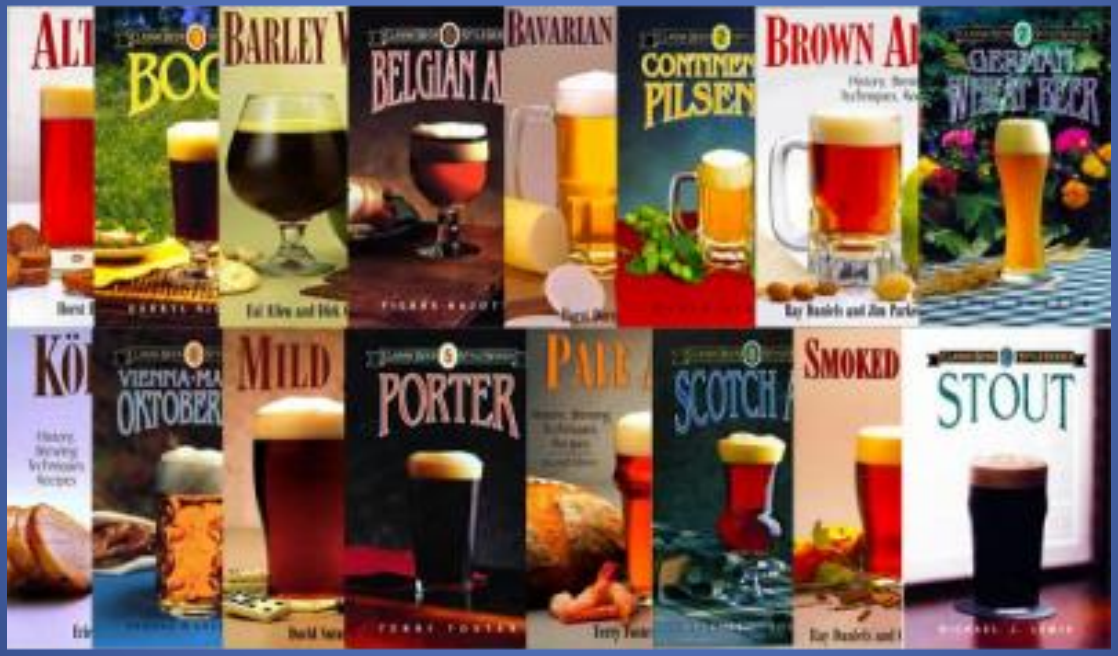
Creating your recipe

Where to start

- Researching a style
- Commercial standards
- Calculations
- Measurements
- Adjustments

