



## A Study On The Growth Of The Spirulina Market And Its Future Trend In The Market

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### ABSTRACT

The analysis of Spirulina's export and import trends reveals significant growth potential in the global market. Data from the past decade indicates fluctuating export volumes, with a positive outlook for future demand. This trend highlights Spirulina's increasing popularity as a nutritious supplement driven by consumer health awareness and sustainable food practices.

### 1.1 INTRODUCTION

Spirulina is celebrated for its impressive nutritional profile, comprising 60-70% protein by dry weight and essential vitamins and minerals like B1, B2, B3, iron, and magnesium; it is recognized as a superfood and offers numerous health benefits. It has a higher nutritional status worldwide and macronutrients such as sodium, magnesium, potassium, chlorine, sulfur, and phosphorous. Spirulina presents a promising sustainable food source to address dietary deficiencies in modern diets.

### 1.2 OBJECTIVES

To Analyze the Future Market Of Spirulina From India To the World Market.

### 1.3 BENEFITS OF SPIRULINA FOR HEALTH

Spirulina is a kind of microalgae. It is also called Art Hospira plates. Spirulina has high protein, minerals, vitamins, and antioxidants. Nowadays, people have a protein deficiency, especially youngsters. The Food and Drug Administration (FDA) has designated spirulina as a "superfood." Spirulina is a good immunity booster. It boosts metabolism and assists with weight loss. Spirulina is also a superfood for people who have iron deficiency. Spirulina is an effective nutraceutical product for the future food industry.

REGION	QUANTITY IN \$ USD MILLION	QUANTITY IN 1000 UNIT
ASIA	0.04	5.88
EUROPE	0.13	7.74
AFRICA	0.01	3.85

### 1.4 SPIRULINA IN THE WORLD MARKET

Spirulina is primarily consumed as a powder, capsules, and tablets. Spirulina powder had the highest CAGR of 10.4% during the year. Capsule had two places in the market, producing 8% CAGR. Globally, the spirulina market is expected to increase significantly between 2024 and 2034. In 2024, Asia had first place in spirulina

production by contributing 0.04 USD per unit, followed by Europe having second place for producing spirulina and third place in Africa. Spirulina products are expected to grow significantly in the future.

## **1.5 SPIRULINA PRODUCTION IN INDIA**

India has four central spirulina production states: Tamil Nadu produces 1500 tons per year, Karnataka produces 400 tons, and Andhra Pradesh produces 300 tons.

## **1.6 REVIEW OF LITERATURE**

**Andrade, L.M. et al. (2018)** The Document Provides a Comprehensive review of Chlorella and Spirulina, two Prominent microalgae known for their nutritional and health benefits. It discusses their bioactive Compound, Potential application in food and nutraceutical industries, and the Current research regarding their use as functional foods and dietary Supplements. Both Chlorella and Spirulina are rich in protein, vitamins, minerals, and essential fatty acids, making them Valuable Nutritional Supplements. It contains high levels of antioxidants, bioactive compounds, long-chain polyunsaturated fatty acids (LCPUFAs), phenolic compounds, vitamins, and minerals. Spirulina has numerous health benefits, including immune system and anti-inflammatory effects. And Cholesterol levels and blood pressure.

**Ayse Burcu Aktas et (2024)** this article discuss the potential of Spirulina, a nutrient-dense microalgae, as a valuable food source to address global hunger and nutritional deficiencies. Known for its rich content of proteins, vitamins, and minerals, Spirulina is a superfood with various health benefits. The author explores how Spirulina can be used as a food analog and additive in multiple products, enhancing their nutritional value. However, the chapter also highlights challenges related to food safety and consumer acceptance that must be addressed for its successful integration into the food industry. Overall, Spirulina presents a promising solution for improving food security and nutrition.

**Cakir, E. et al. (2024)**, adding spirulina plants powder to gluten-free ice cream. Ice cream is formulated with varying rates of spirulina, which are 0%, 0.5%,1%, and 5%, and physical-chemical and sensory attributes were evaluated. Spirulina significantly increased protein, dietary fiber, phenolic, and antioxidant content. Spirulina is recognized as a superfood due to its high nutritional content and health benefits, especially when studying high sensory score degrees with higher spirulina concentration. Ice cream with 0.5% spirulina is most preferred. Those ice creams have high nutritional properties and gluten-free products.

**Dabrowska NK, Marcinkowski K et al (2024)**. Spirulina is a kind of blue-green algae currently grasping attention due to its health benefits. Spirulina is still undergoing research to ensure its efficiency and safety, as it is rich in nutrients, vitamins, minerals, proteins, and antioxidants. Spirulina also provides health benefits such as better immune support, boosting metabolism, improved lipid profiles, and lowering blood pressure levels. One of the side effects of spirulina is that, in some cases, it might cause dermatomyositis (inflammatory disease). Further research is being done to find out its optimal dosage.

