

Domain knowledge

1. Type of beer with characteristic:

1.1. IPA



India Pale Ale (IPA) is a popular beer style known for its bold hop flavors and aromas. Originating in England in the 19th century, IPAs have evolved into several subcategories, each with distinct characteristics:

- **Flavor Profile:** IPAs are characterized by their high hop bitterness, which contributes to flavors that can be floral, citrusy, or piney. This bitterness is balanced by a strong malt backbone, creating a harmonious blend of flavors.
- **Subcategories:**
 - **American IPA:** More hop-forward than English IPAs, with higher alcohol content and pronounced bitterness.
 - **Double IPA (Imperial IPA):** Has an even higher alcohol content and more hop additions, resulting in a robust flavor profile that can be resinous, dank, tropical, or fruity.
 - **New England IPA:** Known for its hazy appearance and creamy mouthfeel, with low bitterness and intense hop aroma.
- **Alcohol by Volume (ABV):** IPAs typically range from 5.0% to 14.0% ABV.
- **International Bitterness Units (IBU):** IPAs can have IBU levels ranging from 30 to 100.
- **Serving Temperature:** IPAs are best served at 45-50 degrees Fahrenheit.

1.2. Stout



Stout is a dark and rich beer style known for its robust flavors and creamy mouthfeel. Originating in the United Kingdom, stout has become a beloved style globally for its distinctive characteristics:

- **Flavor Profile:** Stouts typically feature roasted malt flavors with notes of coffee, chocolate, and sometimes caramel or toffee. They can range from dry and bitter to sweet and rich.
- **Subcategories:**

- **Irish Dry Stout:** Characterized by its dry, roasted malt flavors, often with hints of coffee and chocolate. Notable for its visual cascading effect when poured.
- **Oatmeal Stout:** Brewed with oats, contributing to a smooth and silky mouthfeel. These stouts have a rich, full-bodied flavor with roasted coffee and chocolate notes, sometimes with a touch of sweetness.
- **Imperial Stout:** A bold and intense variation with higher alcohol content, rich malt flavors, and complex aromas. Often features dark fruit, roasted coffee, and bittersweet chocolate notes.
- **Alcohol by Volume (ABV):** Stouts typically range from 3.8% to 8.9% ABV.
- **International Bitterness Units (IBU):** Stouts can have IBU levels ranging from 20 to 60.
- **Serving Temperature:** Stouts are best served at 45-55 degrees Fahrenheit.



1.3. Porter

Porter is a dark and robust style of beer with a rich history and a complex flavor profile. Originating in England in the 18th century, porter has evolved into several distinct subcategories, each with its own unique characteristics:

- **Flavor Profile:** Porter is characterized by its deep brown-to-black color and its complex flavors that often include notes of caramel, toffee, and dark fruit. Unlike stout, porter uses malted unroasted barley instead of unmalted roasted barley.
- **Subcategories:**
 - **American Imperial Porter:** A bold and robust variation with higher alcohol content and intense flavors of roasted malt, chocolate, and coffee.
 - **English Brown Porter:** Offers a moderate take on the style, with a balanced flavor profile that showcases the beer's malt character, creating a smooth and easy-drinking experience.
 - **Robust Porter:** Strikes a balance between American imperial and English brown porters, with a medium-to-full body and a robust malt presence. Known for its smooth mouthfeel and well-rounded flavor profile.
- **Alcohol by Volume (ABV):** Porters typically range from 4.5% to 12.0% ABV.

- **International Bitterness Units (IBU):** Porters can have IBU levels ranging from 20 to 50.
- **Serving Temperature:** Porters are best served at 40-55 degrees Fahrenheit.



1.4. Pilsner

Pilsner is a light and crisp style of beer known for its clean, refreshing taste and golden color. Originating in what is now the Czech Republic and Germany, pilsners have become popular worldwide. Here are the details and subcategories of this beer style:

- **Flavor Profile:**

Pilsners are characterized by their balanced bitterness, light body, and clean finish. They often feature a moderate hop aroma and flavor, with a subtle malt sweetness.

