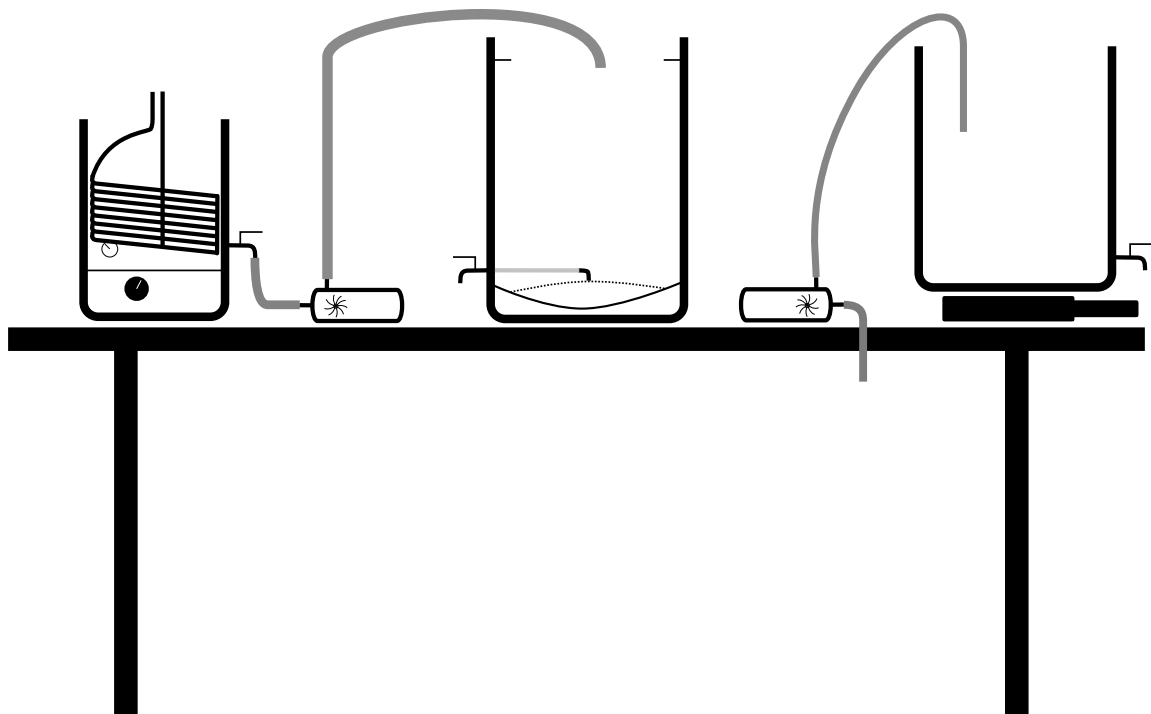


Setup the 3 vessels and pumps

The first step is to setup the 3 vessels and the pumps.

