The Strange Brew Review

The newsletter of the Green Bay Rackers Homebrew Club

Organized 1982 www.rackers.org

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Club Meeting Schedule 2003		
January 7	Club Brew: Bob Franklin & Fred Matzke	**Meetings** unless otherwise indicated are held at Titletown Brewing Company, upstairs area. **Club Brews** are held at members' homes. Occasionally, business meetings are held at other locations. See the club website at www.rackers.org for the most up-to-date information.
February 1	Meeting: Bock, Doppelbock, Dunkel	
March 4	Club Brew: Dan Rogers	
April 5	Meeting: Belgian and Trappist Ales, Lambic	
May 6	Club Brew: Jeff Rogers	
June 7	Club Picnic: Chuck Golueke	
July 8	Club Brew: Jay Brown	
August 2	Meeting: Bitter, Pale Ale, "Lawnmower"	
September 9	**Club Brew:** Mike Conard & Bert Zelten	
October 4	**Meeting:** Oktoberfest, Vienna	
November 5	**Club Brew:** *We need a brewer!*	
December 6	**Christmas Party**	

Club News

Congratulations to these Rackers, winners at the 2003 State Fair Homebrew Competition

Jeff Wright: Gold Medal, Bière de Garde

Fred Matzke, Silver Medal, American Pale Ale

Bob Franklin, Bronze Medal, Traditional Bock

Meeting Minutes, August 2, 2003

Minutes from the August 2, 2003 meeting were not available at publication time. In their place, I offer you this picture of Jay Brown and his basement brewery at the July 8 Club Brew.

New Feature: "ask gak"*

Starting with this issue of *The Strange Brew Review*, I'll be answering beer-related questions from anybody who asks. If you've got questions about brewing, packaging, dispensing, recipes, styles, history, or anything else that has to do with beer, email them to me at rstueven@beerme.com, and I'll do my best to answer them or at least to make up some sort of a convincing answer.

This month, Bob Franklin writes about home draft systems, and Matt Arnold asks about head retention.

*You can blame Matt Arnold for the name.

Technical Note:
Home Tap Systems

Bob Franklin writes:

> I wish I had known this six years sooner! I have recently switched to six feet of $^{3}/_{16}$" I.D. tubing on my beer lines, set the regulator at 12 PSI and my serving problems disappeared. I don't have a flat beer problem anymore. Without even measuring the serving temperature and referring to a conditioning chart, five feet of $^{3}/_{16}$" I.D. tubing and a setting of 10 to 12 PSI at the regulator will greatly improve any system that is currently using a short length of larger tubing at a lower dispensing pressure. (See http://www.brewingtechniques.com/library/backissues/issue1.1/techcomm.html)

Bob's right, and his method is a simple one that anybody with a home draft system can implement. His selections of five feet of $^{3}/_{16}$" tubing at 10-12 psig are close enough for most beers. It really does reduce foaming by keeping the CO_2 in the beer where it belongs.

A more sophisticated approach requires the use of temperature/pressure tables (found at http://www.brewingtechniques.com/library/backissues/issue2.1/millertable.html) along with this resistance table:

	Resistance (psi/ft)		
I.D.	**Vinyl**	**Polyethylene**	**Stainless Steel**
$^{3}/_{16}$"	2.20	2.20	
$^{1}/_{4}$"	0.60	0.50	2.00
$^{5}/_{16}$"	0.20	0.20	0.50
$^{3}/_{8}$"	0.10	0.064	0.20
Vertical lift	add 0.5 psi per vertical foot*		
Vertical drop	subtract 0.5 psi per vertical foot*		
	*measured from center of tank		
Source: *Draught Beer Facts and Trouble Guide*, ADM Amalgamation			

Knowing your storage temperature and desired carbonation level will allow you to balance your serving pressure and draft line length to maintain that carbonation level over the life of a keg. Here's an example:

> You're storing your beer at a comfortable 40°F. It's a Pale Ale, so you'd like a carbonation level around 2.6 volumes. Checking the temperature/pressure table, you find that maintaining 2.6 volumes at 40°F requires a pressure of about 13 psig. Now you want to design your draft system so that all of the pressure gets "used up" on the way to the tap; that

is, you want a pressure drop of 13 psi between the keg and the faucet. Your faucet will take out about 1 psi, and it's mounted, say, 2½ feet higher than the center of your keg, which accounts for another 1¼ psi. That leaves 10¾ psi for your line to take up. From the table above, you determine that you need about $^{10.75}/_{2.20} \approx 4¾$ feet of vinyl of $^{3}/_{16}$" polyethylene tubing.