**EI Shafai, S. et al. (2023)** yesterday explored the nutritional benefits of adding spirulina to children's food products. The prevalence of malnutrition among children is a global concern, so spirulina is an excellent dietary and safety product. This study aims to assess the chemical composition of spirulina-enriched products for biscuits, frozen yogurt, and jelly. Spirulina food products significantly enhance children's nutrition. Spirulina can be a valuable addition to children's diets.

**Karnal et al. (2023)** highlight Spirulina as a nutrient-rich ingredient that can enhance the nutritional profile of ice cream. The study involved adding Spirulina at varying concentrations to replace stabilizers, resulting in improved overrun, penetration values, and a natural light green color. Ice cream with 50% stabilizer replacement showed comparable sensory scores to the control. The research emphasizes the importance of fortifying dairy products with natural ingredients like Spirulina to enhance their nutritional value while avoiding synthetic additives that pose health risks.

**Petya Boynova., et al. (2021)**, this study explores the effects of spirulina plants on the quality and antioxidant characteristics of ice cream. Spirulina had a high antioxidant and protein content and improved melting resistance and sensory characteristics. Spirulina plants are a valuable addition to ice Cream because they enhance antioxidant activity. Spirulina also offers valuable opportunities to create healthy products.

**Priyanka S et al. (2023)**. The spirulina provides a rich nutritional profile and various health benefits. Different methods like food processing, cultivation methods, and growing markets. Nutrients like protein, amino acids, vitamins, and minerals. Superfood due to its high antioxidant content and fatty acid. Various health benefits include boosting the immune system and antiviral properties. Food products include bakery items, dairy products, energy bars, and infant foods. Market growth is industrial growth for a product. Recognized as safe to consume by the FDA. Nutritional deficiencies and promoting health.

## **1.7 SCOPE OF STUDY**

This study aims to analyze Spirulina's current and future export data and gain insights into trends, growth, potential, applications, and challenges in the global market. By conducting this study, we could assume spirulina, which would benefit various exporters and entrepreneurs.

## **1.8 NEED FOR THE STUDY**

Spirulina is a blue-green algae currently grasping attention due to its nutritional value. It can be an anticancer, antiviral, antioxidant, and antiallergic agent. It has potential in pharmaceuticals, the food industry, agriculture, perfumery, and medicine. The primary need for this study is to spread awareness about spirulina among consumers, encourage them to use it in their day-to-day lives, and avail the numerous benefits of spirulina  
**source: food supplements formulated with spirulina. Ruma Arora, Prashant, and Rajeev Rana**

## **1.9 METHODOLOGY**

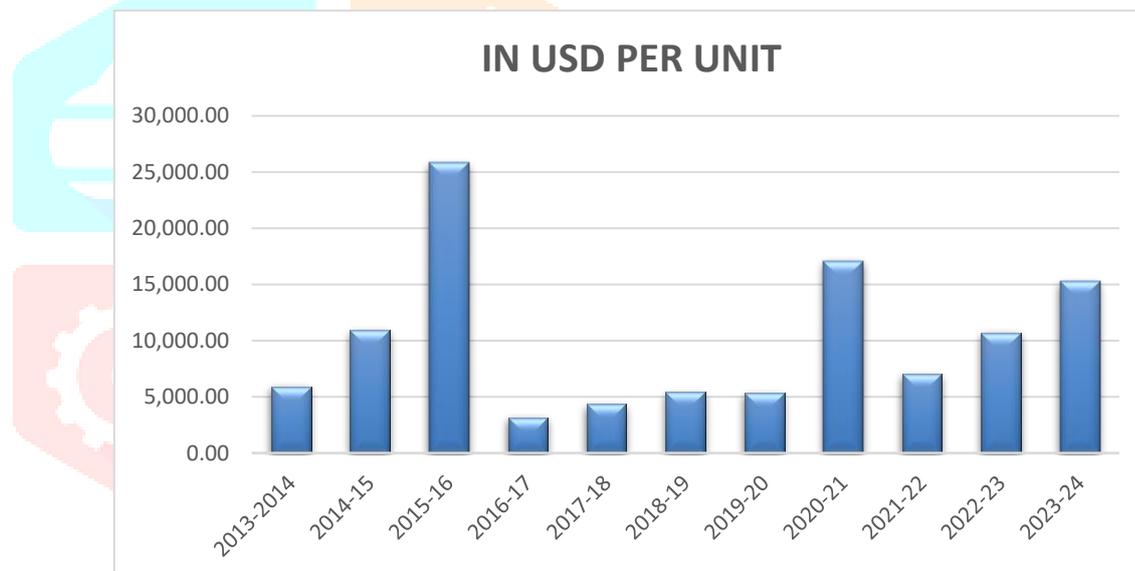
The secondary data were collected about the export of spirulina, and it predicted the future trend of the global market so spirulina would have the opportunity to capture the future globally.

### **1.10 SOURCE OF DATA**

The secondary data was collected through the Ministry of Commerce and Export-Import Databank website. Data was collected and analyzed in the past ten years to identify trends and predict the future market of spirulina and spirulina-based products.

