



# American IPA/DIPA

A liquid poem to the glory of the  
hop...

John Sanatar  
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# Early History of India Pale Ale

- IPA developed as a result of necessity
- During the 1700s, the British Empire established itself in India
- The six month journey between England and India proved to be too long for traditionally brewed English Beer
- It was found that higher alcohol and higher hopped beers naturally preserved themselves and lasted the long journey.

# History of American IPA

- Homebrewing was legalized in 1979
- Crazy homebrewers Ken Grossman and Paul Camusi founded the Sierra Nevada Brewing Company in 1980
- Around the same time new American Hop varieties were being researched and new crosses were being created in Universities
- Anchor Liberty was first brewed in 1975 and Sierra Nevada Pale Ale was brewed in 1980

# History of American DIPA

- First Double IPA brewed in 1994 by Vinnie Cilurzo, the then head brewer of Blind Pig Brewing Company of Temecula, California, now the head brewer of Russian River Brewing Company
- Vinnie was brewing with plastic fermenters and was worried about brewing such a large batch scaled up from a homebrew recipe so he doubled the hops and upped his grain bill by 30% or so to overwhelm any off flavors that may have entered his beer.
- In 2001, The Bistro in Hayward, CA started its now yearly DIPA festival. Pliny the Elder was first released for this festival and was one of only 12 beers.

# IPA/DIPA Style Guidelines

## IPA

vs

## DIPA

**Vital Statistics:** OG: 1.056 – 1.075

**Vital Statistics:** OG: 1.070 – 1.090

IBUs: 40 – 70      FG: 1.010 – 1.018

IBUs: 60 – 120      FG: 1.010 – 1.020

SRM: 6 – 15      ABV: 5.5 – 7.5%

SRM: 8 – 15      ABV: 7.5 – 10%

# Components of Great IPAs

- Water
- Grain Bill
- Hops and Hopping Techniques
- Yeast and Fermentation
- Carbonation and Fining Methods

# IPA Water

- Burton on Trent in England is often cited as the perfect IPA/pale ale water, though actually achieving those values may be a bit extreme.
- Depending on calculated color of beer, residual alkalinity of water should range somewhere between -50 and 0.
- You want a large SO<sub>4</sub>:Cl Ratio – 2:1 to 5:1

# IPA Water – Extract Brewing

- All of the malt extracts used in extract brewing already contain minerals, it is hard to know exactly what your Cl:SO<sub>4</sub> ratio is.
- Adding 1 tsp of gypsum (CaSO<sub>4</sub>) is a very common way to boost Sulfate content which helps accentuate hops.
- Adding Epsom Salt (MgSO<sub>4</sub>) would also help boost Sulfate content, though less often done.

# IPA Water – John's Random IPA Water Recipe

**Water Chemistry**

Quantity  ◆ Browse New Edit Duplicate Delete

Component	Quantity	%	Ca++	Mg...	Na+	HC...	SO4--	Cl-	HDNS
<input checked="" type="checkbox"/> Distilled Water	1.0 gal	100%	0	0	0	0	0	0	0
<input checked="" type="checkbox"/> Calcite	.3 g		32	0	0	48	0	0	79
<input checked="" type="checkbox"/> Epsom Salts	.8 g		0	21	0	0	82	0	86
<input checked="" type="checkbox"/> Gypsum	1 g		61	0	0	0	147	0	154
<input checked="" type="checkbox"/> Table Salt	.1 g		0	0	10	0	0	16	0
<input checked="" type="checkbox"/> Calcium Chloride	.2 g		14	0	0	0	0	25	36

**Totals**  ◆ **108** **21** **10** **48** **230** **42** **355**

Target (Distilled Water): 0 0 0 0 0 0 0 0  
Difference 108 21 10 48 230 42 355

Residual Alkalinity -50.01  
Mash pH 5.7

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# McDole's IPA Water Profile

Water Chemistry

Quantity: 0.1 g

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Component	Quantity	%	Ca++	Mg...	Na+	HC...	SO4--	Cl-	HDNS
<input checked="" type="checkbox"/> Distilled Water	1.0 gal	100%	0	0	0	0	0	0	0
<input checked="" type="checkbox"/> Gypsum	1.6 g		98	0	0	0	236	0	246
<input checked="" type="checkbox"/> Epsom Salts	0.7 g		0	18	0	0	72	0	75
<input checked="" type="checkbox"/> Table Salt	0.2 g		0	0	21	0	0	32	0
<input checked="" type="checkbox"/> Calcium Chloride	0.1 g		7	0	0	0	0	13	18

Totals: 1.0 gal

	106	18	21	0	308	45	339
<b>Target (McDoles Water):</b>	97	16	17	0	308	50	307
<b>Difference</b>	9	2	4	0	-0	-5	32

Residual Alkalinity -86.06  
Mash pH 5.7

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# Brewing Water Resources

- <http://www.greenbeltbrewers.org/wp-content/uploads/2010/01/GBA-water-primer.pdf>
- <http://www.howtobrew.com/section3/chapter15.html>
- <http://www.franklinbrew.org/tools/rac.html>

# IPA Grain Bill/Malt Profile

- Generally, IPAs are very dry, pale beers.
- Base malt of American IPA/DIPA is usually Domestic 2-Row or Ultralight Malt Extract
- Use any unfermentable malts (such as Crystal Malts) with restraint, this will help accentuate the hops and dry out the beer
- Sugar is sometimes used for 5-10% of the fermentables to help beers dry out further, though 100% malt beers are also acceptable

# IPA Grain Bill/Malt Profile

- Mash temps for all grain brewers should be on the low end of things to help promote Alpha-Amylase conversion  
148-151 F
- Thinner mashes can also help create a more fermentable wort.

