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The impact of using superfood products on a sporty lifestyle

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ABSTRACT

The term "superfood" refers to foods that are exceptionally high in nutrients such as vitamins, minerals, antioxidants, and other bioactive substances, which have beneficial effects on health.

Although there is no precise scientific definition, the term is widely used in the context of healthy eating and diets.

Superfoods have a deep-rooted history dating back to ancient times, when foods like quinoa, chia seeds, goji berries, and turmeric were used for their health properties in various cultures around the world. For example, the Aztecs and Incas utilized quinoa and chia seeds as important dietary staples, valued for their nutritional content and ease of cultivation.

In the 20th century, growing interest in healthy eating led to increased scientific research on the nutritional components of various food products. The term "superfood" began to be used to describe foods that provide specific health benefits, a concept that gained traction in health media and literature.

Modern research confirms many beliefs about superfoods, emphasizing their ability to support physical and mental health. Superfoods like acai berries, chia seeds, and spirulina are popular among active individuals and athletes because they can aid muscle recovery, boost energy levels, and strengthen the immune system.

Superfoods are integral to modern dietary trends such as the Mediterranean diet and veganism due to their potential health benefits. Thanks to their unique nutritional properties, they play a significant role in balanced diets and are widely used in everyday nutrition and complementary medicine to support the health and well-being of their consumers.

Keywords :superfood, superfood and sport, superfood products, nutrients in superfood, athletes nutrition

INTRODUCTION

Superfood is a marketing term used to describe foods that have exceptionally high nutrient content, which can bring significant health benefits. Despite the lack of a precise scientific definition, this term is widely used in media, marketing, and popular science literature.

Products referred to as superfoods are often rich in vitamins, minerals, antioxidants, fiber, healthy fats, proteins, and other beneficial bioactive substances. [1] The concept of "superfood" has gained popularity relatively recently, although many of the products currently classified as superfoods were known and valued already in ancient times. [1, 2] The history of these highly nutritious food products spans thousands of years, and their use was often associated with medicinal and culinary traditions of various cultures around the world. [3]

The Aztecs and Incas treated quinoa and chia seeds as staple elements of the diet in the ancient civilizations of South America. The Aztecs considered chia seeds as a source of energy and endurance, while the Incas valued quinoa for its high nutritional value and ease of cultivation in the harsh conditions of the Andes. In China, goji berries have been used in traditional medicine for over 2000 years. They were considered an elixir of youth and health, supporting vision, the immune system, and longevity. Ayurveda, the ancient Indian medical practice, also utilizes superfoods such as turmeric, ashwagandha, and amla. These products were and are still used to support health, treat diseases, and improve overall well-being.[1, 4]

Garlic and honey were used in medieval Europe not only as culinary ingredients but also as medicinal remedies. [3, 4] Garlic was valued for its antibacterial properties, and honey for its anti-inflammatory and antioxidant effects. In the 20th century, scientists began to study the nutritional properties of various food products. The term "superfood" began to be used to describe foods that showed particularly beneficial effects on health, supported by scientific research. In the 1980s and 1990s, the concept of superfoods started to be popularized in the media and health literature. [4, 5]

With the growing health awareness of society, superfoods gained immense popularity in mass culture. Products such as acai berries, chia seeds, spirulina, and green barley began to be widely available in health food stores and used in various diets and health programs. Contemporary scientific research confirms many beliefs about superfoods. Currently, researchers focus on understanding the mechanisms of action of individual nutrients and their impact on health and physical performance. As a result, superfoods are an integral part of modern dietary trends such as the Mediterranean diet, veganism, paleo, or low-carb diets. Nowadays, superfoods are widely used in both dietetics and complementary medicine. They are an important component of a balanced diet, especially for athletes and people leading an active lifestyle. Due to their unique nutritional properties, these products contribute to health improvement, increased energy, and better body recovery. [6, 7]

