

Soaking nuts, grains, seeds, and legumes

Nature has set it up so that the nut, grain and seed may survive (insects, microbes, animal predators, etc.) until proper growing conditions are present. Nature's defense mechanism includes nutritional inhibitors and toxic substances that can be removed naturally when there is enough precipitation to sustain a new plant after the nut, grain or seed germinates. When it rains the nut, grain or seed gets wet (soaked) and can then germinate to produce a plant. So we are mimicking nature when we soak our nuts, grains and seeds.

Nutritional inhibitors and toxic substances found in nuts grains and seed can be minimized or eliminated by soaking. These inhibitors and toxic substances are enzyme inhibitors, phytates (phytic acid), polyphenols (tannins), and goitrogens.

What are Enzyme inhibitors?

There are digestive enzymes and metabolic enzymes. Digestive enzymes such as amylase, protease, lipase, etc. help break down food to be used in biological processes. Metabolic enzymes help in every biological process the body does (one example is the enzyme kinase that transfers phosphate groups). Enzyme inhibitors will clog, warp or denature an active site of an enzyme. They may also bind to the enzyme changing the polarity of the enzyme, which will prevent the intended molecule from binding to the enzyme.

“Once again, the habits of traditional peoples should serve as a guide. They understood instinctively that nuts are best soaked or partially sprouted before eaten. This is because nuts contain numerous enzyme inhibitors that can put a real strain on the digestive mechanism if consumed in excess.”^{1,2}

What are Phytates?

“All grains contain phytic acid (an organic acid in which phosphorus is bound) in the outer layer or bran. Untreated phytic acid can combine with calcium, magnesium, copper, iron and especially zinc in the intestinal tract and block their absorption. This is why a diet high in unfermented whole grains may lead to serious mineral deficiencies and bone loss. The modern misguided practice of consuming large amounts of unprocessed bran often improves colon transit time at first but may lead to irritable bowel syndrome and, in the long term, many other adverse effects.”³

What are Polyphenols?

“Tannins are naturally occurring plant polyphenols. Their main characteristic is that they bind and precipitate proteins. They can have a large influence on the nutritive value of many foods eaten by humans and feedstuff eaten by animals.”⁴

Remember, these polyphenols do have a purpose in nature. “The antimicrobial activities of tannins are well documented. The growth of many fungi, yeasts, bacteria, and viruses was inhibited by tannins.”⁴

“Unlike chocolate, carob contains no stimulants; it does, however, contain tannin, a substance that reduces the absorption of protein through the intestinal wall. Roasting neutralizes most of the tannins so buy only powder made from roasted carob pods.”⁵

What are Goitrogens?

Goitrogens are naturally-occurring substances found in foods. These substances can suppress thyroid function. Millet is one an example of a goitrogens. “Tempering the grain to 26 percent moisture overnight prior to milling resulted in a flour with no goitrogenic activity.”⁶ Foods containing goitrogenic substances include Pine nuts, peanuts, almonds, walnuts, lima beans, and vegetables such as Broccoli, Cauliflower, Brussel Sprouts, Cabbage, Mustard, Sweet Potatoes, Kale, Turnips, kohlrabi, Rutabaga, Radishes, Spinach, Cassava, and all foods containing soy. Cooking may help to inactivate the goitrogenic compounds found in foods where nutrients would be lost in the soaking process, such as vegetables. Other foods such as cherries, apricots, peaches, pears, and strawberries also contain goitrogens and usually don't have the best flavor when cooked or soaked.^{7,8} (Although Sharon's cooked Peach Cream Pie is definitely an exception!)

What are Anti-nutrients?

Phytates, tannins, and goitrogens are anti-nutrients (compounds in food that decrease the nutritional value of the food by making the nutrient unavailable or undigestible for biological processes). Other anti-nutrients are lectins, oxalates, and saponins.

“The principal goitrogens in soybeans are the estrogenic plant hormones known as isoflavones. The antinutrients known as saponins in soy may also be goitrogens. Cooking and processing methods, using heat, pressure, and alkaline solutions, will neither deactivate nor remove isoflavones or saponins.”⁹

“Strong chelating substances, such as phytic acid in grains, oxalic acid in green leafy vegetables and tannins in tea may bind with ionized minerals in the digestive tract and prevent them from being absorbed.”¹⁰

Why soak nuts, grains and seeds?

