

Anti-nutrients

Anti-nutrients are plant compounds designed to protect certain plants from insects and bacterial infections. Anti-nutrients exist in small amounts in some of the foods we eat, particularly whole grains and legumes.

Health effects of anti-nutrients

Although existing evidence is inconclusive and human trials are limited, some experts propose that consumption of anti-nutrients, particularly when consumed in large amounts, can lead to a host of health concerns, such as nutrient absorption issues, intestinal permeability (leaky gut), and increased inflammation.

For most individuals, anti-nutrients aren't a cause for concern. In fact, some anti-nutrients have been shown to exert numerous health benefits. For example, tannins, a type of anti-nutrient found in beans and legumes, may help improve blood pressure and decrease blood lipid levels. Although some foods contain small amounts of anti-nutrients after cooking or processing, the health benefits of eating these plant-based foods often outweigh the risks or minor side effects.

Some individuals may experience digestive discomfort as a result of consuming foods containing anti-nutrients and, therefore, may choose to avoid or limit their consumption of these foods. To mitigate these concerns, certain food preparation techniques can help reduce anti-nutrient concentrations, improve digestibility, and increase nutrient availability.

Common anti-nutrients and their food sources

Anti-nutrient	Action	Sources
Lectins	Interferes with absorption of calcium, iron, phosphorus, and zinc	Beans, legumes, and whole grains
Oxalates	May bind to calcium and interfere with its absorption	Green leafy greens, beans, and legumes
Phytates	Can inhibit absorption of iron, zinc, magnesium, and calcium	Beans, legumes, seeds, and whole grains
Tannins	May decrease iron absorption	Beans and legumes

Food preparation techniques for reducing anti-nutrients & increasing nutrient availability



Boiling

Boiling effectively degrades anti-nutrients in beans, legumes, and whole grains. As a general rule, longer cooking times yield lower amounts of anti-nutrients. Additionally, boiling beans with a large piece of dried kombu seaweed can reduce gas-producing qualities in beans. Boiling is also highly effective for reducing oxalate content in dark leafy greens when compared to steaming or baking; however, be careful not to boil for longer than a minute or two to minimize nutrient loss.



Soaking

Soak beans, legumes, and grains overnight to maximize nutrient absorption and ease potential gas and bloating. Soaking these foods overnight removes some of the indigestible sugars, making them easier to digest, and decreases some anti-nutrients, such as phytates, tannins, and lectins. Be sure to fully submerge beans in cold filtered water while soaking them overnight (minimum eight hours), then drain all liquid before cooking the beans.



