

Designing Your Signature Beer - By Sean Richens

You've accumulated several years of brewing experience. Your sanitation routine is efficient and effective. You hit your gravity and bitterness targets every time. You have a roster of your favourite styles that can stand up with the best commercial examples. You quietly think of yourself as an accomplished brewer. But what are you going to do with all that awesome brewing talent? How are you going to leave your mark on the world? Sooner or later the creative urge reasserts itself.

Most of us have made some "kitchen sink" brews - toss in all those odd ounces of left-over specialty malts and some whimsical ingredients, and given enough brown sugar and hops to hide the rough edges, some of them turned out not too bad. But making a beer you can be proud to serve, and that you want to make more than once, takes a more deliberate approach.

Maybe you just have a thing for a special ingredient (mango? curry powder?) and want to build a beer to highlight its flavour. Perhaps you need a recipe for your house session beer, something you can enjoy day in, day out, and with something in it for everybody - hops for the hopheads, crispness for the commercial beer drinkers, malty sweetness for the dark ale fans. You could try making a beer using 100% organically grown ingredients. Whatever the motivation, if there's no commercial version, it has to be a homebrew and it's up to you to make it.

The final consideration is, of course, your taste. That will be assumed throughout. But to start off there are some practical questions:

1. What is your water supply like? What beers are appropriate for that water?
2. What are the most consistently available hops and malts from year to year?
3. Do you plan to use homegrown hops? Local malts? Local adjunct?
4. Can you cold ferment? Kegs or bottles? Which yeast?

What's Your Excuse?

A theme is a good place to start. Heck, for this one time come up with the name before you brew the beer. Is your hometown famous for its buckwheat? Did you get hooked on blending Guinness stout and Strongbow cider and wondered about brewing it pre-mixed? Did your neighbour plant Nugget hops as an ornamental and offer you the produce? Or do you just want to combine your favourite malty beer, your favourite hoppy beer and your favourite yeasty beer in one masterpiece brew?

Whatever your theme, it is critical to remember that the essential characteristic of any beer is BALANCE. A beer is either balanced, or it is undrinkable. Some ingredients are subtle, others are assertive. Both the amounts used and how they blend with the other ingredients are important. Always watch the balance of sweetness to bitterness, and sourness if present. You can certainly lean one way or the other, but only so far.

Close your eyes and imagine how you want your beer to taste. What is the first thing you notice in the nose? Are you serving it cold or at cellar temperature? What level of carbonation? Is the mouth feel crisp or rounded? And so on through to the after-taste. Look at a list of beer style descriptions and see which styles are associated with each feature, this will give you some idea of what ingredients and techniques you will use to produce them. Books such as Clonebrews (Tess & Mark Szamatulski) and Designing Great Beers (Ray Daniels, 2000) are a great help for translating flavour descriptions into numbers.

Highlighting a feature ingredient while keeping balance is a challenge. If you are designing a beer around a fruit, you will likely want to let its flavour predominate while blending smoothly with the beer. Maximize residual sweetness to bring out the fruit flavour and balance its acidity. For extract brewing, steep generous amounts of light crystal malt, and for mashing use honey malt and high mash-in temperatures. The hops will also need to be restrained, about 15 IBU or 4 AAU will provide a beer flavour without masking the fruit. A highly flocculent ale yeast will provide overall fruitiness and leave plenty of sweetness.

Highlighting a single hop strain also requires some restraint in the bittering, but do use the feature hop for both bittering and flavour/aroma additions. First wort hopping is an excellent way to produce an identifiable flavour, 1 oz/5 gallons is good for imported hops, but is probably too much for homegrown hops, given their freshness. Hybrid hops fall somewhere in between. Dry hopping in secondary is the classic technique for adding aroma, although I find the results grassy-tasting and prefer to add a hop tea instead.

Featuring a grain or other adjunct requires more experimentation. Delicate flavours from wild rice need a light lager or cream ale to come through, while the nutty effect of buckwheat can be used to subtle effect in a complex ale. Only experience will tell whether a sweet or a dry finish is best for your beer. You will have to do some research on gelatinization temperatures or the best way to pre-cook your grain. Start with 20% of the grain bill for most featured grains.