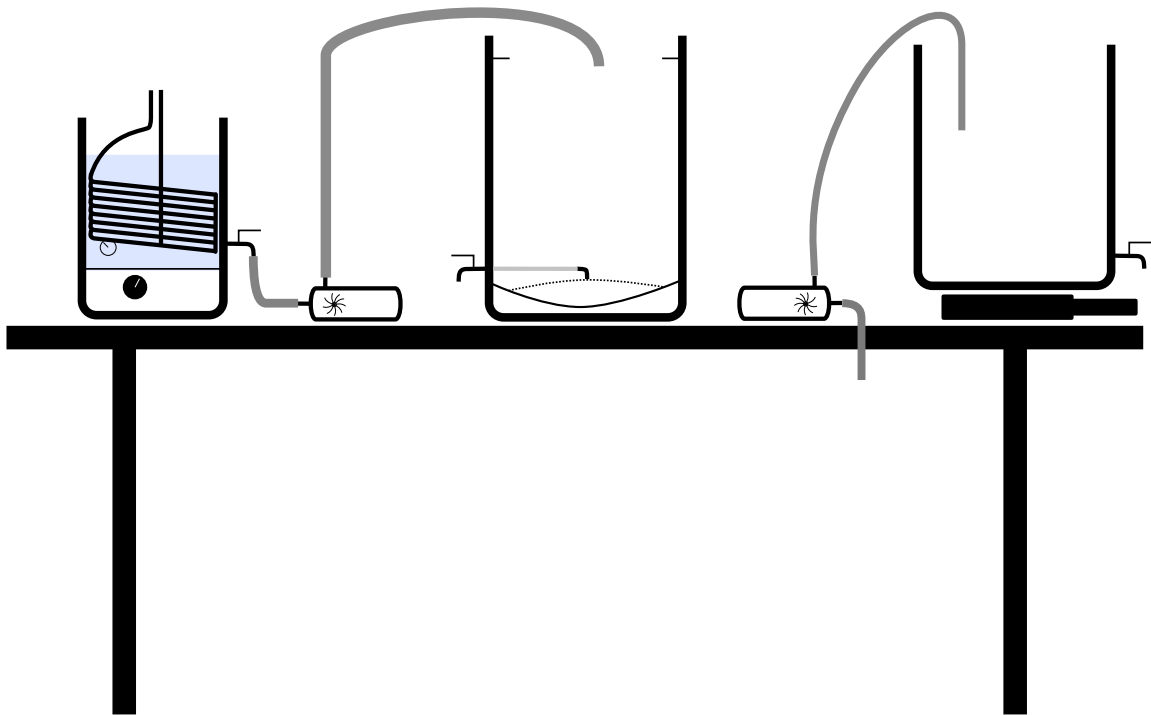


Heat the strike water

Now - we want to heat the strike water to almost the perfect temperature (we will fine tune it later). We heat the water in the urn because it is the most efficient (fastest).

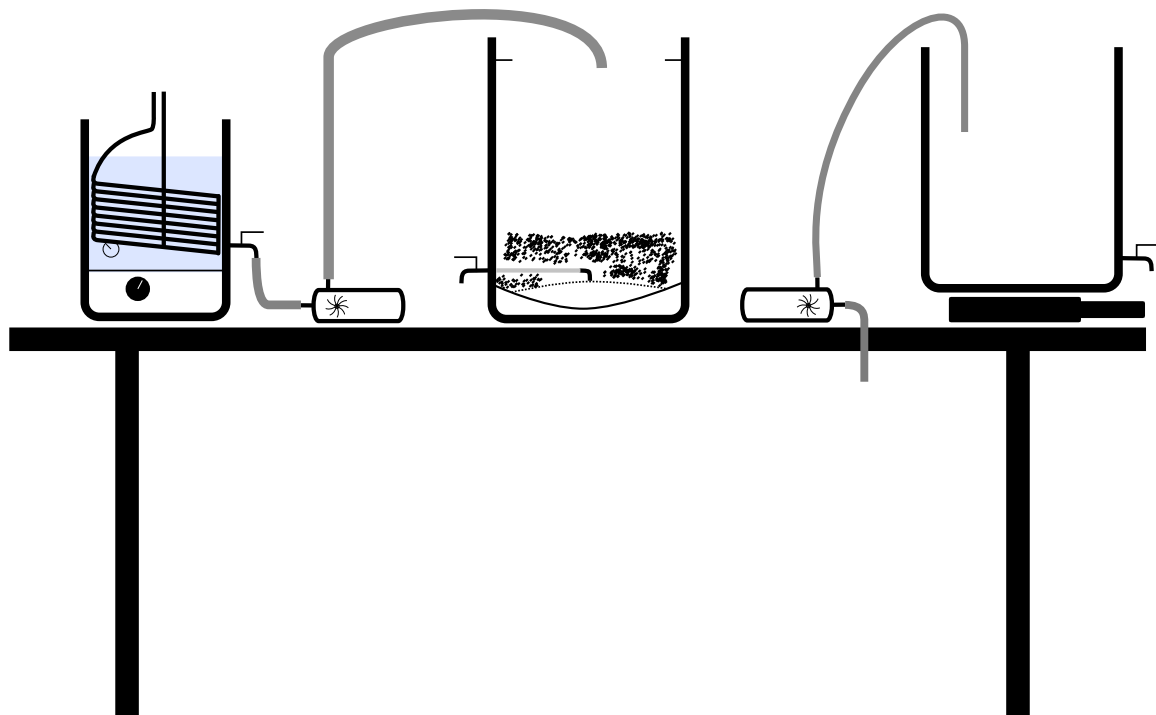
How much water in the urn? Measure the water for the "strike" - for a 19L batch - 13.5L is a typical amount of strike water (1 cm in the hot water urn = 0.8L - measure from the outlet level).

