

Choosing Wheat To Eat

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Which class of wheat and which variety of wheat to choose to eat? *Please see table on next page.*

Most people are eating a mixture of post-1950s wheat varieties from the six main commodity wheat classes, and provided they are eating *organic whole grain* products as their basic food, they are mostly not troubled with digestive problems, or weight problems.

Others are conscientiously eating whole grain organic wheat from the classes: einkorn, emmer, durum, khorasan and spelt, either on the principle of eating only ancient wheat, or to reduce the possibility of digestive problems. They are often concerned that the wheat varieties introduced after 1950 may have unusual gluten, unfamiliar to the human digestive system. So far this seems an unlikely problem, although the possibility exists. It is instead much

more likely that digestive disorders are caused by eating refined wheat endosperm flour as a basic food, in which case there would be insufficient grain fiber in the diet for good intestinal health. In addition it is important to realize that breeders have produced modern varieties of spelt, and durum, and possibly also einkorn and emmer, so it would be wise to discover whether you are eating a truly ancient landrace variety or a modernized variety from these wheat classes.

Those people who truly suffer from celiac disease are generally advised to avoid all classes of wheat products in their diet.

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Class or Type * Commodity wheat classes	Species & subspecies scientific name	Chromosomes n=7 for wheat	Variety names and their time of introduction		
			Before 1880: Landraces (many are ancient)	From 1880 to 1950: Breeder crosses between landraces (some exceptions used other techniques)	After 1950: Usually dwarf or semi-dwarf breeder crosses (some exceptions used ultramodern techniques)
Einkorn wheat	<i>Triticum monococcum</i>	Diploid (2n)			
Emmer wheat	<i>Triticum turgidum ssp dicoccon</i>	Tetraploid (4n)	<i>Ethiopian Blue Tinge</i>		
Durum wheat*	<i>Triticum turgidum ssp durum</i>	Tetraploid (4n)	<i>Durum-Iraq Blue Beard</i>		<i>Kronos</i>
Turgidum wheat	<i>Triticum turgidum ssp turgidum</i>	Tetraploid (4n)	<i>Maparcha Akmolinka</i>		
Khorasan wheat	<i>Triticum turgidum ssp turanicum</i>	Tetraploid (4n)	<i>Kamut</i>		
Hard Red Spring wheat*	<i>Triticum aestivum ssp aestivum</i>	Hexaploid (6n)	<i>Red Fife</i>	<i>Marquis Canus</i>	<i>Yecora Rojo Cal Rojo Lassik Anza Kelse</i>
Hard Red Winter wheat*	<i>Triticum aestivum ssp aestivum</i>	Hexaploid (6n)	<i>Turkey Red</i>		
Soft Red wheat* (Winter)	<i>Triticum aestivum ssp aestivum</i>	Hexaploid (6n)			
Hard White wheat* (Spring)	<i>Triticum aestivum ssp aestivum</i>	Hexaploid (6n)	<i>India-Jammu</i>		<i>Blanca Grande</i>
Soft White wheat* (Spring)	<i>Triticum aestivum ssp aestivum</i>	Hexaploid (6n)	<i>Sonora Wit Wolkoring Foisy Chiddam Blanc de Mars</i>		<i>Alturas Diva</i>
Spelt (Winter)	<i>Triticum aestivum ssp spelta</i>	Hexaploid (6n)	<i>Oberkulmer</i>		<i>Sungold Maverick</i>

** Just a few wheat varieties are listed as examples. There are hundreds of varieties of wheat, therefore it is suggested that you research any variety of interest, and then place it appropriately on this chart for future reference. Ask, *What is*

the Class and name of a wheat variety, and its introduction date? Also possibly ask, What kind of breeding techniques were used and if the variety is proprietary, which company owns the plant protection rights?

Choosing wheat to eat *continued*

Choose to eat organic whole grain wheat and whole wheat flour

The most healthful wheat to eat is organically produced and whole grain. This means that the wheat has not been exposed to pesticides, that it has been grown with naturally fertile soil and it is presented in a form containing all of the original grain: including bran, germ and endosperm. Any flour that is sifted to remove the bran and germ cannot be regarded as whole grain. Similarly flour consisting only of wheat endosperm cannot be considered whole grain. The addition of compensating B-vitamins (thiamin, niacin, riboflavin, folic acid) to white endosperm flour does not make the endosperm flour equal in nutritional value to whole grain flour, although it saves people from outright B-vitamin deficiencies if they choose this kind of flour as their basic food. The grain fiber provided by the bran in whole wheat bread as a basic food is essential to good digestive health, and protects against constipation, obesity, diabetes, cardiovascular disease and cancers of the digestive system.

There are great advantages in the use of stone milling to produce whole wheat flour. First the method can be used for all types of wheat; whole wheat flour is produced in a single pass of the dry grain through the mill. The whole wheat flour produced contains all parts of the grain sent through the mill. The stone ground whole wheat flour can be coarse or fine and its actual texture will be determined by the type of wheat being milled. The bran will form large flakes when soft wheat is milled and the flour will feel velvety. When hard wheat is milled the bran forms very small flakes of bran and the flour feels very finely sandy. The hard wheat types are durum, hard red spring, hard red winter, and hard white. During stone milling there is very little starch damage i.e. the stones do not cause significant

rupture of the tiny starch granules. Stone milled flour from dry grain has good keeping properties. However, the ideal is to use stone ground whole wheat flour immediately or at least within 3 months of milling.

