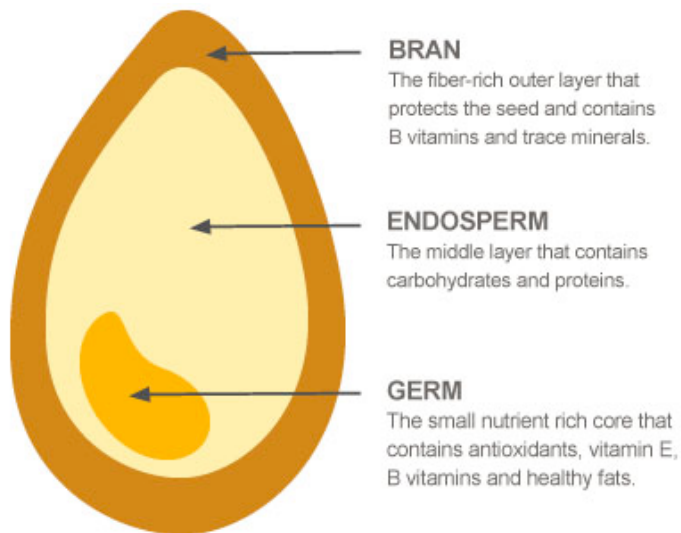


Demystifying Food - Lesson 1 Whole Grains

What are Whole Grains?

Whole grains are the whole seeds of plants. They include the bran (an outer layer which contains most of the fiber), the germ (the part from which new plants sprout that contains many important nutrients) and the endosperm (the largest part of the seed, but it offers little nutrition).



For millions of years, humans ate whole grains straight from the plant stalk. This gave them a rich package high in fiber, vitamins and minerals, healthy fats, enzymes and hundreds of other valuable phytonutrients.

But the late 19th century Industrial Revolution changed our grains.

Modern milling strips away both the bran and germ, along with all the healthy oils that need refrigeration to keep from spoiling. This makes grains easier to store and gives them a much longer "shelf life." But besides all the fiber and oils, wheat loses 90% of vitamin E and half its B vitamins.



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The refining process also smashes the endosperm into tiny bits, which turns wheat into fluffy fine flour to make light airy breads and pastries. In most processed food you find will not contain any whole grains.

What Whole Grains Can Do For You

More and more studies show that returning to whole grains and other unprocessed carbohydrates can improve our health in many ways.

Antioxidants, Vitamins and Minerals

Consumers are increasingly aware that fruits and vegetables contain disease-fighting phytochemicals (healthy plant chemical) and antioxidants, but they do not realize whole grains are often an even better source of these key nutrients. Whole grains have some valuable antioxidants not found in fruits and vegetables, as well as B vitamins, vitamin E, magnesium, iron and fiber.

Health Benefits of Whole Grains

The medical evidence is clear that whole grains reduce risks of heart disease, stroke, cancer, diabetes and obesity. Few foods can offer such diverse benefits. People who eat whole grains regularly have a lower risk of obesity, as measured by their body mass index and waist-to-hip ratios. They also have lower cholesterol levels.

Because of the phytochemicals and antioxidants, people who eat three daily servings of whole grains have been shown to reduce their risk of heart disease by 25-36%, stroke by 37%, Type II diabetes by 21-27%, digestive system cancers by 21-43%, and hormone-related cancers by 10-40%.

Most people are familiar and comfortable with brown rice or oatmeal as whole grains, but there are so many more to explore and experiment with. The basic preparation for most grains is similar. Using a ratio of 2:1, where 2 is the liquid (water, vegetable stock, etc.) and 1 is the grain, you simply bring the liquid and grain to a boil and simmer till the liquid has evaporated. Now you can - and should get much more creative than that, but for starters, that might help you realize that when you consider all the whole grains, preparing them really shouldn't be a mystery.



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Below is a list of many of the whole grains available to you:

- Amaranth
- Barley
- Black Rice
- Brown rice
- Barley
- Buckwheat
- Bulgur (cracked wheat)
- Millet
- Oats
- Quinoa
- Rye
- Sorghum
- Spelt
- Teff
- Triticale
- Wheat berries
- Whole Grain Corn



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Information on Specific Whole Grains (source: Whole Grains Council)

Amaranth

Amaranth was a staple of Aztec culture, until Cortez, in an effort to destroy that civilization, decreed that anyone growing the crop would be put to death. Seeds were smuggled out to Asia, where local dialects referred to Amaranth as "king seed" and "seed sent by God" as a tribute to its taste and sustenance. Amaranth kernels are tiny; when cooked they resemble brown caviar. Amaranth is a "pseudo-grain" – like quinoa and buckwheat, it's not in the Poaceae botanical family, but is listed with other grains because its nutritional profile and uses are similar to "true" cereal grains.