Researching a Style

Beer style books

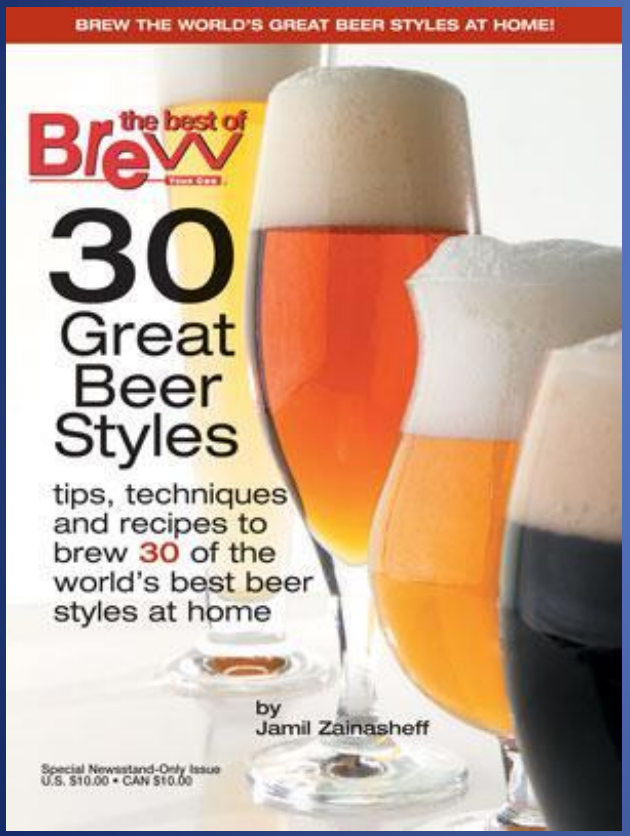


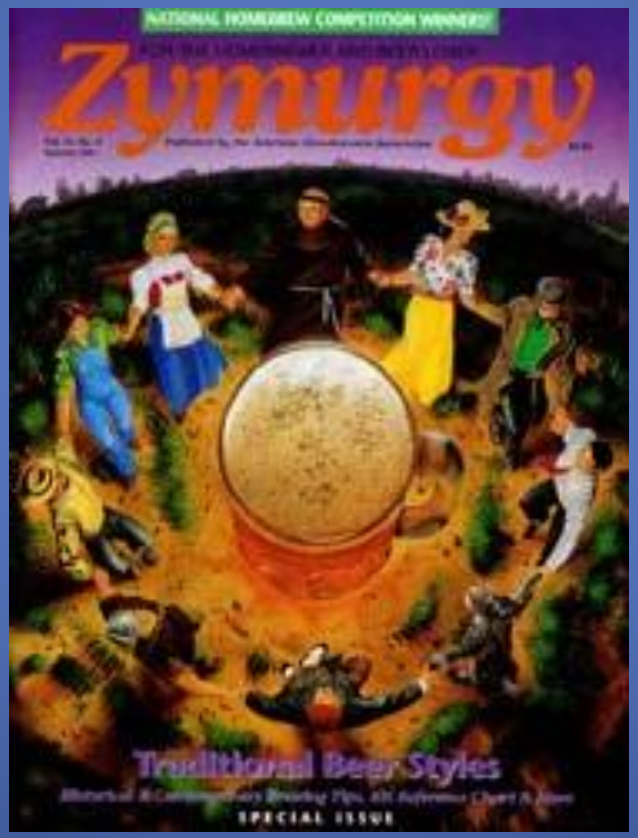
Researching a Style

- Great American Beer Festival style guidelines

Researching a Style

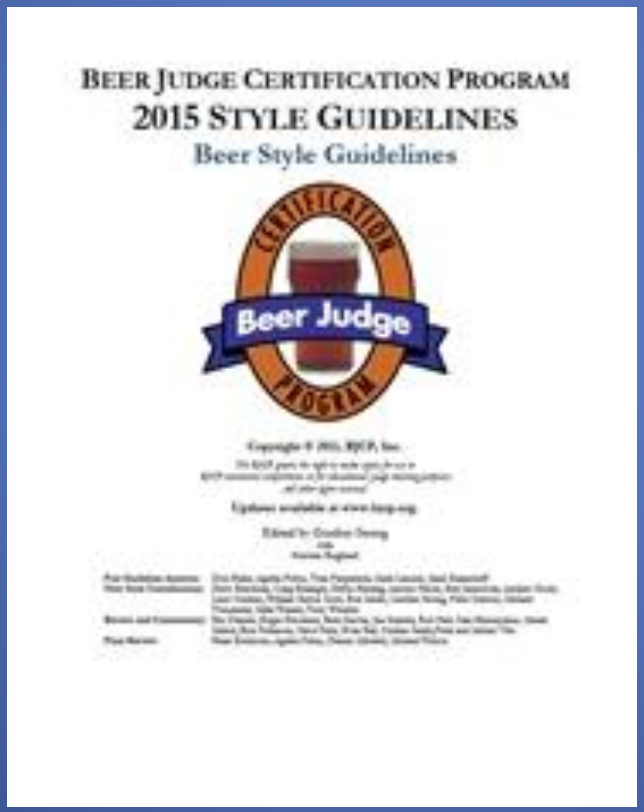
Homebrew magazines





Researching a Style

- Beer Judge Certification Program (BJCP)



