Cold Crashing Home Brewed Beer

This week we look at the advantages of cold crashing your beer which can aid with clarity and also reduce aging time.

Cold Crashing

Cold crashing is simply the process of rapidly dropping the temperature of your finished beer before you bottle, keg and carbonate it. Typically temperatures are rapidly lowered to just above freezing, and this is done after the beer has reached its terminal gravity. Cold crashing historically was developed from the cold aging (lagering) process associated with lager beer styles, but it is now commonly used commercially for many ales. Cold crashing will improve the clarity of the finished beer but also has the significant advantage of reducing the aging time needed which is why it is used on many commercial beers.

How Cold Crashing Works

Cold crashing helps bits of proteins and tannins from the grains precipitate out more rapidly. This is due simply to the fact that many solids are less soluble at colder temperatures, and tend to precipitate out more quickly. You can further aid clarity using various finings.

Perhaps more important is the precipitation of yeast. Cold crashing yeast triggers a survival reaction that forces the yeast to "flocculate" or bond together in clumps. These larger clumps or "flocs" of yeast have a larger radius than individual yeast cells and will precipitate out more quickly due to Stokes law. Stokes law (broadly) says that larger radius particles have a higher settling velocity and will fall out more quickly. Again, certain finings like Irish moss can aid in flocculation of the yeast.

Cold Crashing at Home

While a commercial brewer can simply turn the temperature down on their glycol-chilled fermenter, home brewers most often use a refrigerator to cold crash their beer. Simply put your fermenter in the fridge or keezer and let it sit for a few days at cold temperature.

There are a few considerations that come into play for cold crashing:

- You don't want to cold crash your beer until fermentation is complete. There are still important biotransformations going on in the beer even late in the fermentation phase. Most commercial breweries wait until their beer has reached a stable terminal gravity, and verify that the beer stays there for a few days before cold crashing.
- Generally the faster you can chill your beer, the better, though in practice even commercial brewers can't chill their wort down in much less than a day. Putting your beer in a fridge or keezer will chill it fairly rapidly, but it may take 12 hours or more to reach cold temperatures.

- Generally the closer you can get the beer to freezing the better. Many commercial breweries work between 0.5 C and 5 C (33-41 F), but obviously you don't want to freeze the beer. Fortunately since the beer contains alcohol at this point it will have a freezing point slightly below 0 C (32 F).
- The length of cold crashing can vary. While you can get some benefit in as little as 24 hours, most brewers cold crash for several days to a week. Note this is different than lagering where you may maintain a cold temperature for an extended period.
- Some caution is needed if you have a one way airlock as cold crashing will result in negative pressure in the fermenter and can suck liquid from the airlock into your fermenter. Its best to use a two way (S-shaped) airlock or simply put some sanitized foil over the hole to avoid this problem.
- In most cases you want to dry hop after you cold crash. The cold temperatures used will make it harder to get aroma oils in the beer, and dry hopping closer to bottling will preserve more aroma. You can raise the temperature of your beer back up before dry hopping and bottling.

Those are some tips on cold crashing your beer at home. Thank you again for your continued support!

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