- **Subcategories:**
 - **American Lager:** A type of pilsner widely consumed in the United States. It is light-bodied, clean, and crisp, making it a popular choice for easy drinking.
 - **German Pilsner (Pils or Pilsener):** Known for its pale golden color, floral hop aroma from noble hops, and balanced bitterness. It has a subtle yet complex flavor profile.
 - **Czech or Bohemian Pilsner:** Features a rich malt character, spicy hop aroma, and crisp finish. It is brewed with Saaz hops, which give it an herbal and earthy flavor.
- **Alcohol by Volume (ABV):** Pilsners typically range from 3.2% to 5.6% ABV.
- **International Bitterness Units (IBU):** Pilsners generally have IBU levels ranging from 15 to 45.
- **Serving Temperature:** Pilsners are best served at 40-45 degrees Fahrenheit.

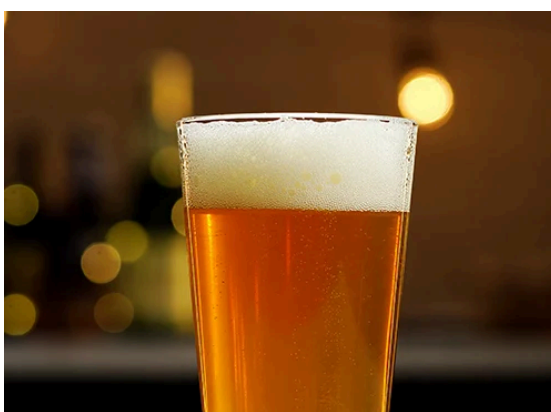
1.5. Wheat Beer



Wheat beer is a popular style of beer known for its refreshing and crisp taste, brewed using wheat malt which gives it a distinct character. Here's a deeper look into wheat beer, including its subcategories, characteristics, and pairings:

- **Flavor Profile:** Wheat beers are characterized by their refreshing and tangy flavors, often with fruity or spicy notes depending on the style.
- **Subcategories:**
 - **American Pale Wheat Beer:** Light and easy-drinking, brewed with a significant proportion of wheat in addition to barley. It has a pale color, mild hop bitterness, and subtle wheat flavor. This style is approachable and refreshing.
 - **Berliner Weisse:** A traditional German wheat beer known for its light body, high carbonation, and low alcohol content. It is typically sour and often served with flavored syrups like raspberry or woodruff to balance the tartness.
 - **Hefeweizen:** A classic German wheat beer brewed with a large proportion of wheat and a distinctive yeast strain that imparts flavors of banana and clove. Hefeweizens are cloudy due to being unfiltered, which allows the yeast to remain in the beer, contributing to its full body and effervescent carbonation.
- **Alcohol by Volume (ABV):** Wheat beers typically range from 2.8% to 5.6% ABV.
- **International Bitterness Units (IBU):** Wheat beers generally have low IBU levels ranging from 3 to 35.
- **Serving Temperature:** Wheat beers are best served at 45-50 degrees Fahrenheit.

1.6. Pale Ale



Pale ale is a versatile and popular beer style known for its balanced flavors, offering a mix of hoppy bitterness and malt sweetness. Here's a detailed look

at pale ale, including its subcategories, characteristics, and pairings:

