Brewing Consistency

Identifying and Controlling the Variables

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Why is brewing consistency important?

• Beer Repeatability
• Clone commercial beers
• Detect the effect of hardware/process changes
• Better brewing experience
Variables to control.

- **Ingredients**
  - Water
  - Malt
  - Hops
  - Yeast

- **Process**
  - Milling
  - Mashing
  - Sparging
  - Boiling
  - Hop Additions
  - Whirlpool
  - Knockout
  - Fermentation

- **Cellaring**
Ingredients - Water

• Beer is over 90% water
• Consistently good tasting water
  • Chlorine removal
  • Water Report
  • Hardness – Salt Additions
  • Dilution
  • RO
Ingredients - Malt

- Freshest possible
- Highest quality
- If possible, check your potential extract
Ingredients - Hops

• Know your alpha
• Freshest possible
• Buy in bulk
• Store correctly
Ingredients- Yeast

• Starter
  • Active
  • Oxygenated
  • Appropriately sized
  • Consistent cell count
  • Yeast Nutrient
BNA9 Session IPA

75% Rahr 2-row
13% Durst Vienna
12% Crystal 15L
Mash at 154F
30 IBU Magnum 60 min
30 IBU Belma and Legacy WP
(courtesy of Puterbaugh farms)
EXP 05256 Dryhop

Safale 04
OG 1.048 FG 1.012
4.7% ABV 60 IBU (measured)
Brewers: Adam Mills – Cranker’s
Nathan Smith
Mike McDole
Process - Milling

- Consistency
- Lauterability
Process - Mashing

• Dough-In
  • Strike Temperature
  • Grist Temperature
• Water-Grist Ratio
• Temperature Control
• Vorlauf
Process - Sparging

- Runoff Rate
  - Consistent
  - Checking it
Process - Boiling

• Boil Off Rate
  • Burner Rating
  • Ambient Conditions

• Pre-Boil Gravity
  • When it’s low
    • Boil until it’s right (make less beer)
    • Add Malt Extract/Sugar
    • Make a different beer
  • When it’s high
    • Add water
    • Make more beer or reduce volume
    • Make a different beer
Process – Hop Additions

• Stick to the recipe
• Loose are bagged
Process - Whirlpool

- Length
- Effectiveness
Process - Knockout

- Length
- Temperature
Process Fermentation

• Oxygenation
• Temperature Control
• Documented profile
Cellaring

- Most beer is meant to be clear
- Conditioning
- Treat it like milk
Questions?