

1995 ISSUE

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AMBER LAGERS

The main event of the Oktober meeting was a contest to select the club's entry in the 'Best of Fest' competition for the styles of Oktoberfest, Marzen and Vienna lagers. There were three homebrewed beers entered by members and the remaining four beers were composed of commercial examples. There were eight judges and the ranking per our palates is as follows:

- 1) Dunkel Acker 274 pts.
- 2) Sam Adams Oktoberfest 264 pts.
- 3) Steve Dimmer's Amber Lager 254 pts.
- 4) Andy Gamelin's Amber Lager 248 pts.
- 5) Spaten Oktoberfest 224 pts.
- 6) Perry's Vienna 217 pts.
- 7) Jack Ridley's Vienna 209 pts.

The Sam Adams was a late entry and we all knew what it was when tasting it so this may have affected the scoring slightly. It is interesting to note how poorly the Spaten did in our judging. The Spaten is considered to be one of the classic beers in this style yet the majority of our judges felt that our sample had a fermentation problem. Congratulations to Steve Dimmer whose entry will represent the club in the national contest.

- Mitch Provoast

1995 RENAISSANCE FAIRE

The Renaissance Faire took place the first three weekends of Oktober. Dan Finn headed up the Brewer's Guild which has the ungodly job of assuring that all the local ales are up to standard. Not only does this duty require the sampling of beers from the shire's ale stands, but also the task of judging local homebrews for the homebrew competition. As we can see this is a tough job with meager rewards. In order to set a standard for the brewmeisters it was also necessary to brew a batch of authentic sixteenth century ale (which also required extensive sampling as a reference point). Participating as a Trappist monk, my chores included brewing of the sixteenth century pale and the drudgery of participating on the judging panel. Some fine homebrews from our club were not only up to standard but also distinguished as top notch homebrews. Congratulations to:

Jerry Weber - second place stout
Ray DiGangi - first place brown ale

Steve Dimmer - first place specialty & mead
 Steve Dimmer - best of show for a heavenly blueberry mead that has already
 assisted in the conception of three sons!
 - Andy Gamelin

RECIPE FORMULATION

Recipe formulation involves defining a beer style and calculating the necessary ingredients to produce the end result. The four basic ingredients are malted barley, hops water and yeast. Calculations of yeast are not presented as they are minor. Methods of calculating color also are not presented as they involve complex dependancies upon ingredients, length of boil, fermentation and measuring techniques. It is my belief that color is best altered in an iterative approach. The recipe formulation of this article is focused on calculations of malt, hops and water.

Malt Extraction

Extract is a term used to define the amount of fermentable sugars present in the wort. Extract is measured in scientific terms as the specific gravity (weight of the liquid in water). Water has a specific gravity of 1 and a wort with a specific gravity of 1.060 (or sixty for short) weighs 1.060 times that of water. Specific gravity is measured with a hydrometer which is simply a weight to air balance with a calibrated hash marks for weights at 60F). Because the hydrometer is calibrated at 60F it is necessary to correct the readings for all measurements taken at different temperatures. The extract in the wort is measured as the original specific gravity(O.G.) and will be one of the key factors determining the style of beer created. In general, beers with higher original gravities will be stronger and fuller as there will be more fermented sugars (alcohol) and unfermentable sugars (body). To calculate the gravity of the wort use the following formula:

$$\text{O.G.} = \frac{(\text{extraction rate}) \times (\text{lbs})}{(\text{gallons of wort})}$$

Extraction rates differ for grains because the kilning processes destroy or crystallize many of the sugars. The following table gives extraction rates for various grains and sugars based on my experiences with my system. Your extraction rates may differ depending on your sparging efficiency and the liquid losses in your process. Do not worry too much about not getting equal extraction results to other brewers - the key is predictability! When using mixes of different grains or sugars calculate the extraction contribution for each material separately and sum them up for the total gravity.

