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## SUPERFOODS: ITS VALUE AND NEED FOR FUTURE

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### ABSTRACT

A consumer trend toward a healthy and nutritious lifestyle has developed during the last two decades. Consumers have started to prefer healthy food options over convenience foods as a result of their busy working life, limited time for exercise, and growing understanding of the relationship between nutrition and health. Technological advancements in the food and nutrition industry have led in the creation of a new food category known as "superfoods." Superfoods are a special category of food that can have a variety of beneficial effects, such as preventing various diseases, boosting the immune system, and providing enough amounts of essential macro- and micronutrients. Due to the rising health concern of customers, these are gaining a lot of attention these days. The concept of superfoods is still little understood, despite its remarkable health or even therapeutic advantages, which are based on their long history of usage. Superfoods include a wide variety of fruits, vegetables, grains, and other foods. The nutritional composition of certain important superfoods, as well as its potential intervention in the prevention of many chronic diseases, are discussed in this article. This review may assist customers in incorporating superfoods into their diet more frequently and successfully.

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### I. INTRODUCTION

Consumer perceptions of food have shifted dramatically in recent years, in combination with an increasing number of research demonstrating that food and its components may have a significant influence on human health. A growing percentage of consumers feel that food has the capacity to improve their health and well-being by preventing nutrition-related sickness and improving mental and physical states, in addition to meeting basic requirements like hunger and providing nourishment. This concept has a long and illustrious history, as Hippocrates said, "Let food be thy medicine, and medicine be thy nourishment." The term 'superfoods' is now widely used to describe functional foods. In recent years, the population of Western countries has shown an increased interest in these topics. Superfoods are thought to be a good source of a variety of macro- and micronutrients. Superfood is defined as food that is "considered exceptionally nutritious or in any case improve human wellbeing and prosperity," according to the Oxford English Dictionary.

The term "superfoods" was initially used to describe functional foods. It is regarded as a common term for foods that, in addition to their regular nutritional value, provide health advantages and/or disease-prevention characteristics. "Superfoods," on the other hand, can refer to some traditional foods that have been modified with increased functional properties by various processing methods rather than gene manipulation. While superfoods are similar to functional foods in that they provide health-promoting effects in addition to nutrition, they differ in several ways. These are functional foods that are minimally processed and occur naturally, with the distinguishing feature of being "traditionally utilised." Superfoods are known for being employed in a small number of culinary and medicinal applications, usually in farflung locations. As a result, they are gaining popularity not only for their exceptional and naturally beneficial health benefits, but also for their common traits of belonging to a genuine, isolated, or exotic group. According to some, superfoods may be classified as both food and medicinal plants since they contain "a variety of synergistic components."

The list of superfoods grows year after year, while tracking important nutrients and understanding the mechanisms of action inside the human system has attracted scientific curiosity, resulting in an expansion of scientific research investigations. According to evidence gathered from many research, the following superfoods are especially significant:

- Fruits: pomegranate, berries, blueberries, raspberries, strawberries, goji berry, chickpeas, grape, acai berry.
- Dried nuts: walnuts, almonds, cereals.
- Pulses: red beans, cocoa, sweet potatoes, mastic.
- Vegetables: broccoli, spinach.

- Seaweed: spirulina, chlorella.
- Milk products: Kefir, camel milk.
- Herbs: ginger, ginkgo biloba, tea, turmeric, moringa.
- Bee products: honey, royal jelly, waxes.

In this study, we will go through several "superfoods" such as hempseed, spirulina, goji berries, kefir and some Indian berries their health benefits and nutritive content.

**1. HEMP SEEDS**

Hemp, scientifically known as (*Cannabis sativa* L.), belongs to the Cannabinaceae family. It is an herbaceous plant having annual growth and has been considered a vital source of medicine, fiber, food, and a religious/psychoactive drug. From the beginning, the use of *Cannabis sativa* L. has been riddled with controversy. *Cannabis sativa* is also classified as a non-drug type (hemp) and a drug type (marijuana). The former is essential for the food and fibre sectors, while the latter serves recreational and therapeutic uses. Hemp seeds are considered to be a good source of oil, having around 33–35 percent oil . Foods generated from hempseeds are regarded a specialist market including specialized food and natural outlets of food, and they are becoming increasingly common in the Western diet because to their great nutritional and flavour qualities.



