
Recipe Formulation

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Introduction

- Trying to come up with an adequate recipe for the style.
 - Does not have to be the “best” recipe for style
 - Explain why recipe fits the style
- Easy to spend lots of time on this question
- Ray Daniels, *Designing Great Beers*
 - An excellent reference for how to develop a recipe

BJCP Exam Question

- Provide a complete **ALL-GRAIN** recipe for a _____, including:

1 point	Target statistics (starting specific gravity, final specific gravity, and bitterness in IBUs or HBUs) and color (as SRM or a textual description of the color)
2 points	Batch size, ingredients (grist, hops, water, and yeast) and their quantities.
3.5 points	Mashing, boil, fermentation, packaging, and other relevant brewing procedures.
3.5 points	Explain how the recipe fits the style's characteristics for flavor, aroma, appearance, mouthfeel and other significant aspects of the style and describe how the ingredients and processes used impact this style.

Potential Styles

- Belgian Tripel
- American IPA
- English Pale Ale
- Robust Porter
- Dry Stout
- Weizen
- Doppelbock
- Oktoberfest
- German Pilsner
- Bohemian Pilsner
- Classic American Pilsner

Target Statistics

- OG – original gravity
- FG – final gravity
- IBU – international bittering units
- Color – SRM or description

- Put these values up front on the answer
- Use a specific value, do not give a range
- Best to shoot for the middle of the guideline range
 - Make OG and FG similar parts of range

Ingredients

- Ingredients are the malt, hops, yeast, water
- Usually grader will just plug ingredients into brewing software and calculate the final statistics
- Specify amounts and types

Ingredients – Malts

- Malts are the backbone of the style
- Start with a base malt
 - Malt should be from beer's country of origin
 - US Pale Malt, UK Pale Malt, German Pilsner, ...
- Add small amount of specialty malts when appropriate
 - Do not go overboard on specialty grains
 - Try to narrow it down to 1-2 grains
- If the style has characteristic grains be sure to use those
 - Roasted Barley, Crystal Malts, Flaked adjuncts

Calculating Malt Quantities

- Theoretical added amount of sugars
 - Base/Specialty Malts – 36 GU from 1lb/1Gal
 - Simple sugars – 1.045 GU from 1lb/1Gal
- Mash is not completely efficient
 - 75% efficiency is a good rule – SPECIFY THIS!
- 10 lbs grain in 5 Gallons water
- $(36 \text{ GU/lb} * 10 \text{ lb} * 75\%) = 270 \text{ GU}$
- $270 \text{ GU} / 5 \text{ Gal} = 54 \text{ GU/Gal} \rightarrow 1.054$

Ingredients – Hops

- Hops can be used for 3 purposes
 - Bittering, Flavor, Aroma
- Use hops associated with the country of origin
 - US – Cascade, Centennial
 - UK – Kent Goldings, Fuggle
 - Germany – Hallertau, Tettnang
- Avoid complicated hopping schedules
 - Bittering – 60 min
 - Flavor – 15 min
 - Aroma – 0 min

Calculating Bitterness

- Bitterness depends on many factors
- Calculate HBU
 - # oz hops x %AA hops = # HBU
- Use a simple rule of thumb for IBU calculations
 - 60 minute → 1 HBU = 4 IBU 25% utilization
 - 15 minute → 1 HBU = 2 IBU 12.5% utilization
 - 0 minute → 1 HBU = 0 IBU
- Mention hop utilization rate
- 1 oz Hallertau (5%) for 60 minutes
 - 1 oz x 5% AA = 5 HBU → 20 IBU

Yeast Choice and Amount

- Yeast should be appropriate for the style you're brewing
 - Ale vs. Lager
 - Country of origin
- Amount of yeast
 - 1 million cells / mL / °Plato
 - Good standard way to describe
 - Ales – 1 Qt starter
 - Lagers – 1 Gallon starter then decant spent wort

Water Choice and Adjustment

- If the region has a characteristic water profile mention that
 - Do not need to go into detail about adjustment
- Average/Moderate water
 - American IPA, Belgian Tripel, Robust Porter, Oktoberfest, German Pilsner, Classic American Pilsner, Weizen
- Bohemian Pilsner – Soft water
- Dry Stout – High carbonate
- English Pale Ale – Hard, high sulfate

Process Choices – Mashing

- All of these styles can be made with single infusion
- Things to specify
 - Mash Temperature
 - Mash Thickness – 1.3 Qt/lb
 - Mash Out (optional)
 - Vorlauf
 - Sparge until you reach pre-boil volume
- Good practice is to note what a traditional method is
 - Ex. Doppelbock is traditionally decocted