Extraction Rates			
Malt Extract Dried	45	Cane Sugars	45
Malt Extract Syrup	36	Corn Sugar	40
Wheat Malt	34	Corn or Rice Flakes	40
Pale Malts	32	Honey	35

Munich Malt	30	Barley Flakes	30
Crystal Malts	21		
Black Malts	21		

Hop Calculations

Hop usage can be broken into three categories: bitterness, flavor, and aroma.

Bitterness is achieved by long boils of the hops (full bitterness at one hour). During this boil most of the flavors and aromas are dissipated (all those fantastic aromas you smell during the brew session are aromatics that have already escaped the wort).

Addition of hops in the final thirty minutes of boil contribute largely to flavor with some aroma in the final few minutes. The best way to add aromatics is through techniques of adding hops to cool wort or beer called dry-hopping. Unlike malt calculations hop flavor and aroma cannot be measured scientifically by the home brewer, but can be adequately described by perception. Here the brewer needs to keep notes of flavor and aroma perceptions thereby altering recipes in an iterative approach. Accurate bitterness calculations are possible because hop manufacturers test each harvest of hops for bitterness and supply these numbers to home brewer so it is possible to calculate the bitterness. Bitterness can be calculated as follows:

$$IBU = \frac{(Woz)(U)(A)(0.7462)}{(Vgal)(1+GA)} \qquad Woz = \frac{(V)(1+GA)(IBU)}{(U)(A)(0.7462)}$$

where IBU = bitterness in International Bitterness Units

Woz = weight of hops in ounces

Vgal = volume of wort in gallons

U = hop utilization (percent of alpha acids extracted through boil)

A = alpha acid content of hops (percent of alpha acid content)

GA = gravity adjustment for wort > 1.050 or concentrated boils > 1.050

GB = specific gravity of boiling wort

If the gravity of the wort boiled is > 1.050 (high gravity beers or resulting from partial boiling of wort) then you must use a gravity adjustment as the bitterness extraction will decrease with higher amounts of sugars. The adjustment is calculated as follows:

$$GA = 5(GB - 1.050)$$

Utilization is dependent on boiling time and is charted as follows:

Boiling Time	%U
< 5 minutes	5
6-10 minutes	6
11-15 minutes	8
16-20 minutes	10.1
21-25 minutes	12.1
26-30 minutes	15.3
31-35 minutes	18.8

36-40 minutes	22.8
41-45 minutes	26.9
46-50 minutes	28.1
> 51 minutes	30

note that the utilization is non-linear and that the maximum utilization is 30%. This is due to the difficulty in dissolving the hop oils into the boiling wort.

Water Calculations

Water can be designed based on the desired mineral content. It is necessary to start with water of a known mineral count. Water reports are available from public water company or water analysis can be provided, but I prefer to start with reverse osmosis water because that way I know I start at zero. Minerals can then be added to approximate classic water sources around the world. It should be stated that exact replicas will not be able to be created due to the addition of two ions per mineral, however these differences are minor and are usually not detectable. The following table shows the addition of minerals and the resulting concentrations in ppm per teaspoon per 5 gallons:

mineral	Ca	Mg	Na	SO4	CO3	Cl
CaCl	95				84	
CaSO4(gypsum)	60		140			
NaCl(salt)		110			170	
CaCO3(chalk)	36				60	
MgSO4(epsom salts)		25		100		

Example: British Extra Special Bitter (ESB)

5 gallons

O.G. = 1.051

IBU = 38

WATER: Burton on Trent	Ca	Mg	Na	SO4	CO3	Cl
	270	60	30	640	200	40

We will use an extract base with 1/2 lb. of brown sugar to add a rumlike flavor characteristic of many British bitters. Crystal Malt will add body and residual sweetness.

	rate	extract
4 lbs. Alexanders light pale malt extract	36	28.8
1 lb. light dry plain malt extract	45	9.0
1 lb. British crystal malt	21	4.2
1 lb. dark brown sugar	45	9.0

We will use a hop schedule with a Willamette and Northern Brewer on the front end and East Kent Goldings for the finishing and dry hopping. Assuming that we boil only 2.5 gallons and top off to 5 gallons, the gravity of boil (GB) weighs in at 1.102 and we must use the gravity adjustment.

$$GA = 5(1.102-1.050) = .26$$

Note that 26 percent of our hop bitterness is lost because of the concentrated boil.