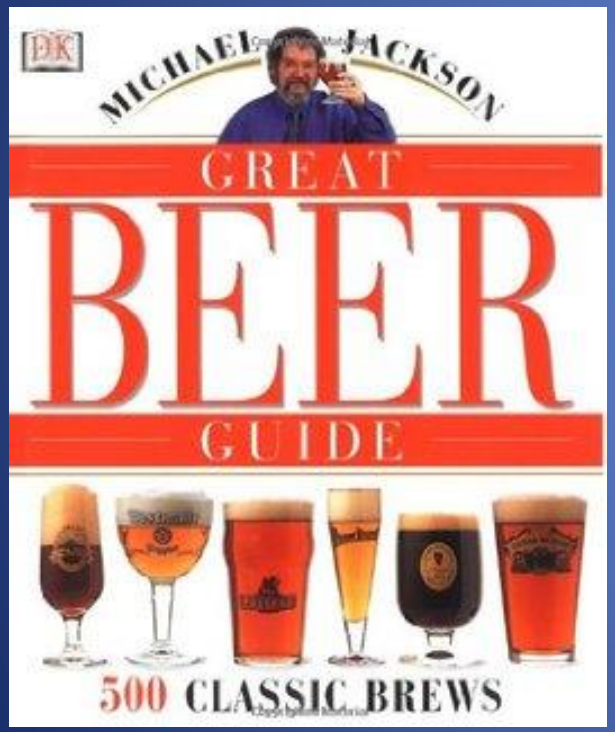
BEER JUDGE CERTIFICATION PROGRAM

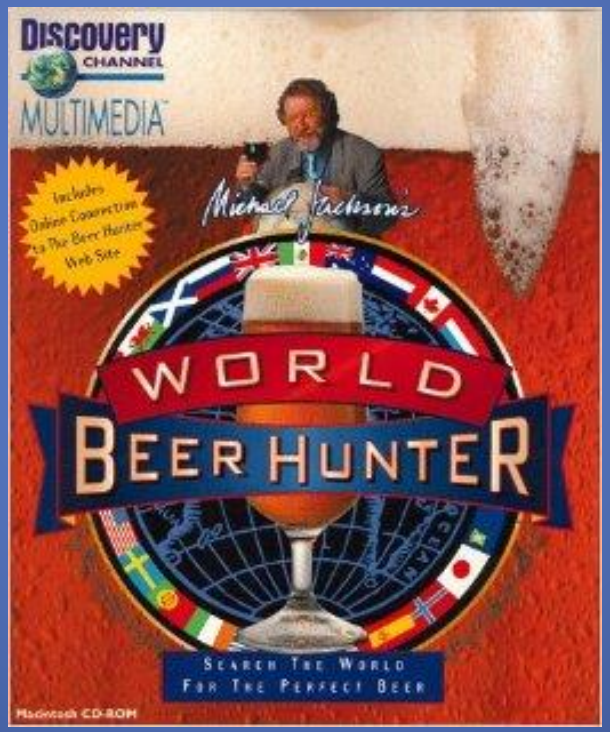
2015 STYLE GUIDELINES

Beer Style Guidelines

Researching a Style

Michael Jackson's books





Compare With Commercial Standards

- Obtain freshest possible samples
- Taste in the best conditions
- Use all the senses
- Be analytical
- Take a lot of notes

