

# IPA

May 2010 Style of the Quarter

# Intro to Style

- A beer that is all about the hops
- Malt should balance by supporting the hops.
- Should not be too filling, too alcoholic, or too small
- Terminal gravity should not be too high, get good attenuation, (>75%) or it will be too sweet/filling.
- Don't make IPA so bitter you cannot taste your hops!
- Combine early and late hopping techniques to explode your hop flavor and aroma.
- Evaluate your hops before using them, don't use poor quality hops!

# History

- Brewed in England, likely by early 1700's for export trade to India.
- Derived from strong October ales, made to last for years, and that would ship well.
- Popularity waned in the face of Pilsners, spirits, and tee totaling movements.
- Modern UK varieties are much less bitter and hoppy than in the past.
  - But who knows, this might change soon...

# BJCP Style Notes

- **14A. English IPA**
- **Overall Impression:** A hoppy, moderately strong pale ale that features characteristics consistent with the use of English malt, hops and yeast. Has less hop character and a more pronounced malt flavor than American versions
- **Vital Statistics:**
  - OG: 1.050 – 1.075                      IBUs: 40 – 60
  - FG: 1.010 – 1.018                      SRM: 8 – 14
  - ABV: 5 – 7.5%

# BJCP Style Notes

- **14B. American IPA**
- **Overall Impression:** A decidedly hoppy and bitter, moderately strong American pale ale.
- **Vital Statistics:**
  - OG: 1.056 – 1.075                      IBUs: 40 – 70
  - FG: 1.010 – 1.018                      SRM: 6 – 15
  - ABV: 5.5 – 7.5%

# Designing an English IPA

- Bittering: BU:GU Usually  $\geq 1.0$  (IBU>SG)
- Flavor & Aroma Hops: choose freshest available for best flavor and aroma
  - Classic UK varieties such as EKG or Fuggles
- Malt bill: Simple.
  - Base malt, a little crystal, sometimes a bit of sugar
  - Mash for good attenuation (low 150's)
- Water:
  - Use Classic UK water profiles
- Yeast:
  - Low esters and well attenuating .
  - Do not let it get too sweet!

# Designing an American IPA

- Bittering: BU:GU Usually  $\geq 1.0$  (IBU>SG)
- Flavor & Aroma Hops: choose for best flavor and aroma
  - Lower Cohumulone hops should be less harsh
  - Classic piney, citrus, resinous, fruity varieties
  - Explore & combine techniques for adding hop aroma & flavor
- Malt bill: Simple.
  - Base malt, maybe a little crystal, Munich, Biscuit, etc
  - Mash for good attenuation ( $\approx <150^{\circ}\text{F}$ )
- Water:
  - A little Sulfate is good, too much can make the hops harsh.
- Yeast:
  - Lower esters and well attenuating strains

# A Basic Recipe: American IPA

Target OG =	1.065	FG =	1.012					
Mash efficiency =	0.70	ABV =	7.0					
Total Vol =	5	SRM =	7					
Total GU needed =	464	IBU =	65					
<b>Grain Bill</b>		<b>Full Mash</b>			<b>Partial Mash</b>			
<b>Grain</b>	<b>lbs grain</b>	<b>Color 'L</b>	<b>Color (SRM)</b>					
US Pale Ale malt	12.0	3	34	Pale Extract	10	lbs		
40L Crystal	0.50	40	1	& Steep the crystal malt				
Total:	12.5		7					
<b>Mash Schedule</b>	Mash in with 1.25 qt/lb H2O			<b>Salts = Add Gypsum at 1.0 grams/gallon</b>				
Protein rest	None		<b>Gallons</b>		1 Gram/gallon	Burton Salts		
60 Minute Mash Rest	147F	Mash in	4	ppm CA	62	352		
<b>Boil</b>	60 minutes	Sparge H2O	2	ppm SO4	147	820		
<b>Hopping:</b>	Total IBU	65						
	BU:GU	1.00						
	<b>Variety</b>	<b>Form</b>	<b>alpha Acids</b>	<b>% Total IBU</b>	<b>Added IBU</b>	<b>Boil Time</b>	<b>% Util'zn</b>	<b>Oz</b>
<b>Mash Hops</b>	Cascade	Pellets	8.0	25	16.25	60	15	0.9
<b>Boil Hops</b>	Cascade	Pellets	8.0	30	19.5	60	30	0.5
<b>Late Hop #1</b>	Cascade	Pellets	8.0	15	9.75	15	14	0.6
<b>Late Hop #2</b>	Cascade	Pellets	8.0	15	9.75	10	10	0.8
<b>Late Hop #3</b>	Cascade	Pellets	8.0	15	9.75	5	6	1.4
<b>At Knockout (170°F)</b>	Cascade	Pellets						1.0
<b>Dry Hop</b>	Amarillo	Pellets						1.0
								Total = 6.2
<b>Yeast</b>		Ferment @ 65-68°F			Per Mr Malty's pitch rate calculator:			
<b>Pitch Rate</b>	Need:	225	billion cells		<a href="http://www.mrmalty.com/calc/calc.html">http://www.mrmalty.com/calc/calc.html</a>			
	# Packs:	1		Starter Type:	Simple with O2 at start			
	# Liters:	2		Yeast Strain:	1056 or WLP001			

