

# GRAINS

- Whole grains play an important part in human nutrition. Each grain has its own unique nutritional properties. Having a variety of grains in your diet and in your food storage adds greater nutrition, taste, and variety to your meals.
- Most grains do not contain all 8 essential amino acids that are needed to make a complete protein. Eating grains with, beans or small amounts of animal products such as meat, eggs, or cheese, makes a “complete” source of protein, but they don’t have to be consumed together at the same meal.
- Processed grains such as white rice, pearled barley, white flour, and some corn meal have been processed and most of the nutrition has been taken from them. Using whole grains when possible will give you the greatest nutritional benefits.
- Combining grains together can give more complete nutrition, and a variety in flavor, color, and texture.

**All grains should always be stored in air-tight containers. For long-term storage, grains should also be nitrogen-packed and kept in a cool, dry place.**

## Grains Cooking Chart

1 Cup Grain	Cups Liquid*	Cooking Time	Yield (cups)
Amaranth	3	15 min.	2-2/3
Barley, hulled	4	45-60 min	2-1/2
Barley, pearl	3	35-45 min	3
Buckwheat	2	15 min	3-1/2
Cornmeal	4	10 min	3-1/2
Millet	3	25-30 min	3
Oats, groats	3	1 hour 10 min	3
Oats, quick	2	1 min + 3-5 min standing time	2
Oats, old-fashioned	2	5 min	2
Oats, steel-cut	4	20 min	2
Quinoa	2	15 min	3
Rice, Brown	2	45-50 min	3
Rice, White	2	15-20 min	3
Rice, Wild	3	1 hour	3
Rye berries	3	1 hour 55 min	2-1/2
Triticale	3	1 hour 10 min	2-1/2
Wheat berries	3	1 hour 10 min	2-1/2

\*Liquids may be adjusted depending on how firm or creamy you want your grains.

## Grain Varieties

### Amaranth

Amaranth is a small round seed about the size of a poppy seed. It is an ancient grain used as a staple by ancient civilizations in Mexico. It is not a true grain, but has the nutritional profile of one. In terms of complete nutrition, amaranth ranks as one of the greatest grains, although it is not quite as versatile as others. Amaranth contains no gluten but has a high protein content of 15–18% protein. It has more of a sticky texture when cooked that contrasts with the fluffier texture of most other grains.

**NOTE:** Like some other edible seeds, *raw* amaranth contains biological factors that can inhibit proper absorption of some nutrients. For this reason amaranth seeds or flour should always be cooked before consumption, whether for human food or animal feed.

#### How Can Amaranth Be Used?

Flour – Mix 25% amaranth flour to 75% wheat flour for yeast bread. In biscuits, muffins, pancakes, pastas, or flat breads, you can go as high as 100% amaranth flour. Use as a thickener for gravies, soups, and stews.

Popped – Eat plain, adds a crunchy texture to breads, salads, soups and granolas

Cooked – Use as a breakfast cereal, combine with other grains and/or beans, in casseroles, as main or side dishes, add to stir-fry or to soups and stews as a nutrient dense thickening agent.

#### How Long Can Amaranth Be Stored?

Short-term: 3-6 months when stored properly at room temperature, but best if kept in the refrigerator or freezer because of high levels of poly-unsaturated fats.

Long-term: Several years when properly stored.

### Barley

This nutritious and often overlooked grain is found in two varieties for consumption: hulled and pearled. Pearl barley has had its outer most hull and bran layers polished off, which makes it lose 25%-33% of its nutrition than hulled barley. However, pearl barley cooks up quicker than hulled. Barley contains gluten, though not as much as wheat.

#### How Can Barley Be Used?

Cooked: Add to soups and stews, as a breakfast cereal, in vegetable stuffing and pilafs, and as a substitute for rice in many dishes.

Flour: Use up to 50% barley flour to wheat flour in bread. When making pancakes, biscuits, and rolls, you can use up to 100% barley flour and get good results.

Flakes: Rolled barley can be prepared like rolled oats for breakfast cereals and granolas, and in breads.

Barley water: Drinking barley water has nutritional and medicinal benefits.

## **How Long Can Barley Be Stored?**

Short-term: 1 year when stored properly at room temperature.

Long-term: Several years when stored properly. Pearl barley should store even longer.

## **Buckwheat**

This unique triangle shaped seed is really a fruit is also is also generally considered a grain. This amazingly nutrient-rich food is so soft that it can be easily chewed. Although its protein content is relatively low (11%), it does contain the eight essential amino acids and is high in lysine. Buckwheat is a gluten-free food.

### **How Can Buckwheat Be Used?**

Sprouts: Use raw buckwheat, only soak for 20 min. Can be added to salads, soups, sandwiches, etc.

Flour: Buckwheat is most widely used in pancakes, biscuits, muffins, and breads. It can be mixed up to 50% with wheat flour for making yeast breads. It can be used to thicken soups, gravies, and dressings. In the orient they use it to make soba or noodles.

Cooked: Buckwheat groats can be soaked and eaten raw as a cereal, used in hot cereal, soups, and eaten like rice in main and side dishes. Toasted buckwheat is known in Eastern Europe as Kasha.

