
Cheap 'n' Easy
Brewing
And the Pragmatic Method

PRAGMATIC

A practical approach to problems and affairs

(dogmatic; opinionated)

Really, Really, Really Great Moments in History

Pragmatic

Make the best beer possible

While having the most fun possible

While doing the least work possible

Corollary

Do whatever it takes to make better beer

BUT

Make sure the effort you take yields results that are worth the effort!

Cheap 'n' Easy Batch Sparge Brewing

What is Sparging?

Sparging is the rinsing of the grain bed to extract as much of the sugar from the grain as possible without extracting mouth puckering tannins from the grain husks, says John Palmer (How to Brew, John Palmer 2nd Edition 2000, 2001). We'll further specify that sparging begins only after runoff of the sweet wort from the mashtun has begun. Otherwise, there would be no such thing as no-sparge brewing, which we'll get to in a minute.

Fly Sparging

The usual way most brewers sparge is continuous (also called on the fly, or fly) sparging. After vorlauf, the wort runoff is begun and water is added to the mash tun at the same rate as the runoff. It's important to go slow so as to extract the maximum amount of sugar and not compact the grainbed. Theoretically, this form of sparging can give you the highest extraction of sugars.

No Sparge

John Palmer says in his BYO article “Skip the Sparge” (May-June 2003), a no sparge brew has the entire volume of “sparge” water added to the mash and stirred in before any runoff has taken place. Even though additional water has been added, since it’s been added to the mash before runoff has begun, we can more properly think of it as a mash infusion, rather than a sparge addition...hence the name “no-sparge”. This method is the easiest way to mash, but at the expense of poor extraction, typically 50%. The advantage, though, is that because all the sugar from the mash is in solution from the agitation of adding the water, lauter design has minimal effect.

Batch Sparge

After conversion, the sweet wort is recirculated as normal and the mashtun is completely drained as quickly as possible (NOTE:quick draining is a benefit, not a requirement, of batch sparging. I recommend you start the recirculation with the valve just cracked open, to set the grain bed correctly. After you return the vorlaufed portion to the mash tun, you can open the valve whatever amount works for your system), and an addition of sparge water is added. This is stirred into the mash, and after recirculation is once more drained as quickly as the system will allow. Sometimes, multiple batches are added if necessary or an additional infusion is made before the first runoff is begun.

Advantages of Batch Sparging

No (or reduced) worries about pH because you're not continually diluting the buffering power of the grains

Inefficient lautering systems don't really affect the extraction rate since the sugars from the grain are in solution

A mashout is seldom necessary (though may still be desirable) since the wort will be in the kettle more quickly and enzymes denatured by boiling

Extraction rates range from slightly less to slightly more than fly sparging. The more inefficient your lautering system is for fly sparging, the bigger the gain in extraction you'll see from batch sparging.

Formulae and definition of variables

- R1=initial runoff volume

  (mash water volume - water absorbed by grain)

- S= batch sparge water volume
- V= total boil volume
- I=volume of infusions for a step mash
- R1+I+S(1)+S(2)+S(etc.) must equal V

AND

R1+I=.5V

Example

- Assume 10 lb. grain, absorption .1 gal./lb., 7 gal. pre boil volume
- 1.25 qt./lb. = 3.125 gal. strike water
- 2.125 gal. predicted runoff, so add 1.375 gal. (5.5 qt.) before mash runoff for a total of 3.5 gal. mash runoff
- Use 3.5 gal. sparge water for equal runoff volumes

The Pragmatic Method

After the mash runoff, measure the amount of wort in your kettle.

Sparge with enough water to hit your boil volume.

Example:
Boil Volume = 7 gal.
Mash Runoff Volume = 3 gal.
Sparge Water Volume = 4 gal.

Building the Mashtun

- A cooler
- Toilet supply line
- Minikeg bung
- Valve
- Hose clamps
- 1/2 inch ODx3/8 inch ID food grade vinyl tubing

Step by Step

1.) Remove the spigot from the cooler. Usually, there's a nut on the inside of the cooler holding the spigot on. Unscrew that and the spigot should pop right out.