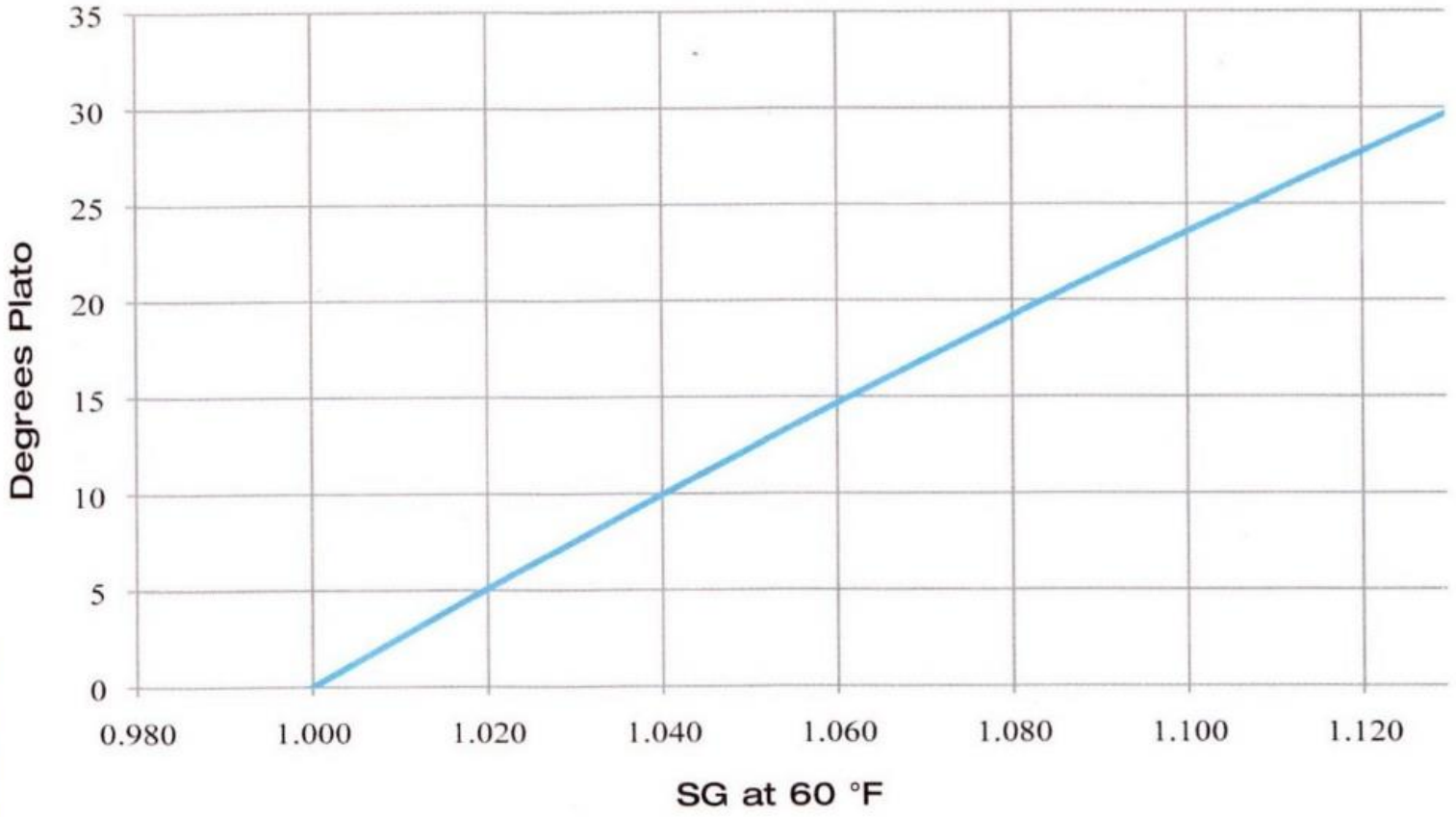
Calculating a Brew

- Decide beer's specifications
- Calculate malt grist
- Calculate hop additions
- Calculate amount and temperature of strike water
- Calculate pitching rate

Beer Vocabulary

- Original Gravity (OG) - is the specific gravity measured before fermentation. Specific gravity is the density of the wort compared to water (1kg/ 1 liter). The Plato scale is the mass (grams) of sugar in 100 grams of wort (°P).
  - S.G.= 1+ 0.004 X °Plato ex) 12 °Plato = 1.048
- Final Gravity (FG) -
  - (AKA - Terminal gravity, Apparent Extract)
  - The Final Gravity is the specific gravity measured at the completion of fermentation.
- Alcohol (ABV) - % alcohol by volume

Figure 1.
Degrees Plato vs. SG at 60 degrees F



Beer Vocabulary

❑ Bitterness (IBU) - International Bittering Units

- An International scale measuring the level of bitterness contributed by alpha acids in hops
- IBU= mg iso-alpha-acids/liter of beer
- same as parts per million

Mass Market American Beers	5 to 9 IBUs	Miller, Bud, Coors, etc.
Porter	20 to 40 IBUs	Smutty Nose Porter, Anchor Porter
Pilsner Lager	30 to 40 IBUs	Pilsner Urquell,Samuel Adams Noble Pils
Stout	30 to 50 IBUs	Guiness Draught , Samuel Smith Oatmeal Stout
India Pale Ale	60 to 80 IBUs	Stone IPA, Race 5 IPA, Harpoon IPA
Triple/Double IPA	90 to 120 IBUs	Harpoon Leviathan Imperial IPA, Heady Topper

Beer Vocabulary

❑ Color (SRM) - Standard Research Method

- Joseph Lovibond (1921) created a method of how a particular malt will contribute color based on a 8° P reference wort and light absorption (430 nm) in a spectrometer.

