



# Quick Souring Techniques

# What is a Sour Beer?

- Sour beer is beer which has an intentionally acidic, tart or sour taste.
- Sour beers get their sour/funky flavors from yeast and bacteria.
- “Sour” is a blanket term, referring to both Sour and “funky” beers
- Most European Sours have low bitterness, with the sourness of the beer providing the balance that hop bitterness would otherwise contribute. Some are sweetened or flavored, whether at the brewery or upon consumption
- Wild Ale styles are influenced by microbes other than traditional brewer’s yeasts. This category is intended for a wide range of beers that do not fit traditional European sour or wild styles. All of the styles in this category are essentially specialty beers where many creative interpretations are possible, and the styles are defined only by the use of specific fermentation profiles and ingredients
- 2015 BJCP Sour Styles
  - Category 23 European Sour Ale
    - Berliner Weise
    - Flanders Red Ale
    - Oud Bruin
    - Lambic
    - Gueuze
    - Fruit Lambic
  - Category 28 American Wild Ale
    - Brett Beer
    - Mixed Fermentation Sour Beer
    - Wild Specialty Beer
  - Category 27 Historical Beer
    - Gose
    - Lichtenhainer

## Why would you want to brew a Sour Beer?

- Sour's are a hot trend in craft brewing.
- It's a fun style - makes people think about what beer could be.
- Sours can be some of the most complex beers.
- Have friends that prefer wine? Sour beer is a gateway beer for wine lovers.
- Sour beers go great with food.
- It's the next Iron Brewer Style!

## But don't Sours take years to mature?

- Well, yes, and no...
- It is true there is no substitute for time when building very complex character, i.e. Belgian Sours / Lambic
- But there other, faster ways....

## Quick Souring Techniques- Technique #1 Sour Mash

- Sour mash
  - Technique for adding acidity to a beer before primary fermentation begins. This is accomplished by the introduction of lactic acid bacteria after the completion of the mashing process.
  - This may be accomplished by addition of a pure culture of Lactobacillus or, more commonly, by the addition of a small amount of unused malt, which has Lactobacillus in addition to other bacteria, yeasts, and molds on the husks.
  - Sour mashes typically last between roughly 12 hours and 3 days. After the mash has reached the desired acidity the wort is separated from the grain and boiling and fermentation are carried out as normal.
- Considerations
  - To avoid Butyric acid and possibly Isovaleric acid, which produce rancid/vomit/fecal aromas, it is important that the mash be kept anaerobic and incubated warm (ideally 113-120°F) throughout the duration of the sour mash. This can be accomplished by purging the headspace with CO<sub>2</sub> and covering with saran wrap at the liquid-air interface to eliminate air contact.

## Quick Souring Techniques- Technique #2- Sour Worting

- Sour Worting
  - Process in which Lactobacillus is given a "head start", pitched before the yeast so that it will be able to produce significant amounts of lactic acid before the Saccharomyces completes the main fermentation.
  - There are several variations on this method, including souring in the primary fermenter, souring in a secondary vessel, or even souring in the boil kettle itself.
  - Considerations
    - Brewer has the option of pasteurizing the wort by heating it to kill the Lactobacillus before adding the yeast for the main fermentation. Many brewers prefer this process over Sour Mashing because it can be easier to control, and when implemented properly it produces a clean sour beer in a short amount of time.
    - The possibility of pasteurizing the soured wort makes it attractive to brewers who are concerned about infection issues in their cold side equipment.

