The Importance of Pitch Rate

by John Giarratano, Inland Island Yeast Laboratories

When purchasing yeast at a commercial scale, it is extremely important to purchase the correct amount of yeast for a healthy fermentation. There are many reasons for this, but in basic terms, a beer that is fermented by yeast pitched at the proper cell count will finish in a predictable amount of time and have a consistent flavor profile. Yeast collected from beers that were pitched at the proper pitch rate will typically be more healthy and ready to be use for another beer. Thus, pitching yeast at the proper cell count will result in a higher quality product, and in the end, save money on yeast.

So what is the proper cell count? For yeast collected in the brewhouse and pitched into another beer, it is pretty common practice to pitch at 1 million cells per mL per degree Plato. What this means, is that if you were brewing a beer at an original gravity (OG) of 15 Plato, or 1.058 SG, you would want to have a cell count of 15 million cells per mL in the final volume of beer being fermented. This is after the yeast has been pitched into the final volume of wort and does not refer to the cell density of the container the yeast is delivered in.

How do you know how much you should be pitching? The math here gets a little complicated so most yeast suppliers will do the math for the customer and sell their product in some quantity like “pitchable units” or “pitchable bbls”. Yeast suppliers usually lower the cell density to 0.75 million cells per mL per degree Plato because it is understood that lab grown cells usually grow a little better and are in better metabolic shape than yeast harvested from a finished beer. This does make it important to know what density your yeast supplier is selling the yeast to you and adjust accordingly.

When purchasing yeast from a commercial yeast supplier it is important to give them the **total volume** of wort being fermented and not just the anticipated finished volume of beer, as well as an accurate original gravity OG that includes any significant sugar additions so that they can calculate the correct amount of yeast to sell you. Some brewers will knock out 12 bbls into a 10bbl tank. In this case you would want to purchase yeast for a 12 bbl volume of beer. Ordering a 10bbl pitch for a 12bbl volume is shorting your cell count by >16%.

Although it is important to get the cell count right with all fermentations, it is especially important to increase the pitch rate with high gravity beers. A high gravity fermentation is one that has an original gravity of 18P or 1.074SG. The issues that can occur due to under pitching a high gravity beer are many, but of particular importance are lagging starts, longer fermentation time, off flavor formation and stalled fermentations. Each of these can cause huge headaches in the brewery, tying up tanks with unfinished beer. It is always better to increase your pitch

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rate and overestimate the amount of pitchable yeast when brewing high gravity beers. Increased O2 and nutrients are also beneficial.

Brewing lagers is another case where increased pitch rate are necessary. Due to the cold temperatures that lager beer is fermented at, lager yeast typically grows slower, and thus more cells are required. It is recommended to pitch lager yeast at 130 – 150% the rate of ales. This increase in pitchable cells helps to ensure a lager fermentation proceeds in a predictable amount of time, cleans up undesirable VDKs and produces yeast that can be collected and pitched into the next lager.

Each of these topics could be an entire article on their own, so I encourage you to reach out to your yeast supplier and have a conversation about the size of the pitches you are purchasing and how that relates to the gravity, volume and style of beer you are brewing. Getting your yeast management on a solid foundation is the best way to ensure a predictable, consistent, and efficiently functioning brewery.

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John Giarratano started his career in the pharmaceutical industry while being immersed in sterile technique and GMP manufacturing. After a decade in pharma and biofuels, John changed industries and started Inland Island Yeast Laboratories. Since 2014 John has grown Inland Island from a lab in his basement to a full-scale yeast and bacterial manufacturing operation on the cutting edge of product quality and customer service.