What’s the Difference Between Chlorella and Spirulina?

Chlorella and spirulina are forms of algae that have been gaining popularity in the supplement world.

Both have impressive nutrient profiles and potential health benefits, such as lowering risk factors of heart disease and improving blood sugar management (1Trusted Source).

This article reviews the differences between chlorella and spirulina and assesses whether one is healthier.

Differences between chlorella and spirulina

Chlorella and spirulina are the most popular algae supplements on the market.

While both boast an impressive nutritional profile and similar health benefits, they have several differences.

Chlorella is higher in fat and calories

Chlorella and spirulina deliver a number of nutrients.

A 1-ounce (28-gram) serving of these algae contains the following (2, 3):

	Chlorella	Spirulina
Calories	115 calories	81 calories
Protein	16 grams	16 grams
Carbs	7 grams	7 grams
Fat	3 grams	2 grams
Vitamin A	287% of the Daily Value (DV)	3% of the DV
Riboflavin (B2)	71% of the DV	60% of the DV
Thiamine (B1)	32% of the DV	44% of the DV
Folate	7% of the DV	7% of the DV
Magnesium	22% of the DV	14% of the DV
Iron	202% of the DV	44% of the DV
Phosphorus	25% of the DV	3% of the DV
Zinc	133% of the DV	4% of the DV
Copper	0% of the DV	85% of the DV

While their protein, carbohydrate, and fat compositions are very similar, their most notable nutritional differences lie in their calorie, vitamin, and mineral contents.

Chlorella is higher in:

- calories
- omega-3 fatty acids
- provitamin A
- riboflavin
- magnesium
- iron
- zinc

Spirulina is lower in calories but still contains a high amount of:

- riboflavin
- thiamine
- iron
- copper

Chlorella contains higher levels of omega-3 fatty acids

Chlorella and spirulina contain similar amounts of fat, but the type of fat differs greatly.

Both algae are particularly rich in polyunsaturated fats, especially omega-3 fatty acids (4Trusted Source, 5, 6, 7).

Omega-3 and omega-6 fatty acids are essential polyunsaturated fats that are important for proper cell growth and brain function (8).

They're considered essential because your body is unable to produce them. Therefore, you must obtain them from your diet (8).

Intake of polyunsaturated fats has been associated with a lower risk of heart disease, particularly when substituted for saturated fats (9, 10Trusted Source, 11, 12).

Omega-3 fatty acids, in particular, are associated with numerous health benefits, including reduced inflammation, improved bone health, and a lower risk of heart disease and certain cancers (8Trusted Source, 13Trusted Source, 14Trusted Source).

However, you would need to consume very large amounts of these algae to meet your daily omega-3 needs. People typically only consume small portions of them (15Trusted Source).

Both forms of algae contain various types of polyunsaturated fats.

However, a study that analyzed the fatty acid contents of these algae found that chlorella contains more omega-3 fatty acids, while spirulina is higher in omega-6 fatty acids (5, 6Trusted Source).

Though chlorella offers some omega-3 fats, concentrated algal oil supplements are a better option for those seeking alternatives to animal-based omega-3 supplements.

Both are high in antioxidants

In addition to their high levels of polyunsaturated fat, both chlorella and spirulina are very high in antioxidants.

These are compounds that interact with and neutralize free radicals in your body to prevent damage to cells and tissues (16Trusted Source).

In one study, 52 people who smoked cigarettes were supplemented with 6.3 grams of chlorella or a placebo for 6 weeks.

Participants who received the supplement experienced a 44% increase in blood levels of vitamin C and a 16% increase in levels of vitamin E. Both of these vitamins have antioxidant properties (17Trusted Source).

Furthermore, those who received a chlorella supplement also showed a significant decrease in DNA damage (17Trusted Source).

In another study, 30 people with chronic obstructive pulmonary disease (COPD) consumed either 1 or 2 grams of spirulina daily for 60 days.

Participants experienced up to a 20% increase in blood levels of the antioxidant enzyme superoxide dismutase, and up to a 29% increase in vitamin C levels. (18Trusted Source)

Blood levels of an important marker of oxidative stress also decreased by up to 36%. (18Trusted Source)

Spirulina may be higher in protein

Civilizations as far back as the Aztecs have used algae, such as spirulina and chlorella, as food (1Trusted Source).

