

Simple All-Grain Beer Brewing

Introduction

When I started brewing I tried making beer from tinned malt extract, which is what you are supposed to start with as a beginner before 'graduating' to all-grain brewing. I found the end result was rather poor, as well as the whole process feeling a bit industrial rather than feeling like a traditional country craft. I decided to start all-grain brewing, and found it's not hard at all, in fact there are only a couple more steps to all-grain brewing compared to using the dreaded tins, and the result is 'proper' beer, the ingredients of which you have total control over. You can avoid any additives you don't want to drink in your final beer, and you can experiment with endless different beer styles and variations. And - you have Made Your Own Beer, rather than just fermenting the contents of a tin.

My main source of information when doing my first few batches was the section on brewing in John Seymour's 'Complete Manual of Self-Sufficiency', which is (like the rest of the book) quite short on detail, leaving you to work out the details yourself. [I suppose that's the whole point of self-sufficiency!] This is how I worked out a way to do a simple all-grain process with the minimum of initial outlay and no chemicals.

Equipment

John Seymour (in his *Complete Guide to Self-Sufficiency*) specifies all sorts of arcane and ancient equipment, like old wooden kives and barrels, which although I'd love to use them, are quite difficult to source and store. I wanted to make about 20-30 litres of beer each batch - enough to make it worthwhile, but not so much it would take a day to bottle it all.

The main piece of equipment is of course the mash tun and the boiler. Using a metal vessel meant I could use the same vessel for both jobs so I got a 30 litre stainless steel chef's stockpot (about £25 from eBay). I cut a hole in the front for a tap assembly (see below) and fitted a basic internal filter using stainless steel flexible hose sheathing as a crude filter system. (see pictures and appendix)

For Mash Tun

- 30 litre chef's stockpot (£25 from eBay, or try catering supply shops)
- Outdoor brass tap, plus hose connector and 3-4 ft of hose
- 12" of flexible hose sheathing (cut off connectors and pull out the rubber hose inside, leaving just the outer steel mesh)
- 1" Jubilee clip

List For Mashing and Hop Boil

- Wooden Spoon
- Weighing scales (need only be accurate to ½ oz.) and bowl
- Thermometer, capable of being sterilised and of reading a range of 30 – 100°C

List for Bottling

- Bottles or other vessel with enough capacity to take all the beer (20 litres beer = 40 Grolsch Swingtop Bottles) – note it is almost cheaper to buy 24 Grolsch Swingtop bottles with Grolsch in them, then it is to buy 24 empty swingtop bottles from a brewing supplier!
- Siphon tubing and clip to attach it to side of fermentation vessel
- 20ml syringe or other small measuring device (eg a spoon)
- Measuring Jug

The Simplified Brewing Process

Before starting

Plan the timings of the process around other jobs/commitments as there are considerable periods of inactivity. Boiling 30 litres of water on my wood fired Rayburn takes upwards of 2 hours, and may take longer on electric or gas hobs. Pick your recipe and weigh out malts and other grains while waiting for the water to come to the boil.

The below method is for a short steep (1 hour) meaning the whole process can be completed in a day. Another way to do it is to start the process later in the day, and leave the wort overnight to steep, draining down in the morning. Be aware though, that the malt contains bacteria which will start to give the beer a funny smell if left for more than 8-12 hours. Overnight steeping gives a stronger, more full-bodied beer.

1000h

- Start 30 litres cold water on the heat, to boiling point (to sterilise)
- Take off the heat when water reaches the boil, and start cooling to 66°C. Keep checking temperature until around 66°C. (The old fashioned way of checking this temperature, if you don't have a thermometer, is that you can see your face in the water – above this you can only see steam!)

1200h

- Add malts (depending on recipe), leave to steep for a period (depending on recipe).

1300h

- After steeping, open the tap to drain the wort down into the fermentation vessel. Consider 'sparging' with boiling water at this point if your recipe suggests it. Clear out malt grains and rinse boiler out.

1330h

- Tip the wort back into the clean boiler vessel, place back on the heat and bring to a rolling boil.