Heat the strike water to 72 (C) to end at a final temperature of 64 (lager - less body more alcohol) (C).



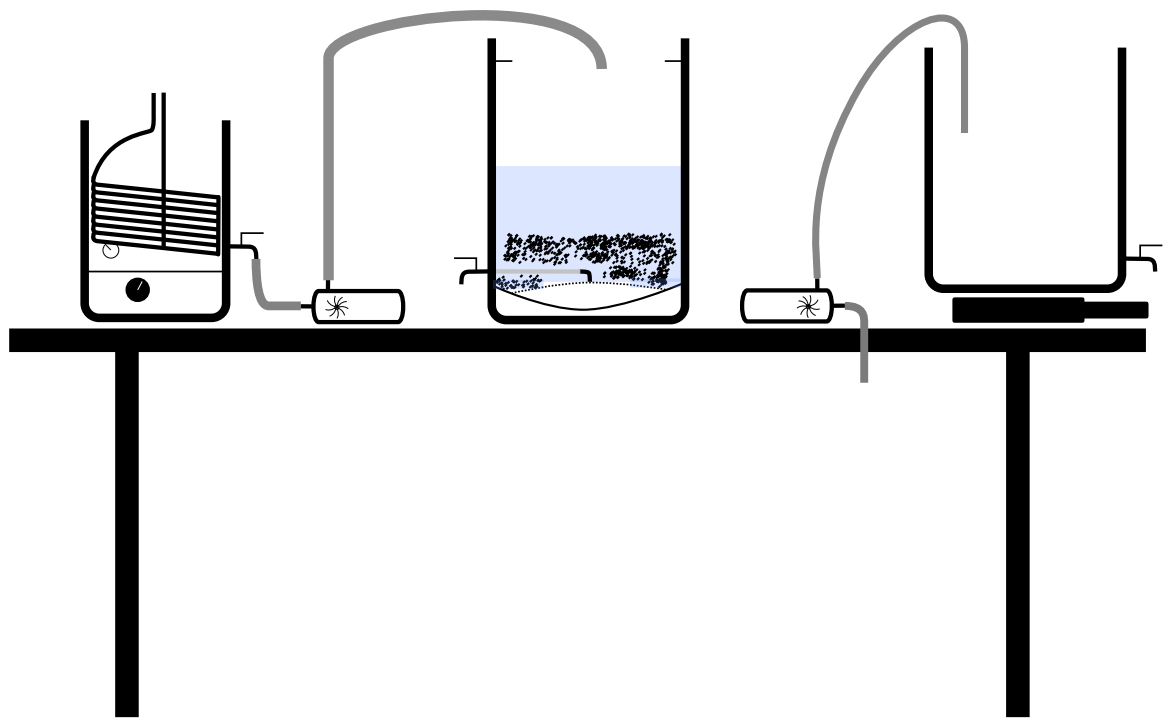
Crush the grains

Crush the grains and add to the mash tank (the keg with the false bottom)