1. To remove or reduce phytic acid.
2. To remove or reduce tannins.
3. To neutralize the enzyme inhibitors.
4. To encourage the production of beneficial enzymes.
5. To increase the amounts of vitamins, especially B vitamins.
6. To break down gluten and make digestion easier.
7. To make the proteins more readily available for absorption.
8. To prevent mineral deficiencies and bone loss.
9. To help neutralize toxins in the colon and keep the colon clean.
10. To prevent many health diseases and conditions.

“Soaking allows enzymes, *lactobacilli* and other helpful organisms to break down and neutralize a large portion of phytic acid in grains.

Soaking in warm water also neutralizes enzyme inhibitors, present in all seeds, and encourages the production of numerous beneficial enzymes. The action of these enzymes also increases the amount of many vitamins, especially B vitamins.

Scientists have learned that the proteins in grains, especially gluten, are very difficult to digest. A diet high in unfermented whole grains, particularly high-gluten grains like wheat, puts an enormous strain on the whole digestive mechanism. When this mechanism breaks down with age or overuse, the results take the form of allergies, celiac disease, mental illness, chronic indigestion and *candida albicans* overgrowth. Recent research links gluten intolerance with multiple sclerosis. During the process of soaking and fermenting, gluten and other difficult-to-digest proteins are partially broken down into simpler components that are more readily available for absorption.”³

What can be used to soak nuts, grains and seeds?

I have found many references to soaking nuts, grains, and seeds in water, salt water, or a warm water mixture with something acidic like yogurt, whey or lemon juice. It seems within 7 to 24 hours the enzyme inhibitors are neutralized and the anti-nutrients are broken down regardless of the method you choose. There is evidence that the process works when you see sprouting begin.

"Nuts are easier to digest, and their nutrients more readily available, if they are first soaked in salt¹ water overnight, then dried in a warm oven (or dehydrator). This method imitates the Aztec practice of soaking pumpkin or squash seeds in brine and then letting them dry in the sun before eating them whole or grinding them into meal.^{1,2} Salt in soaking water activates enzymes that neutralize enzyme inhibitors...."¹

“Soaking the nuts and seeds in water neutralizes the enzyme inhibitors and can increase the vitamin and mineral content.”²

“Because they are acidic, buttermilk, cultured milk, yoghurt and whey (as well as lemon juice and vinegar) activate the enzyme phytase, which works to break down phytic acid in the bran of grains. Sour milk products also provide lactic acid and lactobacilli that help break down complex starches, irritating tannins and difficult-

to-digest proteins. Soaking increases vitamin content and makes all the nutrients in grains more available. This method has the further advantage of softening whole meal flour that the final product is often indistinguishable from one made with white flour.”¹¹

I usually soak my nuts and seeds in salt water this way they will be salty and I know that salt helps digest protein. I will soak my grains in plain water or yogurt if I am making a recipe like pancakes.

What about mold?

Mold and other mycotoxins or aflatoxins are known to be on some nuts, grains, and seeds. It may be a good idea to soak your nuts, grains and seeds in a dilute solution (0.18 % - 0.19 %) of food grade hydrogen peroxide, especially if you have any sensitivity to mold. There are discussions about how these mycotoxins/aflatoxins affect our health. The controversies include these toxins being responsible for cancer and autoimmune diseases.

Concentrated hydrogen peroxide is caustic (dangerous). It is my advice to wear gloves, goggles, and work in an area that can be cleaned up thoroughly before any unsuspecting person comes along. Clean up all spills. If any gets on your skin rinse immediately with lots of water. Medical attention may be required if concentrated hydrogen peroxide gets into your eyes.¹²

To dilute:

1. Read the label on the bottle of the food grade hydrogen peroxide (H₂O₂) to determine the concentration
2. Plug that concentration into the following equation.

$$\text{___ \%} * X = 3\% * \text{volume}$$

Then work this equation to get to a volume in ounces that you can add 1 ounce to (so X=1)

For example 17% * X = 3% * 6 ounces . . . rearranges to X = 3*6/17 = 1.06

Another way 17% * X = 3% * 5.5 ounces . . . rearranges to X = 3*5.5/17=0.97

I would choose the more concentrated one

So if I had a 17% solution I would take 1 ounce of the concentrated food grade hydrogen peroxide

Add this to 4.5 ounces of filtered water to make a final volume of 5.5 ounces

To check your math, take ___% and divide that by final volume – this should equal about 3.