### **How Long Can Buckwheat Be Stored?**

Short-term: 6 months when stored properly at room temperature, 1 year or more in the freezer.

Long-term: Several years when stored properly.

## **Corn**

Yellow Dent Corn (or field corn) is different than the sweet corn we are accustomed to. Corn meal and corn flour are generally made from yellow dent corn. Yellow dent corn is available in whole dried form for longer storage (ready to be ground into meal or flour), or you can buy it already ground. Popcorn is a great treat we all know and love, but it can also be ground into meal as well. Corn is a gluten-free food, that although may not be the most nutrient-rich grain, is an excellent source of several important nutrients.

Some corn meal products have been hulled and de-germed. Although this creates a longer shelf life, it takes away some of the nutrition.

### **How Can Corn Be Used?**

Corn Flour: Finer ground corn is often used in corn bread, pancakes, tortillas, and other baked goods; and used as a breading in frying.

Corn Meal: Is also known as Polenta. It can be used as a breakfast cereal, as a side dish alternative to potatoes or pasta, made into casseroles and lasagna-type dishes covered with tomato sauces, or made into patties and squares for grilling or frying.

Popcorn: Can be popped, or ground into corn meal or flour.

## **How Long Can Corn Be Stored?**

Short-term: Corn meal/flour - 9 months at room temperature, longer if hulled and de-germed.

Long-term: Whole yellow dent corn should store 30+ years when packed with oxygen absorbers in air-tight containers and stored in a cool place. Corn Meal can also store up to 8 years.

## **Kamut**

Kamut is an ancient wheat that is more tolerable for people with wheat sensitivities. It is large, about twice as big as wheat, and packed full of nutrition. Although the protein content in Kamut is higher than wheat, the gluten content is less. For this reason, you may want to use gluten flour or expect a little heavier loaf of bread.

### **How Can Kamut Be Used?**

Kamut is very versatile and can be used in any way you can use wheat—sprouted, in baked goods, as a cereal, in main dishes, side dishes, soups, casseroles, etc.

### **How Should Kamut Be Stored?**

Short-term: 1 year or more when stored properly at room temperature. Ground into flour, Kamut should be kept in the fridge or freezer and used within 6 months.

Long-Term: 30+ years when stored properly.

## **Millet**

This versatile little seed is highly underused. Millet is the only grain that maintains its alkaline properties after being cooked, which makes it a very easily digestible. Millet is also gluten-free. It is a staple grain in Northern China and India. Millet is mild tasting and makes an excellent substitute for white rice because of its texture, greater nutrition, quick cooking time, and long storage life.

### **How Can Millet Be Used?**

Cooked: Millet can be prepared as a hot breakfast cereal, or in pilafs, casseroles, soups, and as a substitute for rice in main and side dishes.

Flour: Millet flour can be added up to 25% with wheat flour in yeast breads, and mixes well with other flours in other baked goods.

Raw: Dry millet added to bread, rolls and biscuits adds a crunch texture and brings variety to baked goods.

Popped: Popped millet can also be added to granolas, breads, and breakfast cereals.

### **How Long Can Millet Be Stored?**

Short-Term: 1 to 2 years when stored properly at room temperature.

Long-Term: 15-20 years when stored properly.

## Oats

Like barley, oats have to be hulled before its ready for human consumption. Hulled oats are referred to as oat groats. Oats are full of nutrition and have a relatively high fiber content. Oats come in a variety of forms and can be used in a wide variety of ways. Whole oat groats will store the longest, and can be cracked or rolled as needed.

### How Can Oats Be Used?

Oat groats: Can be cooked and eaten as a breakfast cereal, in soups, casseroles, grain pilafs, and any other way you could use cooked wheat berries.

Rolled: Can be used as a hot cereal, in granolas, baked goods, and as a meat extender.

Steel cut: Similar to cracked wheat, steel cut oats are used primarily as a hot cereal.

Flour: Use 25% oat flour in breads and baked goods. Use as a thickener for soups, stews, and gravies.

### How Long Can Oats Be Stored?

Short-term: 1 year or more for oat groats, 3-6 months for rolled or steel-cut oats when stored properly at room temperature.

Long-term: Oat groats should store the longest, but all forms of oats have been known to store for many years when stored properly.

## Quinoa

Quinoa is also not a true grain-but a seed and is characterized when cooked as a plump little morsel with a tail. Several things make this little seed of great value. This small seed is packed with nutrients and contains all the essential amino acids that make up protein. It also cooks quickly—only 10-12 minutes, and has a great taste. Because of its high level of lysine, it complements not only legumes, but wheat and other grains nicely.

Quinoa is covered with a dark layer of ‘saponine’ that has a bitter taste. The saponine must be soaked or rinsed well to remove it before using. However, most quinoa sold within the US has the saponine removed and just needs a quick rinse to remove any remaining saponine.

### How Can Quinoa Be Used?

Sprouted: Add to salads, soups, and other dishes.

Cooked: Quinoa can be used as a rice substitute in most dishes, can be added to soups, and makes an excellent salad, side dish, or main dish.