2.) Remove the plastic insert from the hole in the minikeg bung, and insert the bung into the spigot hole, from the inside of the cooler. The beveled edge of the bung goes in first, and the flange of the bung should end up flush with the cooler wall.

3.) Cut off a 6 inch piece of the vinyl tubing and, from the inside of the cooler, insert it into the hole in the minikeg bung. Let a couple inches of tubing protrude from each side of the cooler.

4.) Cut the threaded fittings off the water supply line (I use a hatchet). Pull the tubing out from the braid, leaving you with a hollow length of hose braid. Flatten the last inch or so of one end of the braid. Fold it over on itself 3 times to seal the end. Squeeze the fold with a pair of pliers to crimp it closed.

5.) Slip a hose clamp over the end of the braid, and slip the braid over the end of the vinyl tubing INSIDE the cooler. Tighten the clamp until snug, but don't squeeze the tubing shut! photos 2nd row #2 and #3

6.) Insert one end of the valve into the tubing on the outside of the cooler and secure it with a hose clamp. Slip another hose clamp over the end of the long piece of tubing, connect the tubing to the output side of the valve, and secure with the hose clamp.


STAINLESS

After the mash is complete, I vorlauf (recirculate) by running off into the pitcher until the sweet wort runs clear. Using the hose braid, it never takes more than 2 qts. to clear and 1 qt. is more usual. I then direct the runoff into the kettle, and gently pour what's in the pitcher back over the top of the mash.

As the first runoff progresses, I heat batch sparge water in the 7.5 gal. kettle. After the first runoff, I add the sparge water like I do the mash water, using the pitcher until the kettle is light enough to lift. I use 185-190F sparge water, which gives me a grain bed temp. of 165-168F. I stir the water in well to make sure all the sugar is in solution, then I vorlauf as I did for the first runoff and start the boil.

Resources

- Denny Conn

  www.hbd.org/cascade/dennybrew

- Ken Schwartz, “A Formulation Procedure for No-Sparge and Batch-Sparge Recipes”

  http://home.elp.rr.com/brewbeer/files/nbsparge.htm

Decoction Experiment

Brewers were asked to brew 2 batches of beer (any style) using identical recipes. One batch was to be decocted, using any decoction schedule they preferred. The other batch was to be brewed using either a single infusion or step mash (either infusions or direct fired), again the brewer's preference. The reasons for doing this were to find what type of decoction or infusion schedule a typical homebrewer would use for their beer. Then each brewer was asked to assemble a tasting panel and have them answer a set of questions. Beers brewed were a basic pale ale (single infusion, double decoction with 60 and 30 min. boils), an alt (3 step infusion, single decoction with 30 min. boil), a Dortmunder Export (single infusion, single decoction with 45 min. boil), a German pils (single infusion, single decoction with 30 min. boil), and a Munich dunkel (single infusion, single decoction with 30 min. boil).

Tasting Report Form

Decocting is reputed to have several effects on beer so we are asking you to judge some samples sideby-side to see if you can tell a difference. Both beers are made using the exact same ingredients, yeast, and fermentation times but only one is decocted.

You should now have two beer samples in front of you. Evaluate the beers by sight, smell, taste and texture. Describe each sensation in as much detail as you can on page 2.

