

# What Affects Beer Flavor?

Ingredient	Purpose	How varieties affect flavor
<b>Grain</b>	Fermentable sugars	<b>Barley</b> (2 row or 6 row): Malty, bready, <b>Wheat</b> : creamy, cloudy, <b>Rye</b> : spicy, <b>Oats</b> : full, <b>Rice</b> : neutral, dry, <b>Corn</b> : sweet, light
<b>Water</b>	The bulk of the beer	<b>Soft</b> : clean, <b>Hard</b> : mineral taste, <b>Sulfate</b> : drier, <b>Chloride</b> : fuller, smoother,
<b>Hops</b>	Preservative	<b>Noble</b> : clean, crisp, <b>Aroma</b> : floral, tropical, piney, earthy, <b>Bittering</b> : bitterness, <b>Dual</b> : bitter + aromatic
<b>Yeast</b>	Turn sugar into alcohol	<b>Lager</b> : crisp, <b>English</b> : caramel, <b>American</b> : neutral, <b>Belgian</b> : spice, <b>Weizen</b> : banana, <b>Saison</b> : clove, <b>Brett</b> : funky, sometimes sour (when combined with lactic acid bacteria)
<b>Adjuncts</b>	Various	<b>Sugar</b> : boost alcohol, <b>Fruit/Spices</b> : add flavor, <b>Isinglass</b> : remove suspended particles

Process	What is done	Purpose	How varieties affect flavor
<b>Malting</b>	Grains soaked in water, allowed to germinate, and then dried in a kiln.	Release enzymes that break down starches.	<b>Kiln Temp</b> : Higher temps give darker malt, with more chocolatey flavor.
<b>Mashing</b>	Malted grain is crushed and mixed with hot water to create wort.	Extracts fermentable sugars.	<b>Mash Temp</b> : Higher temp gives fuller body. Lower temp is lighter. <b>Grain bill</b> : Higher grain/water ratio makes beer stronger.
<b>Boiling</b>	Water is boiled and hops are added	Sterilize the wort, and add flavor	<b>Boil time</b> : Longer time adds more flavor but also bitterness. <b>Hop timing</b> : Earlier for bitterness, later for flavor. <b>Boil vigor</b> : More evaporation concentrates the flavor.
<b>Fermenting</b>	Combined with yeast for 1-2 weeks. May also add hops as "dry-hopping"	Turn sugar into alcohol	<b>Temp</b> : Higher temps give more yeast flavor. <b>Secondary fermentation</b> : smooth out harsh flavors and add complexity. <b>Dry hopping</b> : hop flavor without bitterness.
<b>Filtering</b>	Filter out particulate matter	Improve shelf life	<b>Unfiltered</b> : More yeast flavor. <b>Coarse vs fine</b> : Coarse filters retain more flavor.
<b>Conditioning</b>	Stored in bottles, tanks, or barrels	Make flavor smoother and more complex.	<b>Lagering</b> : Stored cold to create clean flavor. <b>Barrel aging</b> : Stored in spirit barrels to get spirit flavor.
<b>Carbonation</b>	Add CO2 or Nitrogen to the beer	Improves mouthfeel	<b>Nitro</b> : Smoother taste. <b>Bottle conditioning</b> : Finer bubbles, <b>Forced Carbonation</b> : Crisper

# Beer Styles

Style	Grain	Malt	Grain bill	Hop Type	Hop Level	Yeast	Filtered	Conditioning
Lager	Barley	Pale	Low	Noble	Low	Lager	Yes	Cold
Wheat	Wheat + barley	Pale	Medium	Aroma	Low	Weizen	No	Bottle
Pale Ale	Barley	Pale	Medium	Dual	Medium	American	Maybe	Tank
English Pale	Barley	Pale	Medium	Bittering	Low	English	Yes	Cask
Nitro	Barley + oats	Pale	Medium	Aroma	Low	English	Maybe	Nitrogen
West Coast IPA	Barley	Pale	Medium	Bittering	High	American	Yes	Tank
Hazy IPA	Wheat + barley	Pale	Medium	Aroma	Dry	American	No	Can or keg
Double IPA	Barley	Pale	High	Dual	High	American	Yes	Tank
Saison	Barley	Pale	Medium	Aroma	Medium	Saison	No	Bottle
Wild Saison	Barley	Pale	Medium	Aroma	Dry	Brett	No	Barrel or bottle
Tripel	Barley	Pale	High	Dual	Medium	Belgian	No	Bottle
Barrel Aged Quad	Barley	Dark	High	Aroma	Low	Belgian	No	Barrel
Sour	Barley + wheat	Varies	Low	Aroma	Low	Brett	No	Barrel or bottle
Brown	Barley	Brown	Medium	Bittering	Low	English	Maybe	Tank
Porter	Barley	Brown	Medium	Bittering	Low	English	Maybe	Tank
Barrel Aged Stout	Barley + oats	Dark	High	Bittering	Low	English	No	Barrel

Noble Hop	Taste	Aroma Hop	Taste	Dual Hop	Taste	Bittering Hop	Taste
Saaz	Earthy, spicy	Cascade	Grapefruit	Galaxy	Passionfruit	Magnum	Smooth, herbal
Tettnang	Floral, pepper	Citra	Citrus, tropical	Perle	Spicy, minty	Warrior	Strong, pine
Spalt	Herbal, spicy	Centennial	Citrus, floral	Northern B	Woody, herbal	Target	Strong, earthy
Hallertauer	Floral, herbal	Amarillo	Orange, tropical	Chinook	Pine, spicy	Columbus	Pungent, earthy
Styrian G	Spicy, earthy	Mosaic	Tropical, berry	Liberty	Floral, spicy	Apollo	Citrus, resin
EK Goldings	Earthy, floral	Fuggle	Earthy, woody	Challenger	Fruity, spicy	Ekuanot	Herbal, citrus