

CA

CRAFT BEER SUMMIT 2019



WELCOME CCBA 2019

- George Thornton
- National BJCP
- Certified Cicerone
- Homebrewing since 2001
- The Homebrewer est. 2012
- Home Brewing Co. est. 2014
- SDSU Business of Craft Beer:
Brewing Basics + Beer Styles I
- How About Y'all? Pro? Home?
Beginner? Advanced?



Photo w/ a beard to establish beer street cred.

Homebrewing Beyond the Basics: How to Develop Your Own Recipes

- Know Your Ingredients & Process
- Know Your Goal
- The “Mosher Approach”
- Thoughts On Balance & Drinkability



Let's Write a Recipe



What do we want to Brew?



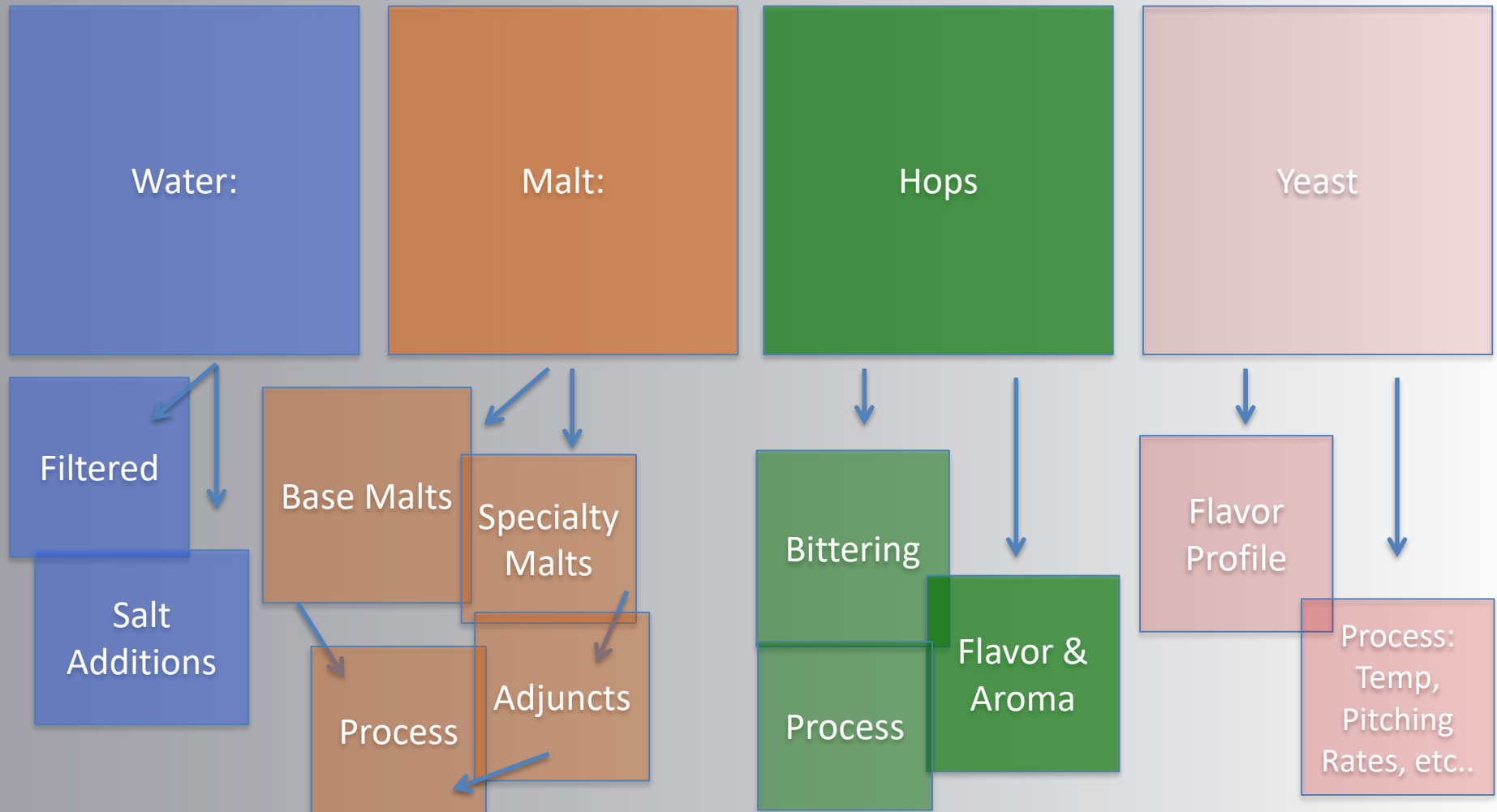
What is our goal/purpose?



