

NEW STUFF

by Greg Hackenberg

Yeah, I know I missed last month... When last I left you, you were awaiting instructions on getting your hands on some of that invert sugar I was extolling, or at least you were interested enough to see where this was all going, or perhaps you don't even remember what I was prattling on about at all. So, a recap...

Well, we've learned that that terrible, awful, nasty, sugar which has absolutely no place in beer, actually can be an incredibly versatile and an effective ingredient with a long history of use in (good) beer. I zeroed in on the use in British beers (surprise!) in the form of **invert sugar syrups**. These are not clear tasteless syrups, mind you, they start with demerarra sugar (aka "sugar in the raw") and are "cooked" to develop deep colors and flavors in a range of grades identified (mostly) as No. 1, No. 2, on up to 4.

So this time around I'm going to walk you through what this stuff is and what goes into making it. I've made several attempts, trying out different techniques and the basic process is rather easy. But to get the results I was looking for, I had to play around with a bit of chemistry. This is going to be advanced stuff, but I'll try not to get too technical. And don't worry, there's no math involved. But first, for you lazy and less advanced sorts, I'm going to give you the short cut. I would draw your attention to the last part, of this web page, "the dilution method":

<http://www.unholymess.com/blog/beer-brewing-info/making-brewers-invert>.

In a nutshell, you blend either an invert syrup of white sugar (the easy, bakers stuff) or Golden Syrup and blackstrap Molasses to create the various syrups.

You may be asking what's golden syrup? Well, I lied before; you can get a brand of sort-of invert syrup. Sold in a small can as Lyle's Golden Syrup, you can find it at World Market. You might just use the Golden for a No. 1 and call it a day, but based on the SRM numbers for the various types, it is too light in color, and the flavor lacks the depth of the real thing, having a pronounced toffee flavor. It is only partially inverted. But blended with Molasses you get a much better approximation of the real deal. There is also the harder to find is Lyle's Black Treacle, a British molasses, which would be the obvious choice for the dilution method in my thinking. The feedback has been good on this method. But with any shortcut, you are missing out some of the nuances. My suggestion? Have at it, and let me know how it works for you. But if you know me I'm going to be doing this hard way. Now, back to the show.

First, what is it? Well, first what is it not. Lurking out among books and web pages are a number of tutorials on attempts to make your own Belgian candy syrup. Okay, just so you know the rock sugar "Candi" stuff named after a stripper is not used by Belgian brewers, they use a syrup, which is commercially available. I may delve into that tradition later, but the important bit is that it is a different thing. It utilizes the basic candy making technique of heating sugar to high temperature, driving off the water and caramelizing it. Water is added back to prevent you from ending up with lolly pops aka "hard crack". But we are not here to make candy or Belgian Syrup.

Obviously, the first thing missing from that is the whole "inversion" part. You may recall last time I said sugar would invert (break the molecular bond) with heat in an acid environment (your boil being a good one). And with the heat and acid combo, the sugar will quickly invert. The second difference is lower heat and time. Why lower heat? First to allow the sugar to invert, and it also avoids any burnt or roasty flavors while allowing the darkening to occur. And it's the darkening or browning that is the bomb flavor wise.

This approach also results primarily in the caramelization of the sugar. From what information we have invert syrups, while including caramelization, were showcases of the Maillard reaction. Caramelizing sugar is a good thing, and is the first step in making a flan. But you are not here to make flan. So that Maillard reaction? Those vets' of Carol Rice's beer school know what I'm talking about, but the long and

the short is browning. Brown something, be it sugar, malt, a piece of dry white toast, etc. and you develop an array of flavors.

This acid inversion and lower/longer is the basis of several tutorials for making invert syrup or Belgian syrups out there, including the aforementioned henkin/Unhloymess's half-a-cat blog web page <http://www.unholymess.com/blog/beer-brewing-info/making-brewers-invert> and in a sidebar on page 20 of the Jan/Feb Zymurgy. Basically sugar is dissolved in water with an acid and heated to 240 degrees where it is allowed to invert and held until the desired color is achieved. And this was what I followed for my first two attempts. They were mostly successful, as in I made a tasty syrup, but I did not get the darkening I was hoping for and what I got took a lot longer than advertised. While some have had success, others had similar experiences to mine.

Then I ran across this <http://ryanbrews.blogspot.com/2012/02/candy-syrup-right-way-hint-weve-been.html>. He notes that the Maillard reaction is inhibited in acid environments and accelerated in alkaline ones (ding!). In his most successful experiment he skipped the acid and added food grade lime, an alkaline, which increases the darkening and decreases burnt flavor. He also includes DAP (diammonium phosphate) or other yeast nutrient to add amino acids to aid which aid in those Maillard reactions. And the inversion? You see, there is more than one way to skin that cat and adding an acid for the inversion is not completely necessary. Heat and time alone can accomplish the same thing, let's give this a try.

Well, I got great color and flavor, but a big solid mass of sugar at the bottom of the jar; worse in the lower colors, but not so much in the darkest. What that tells me is the inversion was hindered by the alkaline environment, but with enough time (and heat) it would eventually come around. Which is the case as just as dark malts become acidic, so does the sugar. If going for the No. 3 and above this will work, lighter, you need the acid treatment first.

Okay, so I dug into the history a bit more. In the making of brewing sugars we know the sugar was acidified for the inversion, and it turns out that the acid was often neutralized at some point. And a DAP addition? There's some precedent for that: Class III Caramel Color.

Wait? Caramel Color? That stuff the food Nazis are always harping on? Yes, in a way. There are types and Class III is for brewing and has a long history. Anyone old enough to remember the lame attempts to market "dark" beer in the late 70's early 80's? That's what made it dark, not malts, of course; these were mainstream brewing megaliths after all. We are not making a colorant, but a full flavored syrup version. But the basic chemistry is carbohydrates heated in the presence of ammonia compounds to produce a dark colorant. An ammonia compound? That DAP, Diammonium Phosphate is right on track. So, my suspicion is Class III Caramel Color descended from the traditional invert syrup.

To sum up where we are? Sugar (Demerara types) water, and an ammonia compound heated with an acid, held for inversion, then neutralized with a base and darkened to your liking. And that was what I did and Bingo! I made a batch of Invert syrups in the exact color ranges I wanted.

Next time...actually making the stuff.