

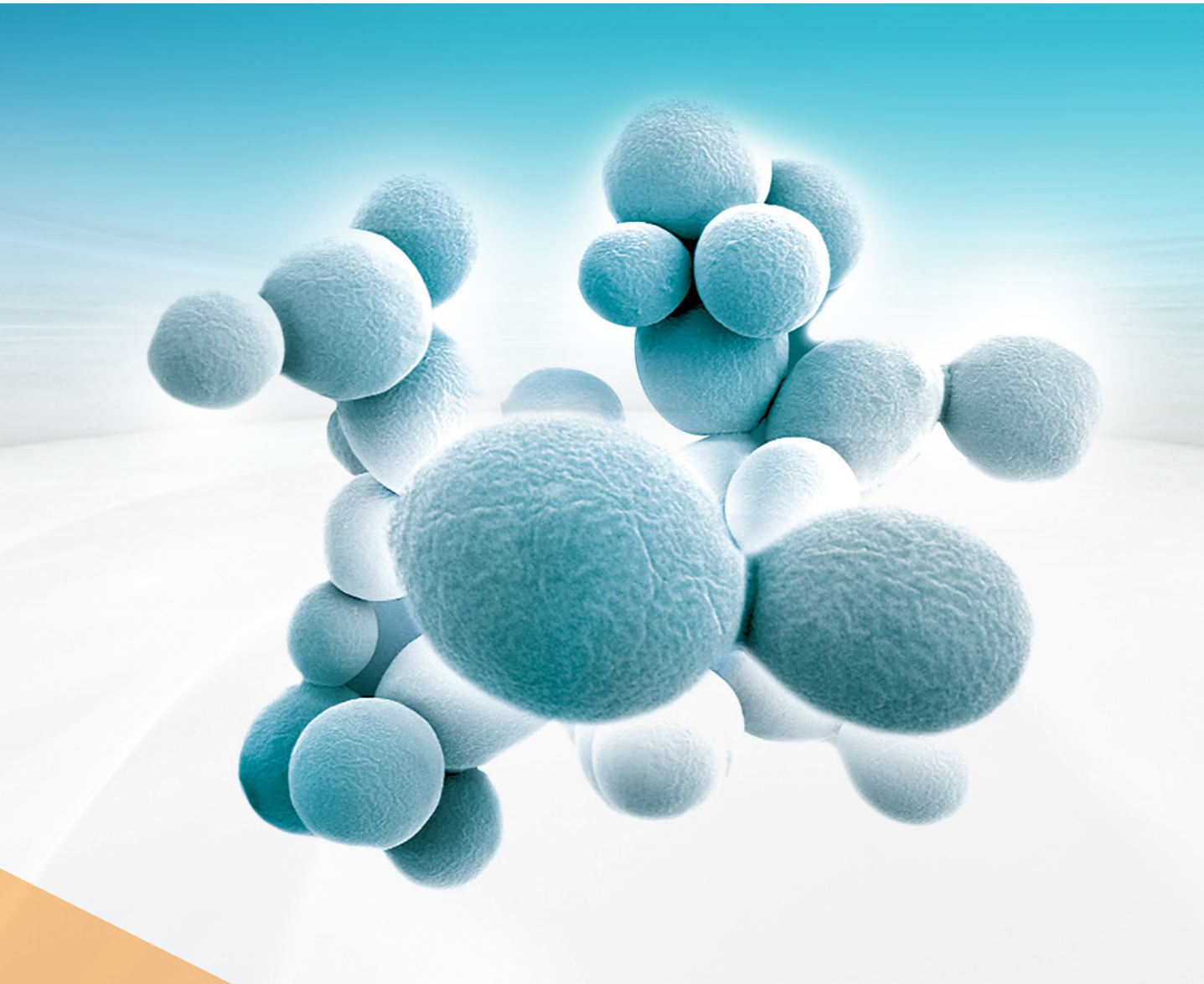


Lallemand's *S. boulardii* yeast probiotic: Time-tested for digestive health and beyond



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Introduction

Saccharomyces boulardii was first identified by French biologist Henry Boulard in 1920 after he observed that certain locals in Southeast Asia did not develop diarrhea during a cholera outbreak. These healthier individuals drank a tea made from lychee and mangosteen skins, from which Boulard isolated *S. boulardii* as the responsible agent¹. The probiotic yeast still is mainly known as a digestive health ingredient,² but researchers also have highlighted immunity³ and skin health benefits.⁴

Now, Lallemand Health Solutions offers both conventional and certified organic versions of this probiotic yeast for use in foods, supplements, and as a pharmaceutical ingredient. This report details how best to formulate with *S. boulardii*, its documented benefits, and market opportunities.



