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Spirulina Farming: A Super Food

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ARTICLE ID: 060

Introduction

Spirulina is a species of bacteria known as cyanobacterium, also blue-green algae [BGA], which can exist in fresh and saline water. This also can be grown in any closed environment where water is available. It uses the photosynthetic method of producing energy from the sunlight, just the same as plants. This Spirulina can be grown in any closed environment where water is available. Spirulina can be produced or grown in large tanks, plastic tanks, and square and circular ponds. Protein is an essential part of a balanced diet. It has the potential to be one of the best protein sources. Spirulina protein is commercially generated for human and animal use in large-scale cultivation systems. Spirulina is a protein-rich algae with a rapid growth rate of 40 to 80 percent. It's simple to harvest and process, and it's high in macro and micro nutrients. Spirulina is regarded as a future food by scientists.

Scientific classification

Genus: Spirulina; Turpin ex Gomont, 1892

Class: *Cynophyceae*

Family: *Spirulinacea*e

Chemical Component	Concentration (Grams Per Liter)
Sodium Hydrogen Carbonate (NaHCO3)	8.0
Sodium Chloride (NaCl)	1.0
Potassium Nitrate (KNO3)	2.0
Hydrous Magnesium Sulphate [MgSO4.6H2O]	0.16
Ammonium Phosphate ((NH4)3PO4)	0.2
Urea (CO(NH2)2)	0.015
Sulphate Hepta hydrate (FeSO4.6H2O)	0.005

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Iron Potassium Sulphate (K2SO4)	1.0
Calcium Chloride Dihydrate (CaCl2.2H2O)	0.1
Ammonium Cyanate (CH4N2O)	0.009

Spirulina Farming Process

Spirulina can be grown in any confined environment with access to water. Temperatures of 30 to 35 ° C are ideal for growing Spirulina. Tropical and subtropical regions are both suitable for commercial production. The growth of the same required year-round sunlight and is also influenced by other variables including as wind, rain, solar radiation, and temperature fluctuations. Spirulina can be cultivated in any cement or plastic tank that received sufficient sunlight. The pond is ready for Spirulina seeding if the water has a standard nutritional composition. In order to achieve uniform growth and harvesting, 30gm of dry Spirulina should be fed to every 10 litres. Seeding the pond with a concentrated live Spirulina culture is also an option. In commercial farms, one pond is dedicated to the seed production of Spirulina. Within three to five days, the algal bacterium's biomass doubles. For good production and yield, farmers must closely monitor the overall nutritional value and add new water at regular intervals. Farmers should be aware of environmental conditions in order to prevent infection of the culture media. Spirulina matures from a bright green colour to a dark green colour. Spirulina harvesting time is determined by the amount of algae present and the colour of the algae.

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Biochemical Composition of *Spirulina platensis*

- **Protein:** Spirulina has very high protein content, ranging from 55 to 70% by dry weight. It's a good source of protein, meaning it's made up of all essential amino acids.
- **Essential fatty acids:** Polyunsaturated fatty acids are abundant in spirulina, accounting for 1.5-2.0 percent of the 5-6 percent total lipid. Linolenic acid, stearidonic acid, eicosapentaenoic acid, docosahexaenoic acid, and arachidonic acid are all abundant in spirulina.
- **Vitamin:** B1, B2, B3, B6, B12, vitamin C, vitamin D, and vitamin E are mostly present in spirulina.
- **Minerals:**Potassium, calcium, chromium, copper, iron, magnesium, manganese, phosphorous, selenium, sodium, and zinc are all found mainly in spirulina.
- **Photosynthetic pigments:** Chlorophyll-a, xanthophylls, -carotene, echinenone, myxoxanthophyll, and the phycobiliproteins C-phycocyanin and allophycocyanin are among the pigments found in spirulina.