Process Choices – Boiling

- Bring to full rolling boil
- Things to specify
 - Length of boil
 - 60 minutes ok, 90 minutes with pilsner malt (DMS)
 - Kettle finings
 - Whirlfloc at 15 minutes
- Chill as quickly as possible after boil complete
 - Best cold break

Process Choices – Fermentation

- Yeast specified in ingredient section
- Aeration of the wort
- Fermentation temperature
 - Ales – 68°F
 - Lagers – 50°F
- Fermentation time
 - “Until fermentation complete” (1-2 weeks)
- Lager Beers
 - Diacetyl rest – 65°F for 2 days
 - Lager at 32°F for 4-8 weeks

Process Choices – Packaging

- Specify method and carbonation level
- Bottle conditioning
 - 4 oz corn sugar
 - Can go up or down based on style
- Kegging
 - Specify carbonation level in volumes CO₂

How Does it Fit the Style?

- This basically asks you for a style description
 - Can be abbreviated relative to other questions
- How do your choices make that style
 - Ingredients
 - Special malts, bitterness, hopping, yeast?
 - Process
 - Mash temperatures
 - Boil times
 - Fermentation temperatures
- Try to focus this on the key aspects of the style
 - Give 3-4 examples of important choices

Key Aspects for Styles – Belgian Tripel

- Ingredients
 - Pilsner malt, simple sugar, higher OG
 - Belgian ale yeast (Trappist)
- Process
 - Lower mash temperature
 - Fermentation temp for esters, phenolics
 - Higher carbonation level

Key Aspects for Styles – American IPA

- Ingredients
 - US 2-row, Light crystal malt, higher OG
 - Lots of American hops – bittering, flavor, aroma
 - Dry hopping
 - Clean ale yeast
- Process
 - Low-moderate mash temperature

Key Aspects for Styles – English Pale Ale

- Ingredients
 - British pale malt, medium crystal
 - English hops – bittering, flavor, (aroma)
 - British ale yeast – some esters
 - Higher sulfate water
- Process
 - Moderate mash temperature
 - Fermentation temperature and esters
 - Slightly lower carbonation

Key Aspects for Styles – Robust Porter

- Ingredients
 - US or UK pale malt, Crystal malt, roasted grains (black patent, chocolate)
 - US or UK hops - bittering, flavor
 - Clean US or UK ale yeast
- Process
 - Moderate-high mash temperature
- This style is fairly broad so you can target either a UK or American version.

Key Aspects for Styles – Dry Stout

- Ingredients
 - UK pale malt, roasted barley (1lb), flaked barley (2lb)
 - UK hops, bittering
 - Higher carbonate water
 - Irish ale yeast
- Process
 - Low-medium mash temperature
 - Med-low carbonation

Key Aspects for Styles – Weizen

- Ingredients
 - 50% malted wheat, 50% Pilsner
 - Noble hops, bittering only
 - German Weizen yeast
- Process
 - Moderate mash temperature
 - 90 minute boil for DMS
 - No kettle finings – should be cloudy
 - Fermentation temperature – significant esters
 - Med-high carbonation

Key Aspects for Styles – Doppelbock

- Ingredients
 - Munich (50%), Pilsner (50%), higher OG
 - Noble hops, bittering only
 - German lager yeast, large starter
- Process
 - High mash temperature for more body
 - Decoction very traditional
 - 90 minute boil for DMS removal
 - Fermentation – cold primary, diacetyl rest, lager

Key Aspects for Styles – Oktoberfest

- Ingredients
 - Pilsner (50%), Munich (45%), light Cara (5%)
 - Noble hops, bitterness, flavor
 - German lager yeast
- Process
 - Moderate mash temperature
 - Decoction traditional
 - 90 minute boil for DMS
 - Fermentation – Cold, diacetyl rest, lagered

Key Aspects for Styles – German Pilsner

- Ingredients
 - 100% German pilsner
 - Noble hops, bitterness, flavor, aroma
 - German lager yeast, clean
 - Water – slightly more mineral, sulfate
- Process
 - Lower mash temperature – for lighter body, dryness
 - Decoction traditional
 - 90 minute boil for DMS
 - Fermentation – diacetyl rest, lagering

Key Aspects for Styles – Boh. Pilsner

- Ingredients
 - 100% Czech Pilsner
 - Saaz hops, bittering, flavor, aroma
 - Czech lager yeast
 - Very soft, low mineral content water
- Process
 - Higher mash temperature for more body
 - 90 minute boil for DMS
 - Fermentation – diacetyl rest, lagered

Key Aspects for Styles – Cl. Am. Pilsner

- Ingredients
 - 75% US 2-row malt, 25% flaked maize
 - Noble hops, bittering, flavor, aroma
 - German lager yeast
 - Water – not too alkaline
- Process
 - Low mash temperature for lighter body
 - 90 minute boil for DMS
 - Fermentation – diacetyl rest, lagered