Where can we look for inspiration?

Recipe Formulation: The Mosher Squares

Each box has an identical set of questions: Are we going for a historical/stylistic reference or for another end goal?



Water's Impact on Beer Styles



SD Water: High in gypsum (bitter/"sharp"). Home of the double IPA... a coincidence?

Malt Types:

BASE MALTS

Standard Process:

Highly modified (good extraction), low color (low kilning). Up to 100% use in Recipe.

Ex: 2-Row, Pale Malt, Munich, Vienna, Maris Otter, Pilsner Malt.

SPECIALTY MALTS

Caramel Malts:

“Green” malts (steeped, germinated, but not kilned) is roasted. Mashed inside the kernel, creating sugars. Range of colors.

Ex: Caramel/Crystal Malts.

Roasted Malts:

Pale malts that are roasted..

Roasting destroys enzymes and sugars.

Ex: Biscuit Malt, Chocolate Malt, Roasted Barley.

Specialty Process:

Ex: Acidulated malt (lowers pH in mash).



Base Malts

2-Row



Munich



Vienna



Pilsner



Maris Otter



- Highly “modified”:
- Proteins and complex starches have been broken down at the malting house; the brewer has less process to finish during brew day.
- **Diastatic Power**: A measurement for how well a grain can convert its own starches into sugar (given the right mashing conditions at the brew house).
- Gently kilned:
 - Preserves crucial enzymes that will convert starches into sugar
- Provides the bulk of sugar in a recipe
- 80-100% use in recipe

Malt Types: Specialty

Crystal

Roasted Barley

Chocolate

Honey

Acid Malt



Either raw barley or green malt that is roasted to a certain specification

Provides breadth of color, flavor, and aroma

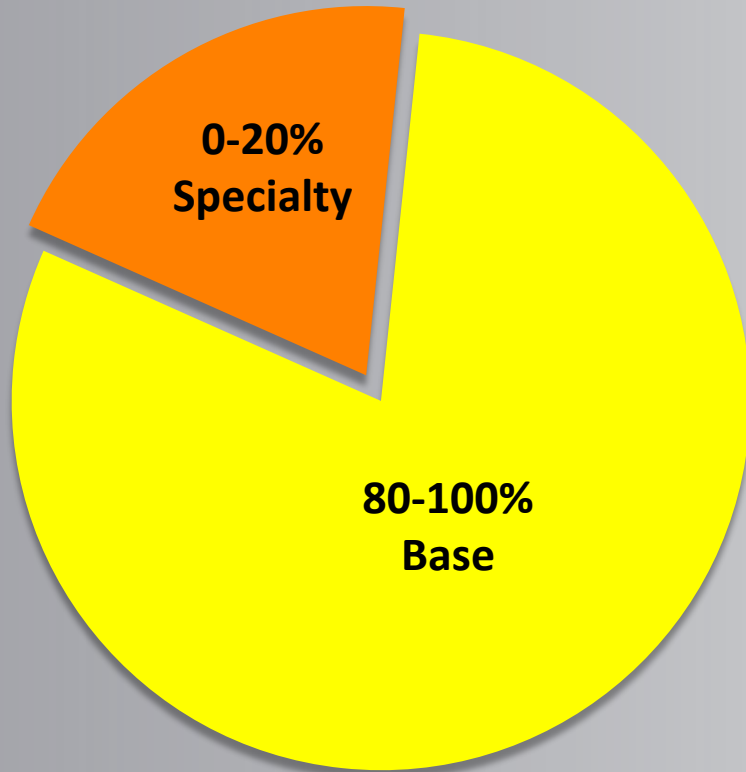
Most do not contain sugar or the enzymes needed to self convert

Crystal/Caramel Malt is the exception – the stewing process actually converts the starch into sugar at the malting house