Longer draws often require a combination of diameters to keep the pressures at reasonable levels. For example, at Egan Brewing Company I kept the beers at 15 psig, and I had about a 30-foot draw. I used $^{3}/_{8}$" beer line for most of the run to minimize the pressure drop, and then stepped down to a $^{3}/_{16}$" vinyl tube for the last six feet to provide most of the restriction. In a typical home system, you probably won't have to worry about inline restrictions...the draws are too short. But if you do, always remember to step *down*; that is, always go from a larger diameter line to a smaller diameter line, and never the other way around.

One more thing: anything in the system that interferes with the smooth flow of beer will cause foam. Aside from the flavor implications, it's vitally important that the inside of your lines and faucets are immaculately clean. Your beer will thank you for it.

For more information on designing and maintaining draft beer systems, check out the Draught Beer Guild's web site at http://www.draughtbeerguild.com/

- Richard Stueven, rstueven@beerme.com

Technical Note:
Poor Head Formation

Matt Arnold asks:

> With a couple of notable exceptions, my beers have been headless wonders. The glassware isn't a problem, since commercial beers hold their head just fine. Any suggestions, especially lower hopped or lower gravity beers?
>
> Most recently with my mild (OG 1.038) I mashed in at 104°F for 15-20 minutes and then did one big infusion to bring it up to 158°F for an hour. I've been doing that with a lot of my beers recently. The 104°F rest is mainly there because the water out of my tap plus my normal grain temperature comes out about there. I also heard that a stiff mash-in there will help everything get nice and moist before the saccharification rest without degrading anything. It was much easier than boiling my strike water and then cooling it until I got the right temperature (and praying my calculations were right).
>
> The grain bill was mostly Weyermann Dark Munich. Along with it was ¼# roasted barley, ¾# (or 1#, can't remember which) of 80°L crystal, and ½# Melanoidin malt.
>
> Hops were my homegrown Goldings and the yeast was Wyeast #1338 European Ale. The water was completely untreated Oconto Falls H_2O.

This doesn't look like a recipe problem; Weyermann Dark Munich is used in a large number of German beers that are famous for their massive, creamy heads. (Think Ayinger Celebrator, for example.)

It is possible that the rest at 104°F — the lower end of the temperature range for proteinases — is causing some of the foam-positive proteins to degrade. George Fix notes in *Principles of Brewing Science* that some German Pilsner brewers mash-in at 140°F to avoid all proteinase activity.

Also note that filtration and clarifying agents such as PVPP can remove foam-positive compounds.

Hop iso-α-acids, especially isohumulone, are concentrated into the foam. Addition of iso-α-acids to beer increases head retention, but, in particular, the iso-α-acids are responsible for foam adhesion, clinging, or lacing. The bottom line here is: More Hops → More Foam. (Especially if you don't know the α-acid content of your homegrown hops.)

Here are some excerpts from *Malting and Brewing Science, Volume 2*, section 22.5.3 "Head Retention in the Brewing Process", with my comments in brackets:

- An all-malt wort should provide ample foam-positive material. [I doubt that your ¼# of roasted barley has any effect; they go on to talk about adjunct-laden industrial beers.]
- The use of unmalted cereals such as wheat or flaked barley in the grist improves head retention in the beer. [I'd guess that ¼# of wheat or flaked barley would suffice for a five-gallon batch.]
- Hop boiling improves head retention but too prolonged boiling may cause coagulation of the foam-stabilizing proteins. [Don't boil your hops for more than 90 minutes; sixty minutes usually suffices. If your beer requires a longer boil, don't add any hops until the last 90 minutes at the earliest.]
- During the brewing process the largest loss of head retention occurs during fermentation. This is due to the loss of foam stabilizing material into the flam and yeast crop and to the formation of ethanol, higher alcohols, fatty acids, and other negative foam factors. [They go on to talk about interesting but impractical ways of controlling this.]
- After fermentation, in order to conserve foam-stabilizing factors, it is desirable to minimize foaming in pipes and vessels. [Someone once said, "Beer only foams once." That is, every time you handle your beer, the foam you create is lost to the beer forever.]
- Fining by means of isinglass always improves head retention.
- Finished beers should be handled gently and finally the maximum head retention will be observed in a beer that is cool and poured fairly vigorously into scrupulously clean tall narrow glasses.

Maybe that doesn't answer the question directly, but it does provide a lot to think about. And if you want even more to think about, take a look at the Institute & Guild of Brewing publication *The Gel Filtration Chromatographic Profiles of Proteins and Peptides of Wort and Beer: Effects of Processing — Malting, Mashing, Kettle Boiling, Fermentation, and Filtering* at http://www.scientificsocieties.org/jib/papers/2003/G109_1_0306090.pdf

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