Spirulina Quality Specifications

S. No	Particulars	Quality %
1	Moisture	3%
2	Protein	65%
3	Fat	7%
4	Crude Fiber	9%
5	Carbohydrates	16%
6	Energy (100 gms)	346 KCal

Advantages of Spirulina:

- ❖ Spirulina is a high-protein food that can be found in a variety of forms.
- ❖ Spirulina use as fertilizer source.
- ❖ Spirulina Use in poultry and cattle feeds as a protein supplement.
- ❖ In aquafeeds, spirulina can be utilised as a partial or complete replacement for protein.

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- Spirulina is a dietary supplement used by astronauts in space.
- It also aids in the development of the human body's immune system.

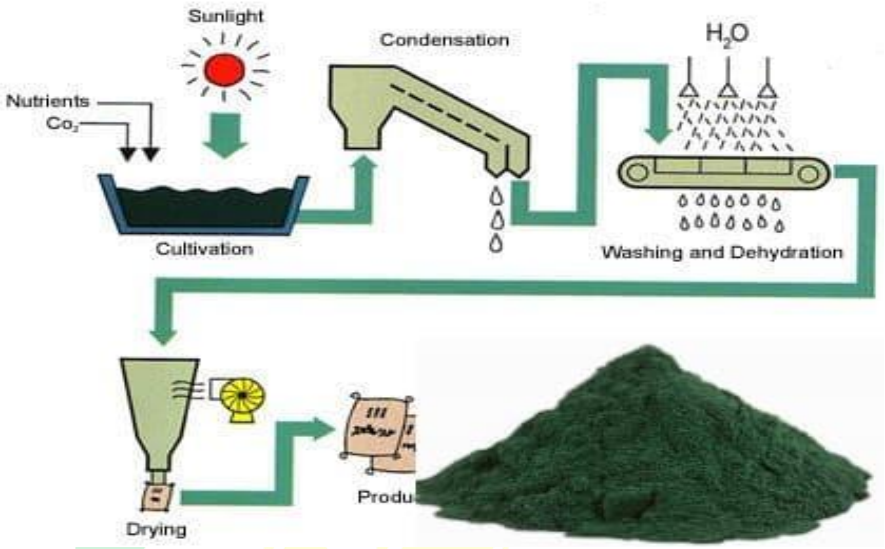

Fig :- Spirulina Cultivation Process

Harvesting process

Different farmers harvest Spirulina in different ways Due to a lack of material resources and financial resources. The culture is collected and placed onto the cloth in a container. Spirulina is left on the cloth as the culture media drains back into the pond. Applying pressure or squeezing can be used to drain any remaining surplus or culture media leftovers. To make the process simple and quick, farmers have created a number of filtering technologies. On the internet, you may find more information on various designs that can be used to eliminate laborious and speedy harvest processing work. After filtration, the collected Spirulina is rinsed in distilled water to eliminate any salts, contaminants, or culture medium residue. The remaining water is squeezed or pushed out after cleaning, and the item is ready to be dried. Spirulina is at its most nutritious when it is freshly harvested. Because spirulina may only be kept fresh for two days, it must be dried in order to preserve its nutritional value and increase its shelf life.

Conclusion

Spirulina appears to have significant development potential, particularly as a small-scale crop promoting nutrition improvement, livelihood development, and environmental mitigation. its production has a modest environmental footprint, with major efficiency in

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terms of water use, land occupation, and energy consumption. Spirulina has been used in aquafeeds as a protein and vitamin supplement, as well as in chicken feed as a supplemental nutritional ingredient, distributing nutritional supplements to rural and urban regions where the fundamental diet is deficient. When land or water resources are few, allowing diversification from traditional crops is possible. Waste water treatment, small-scale aquaculture, and livestock feed supplements are all part of an integrated system.

References

G. Usharani*, P. Saranraj and D. Kanchana[2012], *Spirulina Cultivation: A Review, International Journal of Pharmaceutical & Biological Archives 2012*; 3(6): 1327-1341

M. Ahsan B. Habib MashudaParvin,[2008]*A Review On Culture, Production And Use Of Spirulina As Food For Humans And Feeds For Domestic Animals And Fish*,ISSN 2070-6065