

Consumer leaflet

Please read this leaflet carefully because it provides important information. Immulina Plus Liquid is a dietary supplement, sold in pharmacies and health food shops without prescription. According to Directive 2002/46/EC of the European Parliament and of the Council of 10 June 2002 “the labelling of a dietary supplement must not attribute to it the property of preventing, treating or curing a human disease, or refer to such properties”.

Immulina[®] *plus*

Dietary Supplement
Liquid for Children
Boosts the Immune System

Composition: given for 2.5 ml, the minimum daily dose:

Ingredient Name	Amount [mg]	% DRV
<i>Spirulina</i> Extract (LCEPEEN)	50	–
Acerola Extract (<i>Malpighia glabra</i>) providing	40	–
25% C vitamin	10	33%
β -1-3/1-6-D glucan baker's yeast derived	37,5	–
Zinc (as zinc gluconate)	2,5	38%

1.7 g sucrose providing 6.9 kcal (29.0 kJ) 0.5% DRV.

DRV – Dietary Reference Values

All DRV figures for children above 3 years of age

Composition: given for 10 ml, the maximum daily dose:

Ingredient Name	Amount [mg]	% DRV
<i>Spirulina</i> Extract (LCEPEEN)	200	–
Acerola Extract (<i>Malpighia glabra</i>) providing	160	–
25% C vitamin	40	133%
β -1-3/1-6-D glucan baker's yeast derived	150	–
Zinc (as zinc gluconate)	10	154%

6.8 g sucrose providing 27.5 kcal (115.9 kJ) 2% DRV.

DRV – Dietary Reference Values

All DRV figures for children above 3 years of age

Accessory ingredients: Purified Water, Sugar, Soybean Hemicellulose (E426) natural stabilizer, Cherry Flavour, Potassium Sorbate (E202) natural food preservative.

Direction for use: Shake the bottle thoroughly before each use. To be taken during or after meals. The children older than 1 year: 2,5 ml measure (½ teaspoon), children older than 3 years: 5 ml measure (1 teaspoon). In case of an early infection and/or depressed immune function the dose can be doubled. Do not exceed the recommended daily dose.

Properties and mode of action: Immulina Plus Liquid provides three active ingredients: spirulina extract, yeast extract and acerola extract with proven and a documented beneficial effect on immune system. These actives show synergistic effect¹ enhancing immune system more effectively.

¹ Synergy - joint action of two or more agents (drugs) that, taken together, produce a greater effect than the sum of their individual effects.

Spirulina Platensis Extract: provides the bioactive lipopolysaccharide complex, so called LECPEEN, obtained in a special, patented extraction process. This complex, when taken orally, does not absorb from GI tract and it is phagocytized by macrophages and dendritic cells, so called antigen-presenting cells², causing their stimulation. The stimulated cells migrate to the lymphoid tissue of GI (so called GALT³) and stimulate the whole immune system. Lipopolysaccharide complex obtained from cell wall of bacteria *Escherichia coli*, called endotoxin, is the most powerful immunostimulant traditionally used in laboratories. However, the LPS complex (LECPEEN) in Immulina Plus is 10 times more potent than endotoxin in the activation of macrophages. This is due to the fact that LECPEEN acts through TLR2 receptors while endotoxin acts through TLR4 receptors. The density of TLR2 receptors on dendritic cells is much higher (2.5 times) than that of TLR4 receptors. This may explain the higher potency of LECPEEN.

The preclinical data obtained with LECPEEN indicate that it stimulates first of all cells of the innate immune system. It directly activates cells of the monocyte-macrophage lineage in part via TLR2 and CD14 receptors. In cell culture, THP-1 cells respond to LECPEEN directly with an increased production of cytokines and chemokines. In their activated state, macrophages can destroy bacteria and virus-infected cells. In this state, macrophages also stimulate NK cells through an increased production of cytokines (TNF- α , IL-12 and IL-18). It is by this mechanism that LECPEEN can enhance the activity of NK cells that are key players in the host defence against tumour cells.