## Quick Souring Techniques- Yogurt Souring

- Yogurt Souring-The method of souring wort using unpasteurized yogurt.
  - Greek yogurt is often made with *Lactobacillus acidophilus*. Using cultures of *L. acidophilus* from yogurt reportedly can make a 3.0-3.5 pH sour wort in 24 hours, without producing vomit/fecal flavors and aromas.
  - Method
    - To sour 5 gallons of wort with yogurt, make a 1 liter batch of unhopped starter wort the day before brew day. Add 2-4 teaspoons of live yogurt to the starter wort. Maintain a 100-110°F (37.8-43.3°C) temperature for about 24 hours.
    - On brew day, mash and sparge a low/no IBU wort as normal, boil for a few minutes, and then chill the wort down to 100-110°F. Pitch the yogurt starter into the wort, and hold the temperature as close to the 100-110°F range as possible. Bubbling CO<sub>2</sub> through the wort is advised if possible to prevent potential off flavors, but is not required. Within 24 hours, the wort should be down in the 3.x pH range. Boil the wort, adding any hops that the recipe calls for, yeast nutrient, etc., and then cool the wort down to *Saccharomyces* pitching temperatures.
- Considerations
  - When souring, some brewers first lower the pH of the wort to 4.5-4.8 before pitching *Lactobacillus*. This has sometimes been found to help the head retention of the beer
  - In general, non-fat Greek yogurt that is unpasteurized works best. Brands of yogurt that have been reported to be successful with this method:
    - Fage Yogurt
    - Greek Gods
    - Nancy's Yogurt
    - Seven Stars yogurt

## Quick Souring Techniques- Probiotics Souring

Pro Biotic Souring- The method of souring wort using pro biotics readily available on the market.

- Probiotic Choices:

- Good Choices

- Bacteria that represent good choices are those which have the capacity to sour wort, and will do so with a minimal risk of off-flavors. These are solely species belonging to the Lactobacillus genus – i.e. Lactobacillus sp, where sp merely means “any species”. Lactobacillus plantarum and Lactobacillus rhamnosis are two of the more commonly seen probiotic strains, but any probiotic containing bacteria whose name starts with ‘Lactobacillus’ will work well.

- Probably Don’t Matter

- Species which “probably don’t matter” are those which are unlikely to grow in wort; either because the homebrewer lacks the ability to lower the oxygen level in the wort to the point where these organisms grow, or because wort isn’t nutritionally compatible with these species. The flip side is that if these organisms grow, they should do the same thing as Lactobacillus – i.e. sour the wort while producing minimal off-flavours. So that’s why they probably don’t matter – they’re not likely to do anything, but if they do end up doing something, they will help your wort sour. Included among these are:
    - Bifidobacteria sp. (again, sp means “any species”)
    - Streptococcus thermophilus
    - Leuconostoc sp.



# Quick Souring Techniques- Pro Biotics Souring

- Avoid Under Some Circumstances

- Only one group of organisms fall into this grouping – the Saccharomyces, as in species of yeast from the same genus of yeast that brewing yeast come from. At the time of this post the only Saccharomyces commonly seen in probiotics is Saccharomyces boulardii. Saccharomyces sp. fall into the “avoid under some circumstances” category as they will ferment sugars to form alcohol. You probably should avoid these – they will compete with Lactobacillus for sugars, and thus limit acidification. In addition, if you are planning on heating the wort after souring (to either pasteurizing or boiling temperatures), you will boil off the resulting alcohol leading to a beer with very little sugar left for the subsequent fermentation.

- Avoid At All Cost

- The last group are those you want to keep as far away from your wort, beer and fermenter as possible. These are bacteria which can produce horrid off-flavors and ruin a beer. In this group there are currently three types used in probiotics, but this list may get longer in the future:
  - Clostridium sp. These guys can make butyric acid, which smells and tastes of a mix of parmesan cheese and vomit.
  - Enterococcus faecium. This bacteria can make bioactive amines, which some people are severely allergic to. Moreover, these amines are often quite unpleasant, and are what give feces and corpses (among other things) their unique odors.
  - Bacillus sp. (most often Bacillus ereus, clausii, and pumilus) make diacetyl (butter) and may also make bioactive amines.

A good rule-of-thumb is to limit yourself to probiotics that contain only *Lactobacillus* species, which is easy to remember when you're at the store.

## Quick Souring- Resources

- [Recipe- Berliner Weisse](#)
- [Recipe- Gose](#)
- [Craft Brewers Conference Case Studies](#)
- [Milk The Funk wiki](#)
- [The Mad Fermentationist](#)
- [Fossil Cove Sour Mash Experiment](#)
- [Sour Wort Berliner Weisse](#)