Today amaranth is making its way back, thanks to a lively, peppery taste and a higher level of protein (it's roughly 13-14% protein) compared to most other grains. In South America, it is often sold on the streets, popped like corn. Amaranth has no gluten, so it must be mixed with wheat to make leavened breads. It is popular in cereals, breads, muffins, crackers and pancakes.

How to be sure you're getting whole amaranth: When you see amaranth on an ingredient list, it is almost invariably whole amaranth.

Health bonus: Amaranth has a high level of very complete protein; its protein contains lysine, an amino acid missing or negligible in many grains.

Barley

Barley is one of the oldest cultivated grains. Egyptians buried mummies with necklaces of barley, and centuries later In 1324 Edward II of England standardized the inch as equal to "three grains of barley, dry and round, placed end to end lengthwise." It is a highly-adaptable crop, growing north of the Arctic circle and as far south as Ethiopia.

Barley has a particularly tough hull, which is difficult to remove without losing some of the bran. Hulled barley, available at health food stores, retains more of the whole-grain nutrients but is very slow-cooking. New varieties of hull-less barley are starting to become available. Lightly pearled barley is not technically a whole grain (as small amounts of the bran are missing) – but it's full of fiber and much healthier than a fully-refined grain.

How to be sure you're getting whole barley: Look for whole barley or hulled barley or hull-less barley.



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Health bonus: The fiber in barley is especially healthy; it may lower cholesterol even more effectively than oat fiber.

Buckwheat

Buckwheat goes way beyond the pancake mixes we associate with it. Japan's soba noodles, Brittany's crêpes and Russia's kasha are all made with buckwheat. Botanically, buckwheat is a cousin of rhubarb, not technically a grain at all – and certainly not a kind of wheat. But its nutrients, nutty flavor and appearance have led to its ready adoption into the family of grains. Buckwheat tolerates poor soil, grows well on rocky hillsides and thrives without chemical pesticides.

How to be sure you're getting whole buckwheat: When you see buckwheat on an ingredient list, it is almost invariably whole buckwheat.

Health bonus: Buckwheat is the only grain known to have high levels of an antioxidant called rutin, and studies show that it improves circulation and prevents LDL cholesterol from blocking blood vessels.

Bulgur

When wheat kernels are boiled, dried, cracked, then sorted by size, the result is bulgur. This wheat product is sometimes referred to as “Middle Eastern pasta” for its versatility as a base for all sorts of dishes. Bulgur is most often made from durum wheat, but in fact almost any wheat, hard or soft, red or white, can be made into bulgur.

Because bulgur has been precooked and dried, it needs to be boiled for only about 10 minutes to be ready to eat – about the same time as dry pasta. This makes bulgur an extremely nutritious fast food for quick side dishes, pilafs or salads. Perhaps bulgur's best-known traditional use is in the minty grain and vegetable salad known as tabbouleh.

How to be sure you're getting whole bulgur: In the U.S., FDA has defined all bulgur as whole grain.

Health bonus: Bulgur has more fiber than quinoa, oats, millet, buckwheat or corn. Its quick cooking time and mild flavor make it ideal for those new to whole grain cooking.

Corn

Fresh corn on the cob. Popcorn. Corn cakes. Polenta. Tortillas. Corn muffins. Though sometimes dismissed as a nutrient-poor starch – both a second-rate vegetable and a second-rate grain – corn is lately being reassessed and viewed as a healthy food. Traditional Latin cultures learned how to treat corn with alkali, creating masa harina. This treatment liberates the niacin in corn, so those



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who depend on it for sustenance will avoid pellagra. Eating corn with beans creates a complementary mix of amino acids that raises the protein value to humans. Most of the corn grown in the U.S. is used to feed cattle and to make sweeteners. But some finds its way into the grocery store.

How to be sure you're getting whole corn: Avoid labels that say “degerminated” when you’re looking for whole-grain corn, and look for the words whole corn.

