

## Barley Chemical Characteristics and Grading Factors

### Barley Chemical Characteristics

#### Types of barley for food use:

Food barley can be divided into types by its starch make-up (waxy or normal) and if the hulls adhere (hulled) or are loose (hulless).

Type of barley	Description
Waxy	High amylopectin (70-100%)
Non-waxy	Not high amylopectin content (<45%)
Covered	Outer hull is intact and tightly adhered to the kernel
Hulled	Outer hull is intact

#### Grading factor limits for barley used in food:

Grade	Minimum limit of		Maximum limit of				
	Test weight (lb/bu)	Sound barley	Damaged kernels	Foreign materials	Broken kernels	Thin barley	Adhered hulls
<b>Hulled</b>							
Two-row	50	97	2	0.5	5	7-10	NA
Six-row	50	97	2	0.5	5	7-10	NA
<b>Hulless</b>							
Two-row	55	97	2	0.5	5	7-10	5
Six-row	55	97	2	0.5	5	7-10	5

\* Unit is % otherwise noted.

### Grading Factors and Certification Methods

Factors	Method of measurement
Plump Barley	Take 250 g dockage-free sample and run the mechanical shiever 30 strokes. 6/64 x 3/4 inch slotted-hole sieve.
Thin Barley	Take 250 g dockage-free sample and run the mechanical shiever. 5/64 x 3/4 slotted-hole sieve.

Factors	Description of grading factors
<b>Sound Barley (25g)</b>	Kernels that are not damaged, including 1) skinned and broken kernels of barley which are not damaged, 2) broken kernels which are not damaged, 3) green immature kernels not otherwise damaged, 4) kernels which are considered injured-by-frost and/or injured-by-mold.
<b>Damaged Kernels (25g)</b>	Kernels, piece of barley kernels, other grains, and wild oats that are badly ground-damaged barley weather-damaged, diseased, frost-damaged, germ-damaged, heat-damaged, injured-by-heat, insect-bored, mold-damaged, sprout-damaged, or otherwise materially damaged.
<b>Foreign Materials (25g)</b>	All matter other than barley, other grains and wild oats that remains in the sample after the removal of dockage.
<b>Broken Kernels</b>	Barley kernel with more than 1/4 of the kernel removed.
<b>Adhered Hulls</b>	Kernels of hulless with hulls that have not been removed during harvesting.

### Typical starch and $\beta$ -glucan content of food barley

	TDF (%)	$\beta$ -glucan (%)	Total Starch (%)	Amylose (%)	Amylopectin (%)
Waxy hulless	19.60	7.21	46.83	6.29	93.71
Non-waxy covered	12.70	3.30	59.11	36.64	63.36
Waxy covered	NA	6	NA	NA	NA

- Non-waxy type barley tends to give chewy texture, high expansion and lower density than waxy type. These are good for extruded products and flat bread type of products.
- Waxy type of barley tends to provide better texture in traditional baked goods and rice replacer products.

## FOOD BARLEY SUPPLIERS

Caremoli  
23959 580th Avenue  
Ames, IA 50010  
515-233-1255  
www.caremoligroup.com

Circle Seeds of Montana Inc.  
14990 Madison Frontage Road  
Three Forks, MT 59752  
406-285-3269  
www.circleseeds.com

ConAgra Mill  
11 ConAgra Drive, 11-340  
Omaha, NE 68102  
866-814-8498  
www.conagramills.com

Grain Millers Inc.  
9531 W. 78<sup>th</sup> St. #400  
Eden Prairie, MN 55344  
952-829-8821  
www.grainmillers.com

Guisto's  
344 Littlefield Avenue  
South San Francisco, CA 94080  
650-873-6566  
www.guistos.com

Hesco Inc.  
500 19<sup>th</sup> St. SW P.O. Box 815  
Watertown, SD 57201-0815  
605-884-1100  
www.hesco-inc.com

LaCrosse Milling Company  
P.O. Box 86, 105 Hwy 35  
Cochrane, WI 54622-0086  
800-441-5411  
www.lacrossemilling.com

McKay Seed Company Inc.  
2945 Rd. N NE  
Moses Lake, WA 98837  
509-766-9894  
www.mckayseed.com

MGI Grain Processing LLC  
316 5th Avenue NE  
East Grand Forks, MN 56721  
218-773-7564

SK Food International  
4666 Amber Valley Parkway  
Fargo, ND 58104  
701-356-4106  
www.skfood.com