

How to make 20,000 pints of beer.

by [Kiteman](#) on October 30, 2009

Table of Contents

Author: Kiteman	2
License: Attribution Non-commercial Share Alike (by-nc-sa)	2
Intro: How to make 20,000 pints of beer.	2
step 1: Raw materials	2
step 2: Preparation and control.	4
step 3: Wort.	5
step 4: Hopping	6
step 5: The best bit... ..	6
step 6: Firkin!	7
step 7: The fun part	9
step 8: Art and science	9
step 9: And a little history.	11
step 10: Credit where credit is due.	12
Related Instructables	13
Advertisements	14



Author: **PRO** Kiteman [author's website](#)

An East Anglian Maker, who spends a lot of time in a very small shed. Interested in science, kites, beer (proper beer, not lager) and the general Maker ideal.

Need help on the site? Drop me a PM.

Credo:

Faith, noun; Belief that does not rest on logical proof or material evidence.

"Faith is believing what you know ain't so" - Mark Twain

Science, noun; Set of processes that explain the universe and its contents through hypotheses and theories based on observable evidence.

I am in the universe, a part of the universe. I was not created, I am the most recent product of several billion years' worth of random mutation selected by environmental and sexual pressures, plus a healthy dose of accidents.

I am a unique individual, with my own mind, knowledge, skills, dreams. I am a husband, father, son and friend. I teach others and learn from others.

No god had a part in my genesis. I have no religious faith, although I respect those that have (so long as they do not expect others to share it without question). I take responsibility for my own actions, and bear the guilt for any wrong-doings without feeling the need to confess them to a higher being. When I die, all that will remain of me will be the memories held by those that knew me. I will go to neither heaven nor hell, nor will I be resurrected. When I am gone, I am gone.

To quote the famous philosophers; "Cogito ergo sum" and "I yam what I yam!".

"Those who can make you believe absurdities can make you commit atrocities" - Voltaire.

"READ CAREFULLY." "By reading this article, you agree, on behalf of your employer, to release me from all obligations and waivers arising from any and all NON-NEGOTIATED agreements, licenses, terms-of-service, shrinkwrap, clickwrap, browsewrap, confidentiality, non-disclosure, non-compete and acceptable use policies ("BOGUS AGREEMENTS") that I have entered into with your employer, its partners, licensors, agents and assigns, in perpetuity, without prejudice to my ongoing rights and privileges. You further represent that you have the authority to release me from any BOGUS AGREEMENTS on behalf of your employer."

License: [Attribution Non-commercial Share Alike \(by-nc-sa\)](#)

Intro: How to make 20,000 pints of beer.

There are several projects here for small-scale home brewing.

I thought I'd find out how they do it properly.

I turned to the Adnams Brewery, and enlisted the help of their Quality Manager, Belinda Jennings, who I first met in a field in Suffolk...



step 1: Raw materials

The thing about brewing is that there are no secret ingredients.

Water, malt, hops, yeast. That's it, for a proper beer.

What affects the final flavour is the way these things are treated.

The softness of the water, how dark the malt is roast, the species of hop, the strain of yeast.

Malt adds sweetness, and provides the sugar for fermentation. Yeast adds bitterness, especially to balance the sweetness of the malt, and the yeast, of course, turns the sugar into alcohol.

Most brewers (Adnams included) will happily give their recipes, but they won't give their yeast - established brewers have strains that are slightly different to other brewers' strains, and so affect the flavours. Adnams have been using the same strain of yeast since 1945.

<http://www.instructables.com/id/How-to-make-20000-pints-of-beer/>



Image Notes

1. Baby beer! This tiny smidge of yeast will be fed and nurtured until it has grown into quantities that will produce thousands of pints.



Image Notes

1. Hops are actually female flower cones - pressing them into pellets saves transport costs and makes them easier to handle mechanically.

Image Notes

1. Most beers have a light malt in them.
2. Adding different amounts of darker roasts adds chocolate / toffe tones to the flavours.

step 2: Preparation and control.

Malt must be milled, yeast grown and water boiled.

The remains of the milled malt go to be animal bedding - very little of anything is actually thrown away by Adnams.

In 2008, Adnams installed a whole new brew-house. As well as being highly controllable and automated (in-line systems weigh out ingredients instead of sacks having to be hefted in by hand), it also recycles the waste steam from the brewing process - it saves 30% on energy costs, but it also means that the brewery doesn't smell of brewing, which is a shame IMO.



