



Article: Barley Basics

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When someone mentions barley in conjunction with human consumption, the common reaction is, "sure I have barley regularly in my beer" (wink, wink). In reality, barley ranks among the top 10 crops grown in the world and ranks fourth among cereal crops.

Barley preceeded wheat as a food grain in ancient Egypt. Data published by the United Nations in 1990 showed the Middle Eastern and North African countries to have the highest consumption of barley as a food. Barley is used as an extender of rice and for its health benefits in the cultures of the Far East. In North America, the bulk of barley grown is used for feed, followed by malting, while milling use accounts for a small percentage of demand.

In the past, most U.S. breeding programs have focused on malting barley. Traits that benefit the malting companies and breweries are not necessarily the most desirable for the food industry. Barley was bred for characteristics aiding malt and beer production, which include low protein and high extractable starch, as well as low soluble fiber in the malted grain.

Recently, breeders in both Canada and the United States have shown interest in developing new varieties that exhibit traits that would be beneficial in food and health applications. The National Barley Foods Council (barleyfoods.org) has been instrumental in

trying to bring together barley plant breeders and industry in an effort to establish common goals.

Inside the hull

A number of types of barley are grown in North America. Most common are the two-row and six-row covered types. These are used for feed, malting and human consumption purposes. The term "covered" refers to a husk that is tightly adhered to the kernel. This husk or hull stays with the grain through the harvest process.

In addition to the covered varieties, there are naked or hull-less varieties. The hull-less varieties have a hull that is loosely adhered. Much will come off during harvest and shipping; what is left is easily removed at the mill. Adding to the list of possibilities, both covered and naked barley have varieties that are considered to be waxy with starch at or near 100% amylopectin.

The more readily available covered-type barley varieties have an inedible husk that must be removed through a pearling step during processing. Pearling is an abrasive action that literally sands the husk off the kernels.

Hulled barley is made by stopping the pearling after the husk is removed, but leaving the bran layer as intact as possible. Like the naked varieties, this is considered a whole-grain product. Taking the pearling process further will result in pearled barley, a process comparable to milling brown rice to white rice. Manufacturers will normally produce several different degrees of pearl, depending on cook time, color and size requirements governed by the end use. Once the husk has been removed, the barley can then be used in food products.

Building with barley

Given its bland flavor and light color, barley lends itself well to many applications. With increased interest in whole-grain and multigrain foods, barley has found its way into products such as bread, ready-to-eat cereals, hot cereals, granola and muesli-type products, as well as snack foods, baby foods, meat products, pasta, and of course, soup.

Products currently available in the marketplace are numerous. Hulled barley and pearled barley are whole-kernel products that can be used in soups and side dishes. These whole-kernel products can be flaked to yield a large flake similar to "old fashioned" oat-type flakes. Depending on the degree of pearl, as well as barley variety, these flakes will range in color from tan to almost white. Alternatively, the kernels can be cut and used as a cut product, or cut and then flaked, resulting in a quick-flake, similar to a "quick cooking" oat flake. Meals and flours are also available.

Healthy angles

Barley, like oats, contains the soluble fiber beta-glucan. Oat beta-glucan has been associated with heart health for some time. In 1997, FDA allowed a heart-health claim for foods containing 0.75 grams of beta-glucan in a single serving. In 2001 to 2002, USDA's Agricultural Research Service conducted two human clinical trials showing a significant correlation between barley consumption and cholesterol reduction. And, in 2005, FDA amended its health claim for soluble fiber and coronary heart disease to include barley. Preliminary studies using both animals and humans indicate barley may also have potential in modifying glycemic response in humans. More studies are planned.

In both oat and barley grain, the beta-glucan is located in the cell walls. In the case of oats, the cell walls are thicker in the area near the aleurone layer. This concentrates the beta-glucan content in oats near the bran layer. The thickness of barley cell walls is more consistent throughout the kernel. Depending on the variety of barley, the whole grain will have beta-glucan levels at or above those found in oat bran.

Barley is rich in alpha-tocotrienol, an antioxidant found mainly in the aleurone layer of the kernel. A study undertaken at the University of Minnesota, St. Paul was based on the theory that, due to the tocotrienol content, barley could be used to retard rancidity, and thus, the development of warmed-over flavor in comminuted meat products. The addition of whole-grain barley flour had a more significant effect than did pearled barley flour. This would be

consistent with the theory that at least a good part of the off-flavor fighting ability was due to the tocotrienols.

Although currently underutilized in the food industry, barley has the potential for wider exposure. Barley has been shown to be heart-healthy, and it is available, affordable and relatively easy to work with.

Kris Nelson has been working with malted barley or milled barley products since 1981. Her experience includes basic research in the malting industry, and quality assurance and technical sales in the milling industry.