while over the past decades, the benefits of microorganisms for human, animal and plant health have increasingly come to the forefront.

Supported by our long experience in these fields, our vision is to be one of the leading actors in microbial solutions, specialized in growing selected microorganisms and bringing to the market both traditional and innovative offerings for our clients and partners.

## INFO

### Lallemand Health ingredients are :

- Vegan
- Suitable for plant-based foods
- Gluten-free
- GMO-free
- NGP-verified
- Clean label
- Available as organic
- Kosher and Halal certified

\*Scan QR code on back cover to access the e-brochure with links to videos.

## Our facilities

Lallemand has production plants, distribution centers, and offices located in over 50 countries across 5 continents. Lallemand Health Ingredients are produced in facilities dedicated to inactive yeast and yeast fractions in 6 different countries. Thanks to this global network, we are able to serve our customers worldwide and create innovative products and solutions with the highest standards of quality, reliability and flexibility.

**Virtual tour of Salutaguse, Estonia\***



### Headquarters: Lallemand Bio-Ingredients Inc. Montreal, Quebec Canada

Biotec BetaGlucans  
Tromsø, Norway

Lallemand Inc.  
Tara, Ontario  
Canada

Lallemand Inc.  
Cornwall, Ontario  
Canada

Lake States Yeast LLC  
Rhineland, Wisconsin  
United States

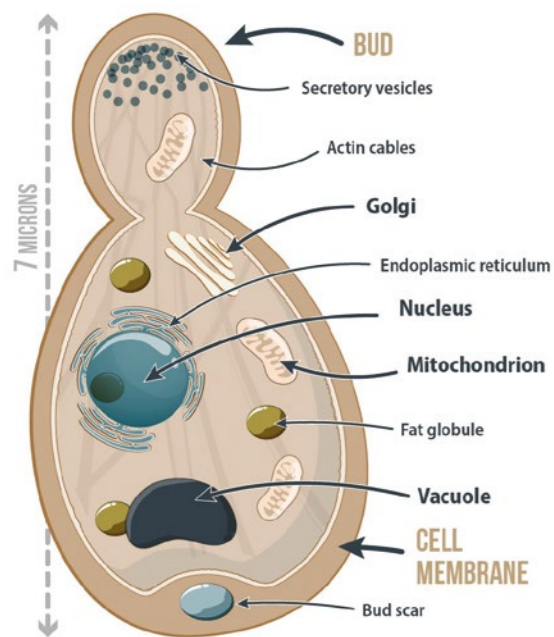
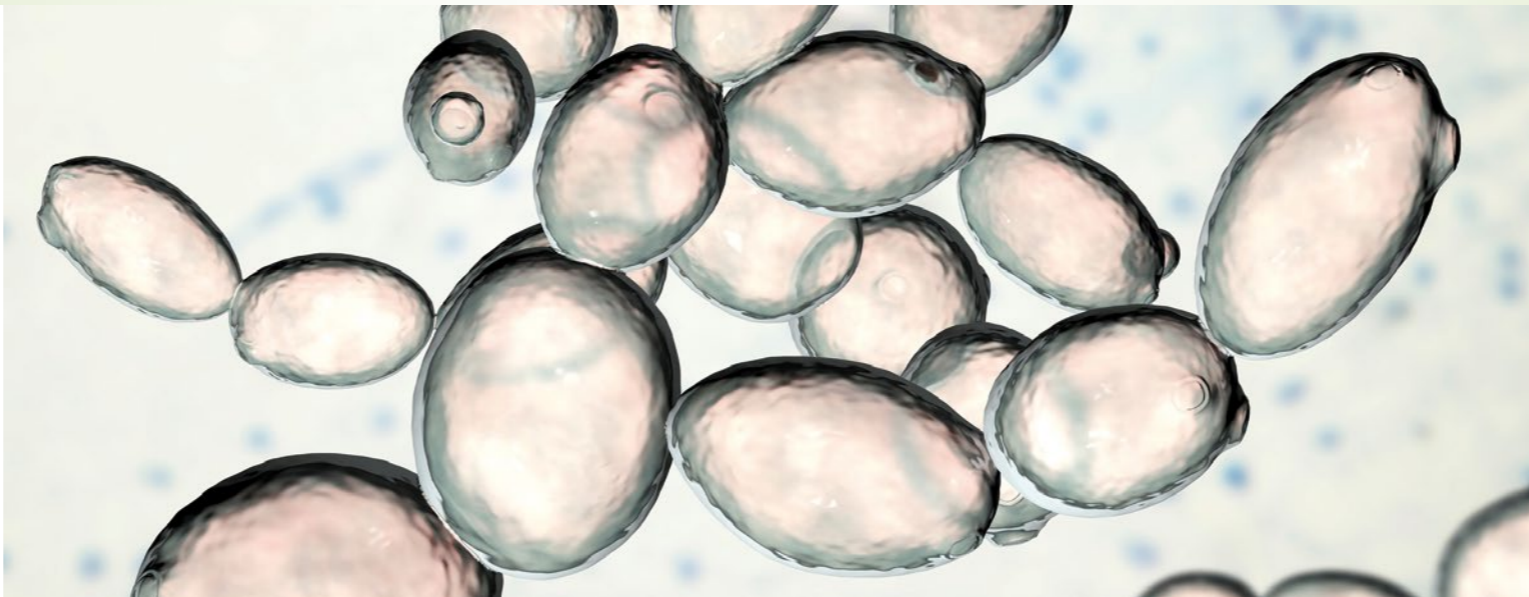
Evolva  
Basel, Switzerland

