

# Sour Beer and Barrels Oh My!

By Gabe Jackson

The use of barrels in brewing is not a new idea. They have been used historically as fermentors, such as the Burton Union systems popular a century ago in Burton-upon-Trent; they have transported beer to the far flung corners of the British Empire, as India Pale Ales were shipped from England around the world in wooden casks; also they have been used to impart oak and aged flavors in many beers out of Belgium such as Flanders Red Ale, Lambic, and Geuze. Due to the cost and inconvenience of managing wooden barrels as well as inclination toward clean, flavor-free lager they have fallen out of favor for general use in the brewing world. But a renaissance in barrel-aged beers has developed of late. Take a look at the shelves of a well stocked beer store and you'll find many of the most interesting (and most expensive) beers have been aged in oak barrels. Last December, I had the pleasure of trying such a beer at an event hosted by the Ratebeer.com administration: crew---*Eclipse Imperial Stout* by *Fifty Fifty Brewing Co.* I loved this beer, but I don't think I'll be buying it anytime soon. It is available currently on E-bay as a 3 pack of 22 oz. bottles for only \$177.95 with tax and shipping. So let's talk about how to homebrew such a beer.

I like to think of barrel-aged beers as two distinct groups, those fermented with brewers yeast only and those fermented with anything else. This distinction is useful since the cultures used to ferment the beer will remain in the barrel wood from batch to batch. Any given barrel, then, will need to be dedicated to one group or the other.

Homebrewers have generally avoided barrel-aged beers because of the difficulty in acquiring an appropriate barrel. Here in Sonoma County, surrounded by hundreds of wineries, barrels are everywhere. The Beverage People has been supplying new and re-coopered barrels for use in home winemaking for a long time, and used wine barrels can sometimes be obtained through a winery connection. The most common size barrel, however, is 60 gallons. That's a lot of beer! If you have a few brewing friends to conspire with, or a brewing club, a full size barrel may work for you. If going solo on your project you will need a smaller barrel. We generally stock re-coopered French Oak barrels in 15, 20, and 30 gallon sizes. These barrels, however, are capable of imparting a very big oak flavor profile. Putting a beer in a freshly toasted barrel will overwhelm the beer with oakiness. The commercial barrel-aged Imperial Stouts so popular now are aged in used bourbon barrels – they impart less oak flavor, some bourbon notes, and have the advantage of low microbial life after the wood has been saturated with alcohol. We now have a source of small American Oak whiskey cured barrels. Currently there are 6, 7, 8 and 10 gallon barrels available but can be expected to change throughout the year. Prices are moderate in the \$150 - \$200 range after delivery (please contact us for quote and availability). Such barrels would be ideal for an aged Imperial Stout, or other strong beer that could stand up to the aging process.

If you want to try one of these clean, beer-yeast-only barrel beers, remember that hops, alcohol, and acidic

(dark) malts are three major factors that will help avoid a spoiled beer. All three contribute to an environment that is inhospitable to wild organisms. Bold red wines have alcohol in the 13 - 16% range and much greater acidity than beer, which keeps it from spoiling in the barrel. If you try to barrel age a low alcohol, yellow beer, you can expect it to become sour and oxidized in due time.

This recipe from Byron Burch would be a good one to try. It was originally brewed for attendees of the National Homebrewers Conference in 1990. Byron shared some saved bottles during Christmas 2009, after 19 years of aging, and it was exceptional. If it held up after all those years in the bottle, it would be a good candidate for a year in the barrel.

## "Epicenter" Imperial Stout (5 gallons)

5 lbs. Double Dark Dry Malt Extract  
2.5 lbs. Dark Dry Malt Extract

Mash all grains @150°F. for 60 minutes.

1 lb. Caramel 40L malt  
1/2 lb. 2 Row malt  
1/2 lb. Chocolate malt  
4 oz. Munich 10 malt  
4 oz. Caramel 20L malt  
[Add to last 5 minutes of boil.](#)  
4 oz. Chocolate malt  
6 lbs. Dry Rice Extract  
Add to priming sugar  
5 oz. of Lactose

3 oz. Priming Sugar

### Water Treatment:

1/8 tsp. Calcium Carbonate  
2 3/4 oz. Northern Brewer Pellets (60 min.) 96.53 IBU  
3/4 oz. Perle Pellets  
(30 min.) 7.05 IBU  
1 3/4 oz. Nugget Pellets  
(30 min.) 26.80 IBU  
2 oz. Cascade Pellets  
(dry hop) 6.20 IBU  
1/4 oz. Saaz Pellets  
(dry hop) .60 IBU  
1 Pasteur Champagne Yeast

Total IBU - 137.18

Starting Gravity = 1.129

For those ready for sour ale adventures, know that you will be dedicating your barrel to this purpose, as well any plastic or soft goods coming into contact with the beverage. The cultures desirable for souring are persistent in these materials and will infect your other beers if given a chance.