- **Flavor Profile:** Pale ales are characterized by their balanced flavors, with a blend of hoppy bitterness and malt sweetness. They are lower in alcohol content compared to IPAs, making them a sessionable choice.
- **Subcategories:**
 - **American Pale Ale:** A hop-forward beer with a moderate malt backbone. It features American hop varieties that impart citrus, pine, and floral notes to the brew. American pale ales are known for their refreshing bitterness and bright aromatics.
 - **Blonde Ale:** A lighter and more delicate version of pale ale, with crisp, clean flavors and a pale golden color. Blonde ales are easy-drinking and versatile, making them a popular choice for those new to craft beer or seeking a lighter option.
 - **English Pale Ale:** A classic beer style with a rich malt profile and earthy hop character. It often showcases traditional English hop varieties, creating a balance between bitterness and biscuity malt flavors.
- **Alcohol by Volume (ABV):** Pale ales typically range from 4.0% to 5.5% ABV.
- **International Bitterness Units (IBU):** Pale ales generally have IBU levels ranging from 15 to 45.
- **Serving Temperature:** Pale ales are best served at 35-45 degrees Fahrenheit.

1.7. German Bock



German Bock is a traditional and robust style of beer known for its rich malt character and higher alcohol content. Here's a detailed look at German Bock, including its subcategories, characteristics, and pairings:

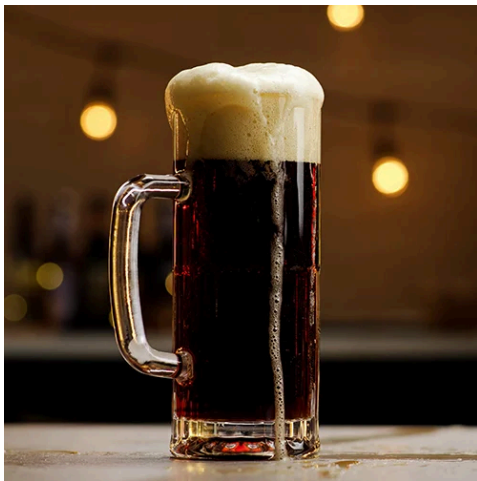
- **Flavor Profile:** Bock beers are characterized by their rich malt sweetness, robust flavors, and higher alcohol content. They can range from pale to dark in color, with notes of caramel, toast, and sometimes chocolate.

- **Subcategories:**

- **Traditional Bock:** A strong lager with a malty sweetness and deep amber-to-dark brown color. Traditional bock beers are known for their rich malt character and warming qualities, making them popular choices during the winter months.

- **Weizenbock:** A wheat bock beer that combines the characteristics of a traditional bock with the fruity and spicy notes of a wheat beer. Weizenbocks have a hazy appearance and a complex flavor profile, including banana, clove, and bubblegum notes from the yeast strain used.
- **Maibock (Helles Bock):** A pale bock beer that is lighter in color and body compared to traditional bock. Maibock is brewed with a higher proportion of pale malts, giving it a clean, crisp profile with a noticeable malt sweetness. This style is traditionally brewed in the spring and enjoyed during the month of May.
- **Alcohol by Volume (ABV):** Bock beers typically range from 6.0% to 9.5% ABV, reflecting their higher alcohol content.
- **International Bitterness Units (IBU):** Bock beers generally have low to moderate IBU levels, ranging from 15 to 35.
- **Serving Temperature:** Bock beers are best served at 40-50 degrees Fahrenheit.

1.8. Brown Ale



Brown ale is a malt-forward beer style with a deep amber-to-dark brown color and flavors of caramel, nuts, and toffee. Here's a detailed look at brown ale, including its subcategories, characteristics, and pairings:

- **Flavor Profile:** Brown ales are characterized by their malt-forward profile with flavors of caramel, nuts, and toffee. They are smooth and easy to drink, making them approachable options for beer enthusiasts.
- **Subcategories:**
 - **English Brown Ale (Northern English Brown Ale):** Known for its malt-forward profile with toasty, biscuity, and caramel flavors. English brown ales have minimal hop bitterness, lower alcohol content, and a lighter body compared to American brown ales, providing a smooth and easy-drinking experience.
 - **American Brown Ale:** A modern take on the traditional English brown ale, characterized by a balanced flavor profile that combines malty sweetness with moderate hop bitterness. American brown ales typically have a medium body and slightly higher alcohol content. They often feature notes of caramel, chocolate, and nutty flavors.
- **Alcohol by Volume (ABV):** Brown ales generally range from 4.0% to 6.3% ABV.
- **International Bitterness Units (IBU):** IBU levels for brown ales typically range from 15 to 45.

