



Sour Mashing: Techniques

Author: Dave Green

From Brew Your Own Issue: [October 2008](#)

Do you like beers with a little tart twinge to them? Or would you like to acidify your mash without adding calcium? If so, you may want to think about sour mashing — the other sour brewing technique.

Have you caught the sour love yet? Are you the type of person that will only buy or try to clone Guinness in its Extra Stout version? Fan of Flemish or lambic style beers? Soured beers can be some of the most refreshing to the palate on a hot summer day, or after a long day at work. If you don't believe me, try picking up a bottle of Rodenbach, or if you can find one, a Berliner Weisse.

Soured beers are quickly gaining popularity among beer lovers and brewers alike. Greg Noonan at Vermont Pub & Brewery in Burlington, Vermont is one brewer getting in on sour mashing currently with four beers in his line-up, a wheat beer, a Flanders red, a wit beer, and a framboise. While a sour mash is not traditional with these beer styles, it is one technique you can utilize to create the sour charac-

(Continued on page 3)

Next Meeting: March 15th

Location: Pub Crawl

Schedule:

Dust Bowl Brewing

Lagunitas Brewing

Faction Brewing

President

Sean Wood

Exec Vice President

Matt Humann

Asst. Vice President

Sean Railing

Secretary

Aaron Collier

Treasurer

Chris Steinkraus

Sergeant of Arms

Wes Tarvin

Webmaster

Chris Steinkraus

Next Meeting: October 15th

February Meeting

February meeting at John Bopp's house. Thanks for a great meeting!



(Continued from page 1)

teristics in these beers. It doesn't matter whether you are an extract or all-grain brewer, a sour mash is a fairly easy process that requires little in the way of special equipment.

Traditionally there were two reasons for a brewer to purposefully sour mash. The first was to biologically acidify the mash to comply with the Rheinheitsgebot Purity Law. Utilizing a sour mash for biological acidification of pale brews produces a "softer" malt profile. The second reason was to make a true sour beer like a Kentucky Common, which distillers in the Appala-

chian Region of the US made as an offshoot to their sour-mashed whiskey.

There are several methods you can employ to create a soured beer. Simple techniques include adding lactic acid to your brewing water or including acidulated malt to your grain bill. Both techniques are going to lower the pH levels of both the mash and final wort, giving a tart, sour edge to the final beer depending how much is added. More advanced techniques include adding either cultured lactic acid bacteria or *Brettanomyces*, a mixed lambic culture of *Brettanomyces*, *Pediococcus* and *Lactobacillus* or oaking the beer with unsanitized oak ingredients while the beer is in secondary stages of fermentation. The final technique in the homebrewers quiver would be performing a sour mash, which is the only technique I will be discussing in this article.

The goal of a sour mash is to employ the work of *Lactobacillus delbruckii* to a great extent while limiting the work of other critters



such as fungi or bacteria like *Acetobacter* or *Clostridium*. You can accomplish this by pitching a live culture of *Lactobacillus*, by controlling the temperature of the mash and by limiting the oxygen introduced to the mash. *Acetobacter*, as the name implies will produce acetic acid, the key acid in vinegar. *Acetobacter* will only play a significant role if the sour mash is incubated for an extended time period. You will know when *Acetobacter* has taken hold when the mash vessel, upon opening, has a cidery-like vinegar smell. While you would like to minimize the vinegar included in the mash, it will not spoil your attempts at creating a clean sour beer if kept in check. *Acetobac-*

ter needs oxygen and will only grow on the top of the mash. If you seal the top of the mash by laying some plastic wrap across the top, pushing all the air bubbles out in the process then you can greatly decrease the opportunity for *Acetobacter* to act. *Clostridium* on the other hand produces butyric acid, which is a foul-smelling acid, faintly resembling my freshman year dorm, a mixture of

rank locker room smell mixed with vomit. If *Clostridium* takes hold in the mashing vessel, it is rather apparent right away and make sure to keep away from significant others if you enjoy their company. I would advise dumping the mash if *Clostridium* takes hold.

But some people seem to be okay adding this rank concoction to their beer stating that the odor can be boiled away. In general, a foul-smelling mash is going to yield a foul-smelling beer. A little "funk" in the mash is OK (some aromas will get scrubbed in the boil and fermentation), but too much and it should be discarded. Skimming the top of the mash can

(Continued on page 5)

Become a BJCP Judge



White Labs

Turn in your used White Labs Vials at the next Meeting...when we get 5000 vials Chris White will brew with us! Every meeting we get closer...