Herbs and spices can be quite variable. Try to stick to one source or buy several brews' worth and store in the freezer. It is worth performing a trial brew first. Make up a batch of a base beer and split it into gallon jugs for secondary fermentation, which gives you a chance to experiment with five different blends.

Delicate aromas are stripped out by carbon dioxide during primary fermentation. Many ingredients are better added to the secondary fermenter, especially fruits. Honey or maple syrup can be used as priming sugar, trapping their aromatic contributions in the bottle.

Designing a Session Lager

My personal goals for "Winnipeg Lager" were:

1. To build my beer around the water supply and "local" ingredients, like a brewer of old
2. "session" beer strength, about 4% abv
3. Malt and hop flavours identifiable for a "fresh" perception, but **BALANCED!**
4. Make a lager since free refrigeration is characteristic of our climate

First, how do I manage my water? I have about 90 ppm alkalinity, 99 ppm hardness, 107 ppm bicarbonate, 28 ppm calcium and 9.8 ppm magnesium. Not a lot of sodium, very moderate sulphate level. Looking at a table of brewing waters, it resembles half-strength Munich water. Based on experience, a medium copper-coloured beer will have enough acidity to mash without water treatment, and I can even sparge with untreated water if I use enough grain to keep the last runnings sweet. The low sulphate level will be kept in mind when balancing the hops.

Canadian 2-row pale malt is a good dependable workhorse, and we have a malting plant here in town (how many homebrewers have had the privilege of talking to their maltster?), so the main malt is a given. Hops are a trickier question. I can at least claim that nearly all modern hop varieties have been crossed with Manitoban wild hop for disease resistance. A good Cascade harvest one year settled it; and the flavour is distinctly North American. Formulating a nice balanced brew with Cascade is not so easy. I want the beer to have an identifiable hop flavour and aroma, but without harshness, much less that intense grapefruit flavour. With the low sulphate levels, I will lean towards late additions and keep the IBUs relatively low.

To mellow the citrusy tang of Cascades, I will balance them with crystal malts. Not knowing in advance whether I need the subtle sweetness and body of light crystal or the more obvious caramel flavours of dark crystal, I used some of each instead of medium crystal so that I could adjust the ratio in future iterations of the recipe. Reading through my old brewing notes, I notice that the proportions I've used for a best bitter can support a lot of hop flavour. In a lager some Munich malt gives an appropriate dry maltiness, and some Gambrinus Honey Malt is good for mouth-feel with a less distinct flavour than crystal malts. To adjust the colour with minimal roasted notes I add black patent malt until I get an estimated 10-13 SRM.

So I now pull out the brewing spreadsheet, and for a 25 L batch (6 US gallons plus expected losses), I will start with 2 oz. each of Crystal-10 and Crystal-120, 4 oz. Honey Malt, and 4 oz. Munich malt. To get the colour I add 1.5 oz. black patent malt. I then fill out the grain bill with base malt, and iterate the yield versus the mash size until I get 25 L at the desired OG.

I then start adding hops to the spreadsheet in the usual order of aroma, flavour and finally bittering. A session beer needs to be on the low end of the IBU scale for drinkability, but this does not rule out having plenty of hop flavour and aroma. I want a noticeable hop aroma over the malts, so I will use 25 grams for aroma. Given the assertive freshness of home-grown hops I only use 12 g at strike, and add the other 13 g five minutes before strike so that some of the grassier notes get driven off.

I love first wort hopping, so that's a given. But it is so effective that with Cascades I only want to use half my flavour hops there, and put the other half in at 25 minutes before strike for 12 grams each. I calculate first wort additions as if they were a 20 minute addition in order to estimate the perceived bitterness rather than the true IBUs.

I then add bittering hops to get my target bitterness. I usually use pellet hops, so 45 minutes is the longest I let them spend in the boil. To quantify my target IBUs, I look at established styles. An Ordinary Bitter is similar in gravity and sweetness, and is about where I am aiming for in drinkability. Oktoberfest is the closest European style but sweeter and stronger, so if I lower the

gravity the relative bitterness will increase to be quite crisp and refreshing. This points to a bitterness of around 30 IBU. However, with 50 grams of hops in the flavour and aroma additions, there is already a lot of perceived bitterness in the beer other than iso-alpha-acid, so I will calculate for somewhere in the 20-25 IBU range. For a session beer at 4% abv, this will be plenty. My stovetop system only allows a 17 L boil, so that gets factored in.