Color based on SRM

SRM	STYLE	COLOR
2	PALE LAGER	
3	MAIBOCK	
4	WEISSBIER	
6	PALE ALE	
8	SAISON	
10	ESB	
13	DOUBLE IPA	
17	DARK LAGER, AMBER ALE	
20	BROWN ALE, DUNKELS	
24	DOPPLEBOCK, PORTER	
29	STOUT	
35	BALTIC PORTER	
40+	IMPERIAL STOUT	

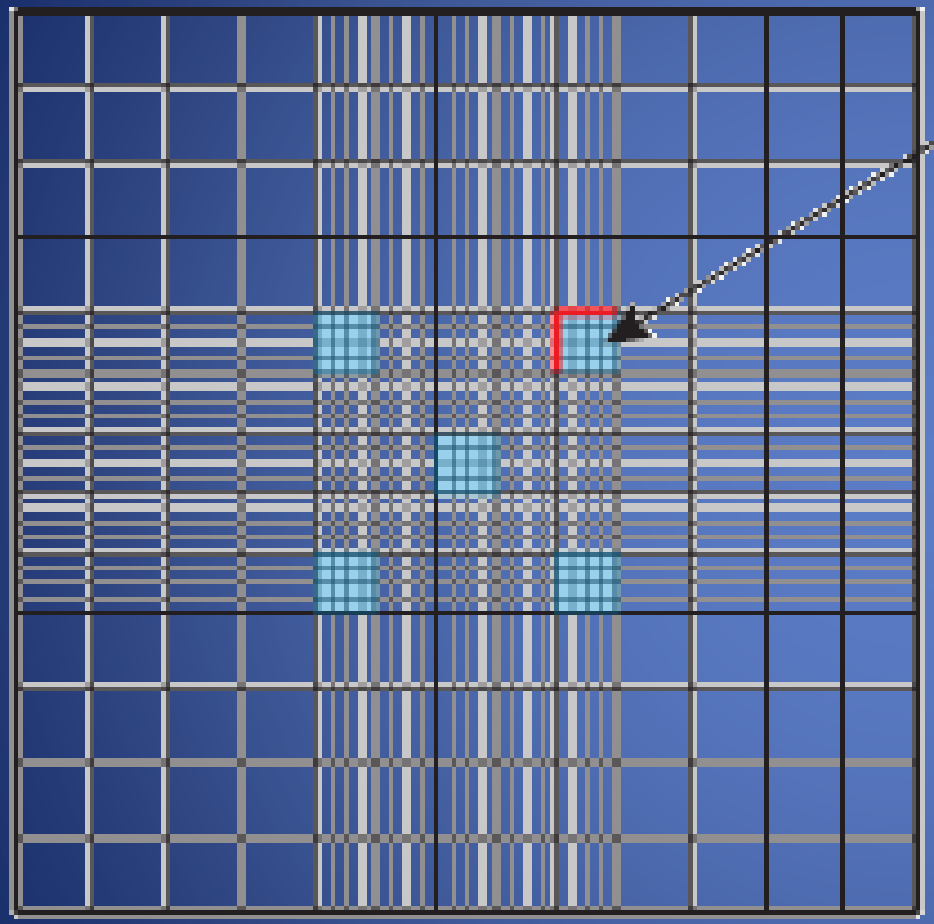
Malt Spec Sheet Sample

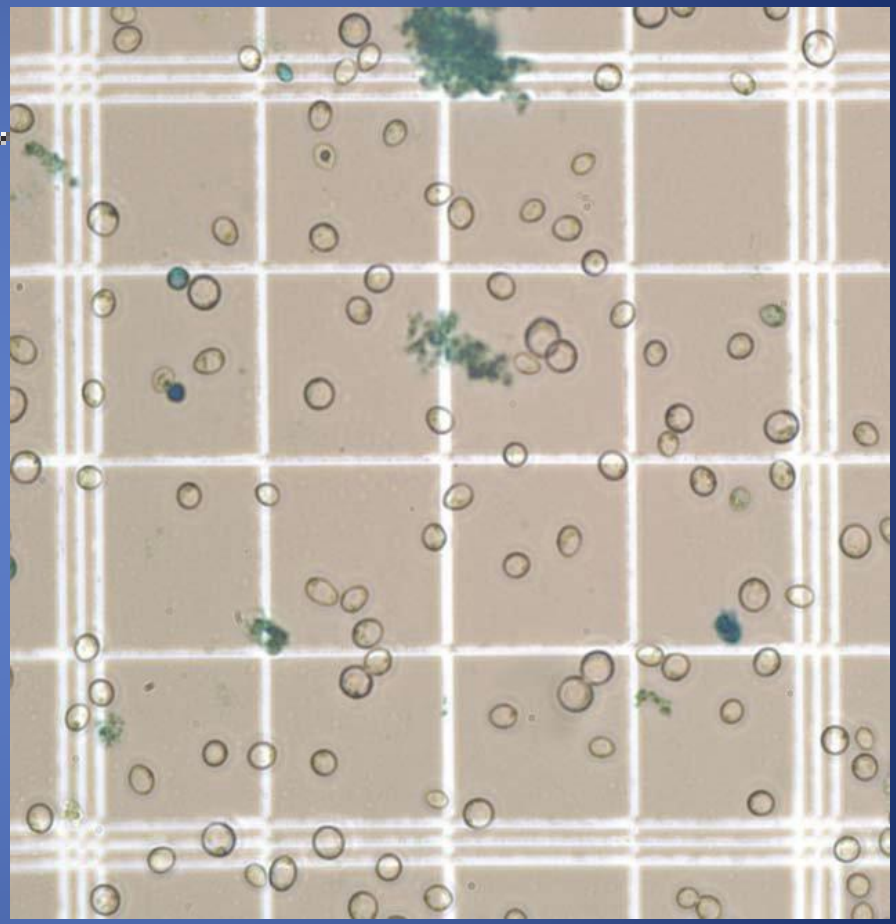
GAMBRINUS MALTING CORPORATION

TYPICAL ANALYSIS FOR GAMBRINUS MALTING

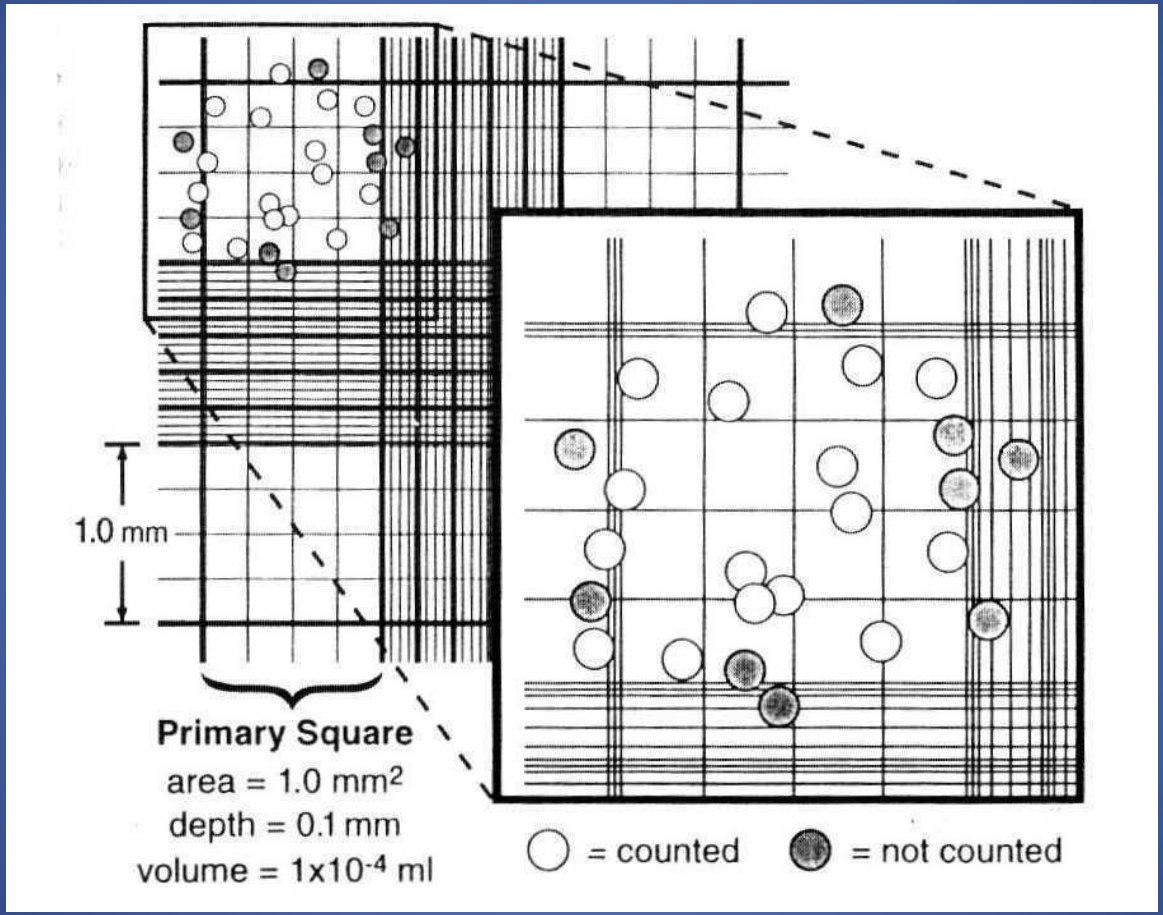
Malt	Pale	Pilsner	E.S.B. Pale	Munich 10L	Munich 30-35L	Vienna	Honey	Wheat
available as	conv/org	conv/org	conv	conv/org	conv	conv	conv	conv/org
Plumpness:								
<5/64"	<1	<1	<1	<1	<1	<1	<1	<1
5/64"	<5	<5	<5	<5	<5	<5	<5	<5
6/64"	15	15	15	20-25	20-25	25	20-25	25
7/64"	80	80	80	70	70	70	70	70