Bitterness calculation of the first Willamette hops addition is as follows:

$$IBU = \frac{(1)(30)(4.9)(0.7462)}{(5)(1+.26)} = 17.4 \text{ IBU}$$

	utilization	30%	17%	9%	0%
	boiling time	60 min		30 min	15 min
dry					
Willamette(AA=4.9%)		1oz(17.4IBU)		1oz(9.9IBU)	
Kent Goldings(AA=5.2%)			.5oz(5.2IBU)	1oz(5.5IBU)	1oz(0IBU)

Burton on Trent water is famous for its natural gypsum mineral content which allowed the Burton brewers to produce pale ales at a time when lighter colored beers were gaining popularity. Our approximation of Burton water is as follows:

	Ca	Mg	Na	SO4	CO3	Cl
3 tsp. CaSO4	180			420		
3 tsp. CaCO3		108				180
2 tsp. MgSO4			50		200	
1/4 tsp. NaCl			28			42
TOTAL	288	50	28	620	180	42

SUMMARY

With these tools you should be able to recreate many of the classic beer styles but do not feel limited to the classic profiles as these were results of what the traditional brewers had at hand. For example I prefer to make my bitters with much less sulfates as the sulfates enhance the bitterness of the hops. In addition do not neglect the yeast strain as many of the classic styles rely on the yeast fermentation for the traditional flavors. What we should strive for is a method to consistently determine the outcome of the designed fermentation and a method to convey the parameters to other brewers.

- Andy Gamelin

OKTOBER MEETING

The October meeting was held at Jack Ridley's Lone Jack picobrewery. We judged Amber lagers including Oktoberfest and Vienna styles. Congratulation to Steve Dimmer for the top homebrew entry that will represent the Society of Barley Engineers in the nationals. Andy Gamelin discussed Recipe Formulation including calculations of hop bitterness malt extraction and water minerals. Ray DiGangi was elected to serve as Vice President/Treasurer and was sworn in on the spot. Jack Ridley was

appointed as Librarian and survived the confirmation hearings after proving that his kittens were adopted legally. Surveys published in last months brewsletter were collected to help us determine future club meetings, priority for expenditures and brew session enthusiasm.

- Andy Gamelin

RECIPE OF THE MONTH

This month's recipe is the Best of Show winning homebrew entry at the 1995 Renaissance Faire and is guaranteed to make any couple fertile. The recipe comes from the meadmaking notebook of Steve Dimmer who has been making mead for two years using wine techniques. His mead has won ribbons at local competitions and acclaim countywide. His meadmaking techniques were the topic of discussion for the July meeting and are published in the August brewsletter.

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- Steve Dimmer with flattery provided by Andy Gamelin

UPCOMING EVENTS

November 1: Society of Barley Engineers November Meeting

The November meeting will be held at Ray DiGangi's Picobrewery and Tavern at 5:30p.m. The meeting will be centered around brown ales and will feature the first round of the Reknown Brown national club competition(to enter the competition bring two bottles). From I-15 exit west on El Norte Pkwy(street changes name to Borden Rd.). Turn right on Richland Rd. and right on Wasatch Place. The address is 916 Wasatch Place ph#591-0350.

November 6-10: Boston Beer Company World Homebrew Contest

Entries are due for the Boston Beer Company World Homebrew Contest. Entry is free and every brewer that enters will receive a 1/2 lb. bag of Kent Goldings hops and an XL t-shirt. Winners of the first round will brew the beer at the Boston Beer Company for the final round(all expenses paid). The three overall winners will receive all-expense paid trips to Europe with six runners up receiving \$2000 worth of travel vouchers. Boston Beer Company intends to bring some of these beers out to market in which case the homebrewers will receive yearly royalties of \$5000. Information will be available at the meeting or from Andy Gamelin 631-8210.