Wood barrels in particular provide a healthy sanctuary for brettanomyces, acetobacter and lactic cultures. The coarse texture of the wood provides good living space. Also, the wood sugar cellulose is a food for brettanomyces. As such, any life that makes a home in your barrel may well survive any cleaning efforts on your part. Use of a barrel previously used by a distiller gives you the best neutral start. Barrels previously used for wine are more likely to contain some microorganisms, as well as flavor that will become part of your beer. Fresh toasted barrels will impart far too much oak flavor.

Belgian and British traditions involve primary fermentation in the barrel, but current brewers often ferment in a clean glass, plastic, or stainless steel fermentor first. I recommend the second method. This allows you to use the barrel as a secondary fermentor, topped up with clean beer. Our local homebrewing club, the Sonoma Beerocrats, used this technique last year to produce two barrels of sour ale with the gracious assistance of Vinnie Cilurzo of Russian River Brewing Company. In our project, 14 ten gallon batches were brewed separately with neutral ale yeast and the fermented beer was brought together for barrel filling about a month into fermentation. The two 60 gallon barrels were filled and the excess beer stored for later topping of the barrels. The beer from this project was bottled in December 2010 as an outstanding success! The club was very happy with the professional results and has chosen to repeat the strategy for the second filling of the barrels.

Of course, when the Beerocrats filled the barrels with clean fermented beer, there was still much to be done to create sour ale. We had to add bugs, and lots of them, to our precious beer. The barrel for which I brewed, a Flanders Red Ale, was inoculated with 12 vials of Brettanomyces Lambicus at the time of filling. The lactic cultures were left out at this time to avoid creating a difficult, acidic environment for the brett. For three months the brett acted alone and produced a distinct cherry pie-like character typical of the strain. Next, we chose to inoculate with a Roeselare Ale Blend culture (grown on a 100% apple juice starter) with the intent of replicating the flavor profile of the Rodenbach Brewery. You may choose other cultures for your sour ale (see Barrel Bugs chart), but we were more than happy with this beer. After one year in the barrel, our beer was bottled.

If you use a smaller barrel for your project, you may want to reduce the time in the barrel. One of the primary reasons for barrel aging---slow oxygen uptake through the barrel walls---occurs faster when the barrel is smaller. Remember, the surface area to volume ratio changes with barrel size. The sour ales, however, cannot be rushed too fast. The cultures need time to act, they are generally much slower than brewers yeast. Many of these cultures will form a pellicle across the top of the beer providing a sign of active fermentation as well as protection from surface oxidation. If a pellicle is present, care should be taken to avoid disturbing it. Fill the barrel

gently through a funnel, and consider using a trick we learned from Vinnie for pulling a sample. A stainless steel nail can be installed near the bottom of the barrel head. Some of the nail should stick out so it can be temporarily removed with pliers creating a leak to fill your glass, and the nail can then be replaced plugging the hole again. Voila! You have a sample without ever disturbing the pellicle.

Care should be taken during the aging process to ensure that your beer remains topped up (headspace causes oxidation) and is not exposed to excessive temperatures. At Russian River, our barrels were in the low 60's. Higher temperatures will lead to faster oxidation and off-flavors.

The Flanders Red Ale, organized by our team lead Mike Persinger, followed the recipe of Jamil Zainasheff in his book *Brewing Classic Styles*. The recipe is included below. The other barrel, organized by team lead Sean O'Conner, was a blonde beer fermented with brettanomyces. Sean recommends this strategy to brewers on their first wild beer attempt: Brew your favorite ale recipe with neutral ale yeast, followed by brett fermentation for several months in secondary or barrel.

When you are ready for a barrel of fun, please get in touch with our shop and we can help you put it together. Barrels and special-order cultures (same price as in-store yeast!) will require a week or two of lead time, but everything else, as always, is here at the shop.

For instructions on barrel cleaning, swelling, storage, and general care please review the Barrel Care instructions in our wine catalog. These instructions are printed in every yearly issue and can be found on our website as well at [www.thebeveragepeople.com](http://www.thebeveragepeople.com).

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