% H2O	4.0-4.5	3.5-4.0	3.5-4.0	3.5-4.0	3.5-4.0	4.5	3.5-4.0	4.5
Colour Deg. Lov	1.8-2.8	1.3-1.8	3.0-4.0	9.5-10.5	30-35	5.0-6.0	20-25	1.8-2.8
Extract Fine	~82	~82	~82	~81	~81	~81	~80	~84
Extract Coarse	~80	~80	~80	~79	~79	~79	~78	~82
Fine-Coarse difference	<2	<3	<2	<2	<2	<2	<2	<2
Tot. Malt Prot. % d.b.	<10.9	<9.9	<10.9	<10.9	<10.9	<12.0	<10.9	<12.0
Soluble Nitrogen mg/100ml	800-900	750-850	800-900	900-1000	900-1000	900-1000	1000-1100	800-900
% Soluble Protein d.b.	4.5-5.0	4.0-4.5	4.5-5.0	5.5-6.0	5.5-6.0	5.5-6.0	5.0-6.0	3.5-4.5
Kolbach ; S/T ratio	42-47	40-45	42-47	48-53	48-53	48-53	55-60	40-45
pH	5.8-6.0	5.8-6.0	5.8-6.0	5.5-5.8	5.0-5.4	5.8-6.0	4.5-5.0	5.8-6.0
Viscosity m Pa s	1.40-1.60	1.40-1.60	1.40-1.60	1.40-1.60	1.40-1.60	1.40-1.60	1.40-1.60	1.75-2.25