**1.11 GROWTH RATE OF SPIRULINA IN QUANTITY FROM THE YEAR 2013 – 2024**

YEAR	IN QTY TONS (1000 units)	IN USD PER UNIT	PERCENTAGE
2013-2014	52.97	5,935.54	5.35%
2014-15	28.42	10,919.72	9.84%
2015-16	10.16	25,816.05	23.26%
2016-17	87.3	3,159.82	2.85%
2017-18	69.79	4,349.14	3.92%
2018-19	60.99	5,412.00	4.88%
2019-20	58.84	5,325.65	4.80%
2020-21	17.1	17,064.82	15.37%
2021-22	60.15	7,015.87	6.32%
2022-23	42.15	10,701.54	9.64%
2023-24	28.58	15,292.93	13.78%
TOTAL		110,993.080	100.00

**1.12 GRAPH CHART OF SPIRULINA IN 2013 – 2024**

Source: Import Export Data Bank Ministry Of Commerce

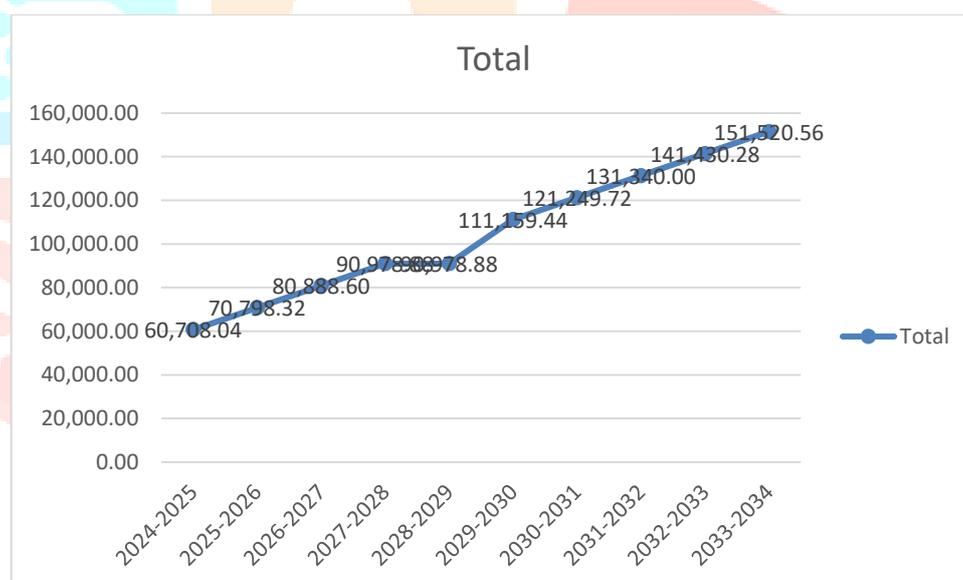
**1.13 EXPORT DATA CHART ON 2013-2024**

YEAR	IN USD PER UNIT( TONN)	X	XY	X <sup>2</sup>
2013-2014	5,935.54	-5	-29677.7	25
2014-15	10,919.72	-4	-43678.9	16
2015-16	25,816.05	-3	-77448.2	9
2016-17	3,159.82	-2	-6319.64	4
2017-18	4,349.14	-1	-4349.14	1
2018-19	5,412.00	0	0	0
2019-20	5,325.65	1	5325.65	1
2020-21	17,064.82	2	34129.64	4
2021-22	7,015.87	3	21047.61	9
2022-23	10,701.54	4	42806.16	16
2023-24	15,292.93	5	76464.65	25

**1.14 FUTURE PROJECTION DATA TABLE 2024 – 2034**

YEAR	X	XY
2024-2025	6	60,708.04
2025-2026	7	70,798.32
2026-2027	8	80,888.60
2027-2028	9	90,978.88
2028-2029	10	90,978.88
2029-2030	11	111,159.44
2030-2031	12	121,249.72
2031-2032	13	131,340.00
2032-2033	14	141,430.28
2033-2034	15	151,520.56

Table 3 shows the growth of spirulina in the global market. After the pandemic, the growth of spirulina has slightly declined. As per our trend analysis, there's a positive trend, and in the upcoming years, the growth of spirulina will spike drastically; the forecast is that more spirulina-based products will emerge after the COVID period. Consumers are more concerned about their health and look towards organic and nutritious products.

**1.15 FUTURE PROJECTION GRAPH CHART 2024 – 2034****1.16 CONCLUSION:**

The study analyzed the reported data of spirulina and spirulina-based products for the past 10 years and forecasted spirulina's future trend and growth. Compared to the previous years, the coming global market of spirulina will progress as the years progress. This study suggests that the spirulina market will grow so that you can also develop spirulina-based products and hold a valid position in the global market. Innovative product formulation, enhanced quality standards, and strategy market expansion could lead to massive growth in the spirulina and spirulina-based product industry.

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