



Product Description

Spirusol

INTRODUCTION

Spirulina is a microalga member of the family of blue-green algae, also known as cyanobacteria.

The name was inspired by the spiral shapes, in which, these microalgae array themselves as they grow.

Spirulina belongs to the *Arthrospira* species, being *Arthrospira platensis* the species that mainly grows in Asia and is marketed worldwide. This microalga is very popular as an ingredient in functional food and drinks, energy bars and food supplements in powder form, tablets and capsules.

Spirulina is used as a nutraceutical ingredient thanks to the presence of a unique combination of phytonutrients such as fibre, plant pigments, polyunsaturated (GLA) acids, galactolipids, sulpholipids, vitamins (B group) and minerals (calcium, iron, magnesium, manganese, potassium and zinc). However, spirulina is consumed mainly for being one of the higher sources of protein containing the 60 - 65% of its dry weight.

Spirulina also contains vitamin B12, an essential vitamin for our body that is scarce in vegetables. It is also an important source of this vitamin for vegan people.

While spirulina has remarkable nutritional and healthy properties, it is essential to note that it belongs to a group of algae, the cyanobacteria, which can produce certain toxins and accumulate contaminant substances, so the health and safety procedures in its production are paramount (see Spirusol Safety section).

BENEFITS FOR HEALTH

Spirulina has been consumed worldwide for long time and, in some countries, and it is an important source of essential nutrients. Thanks to its high protein content, it has become an important ingredient for hyperprotein diets, as well as for sportsmen interested in muscle mass development.

Some studies have shown that the nutritional content of spirulina can help in the treatment of diabetes Type 2 in people with insulin resistance at doses of 2 g of spirulina daily.

In addition to this, spirulina reduces hepatic tri- glycerides in experimental animals with induced diabetes.

In hypercholesterolemic persons, at doses of 4 to 5 g per day, Spirulina has a positive effect in controlling dyslipidaemia, especially in cases of high presence of triglyceride. Studies have shown that reduces triglycerides and raises HDL, which produces a decrease in total cholesterol.

Much of these therapeutic actions are attributed to the presence of different compounds. The natural presence of different pigments, which are not found in other food, means important health benefits beyond the general nutritional support.

For example, the presence of various carotenoids, such as beta- carotene, xanthophyll and zeaxanthin, might play an important role in preventing macular degeneration.

However, the main pigment in spirulina, and unique in cyanobacteria, is phycocyanin.

Phycocyanin has proven to be a potent blocker of free radicals, preventing the peroxidation of lipids, which is the main cause of the destabilization of cell membranes. Furthermore, it prevents oxidation of LDL cholesterol, which is responsible for the atherosclerosis process.

Finally, phycocyanin has shown to increase the expression of essential enzymes in liver and kidney detoxification processes as cytochrome P450, the superoxide dismutase, catalase, and alanine aspartate transaminases.

SUPERFOOD

This term has been used for long time to describe certain foods and ingredients that have to meet two fundamental requirements: be beneficial to health and be safe.

Spirusol can be considered a superfood and a nutritional source of:

- 60 to 65% protein.
- 10 to 15% fibre.
- 20 to 30% complex carbohydrates.
- polyunsaturated fatty acids, with minimum content of 2% omega-6 (linoleic acid and gamma-linolenic acid) and 0.7 to 1% omega-3 DHA.
- 6% of minerals, highlighting phosphorus, magnesium and potassium.
- B vitamins, including folic acid and B12.
- All essential amino acids.

Besides its nutritional value, which makes Spirusol a Superfood, the presence of important pigments concentrations shows a direct action on health. These pigments are:

- 7 to 13% of phycocyanin,
- 1% chlorophyll.
- 5000 mcg carotenoid per gram.
- Around 800 - 2000 mcg of beta-carotene per gram.
- Around 3000 mcg of xanthophylls per gram.
- Around 1200 - 2000 mcg zeaxanthin per gram.

SAFETY

Some kind of cyanobacteria are able to generate toxins that harm aquatic life and, if consumed, they can affect human health. Among these substances are included microcystins which are hepatotoxins and that are produced mainly by the species *Microcystis aeruginosa* and *Microcystis viridis*, and BMAA neurotoxin (ss-N-methylamino-L-alanine).

Despite *Arthrospira plantensis* does not produce these toxins, a study revealed the presence of microcystin in 36 products containing spirulina and marketed in China, so it becomes necessary to control the absence of substance during production of the algae.

Other factors contributing to the presence of harmful substances in spirulina crops are:

- The use of fermented fertilizers from animals.
- Water enrichment with organic material
- Environmental pollution in the culture area, because spirulina can absorb and concentrate heavy metals such as lead and mercury, if these are present in their environment.

In this sense, Spirusol ensures the absence of pollutants because:

- its crops are in remote areas of China, far from any environmental pollution.
- Absence of pesticide or any other biocide used during cultivation.
- Absence of eutrophication of the water in which it grows.
- Controls that show the absence of toxins microcystin, BMAA and contaminants such as heavy metals, benzo-pyrene, aflatoxin and polycyclic aromatic hydrocarbons (PAH).

CONCLUSION

Spirusol is a high quality nutritional and functional Spirulina. It grows in pollution free environments and follows strict quality controls ensuring the absence of

both toxins and contaminants, making Spirusol consumption totally safe.

Spirusol contains a potent blend of antioxidants associated with its pigment content: carotenoids (carotenes and xanthophylls mixture), chlorophyll and phycocyanin (blue pigment).

It is very unusual to obtain phycocyanin in diet due to its small presence in plants, so that 3 g of Spirulina contains about 300 mg of phycocyanin, providing health benefits. For this reason, **Spirusol™** becomes an easier and economic source for obtaining phycocyanin.

To sum up, Spirusol is:

- A superfood for its content of protein, fibre, vitamins (B group) and minerals.
- Rich in antioxidants (because it contains phycocyanin).

It helps to manage human health:

- Diabetes type 2.
- Dyslipidemia.
- Macular degeneration.
- Cardiovascular problems.

DOSE

Research and clinical studies conducted on spirulina show that the recommended dose is between 1 and 8 g daily.

Given the high protein content, it is not recommended for people with liver or kidney failure.

REMARKS

Due to its high protein content, the consumption of spirulina is not indicated to people suffering from liver and/or kidney failure, except if this consumption is controlled under medical advice.

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