**Fig -1-** *Cannabis sativa* L

**Nutritional Composition of Hempseed**

*Table 1.* Typical nutritional content (%) of hempseed<sup>a</sup>

	Whole seed	Seed meal
Oil (%)	35.5	11.1
Protein	24.8	33.5
Carbohydrates	27.6	42.6
Moisture	6.5	5.6
Ash	5.6	7.2
Energy (kJ/100 g)	2200	1700
Total dietary fiber (%)	27.6	42.6
Digestible fiber	5.4	16.4
Non-digestible fiber	22.2	26.2

**Macro-Nutrients-** Hempseed contains rich amounts of oil, protein, carbohydrate, fiber, and moisture, with values ranging approximately from 25% to 30%, 25% to 30%, 20% to 30%, 30% to 40%, and 6% to 7%. A considerably large number of unsaturated fatty acids (>90%) is present in hempseed involving the necessary stability of  $\omega$ -6/ $\omega$ -3 fatty acid.

Hempseed protein, due to its high nutritional value, has increasingly gained attention in scientific studies and research, resulting in an increased quantity of scientific publications under the term “hemp protein”, generally present in keywords, abstract, and title of publications [32]. Hempseed protein consists of over of 181 proteins, involving classification into two major protein groups: globular-associated albumin (25% to 37%) and leguminassociated globulin edestin (67% to 75%)

**Micro nutrients**-The concentration of anti-nutritional compounds (condensed tannins, phytic acid, trypsin inhibitors) was reported to be very low in hempseeds . Total phenolic content (TPC) generally varies in hempseeds and it is considered to be the highest in the hull than the kernel.

The highest amount of minerals in hemp seeds was reported for iron followed by zinc, manganese, and copper, while molybdenum, nickel, and cobalt were found to be in minor quantities.

### **Potential Health Benefits**

#### **1. Rich in GLA**

Gamma-linolenic acid (GLA) is an essential structural block for some prostaglandins -hormone-like chemicals in the human body that help smooth muscles, control inflammation and body temperature. GLA is also vital to other body functions.

#### **2. May Alleviate Arthritis and Joint Pain**

Various researches have shown that hemp hearts and hemp seed oil can be significantly helpful in relieving rheumatoid arthritis symptoms.

#### **3. Aid Weight Loss**

According to a systematic review published in the Journal of the American College of Nutrition, fiber intake is associated with a lower body weight. Consumption of hemp seeds works as a natural appetite suppressant. Adding these seeds, and other high-fiber foods, to daily meals will help to curb excess hunger

#### **4. Improves Digestive Health**

Hemp seeds robust immune system. A study published in the American Journal of Gastroenterology. found that hemp seed pill treatment was effective for relieving functional constipation.

#### **5. Boosts Hair, Skin and Nail Health**

Hemp seed benefits for skin and hair. It goes a long way in improving dry, red, flaking skin. Mostly it is used in high-end cosmetic products; hemp oil is oftentimes included in lip balms, lotions and soaps. The oil in hemp seeds penetrates the inner layers of the skin and promotes healthy cell growth.

#### **2-Spirulina (Arthrospira plantensis)**



**Fig-2-Spirulina powder**

Spirulina is an edible seaweed of fresh water with blue-green color, due to natural pigments contained therein.<sup>27</sup> The scientific name is *Arthrospira plantensis* and is growing mainly in alkaline lakes rich in metals and metalloids. Spirulina consists of 55-70% proteins, 15- 25% carbohydrates, 6-8% fat, 3-4% fiber, while the remaining percentage is divided into metals (iron, potassium, magnesium, etc.), trace elements and vitamins (A, B, E, K) (Table 2). Spirulina contains more than 100 nutrients and is the richest plant source of protein, it has a very good source of vitamin B12 and phytochemicals with strong antioxidants properties. Continuous studies confirm that spirulina contain high the numerous nutrients it contains are listed in table 2.