Circle your choices on the questions below

1.) Which beer seemed to you to be "maltier"?
A B No preference

2.) Which beer seemed to you to have more body?
A B No preference

3.) Which beer seemed to you to be sweeter?
A B No preference

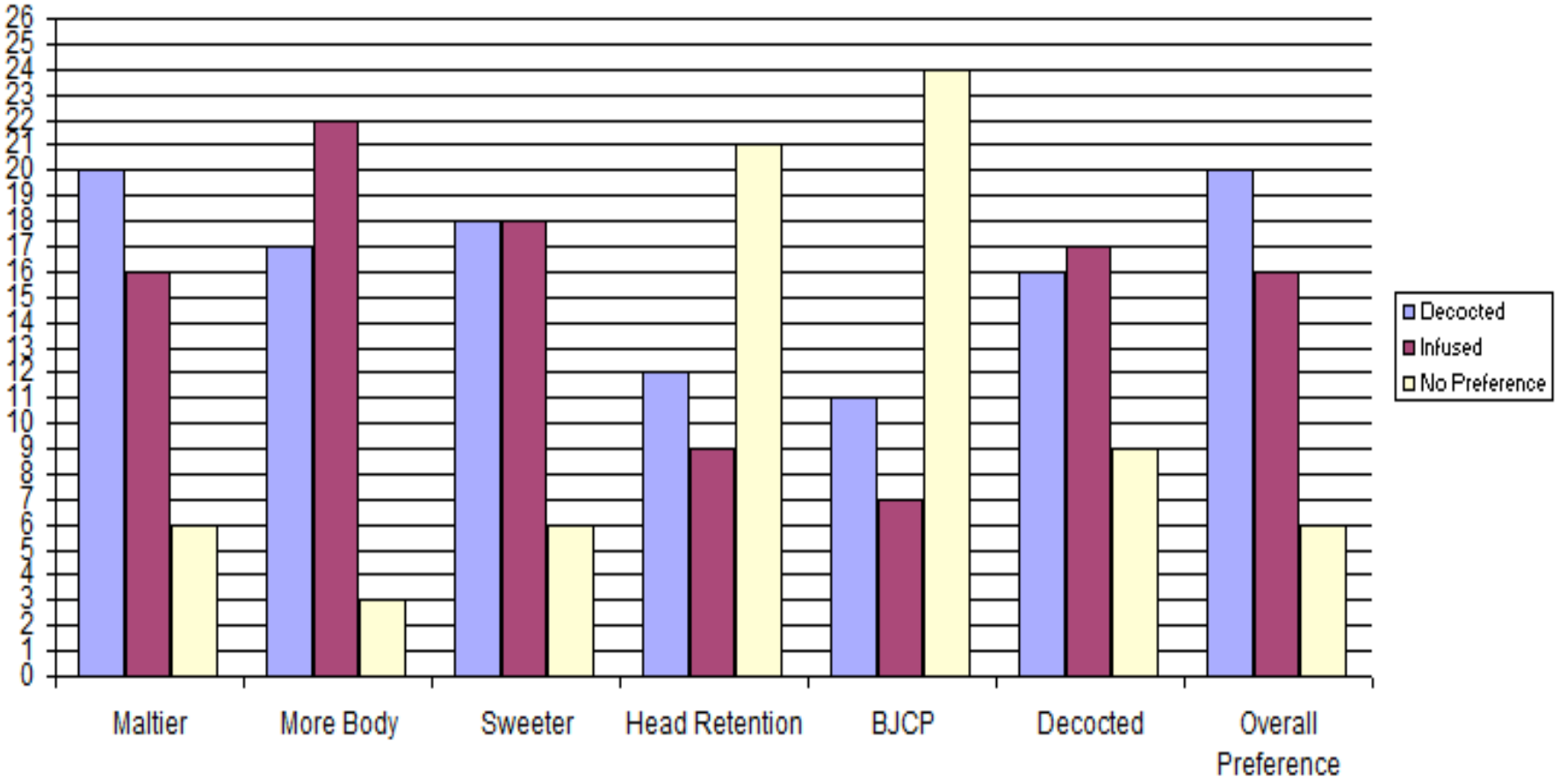
4.) Which beer seemed to you to have better head retention and formation?
A B No preference

5.) Which beer seemed to you to better fit the BJCP guidelines for the style?
A B No preference

6.) Which beer do you think was decocted?
A B No preference

7.) Which beer do you prefer, regardless of your other choices?
A B No preference

Overall Results



Decoction Conclusions

The purpose of the experiment was to find if tasters preferred the flavor of decocted beers. Despite other purported benefits of decoction mashing, the overall goal is to make a beer that drinkers prefer. Looking at the results, decocted beers were slightly preferred over infused beers. But combining the results for infused beers with the “no preference” results gives the combination a slight preference. This says to me that a single decoction with a 30 min. boil does not make a clearly preferred beer, and that the difference in preference for this decoction method is so close to the preference for infused beers that the decoction may not be worth the effort for the results it provides. I urge homebrewers to do their own experiment to decide if decoction is worth it, but make sure to do it objectively and not let their own prejudices or expectations influence the experiment.

