**Making A Yeast Starter**

When the amount of available yeast is equal to the amount required, the yeast can be pitched without any further preparation. But if there may less yeast (or fewer active yeast cells) available than required. High gravity brews with tons of sugar that has to be fermented, lagers which ferment at a low temperatures at which the yeast is far less active, and small or old liquid yeast samples that contain few cells that are still viable are all situations in which the yeast needs to be multiplied before use.

As a rule of thumb, you don't need to yeast starter when pitching:
- Dry yeast that is not beyond its expiry date;
- A sufficiently large quantity of yeast sludge reused from a recent previous fermentation;
- A fresh vial of liquid yeast that comes with a guarantee from the supplier that is ready to pitch and sufficient for the quantity of beer brewed.

In other cases making a yeast starter is recommended, e.g. when pitching:
- Liquid yeast nearing its expiry date;
- Dry yeast past its expiry date;
- A small quantity of yeast sludge from a previous fermentation (less than half a cup or so into 25-ish litres of wort) or sludge that has been sitting in the fridge for a while;
- Any yeast the viability of which you're not 100% sure of.

Making a yeast starter is not complicated, but it takes a few days and therefore should be planned accordingly.

First, prepare a starter wort by adding some dry or liquid malt extract to a pot of water and bringing it to the boil. Aim for a wort gravity of around 1.040. (About 100 grams of dry malt extract per litre of water or about 130 grams of liquid malt extract topped up to 1 litre of wort is a good way to start.) Add some high alpha acid hops as a preservative. Some brewers make a fresh starter wort every time, others prefer to make a large batch and store that in sterilized, capped bottles so they have some on hand whenever they need to propagate some yeast. Boil the wort for about 10 minutes. Cover the wort and let it cool with the lid on the pot to prevent contamination. Placing the pot into a bath of cold water or ice in order to cool it down as quickly as possible is recommended.
Next, pour the cooled wort into a sterilized glass jar, bottle or flask. Don't worry about the sediment; it can go into the jar with the rest of the wort and will actually help to promote yeast growth. Try to splash the wort into the jar or flask in order to get as much air into the wort as possible. The wort should be as well aerated as possible in order to promote yeast growth. Giving it a good shake will help to achieve that.

Add some yeast nutrient, then add the yeast. The yeast should be at more or less the same temperature as the starter wort, i.e. fermentation temperature. Cover the jar with some sterilized tin foil or plastic wrap and secure it with a rubber band, or fit a bung and airlock bubbler. Carefully shake the jar of flask to provide more aeration.

The fermentation should be underway by the following day, and will complete quickly. (In fact, it's easy to miss as this fermentation can take as little as a few hours!)

If desired, the fermented wort may be poured off the yeast sediment and replaced with a fresh starter wort, along with more yeast nutrient and the required aeration. This process may be repeated two or three times if the amount of starter yeast was small, or if the final amount required is large.

Once the yeast has grown to sufficient quantities, the bulk of the fermented wort can be poured off, leaving only enough of it so that the settled yeast can be shaken into a slurry. Then the slurry can be pitched into the fermenter. The fermented starter wort won't taste very good, so don't add more of it to the beer than is required in order to transfer the yeast.

The most essential part of making a yeast starter is to avoid bacterial contamination. Sterilize all equipment to laboratory standards by soaking it in concentrated alcohol or boiling it in water for at least ten minutes before risking contact with the yeast.