**Table 2:** Spirulina nutrient composition per 100g

Basic Nutrients		Metals / Trace Elements	
Protein (g)	62.9	Calcium (Ca) (mg)	1.028,3
Total Fat (g)	3,8	Iron (Fe) (mg)	50,4
Polyunsaturated (g)	1.03	Phosphorus (P) (mg)	1.374,8
Monounsaturated (g)	2,4	Iodine (I) (µg)	22
Carbohydrates (g)	8,4	Magnesium (Mg) (mg)	598,8
Sugar (g)	<0,5	Zinc (Zn) (mg)	6,5
Edible Fibers (g)	6.9	Selenium (Se) (µg)	59
Aminoacids		Copper (Cu) (µg)	810
Isoleucine (g)	3.41	Manganese (Mn) (mg)	5.3
Leucine (g)	5.29	Chromium (Cr) (µg)	110
Lysine (g)	2.7	Potassium (K) (mg)	1.558
Methionine (g)	0.78	Barium (Ba) (µg)	1.190
Phenylalanine (g)	2,8	Cobalt (Co) (µg)	35
Threonine (g)	2.98	Sodium (Na) (mg)	756
Tryptophan (g)	1.16	<b>Fatty acids</b>	
Valine (g)	3.66	γ-Linolenic (C18: 3) (mg)	1.960.4
Histidine (g)	0.93	γ-Linolenic (C18: 3) (mg)	311.2
Alanine (g)	4.92	Linoleic (C18: 2) (mg)	138.7
Arginine (g)	4.07	Palmitic (C16: 0) (mg)	735.3
Asparagine Acid (g)	5.66	Oleic (C18: 1) (mg)	157.3
Cystine (g)	0.18	Myristic (C14: 0) (mg)	85.9
Glutamic Acid (g)	8.05	Capric (C10: 0) (mg)	61.2
Glycine (g)	3.08	Laureate (C12: 0) (mg)	59.3
Proline (g)	2.31	Palmitoleate (C16: 1) (mg)	48.6
Serine (g)	2.87	Stearate (C18: 0) (mg)	48.3
Tyrosine (g)	2.73	Arachidate (C20: 0) (mg)	42.2

**Table 3:** Summary of some health benefits of Spirulina

Health benefits	Compound/s responsible for benefits
effect on blood glucose level, pulmonary function	Low carbohydrate, sugars
Immune system enhancement	γ-linolenic acid and antioxidants
Antiviral effect	polysaccharide spirulane
Antimicrobial and antioxidant activity	β-carotene, vitamin E, selenium and polyphenols

**3- Goji berries (Lycium barbarum)**



**Fig-3-Goji Berries**

Goji berries are endemic fruits of Tibet. The fruits are easily oxidatized, and they are almost never fresh, except in the production areas. The degree of drying is differentiated depending on the species. They also called "berries of happiness" with the scientific name *Lycium barbarum*. Goji berries are one of the richest natural sources of nutrients, such as  $\beta$ -carotene, vitamins C, E, B1 and B2, minerals, antioxidants and amino acids. Also they contain a high percentage of carbohydrates, fatty acids and fibers. Goji's fruit contains 18 amino acids, 21 trace elements, such as zinc, calcium, germanium, selenium and phosphorus, vitamins of the B complex (B1, B2, B6), more beta-carotene than carrot, more iron from spinach, vitamin E, vitamin C at concentration 500 times higher than oranges, phytosterols, such as beta-sitosterol and beneficial fatty acids such as linoleic acid.<sup>53</sup> Goji berries are superfood with multiple benefits within the human organism. The most important action documented by many studies, is the strong antioxidant protection against the harmful free radicals present in the human body. This has the consequence of being important contributing firstly to the prevention of diseases such as cardiovascular diseases and diabetes, the pathophysiology of which is promoted in the presence of free radicals, and secondly to the strengthening of the immune system.

**Table 4:** Summary of some health benefits of Goji berries

<b>Health benefits</b>	<b>Compound/s responsible for benefits</b>
Prevention of cardiovascular diseases and diabetes	Polysaccharides in the form of glycosides, germanium and various antioxidant substances
Reduce of inflammation and blocking of the blood vessels	Antioxidants like phenolic compounds
Stomach Cancer prevention	Beta-sitosterol
Improve vision	Zeaxanthin, lutein, polysaccharides and polyphenolic compounds

**4-Kefir**

Kefir is a fermented milk beverage that is pleasant, sweet, simple to digest, and nutritious. It's a viscous, foamy, sour drink with a strong flavour. Kefir is made by fermenting lactic and alcoholic sugars with a variety of microorganisms. As a result, it is regarded as better to yoghurt made only by lactic fermentation. Russian

experts studied the nutritional content of kefir and discovered that it has several health benefits. Due to the presence of acetic acid generating bacteria, kefir outperforms other acidic milk products when it comes to fighting microbes that enter the digestive system with food and water. And in the intestine increases amounts of vitamin B complex.



Fig-4- Kefir

Table 5: Kefir nutrient composition (mg per 100g)

**Vitamins and minerals (mg per 100 g)**

Calcium	120
Phosphorus	100
Magnesium	12
Potassium	150
Sodium	50
Vitamin A	0.06
Carotene	0.02
Thiamine	0.02
Vitamin B2	0.17
Vitamin B6	0.05
Vitamin B12	0.005
Phosphoric acid	0.0095
Niacin	0.09
Vitamin C	1
Vitamin D	0.08
Vitamin E	0.11
Iron	0.05
Copper	0.012
Molybdenum	0.0055
Magnesium	0.005
Zinc	0.36

Kefir's contribution to human health is recognised by the fact that it has better levels of absorption from the human body than yoghurt because it contains beneficial bacteria, yeasts, vitamins, minerals (Table 5) and high-value proteins. Kefir appears to stimulate the immune system, reduce intestinal troubles, and contribute to a

healthy digestive system in general, making it a complete superfood. Kefir's helpful yeasts and bacteria eat the majority of the lactose in milk, making it a perfect diet for lactose intolerant people. The increased presence of calcium, magnesium, and phosphorus (Table 5) aids to appropriate cell development and bodily health maintenance. Kefir's effects for human health appear to be beneficial based on present studies.

