

SPIRULINA

Synonym: Blue green algae

- Spirulina is a biomass of Cyanobacteria (blue-green algae) that can be consumed by humans and animals, obtained from the species of *Spirulina platensis*, *Spirulina maxima*, *Spirulina fusiformis* or *Arthrospira platensis*, belongs to the family at Oscillatoriaceae.
- At first it was classified in the genus *Arthrospira*, but later it was placed the genus *Spirulina*.
- The common name, spirulina, refers to the dried biomass of *A. platensis*, which belongs to photosynthetic bacteria that cover the groups Cyanobacteria and Prochlorophyta.
- *A. platensis* occurs in Africa, Asia, and South America, whereas *A. maximum* is confined to Central America.
- Most cultivated spirulina is produced in open-channel raceway ponds, with paddle wheels used to agitate the water.
- Spirulina thrives at a pH around 8.5 and above, which will get more alkaline, and a temperature around 30°C (86°F).
- In 1974, the World Health Organization described spirulina as an interesting food or super food for multiple reasons, rich in iron and protein, and is able to be administered to children without any risk, "considering it" a very suitable food.
- "The United Nations established the Intergovernmental Institution for the use of Micro-algae *Spirulina* against Malnutrition in 2003.
- In the late 1980s and early 90s, both NASA and the European Space Agency proposed spirulina as one of the primary foods to be cultivated during long-term space missions.

Constituents

- Dried spirulina contains 5% water, 24% carbohydrates, 8% fat, and about 60% (51-71%) protein.
- 100 gm amount of spirulina supplies 290 calories and is a rich source (20% or more of the Daily Value, DV) of numerous essential nutrients, particularly protein, vitamins (thiamin and riboflavin, 207 % and 306 % DV, respectively), and dietary minerals, such as iron (219 % DV) and manganese (90% DV).

- The lipid content of spirulina is 8% by weight providing the fatty acids, gamma-linolenic acid, alpha-linolenic acid, linoleic acid, stearidonic acid, eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), and arachidonic acid.
- Spirulina supplements are not considered to be a reliable source of vitamin B as they contain predominantly Pseudo vitamin B₁₂, which is biologically inactive in humans.
- The American Dietetic Association stated that spirulina is not a reliable source of active vitamin D.
- The medical, literature similarly advises that spirulina is unsuitable as a source of B₁₂.

Health food

- Food and Drug Administration (FDA), allows, manufacturers to use Spirulina as a color additive in gum, candy and other packaged foods.
- Spirulina is a microalgae that has been consumed for centuries due to its high nutritional value and supposed health benefits.
- Today, popular lifestyle personalities endorse Spirulina as a secret potent "superfood, and a miracle from the sea.
- Spirulina was once classified as a plant because of its richness in plant pigments as well as its ability of photosynthesis, according to a study published in the journal Cardiovascular Therapeutics.
- People with certain autoimmune conditions should avoid Spirulina supplements, according to the NIH (National Institute of Health).
- Since Spirulina enhances the immune system, Spirulina supplements may worsen symptoms of multiple sclerosis (MS) [A disease in which the immune system eats away at the protective covering of nerves. In MS, resulting nerve damage disrupts communication between the brain and the body], the rheumatoid arthritis and other conditions linked to overactive immune systems.
- Spirulina may also interfere with drugs that slow blood clotting, including blood thinners such as warfarin as well as non-steroidal anti-inflammatory (NSAIDS) pain medications.
- Combination of Spirulina with herbal supplements that slow blood clotting may increase a person's risk of bleeding.
- Such herbs include cloves, garlic, ginger, ginkgo, ginseng and turmeric, according to the NIH.

- Initial research suggests taking spirulina may improve the; weight loss, diabetes, management of blood pressure, cholesterol, risk of heart disease metabolic rate, allergy symptoms, mental health.
- Alongside zinc, spirulina shows promise as a treatment for chronic arsenic poisoning.

Carotenoids

Gold kiwifruit is genetically modified for a high level of ascorbic acid, carotenoids, and Lutein and Zeaxanthin.

Isoprenoid derivatives: Carotenoids, saponins, tocotrienols, tocopherols, simple terpenes.

Carotenoids are a group of photochemical responsible for different colors of the foods. They have antioxidant activities and effective on cancer prevention.

Recent interest in carotenoids has focused on the role of lycopene in human health, especially in cancer disease.

Lycopene is one of the major carotenoids and is found exclusively in tomatoes, guava, pink grapefruit, water melon and papaya.