Therefore, usage is limited to 0-20% in most recipes

Recipe Formulation: Malt

Grist



Ingredient Considerations:

Base:

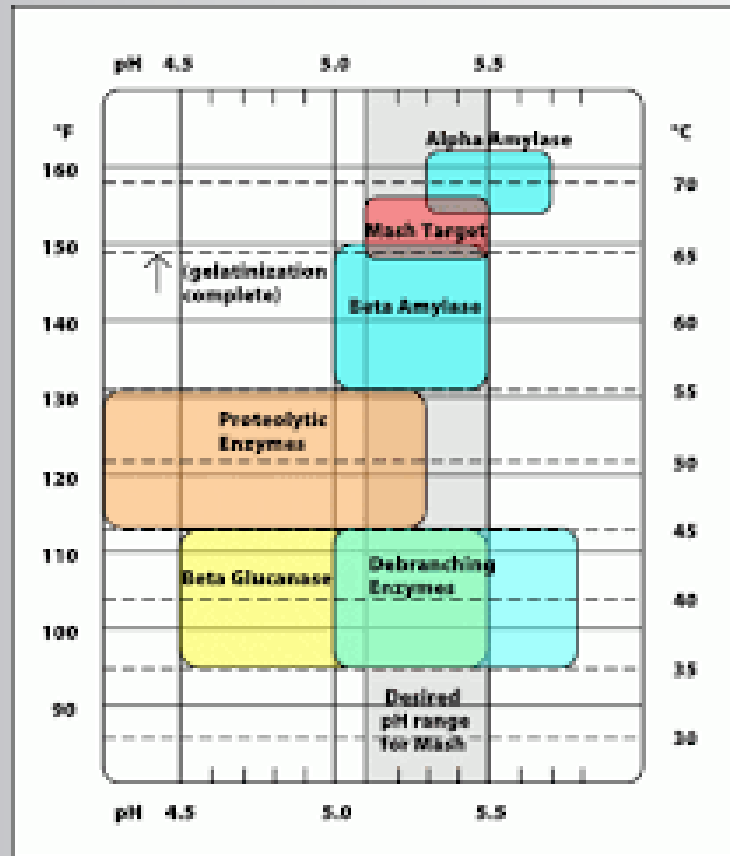
- Style Determined?
- Clean Finish?
- Malty Finish?

Specialty:

- Color Only?
- Flavor/Aroma
- Mix & Match
- Other: Head retention & mouthfeel

Process as an Ingredient

- Mash Temperature
 - Step Mash
 - Single Infusion
 - Decoction
 - Cold Steeping Dark Grains



Hop Contributions During the Boil:

LUPULIN GLANDS

Yellow sticky globs of essential oils and resins that are the main source of aroma and bittering compounds in beer.

STRIG

The stem extending through the cone, where bracteoles originate.

BRACTEOLES

Protective leaves of the hop cone that yield more oil and resin, in addition to tannins and polyphenols.

SAN FRANCISCO
**BREWERS
GUILD**

Alpha Acids:

- Provide bitterness
- Non-soluble (hydrophobic)
- Isomerized during the boil
- Foam stability

Flavors & Aroma:

- Essential oils found in lupulin glands
- Volatile (burn off quickly)
- Same chemical compounds found in the fruits & spices

