

Storing Wheat



Wheat is the cornerstone of any emergency storage supply. Approximately 150 lbs will supply an adult for one year. A three-week emergency supply is approximately 5-10 lbs per adult. Children 8 years old or younger would need half those amounts. Wheat has been separated into several commercial classes based on color, hardness of the kernel, and growing season. The hard wheat classes are produced in areas that have dry-temperate climates. The kernels are usually small, red, and have a hard texture. The white wheat classes are usually produced in areas where winters are relatively mild and there is adequate moisture. White wheat kernels are more plump and larger than red wheat kernels and have a softer texture than hard wheat. Wheat kernels are also known as wheat "berries". Gluten is a wheat protein that giving flours the ability to retain gases produced by bread yeast to permit dough leavening. The hard red wheat varieties are high in gluten and make the best bread flour. Gluten will degrade during storage and lose half its raising power after several years of storage. Gluten can be purchased and added to poor quality flour in order to produce better quality bread.

Quality and Purchase

Whole wheat berries can be purchased from a producer (farmer). These grains are almost always not cleaned and may have been bulk stored for many months. Grains may also be purchased from a processor. In this case they may have been cleaned and packaged. Do not purchase "seed" wheat for storage, since these products may have toxic chemical treatments. Lastly, grains may be purchased cleaned and packaged from a retailer. Please call your local county Extension office for local outlets to purchase grains for storage.

Variety	Protein	Best Use(s)
Hard red spring , Hard red winter & Hard white spring	11-15%	bread flour (high gluten)
Soft red winter, Soft white winter & Soft white spring	9-12%	pasta, cake, biscuit, cracker, and pastry flours (low gluten)

Packaging

Store wheat in moisture-proof, food-grade packaging, such as Mylar-type bags, polyethylene bags, plastic buckets, or #10 cans. Be aware that rodents can chew through plastic bags. Wheat stored in ~10 pound bags is easy to manipulate, facilitates rotation, allows easy inspection of the grain, and compartmentalizes the grain so contamination of one lot does not expose large quantities of stored grain to contamination. Several bags can be placed inside a 5-gallon plastic bucket. It is not necessary to store wheat in the absence of oxygen unless insects are present.

Storage Conditions

Storage at 40-60°F is optimal for most home stored grains but is usually impractical in most homes except during winter months. Freezing or sub-zero temperatures do not damage stored grains. Storage at temperatures above 60°F causes a more rapid decline in seed viability (ability to germinate) but only a slightly faster loss in food value. A moisture level more than 12% encourages mold growth and chemical degradation of all grains (barley, corn, millets, oats, rice, rye, sorghum, triticale, and wheat). Moisture levels of more than 12% may allow grains to start to respire causing chemical degradation. Moisture levels of more than 15% will allow molds to grow. When the moisture reaches 20% some bacteria can start to grow. The result is spoiled grain unfit for use. Store containers off the floor-- especially off concrete floors. Concrete can wick moisture to stored containers very easily. Inspect grain often for insect activity. Treat for insects (see below) or discard affected lots.

Method	Insect Control Recommendation
Insecticides	NOT RECOMMENDED, may be toxic if not correctly used

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Heating	NOT RECOMMENDED, too difficult to control the correct amount of heat to apply.
Bay Leaves, Nails or Salt	NOT RECOMMENDED, these have absolutely no effect on insects or insect eggs.
Freezing	Freeze 1-15 lb bags of wheat for 2-3 days. Allow to warm for 24 hours. Freezing kills live pests, but not insect eggs. Multiple freezing and warming cycles may be needed to kill all insects and hatching eggs.
Vacuum Sealing	Seal wheat in vacuum bags using follow vacuum sealer instructions. Regular polyethylene bags are not suitable to maintain a vacuum.
Dry Ice (CO ₂)	Place 3-4" of grain in the bottom of a 5-gallon plastic bucket. Use gloves when handling dry ice. Add 2-3 oz. crushed dry ice. Fill the container to the full height. Place the lid on top slightly askew. After 30 minutes, seal the lid air-tight. Dry ice will control most adult and larval insects present, but usually will not destroy eggs or pupae. If properly applied, a single treatment with dry ice is sufficient for long-term storage. Annual dry ice treatments are not necessary unless an infestation is recognized in the stored grain. Treating grain with dry ice does not reduce its ability to sprout or its food value.

Method	Insect Control Recommendation
Oxygen Absorbers	Seal wheat in Mylar-type bags or #10 cans along with appropriate number of oxygen absorber packets to create an oxygen-free atmosphere. This will kill adult insects and prevent larval insects from surviving.
No Treatment	Choose insect-free sources for wheat. Store them in clean and dry containers impermeable to insects.

Polyethylene bags and 5-gallon food grade plastic buckets will not maintain an oxygen-free environment after dry-ice or oxygen absorber treatment. Over time oxygen will re-enter the container and this may allow larvae to grow to adults and cause an infestation during storage.

Nutrition and Allergies

A typical serving of whole wheat is 16 grams. It is recommended that adults get at least three servings (48g) per day. Wheat grain is high in protein, fiber, calcium and iron. Spouting wheat can obtain small amounts of vitamins A, B, C, and E not present in whole grain wheat. Other health claims for sprouted wheat remain unsubstantiated and lack science-based credibility.

Wheat Nutrition

16g Serving	Hard Red	Hard White	Soft White	Soft Red
Calories	57	53	53	53
Cal. From Fat	3	1.5	3	2
Fat	.35	.15	.35	.25
Total Carbohydrates	11	11	11	12
Dietary Fiber	1.7	2.0	2.0	2.0
Protein	2.3	2.0	2.3	1.7

Some people are allergic to wheat proteins. The allergy can cause a variety of symptoms due to an autoimmune inflammation of the digestive system, such as diarrhea, bloating, constipation, and pain. Ulcerative colitis and irritable bowel syndrome may be caused by a food allergy. A severe allergy can result in life-threatening anaphylactic shock. In some the allergy is life-long and non-reversible and is called "celiac's disease". Other people may be simply "intolerant" to wheat. In this case they suffer from symptoms, but there is not an immune response. People with minor allergic reactions or intolerance can lose them over time. Always seek the advice of a physician to help with any allergies. All varieties of wheat and processed wheat (flour, germ, cracked, etc) contain the allergy proteins.

Shelf Life

Develop a program to utilize stored wheat on a regular basis. As stored wheat is used, replace it with containers of new wheat. Identify each container for variety and storage date. A good rule of thumb is to rotate wheat so that no stored product is older than 5 years. However, older stored wheat did make acceptable bread. A B.Y.U. study indicated that, regardless of headspace oxygen level, wheat packaged in No. 10 cans throughout 32 years of storage at ambient or cooler temperatures made bread acceptable to a majority of consumers.

Use From Storage

Stored wheat can be ground for flour, popped (like popcorn), steamed, or cracked and cooked. Some like to germinate and sprout wheat for wheat grass.

References

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- USDA Nutrition Database. Obtained via Esha Genesis Software.
- www.wheatfoods.org for recipes using wheat
- USU Publications - [Home Storage of Wheat](#)

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