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SUPER FOODS

Quinoa

A Complete, Gluten-Free Protein

People everywhere are turning to **quinoa** for an excellent, meat-free, complete source of low-fat protein.¹⁻³

The high-protein content of this vegetable seed—often mistakenly called a grain—means quinoa has a much lower carbohydrate content than grains,² as well as a lower glycemic index.⁴ It is also low in sodium⁵ and unlike some grains, is completely gluten-free.^{2,6}

Quinoa contains a range of nutrients including riboflavin (vitamin B2),⁶ quercetin,⁷ tocopherols,⁸ polyphenols,^{3,8} saponins,⁸ phytosterols,³ minerals,³ vitamins,³ free-radical fighting molecules,^{7,9} fiber,¹⁰ and highly potent compounds like hydroxybenzoic acids and arabineans.⁹

Scientists continue to find evidence that this versatile grain substitute may inhibit inflammation,⁹ reduce cholesterol,^{8,9} quench free radicals,⁷ improve glucose levels,⁷⁻¹⁰ promote cellular energy production,¹⁰ support weight loss,¹⁰ act as a prebiotic,^{11,12} and potentially help prevent cancer and heart disease.¹³

In fact, NASA scientists have suggested quinoa as a possible crop for cultivation on long-duration manned space flights.¹⁴ And the United Nations officially declared 2013 to be the International Year of Quinoa, with UN Secretary-General Ban Ki-moon declaring, "Quinoa is now poised for global recognition."¹⁵



A Protein Powerhouse

Quinoa was a dietary staple in South America as long as 4,000 years ago.¹⁶

However, it wasn't until 1955 that scientists concluded, "While no single food can supply all the essential life-sustaining nutrients, quinoa comes as close as any other in the plant or animal kingdom."¹⁷

Prominent among these nutrients is its high-quality protein.^{2,3,9,10,18} The seed of this vegetable, related to spinach and beets, is one of the most protein-rich foods we can eat.¹⁰

It is possible for plant foods to include all nine of the essential amino acids—those that must be derived from diet. But one or more of these protein-building blocks is generally in short supply, limiting the amount of usable protein.^{1,6,9} This means that vegans have very limited options for quality protein.

For instance, grains often lack sufficient amounts of lysine and isoleucine, rendering their protein contribution incomplete.⁶ But quinoa contains ideal levels of

these and all of the other essential amino acids⁶—making it the only grain-like food that is a complete protein.⁹

The gluten molecules in wheat, barley, and rye trigger an autoimmune response in celiac patients. However, quinoa—which can be eaten like a cooked grain—is gluten-free and safe for celiac patients, as well as those with gluten intolerance.¹⁹

Compared to grains, quinoa provides a substantially higher proportion of protein relative to carbohydrate.^{2,18} The concentration of protein is highest in the germ, and the quinoa germ comprises up to about **60%** of the quinoa seed—while the wheat germ makes up less than **3%** of the wheat kernel.² This makes quinoa ideal for low-carb and low-glycemic diets.

Many people consume grains because they can be a good source of fiber. But quinoa is fiber-abundant,¹⁰ with just one cup delivering **21%** of your recommended daily fiber intake.⁵ The fiber content of quinoa is significantly greater than that of either whole wheat or brown rice.¹⁸

Quinoa is recognized as a "functional food." That is, its balanced content of protein, minerals, vitamins, and fatty acids deliver such a strong contribution to nutrition that it may lower the risk of a broad range of diseases. Let's examine a few of these main health effects.

Protecting Against Cardiovascular Disease

Researchers continue to find that quinoa provides significant cardiovascular benefits.

In a University of Milan study, scientists compared various gluten-free foods. Quinoa stood out in the study for producing lower free fatty acid levels and triglyceride concentrations than other foods studied, including gluten-free pastas and breads.²⁰

Quinoa is high in magnesium,²¹ which can reduce blood pressure²² by relaxing blood vessels.