Minnesota Specialty Yeast LLC  
Hutchinson, Minnesota  
United States

Lallemand S.A.S.  
Toulouse, France

De Danske Gaerfabrikker A/S  
Grenaa, Denmark

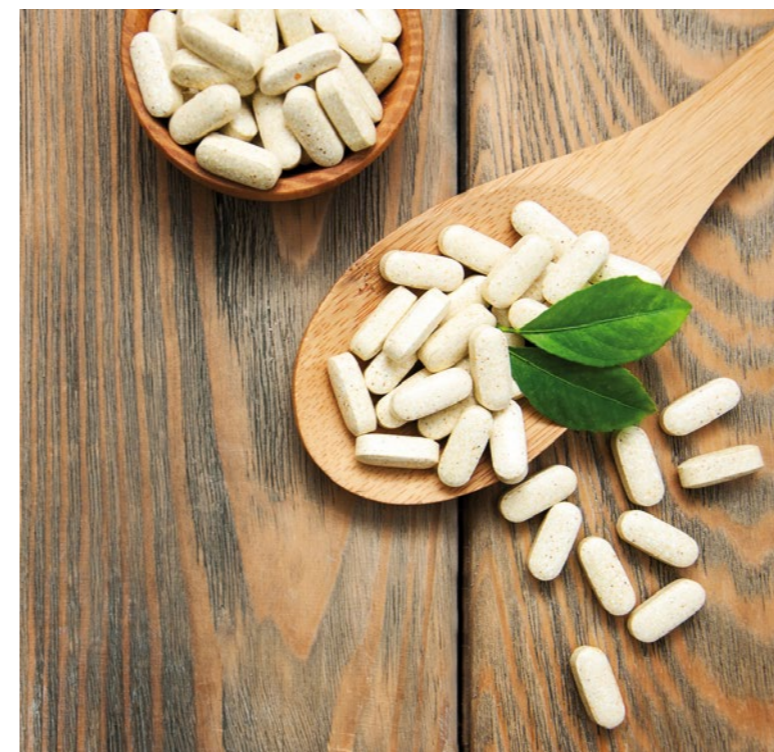
De Danske Gaerfabrikker A/S  
Lunderskov, Denmark A.S. Salu-  
taguse Pärmitehas  
Salutaguse, Estonia



## What is yeast?

Yeast is a eukaryotic, single-celled microorganism with a nucleus, in which genetic material is contained by a membrane. It belongs to the fungus kingdom and is the oldest domesticated organism we can find. The first records of any kind of bread and brewing were found in ancient Egyptian hieroglyphics approximately 5000 years ago. Yeast consumption as a health supplement was first promoted in the 1930s. It is also considered a source of single-cell protein, delivering a complete protein containing branched chain amino acids.

Primary grown *Saccharomyces cerevisiae*, also called baker's yeast, is yeast grown in a controlled environment, for a specific use, instead of derived as a by-product of brewing or distilling. It contains 45-60% high quality protein, 15-25% fiber, beta-glucan, manno-oligosaccharides and other components for nutrition and health. It is low in fat, sodium and sugar and is a natural source of B-vitamins, choline, glutathione and nucleotides.