1400h

- Once boiling, add hops and boil hard for an hour or so depending on recipe.
- Notes on hop addition:
 - Bittering Hops – added at the start of boiling, give bitter flavour and preserve beer
 - Flavour Hops – added in the last 10-15 mins of boil, give hop flavours
 - Aroma Hops – added in last minute of boil, give the finer nose on the beer
 - Dry-Hopping – add dry hops (in a muslin bag usually) to the cooled beer when it's fermenting, this is used to make hoppy continental pale ales for example.

1500h

- Drain down immediately the boil is complete, into the fermentation vessel. Now the beer needs to be cooled quickly to fermentation temperature (30-35°C) before bacterial action starts to make it go off. There are special wort coolers available, but I found it's quite quick (and cheaper) to put the plastic lid onto the fermentation vessel most of the way round, leaving a gap for air to go in as the hot air cools, and put the whole vessel in the water butt, wedging it so the rim is above the waterline and it can't roll over. Within an hour it is cooled to the right temperature.
- Activate dried yeast in a jug of warm water with a bit of honey/sugar added

1600h

- Check temperature and 'pitch' your yeast

Fermentation takes 5-10 days depending on ambient temperature. Ales and bitters are usually fermented at room temperature, lagers ferment at 12-15°C. I usually bottle the beer at 7 days.

Bottling and Conditioning

Bottles

I prefer swingtop bottles as they are easy to clean and re-use. You can collect normal beer bottles and buy a crown-capping machine but this requires consumables (crown caps) and takes longer than flipping the top of a swing-top bottle.

Casks/Pressure Vessels

The ideal would be small wooden casks but I have never found these on sale. You can buy plastic pressure vessels which allow you to carry out the secondary fermentation (which makes the beer carbonated) in them, however I have had a lot of beer go bad in such vessels and it's never quite as nice as bottle conditioned beer.

Once the beer has finished the primary ferment, usually after about a week at ambient household temperatures, (there are technical ways to determine the degree of completeness of fermentation, but I just do it by timing) it can be bottled. If bottled too early or with too much priming sugar then the pressure built up in the bottle can explode it. If not enough priming sugar is added then the beer can be flat and tastes like what people imagine bad home-brew to taste of. *The key to getting good homebrew that people will drink (often in preference to bought beer) is the conditioning.*

I sterilise all the bottles in a dishwasher as and when they are emptied, and seal immediately they come out of the dishwasher while still hot. Put all the bottles on the floor in close formation with the lids open, and siphon the beer after primary ferment into the bottles, leaving a space at the the top of each bottle (for the gas that will be produced by the secondary ferment).

With the last pint of beer make a mixture of sugar and beer (which inevitably contains some live yeast from the bottom of the fermenter) in a measuring jug. I tend to use $\frac{1}{2}$ to $1\frac{1}{2}$ **tsp of demerara sugar or honey per bottle** and aim to dissolve this in about **5ml of beer per bottle**.

Thus if you have 40 bottles you need 200ml of beer and (say) 40 tsp of sugar/honey. Dissolve it all together and put 5ml of mixture in each bottle. I use a 20ml syringe for this which makes it easy and less messy.

Close all the lids, put the bottles in storage boxes, label them (at the very least with a batch number that you can reference to your records) and store.

After 1-2 weeks it is ready to drink but will keep for months.

The Next Batch

If you keep a bit of the thick layer of yeast on the bottom of the primary fermenter, putting it in a jug with some sugar, you can re-activate the yeast. If you time batches so that you are bottling one batch on or around the same day you are making the next batch, then you can take that yeast forward into the new batch. In this way you don't need to buy the yeast as often.

Problems?

- Funny smells and a thin white dusty layer on top of the beer usually means an 'infection', ie a bacterial or fungal contaminant has got in. Make sure all equipment is as sterile as possible before using with beer. Sterility is most important after the primary fermentation and during bottling.
- Cloudy beer? Let it settle in bottles for longer, then when pouring out do it in one smooth action, leaving the last (cloudiest) bit in the bottle. Bottle conditioned REAL beer is always a bit hazy. You can use additives (Isinglass - made from fish, or Carrageenan/Irish Moss – a type of seaweed) which form a gel in the beer and settle it out to make it clearer but I find they change the taste of the beer too much.

Further Reading

- 'The Complete Guide to Self-Sufficiency' - John Seymour
- 'Clone Brews'

Filter System