Quercetin, abundantly found in quinoa, has been shown to target blood pressure in hypertensive subjects.²³ Quinoa also delivers a significant fiber punch, which may help lower high blood pressure, as well as decrease cholesterol levels.¹⁰

Substantial levels of potent phytochemicals in quinoa—such as saponins and phytosterols—support significant cholesterol reduction. In a 2010 animal study at Jagiellonian University in Krakow, Poland, scientists concluded that quinoa decreased total cholesterol by **26%**, LDL cholesterol by **57%**, and triglycerides by **11%**, compared to controls. And while the control group suffered a significant decrease in beneficial HDL, quinoa inhibited this effect in the first group.⁸



Cooking Quinoa

If you mistakenly pronounce the name of this grain substitute as “kwin-OH-a,” someone will quickly inform you it’s “KEEN-wa.” A little-known fact is that it can also be pronounced “kee-NO-a.”³⁴ Now that you know how to say it, here is some guidance on how to cook it.

While the directions call for rinsing quinoa, you may be tempted to skip this step. Don’t. If you fail to wash away the thin coating on this tiny seed, it’s going to taste bitter. Use a strainer with a fine mesh because quinoa seeds are tiny enough to slip through some strainers.

To get the greatest nutritional punch from quinoa’s powerful compounds, don’t overcook it. (You wouldn’t want to eat mushy quinoa anyway.) Add two cups of water to one cup of quinoa and bring to a boil. Then, cover and reduce the heat to low. Let the quinoa simmer until tender, which should be in about 15 minutes.

You’ll know it’s cooked when the grain becomes translucent and the white germ forms a visible spiral on the exterior of the quinoa seed.

Remove the cooked quinoa from the pot and drain it, making sure to use a fine-mesh strainer again. Quinoa holds an incredible amount of water and forgetting to drain it thoroughly will make your dish watery.

Then, return the cooked and drained quinoa to the pot and—with the heat off—let it sit, with the pot covered, for another 15 minutes. Letting it rest in the still-warm pot dries it out a bit to ensure you don’t end up with wet, clumpy quinoa.

Uncover and fluff with a fork. The quinoa should look light and fluffy, and you should be able to see the germ separating from the seed. You’ll find quinoa’s consistency and texture is similar to a combination of rice and couscous.

To get maximum nutritional value and flavor, freshly cooked quinoa should be served immediately. Serve with a stir-fry, using quinoa as a substitute for rice. Add it to curries, salads, casseroles, or just about any dish.

Quinoa can also be cooked in a rice cooker or an oven.

The fat content in quinoa is higher than in cereal grasses such as wheat, and includes valuable amounts of heart-healthy fats such as oleic acid, a monounsaturated fat. Quinoa also provides small amounts of alpha-linolenic acid (ALA), an omega-3 fatty acid.^{24,26}

Studies have demonstrated a remarkable fact: Quinoa does not get oxidized as rapidly as might be expected given its higher fat content. As a result, cooking quinoa doesn’t appear to significantly compromise the quality of its fatty acids. This oxidative protection

may be due to quinoa’s diverse array of polyphenols, various members of the vitamin E family such as alpha-, beta-, gamma- and delta-tocopherol, as well as flavonoids such as quercetin and kaempferol.^{24,27}

Controlling Blood Sugar

Quinoa is at the low end of the glycemic index,⁴ which makes it a great grain substitute for those with blood sugar issues. Its magne-

sium content may also reduce the risk of type II diabetes by promoting healthy blood sugar control.¹⁰

The high fiber content of quinoa can contribute to lower glucose levels and may promote weight loss¹⁰—which in turn, may further reduce the risk of diabetes. A University of Milan study found that quinoa has a higher Satiating Efficiency Index (SEI) than wheat or rice,²⁰ meaning it promotes a feeling of fullness that can block the weight gain associated with increased diabetes risk.

Investigators showed that “quinoa seeds can reduce most of the adverse effects exerted by fructose on lipid profile and glucose level.”⁸

In 2009, scientists at the University of São Paulo in Brazil studied 10 traditional Peruvian grains and legumes for their potential to inhibit type II diabetes-relevant hyperglycemia. This *in vitro* study concluded that quinoa could possibly be developed as dietary strategy for managing type II diabetes.⁷

Reducing Cancer Risk

High levels of *bioactive* compounds in quinoa have the potential to lower the risk of cancer.