## Yeast – sustainable and plant-based

Although not biologically classified as plants, fungi- and algae-based products are usually included in the definition of plant-based foods. Active yeast (*S. cerevisiae*) is used for a wide range of applications such as baking, brewing, distilling and industrial fermentation. Inactive yeast provides tasty nutrition and can be used as a dietary supplement.

The whole yeast cell can be separated into valuable fractions, such as cell walls and yeast extracts. Inactive yeast extracts are used for

savory flavors. Molecules such as beta-glucan, for health applications, can be isolated from the cell walls.

Yeast production is environmentally sustainable. It is grown, or fermented, on molasses, the byproduct of sugar production. After fermentation and yeast separation, the leftover material can be used as organic fertilizer. Water used in facilities during the production steps can be treated, purified, and reintroduced into the environment.





# Lalmin®

Lalmin® mineral and vitamin yeasts are whole food fermented, then inactivated whole cell yeast products containing standardized amounts of specific vitamins and/or minerals. They are produced by enhancing and converting natural vitamins in the yeast during fermentation or by supplementing natural yeast with standardized levels of vitamins or minerals. Lalmin® products are suitable for tablets, gummies, hard capsules, beverage mixes, energy bars and many other applications.

## LALMIN® B COMPLEX VITAMINS

B-complex vitamins play important roles in red blood cell production, energy metabolism, the synthesis and repair of DNA and RNA, and carbohydrate, protein and fat metabolism. They also support a healthy nervous system and can be important in the maintenance of healthy skin and muscle tone.

## LALMIN® CHROMIUM (Cr)

Chromium is a component of Glucose Tolerance Factor (GTF) and supports normal glucose metabolism through improved insulin sensitivity. Our recent studies show that chromium is organically bound to the yeast.

## LALMIN® COPPER (Cu)

Copper helps to maintain connective tissue, protect DNA, proteins and lipids from oxidative damage, and maintain normal functioning of the nervous system.

## LALMIN® IODINE (I)

Iodine is critical for normal thyroid hormone production, which directly affects energy metabolism. It is also important for normal functioning of the nervous system and cognitive processes.

## LALMIN® IRON (Fe)

Iron supports the formation of red blood cells and their ability to transport oxygen throughout the body, thereby reducing tiredness and fatigue and improving cognitive function. Our recent studies show that most iron is organically bound to the yeast.

## LALMIN® MAGNESIUM (Mg)

Magnesium contributes to electrolyte balance, affecting neurotransmission and muscle contraction, including heart muscle contraction. Adequate levels of magnesium are essential for the absorption and metabolism of vitamin D and calcium therefore supporting healthy bones and teeth.

**Video: Introduction to vitamin D yeast\***



**Video: Health benefits of vitamin D yeast\***



## LALMIN® MANGANESE (Mn)

Manganese is an essential trace element required for the activity of several enzymes used for maintenance of bones and connective tissue, and protects cells from oxidative stress.

## LALMIN® MOLYBDENUM (Mo)

Molybdenum is an essential trace element and contributes to normal sulphur amino acid metabolism (methionine, cysteine, homocysteine, and taurine).

## LALMIN® SELENIUM (Se)

Lalmin® Selenium is a safe form of this essential mineral containing elevated levels of organically bound selenium in its most bioavailable natural form: selenomethionine. *Saccharomyces cerevisiae* yeast can convert more than 99% of toxic, inorganic selenium into its safest, organically bound food forms. Up to 95% of organically bound selenium can be easily absorbed by the body.

Supplementation with selenium yeast may prevent some forms of cancer and supports brain health, thyroid health, immunity and fertility.

## LALMIN® VITAMIN D

Vitamin D regulates calcium absorption and stimulates mineralization of bone and teeth. Deficiency is associated with cardiovascular disease, hypertension, stroke, diabetes, multiple sclerosis, rheumatoid arthritis, inflammatory bowel disease, osteoporosis, periodontal disease, macular degeneration, asthma, mental illness, propensity to fall, and chronic pain.

*Saccharomyces cerevisiae* naturally converts ergosterol (endogenous to yeast) into ergocalciferol (vitamin D2), a vegan source of vitamin D.



## LALMIN® ZINC (Zn)

Zinc supports maintenance of bone, skin, hair, and nails. It strengthens the immune system and is important for normal vision and reproduction. Our studies show that zinc is organically bound to the yeast.