- It affects the treatment of pathological conditions in the body, such as anaemia, and disorders of the digestive system, such as chronic enteritis.
- It has increased diuretic properties.
- It has a low lipid content and low calorie content, thus it does not add calories to the human body.
- It aids in the prevention of atherosclerosis and high blood pressure.
- It may have anticancer properties.
- It aids in the reduction of elevated blood cholesterol levels.
- It contains antibacterial and antioxidant effects.
- It boosts the immune system.

### 5-INDIAN SUPERFOODS

While the rest of the world deliberated whether or not special foods known as superfoods should be included, India had long recognised the importance of including some fruits, herbs, and spices that had certain healing and protective properties in addition to their highly nutritious properties; the term "superfood" was coined recently after its boom in the western and other major markets. There are several foods that have the conventional high phytochemical content. Indian superfoods are abundant in the list of the most popular and effective superfoods. The following are some of the most prominent Indian superfoods:

1. **Turmeric (*Curcuma longa*)** that is a widely cultivated crop in India whose rhizome is used as a staple spice in Indian meals; turmeric has natural anti-inflammatory properties that help against various degenerative diseases, like cancer, Alzheimer's disease, etc
2. **Gooseberry (*Phyllanthus emblica*)**, popularly known as Amla in India, contains astringent, antidiarrheal, anti-dysenteric, anti-scorbutic, and carminative therapeutic effects.
3. **Moringa (*Moringa oleifera*)**, often known as the drumstick plant, grows in India's southern states. Moringa includes a total of seventeen amino acids. Protein makes up about 70% of the leaf, which is rare in plants. Furthermore, vital amino acids make almost 28% of the leaf. It has antihypertensive, diuretic, cholesterol-lowering, antispasmodic, antibacterial, and antifungal properties, as well as the ability to protect against a variety of ailments.
4. **Ashwagandha (*Withania somnifera*)**, often known as winter cherry, is a pain reliever, anti-inflammatory, and neurological debility reducer. It has 40 anolides and 12 alkaloids, which provide it a wide range of therapeutic characteristics.

### MARKET VALUE OF "SUPERFOOD"

The claims made by the marketing and processing businesses have been deemed sufficiently supported by scientists and nutritionists. These industries are typically financially driven and invest a significant amount of money to get the desired findings, which may then be used to reinforce the claims made by superfoods; the example of Royal Hawaiian Macadamia Nut is given to illustrate how research results might be misinterpreted. The FDA issued a wise statement stating that eating 1.5 ounces of macadamia nuts per day as part of a low cholesterol, low fat diet helps to reduce the risk of coronary heart disease. Another reason to believe that the claim that superfoods provide nutritional benefits is exaggerated is that most industries process the so-called superfood before consumption, resulting in a reduction in the original nutritional quantity; superfoods will only provide the benefits claimed if consumed raw or organically. As the name implies, superfoods have potential health benefits and aid in the incorporation of nutritional content in the diet, making it a complete nutritional package for our bodies.

## II. CONCLUSION

According to experimental findings, superfood consumption can provide the human body with a variety of antimicrobial and antioxidant substances, fibre, a variety of vitamins (A, B, C, K, etc.), inorganic compounds, as well as beneficial fatty acids like -3, -6, and other ingredients in quantities that often exceed the typical daily intake of other foods. Incorporating superfoods into one's daily diet can help to lower the chance of developing a variety of degenerative illnesses, including cardiovascular disease, diabetes, metabolic syndrome, obesity, neurological disorders, and cancer. As a result, superfoods appear to have the same fundamental role in prevention as traditional functional meals, providing a high concentration of bioactive chemicals.

Nutritionists and clinical professionals highlight the need of having a well-balanced diet rich in a variety of foods. They emphasise the importance of food in supplying nutrition, but they do not advocate for the inclusion of things that exceed nutritional limitations on their own. Experts recommend that in order to remain fit and increase the rate of lifespan, individuals should incorporate diversity in their food consumption, as well as specifically branded food products such as superfoods. When combined with a well-balanced diet, the superfood's role in supplying enough nourishment is maximised.

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