I have found 12% and 35% food grade hydrogen peroxide in the stores.

12% divided by 4 equals three (that one is easy) so I take 1 ounce of the concentrated and three ounces of filtered water to make a 1:4 solution.¹³

35% * X = 3% * 12 . . . 3*12/35=1.03 which is close enough, so you want a final volume of 12 ounces . . . add one ounce of concentrate and 11 ounces of filtered water to make a 1:12 solution.¹³

3. Put rubber gloves on your hands and safety goggles on your eyes
4. Pour up 1 ounce of your concentrated solution and pour into a container that you can store this solution in. We keep a well labeled liter of this 3% solution in our refrigerator – out of the reach of children.
5. Add the amount of filtered water you have calculated in step 2 (will be once ounce less than the final volume).
6. You now have a 3% solution that you will use to make a 0.18 % - 0.19 % solution to soak your nuts, grains and seeds. Follow this equation: 3 divided by 16 = 0.187 that is one ounce of 3% plus 15 ounces filtered water to make one pint (16 oz) of a 0.18% solution. You will need to cover your food item with water, this will require more than one pint of water. If you soak gallons of raw material (seeds, grains, legumes) at a time, you'll need gallons of dilute hydrogen peroxide. For every gallon of water used, 8 ounces of hydrogen peroxide is required (that is 8 ounces of the 3% plus 120 ounces of filtered water for a final volume of 1 gallon).

I believe in rinsing the items soaked in hydrogen peroxide well in filtered water.

I found a nice website with steps for germinating nuts that describe another method of disinfecting. “Do a final rinse with grapefruit seed extract (GSE) or organic apple cider vinegar. (GSE or ACV will clean the pulses of most bacteria, without being absorbed. You should consider using one of these especially if you live in a warmer climate.) Refrigerate the germinated nuts and seeds.”¹⁴ I wanted to include this reference, even though

the website is about feeding monkeys because I found the website very informative. Also, it supports the ideas in this article. Monkey as well as humans love nuts and benefit from them being properly prepared.

How long does the soaking process take?

It takes at least 7 (seven) hours to properly break the phytic acid and enzyme inhibitors se compounds down. I have soaked for as little as 7 hours and as long as 48 hours.

“As little as seven hours of soaking in warm acidulated water will neutralize a large portion of phytic acid in grains. The simple practice of soaking cracked or rolled cereal grains overnight will vastly improve their nutritional benefits.”³ “Flour products should be soaked at room temperature for at least 12 hours but better results may be obtained with a 24-hour soaking.”¹¹

Are the nuts, grains and seeds used wet?

I have enjoyed almonds wet. If you choose to try consuming anything in the soaked state, make little batches and store them in the refrigerator. Usually everything that is soaked is dried in a dehydrator or oven on the lowest possible setting for 24 – 48 hours to remove all moisture.

Wheat berries can be soaked whole for 8 to 22 hours, then drained and rinsed. Some recipes use the whole berries while they are wet, such as cracker dough ground right in the food processor. You can also dry sprouted wheat berries in a low-temperature oven or dehydrator, and then grind them in your grain mill and use the flour in a variety of recipes.¹⁵

Nuts, grains, seeds and legumes can be ground up to use as flour in many recipes after they have been dried.

Any advice on what to do with legumes?

Maureen Diaz recommends soaking any beans or legumes in water and vinegar for at least 12 hours before cooking. Soaked and dried beans (white and navy have the most benign flavor) may be ground up and used as flour for thickening and baking. This is helpful for those on a gluten free diet.¹⁶

Paul Pitchford in his book, *Healing with Whole Foods*, has a wonderful chapter on legumes that explains the healing properties of each bean, how to improve the digestibility of legumes (11 tips), techniques for cooking legumes (Beans, Peas and Lentils) and a nice collection of recipes. The end of the chapter also covers Miso, Tempeh and Tofu recipes, healing properties, nutrients, uses, words of caution and best results in preparation.¹⁷

One of his recommendations includes placing soaked kombu or kelp seaweed in the bottom of the pot when soaking legumes. Add 1 part seaweed to 6 or more parts legumes. This is for improved flavor and digestion, more nutrients, and faster cooking.¹⁸

