



NUTRITION AND HUMAN HEALTH

Yeast is a powerful ally to support the everyday health of humans. As such, it is an essential tool in the service of a global health thanks to its beneficial role on microbiota.



ROLE OF YEAST

→ *S. boulardii*

- 1. Improvement of the intestinal barrier:** strengthens the intestinal barrier, with an antagonism effect against pathogens⁽¹⁾.
- 2. Reduction of gut inflammation:** thanks to its anti-inflammatory properties, it helps reduce inflammation in the intestine, such as Crohn's disease and ulcerative colitis.
- 3. Immune support:** about 70% of the immune system resides in the intestine. *S. boulardii* helps balance the gut microbiota, thereby strengthening the immune response. It can also positively influence the production of immunoglobulins.
- 4. Prevention of intestinal disorders:** used in more than 90 countries to prevent and treat various gastrointestinal disorders such as antibiotic-associated diarrhoea and traveller's diarrhoea.

→ *S. cerevisiae*

- 1. Beneficial Health Effects on digestive comfort:** intestinal pain, bloating and regulation of transit as well as protective properties for vaginal flora.
- 2. Nutritional Yeast:** dried and inactivated *S. cerevisiae* is rich in macronutrients, providing essential amino acids. *S. cerevisiae* is particularly rich in B-vitamins, such as B1, B2, B3, B5, B6, B7, B9, and B12 when fortified.
- 3. Vitamin and Mineral Yeast:** can be added to any food as flakes or powder, enriched, fortified (with added vitamins and minerals) or unfortified. *S. cerevisiae* produces vitamin D2 when exposed to UV light, making it a safe, vegan source of vitamin D. During fermentation, it can be supplemented with vitamins (such as B-vitamins) and/or minerals (selenium, iron, and zinc).

4. Other Yeast Cell Components

- Beta-1,3-/1,6-glucan is a complex polysaccharide found in the cell walls of *S. cerevisiae*. It strengthens the immune system⁽²⁾ and may support cancer treatments⁽³⁾.
- Mannan-oligosaccharides (MOS) are short chains of mannose that are known to confer health benefits when ingested. These prebiotics with bio-active properties support microbiome balance.
- Glutathione plays a crucial role in the cellular response to oxidative stress thanks to its ability to eliminate free radicals. It can also stimulate other defence processes.
- Choline (formerly classified as B-vitamin) plays an essential role for liver, muscle, brain function, lipid metabolism, cellular membrane composition, and prenatal health.

(1) Pais P, Almeida V, Yilmaz M, Teixeira MC. *Saccharomyces boulardii*: What Makes It Tick as Successful Probiotic? J Fungi (Basel). 2020
 (2) Stier, H., Ebbeskotte, V. & Gruenwald, J. Immune-modulatory effects of dietary Yeast Beta-1,3/1,6-D-glucan. Nutr J 13, 38 (2014).
 (3) Vlassopoulou et al. Effects of fungal beta-glucans on health – a systematic review of randomized controlled trials. Fonction alimentaire. , 2021, 12 , 3366-3380

NUTRITIONAL ASPECTS PER 100G

Nutrient	Amount per 100g (Dry Matter)
Energy	1610 kJ
Fat	6% ± 2%
Carbohydrates	15% ± 9%
Fiber	28% ± 5%
Protein	50% ± 9%
Potassium	0.6% - 2.5%
Sodium	< 1%
Calcium	0.02% - 0.15%
Magnesium	0.03% - 0.25%
Zinc	>0.005% (>50 ppm)
Iron	0.001% - 0.1%
Vitamin B1	2 - 15 mg/100g
Vitamin B2	6 - 8 mg/100g
Vitamin B6	2 - 6 mg/100g
Folic Acid	2 - 4 mg/100g
Niacin (Vitamin PP)	10 - 60 mg/100g
Biotin	0.05 - 0.25 mg/100g



KEY DATA

Yeast has a very high nutritional value

Source: DIN specification "Characteristics of Fresh and Dry Baker's Yeast", DIN Spec 91473



SPECIES OF YEAST USED

Two species of yeast are mostly used for applications in nutrition and human health:

- ***S. boulardii***: As early as 1953, the probiotic yeast, *S. boulardii*, was marketed as a medicine to prevent acute diarrhoea. Since then, this microorganism has been considered in more than 100 clinical studies analysing its benefits for gastrointestinal health, leading to good digestive and immune health and therefore, general well-being.
- ***S. cerevisiae***: commonly known as baker's yeast, it can be consumed in its whole form as nutritional inactivated yeast or vitamin and mineral fortified or enriched inactivated yeast. Components of the *S. cerevisiae* cell wall and cytosol offer a variety of proven health benefits⁽⁴⁾. Recent research has shown that certain strains are also qualified as a probiotic microorganism.



A SHORT HISTORY

- ***Saccharomyces cerevisiae var boulardii (S. boulardii)*** was discovered by French microbiologist Henri Boulard in 1923 in Southeast Asia. During a cholera epidemic, he noticed that people drinking a mixture of lychee and mangosteen peels did not develop diarrhoea. He isolated a yeast strain from these peels, named *Saccharomyces boulardii*, marking the birth of the first probiotic yeast.
- ***Saccharomyces cerevisiae (S. cerevisiae)***: extensively used in bakeries and breweries, recent reports also highlight its health benefits, including anti-infective properties, antioxidant activities, and other probiotic-related effects.



PROSPECTS AND INNOVATIONS

Yeast Microbial Consortia

- ***S. boulardii***: Research continues to explore new applications for *S. boulardii*. Beyond the intestine, clinical studies have shown its effectiveness in the case of skin imperfections.
- ***S. cerevisiae***: Research on *S. cerevisiae* cell wall components include potential bowel transit benefits from mannan-oligosaccharides, possible synergy of yeast beta-1,3/1,6-glucan with respiratory vaccines, and iron yeast benefits for female athletes⁽⁵⁾.

(4) Lesage, G., and H. Bussey. "Cell Wall Assembly in *Saccharomyces Cerevisiae*." *Microbiology and Molecular Biology Reviews*, vol. 70, no. 2, 1 June 2006.

(5) Gemilang Lara Utama, et al. "Potential Application of Yeast Cell Wall Biopolymers as Probiotic Encapsulants." *Polymers*, vol. 15, no. 16, 20 Aug. 2023.