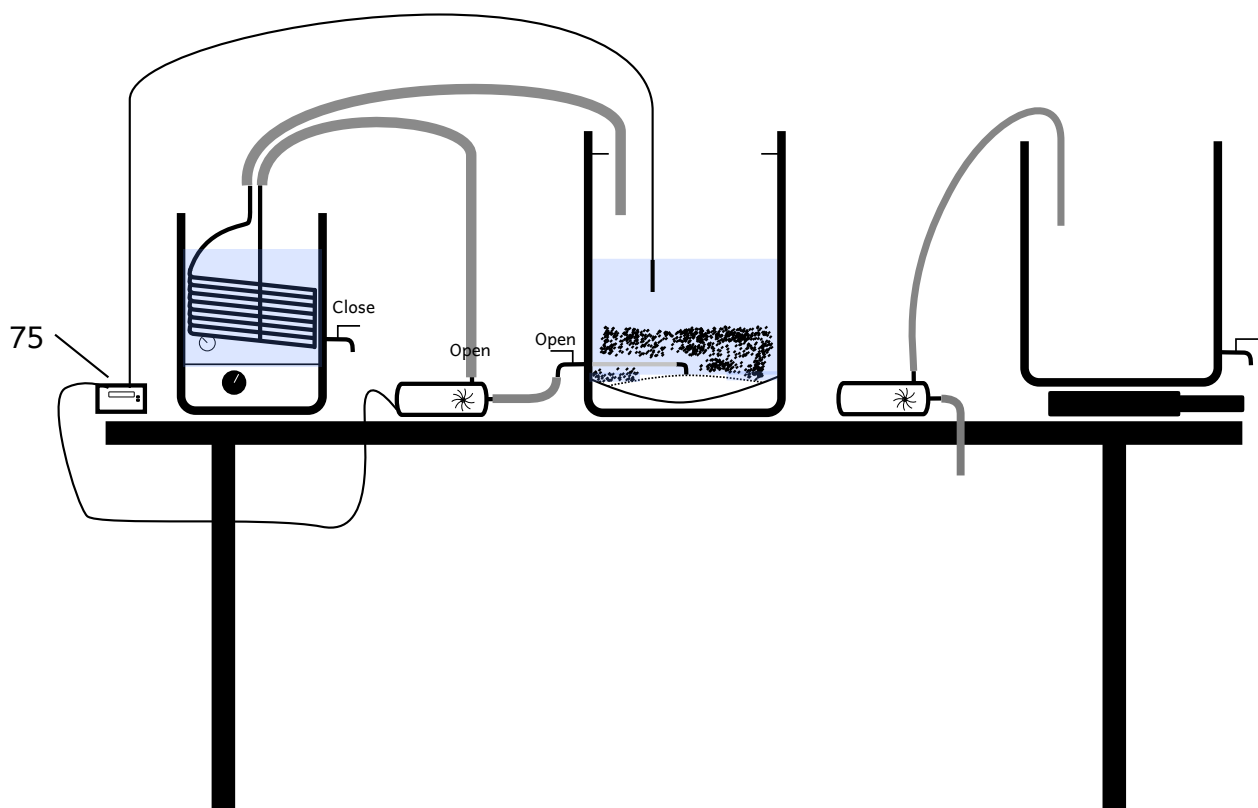
Strike!

Turn on the pump to pump all the strike water to the mash tank. Start timing the mash (see recipe - mine was 75 mins).



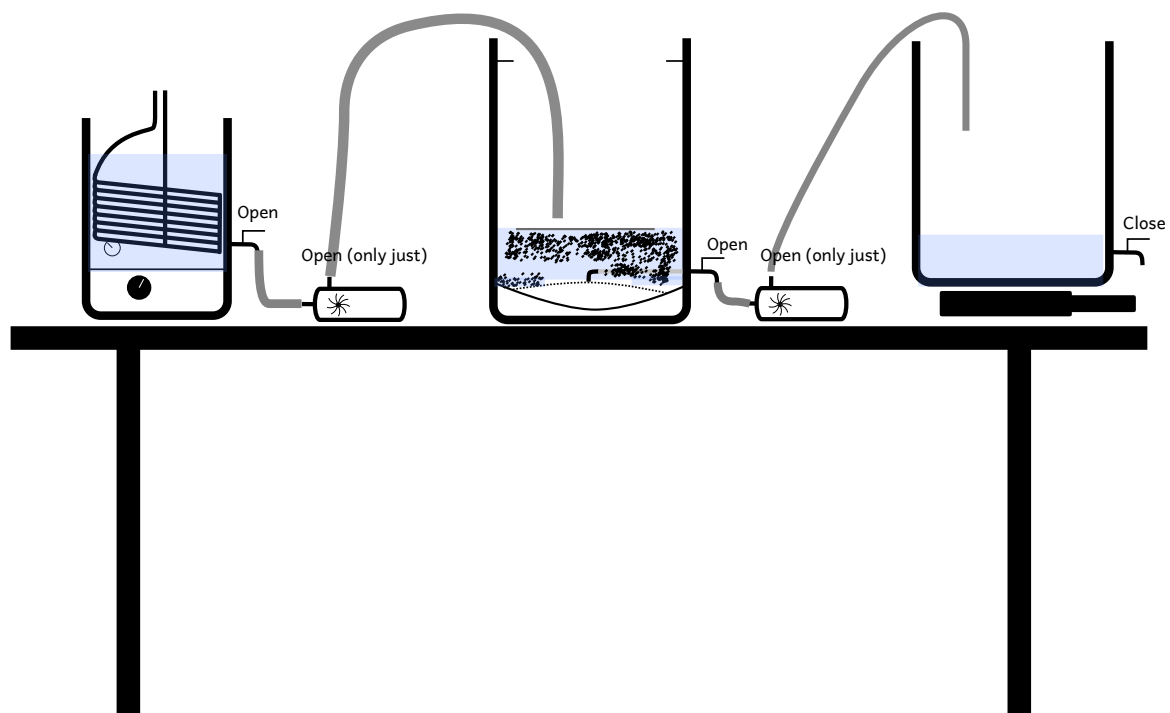
Mash out!