Modern refined flour milling deliberately removes and separates the bran and germ from the endosperm, so that the endosperm can be ground into the whitest possible flour. Each step uses specially designed steel rollers, hence the name roller milling. When this process is used to make whole grain flour, the separated bran and germ must be mixed back into the endosperm flour. This has great disadvantages, mostly because in order to efficiently remove the bran and germ, in the first place, the grain is moistened. Moist bran and germ carry this moisture into the flour, together with increased enzyme activity and make the whole wheat flour vulnerable to molds; the flavor and quality are thus compromised. Also this roller milling process was designed primarily for hard red wheat. The milling rollers must be modified for the efficient removal of bran and germ from the much harder durum wheat and the much softer soft white wheat, and each kind of mill is likely to be regionally based. Modern roller milling is not recommended for the production of whole wheat flour. Unfortunately these roller mills are the major milling system currently used all over the Western world.

Other milling systems exist for dry whole grains, such as hammer milling, and micronizing, but none currently is so well suited generally to milling whole wheat flour as the stone milling system.

Choosing wheat to eat, continued

Choose wheat to eat from the class most suited to the whole grain product. See table on next page

The original landrace wheat varieties grew for hundreds of years, and perhaps millennia, in the same region of the Old World. This allowed whole grain wheat cuisines to arise based on the particular wheat type growing in the region. When wheat was introduced onto the American continent some of these uses for wheat were continued, but only until 1880. At that time a refined flour based *Modern American Cuisine* was begun and still continues.

Fortunately we can still look to the cuisines in the Old World and find indications of the best whole wheat products to make with each particular type or class of wheat.

Basically *Emmer*, *Durum*, *Turgidum* and *Khorasan* wheat were grown in the Middle East in a Mediterranean Climate, *Einkorn* was grown in the cooler parts of the Middle Eastern region. *Hard Red* wheat varieties were brought from the Continental Climate regions of Central Europe and Russia. *Hard Red Spring* wheat came from the regions with the most severely cold winters, and the *Hard Red Winter* wheat from the regions with less severe, but still cold winters. *Landrace Hard White* wheat is rare; it is possible that the one example in the table on the next page: *India-Jammu* should be classified as hard red spring wheat, even though

its color is so light. Most *Hard White* wheat has been introduced by breeders since the 1980s; it is the newest class of wheat specially bred and introduced to make light colored whole wheat bread and pasta. *Soft Red* wheat was brought from cool temperate regions. *Soft white* wheat was brought from nearly desert Mediterranean climate regions. *Spelt* was brought from the mountainous regions of Europe.

The gluten character in hard red, hard white wheat and spelt is *elastic*. When a piece of dough is rolled out, there is a strong tendency for the dough piece to spring back to its original size. It is necessary to rest this dough between working it and forming the finally shaped bread loaf. In this way the gluten relaxes and the dough from this elastic gluten can be shaped without tearing the gluten. Elastic gluten wheat is best for making high open textured loaves of bread. All the other wheat types display a *mellow* gluten character, such that a dough piece can be rolled out with very little if any resistance. Breads made from mellow gluten wheat are best made to be low and wide in shape. The property of mellow gluten is useful for making, for example, pancakes, pasta, cookies, and crackers.

Which Class of wheat for which product?

Wheat Class * Commodity wheat class	Gluten type (mellow or elastic)	Major preferred whole grain food uses	
		High protein >12%	Low protein < 11%
Einkorn	mellow	<i>Pasta</i> <i>Soup grain</i>	
Emmer	mellow	<i>Pasta</i> <i>Soup grain</i>	
Durum*	mellow	<i>Pasta</i> <i>Asian noodles (e.g. udon)</i> <i>Middle Eastern breads</i> <i>Southern Italian breads & pizza crust</i>	
Turgidum	mellow	<i>Pasta</i>	
Khorasan	mellow	<i>Pasta</i> <i>Asian noodles (e.g. udon)</i> <i>Middle Eastern breads</i> <i>Southern Italian breads & pizza crust</i>	
Hard Red Spring* Hard Red Winter*	elastic	<i>Modern & Artisan breads</i>	
Soft Red*	mellow	<i>Biscuits (scones)</i> <i>Artisan breads</i> <i>Pancakes</i>	<i>Cookies</i> <i>Cake</i> <i>Short pastry</i> <i>Pancakes</i>
Hard white*	elastic	<i>Modern & Artisan breads</i> <i>(Asian Noodles)</i>	<i>Asian noodles</i>
Soft white*	mellow	<i>Biscuits (scones)</i> <i>Artisan breads</i> <i>Asian noodles</i> <i>Pasta</i> <i>Tortillas</i> <i>Indian Roti</i> <i>Pancakes</i>	<i>Cookies</i> <i>Cake</i> <i>Short pastry</i> <i>Pancakes</i>
Spelt	elastic	<i>Artisan breads</i> <i>Soup grain</i>	