Ever wanted to know more about beer, be a better brewer, and help out other brewers? Then becoming a BJCP Judge is for you. Check on the BJCP website at <http://www.bjcp.org/>. The first step is to download the study materials, study and take the online **BJCP Beer Judge Entrance Examination**. Once you pass the exam you will need to take the **BJCP Beer Judging Examination** in the next twelve months. If we have at least 8 people pass the entrance exam Tom Pope can facilitate the Judging Exam!

Bencomo's Homebrew Supplies

Bencomo's Homebrew Shop was started in 1991 in Mike's Liquors on north Palm Ave. Julian Bencomo has been brewing since 1988, is a nationally recognized beer judge, and has won numerous awards for his

beers. The shop is located on the northeast corner of Olive and Arthur between Palm and Fruit at . Hours of operation are M-F 10-4; Sat. 9-5 we also take appointments after hours and on Sundays. Bencomo's is a full service shop with great selection of grains, hops, yeasts, extracts and equipment. Homebrewing advice is always just a phone call away. Phone 559-486-3227



(Continued from page 3)

get rid of many off odors. A good sour mesh smells “cleanly” sour. *L. delbruckii* produces lactic acid, an odorless acid that got its name because it is the spoiling agent in milk when lactose is broken down.

There are some basic items you will want to have in your possession before attempting a sour mash. In my opinion a pH meter is important, especially if you’re an all-grain brewer. They will start at \$30 for a simple digital meter plus you will want to buy a calibration kit, which you can get for under \$10. Other key pieces include a thermometer and a small mash container that you can seal up tight. A small, insulated cooler will work well in a pinch. This will also help regulate the temperature of the mash over the course of several days. If you have a space in your house that can hold the temperature above 100°F (38 °C) for several days like a furnace room or hot water heater then you can also utilize a gallon jug or even smaller, depending on the size of your sour mash. One key to a good clean sour mash is that your container be filled right to the top for the incubation period.

So what type of beers might you utilize a sour mash for? Really the sky is the limit, but a short list of good examples would include, but not limited to Berliner Weisse, lambic-styled beers, Flemish reds and browns, stouts, porters, summer ales, weizens, wits, saisons and the more obscure style Kentucky Common. From my experience hoppy beers don’t seem to benefit from the effects of souring



but maybe that is the reaction of my taste buds. The

sour mash will add a nice twang to the beer if a moderate percentage of the total grain bill is added and a full pucker face if a large percentage of soured grains are added. Utilizing 5% of the total grist for the sour mash is generally the lowest end of

spectrum. This is in the realm of using the sour mash for mash acidification. That means that if your recipe calls for 10 lbs. (4.5 kg) of grist then your sour mash would contain 0.5 lb (0.23 kg) of your base grain.

The question on how much sour mash that one should add is really dependent on the brewing water you will be utilizing, the end pH of the sour mash, and the extent of sourness you are looking to achieve. The stronger the buffering capacity of your brewing water, the higher the carbonate levels, the more sour mash you will need to add to achieve your desired effects. A 10% sour mash using soft water may produce the same results as a 15% mash when hard water is utilized. Trial and error is really the only way a homebrewer will achieve their desired level of sourness.

The end pH of the mash is also very important, especially to all-grain brewers because ideal mash pH should lie in the range of 5.2–5.4. According to Greg Noonan, “a 2-day sour mash will give a better flavor but half the acidity

(Continued on page 7)



2014 "Worthog of the Year"

Official Rules

Worthog of the Year" (also known as WotY) is an honor bestowed upon an individual who brews the best beers through a single year. To honor this member, a trophy is given to the highest scoring Worthogs to highlight their outstanding brewing skills. Please read below for official rules.

Official Rules

1. Only actively paid members may participate in the competition.
2. The competition consists of brewing 4 different styles of beer between the dates October 31st and the September general meeting.
3. Each contestant must register their beers at <http://sjworthogs.org/woty>
4. Competition entries will **only** be accepted at the general meeting listed below **no later than 12:30 pm**. Beers will be inventoried by the current acting Executive Vice President or any person on the board who will not be participating in the judging.
5. All entries must be submitted in two - 12 oz. or higher bottles with the competitors name clearly printed on them. You may also use the bottle ID generated for you when registering your beer at <http://sjworthogs.org/woty>. Any bottle that does not specify a first and last name will be disqualified.
6. Each candidate may only enter in one beer per style.
7. All entries will be judged by two or more judges based on BJCP guidelines using the official BJCP score sheet (http://www.bjcp.org/docs/SCP_BeerScoreSheet.pdf). Entries that are out of style will be disqualified.
8. Depending on the number of judges, scores will be averaged between the score sheets to determine the value for that particular entry. For example; judge one gives 40 points and judge two gives 42 points. Your official score value for that competition will be 41. The participant with the highest cumulative amount of points at the end of all four competitions will be awarded WotY.
9. The styles for 2014 and their due dates are as follows:
 - a. **Mild Ale (Category 11A)** will be due at the **January** general meeting.
 - b. **Belgian Dubbel (Category 18A)** will be due the **April** general meeting.
 - c. **Cream Ale (Category 6A)** will be due at the **June** general meeting.
 - d. **Oktoberfest/Marzen (Category 3B)** will be due at the **September** general meeting.
10. The Worthog of the Year winner will be awarded the trophy at the annual Hogtoberfest event.

