MAGNETIC STIR PLATE

What is a Magnetic Stirrer

A magnetic stirrer is a device that lets you stir a solution without having any contact between the stirring motor and the solution. What you do is add a small, sterilised stir bar into the liquid and sit the container on the magnetic stirrer. This is an ideal device for kicking off yeast starters in a short time.

Why use a Magnetic Stirrer

There are many of us that have yeast farms and want to step yeast up quickly from a plate or storage under sterile water, or even from a commercial yeast package.

A magnetic stirrer stimulates the yeast activity and helps you grow the yeast population rapidly. As an example, I stepped up from a partially swollen Wyeast packet to a 2 litre starter where the yeast had fully fermented the starter wort and flocculated in 24 hours.

YEAST STARTER

A yeast starter will insure that your beer has the best possible chance of turning out well. You will need to build one:

- For beers with a original gravity above 1.045,
- For yeast that is of questionable quality,
- For every lager,
- For every high gravity beer,
- For large batches,

If you want your yeast in optimum health, if you want to reduce the lag time (and the chance for bacteria to take hold) and if you want consistent and reproducible recipes, you should make a yeast starter.

Pitching Rates

The cell count numbers can be confusing. If you really want to understand cell counts and pitching rates, go to MrMalty.com and check out Jamil's*Proper Yeast Pitching Rates* article. Both Mr. Malty.com andWyeastLab.com have pitching rate calculators. If you love to crunch the numbers that's great. For me, I like to use all the tools available to me. Use the calculators and know how much yeast you need to be pitching. It's one of those details that takes you to the next level as a homebrewer.

So how much yeast do I need to pitch? Well, 2000 ml will more or less double the amount of yeast in a vial or packet. Using a stir plate will increase those results dramatically. Trust the calculators and grow your yeast accordingly. As a ballpark figure, use 6 ounces of light DME to 2 quarts of water. This will give you approximately a 1.040 SG wort.

If you have a scale that weighs in grams, even better. This makes the measurements easier and more precise. Figure a factor of 10. For a 1000 ml, use 100 grams of DME (100x10=1000). For a 2000 ml use 200 grams of DME and add enough water to make 2000 ml of wort (200x10=2000). This x10 ratio will produce a wort with approximately a 1.040 SG. Do not grow yeast in high gravity worts, it stresses the yeast. Keep the fermentation temperature around 70-72 degrees F, a little cooler for a lager yeast.

There are several reasons that you wouldn't want to pitch a large starter into your wort. One is that a large amount of wort, over a gallon, will dilute your OG, your color, and your specialty malts and adjuncts. The large starter will contribute unknown flavors to your beer, especially if it is fermented at warmer temperatures producing unwanted esters, polyphenols, and who knows what other flavors get into the starter beer. I don't usually taste mine to see if it is any good.

According to Jamil and Dr. Chris White from White Labs on the podcast entitled "Homebrewing Saison" originally aired on 09-18-2007, the yeast must go through a growth phase so it can produce the enzyme alcohol acetate transferase (AAT). Esterification of alcohol is controlled by this enzyme. Thus, more AAT means more fruity esters in your beer.

Pitching too much yeast, such as when you reuse the entire cake from a previous batch, will cause the yeast to have a very short lag phase with very minimal AAT production and thus very little ester production. For some beers, especially those from Great Britain, this makes an uninteresting example of the style. Some beers must have some fruity esters to fall within the BJCP guidelines for that style. If you find your beers need more esters, try pitching on the low end of the scale for that style so the yeast have a chance to grow and produce the fruity esters you expect

When To Pitch

Most brewers like to pitch their yeast when it is at it's height of activity, or full krausen. According to Wyeast Labs, this will be between 12-18 hours. This works out well for most homebrewers. You can make your starter the day before you brew and it should be ready to pitch when your wort is ready.

If you want to pitch the yeast only, with no fermented "starter beer", you will have to let the yeast attenuate fully. After it has finished fermenting, turn off your stir plate and allow the yeast to settle or place the flask in the fridge and it will settle faster.

Pour off the "starter beer" above the yeast leaving just enough to get the yeast into suspension. Just make sure that the yeast is within 15 degrees of the wort temperature when you pitch. This means that if you put your yeast into a fridge, take it out and allow it to equalize to the same temperature as the wort before pitching.

Equipment I'll Need

The equipment you need to make yeast starters is minimal. You can make them by boiling the wort in a pot, cooling it in an ice bath, then pouring it into a sterilized quart jar. The easiest way is with a **Erlenmeyer flask.**

They come in all sizes but the ones you want are 1000 ml, 2000 ml, 3000 ml and for really big batches, 5000 ml. You will need either a foam stopper or aluminum foil to cover the top of the flask while the yeast is fermenting, or you can use a stopper and an airlock. If you use a stir plate, you'll need a magnetic stir bar. You will need a way to aerate or oxygenate the wort before pitching. Use a air-stone, pure oxygen, or just agitating or swirling the wort every time you walk by. Don't over oxygenate with pure oxygen, around 10-15 seconds should be adequate. And lastly, you need to add 1/4 tsp of yeast nutrient.

Here is the procedure for making your yeast starter:

1. If you are using Wyeast's smack pack, smack to break the nutrient packet inside and allow yeast to swell (gives the yeast a head start and also is a test of viability).
2. Sanitize everything prior to starting.
3. Measure or weigh your DME and pour it into the container, remember the "factor of 10" rule from pitching-rate section.
4. Add yeast nutrient (about 1/4 tsp per 2 liters). Make sure you add the nutrient before you begin the boil, not during, or all the nucleation sites from the nutrients will cause the wort to boil over, all over the stove.
5. Bring wort to a boil, slowly, watching for boil-over. Reduce heat just as you see the foam building, not when it's about to overflow. This is especially important when using the flask to make your yeast

starter in and not so important if you are using a large pot. Don't cover the pot while boiling either or you will get a boil-over.

6. Boil for 15 minutes. Note: If you have an electric stove with coil type burners, use a heat diffuser (very cheap) when making your yeast starter in an Erlenmeyer flask. The Borosilicate glass expands and contracts and the electric stove heats unevenly. There have been many instances of the borosilicate flasks shattering on electric stove tops.
7. Place container in an ice bath and cool to pitching temperature (around 20 degrees C).
8. If using a pot, pour wort through a funnel into a fermenting container such as an Erlenmeyer flask or gallon jug.
9. If using **stir plate,** put your magnetic stir-bar into the glass fermentation container.
10. Oxygenate your wort, or start shaking it and shake it every few hours.
11. Sanitize your yeast packet or vial with a no rinse sanitizer.
12. Cut with sanitized scissors or open vial and pour contents into flask.
13. Cover the top with foil, put foam stopper in, or stopper with airlock.
14. Place container on stir plate if you are using one. Turn on and adjust to keep yeast in suspension, it doesn't need to have a big vortex.
15. Allow yeast to ferment. Keep an eye on it. If there are any problems with the fermentation, you may want to obtain fresh yeast. The yeast should turn opaque and creamy as they multiply. Turn off the stir plate and check for CO2 bubbles. There should be at least some krausen or foam on top and CO2 bubbles rising after 12 hours.
16. If fermentation went well, pitch 12-18 hours later into your cooled wort.

If you are not already, begin using yeast starters and you will notice a definite improvement in your beer. This is one of the easiest and most important things you can do to improve your fermentations. Happy yeast makes better beer.

References: Information for this article came from Bobby Don Johnson, Jamil Zainasheff's website Mrmalty.com, from How To Brew by John Palmer.