## Lalmin® Customized Solutions

Lalmin® Customized Solutions offer ready-to-go combinations of vitamins, minerals, and other fractions from whole food cultured yeast. These combinations may be used as-is, or as the base of a custom formulation for natural, vegan and gluten-free dietary supplements. Products include Lalmin® Beauty, Lalmin® Combi, Lalmin® Detox, Lalmin® Immune PRO, Lalmin® Senior and Lalmin® Vitality & Sport.

**Video: Introduction to selenium yeast\***



**Video: Lalmin® Immune Pro**





## M-Gard® supports your immune system

Every day your immune system is under attack from millions of pathogens, such as bacteria, viruses, fungi etc. A strong immune system is what keeps you healthy. Small changes in health such as increased pollution, excessive mental or psychological stress, excessive physical stress or poor diet can lower immune resistance and tip the scales in favor of pathogens.

M-Gard® helps support healthy immune function, in a variety of different situations. Studies have demonstrated that M-Gard® can:

- Strengthen the immune system
- Enhance protection against pathogens
- Protect during periods of excessive stress
- Promote healthy inflammatory responses
- Support respiratory health

M-Gard® is produced under pharmaceutical GMP, in the world's northernmost beta-glucan production facility above the arctic circle, in Tromsø, Norway. The product is the outcome of first-class scientific efforts combined with extremely high Norwegian quality standards.

### New clinical study

Our new clinical trial will be a randomized, placebo-controlled study examining the effect of yeast beta-glucan supplementation on the immune response following vaccination for influenza virus. Beta-glucan has been shown to enhance the immune response in cell cultures, animal models, and humans. Older adults receiving the influenza vaccination supplemented with beta-glucans may benefit from a better immune response.

Available products

### M-Gard® Particulate EW

A multi-functional, particulate ingredient concentrate with a beta-glucan content of at least 80% is perfectly fit for dietary supplement or functional food applications.

**Video: M-Gard® yeast beta-glucan for immune support\***



**Video: Video: How does M-Gard® work?**



## Gastro-AD®

### Fermented soy postbiotic for natural digestive support

Gastro-AD®, is a unique fermented non-GMO soy product, clinically proven to treat gastric upset and complications from excess stomach acid. It is a food supplement produced from the fermentation of soy by our proprietary *Lactobacillus* strain, R0187. It has been studied in over 800 people and proven to be very well tolerated. Gastro-AD® is a safe, natural and effective option to support stomach acid balance, and digestive upset, without side effects. It contains no synthetic ingredients and is available as a powder, suitable for chewable tablets, dispersible sachets and other delivery systems.

**Video: Introduction to Gastro-AD®\***



### Mechanism of action

To date, Gastro-AD® has three identified mechanisms of action: buffering of stomach acid, suppression of gastric acid secretion and a beneficial effect on the immune system.

A recent analysis of metabolites in Gastro-AD® identified a number of biologically active molecules, including genistein, lunasin and formate. Immunomodulation by lunasin and genistein leads to reduced gastric inflammation. Formate causes a reduction in the expression of proton pump transporter proteins, thereby reducing acid secretion into the stomach. The presence of this combination of metabolites helps to explain the clinical outcomes of reduced gastric pain and discomfort seen in previous Gastro-AD® studies.

**Video: Gastro-AD® as a postbiotic**





## Veri-te resveratrol supporting healthy living

Resveratrol is a polyphenol that is naturally produced by grapes, blueberries and other plants as a defense mechanism against harsh growth conditions and pathogens.

Veri-te is from a natural fermentation process. Using Swiss technology, including precision fermentation, it is produced in a sustainable manner and is very consistent in quality.

With more than 18,000 published studies and over 270 human clinical trials, resveratrol is considered one of the most well-investigated compounds applied in dietary supplements, food and beverages, cosmetics and animal health. This published research and clinical data suggests that resveratrol can be a key ingredient for healthy living.

### How does resveratrol work? Beyond an antioxidant

As our bodies combat daily stress or age, mitochondrial function can become slowly compromised leading to impairment in many bodily functions including blood pressure, attention and concentration, skin health, bone and joint health, and other areas.

Veri-te clinically supported health benefits:

Veri-te™ resveratrol is a branded, high-purity ingredient (> 98% trans-resveratrol) backed by proprietary clinical studies. We continue to invest in human clinical studies to contribute to the expanding body of evidence that resveratrol supports healthy living.

The latest research highlights that not only does resveratrol act as a very effective antioxidant, but it also exhibits a number of complementary functions on cellular and systemic levels, leading to an plethora of beneficial health effects. Ultimately, resveratrol can potentially help rejuvenate the mitochondria and counteract the negative effects of stress and aging.

