

Whole Grains

The Essentials About Grains

-  Good source of fibre, complex carbohydrates, vitamins (especially vitamins B and E) and minerals (especially Mg, Zn, Fe, K, Ca, P, Cu)
-  Not complete proteins, low in essential amino acids lysine (which is high in legumes)
-  There are three parts to a kernel of grain:
 - 1) *Endosperm* (central core)- 85% of kernel; mainly starch, therefore has less vitamins, minerals & fiber compared to the other components of the kernel; only remaining part of kernel when grain is refined
 - 2) *Germ* - 3% of kernel; future sprout, highest concentration of nutrients
 - 3) *Bran* - 15% of kernel; fibre, usually removed because difficult to digest and contains highest concentration of phytic acid, a component of all grains that binds minerals to extend shelf life, many packaged foods are stripped of 25 - 75% of their nutritional value during the refining process

How to Prepare and Cook Grains

- 1) *Rinse* - Rinse thoroughly in cold water until the water runs clear, strain to remove any dirt or debris
- 2) *Presoaking* - This optional step reduces cooking time. After rinsing, soak grains overnight or for 6 - 8 hours and cook in the same water that the grains were soaked.
- 3) *Boil and Simmer* - Bring water to a boil, add grains and return to a boil. If using presoaked grains, bring water to a boil with the grain in it. Reduce heat and simmer, cover tightly, until done. Do not lift the cover until the time is up. Use broth or fruit juice instead of water for different flavourings.
- 4) *Test* - Most whole grains are slightly chewy
- 5) *Fluff* - When grains are cooked to your preferred texture, remove from heat and gently lift and separate them with a fork, recover and allow to sit for 5 - 10 min, before serving.

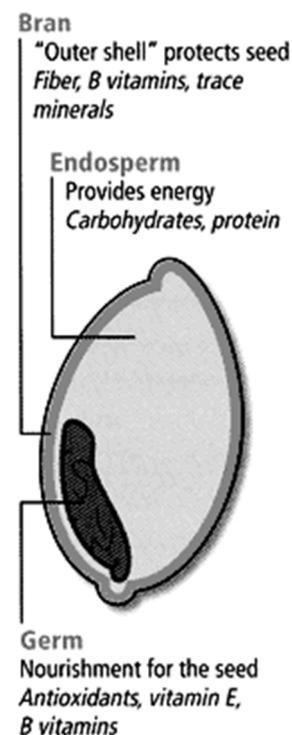
Notes:

- Certain grains (amaranth, cornmeal, cracked wheat, teff) become thick and porridge like when cooked and make excellent breakfast cereals
- Pre-steamed grains (bulgar, couscous) only need to be soaked in boiling water and covered, no cooking is necessary

Storage of Grains

-  Store grains in airtight ceramic jars in a cool, dry place/refrigerate in hot humid climates; helps preserve natural oils from going rancid
-  If stored properly grains will keep from several months to a year (millet has a short shelf life and should be brought from a store with a high turnover and in a cool pantry or refrigerator)
-  If a grain smells musty or bitter, it is probably rancid