A healthy diet plays a key role in achieving and maintaining optimal physical performance. Nutrients provided by food affect energy, endurance, muscle recovery, and overall well-being. In the context of a sporty lifestyle, increasing attention is paid to superfood products, which, due to their richness in essential nutrients, can support athletes in achieving better results and faster recovery. Superfoods such as goji berries, chia seeds, spirulina, and quinoa have gained popularity among athletes thanks to their potential health benefits, including improved physical performance, strengthened immune system, and enhanced recovery processes. [2, 3]

AIM OF THE STUDY

The aim of this review is to analyze the impact of using superfood products on a sporty lifestyle and to determine what health and performance benefits these products can offer to individuals leading an active lifestyle.

REVIEW METHODS

To address the discussed topic, resources from the PubMed and Google Scholar databases were analyzed, as well as official websites of dietary and nutritional organizations (such as the National Center for Nutrition Education). Statistical information posted on government websites was also used to prepare the article.

A total of 24 works in English and Polish were utilized. These included original and review papers, and during the electronic search, the analysis of publications was enabled by the use of the following keywords and their combinations: "superfood," "superfood and sport," "superfood products," "nutrients in superfood," and "athletes' nutrition."

DESCRIPTION OF CURRENT KNOWLEDGE

Superfood is a term used to describe foods that are particularly rich in nutrients, antioxidants, vitamins, and minerals. Each superfood has its unique nutritional properties that can positively impact human health. [1, 5]

Here are some key nutrients commonly found in superfoods:

- Antioxidants: Such as polyphenols, flavonoids, and vitamin C, these substances are naturally present in many superfoods. Their primary role is to neutralize free radicals

in the body, which can cause cell damage and contribute to the development of chronic diseases. [7, 8]

- Fiber: Superfoods are often rich in fiber, which is essential for digestive health. Fiber helps maintain proper bowel movements, prevents constipation, and supports a healthy gut microbiota. [8]
- Omega-3 fatty acids: Products such as chia seeds, flaxseeds, walnuts, and fish oil are known for their high content of omega-3 fatty acids. These fatty acids are crucial for heart, brain, and nervous system health. [9]
- Proteins: Some superfoods, like spirulina and hemp seeds, are rich in high-quality protein, containing all essential amino acids. Protein is necessary for building and repairing tissues, producing enzymes, and as a source of energy.
- Vitamins and minerals: Superfoods often provide abundant amounts of vitamins (such as vitamins A, C, E, K) and minerals (such as iron, magnesium, zinc). These substances are key to maintaining bone, skin, immune system health, and other physiological functions.
- Phytonutrients: These are natural chemical compounds found in plants that can have beneficial health effects. Examples include carotenoids, lutein, lycopene, and resveratrol, which may help protect against heart disease, cancer, and other illnesses. [9, 10, 11]

Consuming superfoods can also lead to higher training performance. For example, beetroot juice, rich in nitrates, increases the production of nitric oxide in the body. Nitric oxide helps dilate blood vessels, improving blood flow and delivering more oxygen to muscles during physical exertion. Green tea contains catechins and caffeine, which can increase fat burning and improve endurance. Almonds, walnuts, and pumpkin seeds are rich in protein, healthy fats, and minerals that support muscle recovery and maintain high energy levels. Spirulina, a blue-green algae, is extremely rich in protein, B vitamins, iron, and antioxidants, which can improve endurance and recovery after intense training. [12] Due to their unique nutritional properties and antioxidant capabilities, as detailed in Table 1, superfoods can significantly enhance the body's endurance, energy efficiency, and training performance. Regular consumption of these products supports health on multiple levels, providing essential nutrients, protecting cells from oxidative damage, and aiding metabolic processes. Incorporating superfoods into a daily diet can be a key element of a healthy lifestyle and improved physical fitness. [13]

Table 1. Comparison of nutrient content in superfoods.