Due to its high protein content, NASA has used spirulina as a dietary supplement for their astronauts during space missions (19).

Currently, scientists are investigating chlorella as a potential high protein, nutritious food source for longer missions in space (20, 21Trusted Source, 22).

The protein found in both spirulina and chlorella contains all essential amino acids, and your body easily absorbs it (23Trusted Source, 24, 25).

While chlorella and spirulina both contain high amounts of protein, studies indicate that some strains of spirulina can contain up to 10% more protein than chlorella (23Trusted Source, 26Trusted Source, 27Trusted Source, 28Trusted Source).

SUMMARY

Chlorella is rich in omega-3 fatty acids, vitamin A, riboflavin, iron, and zinc. Spirulina contains more thiamine, copper, and possibly more protein.

Both may benefit blood sugar control

Numerous studies have shown that both chlorella and spirulina may benefit blood sugar management.

Exactly how this works is unknown, but several studies have indicated that spirulina may help increase insulin sensitivity in both animals and humans (29Trusted Source, 30, 31).

Insulin sensitivity is a measure of how well your cells respond to the hormone insulin, which shuttles glucose (blood sugar) out of the blood and into cells where it can be used for energy.

Furthermore, several human studies have found that taking chlorella supplements may increase blood sugar management and insulin sensitivity.

These effects may be particularly beneficial for those with diabetes or insulin resistance (32Trusted Source, 33, 34Trusted Source).

SUMMARY

Some research shows that spirulina and chlorella may help lower blood sugar levels and increase insulin sensitivity.

Both may improve heart health

Studies have shown that chlorella and spirulina have the potential to improve heart health by affecting your blood lipid composition and blood pressure levels.

In one controlled 4-week study, 63 participants who were given 5 grams of chlorella daily showed a 10% reduction in total triglycerides, compared with a placebo group (35Trusted Source).

Furthermore, those participants also experienced a 11% reduction in LDL (bad) cholesterol and a 4% increase in HDL (good) cholesterol (35Trusted Source).

In another study, people with high blood pressure who took chlorella supplements daily for 12 weeks had significantly lower blood pressure readings, compared with the placebo group (36).

Similarly to chlorella, spirulina may benefit your cholesterol profile and blood pressure.

A 3-month study in 52 people with high cholesterol found that taking 1 gram of spirulina per day lowered triglycerides by about 16% and LDL (bad) cholesterol by about 10% (37Trusted Source).

In another study, 36 participants with high blood pressure experienced a 6–8% reduction in blood pressure levels after taking 4.5 grams of spirulina per day for 6 weeks (38Trusted Source).

SUMMARY

Studies have found that both chlorella and spirulina may help improve your cholesterol profile and reduce your blood pressure levels.

Which one is healthier?

Both forms of algae contain high amounts of nutrients. However, chlorella is higher in omega-3 fatty acids, vitamin A, riboflavin, iron, magnesium, and zinc.

Though spirulina may be slightly higher in protein, some studies suggest that the protein content in chlorella is comparable (23Trusted Source, 27Trusted Source, 28Trusted Source).

The high levels of polyunsaturated fats, antioxidants, and other vitamins present in chlorella give it a slight nutritional advantage over spirulina.

However, both offer their own unique benefits. One isn't necessarily better than the other.

As with all supplements, it's best to talk with your healthcare provider before taking spirulina or chlorella, especially in high doses.

This is particularly important because they may interact with certain medications, such as blood thinners (23Trusted Source, 39Trusted Source).

What's more, spirulina and chlorella may not be appropriate for people with certain autoimmune conditions.

If you have an autoimmune condition, speak with your doctor before adding chlorella or spirulina into your diet (40).

Additionally, consumers should only buy supplements from a reputable brand that has undergone third-party testing to ensure safety.

SUMMARY

While both chlorella and spirulina are high in protein, nutrients and antioxidants, chlorella has a slight nutritional advantage over spirulina.

However, both are great choices.