Hop Anatomy

Process As Ingredient: Hopping Techniques

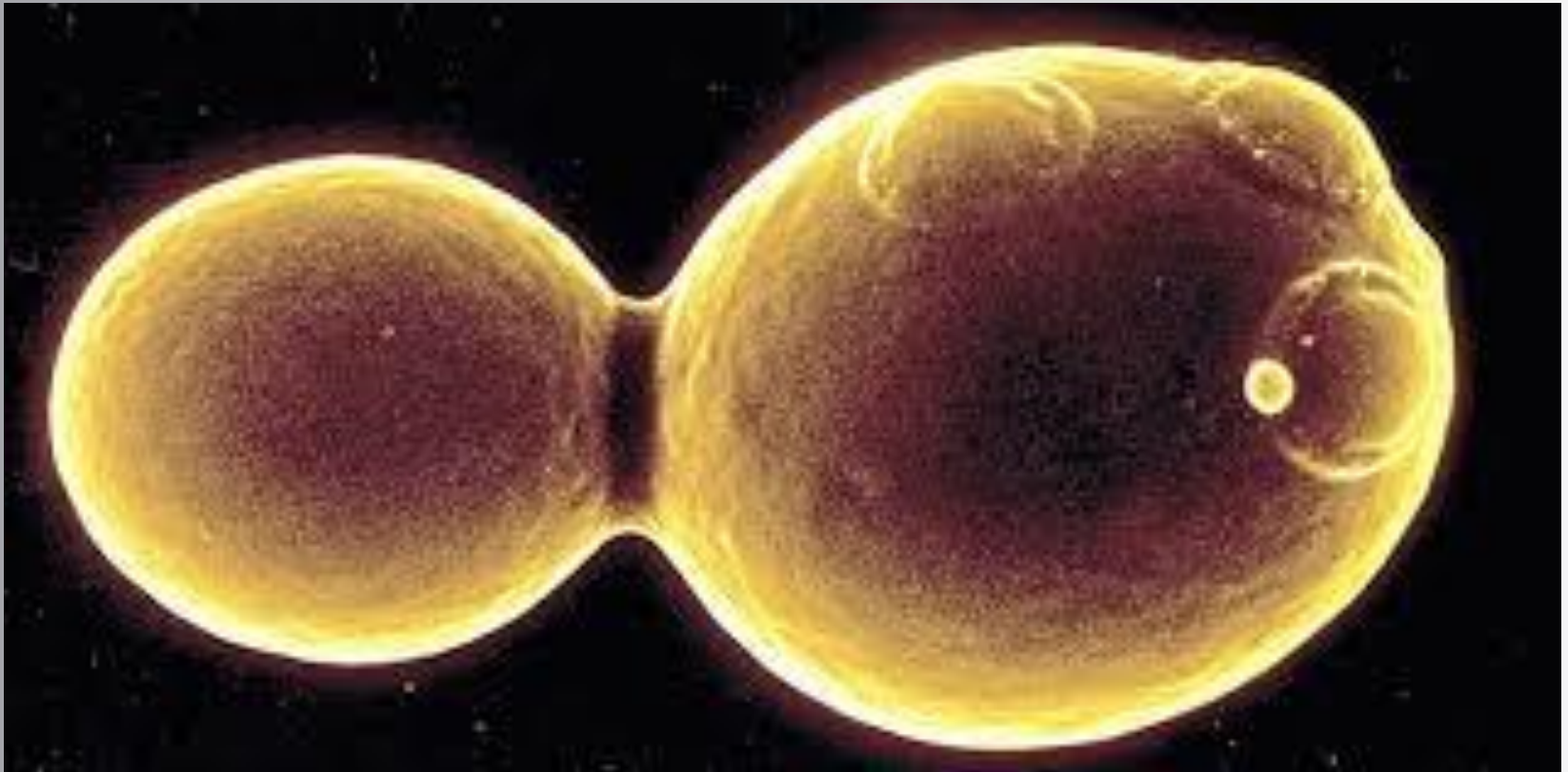
- Mash Hopping: debate still on
- First Wort Hopping (FWH)
- Boil: (45-90=bitter;
0-20=flavor/aroma)
- Whirlpool: post boil, sometimes not
until temp is below 180F
- Hop Back/Randal/Torpedo: like an
inline coffee filter
- Dry hopping: in stages? Warm/cold?
Dump the yeast first? No right answer.



Torpedo at Sierra Nevada

Strain Selection:

- Flavor profile: Clean, ester production, phenol production, etc...
- Attenuation: Ability to consume sugars in wort. (67-70% = low; 71-74% = med; 75-78% = high)
- Flocculation: The ability of the yeast to clump together, which will impact how well they drop out, or clear up a beer.