May the best Worthog win!

of a 3-day mash.” In acidified beers, the sour mash is stirred into the main mash to hit a proper mash pH. In sour beers made with a full sour mash (Kentucky Commons, for example), the malts are mashed normally, then allowed to cool and sour. A brewer could also make a sour beer by stirring a large sour mash into the main mash after conversion has taken place. This would work well for moderately souring experimental beers. The percentage of mash which is soured will play the biggest role. Souring between 5–20% of the grain bill will give the beer anywhere from barely a touch of sourness to a nice twang. If you sour above 20% of the total grain bill, then you are entering true sour beer territory. Some homebrewers will sour mash upwards of 50% or more of their total grain bill. This quantity is ill-advised for anybody who doesn’t want a true pucker-up beer or anybody that suffers from acid-reflux problems.

For first time sour mashers I would recommend souring between 5–20% of the total dry grist. This will give you something to work with for your next sour mashing session. Begin the sour mashing process two to four days prior to brewing the entire batch. Calculate how much of your base malt needs to be soured. You can use crushed 2-row, 6-row, pale ale or Pilsner malt. Begin by heating 1.25 qts. (1.18 L) of water for every 1.0 lb. (0.45 kg) of grain in the mash, up to a temperature of about 162 °F (72 °C). In a pot, slowly mix the water into the grains and stir thoroughly. Wrap the pot in a towel and let the mixture stand for 40 minutes. After the 40 minutes, heat the mash up to 170 °F (77 °C) and hold for 10 minutes. Gently pour the mash into the vessel it will be stored in for the next several days, introducing as little oxygen is possible to the mash while pouring. The less oxygen introduced during this process, the less chance there is for mash spoiling critters to take control. Cover tightly with plastic wrap making sure to expel any air bubbles trapped on top and cool the mash down to roughly 115 °F (46 °C).

Inoculating (pitching the critters) in the sour mash is the final critical choice in the sour mashing process. The simplest and most straightforward technique is to keep a handful of dry grains from the preceding mashing steps, either crushed or whole grains work. Simply toss in the grains when the temperature of the mash falls below 120 °F (49 °C). The grains already contain the bacteria *L. delbruckii* in their husks. Another way would be to pitch a culture of live bacteria. Both Wyeast and White Labs have made this strain avail-

able to homebrewers, or you may be able to find live cultures in some health food stores as packaged yogurt culture. Again pitch the culture when the temperature falls below the 120 °F (49 °C) threshold. Reseal the vessel and place in a warm spot. The closer you can keep the mash to the 120 °F (49 °C) mark without going over, the better your *Lactobacillus* will fair and the less likely unwanted visitors will take control.

When brew day arrives, extract brewers can pour the sour mash through a strainer or colander to separate the grains from the liquid and add the sour liquid directly to the boil. The all-grain brewer may follow the same procedure as the extract brewer, or if biological acidification is your goal then add the sour mash to the main mash making sure the mash pH doesn’t fall below the 5.2 threshold. Begin by mashing the grains as normal in your mash tun. You will want to heat the sour mash up to your first rest temperature to avoid any complications with volume and temperature of strike water to add. If your goal is to make a sour beer, then you can add more of the sour mash just after the saccharification rest but before lautering in order to raise the sour intensity.

So now that you have some general guidelines it’s time to turn brainstorming into reality. Sour mashing can be both a fun and frustrating side project to brewing. As you gain practice in the technique, it becomes easier over time and you can start culturing your own strains of bacteria or yeasts for souring. *Lactobacillus* is a nice straightforward bacteria for souring a beer but there are several other strains of bacteria and yeast that can be utilized and provide interesting characteristics. So experiment and don’t be afraid to ask questions because a sour beer when done properly is a beautiful thing.

Dave Green is the Advertising Sales Coordinator for Brew Your Own. He is an avid homebrewer and worked as an assistant brewer at Brickhouse Brewery in Patchogue, New York.