Health bonus: A new study shows that corn has the highest level of antioxidants of any grain or vegetable – almost twice the antioxidant activity of apples!

Farro

Emmer, an ancient strain of wheat, was one of the first cereals ever domesticated in the Fertile Crescent, and centuries later, it served as the standard daily ration of the Roman legions. But over the centuries, emmer was gradually abandoned in favor of durum wheat, which is easier to hull.

By the beginning of the 20th century, higher-yielding wheat strains had replaced emmer almost everywhere, except in Ethiopia, where emmer still constitutes about 7% of the wheat grown.

In Italy – and increasingly throughout the world – emmer is known as farro or grano farro and is staging a comeback as a gourmet specialty. Semolina flour made from emmer is still used today for special soups and other dishes in Tuscany and Umbria, and farro is thought by some aficionados to make the best pasta.

How to be sure you're getting whole farro: Avoid labels that say “pearled” when you’re looking for whole-grain farro, and look for the words whole farro.

Grano

When durum wheat kernels (“wheat berries”) are lightly polished, they become grano, a side-dish full of nutty flavor and al dente texture. Those who have tried wheat berries (see below) know that they require soaking and then cooking for an hour. But the minimal processing given to grano means that some of the thick outer casing of the grain is removed, sacrificing a small amount of bran in order to cut cooking time to about thirty minutes.

Grano is in fact the Italian word for grain, a name that evokes its origins. In Italy, grano predates pasta (also made from durum wheat) but is still enjoyed in traditional dishes, especially in Sicily and Apulia.



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Because it is missing some of its bran, grano is not technically a whole grain, but is still a healthier choice than a totally-refined grain.

Kamut® Grain

Kamut® grain is another example of an heirloom grain, once pushed aside by an agricultural monoculture but now returning to add variety to the food supply. Brought back as a souvenir said to be from an Egyptian tomb, this wheat variety was peddled without much success at the Montana State Fair in 1960 as “King Tut’s Wheat.”

Years of selecting, testing and propagating eventually brought the grain – now called Kamut, an ancient Egyptian word for wheat – to prominence. Today, millions of pounds of this rich, buttery-tasting wheat are grown on organic farms and made into over 450 whole-grain products around the world.

How to be sure you're getting whole Kamut: Look for the words whole Kamut.

Health bonus: Kamut® grain has higher levels of protein than common wheat, and more Vitamin E.

Kañiwa

A cousin of quinoa, kañiwa (pronounced *kah-nyee-wah*) also hails from Peru and Bolivia. Like quinoa, it is a "pseudo-cereal" with a high level of protein (15 to 19 percent) and a more complete balance of amino acids than most grains. Unlike quinoa, kañiwa is not coated with bitter saponins that must first be rinsed off.

How to be sure you're getting whole kañiwa: Kañiwa is such a tiny grain with such specialized uses that you are unlikely to encounter it in refined form. As always, look for the word whole, but even if you don't see it, the grain is likely whole.

Health bonus: Research shows that kañiwa is high in the antioxidant quercetin.

Millet

Millet is rarely served to humans in the United States – here, it’s the grain most often found in bird feeders. Yet it’s the leading staple grain in India, and is commonly eaten in China, South America, Russia and the Himalayas.

Millet has a mild flavor and is often mixed with other grains or toasted before cooking, to bring out the full extent of its delicate flavor. Its tiny grain can be white, gray, yellow or red.



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How to be sure you're getting whole millet: When you see millet on an ingredient list, it is almost invariably whole millet.

Oats

Oats have a sweet flavor that makes them a favorite for breakfast cereals. Unique among grains, oats almost never have their bran and germ removed in processing. So if you see oats or oat flour on the label, relax: you're virtually guaranteed to be getting whole grain.

In the U.S., most oats are steamed and flattened to produce "old-fashioned" or regular oats, quick oats, and instant oats. The more oats are flattened and steamed, the quicker they cook – and the softer they become. If you prefer a chewier, nuttier texture, consider steel-cut oats, also sometimes called Irish or Scottish oats. Steel-cut oats consist of the entire oat kernel (similar in look to a grain of rice), sliced once or twice into smaller pieces to help water penetrate and cook the grain. An interesting use for oats, use a little bit of oats in pureed soups as a thickener instead of unhealthy cream and butter.