Flour: Use 25% quinoa flour with wheat flour for a nutritionally boosted bread. Quinoa flour can be added to other baked goods and has been used to make pasta.

Popped: Add to salads, soups, baked goods, etc.

### How Long Can Quinoa Be Stored?

Short-Term: 9 month if stored properly at room temperature.

Long-Term: 8 years if stored properly.

## Rice

**White Rice** – is brown rice with the husk, bran, and germ polished off. What is left is 81-83% starch. Most of the nutrition is removed, although, this makes it cook faster and have a much longer shelf life. White rice should be stored as a great energy source, but not for nutrition—this needs to be supplemented by other foods.

**Brown Rice** – is a whole grain with all the full nutrition intact. The flip side is that it does take longer to cook, (about 45 minutes) and has a shorter shelf life. Rice is gluten free.

**Wild rice** – is a whole grain, though not a true rice. It has an almost indefinite storage life and packed with nutrition. It is quite expensive and is considered a gourmet food. Therefore, it isn't generally found or used as a food storage item.

### How Can Rice Be Used?

Cooked: Rice is well known and used in our culture in main dishes, side dishes, in soups, cereals, puddings, etc.

Flour: Can be added to all kinds of baked goods.

Popped: Add to salads, soups, etc.

### How Long Can Rice Be Stored?

Short-Term: White Rice – 1 to 2 years or more, Brown Rice - 6 months if stored properly at room temperature.

Long-Term: White Rice - 25-30 years, Brown Rice - up to 8 years if stored correctly.

## Rye

Rye is known for its distinctive flavor and is well known for its use in breads. Rye has a high fiber content, and has double the lysine as wheat among its many nutritional benefits. It's gluten content is lower than wheat, so it generally creates a heavier bread and is usually combined with wheat flour because of its higher gluten content.

### How Can Rye Be Used?

Flour: Use it in breads, crackers, as a thickener for sauces and soups.

Cooked: Has the versatility of wheat. Is often combined in multi-grain mixtures.

Rolled: Used like rolled oats and often combined in multi-grain mixtures.

### How Long Can Rye Be Stored?

Short-Term: 1 year if stored properly at room temperature.

Long-Term: 8+ years if stored properly.

## Spelt

Is an ancient form of wheat with a high protein content and great nutritional benefits. People who are allergic to wheat can often tolerate spelt.

### **How Can Spelt Be Used?**

Spelt is very versatile and can be used in any way you can use wheat—sprouted, in baked goods, as a cereal, in main dishes, side dishes, soups, casseroles, etc.

### **How Long Can Spelt Be Stored?**

Short-Term: 1 year or more if stored properly at room temperature.

Long-Term: 30 years if stored properly.

## Triticale

Triticale is a man-made grain created by crossing rye and durum wheat. It's protein content is superior to that of wheat, but the gluten content is less. It has a flavor much like wheat and can be used in much the same way.

### **How Can Triticale Be Used?**

Triticale is very versatile and can be used with all the variety that you can wheat. When making bread, however, combine with at least 50% wheat flour.

### **How Long Can Spelt Be Stored?**

Short-Term: Store at room temperature for 1 year.

Long-Term: Store in air-tight nitrogen packed container for 12+ years.

## **How Do I Decide Which Grains I Should Use and Store?**

It would be wise to use and store a variety of grains, and not limit yourself to just wheat, rice, and corn as many people do. There are many things to consider when choosing which grains to use and store:

Nutrition – Whole grains will have greater nutrition than processed grains.

Storage Life – Some grains have a longer storage life than others. Using and rotating your grains can help alleviate this problem.

Versatility – Some grains have greater versatility than others. Make sure part of the grains you choose to store have that greater versatility (esp. whole wheat, spelt, or kamut if possible).

Cooking time – Choosing some grains that cook quickly could be beneficial if you were in a cooking without power situation. Cracking or rolling grains can help them cook quicker.

Cost – Many grains are quite inexpensive, some are more. Keeping within your budget is important.

Taste – Choosing grains your family enjoys is very important.

## How Can You Make Whole Grains Part of Your Regular Diet?

- Information x Experience = Knowledge !! The more you use them, the easier it will become and the more confident you will be in using whole grains!
- Add grains to recipes your family already knows and loves.
- Cook grains in large quantities and freeze in 1-2 cup quantities. They will be ready to add to soups, casseroles, etc.
- Grind flours in advance (individually or as a multi-grain mix) and keep them in your freezer. Add them to your recipes to replace some of the wheat flour.
- Make a 30-90 day meal plan that incorporates the grains you want to use and store. You are more likely to make it if it is planned in advance.
- Obtain several good cookbooks with whole grain recipes and ideas and experiment with new ones. Also check the Internet for great recipes on some of the lesser-known grains. There are many books available. A few suggestions include:
  - Cooking with Home Storage by Vicki Tate
  - The Amazing Wheat Book by Rita Bingham
  - Eating Off the Grid by Denise Hansen
  - Emergency Food in a Nutshell by Leslie Probert and Lisa Harkness
  - The Essential Food Storage Cookbook by Tami Girsberger and Carol Peterson
  - Natural Meals in Minutes by Rita Bingham