Process: The 5th Ingredient

- Temp:
 - Increased temp leads to increase ester and fusel production
- Pitching Rates:
 - Lower pitching rates (when combined with adequate oxygen for growth) will lead to increase ester production
- Mixed Cultures:
 - It is possible to combine yeast. Can be done at beginning of fermentation, or one can be used to “clean up” or finish fermentation.
 - Rule of thumb: the yeast with more food will have the greater impact

Copy The Greats: (Which Is To Say... Copy The Greats)



The Beatles



Picasso



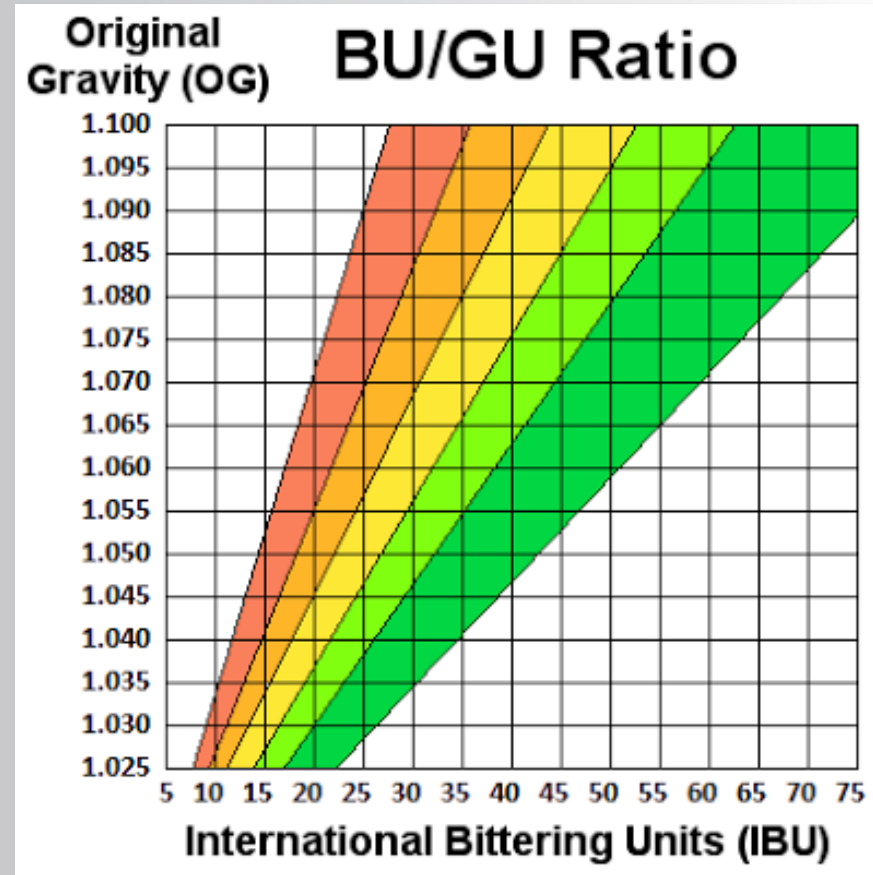
A monk at St. Joseph's Abbey inspects the boil. Nick Hiller/The Spencer Brewery.

Example: American Porter

Anchor Porter	Sierra Nevada Porter	Deschuttes Black Butte	NHC Gold 2019
2-ROW PALE, CAMEL, BLACK & CHOCOLATE	TWO-ROW PALE, CAMELIZED MALTS, CARAFA, BLACK, CHOCOLATE, MUNICH	PALE, CARAPILS, CHOCOLATE, CRYSTAL, WHEAT	8.75. MARIS OTTER 1 LB. FLAKED OATS 0.75LB. CHOCOLATE 0.675 LB. 40°L CRYSTAL .55 LB. CARAFA I 4 OZ. BLACK PATENT 4 OZ. ACID MALT
NORTHERN BREWER	AURORA, YAKIMA GOLDING	CASCADE, BRAVO, TETTNANG	0.6 OZ MAGNUM (60)
----	ALE YEAST	----	SAFALE US-05 US DRY ALE
	5.6% ABV 32 IBU 1.056 1.014	5.2% 30 IBU	6% ABV 27 IBU 1.067 1.021

Balance

- BU:GU
(Who cares about IBUs!?!)
- Keep style goals in mind
- Keep balance in mind:
balance always wins!
- Separate hops into two
“boxes:” bitterness &
flavor.
 - Clean bitterness?
 - Big flavor?



<http://finnhillbrewing.blogspot.com/2011/04/bugu-ratios.html>

EQ BALANCE IN RECIPE DESIGN