How to be sure you're getting whole oats: When you see oats or oatmeal or oat groats on an ingredient list, they are almost invariably whole oats.

Health bonus: Scientific studies have concluded that like barley, oats contain a special kind of fiber called beta-glucan found to be especially effective in lowering cholesterol. Recent research reports indicate that oats also have a unique antioxidant, avenanthramides, that helps protect blood vessels from the damaging effects of LDL cholesterol.

Quinoa

Quinoa (*keen-wah*) comes to us from the Andes, where it has long been cultivated by the Inca. Botanically a relative of swiss chard and beets rather than a "true" grain, quinoa cooks in about 10-12 minutes, creating a light, fluffy side dish. It can also be incorporated into soups, salads and baked goods. Commercially, quinoa is now appearing in cereal flakes and other processed foods. Though much of our quinoa is still imported from South America, farmers in high-altitude areas near the Rockies are also beginning to cultivate quinoa.

Quinoa is a small, light-colored round grain, similar in appearance to sesame seeds. But quinoa is also available in other colors, including red, purple and black. Most quinoa must be rinsed before cooking, to remove the bitter residue of saponins, a plant-defense that wards off insects. Botanists are now developing saponin-free strains of quinoa, to eliminate this minor annoyance to the enjoyment of quinoa.



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How to be sure you're getting whole quinoa: When you see quinoa on an ingredient list, it is almost invariably whole quinoa.

Health bonus: The abundant protein in quinoa is complete protein, which means that it contains all the essential amino acids our bodies can't make on their own.

Rice

White rice is refined, with the germ and bran removed. Whole-grain rice is usually brown – but, unknown to many, can also be black, purple, red or any of a variety of exotic hues. Around the world, rice thrives in warm, humid climates; almost all of the U.S. rice crop is grown in Arkansas, California, Louisiana, Mississippi, Missouri and Texas.

Converted rice is parboiled before refining, a process which drives some of the B vitamins into the endosperm so that they are not lost when the bran is removed. As a result, converted rice is healthier than regular white rice, but still is lacking many nutrients found in brown rice. Brown rice is lower in fiber than most other whole grains, but rich in many nutrients.

How to be sure you're getting whole grain rice: The term brown rice is always whole grain, as are most other colored rices, such as black rice or red rice.

Health bonus: Rice is one of the most easily-digested grains – one reason rice cereal is often recommended as a baby's first solid. This makes rice ideal for those on a restricted diet or who are gluten-intolerant.

Rye

Long seen as a weed in more desirable wheat crops, rye eventually gained respect for its ability to grow in areas too wet or cold for other grains. For this reason it is a traditional part of cuisine in Northern Europe and Russia. Rye was also widely grown in colonial America; some historians believe a fungus, rye ergot, triggered hallucinations leading to the Salem witch trials.

Recently the Finnish bakery group Fazer started a three-year program to publicize the health benefits of rye products, in a major push to increase rye consumption. Rye is unusual among grains for the high level of fiber in its endosperm – not just in its bran. Because of this, rye products generally have a lower glycemic index than products made from wheat and most other grains, making them especially healthy for diabetics.

How to be sure you're getting whole rye: Look for whole rye or rye berries in the ingredient list – just because something is labeled "rye bread" doesn't guarantee it's whole grain.



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Health bonus: The type of fiber in rye promotes a rapid feeling of fullness, making rye foods a good choice for people trying to lose weight.

Sorghum / Milo

Farmers on the Great Plains from South Dakota to Texas appreciate that sorghum thrives where other crops would wither and die; in drought periods, in fact, it becomes partially dormant. Worldwide, about 50% of sorghum goes to human consumption, but in the U.S., most of the crop is fed to animals, made into wallboard or used for biodegradable packing materials.

That's a shame, because sorghum, also called milo and believed to have originated in Africa, can be eaten like popcorn, cooked into porridge, ground into flour for baked goods, or even brewed into beer.

How to be sure you're getting whole sorghum: When you see sorghum on an ingredient list, it is most likely whole sorghum – but you can be even more sure with the word whole.

Health bonus: A gluten-free grain, sorghum is especially popular among those with celiac disease.

Spelt

Spelt is a variety of wheat widely cultivated until the spread of fertilizers and mechanical harvesting left it by the wayside in favor of wheats more compatible with industrialization. Spelt can be used in place of common wheat in most recipes.

