

## INTRODUCTION

### BARLEY

Barley (also known as groats) is a cereal grain botanically known as *Hordeum vulgare L.*, and is believed for its origin from western Asia or Ethiopia. Barley is still considered one of the top five cereal grains in the world. Only ten percent of barley is used as human food, while the remaining percentage is used for brewing malt beverages, including beer and whiskey. However, the majority of harvest barley is used for livestock feed.

Barley is also a prime ingredient in the making of variety of the popular foods in the world. The exact origin of barley is debatable, possibly originating in Egypt, Ethiopia, and the near East of Tibet <sup>(4)</sup>. However, it is confirmed that certain barley species was among the earliest cultivated grains, around the same time as domestication of wheat, Barley was grown in the Middle East prior to 10,000 BC <sup>(5)</sup>, but barley's cultivation in China and India probably occurred later <sup>(5,20,31)</sup>.

The old English word for 'barley' was baere, which traces back to Proto-Indo-European and is cognate to the Latin word *farina* "flour". The un-derived word 'baere' survives in the north of Scotland as *bere*, and refers to a specific strain of six-row barley <sup>(4, 15)</sup>. The word barn, which originally meant barley-house, is also rooted in these words <sup>(2)</sup>.

In a ranking of cereal crops (2007) in the world, barley was fourth both in terms of quantity produced (136 million tons) and in area of cultivation (566,000 km<sup>2</sup>) <sup>6</sup>.

## **BARLEY IN ISLAMIC LITERATURE**

According to the scholars of Hadiths (Prophetic sayings) barley supposed to be very nutritious, beneficial in coughs and inflammation of the stomach. Hadiths recommends Sattoo (powdered barley) is a health product. Another health product Talbina is a meal made from Sattoo, by adding milk and honey to the dried barley powder. This meal is highly useful for the sick and grieving and also gives rest to the heart of the patient and makes it active <sup>(23)</sup>.

According to Ibn al-Qayyim, barley water one liter boiled until the contents reduce to three-quarters is used as a thirst quencher, skin freshener (cleansing and softening normal skin). Hagiwara discovered the high organic sodium content of barley, which keeps calcium in solution form in the bloodstream, this helps to dissolve the calcium deposits in the joints <sup>(21)</sup>.

Barley also replaces the organic sodium of the stomach lining, which helps the digestion by improving the hydrochloric acid in the stomach. The enzyme, super-oxidase dismutase, SOD, isolated from barley is a powerful antioxidant which protects the cell against the disease-causing free radicals that destroy healthy cells <sup>(33)</sup>.

## TAXONOMY AND CLASSIFICATION OF BARLEY

Barley is a member of the grass family. It is a self-pollinating, diploid species with 14 chromosomes. The wild ancestor of domesticated barley, *Hordeum vulgare*, subsp. *spontaneous*, is abundant in grasslands and woodlands throughout the Fertile Crescent and is abundant in disturbed habitats, roadsides and orchards. The wild barley is less commonly occurred and is usually found in disturbed habitats <sup>(35)</sup>.

<b>Kingdom</b>	:	Plantae -Plants
<b>Sub-kingdom</b>	:	Tracheobionta-Vascularplants
<b>Super-division</b>	:	Spermatophyta-Seedplants
<b>Division</b>	:	Magnoliophyta-Floweringplants
<b>Class</b>	:	Liliopsida-Monocotyledons
<b>Subclass</b>	:	Commelinidae
<b>Order</b>	:	Cyperales
<b>Family</b>	:	Poaceae-Grassfamily
<b>Genus</b>	:	<i>Hordeum</i> – barley

Barley can be classified in many different ways:

(A) One way to classify barley is to identify it by whether there are two; four or six rows of grains on the head <sup>(26, 31)</sup>. Six row barley can produce 25-60 grains, while two-row barley produces 25-30 grains <sup>(4)</sup>. Four-row barley is actually loose six-row barley. Wild barley is generally two-row, most cultivated barley is of the six-row type.

(B) Second way to classify barley is to describe the beards (awns) covering the kernels <sup>(25)</sup>. In the barley germplasm database awns are described according to the following morphology.

1. Long awned
2. Short awned

3. Normal hooded
4. Elevated hooded
5. Subjacent hooded
6. Long awned in central row, and awnletted or awnless in lateral rows
7. Short awned in central row, and awnletted or awnless in lateral rows
8. Awnless or awnletted in central and lateral rows
9. Elevated hoods in central row, and awnless in lateral rows.

(C) Another way of the classification of barley is on the basis of their nature -

1. **Pearl barley** is the most popular form of barley in the United States. Extensive processing removes the two outer hulls along with the bran layer resulting in uniformly-sized, ivory grains with very little fiber. This processing makes it less chewy to the bite, but it also removes a vast majority of the barley's inherent nutrition. Its flavor is mild and nutty.

2. **Rolled or flaked barley** is similar to rolled oats and is used as a cereal.

3. **Barley flour** (also known as **barley meal**) has a low gluten content which results in a low-rise, so it is often combined with higher-gluten flours when used for leavened breads that need to raise.

4. **Barley grits** are toasted; ground barley grains used as a cereal or cooked side dish.

5. **Hulled barley** (also known as **whole-wheat barley**) has only the outer layer removed, leaving the bran layer intact. It is extremely high in fiber and nutrition, with a pronounced flavor that makes the toothy workout worthwhile. This form requires the longest cooking time.

6. **Scotch barley** has been husked and then coarsely ground. It takes a long cooking time to become tender.

7. **Quick barley** is pearl barley that has been steamed and dried. It will cook up the fastest, usually in less than 15 minutes.

## QUALITY REQUIREMENTS

According to the Brewing and Malting Barley Research Institute Australia, good malting barley has the following characteristics <sup>(14)</sup>:-

- (i) A pure lot of an acceptable variety
- (ii) High percent germination and vigorous growth (95 % or over)
- (iii) Fully mature and plump kernels of uniform size
- (iv) Free from disease
- (v) Free from frost damage
- (vi) Not weathered or deeply stained
- (vii) Less than 5% peeled and broken kernels
- (viii) Free from heat damage
- (ix) 13.5% moisture maximum
- (x) Not artificially dried and desiccants
- (xi) Free of primary insects, large oil-bearing seeds, ergot, treated seeds, smut and odor.
- (xii) Low to moderate protein content 10.5% to 13% dry basis.