Chlorella Vulgaris
Related Ingredients: DERMOCHLORELLA, PHEOHYDRANE

Chlorella Vulgaris is a microscopic green algae which appeared on the Earth more than 2 billion years ago. The word Chlorella comes from the Greek chlor which means green and the Latin ella which means tiny.

Synonyms: Chlorella pyrenoidosa, C. regularis, Chlorella

Source: sciencephoto.com
BOTANICAL

Botanical Family: Chlorellaceae

Chlorella is a single celled fresh water green micro-algae, from 2 to 8 µm in size. Its sphere contains a nucleus surrounded by chloroplasts, bound with a cellulosic fibrous membrane. It is dark green due to its high chlorophyll content.

Photosynthesis enables it to reproduce very quickly – once a day, each cell divides into four.

Composition of Chlorella Vulgaris:

- 55 to 60% high quality vegetable protein (including all the essential amino acids and non-essential amino acids).
- Numerous minerals: Iron, Calcium, Magnesium, Potassium, Phosphorous, Sulphur.
- Trace elements: Copper, Manganese, Zinc.
- Vitamins B1, B2, B3 ou PP, B5, B6, B9, B12, C, E (more Vitamin E than in milk). It is one of the plants with the highest Vitamin B12 content.
- Fatty Acids including Omega 3s.
- Micro fibre.
- Pigments and Enzymes:
  - varied carotenoids including provitamin A (beta carotene) and lutein, powerful anti-oxidants;
  - the green pigment chlorophyll (chlorella is the plant with the highest chlorophyll content).
- Porphyrrins, cellular metabolism activators.
- Sporopollenin.
- Chlorellin.

BIOTOPE

Chlorella Vulgaris is found in fresh water across the globe. The alga is often a major component of phytoplankton populations in nutrient poor water. More generally, the various Chlorella species have developed a variety of effective mechanisms for consuming nutrients and are capable of increasing their numbers rapidly to compete with the more important phytoplankton species in lakes of low to moderate nutrient content. In some situations Chlorella forms symbiotic relations with other organisms (such as the fresh water polyp Hydra Viridis).
*Chlorella Vulgaris* only needs a small amount of minerals, along with water, sunlight and carbon dioxide to grow. It can then quadruple in size every 24 hours.

*Chlorella Vulgaris* is also grown in large vats or tanks for commercial and scientific purposes. The water is purified and nutrients are added to help the algae develop. The vats are often covered over or kept inside since *Chlorella* can also grow under artificial light.

**HISTORICAL AND GEOGRAPHICAL DISTRIBUTION**

Originally from Asia and other parts of the world, *Chlorella Vulgaris* was discovered in 1890 by a Dutch microbiologist Martinus Willem Beijerinck. This important research scientist, considered to be one of the founders of virology, remarked that this microscopic plant has an exceptional concentration of chlorophyll and possesses a membrane so thick that viruses cannot attack it.

After the Second World War, the industrialised nations and the Rockefeller Foundation undertook research into producing a highly nutritious foodstuff to fight malnutrition. A large number of plants were studied. The Japanese decided on *Chlorella*. They researched the best way to use the algae and developed means to consume it by incorporating it in food and drink initially intended for schools and the military.

The first harvests for nutritional purposes date back to 1955 in Japan, a country which has traditionally eaten marine algae. The Japanese are still the main consumers of *Chlorella*, eating more than 1500 tonnes per year. In the 1970s *Chlorella* was made more digestible with a process which succeeded in breaking the cellular membrane around the algae.

*Chlorella Vulgaris* is found worldwide, since it is so adaptable to its environment. This universal presence is a measure of its fortitude and independence under the most diverse and challenging conditions for life.

**MEDICINAL USES**

*Chlorella* is a plant with one of the highest levels of chlorophyll and Vitamin B12. It is a source of essential nutrients such as protein (60% of it is comprised of essential or non-essential amino acids); vitamins A, B, C and E; non-saturated essential fatty acids; and minerals (iron, calcium, magnesium, zinc, potassium, sulphur, manganese). It supplies porphyrins which activate cellular metabolism; promotes cicatrisation, controls sugar and fat uptake, acts against inflammation and so forth.

**Main indications of this alga**

Liver function regulation.
Elimination of heavy metals, particularly mercury (detoxifying properties).
Heals and soothes stomach ulcers.
Stimulates the immune system.
Slows down ageing.
Reduces blood lipids.
Reduces risk of cardio-vascular disease.
Counteracts diseases such as obesity, diabetes, depression, osteoporosis etc.

May also have anti-viral, anti-inflammatory and anti-cancer properties.

In Japan *Chlorella Vulgaris* is considered to be a foodstuff of national interest for health. It is the most popular food supplement and has been the most consumed supplement in the country for more than thirty years.
DIETARY USES

In Japan, seven million people eat *Chlorella Vulgaris* every day, following the Chinese proverb which says that health comes through food.

For instance, *Chlorella* can be used as a seasoning. In Asia, the range of *Chlorella* based produce is extremely wide. *Chlorella* enriched biscuits and food pastes are particularly prized for their high nutritional content. Honey and nectar with added *Chlorella* are also sold.

In the USA, *Chlorella* biodrinks are experiencing growing success.

Due to its nutrient trace element content, *Chlorella Vulgaris* is also often sold in the form of food supplements.

OTHER USES

In 2010 an analysis of the complete Chlorella genome was carried out by the French CNRS’ Genomic and Structural Information laboratory. The CNRS headed up an international team of US and Japanese research organisations. *Chlorella* is of particular interest for the development of second generation biodiesel due to its high lipid content – only 30% of the organism is comprised of dry matter.