



➔ Product Review ➔

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A NEW ADDITION TO THE MOSS NUTRITION PROFESSIONAL LINE – SACCHAROMYCES BOULARDII

As the vast majority of you are probably well aware, one of the most clinically versatile and popular probiotic supplements has been ***Saccharomyces boulardii*** (*S. boulardii*). As its popularity has grown however, so has its availability on the Internet. Therefore, in response to your requests, we are now making a very high quality *S. boulardii* product. This product, as with all products in the **Moss Nutrition Professional** line, is covered by our strictly enforced True Market Protection policy. (Please refer to the policy-mailing that was sent earlier this month.)

Of course, one of the reasons that *S. boulardii* is so popular is the significant number of clinical papers that have been published about it over the last 10–20 years. Interestingly, a search for “*saccharomyces boulardii*” on PubMed demonstrated that, even though a large amount of papers have been published in the past, more recent papers continue to be released. One of the more recent ones that piqued my curiosity is “Efficacy and safety of the probiotic *saccharomyces boulardii* for the prevention and therapy of gastrointestinal disorders” by Kelesidis and Pothoulakis (Kelesidis T. & Pothoulakis C. *Ther Adv Gastroenterology*, Vol. 5, No. 2, pp. 111–125, 2012). While the paper did feature discussions on the clinical entities for which administration of *S. boulardii* has attained such a good reputation over the years such as antibiotic-associated diarrhea, *Clostridium difficile* infection, acute and persistent diarrhea, what really impressed me about the paper was its extensive listing of the clinically beneficial metabolic properties of the organism that have been pointed out in various published reports.

Therefore, I would like to devote the majority of this product newsletter to a discussion of the vast array of reported positive metabolic properties seen when this amazingly versatile organism is administered.

Concerning the authors’ discussion on the mechanism of action of *S. boulardii*, it is divided into three parts: (1) Luminal action; (2) Trophic action on the intestinal mucosa; and (3) Regulation of immune response.

1. Luminal action

“A) Antimicrobial activity

- 1) **Inhibition of growth of bacteria and parasites**
- 2) **Reduction of gut translocation of pathogens**
- 3) **Neutralization of bacterial virulence factors**
- 4) **Suppression of host cell adherence that interferes with bacterial colonization**

B) Antitoxin effects

- 1) **Inhibition of toxin receptor binding sites**
- 2) **Stimulation of antibody production against *Clostridium difficile* toxin A**
- 3) **Direct proteolysis of the pathogenic toxins/Secretion of enzymatic proteins**
 - a) **Produces a serine protease that cleaves *C. difficile* toxin A**
 - b) **Produces 63 kDa phosphatase that destroys the endotoxin of pathogenic *Escherichia coli***
 - c) **Produces a 120 kDa protein that reduces the effects of cholera toxin**

C) Cross-talk with normal microbiota

When *S. boulardii* is given to antibiotic-exposed mice or patients with diarrhea, normal microbiota is re-established rapidly.”

2. Trophic action on the intestinal mucosa

- 1) “Reduces the number of infected cells and stimulates the growth and differentiation of intestinal cells in response to trophic factors
- 2) Prevents apoptosis and synthesis of TNF α
- 3) Reduces mucositis
- 4) Restores fluid transport pathways
- 5) Stimulates protein and energy production and restores metabolic activities in colonic epithelial cells
- 6) Secretes mitogenic factors that enhance cell restitution
- 7) Enhances release of brush-border membrane systems
- 8) Stimulates the production of glycoproteins in the brush border
- 9) Stimulates production of intestinal polyamines
- 10) Restores normal levels of colonic short chain fatty acids (SCFAs)
- 11) Stabilizes gastrointestinal barrier function and strengthens enterocyte tight junctions
- 12) Reduces crypt hyperplasia and cell damage in colitis models
- 13) Decreases intestinal permeability in Crohn’s disease patients”

3. Regulation of immune response

A) “By acting as an immune stimulant

S. boulardii effects on innate immunity

- 1) Triggers activation of complement and migration of monocytes and granulocytes
- 2) Enhances the number of Kupffer cells in germfree mice

S. boulardii effects on adaptive immunity

- 1) Enhances the mucosal immune response and secretory IgA intestinal levels
- 2) Enhances systemic immune response and levels of serum IgG to *C. difficile* toxins A and B
- 3) Contributes to earlier production of IFN- γ and IL-12
- 4) Stimulates regulatory T cells
- 5) Inhibits dendritic cell-induced activation of T cells
- 6) Modifies migration of lymphocytes in a chronic inflammatory bowel disease model
- 7) Modifies lymphocyte adherence to endothelial cells, improves cell rolling and adhesion

B) By reducing pro-inflammatory responses and promoting mucosal anti-inflammatory signaling effects

- 1) Decreases expression of pro-inflammatory cytokines (IL-8, IL-6, IL-1 β , TNF- α , and IFN- γ)
- 2) Increases expression of the anti-inflammatory cytokine IL-10
- 3) Interferes with NF- κ B-mediated signal transduction pathways, in immune and colonic epithelial cells
- 4) Blocks activation of ERK1/2 and MAP kinases
- 5) Decreases NO and inhibits production of inducible NOS
- 6) Modulates T cell migratory behavior and increases trapping of T helper cells into mesenteric lymph nodes
- 7) Stimulates production of anti-inflammatory molecules in human colonocytes such as PPAR- γ ”

As I mentioned in the beginning of this commentary, I would assume that many, if not most of you, are familiar with the incredible utility and versatility of *S. boulardii* supplementation. Now, hopefully, you have a better idea of why that is so.

S. BOULARDII FROM MOSS NUTRITION – DOES IT NEED REFRIGERATION?

Certainly the biggest controversy concerning the different *S. boulardii* products on the market relates to shelf life and the need for refrigeration. As you will see in the enclosed technical bulletin, according to the manufacturer’s specifications, this freeze-dried product is quite stable at room temperature for a significant period of time. However, given that this supplement is composed of living organisms, time, temperature and humidity will take their toll. Therefore, to maximize viability at the time you receive the product, Moss Nutrition receives and stores each bottle in refrigerated conditions. Furthermore, based on need related to the time of year and the locale in which you reside, our *S. boulardii* product can be shipped in a freezer bag with a cold pack.

Moss Nutrition - *Saccharomyces boulardii*

Item # M040

Contents: 60 Vegetarian Capsules

Item # M059

Contents: 120 Vegetarian Capsules