



URBAN EST 1981 WINERY & CRAFT BREWING SUPPLIES

How to Make a Lager/Pilsner

Lagers are an oft-derided style, and yet they're one of the hardest to produce. Lagers are designed to be clean tasting, which means any faults in the beer will be exposed. On top of this, specific temperatures are often needed and there are greater aging requirements vs an ale. In our mind its worth all the hard work, a well-made lager can be absolutely refreshing. This is our method to produce a nice, clean tasting lager. This guide also applies to Pilsners.

Important Tips

- A 90 minute boil is highly recommended. Lagers are highly susceptible to DMS (creamed corn taste), and a longer boil will help guard against that. This is especially true if using Pilsner malt.
- Water choice: we have used Guelph's very hard water with success in making lagers in the past. However, the optimal water is very pure, soft not softened water (softened water adds sodium to the wort). Typically supermarkets will sell water that is pretty low in minerals.
- Temp control is critical for lager making.
- Lagers really benefit from extended aging at cold temps. Having somewhere cold to stick a carboy will be very beneficial but, the longer something is aged, the greater the danger of oxidization. Be mindful of O2 issues in your aging set up.

Pre-Fermentation

For the most part, lagers can be treated the same as an ale during the mash and boiling process. There are a couple key differences which will be outlined here.

- Lagers should be fermented dry (sub 1.006 S.G. is ideal). There are a few ways brewers can maximize the fermentability of their wort. A combination of methods will get the best results.
 - o **Why so low?** *Lagers are generally low hopped, and very clean. A normal gravity of 1.010 will end up tasting pretty sweet.*
- Doing a two stage mash will make the wort more fermentable. We recommend mashing at 145-147°F for 30 minutes, followed by 30 minutes at 154-156°F. This converts both the (beta and alpha) enzymes. Check out John Palmer's "How to Brew" for more detail regarding these enzymes.
 - o A two stage mash is a lot easier to do with a BIAB setup. Simply turn on the heat to bring it to the next temperature. Using a mash tun is more challenging.
- To achieve a two stage mash using a mash tun, we recommend starting your mash with less water than normal. If on average you do 4 gallons of water in your mash, use 3 gallons instead and heat up more water on the side. After 30 minutes of mashing at the 145-147°F range, add 1 gallon of significantly hotter water (185-190°F) to the tun. It's not an exact number, but add enough to get the temp up to 154-156°F – we recommend not exceeding 4.5 gallons total mash water.
- The most impactful technique in getting the final gravity low is the use of enzymes to assist fermentation. In particular, we like using **Amylo 300**. For best results, it is used both during the mash and at fermentation.
 - o Amylo 300 works best below 147°F – the ideal time to add it is during the 1st stage of the mash.
 - o How much to add? We recommend adding 2.5ml/5 gallon batch, or about 1/10th of a 1oz shot glass.
- After the two stage mash is done, proceed to the standard mash out/sparge stage.
 - o *If you would prefer not to do a two stage mash, then simply mash at 149-150°F for an hour. Do not bother adding Amylo 300 at the mash step, it will not work if heated beyond 147°F.*

- When it's time to boil, do a 90 minute boil instead of a normal 60 minute one. This will reduce potential DMS issues. In addition to this, try to have the lid off during the process.

Fermentation

Temperature control in the production of lagers is critical. Without dedicated temp control it can be hard to have the proper conditions to make a lager. Why is temperature so important? Lager yeast, if fermented warmer than 14°C, tends to give beer estery flavours. Esters are a fruity flavour developed during fermentation. For many beers, an estery flavour is great – not so much for lagers. Lagers are meant to be clean and crisp tasting.

- Aim to ferment between 10-14°C. Some yeasts do better cool or warmer, check your strain to get the right temp (we find W34-70 is the most forgiving lager strain). It's very important to hold this temperature. Having the ambient temperature go up and down will not be good for the beer.
- As you pitch the yeast, add 1/10th of a 1oz shot glass (2.5ml) of Amylo 300 to the wort. This will ensure a nice low final gravity in two weeks.
- Ferment in the 10-14°C range for 8 days.
- After 8 days it's time to start warming the beer up. Move it to a warmer spot - somewhere in the 16-18°C range for 1 day, and then the following day move it to somewhere 18°C-21°C and hold it there for 2-3 days.
- *Why move it to warmer temps? This is to guard against diacetyl. Diacetyl is an off flavour that develops in the yeast, and is naturally removed when exposed to warmer temperatures (18-21°C).*
- Summing up: 8 days at 10-14°C, 1 day at 16-18°C, 2-3 days at 18-21°C.

Secondary

- Take a hydrometer measurement. It should be at 1.006 or lower.
- Rack into a carboy and ensure there is no airspace, or add CO₂ to displace any oxygen that might be in the carboy.
- Move the carboy somewhere cold. Ideally it would be between 0°C-8°C, and let it sit and age for at least a week. Longer is better.
- In our experience, lagers benefit more than almost any other beer from aging time. What it tastes like post fermentation vs after a month of cold chilling can be pretty profound.
- If bottling, a lot of the aging can be done safely in bottle. Age in secondary for a week, and then bottle as you normally would – giving it two weeks post bottling to fully carbonate. Following that, move it into a fridge or somewhere cold and let the beer chill and age in bottle. Try to avoid opening a bottle for at least a few weeks.
- If kegging, we recommend giving it more time in the carboy. This way your kegs aren't being used by a beer that is not being drank, and it allows for a cleaner beer to go into the keg.

Summing Up

- Make the wort as fermentable as possible by doing both a two stage mash, and an Amylo 300 addition during the 1st part of the mash.
- Boil for 90 minutes with the lid off.
- Ferment at 10-14°C for 8-9 days, then bump it up to 16-18°C for a day, followed by 2-3 days at 18-21°C.
- Try to age in secondary longer than a standard ale. Lagers taste MUCH better when aged.

That's it! It certainly is a bit more work than a standard ale, but a well-made lager is a beautiful thing. Patience during production is essential to getting the best tasting lager. Brew a lager in October to enjoy in January.