# Hops – Varieties & Properties

Name	% AA	% Beta acids	Cohumulone % of AA	Total Oil %	Carophyllene (as % of oil)	Farnesene (as % of oil)	Humulene (as % of oil)	Myrcene (as % of oil)	Descriptors
Ahtanum	5.7-6.3	5.0-6.5	30-35	0.8-1.2	9-12	0	16-20	50-55	Cirus, resinous, fruity.
Amarillo	8-11	6-7	21-24	1.5-1.9	2-4	2-4	9-11	68-70	Aricot, peach, fruity. In excess: petroleum
Cascade	4.5-6.0	5.0-7.0	35-40	.8-1.5	3-6	4-8	10-16	45-60	Geraniums, alfalfa, citrus, floral.
Centennial	9.5-11.5	3.5-4.5	28-30	1.5-2.5	5	0	11	58	Juicy fruit, Trix, Fruit Loops, fruity, citrus.
Chinook	12-14	3.0-4.0	29-34	1.5-2.5	9-11	0	20-25	35-40	Piney, peppery, spruce, catty.
Columbus/ Tomahawk/ Zeus	14-16	4.5-5.5	30-35	1.5-2.0	8-12	0	15-25	25-45	“dank”, onion, garlic, spicy
Crystal	3.5-5.5	4.5-6.5	20-26	1.0-1.5	4-8	0	18-24	40-65	Spicy, peppery, fruity
Glacier	5.5	8.2	11-13	.7-1.6	6.5-10	0	24-36	33-62	Peach
Newport	13.5-17	7.2-9.1	36-38	1.6-3.36	4.5-7	0	9-14	47-54	Apricot, grapefruit, pine, peach
Palisade	5.5-9.5	6-8	24-29	1.4-1.6	16-18	0	19-22	9-10	Grassy, Piney, Apricot
Simcoe	12-14	4-5	15-20	2-2.5	5-8	0	10-15	60-65	Pineapple, grapefruit, “grungy”
Summit	15-19?	?	?	2-2.5	?	?	?	?	Tangerine, onion, dank

- “onion” is a sulfurous aroma associated with dimethyl trisulfide (DTMS) that is found in hops.
- Myrcene- Spicy, petroleum
- Caryophyllene, Farnesene, Humulene - When in oxidized form, associated with Woody, Deep-Rich Resin Like “hoppy” “noble” aroma.

## References:

The New Brewer Volume 23, Number 6. “The Eternal Quest for the Ultimate Hop Impact” by Matthew R. Brynildson (p. 22-29) Brewer’s Association.

<http://www.yakimachief.com/hopvarieties/hopvar.html>

<http://www.hopunion.com/hopunion-variety-databook.pdf>

<http://www.ratebeer.com/Beer-News/Article-482-1.htm>

<http://destroy.net/brewing/IPA-hop-ref-062008.pdf> - nate@destroy.net

# Traditional Kettle Hopping

- Bittering additions:
  - Get lots of bittering, little flavor or aroma survives this process.
  - Boil 45-90 minutes, usually 60 minutes
- Flavor additions: at 30 – 15 minutes
- Aroma Additions: 5 – 0 minutes
- Post boil additions:
  - Whirlpool hopping
  - Hopback
  - Dry Hopping

# Mash Hopping & First Wort Hopping

- A 're-discovered traditional method'.
- Supposed to add finer bittering.
- Surprising amounts of flavor and aroma survive this process.
  - Heat at mashing temperature seems to stabilize certain hops flavors/aromas through the boil.
- % Utilization ~15%

# Late Hopping

- Hops bittering is extracted at short boil times, but less efficiently
- This means that you can bitter your beer using more hops for shorter time.
  - Why would you do this?
  - Because this = LOTS of flavor and aroma hops!

Boil Time	% Utilization (pellets)
60 minutes	30%
20 minutes	17%
15 minutes	14%
10 minutes	10%

# References & Resources

- BJCP Style Guidelines
- Nathan Smith's web site: <http://destroy.net/>
- Brewing Classic Styles, Zainasheff & Palmer
- The Secret to Big Hop Aroma & Flavor
  - [www.mrmalty.com](http://www.mrmalty.com)
- Mythbusting the IPA, Pete Brown
  - All About Beer Magazine, Vol 30, No 5, Nov 2009
- Lupulin Love: The Hops of IPA
  - Ted Hausotter, Zymurgy, Vol 32, No 4, July/Aug2009
- Norm Pyle's Hops FAQ
  - <http://www.realbeer.com/hops/FAQ.html#aroma>