FIRST WORT HOPPING EXPERIMENT

The purpose of this experiment was to determine the effects of First Wort Hopping (FWH) on a beer's flavor. Purported effects are increased hop flavor and a "smoother" quality of bitterness. A 10 gal batch of wort was produced and split into 2 5 gal. batches. One batch received and ounce of Cascade hops at 60 min. as the only addition, the other received an ounce of Cascade as FWH as the only addition. Boil times, yeast pitching rates, and fermentation characteristics were controlled as tightly as possible to produce 2 batches with the only difference being the hop schedule. The beers were tasted by 2 panels, one in California and the other in Eugene, OR, by experienced homebrewers, BJCP judges, and commercial brewers in a blind triangle tasting. In the first part of the tasting, panelists were told nothing about the 3 beers they were presented and asked to answer questions about them. In the second part, tasters were told that there were only 2 different beers and again asked to fill out questionnaires about the beers.

PART 1

1) **These three samples are:**

- The same
- One is different from the other two
- All three are different from each other.

2) **If 2 or more beers are the same, list which they are.**

3) **If you detected a difference, describe what was detected for each sample:**

A: drier finish, softer/less bitter, more pronounced bitter, slightly more bitter than C, more hop aroma & flavor

B: more hop aroma, drier, sharper finish, less edgy than A,

C: more malt flavor, not as sharp, less bitter

4) Did you prefer one of the samples? A B C no preference

5) If you had a preference, what was it about the sample that you preferred?

PART 2

At this point, identify the 2 different samples and re-label them as 1 and 2

1) Thinking of bitterness, did one sample seem more bitter?

1 2 no preference

2) Subjectively describe your impression of the bitterness of each sample

1:

2:

3) Thinking of hop flavor, did one sample seem to have more hop flavor?

1 2 no preference

4) Subjectively describe your impression of the hop flavor of each sample

1:

2:

IBU Analysis Results

- Gas Chromatography by Scott Bruslind at Analysis Laboratory

Beer	**IBU**
A (FWH)	31
B (60)	28.7

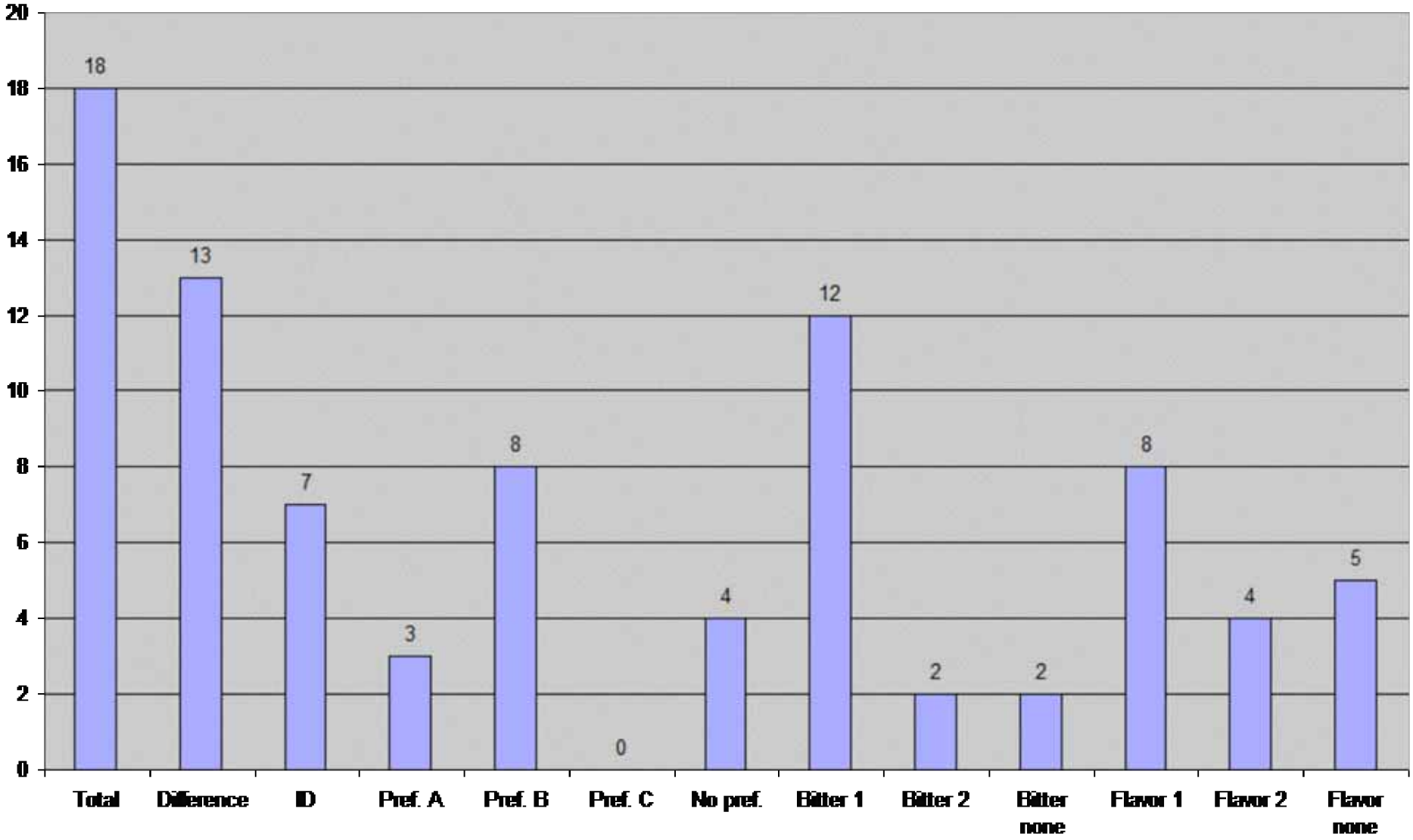
IBU Analysis Results

- Here are the HPLC (High Pressure Liquid Chromatogrpahy) results of the brews: The alpha-acids are not bitter though they contribute to bitterness units value. The humulinones are oxidized alpha-acids and are slightly bitter.

Beer	Iso-alpha-acids	Alpha-acids	Humulinones
A (FWH)	24.8	3.5	1.9
B (60)	21.8	4.7	1.8

- Thanks to Bob Smith at S.S. Steiner

FWH Tasting Results



FWH TASTING RESULTS

Difference A	Difference B	Difference C	Pref. reason	Bitter desc. 1	Bitter desc. 2	Flavor desc. 1	Flavor desc. 2
drier finish	more hop aroma	more malt flavor	better aroma	more early	more late	balance, cleaner	less flavor
softer,less bitter	drier, sharper finish			fresh,crisp,dry		almost none	none
	smoke aroma	lighter smoke	more sweetness&body	smoother			
more pronounced bitter	less edgy than A	not as sharp	pronounced bitter, not as soft	slightly bitter	mellow	hop lingers	fuller hop
bitter	less than A&C		A&C sour bitterness			most bitter, hoppier	smoother
slightly more bitter than C				more edge to bitterness	not as pronounced	shaper	more flavor
		less bitter		lingering aftertaste bitter	light finish	pleasant, nice balance	more malt
			less hoppy	balanced	lingering bitter	light,just right	
more hop aroma, flavor	malty, grainy			upfront, sharper	maltier, more hop aftertaste		

FWH Conclusions

As you can see from the comments from tasters, there was no clear conclusion to be drawn. Although the FWH beer was measured to have approximately 10% more IBUs than the 60 min. beer, taster's comments often found the FWH beer to have less bitter character and a "smoother" bitterness. But these conclusions were by no means unanimous. Again, I encourage homebrewers to repeat this experiment for themselves, especially the blind triangle tasting. When I tasted the beers before the blind tasting, I could clearly discern the differences I'd expected to be there. When I did the blind tasting, it took me 3 tries to pick out the different beer and even then I misidentified which one it was. Only 7 out of 18 tasters correctly identified the different beer, which says to me there may be little difference made by FWH. On the other hand, I still use the technique because it's easy to do and I think it might make a difference.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