- * Raise the temperature on the temperature controller to 75.
- * Now is the time to make sure we have the exact amount of water in the urn needed to sparge.
- * My recipe says we need 17L of water to sparge (remember 1cm = 0.8L).
- * Let the temp of the mash rise to 75 C over 20 mins.
- * Keep stirring



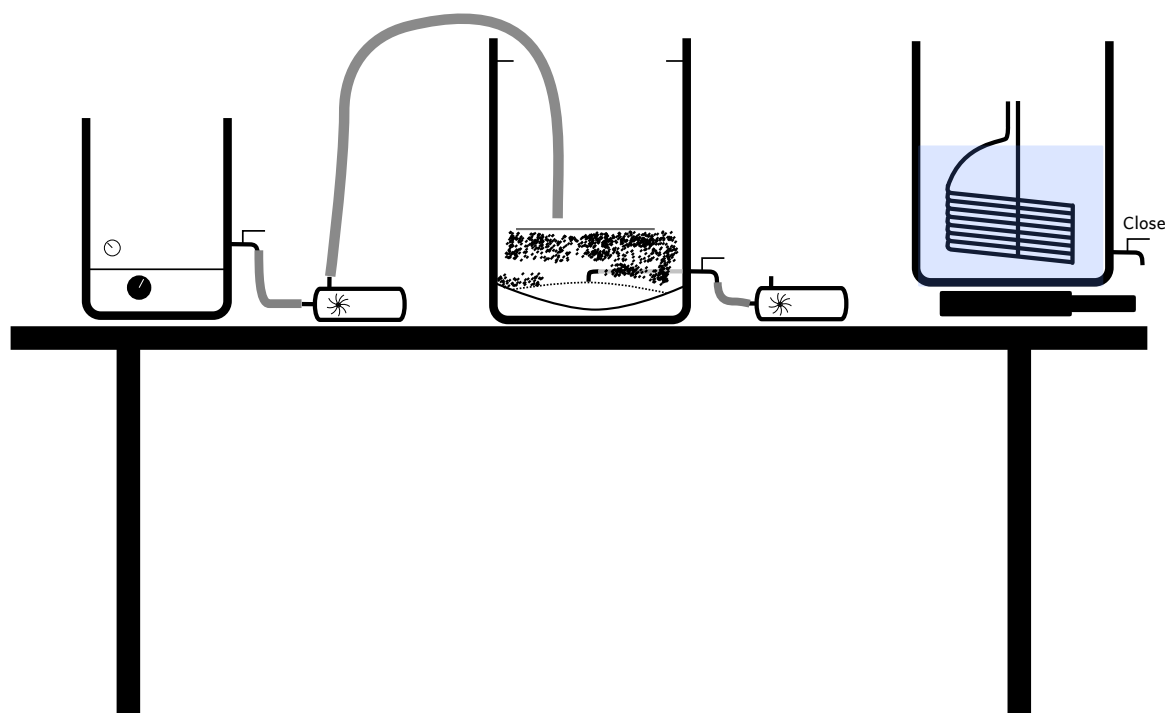
Fly sparge

- * Now we use both pumps at the same time to do a fly sparge.
- * Make sure we do not restrict the flow with any valves "before" the pump. Only restrict the flow with the valve immediately "after" each pump to prevent the pump cavitating.
- * Connect the pumps as shown - have the flow restricted after each pump so the valve is barely open (we are aiming for 1L per minute)
- * Put a circle of baking paper with holes in it on top of the mash.
- * Turn on the second pump first - wait until the level in the mash tank drops below the grains - now turn on the first pump.
- * The first pump should have a slightly higher flow rate than the second (we do not want the second pump running dry).
- * Turn each pump off as it runs dry (the first pump should run dry first).