# Hops And Hopping Techniques



**F** Also Floral    **U** Also Fruity    **C** Also Citrus    **H** Also Herbal  
**R** Also Grassy/Earthy    **V** Also Evergreen    **S** Also Spicy

Hop Character Wheel

# Common American IPA Hop Varieties

- Bittering Varieties
  - Warrior, Magnum, Chinook, Horizon, Columbus
- Aroma/Flavor Varieties
  - Simcoe, Columbus, Cascade, Centennial, Amarillo, Citra
- New and exciting hop varieties keep coming out, its important to experiment with different varieties.
- Green Flash's DIPA is Brewed with Summit and Nugget hops, completely non-traditional but still tasty!

# Hop Purchasing and Storage

- The key to brewing great hoppy beers is having lots of fresh, properly sealed hops to use.
- Pellets vs. Whole Flower Hops
- Light, oxygen and heat are hops' enemies, keep hops stored in the freezer, vacuum sealed if possible.
- Purchasing bulk hops is a great idea if you plan to brew a lot of IPAs, check out [www.hopsdirect](http://www.hopsdirect.com) and [www.freshops.com](http://www.freshops.com)
- I wouldn't recommend using hops that are over a year old; hop harvest is in late summer/early fall, plan on buying the new harvest crop at that time for your IPA needs for the whole year.

# Hopping Techniques

- First Wort Hopping
- Mash Hopping
- Late Boil Hopping/Hop Blasting
- “Whirlpool” Hopping
- Dry Hopping

# First Wort Hopping (FWH)

- First Wort Hopping is the process of adding hops to your kettle before you start sparging into it
- With this method hops are in contact with your wort during the whole sparging procedure, as well as through the boil.
- Most people say that the amount of bittering imparted to your beer is roughly equivalent to the same hops added for 20 minutes. However, there is still some debate over this fact.
- FWH seems to result in a bit more refined hop aroma. The bitterness is less harsh and more uniform.
- The only downfall I can see about FWH is that it may be difficult to calculate exact IBUs since its impact is still uncertain.

# Mash Hopping

- The process of adding hops directly to the mash, and then continuing with the brew process as usual.
- Similar to FWH, the actual scientific result of this type of hopping is unknown.
- Most people believe that Mash Hopping contributes to the beer's overall aroma while keeping the bitterness smooth.
- All I can say is try it out!

# Late Boil Hopping/Hop Blasting

- Another interesting hopping technique that is being used by pro brewers and homebrewers
- Basically, instead of adding your traditional 60 minute hops and so forth, you only add hops (and a lot of them) during the last 20 minutes or so of the boil.
- This is said to achieve a very smooth bittering with a huge hop aroma and flavor
- [http://www.mrmalty.com/late\\_hopping.htm](http://www.mrmalty.com/late_hopping.htm)

# Whirlpool Hopping

- New hopping technique developed to mimic commercial breweries
- Many commercial breweries add hops to their whirlpool after the boil
- As a homebrewer, you can mimic the effect of these additions by adding hops after your boil is over and holding the wort at warmer temperatures rather than cooling it all the way down.

# Dry Hopping

- The process of adding hops to the beer after fermentation is complete.
- My process
- Other processes I have heard about
  - Fermentation hopping?

# My Dry Hopping Process

- After 7-10 days when the beer has finished fermenting, I drop the temperature to the 40s or so to drop out all of the yeast.
- I then transfer to secondary and warm back to fermentation temps, then add the hops.
- Once or twice in the 7-10 day dry hop I blast CO<sub>2</sub> in my secondary fermenter to rouse the hops back into suspension.

# Other Dry-Hopping Processes?

- McDole's Process
- Fermentation Hopping?
- Any other interesting hopping methods?

# Yeast Strains and Fermentation

- Most common yeast strain is California Ale Yeast, WLP001, US-05 or WY1056
- Supposedly Stone uses WLP007 for their IPAs and Firestone Uses WLP002 for Union Jack IPA.
- Keep fermentation temp under control at happy ale temps, 66-69F

# Carbonation and Fining Methods

- Carbonate IPAs to 2 – 2.5 Volumes CO<sub>2</sub>
- Carbonation helps perceive beers as drier, thus accentuating hops.
- “If it’s not clear, it’s not beer” – Tasty McDole
- I like to drink my IPAs as fresh as possible, so using fining methods to clear my beer ASAP is always a plus.
- I have used plate filters and gelatin with great success.
- Gelatin: ½ tsp in 5 gallons – Dissolve in ¼ - ½ cup warm water and add to beer in keg or secondary, wait a few days and watch the magic happen!

# IPA Style Spin Offs

- Belgian IPA
- Black IPA (IBA, Cascadian Dark Ale)

# Favorite Commercial Examples

- Russian River – Blind Pig IPA, Pliny the Elder, Pliny the Younger, Hopfather IPA
- Firestone Walker – Union Jack IPA
- Ballast Point – Sculpin IPA
- Green Flash – West Coast IPA
- Stone Brewing Co – Ruination, Stone IPA, Sublimely Self Righteous, Cali Belgique
- Lagunitas – Hop Stoopid, Little Sumpin' Sumpin'