Probiotics market overview

Interest in gut health is on the rise for digestive benefits and beyond. More than two-thirds (68%) of consumers recognise the link between good gut health and overall health,⁵ and half of probiotic users specifically aim to support their digestive health.⁶



Probiotics remain the best-recognised ingredients for digestive wellness, and in the European Union (EU) alone, sales of probiotic supplements, probiotic yoghurt and sour milk products reached a value of \$10.2 billion in 2019, far outstripping sales of other gut health ingredients, such as prebiotics and fibre, according to the International Probiotics Association (IPA) Europe.⁷ In the US, Mintel research suggests nearly three in five adults aim to eat foods that contribute to a healthy gut, especially as new research increasingly draws links between digestive health and overall health, including immune health, metabolic health, and even neurobehavioral traits.⁸

In the Asia-Pacific region, the market for probiotic products is small but growing fast, with a 23% increase in the number of new foods, drinks, and supplements carrying digestive health claims in the past five years.⁹ Still, only 2% of all new products in the APAC region hold such a claim.¹⁰

"I anticipate gut health will remain among the top trends and shouldn't be overlooked," said Romane Maillet, product manager of Lallemand Health Solutions' gut health portfolio.¹¹ "Everything connects to the gut, from the immune system in the gut-associated lymphoid tissue to the 500 million neurons constituting the enteric nervous system."

From a labelling perspective, companies should bear in mind that while the phrase "gut microbiome" is widely used in the food and nutrition sector, it is still not well-known among consumers.¹² Just one in five worldwide say they are familiar with the term – and even fewer in Europe, where only one in ten consumers say they have heard of the gut microbiome.¹³ For consumers, terms like gut health and digestive health are more familiar, but there are still regulatory restrictions in various markets about how such benefits can be communicated.¹⁴

The documented benefits of *S. boulardii*

S. boulardii has been the subject of more than 100 clinical studies and has been used for digestive health for decades. It is tolerant to acidic environments, survives and thrives at body temperature, and is unaffected by antibiotic intake.¹⁵

Its main benefits are for digestive health, but it also has immune¹⁶ and skin health benefits.^{17 18}

"Probiotics are known to maintain gut barrier integrity, which helps support everyday gut comfort, occasional constipation, and irritable bowel syndrome (IBS)-like symptoms," said Mailliet¹⁹. "A converging body of scientific evidence suggests probiotics promote digestive comfort and gut transit in all healthy population groups, from babies to pregnant women to older adults."

The use of *S. boulardii* is evidence-based for both efficacy and safety for periods of occasional diarrhea due to temporary lifestyle or environmental changes as well as other gastrointestinal discomforts.

It works through three distinct mechanisms of action: the luminal effect; the trophic effect; and the immunomodulatory effect²⁰. *S. boulardii* may compete with opportunistic bacteria attachment, interact with native microbiota, and help maintain normal short chain fatty acid levels.²¹ *S. boulardii* may also contribute to normal immune functions such as helping to increase antibody production and contributing to the body's natural defense.²²

For skin health, studies have suggested beneficial results for adults with imperfect skin,^{23 24} and research also suggests a role in immune support.²⁵





Certified organic *S. boulardii*

Lallemand has recently launched an organic version of its *S. boulardii* probiotic yeast.²⁶ As yeast is a plant fungus belonging to vegetal land, rather than a bacteria, it can grow from agricultural nutrients, and , it is the only probiotic ingredient available with organic certification, bringing additional benefits and consumer trust.²⁷ Indeed, 48% of global consumers say they are willing to pay more for certified organic products most or all of the time,²⁸ while 37% say an organic claim is important to them when buying nutritional supplements.²⁹

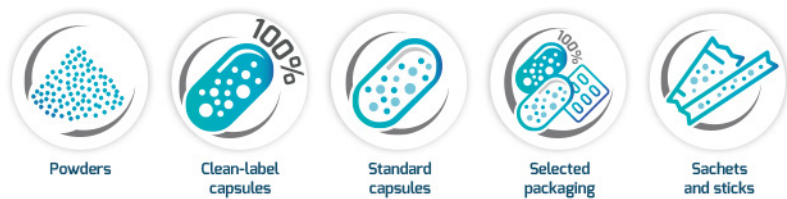
The certification process follows European organic regulation and is ensured through a third-party verification programme.