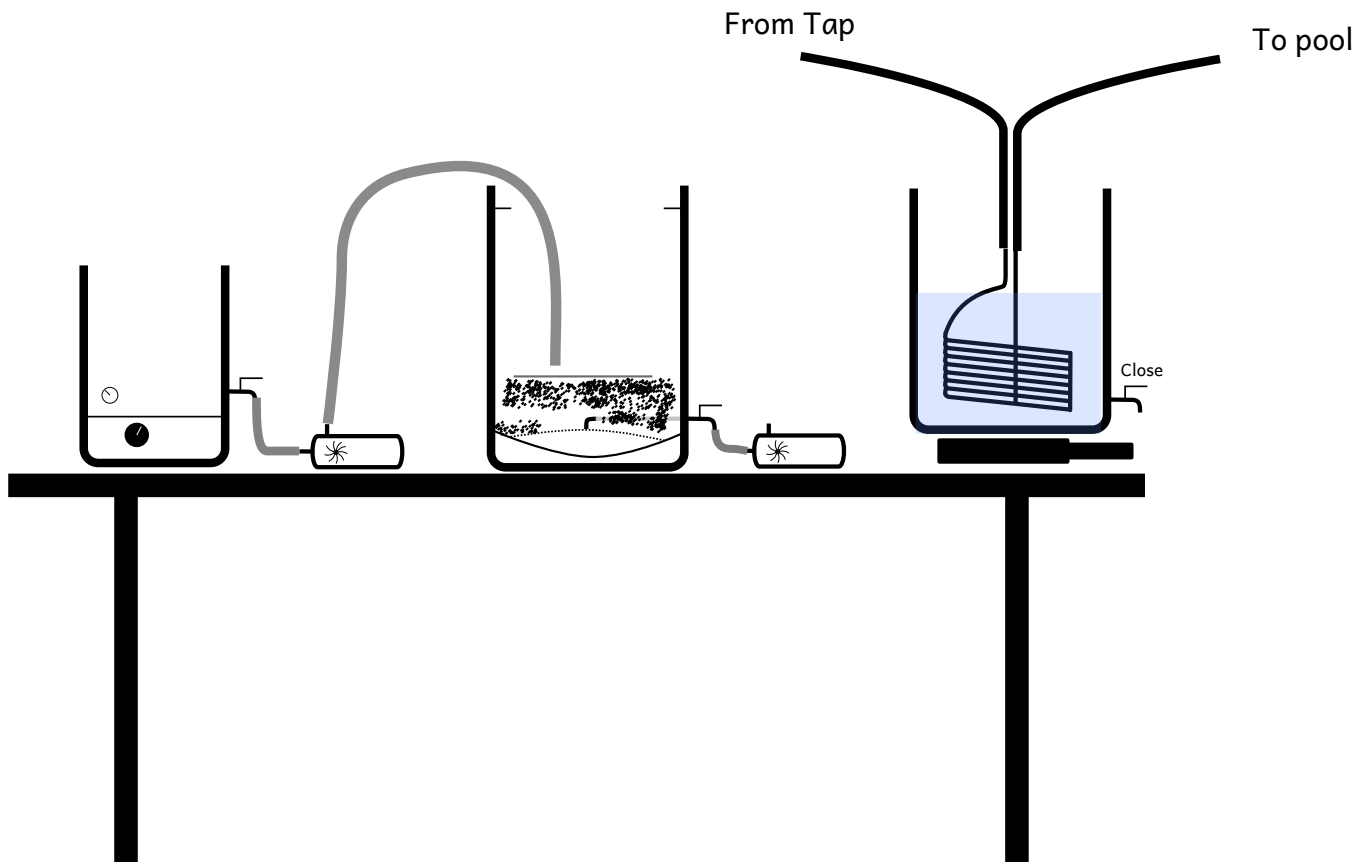
Boil

Now we boil for 60 mins (fully open rings 1 and 3), adding hops as required (in hops bags). The heat exchanger **MUST** be immersed in the liquid for at least the last 15 minutes of the boil (to sterilize it). Do not put a lid on the boil tank (gives bad flavours). We need a rolling boil (it won't boil over with the lid off).



Cool

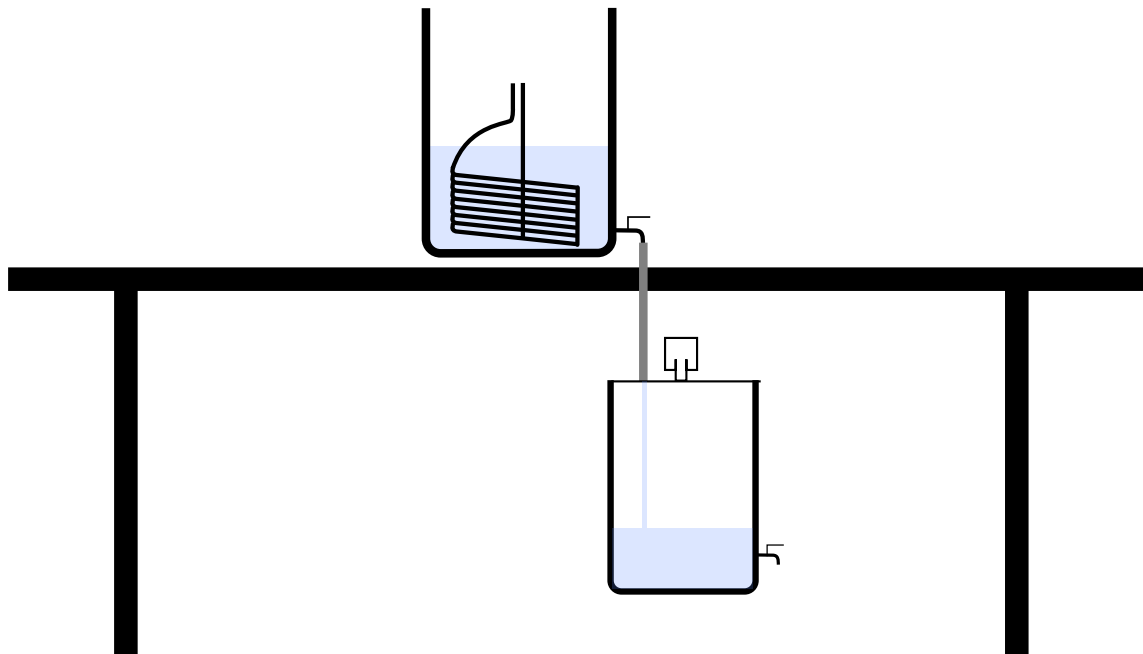
It is good to cool the wort as quickly as possible now to get a clearer beer (trub drops out of the suspension). Connect 2 hoses (with clamps) to the copper coil and run water through to drop the temperature until it is at pitching temp (I get it under 30, put the wort in the fermenter and put the fermenter in the fridge to get it down the last 10 C).



Transfer to fermenter

When the wort has cooled to below 30 C, we can put it in the sterilized fermenter and pitch the yeast. If adding hops at this stage, the hops bag **MUST** be sterilized (or don't use a bag and we can filter later). Just gravity feed the wort down to the fermenter.

Note - for sterilizing mix up one heaped teaspoon of keg and line cleaner in the spray bottle, and then after cleaning the fermenter with water + paper towel, spray all surfaces with the spray bottle (don't wipe off).



Clean Everything!

Clean everything - make sure to run water through the pumps and hoses (sanitiser is better).