The *Journal of Agricultural and Food Chemistry* published a study in 2011 that employed sophisticated laboratory techniques to determine levels of phenolic compounds in quinoa.²⁸

The researchers identified in quinoa the following compounds: genistein, quercetin, kaempferol, epigallocatechin (the anti-inflammatory polyphenol present in green tea) and other phenolic substances that have the capacity to suppress new blood vessel growth (*antiangiogenesis*) and inhibit the proliferation of cancer cells.²⁸ In

fact, the concentration of quercetin and kaempferol in quinoa sometimes exceeds their concentration in high-flavonoid berries such as cranberry and lingonberry.^{24,29}

Quinoa also contains a range of potent *compounds* known as saponins. These bitter-tasting chemicals provide strong antitumor, *apoptotic* (cell death), and tumor antiangiogenic effects.³⁰ They are sometimes used as an adjunct to chemotherapy.³⁰

The saponins in whole quinoa flour have been found to be so abundant that they constitute between **5.6** and **7.5%** of the flour's total composition.²⁸

Inhibiting Inflammation

Quinoa provides substantial anti-inflammatory effects.

A 2014 study in the *Journal of Food Science* tested some of the many saponins in quinoa on rodent macrophage cells for anti-inflammatory effect. The researchers found that these compounds decreased the production of nitric oxide, an inflammatory mediator. The quinoa saponins also inhibited the release of inflammatory cytokines, including tumor necrosis factor-alpha and interleukin-6. This study concluded that, "These results suggest that quinoa saponins may be used as functional food components for prevention and treatment of inflammation."³¹

Beyond saponins, research has been identifying a greatly expanded list of anti-inflammatory components in quinoa. The unique combination of these phytonutrients in quinoa may explain the results of animal studies indicating that daily ingestion of quinoa decreases the risk of inflammation-related health issues, including obesity.^{24,32}

Nutritional Content Of Quinoa

Incorporating quinoa into your diet is a sound nutritional strategy for getting high-quality protein while reducing your meat intake. It is the ideal choice for:

- Vegans,
- People negatively affected by gluten,
- Low-carb dieters,
- Those who prefer to eat foods low on the glycemic scale,
- People on low-sodium diets, and
- Individuals who need to boost their fiber intake.

Quinoa provides a wide array of saponins, phytosterols, polyphenols, polysaccharides, free-radical fighting molecules, minerals, and other nutrients.

A typical serving of quinoa, 1 cup (**185 grams**), contains:³⁵

Calories	222
Calories from fat	32
Protein	8.1 grams
Total fat	3.6 grams
Saturated fat	0 grams
Cholesterol	0 grams
Vitamin E	1.2 mg
Thiamin	0.2 mg
Riboflavin	0.2 mg
Vitamin B6	0.2 mg
Folate	77.7 micrograms
Copper	0.4 mg
Iron	2.8 mg
Magnesium	118 mg
Manganese	1.2 mg
Phosphorus	281 mg
Sodium	13 mg
Zinc	2.0 mg



Potent inflammation-inhibiting phytonutrients found in quinoa are now known to include hydroxycinnamic and hydroxybenzoic acids; polysaccharides such as arabinans and rhamnogalacturonans; the flavonoids quercetin and kaempferol; and novel saponins, including molecules derived from oleanic acid, hederagenin, and serjanic acid. Quinoa also provides a form of vitamin E called gamma-tocopherol and small amounts of alpha-linolenic acid, an anti-inflammatory omega-3 fatty acid.^{9,27,29,33}

Summary

Gluten-free quinoa is increasingly recognized as a superfood as scientists continue to confirm that its high content of fiber and high-quality protein—combined with a vast array of potent compounds—delivers diverse and powerful health benefits. The saponins, phytosterols, polyphenols, polysaccharides, *free-radical fighting* molecules, minerals, vitamins, and other constituents in quinoa provide strong protection against cardiovascular disease, diabetes, cancer, and inflammation.

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

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