- **Serving Temperature:** Brown ales are best served at 40-50 degrees Fahrenheit.



1.9. Belgian Ale

Belgian ale is a diverse and flavorful beer style known for its spiced fruity flavors, high alcohol content, and low bitterness. Here's a detailed overview of Belgian ale, including its subcategories, characteristics, and pairings:

- **Flavor Profile:** Belgian ales are characterized by their spiced fruity flavors, often with notes of banana, clove, citrus, and sometimes bubblegum. They typically have a high alcohol content and are low in bitterness, allowing the malt and yeast flavors to shine.
- **Subcategories:**
 - **Belgian Pale Ale:** Known for its balanced maltiness and hop bitterness. It features fruity esters and spicy notes, with a moderate alcohol content.
 - **Belgian Tripel:** A strong ale with a higher alcohol content compared to other Belgian styles. It is characterized by its pale color, complex malt profile with a dry finish, and effervescent carbonation.
 - **Belgian Saison (Farmhouse Ale):** A rustic beer style originating from Belgium. Saisons are known for their fruity and peppery yeast character, dry finish, and sometimes a bit of tartness. Traditionally brewed in the winter for consumption in the summer.
- **Alcohol by Volume (ABV):** Belgian ales generally range from 4.4% to 10% ABV.
- **International Bitterness Units (IBU):** IBU levels for Belgian ales typically range from 20 to 50, although they are often lower due to the focus on malt and yeast flavors.
- **Serving Temperature:** Belgian ales are best served at 45-55 degrees Fahrenheit.

2. Aspect evaluating guide

1. Appearance













1.1 Color

Some terms that describing beer's color:

Straw colored, honey, copper, brown, dark red, apricot, black, orange, golden, deep gold, ruby red, chestnut and amber.

Good: The color that style of beer should have

Bad: The color doesn't reflect the style of beer

Beer Colors and SRM Value			Beer Style SRM Color Ranges	
Color Swatch	SRM	Color	Style	SRM Range
	2	Pale Straw	Pilsner	2 - 7
	3	Straw	Witbier, Berliner Weisse	2 - 4
	4	Pale Gold	Belgian Strong Ale	4 - 7
	6	Deep Gold	Maibock	4 - 10
	9	Pale Amber	Vienna Lager	7 - 14
	12	Medium Amber	Oktoberfest	4 - 12
	15	Deep Amber	American Pale Ale	6 - 14
	18	Amber-Brown	Pale Ale	5 - 14
	20	Brown	English Golden Ale	4 - 8
	24	Ruby Brown	Bavarian Weizen	4 - 10
	30	Deep Brown	Bitter, ESB	8 - 14
	40	Black	Märzen	7 - 15
			Imperial Pale Ale	5 - 11
			Bière de Garde	6 - 13
			Dunkel Weizen	9 - 13
			Amber Ale	11 - 18
			English Brown Ale	12 - 22
			Bock	15 - 30
			Porter	20 - 40
			Oatmeal Stout	25 - 40
			Baltic Porter	17 - 40
			Foreign Stout	30 - 65
			Imperial Stout	50 - 80

Source: Tasting Beer by Randy Mosher

1.2 Head

Most beers should have some form of head when poured. There are some beers like sours which might not have a head. For darker beers like stout (think guinness), the head will be

off-white, closer to light brown. This comes from the darker malts used when brewing the beer.