So I now summarize the recipe and see if it makes sense. I estimate the homegrown hops at 4% alpha and my brewhouse efficiency at 75%.

9 lb 4 oz. IMC Canada 2-row malt
8 oz. Bonlander Munich (9oL)
8 oz. Gambrinus Honey Malt (25oL)
2 oz. Crystal-10
2 oz. Crystal-120
1.5 oz. Black Patent

Time	Amount	Variety
FWH	12g	Homegrown Cascades
45mins	35g	Cascade Pellets (%5)
25mins	12g	Homegrown Cascades
5mins	12g	Homegrown Cascades
Strike	12g	Homegrown Cascades

OG 1.041, colour 16 HCU (est. 10 SRM), bitterness est. 20 IBU 1 week primary and 4 weeks secondary fermentation at 50F, 2 weeks at 60F after bottling, then 8 weeks bottle aging at 50F.

That's a whole lot of homegrown Cascades, but there's 3/4 pound of sweet specialty malts to make that citrusy flavour as refreshing as fresh-squeezed orange juice. If I don't have homegrown hops, I increase the flavour and aroma additions, especially if using pellets.

I mash overnight, which tends to give a dry beer, so I mash in at 155F to compensate for that as well as the low gravity. I let the strike hops rest 5 minutes before chilling the wort. Carbonation should be about the same as a European lager - 1 cup dextrose to 23 L if bottle priming. If kegging, 12-15 psi at serving temperature will do.

Since the first batch I have not tweaked the recipe much. The sweet/citrus balance was a lucky shot on the first try. I find that substituting specialty malts based on availability does not have a huge impact if the four basic categories of sweet, caramel, body-building and roasted malts are used with the quantities adjusted according to expected impact (e.g. use more Cara-Pils than Honey Malt).

At bottling, it still has quite a lot of vegetal bitterness, but with a couple of months of lagering it comes out just right. Time to try it out on other beer drinkers.

My brother-in-law and his extended family are mainly British pale ale drinkers, favouring Newcastle Brown Ale and Big Rock Traditional, while still appreciating the more assertive Pilsners. They always politely try my homebrew, but I don't put them on the spot by asking for a reaction; after all, we're family so they would be kind before being honest. But this recipe got unsolicited praise from them and from some club members.

And of course, the most important thing: I like it. I like having lots of it. I switched up to swing-top bottles because 12 oz. isn't enough. I make double batches of it. With liquid malt extract added to the boil, I can double the specialty malts and increase the hopping rate to get a double batch. Since the beer is already full of sweet and caramel-ly malt flavours, the difference is not noticeable as long as the hop utilization is adjusted for. My next step was to make a version with slightly more Honey Malt and light crystal, slightly higher mash temperature, and slightly lower hopping in order to sustain longer aging. I can then make two batches during lager season, one for drinking early in the summer and another to peak later.

So have I really created something new, or just reinvented the wheel with my name on it? The Maltose Falcons homebrew club (<http://www.maltosefalcons.com>) have a neat spreadsheet downloadable from their website where you type in your recipe and it produces a colour-coded table showing which styles you match for gravity, colour and bitterness. It showed me what you would expect: in that range of colour there are several session beers, but mostly ales. The lager styles either don't use North American hops or are much higher in gravity and bitterness. So it's fair to say that my Winnipeg Lager isn't on the BJCP list. There are certainly some similar lagers made by some medium-size breweries in North America, except for the market tyranny of the 5% alcohol level. But I'm a homebrewer, so I'm free to make a beer that I can drink three of without falling asleep.

Back to You

So what is your water like? Is there a kind of beer that naturally follows? Remember, this is a long-term project, the beer you're going to make for the rest of your life. Of course you take scrupulous brewing notes, but for creative work you need to go to the next step. Record why you made an adjustment, what you were trying to achieve, and how it turned out. Don't be afraid to "fix" a beer at bottling time; keep some lactose and hop extract on hand to avoid being stuck with gallons of beer you don't like. You will fix the recipe next time. A few get-acquainted batches are not to be begrudged. Just remember that beer is all about balance.