Whole grain kernel



Grains	Comments	Nutritional Qualities	Ratio of Grain:Water Cooking Time
Amaranth*	<ul style="list-style-type: none"> - native to Central America (Aztecs) - small grain, size of a poppy seed - cooks into a sticky, gelatinous texture with a nutty flavour - great for porridge, to thicken soups or add to other grains (rice, millet) to increase protein content, popped as popcorn - store in refrigerator 	<ul style="list-style-type: none"> - gluten free - high amount of protein, especially the amino acids lysine and methionine - contains 60 mg of calcium/ ½ cup (more than milk), iron, vitamin C - contains a component that inhibits cholesterol formation 	<p>1:3 25 min</p>
Barley, pearled	<ul style="list-style-type: none"> - pearled barley is refined, bran has been removed, therefore it is less nutritious - mild flavour and chewy - commonly used in soups; cook as breakfast cereal or in stews/soups 	<ul style="list-style-type: none"> - contains small amounts of gluten - contains a component that inhibits cholesterol formation 	<p>1:3 35 - 45 min</p>
Barley, whole	<ul style="list-style-type: none"> - slightly refined, therefore chewier - expands to 4X its dry size - use in soups, stews or cook with extra water to make a porridge 	<ul style="list-style-type: none"> - contains small amounts of gluten - higher than pearl barley in protein, potassium and calcium - contains a component that inhibits cholesterol formation - mild laxative 	<p>1:3 1 ½ hours (reduce cooking time by 60 min if soaking)</p>
Buckwheat, raw*	<ul style="list-style-type: none"> - native to China - not a member of wheat family - not a grass, a thistle plant, rhubarb relative, does not have a germ or bran layer - has a delicate flavour - use as porridge, in soups and stews as a substitute for rice, or serve as a side dish 	<ul style="list-style-type: none"> - contains high amounts of all 8 essential amino acids, calcium, iron, vitamin E and B vitamins - good source of chlorophyll, enzymes & vitamins when sprouted - less allergenic for those sensitive to wheat grains - alkaline 	<p>1:3 15 - 20 min</p>
Buckwheat, roasted* (kasha)	<ul style="list-style-type: none"> - raw buckwheat that has been lightly roasted - stronger, more assertive nut-like flavour and drier texture than raw buckwheat - same uses as raw buckwheat 	<ul style="list-style-type: none"> - same as raw buckwheat 	<p>1:3 1 ½ hours</p>
Bulgar	<ul style="list-style-type: none"> - form of cracked wheat - used to make popular Middle Eastern dish, tabouli 		<p>1:3 30 - 40 min (soak only, don't cook)</p>
Couscous	<ul style="list-style-type: none"> - smaller form of cracked wheat (semolina wheat flour) that is rolled into strands, crumbled into tiny pieces, steamed and dries - light and quick - used in salads, pilafs, as a side dish, and in desserts - store in refrigerator 		<p>1:1 ½ 7 min 18 min if using whole wheat couscous Bring water to a boil, add grain and stir, cover, reduce heat to low, simmer 5 minutes, fluff and let stand, covered for 10 minutes</p>

Kamut	<ul style="list-style-type: none"> - ancient form of durum wheat; many properties similar to wheat but less allergenic - light, delicate flavour - use in casseroles, chili, stews 	<ul style="list-style-type: none"> - 30% higher in protein and many other nutrients (magnesium, zinc, vitamin E) than wheat - easier to digest than wheat - glutinous, yet tolerated by gluten-sensitive people 	<p>1:3 18 min</p>
Kamut Flakes	<ul style="list-style-type: none"> - similar to oatmeal - use in cookies, porridge, cakes, meat loaves 		<p>1:2 18 min</p>
Millet*	<ul style="list-style-type: none"> - the “Queen of Grains” because it is high in many nutrients - one of the easiest grains to digest - great as a side dish, use in salads, warm breakfast cereal 	<ul style="list-style-type: none"> - gluten-free - alkaline 	<p>1:3 35 min Boil, cover, reduce heat to medium, cook 15 minutes, remove from heat, let stand 20 min</p>
Oat Groats	<ul style="list-style-type: none"> - richer in flavour & chewier than rolled/steel cut oats - use as a porridge 	<ul style="list-style-type: none"> - mild laxative - oat bran helps lower cholesterol - one of the richest sources of Si 	<p>1:3 2 hours</p>
Oats, steel cut (Scottish or Irish oats)	<ul style="list-style-type: none"> - made from whole oat groats that are steamed and coarsely cut with steel blades; retains most of its nutritional content - use as a porridge 		<p>1:3 30 min.</p>
Popcorn*	<ul style="list-style-type: none"> - yellow pops the largest kernels and white has a sweet flavour 		<p>Oil popping: place ¼ cup popcorn and 1 Tbsp oil in heavy pot, cover and shake over medium-high heat until popping stops</p>
Quinoa*	<ul style="list-style-type: none"> - native to Central America (Incas) - cousin of amaranth - used as a grain, actually a seed; looks like a cross between mustard and millet - combine with other grains, substitute for rice or add to salads, soups, puddings 	<ul style="list-style-type: none"> - higher in protein than any of the other grains - contains more iron, phosphorus, vitamins A, E, and B 	<p>1:2 20 min Rinse before cooking to remove the natural bitter saponin (soap like) coating</p>
Rye, berries	<ul style="list-style-type: none"> - native to Europe - used in breads 	<ul style="list-style-type: none"> - highest of all grains in the essential amino acid lysine - contains low amounts of gluten 	<p>1:4 1 ½ hours</p>
Rye, flakes	<ul style="list-style-type: none"> - use like oat flakes; or eat it raw sprouted or soaked to benefit from its FI content 	<ul style="list-style-type: none"> - contains FI 	<p>1:3 25 - 30 min</p>
Spelt, berries	<ul style="list-style-type: none"> - most ancient of the wheats, used for >9000 years - similar to wheat, denser texture and nuttier taste - well tolerated by wheat sensitive people but still contains gluten 	<ul style="list-style-type: none"> - contains 30% more protein than wheat, B vitamins, magnesium, soluble fibre 	<p>1:3 1 ½ hours</p>
Spelt, flakes	<ul style="list-style-type: none"> - use like oat flakes 		<p>1:3 25 - 30 min</p>
Teff	<ul style="list-style-type: none"> - native to Africa - tiny grains - use in soups and stews 	<ul style="list-style-type: none"> - source of iron, calcium, most minerals - less allergenic than wheat 	<p>1:3 15 min</p>