Good: In general, a beer should have approximately 1,25 to 2,5 cm of head on the top of the beer. A beer that maintains its head throughout the beer is good

Bad: A beer that has thin head or no head at all or the head disappear quickly

Some terms that describing a beers head/foam:

- **Persistent** – The head stay as you drink down the glass somewhat
- **Rocky** – Usually means a thick head
- **Large** – Some people like a lot of head/foam on their beer. See the north/south divide mentioned above.
- **Fluffy** – Again the head is thick, with an almost shaving cream like quality
- **Dissipating** – The head of the beer leaves quite quickly
- **White** – As described earlier, lighter beers can have a brilliant white head
- **Off-White** – Beer are generally darker due to the special malts used and the head becomes off-white, usually brown or TAN (another descriptor) in color.
- **Frothy** – The head is quite thick but not quite fluffy, usually from beers with bigger bubbles.

1.3 Lacing



Lacing is the residue from the beer foam which sticks to the inside of the glass as you drink your beer. If the beer has a good head, you'll see layer of residue from every sip you take, as you work your way down the glass.

You can see the lines from each sip. The slower you drink a beer with good foam the more lacing you'll see.

1.4 Clarity

Beer styles, such as pilsner are meant to be clear. Although it's up to the brewery's discretion. To clear a beer, a brewer will filter, fine or centrifuge the beer before it's packaged. Then there are beers such as NEIPA (New England IPA), which are supposed to be hazy,

- **Good/Bad:** Depends on beer style and consumer's preferences, but most of the time, the clearer the better a beer.

Some terms that describing a beer's clarity:

- **Brilliant** – The beer is really clear
- **Hazy** – A beer which you can't see through...mostly used with hazy IPA
- **Turbid** – Another word for haze.
- **Cloudy** – The beer is not clear but you can see through the glass.

- **Opaque** – The beer is pretty clear; some might say, the beer “has a cast”.
- **Clear** – If you don’t look too closely the beer is clear, but if you do look very closely the beer might have a slight cast.
- **Crystal** – Similar to brilliant
- **Bright** – Same as clear, it’s good but don’t look too closely might have a tiny, tiny cast.
- **Dull** – The beer is for the most part clear but there’s something stopping it being clear. It lacks a shine.

2. Aroma

Beer is produced from four main ingredients; malt, hops, yeast and water. The first two can give distinctive aromas to a beer.

2.1 Malty

Something smells like Ovaltine

Some terms that describing malty aroma:

Sweet, grainy, graham cracker, biscuit, caramel, toast, espresso, roast and coffee.

2.2 Hops

Besides flavor, hops contribute to beer’s aroma. The essential oils in hops give off a variety of fragrances, ranging from **fruity to piney to earthy**.

Good: term for a hops: hay, straw, tobacco, pine

Bad: fresh cut grass, burnt, alcohol and leather

2.3 Some terms that describing aroma

Good terms:

- **Dark Fruits:** Some hops give dark fruit aromas to a beer. These aromas can range from raisins, currant, dates, figs, plums, blackberries and blueberries.
- **Light Fruits:** In some IPA’s, light fruit aromas are desired with notes ranging from pineapple, apricot, nectarine, peach, mango to prickly pear. Then there are others light fruits aromas like banana, which can be smelt in Hefeweizens, a German wheat beer.
- **Citrus Notes:** These hops give aromas such as lemon, lime, lemon zest, sweet orange peel, bitter orange peel, tangerine and grapefruit.
- **Spicy Notes:** phenolics, often used when describing Belgian beers. Where you get pepper or clove notes. Other spicy note are white pepper, anise, licorice, nutty, earthy, fresh bread, musty and even smoked bacon.

Bad terms: Beer that gives unpleasant aromas

3. Palate

Good: The palate that style of beer should have

Bad: The palate doesn't reflect the style of beer

Palate, also known as the "feel" of a beer, is a crucial aspect when evaluating and describing the taste and sensation of the beer in your mouth. Here are the basic factors to consider when assessing the palate of a beer:

3.1. Body/Texture:

- The body or fullness of a beer refers to its perceived weight or thickness on the palate and how it feels as it flows through the mouth, whether it's smooth, creamy, harsh, or thin.
- **Good:** Not too thick or too thin, it goes in the middle, smooth, creamy, full feel on the palate
- **Bad:** Too thick or "watery", too thin, dissipates quickly