His recommendation for soaking: “Soak legumes for 12 hours or overnight in four parts water to one part legume. For best results, change the water once or twice. Lentils and whole dried peas require shorter soaking, while soybeans and garbanzos need to soak longer. Soaking softens skins and begins the sprouting process, which eliminates phytic acid, thereby making more minerals available. Soaking also promotes faster cooking and improved digestibility, because the gas-causing enzymes and trisaccharides in legumes are released into the soak water. Be sure to discard the soak water. After bringing legumes to a boil, scoop off and discard foam. Continue to boil for 20 minutes without lid at beginning of cooking to let steam rise (breaks up and disperses indigestible enzymes).”¹⁸

Other noteworthy advice: “Season with sea salt, miso, or soy sauce. Add salty products such as these near the end of cooking. If added at the beginning, the beans will not cook completely and skins will remain tough. Suggested salt: ¼ teaspoon unrefined salt or 1 teaspoon soy sauce to 1 cup dry legumes.” He adds that the amount of salt may be increased if salt is used sparingly in other foods as salt is a digestive aid to high protein products.¹⁷

It’s interesting that Mr. Pitchford also mentions pouring a little apple-cider, brown rice or white-wine vinegar in the water in the last stages of cooking legumes. This softens the legume breaking down protein chains and indigestible compounds helping those who suffer after eating them.
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Basic Method of Cooking Legumes¹⁹ (for specific details on ten different legumes see page 513)

1. Sort through for dirt and stones. Then wash and rinse thoroughly.
2. Add **soaked** legumes and cold water (and soaked kombu to the bottom of the cooking pot if desired).
3. Bring to boil. Reduce heat to low.
4. Cover and simmer until almost done.
5. Add seasonings and salt.
6. Continue to cook, about 15 minutes, until soft.
7. Uncover. Turn to medium if you want to cook off excess liquid.¹⁹

In conclusion, we hope you will enjoy eating your nuts, grains, seeds and legumes when they are properly prepared. The added step of soaking may seem like an inconvenience, however, all the added health benefits will make this preparation wisdom well worth the effort!

Written by Delicia Beaty and Sharon Foutch on April 7, 2006

¹ Fallon, Sally. Nourishing Traditions Cookbook Revised Second Edition page 512

² Wilderness Family Naturals website found at http://www.wildernessfamilynaturals.com/nuts_soaked_dried_organic.htm on April 6, 2006

³ Fallon, Sally. Nourishing Traditions Cookbook Revised Second Edition page 452-453

⁴ Tannins: fascinating but sometimes dangerous molecules. <http://www.ansci.cornell.edu/plants/toxicagents/tannin/> found on April 4, 2006

⁵ Fallon, Sally. Nourishing Traditions Cookbook Revised Second Edition page 550

⁶ Klopfenstein, C.F., Leipold, H.W. & Cecil, J.E. 1991. Semi wet milling of pearl millet for reduced goitrogenicity. Cereal Chem. 68: 177-179

⁷ Goitrogens website found at <http://www.ithyroid.com/goitrogens.htm> on April 6, 2006

⁸ The worlds healthiest foods website found at <http://www.whfoods.com/> search on goitrogens on April 6, 2006

⁹ Kaayla T. Daniel, PhD, CCN, *The Whole Soy Story: the Dark Side of America's Favorite Health Food*, New Trends Publishing, Inc., Washington, DC, 2005.

¹⁰ Fallon, Sally. Nourishing Traditions Cookbook Revised Second Edition page 40

¹¹ Ibid. page 476

¹² Answers to questions regarding H2O2 website found at <http://www.dfwx.com/answers.html> on April 7, 2006

¹³ Dilutions website found at <http://www.wellesley.edu/Biology/Concepts/Html/volumetovolume.html> on April 7, 2006

¹⁴ Your Monkey's Diet and Health website found at <http://www.monkeymatters.com/articles/nuts/nuts02.htm> on April 6, 2006

¹⁵ Allbritton, Jen. Wheaty Indiscretions. *Wise Traditions Magazine* Spring 2003 page23

¹⁶ Diaz, Maureen. Traditional Foods Preparation Workshop Video

¹⁷ Pitchford, Paul. *Healing with Whole Foods, Asian Traditions and Modern Nutrition*, Chapter 37 pages 506 to 529

¹⁸ Ibid. page 512

¹⁹ Ibid. page 514