#### Bone Health

- Supports bone mineralization and formation
- Complements other bone supporting supplements

#### Cognitive Function

- Improves mood, well-being and pain perception
- Enhances ability to maintain memory, alertness and concentration

#### Cardiovascular Health

- Supports blood circulation and healthy blood pressure
- Improves vascular system and maintains healthy cholesterol and lipid levels

#### Oral Health

- Promotes gum and oral health due to anti-inflammation properties
- Prevents chronic bad breath based on selective anti-bacterial activity

#### Skin Health

- Protects skin from oxidative stress and inflammation
- Improves skin elasticity and hydration, reduces the appearance of age spots and wrinkles

#### Healthy Gut Microbiota

- Preserves healthy gut bacteria with selective anti-bacterial activity
- Helps soothe inflammation of the intestine

#### Eye Health

- Promotes normal blood flow and oxygen delivery
- Helps protect retinal cells from the aging processes and environmental stressors like UV-light

#### Blood Glucose Support

- Triggers cellular blood glucose (energy) uptake
- Supports healthy fasting and post-meal blood glucose level

#### Women's Health

- Improves general well-being and quality of life in post-menopausal women
- Supports cognitive health and healthy cerebrovascular function



## Resveratrol is a holistic ingredient with complementary functions:

- 1. Antioxidant capacity** – it scavenges reactive oxygen species
- 2. Activates AMPK (Adenylate Monophosphate Kinase)** – this activates proteins which regulates glucose (energy) uptake
- 3. Activates SIRT1 (Transcription factor, which turns on gene expression)** – this regulates stressors associated with longevity and healthy aging
- 4. Vasoactive** – increases blood flow, delivering more oxygen and nutrients

### INFO

**Veri-te™ resveratrol can be formulated into multiple applications including:**

- Tablets
- Liquid Shots
- Softgels
- Instant Powder Beverages
- Functional Beverages
- Gel Sachets
- Film Strips
- Chocolates
- Chewing Gum

## Engevita® Bio-Engevita®

### Engevita® Premium Nutritional Yeast

Nutritional yeast (“nooch”) is the original health food, and Engevita® premium nutritional yeast has been enjoyed by consumers since the 1950s. Inherently rich in complete protein and fiber, as well as significant amounts of vitamins and minerals, Engevita® also contains naturally high levels of choline, an essential nutrient necessary for good liver and skeletal muscle health. These products are available as powder or flakes and suitable for plant-based food and supplement applications.

#### BIO-ENGEVITA®

Organic certified, primary grown inactive nutritional yeast.

#### ENGEVITA® IMMUNE

Unique product formulated to be a rich source of immune-supporting ingredients. It is abundant in selenium, vitamin D2, zinc and M-Gard® yeast β-1,3/1,6-glucan. Selenium and vitamin D2 are essential for proper functioning of the immune system, zinc has powerful antioxidant activity, yeast beta-glucan keeps the immune system primed for quick defense against pathogens.

#### ENGEVITA® GARLIC PARMESAN STYLE FLAKES

A delicious umami burst of savory garlic and rich parmesan cheese flavors united with the natural goodness of premium nutritional yeast flakes. A sustainable source of alternative protein.

#### ENGEVITA® GOLD

Rich in B-complex vitamins, with a nutty, roasted flavor. Additional riboflavin (vitamin B2) provides a vibrant golden color.

#### ENGEVITA® GSH

Naturally high in glutathione, a powerful antioxidant known as “The Master Antioxidant”. Engevita® GSH is also naturally rich in B-vitamins and contains high quality proteins.

#### ENGEVITA® HIPRO

A high quality, high protein source that is vegan, soy-free and gluten-free. As such, it has a wide variety of food and health applications. Yeast protein is a complete protein containing all essential and branched-chain amino acids. Contains minimum 55% protein.

#### ENGEVITA® TOASTED

Slightly yeasty with a mild toasted and savory flavor. Suitable to eat directly or to add to snacks, meals and recipes for added nutrition.

#### ENGEVITA® VEGEFIT

Designed to complement a vegetarian diet, supplying a good source of vegan vitamin D, vitamin B12 as well as other B-vitamins and zinc.

#### ENGEVITA® VEGEVITA / VEGEREGIME

Designed to complement a vegetarian diet, supplying vitamin B12 as well as all other B-vitamins and zinc.







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Digital Brochure



LALLEMAND BIO-INGREDIENTS