“Lallemand Health Solutions is proud to be offering this exclusive innovation. We have revamped this classic probiotic yeast to meet modern market trends”, said Maillet.³⁰

Formulating with *S. boulardii*

Lallemand Health Solutions' *S. boulardii* is manufactured in a Good Manufacturing Practices (GMP) certified plant, and is available in various formats:

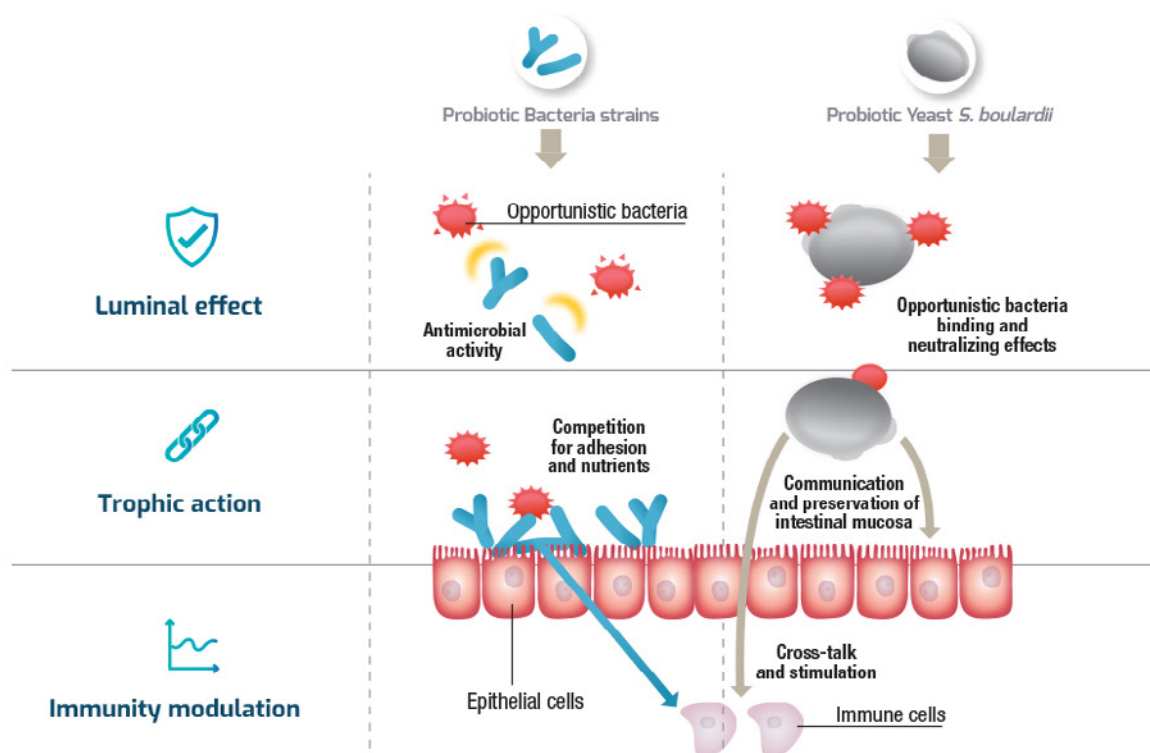
- Pure organic bulk powder for use in organic dietary supplements, with an expected shelf-life stability of 24 months at 25° Celsius.
- Traditional (non-organic) bulk powder for use in dietary supplements or in pharmaceutical applications, with a three-year shelf-life.
- 100% pure *S. boulardii* capsules, which are clean-label and excipient-free and come in selected final packaging such as semi-finished or finished product. They come in two sizes, either 5 billion or 10 billion CFU per capsule.
- Soluble and flavoured orodispersible formula in sachets and sticks for those aged six months and over.



In combination with probiotic bacteria

S. boulardii may also be used in conjunction with probiotic bacteria for added health benefits, as the microorganisms have different modes of action. Bacteria, mainly from the *Lactobacilli* and *Bifidobacteria* species have been used as probiotics in conjunction with *S. boulardii* for decades, and in pre-clinical studies have shown promising results for digestive health.³¹ Their actions are complementary, thereby bringing additional benefits, including for immune health or skin health. Combination with prebiotic fibres may also promote microflora balance.³²

According to Maillet, "Lallemand has particular expertise in yeast production and our strength is to combine and understand both worlds to bring additional complementary effects."³³



Adapted from Keesidis, 2012

Global health claims

S. boulardii is approved and sold in more than 100 countries worldwide, but the claims that companies can make about its health benefits vary depending on the region.