Baker's Yeast Extract (*Saccharomyces cerevisiae*) provides β -1,3/1,6-D-glucan is derived from the yeast-cell wall. The most active forms of β -glucans are those comprising D-glucose units with (1,3) links and with side-chains of D-glucose attached at the (1,6) position. These are referred to as β -1,3/1,6 glucan. β -glucans are known as "biological response modifiers" because of their ability to activate the immune system. After it is taken orally, it does not absorb from GI tract and it is phagocytized by macrophages and dendritic cells, so called antigen-presenting cells, causing their stimulation and through them the whole immune system. In several studies it has been shown that β -glucan activates macrophages, NK cells, and increases ability to produce cytokines and complement. Immunologists at the University of Louisville discovered that Complement Receptor 3 (CR3) is responsible for binding to beta-glucans, allowing the immune cells to recognize them as "non-self". Several clinical studies have shown that β -glucan administration significantly reduces risk of infection and infectious complications.

Acerola Fruit Extract (*Malpighia glabra*), so called Barbados cherry, is known for being extremely rich in vitamin C, the highest vitamin C content measured in any fruit. One acerola fruit weighing approx. 4.5 g has as much C vitamin as one kg of lemon fruits. One small glass (180 ml) of acerola juice may contain as much C vitamin as 3.5 gallons of orange juice. It also contains substantial amount of vitamins A, B1, B2 and B3 as well as carotenoids, bioflavonoids and minerals (calcium, phosphorous, iron), which provide very important nutritive value and have antioxidant uses. The C vitamin in acerola fruit is provided in a bioflavonoid complex (together with rutin and hesperidin), which is better absorbed by human organisms than synthetic ascorbic acid. Vitamin C in this complex is also more stable and continuously released that enhances its activity. Moreover, rutin and hesperidin have beneficial influence on immune system and blood vessels. Vitamin C plays many functions in the body i. a. enhances immune system, increases resistance to infection, counteract tiredness and fatigue.

Immulina Plus Liquid is a dietary supplement that strengthens our immune system. Immulina Plus consumption is particularly beneficial for children with a weakened immune system. An impaired

² Antigen-Presenting Cells - (APCs) are cells that display foreign antigen complexes with major histocompatibility complex (MHC - determines compatibility of donors for organ transplant) on their surfaces. APCs are very efficient at internalizing antigen, either by phagocytosis or by receptor-mediated endocytosis, and then displaying a fragment of the antigen, bound to a class II MHC molecule, on their membrane to the other elements of the immune system. There are three main types of antigen-presenting cell: dendritic, macrophages and B lymphocytes.

³ GALT - gut-associated lymphoid tissue and works to protect the body from invasion. The digestive tract is an important component of the body's immune system. In fact, the intestine possesses the largest mass of lymphoid tissue in the human body. The GALT is made up of several types of lymphoid tissue that store immune cells, such as T and B lymphocytes, that carry out attacks and defend against pathogens.

immune system may manifest itself in many ways e.g. proneness to infections or recurrent infections and allergy. Regular usage of Immulina Plus Liquid supports immune system during or after treatment with antibiotics, x-ray-, chemotherapy and in cases of physical exhaustion. It also reduces cold sore recurrence, improves skin condition (in acne), and reduces muscle pain after intensive physical exercise if taken beforehand. It is also helpful in alleviating joint problems.

Zinc (as zinc gluconate) – is an essential element that plays important role in numerous functions of human body. Zinc is also known to play a central role in the immune system, and zinc-deficient persons experience increased susceptibility to a variety of pathogens. The immunologic mechanisms whereby zinc modulates increased susceptibility to infection have been studied for several decades. It is clear that zinc affects multiple aspects of the immune system, from the barrier of the skin to gene regulation within lymphocytes. Zinc is crucial for normal development and function of cells mediating nonspecific immunity such as neutrophils and natural killer cells.

Additional remarks: Do not use if you are allergic to any ingredient. Do not use after expiry date. Consult your health care professional before administrating to children below the age of 1 or to pregnant or nursing women. A dietary supplement cannot be used as a substitute for a varied diet. The product should be stored out of the sight and reach of young children at room temperature and after opening in the fridge. This syrup is a natural product and therefore the taste may vary, and the bottle may contain precipitation, which does not constitute any product fault.

Available packages: bottles containing 100 ml or 250 ml of liquid (suspension).
Manufactured in European Union, phone: +48 550 60 30, Immulina.co.uk
Immulina® is registered trade mark

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