Nutritional Ingredient	**Goji Berries**	**Chia**	**Quinoa**	**Spirulina**	**Avocado**
Protein (g/100g)	14	17	14	57	2
Fiber (g/100g)	8	34	7	0	7
Omega-3 (g/100g)	0.06	17.8	0.4	0.3	0.1
Vitamins	A, C	B1, B2	B1, B2	B1, B2, B12	K, E

Source of Table 1: own study.

The use of superfoods can not only affect the physical aspects of athletic performance, but also mental health. A healthy diet, rich in superfoods, can support mental well-being, improve mood and increase energy levels. Examples include:

- Chia: these small seeds are rich in fiber, protein and omega-3 fatty acids. Chia can improve endurance and provide long-lasting energy during workouts.
- Quinoa: is a complete source of protein containing all essential amino acids. Quinoa is also rich in magnesium and iron, which promote energy production and oxygen transport in the body. [14, 15]
- Spirulina: this blue-green alga is extremely rich in protein, B vitamins, iron and antioxidants. Spirulina can improve endurance and speed up recovery after intense training.
- Beets: beet juice, thanks to its high nitrate content, can improve aerobic capacity and increase endurance.

- Berries: are rich in antioxidants that protect cells from oxidative damage and promote heart health. Regular consumption of berries can also improve cognitive function and support muscle recovery. [15]
- Walnuts and seeds: are rich in omega-3s, which can support brain health and improve mood.
- Cocoa: raw cocoa contains mood-enhancing compounds such as theobromine and phenylethylamine. [21]

Superfoods, with their unique nutritional and anti-inflammatory properties, can significantly support the health and performance of athletes. Including these products into the daily diet can bring a range of benefits, such as strengthening the immune system, improving cognitive function and concentration, reducing inflammation and speeding up recovery after workouts. By harnessing the power of superfoods, athletes can perform better and enjoy better health on a daily basis. [15, 16]

Understanding that every athlete is different leads to the conclusion that their dietary needs must be tailored to their individual goals, the type of sport they play and their stage of training. Superfoods can play a key role in a personalized nutrition strategy, providing essential nutrients at the right times. [21, 22]

Endurance sports, such as marathon running, triathlon and cycling, require prolonged exercise and aerobic endurance. The diet of endurance athletes should focus on providing adequate energy and ingredients to support muscle and cardiovascular recovery.

- Beets: contain nitrates, which can increase aerobic capacity by improving blood flow and muscle efficiency.
- Chia seeds: provide long-lasting energy due to their fiber and healthy fats. They also help with hydration as they absorb a large amount of water.
- Quinoa: is rich in protein and complex carbohydrates, providing long-lasting energy. [22]

Strength sports, such as weightlifting, bodybuilding and crossfit, require a diet rich in protein to promote muscle development and recovery. Strength athletes also need nutrients to help reduce inflammation and support joint health.

- Spirulina: rich in protein, B vitamins and iron, supports muscle recovery and development.
- Nuts and seeds: provide healthy fats, protein and minerals to support muscle recovery and joint health.
- Turmeric: has powerful anti-inflammatory properties that can help reduce inflammation after intense workouts. [22, 23]

Mixed sports, such as soccer, basketball and combat sports, require both endurance and strength. Athletes in these sports need a varied diet that provides energy, promotes recovery and cares for overall health.

- Goji berries: rich in antioxidants, they help protect cells from oxidative stress, support immune system health and recovery.
- Cacao: raw cacao is rich in magnesium, iron and antioxidants, supports cardiovascular health and boosts energy.
- Beets: increase aerobic capacity, which is beneficial for both endurance and intense strength intervals. [23]
-

During intense training phases, when an athlete increases the volume and intensity of exercise, the diet should provide adequate calories and nutrients to support performance and recovery.

- Chia seeds and nuts: provide long-lasting energy and healthy fats, which are crucial during intense training.
- Bananas and yams: are excellent sources of carbohydrates that provide fast and sustained energy.
- Protein from plants: spirulina, quinoa and other plant protein sources help in muscle recovery. [23, 24]

During the recovery phase, when the goal is to rebuild muscles and recover after intense workouts, the diet should focus on proteins, healthy fats and antioxidants.