Yeast Counting





Yeast Counting



Start Simple and Add Complexity Only as Required

Extract Efficiencies

- Establish brewhouse efficiency
- Apply efficiency to recipe calculations
- Expect a lower efficiency for stronger beers
  - Lower efficiency in terms of both extract recovery and hop utilizations

Factors effecting extract recovery

- Grind of the malt will effect efficiency of extract recovery
- Mash temperature will effect yield and wort fermentability
- Rate of wort recovery (run off)
- Sparge water method of delivery, treatment and temperature

Factors Increasing Hop Utilization

- Intense rolling boil
- Longer boil time
- Higher wort pH i.e. 5.8-6.0
- Lower wort gravity
- Pelletized hops or hop extracts
- Lower hopping rates

Factors Decreasing Hop Utilization

- Whole flower hops
- Strong wort
- Lower pH
- Large hot break

Measure and Record Mash Information

- Liquor : Grist ratio
- Time to mash-in
- Mash rest time
- Mash pH
- Time to a +/- ve iodine result

Measure and Record Run-Off Information

- Vorlauf time and volume
- Run - off rate
- Sparge temperature and volume
- Kettle volumes and gravities
- Kettle full volume

Measure and Record Kettle Boil Information

- Boil time
- Time and amount of hop additions
- Evaporation rate
- End of boil volume
- Whirlpool time
- Amount of hot break

Measure and Record Wort Collection Information

- Time to collect wort
- Volume collected
- Original gravity
- Yeast volume pitched
- Fermenter cell count

Tweaking The Recipe

- Make gradual changes
- Change one thing at a time

When Are You Satisfied?

When you win a medal

Never!