November 8: Officers Meeting @ San Marcos Brewery and Grill

We will discuss club direction and review the brewery at 5:30p.m. (open to all members).

November 11: Greater San Diego Brewers Network Oktoberfest

The Barley Literates, in conjunction with the Greater San Diego Brewers Network have planned an Oktoberfest with festivities beginning at 11a.m. at Admiral Baker Recreational Area (off of I15). Homebrew competition entries(two bottles) may be brought to the November meeting or must be entered at the site by 10a.m.(\$5 first entry, \$1 thereafter). BBQs will be available, but you must bring your own main dish and a side dish to share.

December 6: Society of Barley Engineers December Meeting

The December meeting will be held at Andy Gamelin's picobrewery and hop hill. Stan Aguilar will discuss kegging systems and we will engage in a holiday specialty competition. So get those pumpkin ales, peppermint stouts and razzleberry wheats started!

December 9: Brew Widow's Party

The long awaited brew widow's party is upon us. The purpose of the brew widow's party is to get together socially with our significant others and, of course, drink homebrew. However there is a twist. The homebrew consumed is to be brewed in accordance with your particular Brew Widow's specifications as this festival is to honor the widows that have sacrificed so much so that we could brew!

December 20: Julian Cider Run

Time to road trip to Julian for their famous apple juice to ferment into hard cider. Last year we obtained over 20 gallons of which produced full flavored hard ciders.

Blueberry Mead '94

Batch size

6 gallons

H Ingredients

Volume

Comments

Water "drinking"

Pectic Enzyme 3 tsp.

Yeast nutrient 5 tsp.

Acidity 0.26%.

Acid Blend 7 tsp.

Juice left for 24 hours with camden

Camden Tablets before yeast pitched.

Irish moss 1 tsp. Added before 15 minute boil.

Blueberries (fresh Canadian) 3 lb

Fermented on "skins" for one week

Grain m wt (lbs)

3 , wt (oz) - 2" 5 4 —Extract %

lbs extract

Honey

0.85

10.20

Per Gallon

2.04

Predicted SPG

1.0913

Juice

SPG Measured

1.077

Temperature

degrees F

Corrected SPG

1.0770

to 60F

Yeast

Wyeast #3184 Sweet Mead, with starter. Montrochet added 10/15/94 (finish was too high).

Fermentation Name

Blueberry Mead '94

Batch size

gallons

Ingredients

Volume

Comments

Water "drinking" [

Pectic Enzyme 3 tsp.

Yeast nutrient 5 tsp.

Acidity 0.26%.

Acid Blend 7 tsp.

Juice left for 24 hours with camden

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Irish moss 1 tsp. " Added before 15 minute boil.

Blueberries (fresh Canadian) 3 lb " Fermented on "skins" for one week Grain

wt (lbs)

wt (oz)

Extract %

lbs extract

Honey

Per Gallon

SPG Measured

Temperature degrees F

Corrected SPG to 60F

Yeast Wyeast #3184

Sweet Mead, with starter. Montrochet added 10/15/94 (finish was too high)

End SPG Fermentation

Temp

Begin

End PG Temp.

Calc Duration

Primary room 49 days

Secondary room 82 days

Lagering 0 days

Finish SPG after fermentation

Date

degrees F

Corrected SPG

Alcohol % 5

% Residual Sugar &

% Attenuation

Comments: Nice and clear

Final Yield

gallons

Blueberry Mead '942" — μ , Grain - 2" — ù , wt (lbs)

- 2" ^ i — 3 , wt (oz) - 2" 5 4 — r , Extract %

lbs extract Honey

Per Gallon 2.04

Predicted SPG 1.0913

Juice SPG Measured 1.077

Temperature

Wyeast #3184 Sweet Mead, with starter. Montrochet added 10/15/94 (finish was too high).

End Fermentation Temp. degrees F

Corrected SPG 1.0040 60F

% Alcohol 9.6%

% Residual Sugar 5.2%