3.2. Carbonation:

- Carbonation refers to the level of bubbles or effervescence in the beer. Typical beers will have a carbonation level around 2.2 - 2.4 volumes of CO₂ by less common styles can have much higher or lower carbonation
- **Good:** The amount of carbonation that the style of beer should have
- **Bad:** The amount of carbonation that the style of beer shouldn't have

3.3. Dryness:

- The dryness of the beer after swallowing.
- **Good:** Appropriate dryness for the beer style, it shouldn't too dry
- **Bad:** Dryness or sweetness that doesn't fit the style, often too dry

3.4. Mouth-coating

- The lingering sensation of the beer in the mouth after swallowing.
- **Good:** Impressive sensation, appropriate dryness or wetness under the palate after drinking.
- **Bad:** A sense of discomfort, too strong or unbalanced.

3.5. Special Features

- Any unique aspects of the mouthfeel, such as oily, sticky, astringent, etc.
- **Good:** Unique mouthfeel characteristics like oily, sticky, astringent, etc.
- **Bad:** Unpleasant or overpowering sensations.

4. Taste

Good: The taste that style of beer should have. The taste should be balanced, nothing too hard, or it could have a dominant flavour, but bring pleasant

Bad: The taste doesn't reflect the style of beer. Often referred as too strong on some flavour that make it unpleasant to drink, or too 'plain', 'thin', 'watery' in the flavour.

4.1. Initial Flavor

- The taste you perceive immediately upon tasting the beer.
- **Example:**
 - An IPA may have a strong initial bitterness with flavors of citrus, pine, or floral notes.
 - A stout might have initial flavors of sweet chocolate, roasted coffee, or caramel.

4.2. Middle Flavor

- The taste that develops as you hold the beer in your mouth before swallowing.
- **Example:**
 - A lager might have a middle flavor that is malty with mild sweetness and low bitterness.
 - A sour ale might develop from a tart or sour taste to a more complex fruity or funky flavor.

4.3. Finish

- The taste that lingers after you swallow the beer.
- **Example:**
 - An IPA may have a lingering bitter finish from the hops.
 - A lager might have a clean and crisp finish.

4.4. Aftertaste

- What remains in your mouth after you've finished drinking the beer.
- **Example:**
 - A stout might leave a lingering taste of chocolate or coffee.
 - A sour ale might leave a slightly tart or dry aftertaste.

4.5. Intensity of Bitterness, Sweetness, and Sourness

- Evaluate the level of bitterness, sweetness, and sourness in the beer.
- **Good:** Appropriate Intensity of Bitterness, Sweetness, and Sourness. It shouldn't be too strong nor too thin, and should go well with the beer style.
- **Bad:** Unpleasant or overpowering, does not reflect the beer style.

4.6. Points to Consider

- **Flavor Development:** Pay attention to how the flavor changes from the initial taste to the aftertaste.
- **Balance of Flavors:** Evaluate if the flavors are balanced or if one dominates.
- **Complexity of Flavor:** Consider if the flavor is simple and straightforward or complex with multiple layers.
- **Intensity of Flavors:** Assess the intensity of bitterness, sweetness, and sourness, and how well they complement each other.

References:

<https://www.webstaurantstore.com/article/27/different-types-of-beers.html>

<https://www.ratebeer.com/Story.asp?StoryID=292>

<https://www.ratebeer.com/Story.asp?StoryID=103>

<https://www.ratebeer.com/StyleGuide.asp#Ales>

<https://www.kegking.com.au/blog/post/how-to-carbonate-beer-in-a-keg>

<https://www.brewshop.co.nz/blog/bubbles-for-beginners-understanding-carbonation/>

<https://www.asianbeernetnetwork.com/describe-beer-like-a-brewer-a-cheaters-guide/>

<https://www.ratebeer.com/HopGuide.asp>