

# Bio.Revive™ Beta Immune +

Immune support with fermented Beta glucans

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Nutritional Information	Per Dose	
Actives	1 capsule	NRV%*
BGF Immune® (providing 1,3 Beta Glucans)	350mg	†
Vitamin A   2,000 IU (as Retinyl Palmitate)	600µg RE	75%
Vitamin D3   1,000 IU (vegan) (as Cholecalciferol)	25µg	500%
Zinc (as Zinc Bisglycinate)	20mg	200%
*NRV = Nutrient Reference Value		
† = Nutrient Reference Value not established		
<b>Other Ingredients:</b> Capsule Shell: Hydroxypropyl Methylcellulose		

Bio.Revive™ Beta Immune + contains the vitamins and minerals required to support the production of non-specific immunoglobulins, and for the health of the innate immune response of the epithelial lining.

Stress, food intolerances, chronic bacterial infections, auto-immune diseases and chronic inflammation can all reduce the body's first line of defence. Anti-microbial peptides such as beta-defensins, lysosymes, and non-specific antibodies such as secretory immunoglobulin A (sIgA) are produced in the epithelial lining of mucosal membranes, before being transported to, and residing in, the mucus lining. Together, they provide a physical and immune cell-rich first line of defence against invasion.

## Bioactives

### BGF Immune ® (providing 1,3 Beta glucans)

Beta glucans are naturally occurring polysaccharides that are found in the cell walls of bacteria, fungi, yeasts, algae, lichens, and plants, such as oats and barley. They have been shown to have strong immunostimulant and immunomodulatory effects in humans.

The linkages, or chemical bonds, between the polysaccharides within the beta glucan are important for their immune effects. Beta glucans with 1 a (1→3) β - linkages have been shown to be the most immunostimulant in their effect<sup>2</sup>. The main structural component of BGF Immune® is a linear β-Glucan with a (1→3)- β-D-glucose backbone produced by fermentation.

Beta glucans are considered to be strong activators of cellular immunity, with macrophages being the main target. Many models of infection have shown an improved immune response against infection<sup>1</sup>. Beta glucans have been shown to increase host immune defences by activating the complement system, enhancing macrophages and natural killer cell function through activation of several cell surface receptors.

Beta glucans have also received much research and attention for their anti-tumour properties, and as a fibre that reduces cholesterol absorption from the gut<sup>1</sup>. Their immunomodulatory impact is systemic. Beta glucans are also prebiotic in nature, and have been shown to have an impact on *Lactobacilli* species growth<sup>3</sup>

In a trial of 77 children with chronic lung conditions, 100mg of beta glucans was shown to stabilise secretory immunoglobulin A sIgA (against the control group in which sIgA continued to decrease)<sup>4</sup>. In murine models of induced inflammatory bowel disease, beta glucans reversed the impact on T-reg cells and a dysfunctional immune response<sup>5</sup>.

BGF Immune® is produced in a solvent-free production process and is Kosher & Halal and is Non-GMO Project Verified.

### Vitamin A, Vitamin D3 and Zinc

Vitamin D3 and vitamin A perform many important roles in regulating and protecting the GI epithelial cell layer and the homeostasis of the mucosal barrier, as well as the innate and adaptive immune response<sup>6,7</sup>. Zinc participates as a co-factor in many enzymatic reactions in the body, and it plays a role in maintaining immunity, reproduction, skin health, neurotransmitter function, and epithelial health.

Vitamin A is an important nutrient for the regulation of immunity and the health of mucus membranes. Children with vitamin A deficiency have higher rates of diarrhoeal infections, lung infections and of mortality from diseases such as measles<sup>8</sup>. Vitamin A is associated with lower levels of *Giardia* infection in children<sup>7</sup>. Vitamin A also plays an important role in immune function, lung development, reproductive function and eye health<sup>9</sup>. Vitamin A is required to transport secretory immunoglobulin A (sIgA) across into the mucosal barrier<sup>10</sup>. Deficiency of vitamin A and vitamin D reduce natural killer cell (NK cell) function<sup>11</sup>.

Several epidemiological studies have shown that vitamin D insufficiency has a strong correlation with a wide range of pathological conditions associated with immune dysfunction including inflammatory, autoimmune, metabolic and gut disorders<sup>12</sup>. Vitamin D deficiency is found in 82% of IBD patients, compared to the 31% national average, and has been linked to defective epithelial processes<sup>11</sup>.

Both vitamin A and vitamin D help to preserve the tight junctions and function in the epithelial cells<sup>13</sup>. A deficiency of both vitamins has been shown to increase gut permeability, increase low-grade inflammation in the gastrointestinal tract and increase translocation of LPS into the blood stream, causing metabolic endotoxemia<sup>7,14</sup>. Vitamin D3 supplementation has been shown to reduce zonulin release, which is a protein that opens the tight junctions of epithelial cells<sup>15</sup>.

Zinc deficiency has been shown to cause diarrhoea and mucosal barrier dysfunction, and can lead to an increased risk of gastrointestinal infectious diseases<sup>16</sup>. Zinc supplementation improves intestinal barrier function, intestinal permeability, nitrogen absorption, and increases immune responses<sup>11,16</sup>.

### References

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