

What is the worst thing about brewing our own beer? The early start! From then on the day improved. Great Heck Brewery had kindly agreed to let two of us come and help brew the Festival Special for this year's York Beer and Cider Festival. We were going to be brewing under the direction of brewer, Jason who had derived a special recipe – aiming at a 5% golden beer with plenty of Cascade hops.

After climbing a ladder into the small roof space of the brewery where the malt and hops are stored the first job was to weigh out the malt and load it into a wooden chute positioned above the mash tun. The pale malt was easy – we started off by the sack load. Then we added a small amount of roasted barley for colour, more pale malt then some crystal malt with more pale to finish up.



Melissa tipping the first bag of pale malt in under Jason's watchful eye.

With all the malt loaded up and ready to go we climbed back down the ladder to check the liquor (water!) in the hot liquor tank was at the right temperature and ready for use.



Malt ready for mashing.

The next step was to make porridge (or so it seemed). The malt and hot liquor both flowed into a pipe and then into the mash tun, forming a sloppy mixture that looked and smelt like porridge.



Allan stirring the “porridge” as the malt and hot liquor pour into the mash tun.

This continued until the mash tun was very full, but Jason’s calculations were correct and it didn’t overflow. Meanwhile Denzil had been getting on with the really important stuff, going to the local butchers and buying and cooking breakfast.



The mash tun is almost full.

With the mash tun full Jason checked the temperature and recorded the time on the brew sheet. This was a printout of the plan for the brew with spaces to fill in information as we went. The time the mash started was recorded and with it the time when the mash was done. This gave us plenty of time to enjoy the excellent breakfast Denzil had cooked.

Breakfast over and it was back to work. The aim of this stage was to produce wort – a mixture of water and the sugars from the malted grain. We tasted the mix soon after we started and it was already very sweet. Jason explained that the conversion from starch in grain to sugars started very rapidly after the hot liquor and malted barley were mixed. The grain / liquor mix sits on some sieve like plates near the bottom of the mash tun. Wort drains through this and can be collected from the bottom.

After the mash has sat for an hour and a half the next stage of this process begins – sparging. More hot liquor is added to the mash through the sparger – a pipe with holes in that spins round spraying the top of the mash with hot liquor.



Steam rises as the sparging arm does its job.

The wort at the bottom gradually drains out and is collected in an underback (a plastic tub that sits between the mash tun and the copper (which isn't made of copper)). The underback fills allowing the pump to have a steady flow of liquid as it pushed the wort up and into the copper.

Sparging ensures that the sugars that are being released from the malted barley are all washed through the mash and taken in the wort to become beer. Once this was complete the mash tun contained the spent grain which gets collected by a local farmer to feed to his pigs. We tasted the grain and it had very little flavour left – all the sweetness that was there before was gone leaving just husks. I'll leave those for the pigs in future!



Spent grain left in the mash tun.



The first sample gives an indication of the colour of the brew.

The wort was then in the copper which contains heating elements which are used to bring the mixture to the boil. This takes a bit of time so we are free to start cleaning up as we go along i.e. empty the mash tun. There is only one way to do this – dig, dig then dig some more. It was hot and steamy work, but before too long the bags that started off holding the malt were filled instead with the spent grain, tied up and left outside for the farmer.



Pig food!

Once the wort has come to the boil the time was recorded along with times by the next three entries – first hops, second hops and third hops so we deduced that we were going to add three lots of hops (all Cascade from the USA). This meant another trip up the ladder to the loft to weigh out the first hops which were added to the boiling wort in the copper and stirred in. The smell of hops was wonderful although the brew house was starting to get a little warm with the steam coming from the boil. At the specified times the second and third lots of hops were added and the mixture boiled until the specified time. Copper finings (made from seaweed) were also added to help the beer clear.



Hops being added to the steaming brew.



The second addition of hops.

At this point all we were missing to get beer is yeast and time. It is also the point where we had to switch from things having to be clean to everything having to be sterile. Before the boil any microorganisms on the malt or hops will be killed during the boil. Once this liquid is cooled down it is very important to keep everything out except the yeast we are adding.



Allan adds the all important yeast.

During the later stages of the boil the heat exchanger and the fermenting vessels were sterilised and rinsed thoroughly ready for the transfer. The boiling liquid is far too hot for yeast to be added when it comes out of the copper. Yeast (like other microorganisms) is killed at high temperatures. Therefore the very hot liquid is passed through a heat exchanger, a series of fine piped concertinaed together. There are two pipes, one in each direction that touch each other. Our very hot liquid went in one of them at one end and cold water entered the other at the other end. Heat is exchanged between the contents of the two pipes and cool wort and hot water leaves the heat exchanger. The water goes back to the hot liquor tank ready for the next brew (it is almost hot enough already) and the wort continues to the fermenting vessel.



Whoops!

We left the (soon to be) beer in the fermenting vessel for the yeast to do its work. After a few days it will be cooled down and racked into casks and delivered to the Knavesmire. That is when we will be reunited with our brew and will be able to taste the fruits of our labour.

The final task was to measure the original gravity of the brew with a hydrometer in order to calculate the final alcohol by volume (ABV). The calculations gave a likely ABV of 4.7%.

The beer will be called Union Gap after the US city near the Yakima Valley in Washington state where the hops are grown.



Jason completing the cleanup after the hops had been shovelled out.