Triticale, berries	<ul style="list-style-type: none"> - man-made cross between wheat and rye - retains a slight crunch even after cooking - great in pilafs, breakfast cereal, soups and stews 	<ul style="list-style-type: none"> - 50% more protein than wheat and more complete balance of amino acids - higher in amino acid lysine and lower in gluten than wheat 	<p>1:3 2 hours (50-60 min if presoaked)</p>
Wheat, cracked	<ul style="list-style-type: none"> - often confused with bulgar - uncooked wheat that is dried, then cracked by milling - add to bread or cook as breakfast cereal and top with yogurt and raisins 		<p>1:2 25 min (let sit 5 min before serving)</p>
Wheat, berries	<ul style="list-style-type: none"> - approximately 30,000 varieties of wheat with 3 common species: hard, soft and durum semolina - when sprouted, the grass is used to make wheat grass - add to soups, use in pilafs, as a side dish to fish or meat, or as a breakfast cereal 	<ul style="list-style-type: none"> - contains B vitamins, vitamin E, protein, essential fatty acids, numerous trace minerals such as zinc, iron, copper, manganese, magnesium, phosphorus 	<p>1:3 2 hours (50-60 min if presoaked)</p>
Wheat flakes	<ul style="list-style-type: none"> - use like oats flakes 		<p>1:4 15 - 20 min</p>
Yellow corn*	<ul style="list-style-type: none"> - native to America - kernels used as popcorn - cornmeal/flour used in cornbread, corn tortillas, mixed with beans or vegetables 	<ul style="list-style-type: none"> - only grain that contains vitamin A - gluten-free, although many people are intolerant to corn; other options that may be less bothersome: popcorn, blue corn (higher in protein, iron, Mn & K) - low in niacin 	<p>1:3 35 min</p>
Yellow cornmeal* (polenta)	<ul style="list-style-type: none"> - grain with solid American roots - produced by finely grinding whole dried corn; from coarsest to finest - grits, meat, flour and atole/pinole; best form is stone ground because it retains its nutrients - use as porridge, or in muffins, cakes, pancakes 	<ul style="list-style-type: none"> - gluten-free 	<p>1:4 25 min</p>

*= gluten-free

Grain Allergenicity

Wheat ■ Oats ■ Rye ■ Corn ■ Barley ■ Rice ■ Buckwheat ■ Millet ■ Amaranth ■ Quinoa

Most ◆ Common
Least Common

Resources

Haas, ElsonM. Staying Healthy with Nutrition. Celestial Arts. Berkely, CA. 1992.
McLaren, Tannis. Simply Healthy Cookbook. U of T Press Inc. Toronto. 2002
Pitchford, Paul. Healing with whole Foods, 3rd ed. North Atlantic Books, Berkely, CA. 2002