Twelfth-century mystic St. Hildegard is said to have written, "The spelt is the best of grains. It is rich and nourishing and milder than other grain. It produces a strong body and healthy blood to those who eat it and it makes the spirit of man light and cheerful. If someone is ill boil some spelt, mix it with egg and this will heal him like a fine ointment." Today, the German abbey she founded still sells spelt products and even spelt liqueur.

How to be sure you're getting whole spelt: Like other varieties of wheat, spelt can be found in both whole and refined form in our food supply – so look for the words whole spelt.

Health bonus: Spelt is higher in protein than common wheat. There are anecdotal reports that some people sensitive to wheat can tolerate spelt, but no reliable medical studies have addressed that issue.



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Teff

It is estimated that teff is the principal source of nutrition for over two-thirds of Ethiopians, who make it into the ubiquitous spongy injera flatbread. Teff grains are minute – just 1/150 the size of wheat kernels – giving rise to the grain’s name, which comes from *teffa*, meaning “lost” in Amharic.

This nutritious and easy-to-grow type of millet is largely unknown outside of Ethiopia, India and Australia. Today it is getting more attention for its sweet, molasses-like flavor and its versatility; it can be cooked as porridge, added to baked goods, or even made into “teff polenta.” Teff grows in three colors: red, brown and white.

How to be sure you're getting whole teff: All varieties of teff are whole-grain, because the kernel is simply too small to mill easily.

Health bonus: Teff has over twice the iron of other grains, and three times the calcium.

Triticale

Triticale (trit-i-KAY-lee) is the new kid on the block, a hybrid of durum wheat and rye that’s been grown commercially for only thirty-five years. Rye and wheat have long cross-bred in nature, but the resulting offspring were sterile, until a French scientist, in 1937 discovered how to induce fertility.

Triticale was over-hyped as a miracle crop in the 1970s, but initial interest faded when crops were inconsistent and acceptance was slow. Today about 80% of the world’s triticale is grown in Europe. It grows easily without commercial fertilizers and pesticides, making it ideal for organic and sustainable farming.

How to be sure you're getting whole triticale: When you see triticale on an ingredient list, it is almost invariably whole triticale.

Wheat

Wheat has come to dominate the grains we eat because it contains large amounts of gluten, a stretchy protein that enables bakers to create satisfying risen breads. It’s almost impossible to make an acceptable risen loaf without at least some wheat mixed in.

Two main varieties of wheat are widely eaten. Durum wheat is made into pasta, while bread wheat is used for most other wheat foods.

Bread wheat is described as “hard” or “soft” according to its protein content; as “winter” or



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“spring” according to when its sown; and as “red” or “white” according to color of the kernels. Hard wheat has more protein, including more gluten, and is used for bread, while soft wheat creates “cake flour” with lower protein.

Winter and spring wheat differ largely in their growing areas, with northern areas supporting spring wheat and more southerly climates able to plant winter wheat, which is actually planted in the fall and harvested in the spring. Red wheat has more strong-flavored tannins than milder white wheat; in this case the word “white” does not mean that the grain has been refined.

Like the other grains above, wheat can be enjoyed in many different forms than baked goods and pasta. Bulgur and grano (see above) make excellent side-dishes. Wheat berries – whole wheat kernels – can also be cooked as a side dish or breakfast cereal, but must be boiled for about an hour, preferably after soaking overnight. Cracked wheat cooks faster, as the wheat berries have been split open, allowing water to penetrate more quickly. Some stores also sell wheat flakes, with an appearance similar to rolled oats.

How to be sure you're getting whole wheat: When you're shopping for wheat, make especially sure to look for the term whole wheat (and in Canada, for the term whole grain whole wheat) to make sure you're getting all the bran, germ and endosperm. Just plain wheat legally refers to refined wheat.

Wild Rice

Wild rice is not technically rice at all, but the seed of an aquatic grass originally grown by indigenous tribes around the Great Lakes. Today some commercial cultivation takes place in California and the Midwest, but much of the crop is still harvested by Native Americans, largely in Minnesota.

The strong flavor and high price of wild rice mean that it is most often consumed in a blend with other rices or other grains. Wild rice has twice the protein and fiber of brown rice, but less iron and calcium.

How to be sure you're getting whole wild rice: When you see wild rice on an ingredient list, it is almost invariably whole wild rice.