- Spirulina and chlorella: rich in protein and chlorophyll, they help detoxify the body and aid in muscle recovery.
- Turmeric and ginger: have strong anti-inflammatory properties that can speed up recovery after exercise.
- Blueberries and dark fruits: rich in antioxidants, help reduce oxidative stress and support overall health. [24]

Superfoods, despite their many health benefits, are not without possible side effects, contraindications and controversy. Consumption of superfoods in excess can lead to overconsumption of certain nutrients, which can be detrimental to health. For example, excess vitamin A from acai berries can lead to vitamin toxicity. [14] Some superfoods may have interactions with drugs, which can lead to adverse effects. For example, curcumin, present in turmeric, can affect the metabolism of certain drugs and alter their effects in the body. [17]

Some superfoods can cause stomach problems in people with sensitive digestive systems. For example, chia seeds can lead to constipation or stomach discomfort in some people. [18] Some superfoods may have contraindications during pregnancy or breastfeeding due to potential health risks to the mother and baby. Consult your doctor before consuming them. People with certain medical conditions, such as kidney disease, liver disease or hyperthyroidism, should be cautious when consuming certain superfoods. For example, excess iodine in marine algae can impair thyroid function. [19] People with food intolerances, such as lactose intolerance or histamine intolerance, may have difficulty with tolerating some superfoods, which contain substances that can cause allergic reactions. [18, 19]
Superfoods are often promoted as a panacea for many health ailments without adequate scientific support. Marketing hyperbole can lead to the belief that consuming superfoods in large quantities is the key to health, which may not be true. While many studies confirm the health benefits of superfoods, there is also a great deal of controversy regarding the research methodology and interpretation of the results. Some health effects may be temporary or insignificant. Production and global trade of some superfoods, such as cacao and avocados, may have negative impacts on the environment and local communities. High demand for these products can lead to deforestation, labor abuses and unfair trade practices. [20]

Superfoods are often more expensive than traditional foods, which can affect availability and accessibility for all segments of society. The lack of a clear definition of superfoods can lead to conflicting information about which products qualify as superfoods and exactly what health benefits they provide. Some superfoods are produced under unsustainable or inappropriate conditions, which undermines their ethics and sustainability. [17, 20]

CONCLUSION

Conscious food choices, including superfoods, play a key role in maintaining a healthy lifestyle. Superfoods, as the name suggests, are rich in of nutrients that can promote health and well-being. However, consumers should make their decisions with full awareness and knowledge of the properties and potential side effects of these products.

Although many studies confirm the health benefits of some superfoods, there is a need for further research and experimentation to better understand their effects and potential interactions with the human body. Studies to date often provide contradictory results or are methodologically limited, necessitating more detailed and thoughtful research. While there is evidence that some superfoods may help improve antioxidant function and support heart health, it is important to understand how long-term consumption of these foods may affect overall health and specific health conditions. Further research can also help in identifying the best methods for storing and preparing superfoods, to preserve their nutritional value.
In addition, experimentation with different varieties of superfoods and research into their potential synergistic effects with other dietary components may lead to new discoveries about optimal nutrition.

For example, research into combinations of different superfoods can help develop a diet rich in a variety of nutrients that promote health and well-being.

Accordingly, we encourage continued scientific research in the field of superfoods to expand our knowledge of them and provide more precise dietary recommendations for the public.

DISCLOSURE

Author'scontribution

Conceptualization, JD, PS, PSR, GRS, PM; methodology, JD, BJ, PS; software, WK, RO; check, PS, MB, PSR and PM; formal analysis, DR, PM; investigation, PS; resources, WK; data curation RO, MB, PS; writing - rough preparation, PS, JD, PM; writing - review and editing, JD, PS, PSR, GRS; visualization, JD, PS; supervision, PS, GRS, PM; project administration, PSR, PM, RO; receiving funding, no specific funding.

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