

# Starter Cultures – Home Brewers

Making a starter culture to increase the quantity of yeast pitched into a particular beer is a great way to assure consistent results. If you are brewing a high gravity beer (greater than 1.065 original gravity) or a lager that will be fermented cold then you need to increase your pitch rate by pitching more packages of yeast or making a starter culture.

The Wyeast Activator (125 ml) smack-pack is designed to directly inoculate 5 gallons of standard ale wort (O.G. < 1.060, 65-72°F). When brewing high gravity beer (O.G. >1.060) or cold fermented lagers or ales (<65°F) additional yeast will be required. An Activator contains approximately 100 billion cells which will deliver slightly less than 6 million cells per milliliter in a 5 gallon batch of beer.

## **Pitch Rates:**

For a determination of appropriate pitch rates please see the [Pitch Rates](#) section in the Technical Information section of this website.

Once you know how much yeast you need, you can plug the numbers into Wyeast's [Pitch Rate Calculator](#) to determine the size of starter to make.

## **Cell Growth:**

The two main factors associated with controlling the level of cell growth in fermentations are sterol content in cell membranes and amount of sugar available.

In most standard fermentations, the sterol content in the cultures is the limiting factor in cell growth. Sterols (See [Oxygenation](#) section) are only synthesized during the early stages of fermentations and are diluted every time a cell buds. When sterol levels reach a certain point in the cell membrane, the cell will stop budding. If very high pitch rates are used, as is the case with most starters, the culture can exhaust the sugar source prior to depleting the sterol contents. The depletion of sugar will cause the culture to stop growing.

## **Starter Recipe:**

The optimal media for cell growth and health require using a malt based media (DME) fortified with nutrients. Gravity should be kept near 1.040 and cultures should be grown at 70°F.

### Recipe

0.5 cup DME (100g, 3.5oz)

½ tsp Wyeast Nutrient

1qt.(1L) H<sub>2</sub>O

Mix DME, nutrient, and water.

Boil 20 minutes to sterilize.

Pour into a sanitized flask or jar with loose lid or foil.

Allow to cool to 70°F.

Shake well and add yeast culture.

**Timing of Starter:**

Because starters are inoculated at high cell densities, growth is usually maximized within 24-36 hours. The gravity of the starter should always be checked prior to inoculation into wort to assure proper cell growth. Cultures should be used immediately, or refrigerated for up to 1 week before using. Cell viability will decrease rapidly if cultures are left at ambient temperatures for extended time.

**Stirring and O<sub>2</sub>:**

Agitation aids in removing inhibitive CO<sub>2</sub> from suspension as well as possibly adding small amounts of oxygen. Stirring or shaking the starter periodically or using a stir plate will improve cell growth. The use of stir plates has been shown to increase cell growth 25-50% over a non-stirred starter.

Small additions of oxygen periodically throughout the growth of a starter will replenish sterols and improve cell yield.

**Caution:** It is important to understand that creating a starter can increase the risk of infection by undesirable organisms. Small levels of contamination can multiply to unacceptable levels, causing undesirable effects on the finished product.

Source: Wyeast Lab