Sprouting

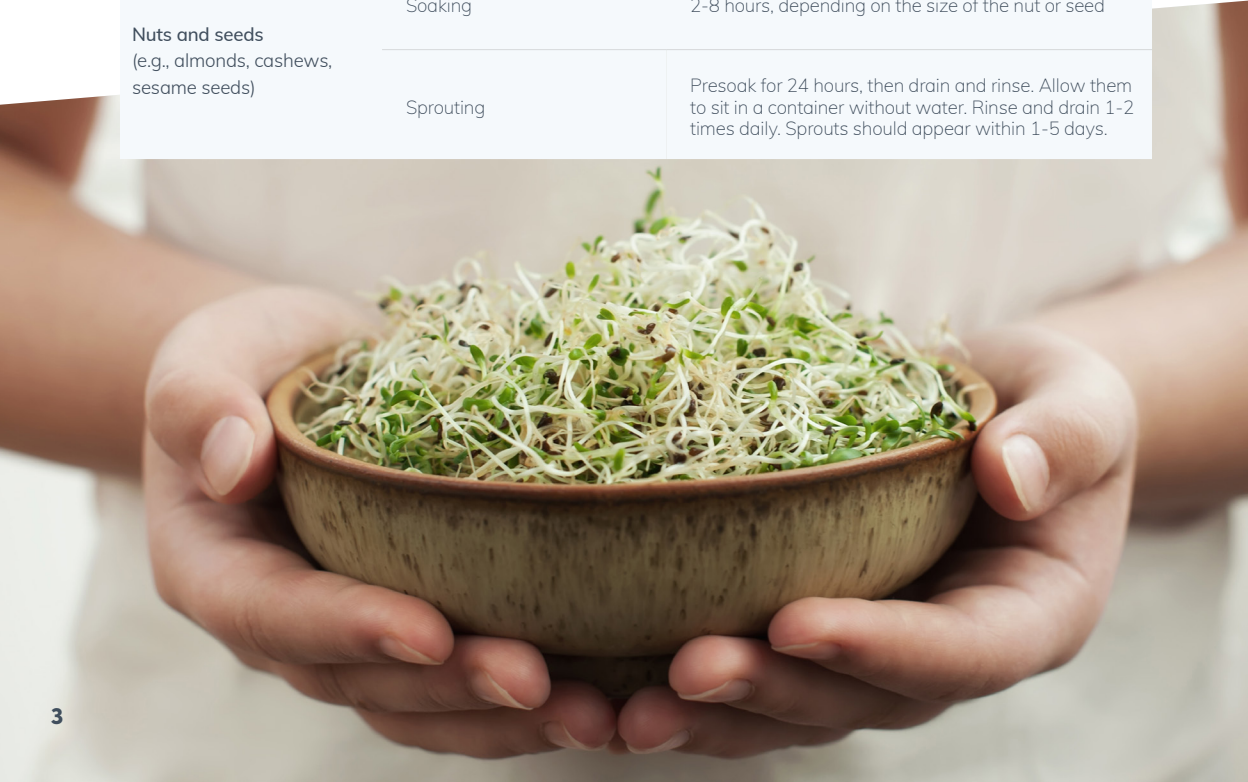
Grains, nuts, and seeds can be sprouted to reduce their anti-nutrient content and improve digestibility. Sprouting foods may also increase their nutrient availability. Sprouting is a simple process that involves placing the grains, nuts, or seeds in a glass jar or bowl and covering them with filtered water (2:1 ratio). Once they've plumped up and are hydrated, drain and rinse them well. The time it takes to hydrate is dependent on the type of grain, nut, or seed, but it typically takes about 24 hours. Add them back to the bowl or jar, cover with mesh or a thin cloth, and wait for them to sprout. This process can take several days. Sprouted grains, nuts, and seeds can be eaten raw, cooked, or ground into a flour.



Fermenting

Fermentation occurs when bacteria begin breaking down the carbohydrates found in food. Fermenting pre-soaked grains and legumes can reduce anti-nutrient content by up to 50% and improve their digestibility. Begin by rinsing the legumes or grains under cold water, then soak them in warm water for 24 hours. Add a starter, such as whey, yogurt, kombucha, or another fermented food, to assist in the fermentation process. Allow them to soak for two full days, then drain. The grains or legumes are now ready to be cooked as you'd normally cook them.

Foods	Technique	Preparation/cooking time
Bean and legumes (e.g., black beans, garbanzo beans, lentils, pinto beans)	Boiling	1-3 hours
	Soaking	Overnight (8+ hours)
	Fermenting	Presoak for 24 hours. Add a starter and soak for two more days. Drain and boil for up to three hours.
Grains and pseudograins (e.g., barley, oats, rice, quinoa, amaranth)	Boiling	Most grains can cook in 20 minutes or less. Whole grains, particularly brown rice, can take up to 40-60 minutes.
	Soaking	Overnight (8+ hours)
	Sprouting	Presoak for 24 hours, then drain and rinse. Allow them to sit in a container without water. Rinse and drain 1-2 times daily. Sprouts should appear within 1-5 days.
	Fermenting	Presoak for 24 hours. Add a starter and soak for two more days. Drain and boil for up to 1 hour.
Nuts and seeds (e.g., almonds, cashews, sesame seeds)	Soaking	2-8 hours, depending on the size of the nut or seed
	Sprouting	Presoak for 24 hours, then drain and rinse. Allow them to sit in a container without water. Rinse and drain 1-2 times daily. Sprouts should appear within 1-5 days.



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