

No Boil Hop Beer

Presented by Matthew Brown

About Me

- B.A. Of Chemistry from University of Cincinnati
- Homebrewing for about 10 years
- Two time Dunedin Brewers Guild Homebrewer of the Year
- Working as a brewer at Cigar City Brewing, Tampa FL
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Current techniques for using hops

- Bittering addition and flavor additions
 - Traditionally method everyone learns
- Other places to use hops
 - First-Wort, Mash, Whirlpool, Hopback
- Late boil additions only
 - Hop Bursting
- No-mi batches
 - John Mallet of Bell's Brewery

Why put hops into the boil?

- Isomerization
 - Reaction takes place over 185°F
 - Longer hops are held above 185°F, more bitterness is gained
- Flavor and aroma
- Head retention
- Preservative qualities

Brewing a balanced beer without boil hops, is it possible?

- Discussions with fellow brewer led to the idea
- American Homebrewers Association Research and Education Fund gave the okay to perform the trials

The plan to test idea

- Do not use any hops in the boil
- Use a hopback and whole leaf hops
- Place hopback in between the mash tun and kettle
- Run the wort through hopback after mashing
- Split batch after boil and use hopback again

No hop back, no problem. Build one!



Hopback Build



My homemade hopback



Sparge Hopping brew day; hot side

- Mash for 1 hour
 - 15 minute vorlout step
- Mash out step heat to 165°F
- Run entire preboil wort volume through hopback
 - 127g (4.48oz) whole leaf Chinook 14.3% A.A.
 - 45 minutes until kettle full
- Boil for 60 minutes
 - 15 min yeast nutrient and whirlfloc addition

Hopback in the flow of mash run-off



Hopback full of wort and hops



Crystal clear wort in kettle



Only hot break in boil



Sparge Hopping brew day; cold side

- Hopback loaded with new hops
 - 175g (6.16oz) Chinook 14.3% A.A.
- 10 minute whirlpool rest
- Split batch into 2.5 gallons, gravity flow
 - First half through hopback (sample A)
 - Second half no hopback (sample B)
- Identical carboys
- Same fermentation temp
- Same volume and type (1728) of yeast

Hopback after boil



Only hot break left after heat ex



Sample A on left, Sample B on right



First Brew – The results

	IBU	OG	FG	Sparge Hop Contact Time	ABV
Sample A	99	14	2.8	45 min	6.1%
Sample B	54	12.9	2.4	45 min	5.7%

Numbers are great, does it taste good?

- BJPC judges evaluate the beer
- Simple 1-10 scale
 - Quality & Intensity of Hop Aroma, Quality & Intensity of Hop Flavor, Citrus, Fruity, Grassy, Malt Character, Malt v Hop Balance
- Common response
 - Very clean bitterness in Sample B
- Overall impressions
 - Better for flavor and aroma for Sample A
 - Sample B out of balance with bitterness

The rebrew

- Same recipe, batch size, OG and hops before and after boil. Split batch.
- Same hop type
- Same yeast and fermentation profile
- Different amounts of hops in each hopback
 - 99g (3.5oz) in sparge hopback
 - One ounce reduction
 - 114g (4.07oz) in post boil hopback
 - All that was left in bag

The rebrew – results

	IBU	OG	FG	Sparge Hop Contact Time	ABV
Sample C	71	13.1	3.1	30 min	5.5%
Sample D	45	12.8	2.8	30 min	5.4%

The re-rebrew

- Same recipe, batch size, OG and hopping method
- Same hop type
- Same yeast and fermentation profile
- Different amounts of hops in each hopback
 - 57g (2.0oz) in sparge hopback
 - One and a half ounce reduction
 - 175g (6.16oz) in post boil hopback
 - Seemed to work great the first time

The re-rewind – results

	IBU	OG	FG	Sparge Hop Contact Time	ABV
Sample E	60	15.8	2.4	45 min	7.3%
Sample F	23	15.8	2.5	45 min	7.3%

Lets get weird

- Using sparge hop method to brew a 5 gallon batch of porter
- No hops added to the boil, 28g(1oz) sparge hop
- No hopback after the boil
- 16° OG
- Results
 - 26 IBUs measured

Lets get weirder

- Using sparge hop method to brew 10 gallons of double IPA
- 170g Chinook before and after boil
- No hops added to the boil
- 20° OG
- Results
 - 108 IBU measured

Results summary

	Measured IBU	Amount of Sparge Hops
Sample B	54	127g
Sample D	45	99g
Sample F	23	57g
Porter (5 gallons, sparge hops only)	26	28g
Double IPA (10 gallons, pre & post boil hops)	108	170g

Analysis of results

- Hop plant matter not required to be boiled to yield bitterness and produce balanced beer
- The IBU pickup using post boil hopback

Trial 1	45 IBU	175g hops
Trial 2	26 IBU	114g hops
Trial 3	37 IBU	175g hops

- More than just IBU numbers

Benefits

- Excellent mash filter
- Cleaner boil kettle
- Clean bitterness, low astringency achieved by limiting plant matter exposure to boiling wort
- Higher yields
- Excellent pre-chiller and hot break filter
- Simplified boil additions schedule

Disadvantages

- Potentially use more hops
- More equipment required to brew
 - Hop back, extract tubing, configurations
- Access to fresh whole leaf hops

More ideas to apply the method

- Slower or faster run-off
- Vary gravity of wort
- Use same hops before and after boil
- Recirculate wort through hopback until boil
- Scale up batch size using same amount of hops to find limit of utilization
- Shorten boil time
- Only use hopback after boil

Questions

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