North America

The Canadian market is among the most open to specific claims regarding *S. boulardii*, and Health Canada has approved the following (NPN 80021796 & 80038395) :

- Provides intestinal comfort in travellers
- Helps to reduce the risk of traveller's diarrhea
- Helps to reduce the risk of antibiotic-associated diarrhea
- Helps to prevent antibiotic associated diarrhoea in adults
- Helps to prevent antibiotic associated diarrhoea in acute infections diarrhoea in children
- Helps prevent antibiotic associated diarrhea
- An adjunct to physician supervised antibiotic therapy in patients with *H. pylori* infection
- An adjunct to physician supervised antibiotic therapy in hospitalized patients with *C. difficile* infections/ CDAD

In the US, the following claims are permitted:

- Promotes digestive health
- Supports gastrointestinal comfort
- Populates the gut with friendly microorganisms
- Balances intestinal microflora
- Supports a healthy immune system
- Maintains natural defenses



Europe

The European market has been notoriously strict on the issue of health claims, and the European Food Safety Authority (EFSA) considers even the word 'probiotic' itself to be an implied health claim³⁴.

EFSA so far has considered almost 400 health claims related to probiotics and has rejected all but one³⁵, which links live cultures in yogurt or fermented milk with improved lactose digestion³⁶.

However, there are exceptions to the rule in individual countries. Most recently, in January 2023, France authorised the use of the word 'probiotic' on food supplements, as long as they are safe, used in recommended quantities, and labelling and communication is limited to their effect on the balance of intestinal flora³⁷.

In 2012, Italy was the first country in Europe to allow companies to use the word probiotic on products.³⁸ It stated that since EFSA considered the balance of the intestinal flora was not a health effect, then probiotics could be regulated according to their specific conditions of use.³⁹ Other countries have followed suit with this approach, namely Spain, the Czech Republic, Denmark, and the Netherlands.

In those countries where even the term 'probiotic' is disallowed, specifying 'living yeast' or naming *S. boulardii* itself on-pack are other practical options for manufacturers, considering that it is already widely recognised.⁴⁰



About Lallemand: A trailblazer in fermentation for food and health

Lallemand is a family-owned pioneering Canadian company with roots dating back to the end of the 19th century. It has an established history and exceptional reputation as a global leader in microbial fermentation, using yeast, bacteria and their derivatives for food, health, and agricultural applications, reaching hundreds of thousands of consumers every day. Lallemand owes its present success to its 5,000 dedicated and passionate employees who now operate at 48 sites on four continents.

A global leader of the probiotic industry

As one of Lallemand's business units, Lallemand Health Solutions is a global multinational company recognised as a vertically integrated lab-to-shelf leader in the manufacturing of probiotic yeast and bacteria-based formulas for human health supplements, for food applications, and nutricosmetics. Lallemand Health Solutions' documented probiotics deliver gut, immune, metabolic, mental, skin, oral, and women's health benefits. Its manufacturing processes adhere to the highest quality standards and it runs an ambitious research programme, providing distributors probiotic strains that enhance life in countless ways. Over 600 Lallemand Health Solutions probiotic formulas are currently marketed in over 60 countries across five continents.

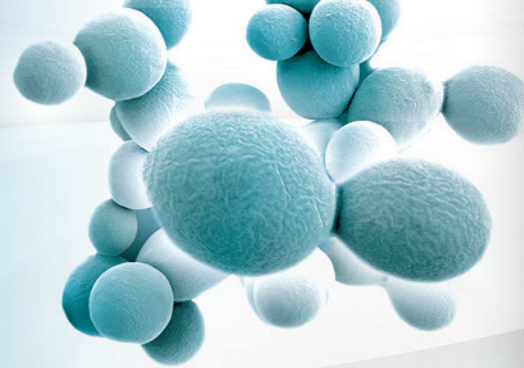




Key takeaways

- Interest in ingredients for digestive wellness is expanding
- Consumers are gaining awareness of the benefits of a healthy gut beyond digestive health
- *S. boulardii* has about 100 years of history of use
- It is the only probiotic available with organic certification
- *S. boulardii* is well-documented as a digestive wellness ingredient
- A growing body of research links *S. boulardii* with immune and skin health benefits
- It may also be used in conjunction with other probiotics for complementary effects
- Marketing opportunities include using approved health claims in the US and Canada, and ingredient is already well-known, allowing a simple *S. boulardii* label to imply benefits
- Lallemand's long history in microbial fermentation and global reach make it a highly reputable partner for companies looking to use probiotics like *S. boulardii* in their new product development

ORGANIC *S. BOULARDII*
A PROBIOTIC BREAKTHROUGH
BY LALLEMAND



Saccharomyces boulardii
Since 1923

100%
Pure ingredient

100
YEARS OF
EFFICACY
Science-based

100+
Clinical trials

A New Milestone Has Been Reached
in 2023

with the
**1st Organic
Probiotic Yeast**



**A Classic Strain Revamped to Meet Modern
Market Trends**

Organic *S. boulardii* is a unique health solution offered in exclusivity by Lallemand. This innovative positioning for a classic probiotic creates new opportunities for consumers willing to make conscientious buying choices.

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