Image Notes

1. Dust! The flaky remains of the malt get used for animals bedding.



Image Notes

1. A really bad photo of the malt being cleaned of grit and stones by vibrating screens.

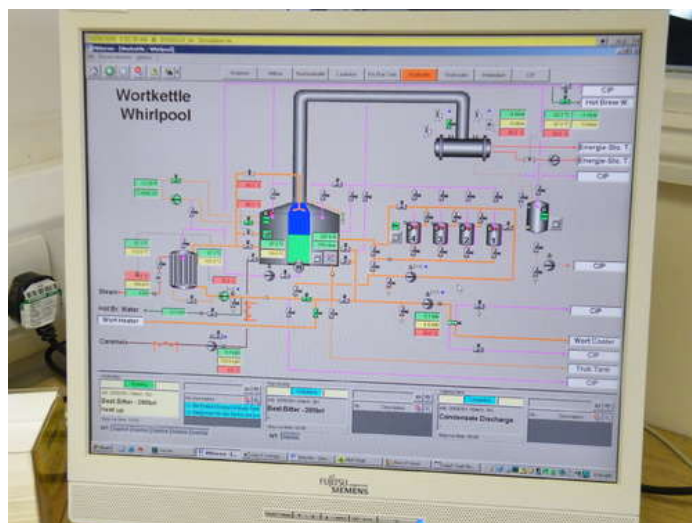
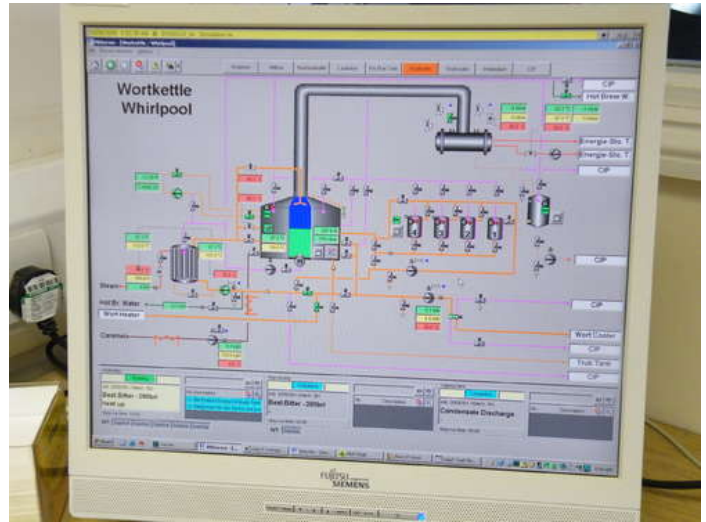




Image Notes

1. The "energy storage tank" - steam heated water, which can reach 90C.



step 3: Wort.

The milled malt is heated and stirred (mashed) with water in the lauter tun, for 90 minutes. This dissolves the sugars and other flavours out of the solid malt, making a liquid called *wort*.

The heating pattern - how hot, how long, when the temperature is changed etc - affects how much of what flavours are dissolved out of the malt, and will affect the final flavour.

When the wort is transferred to the next tun, the solids are left behind, eventually to end up as cattle feed.



Image Notes

1. An empty lauter tun.

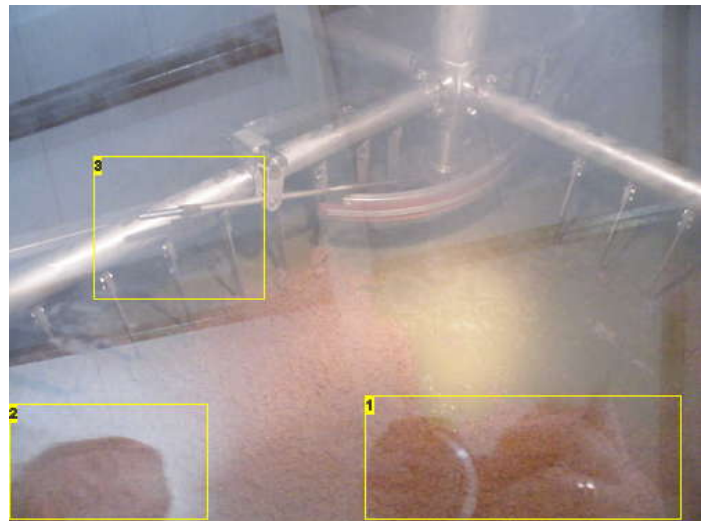


Image Notes

1. Camera.
2. Belinda.

3. Mash in the making.



Image Notes
1. Tun.

step 4: Hopping

Hops and bitterness, flavour and aroma to a beer.

Hops added early to the wort cook the longest and add most bitterness (the bitter flavourings are resins, which are harder to cook out of the hop). Hops added later provide flavour and aroma from oils which evaporate quickly when heated.

The timing of hopping has a huge affect on the flavour.

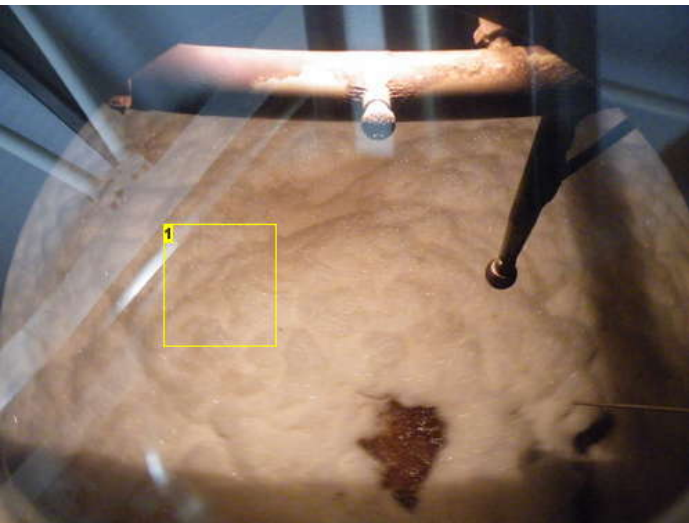


Image Notes
1. Hopped wort.



Image Notes
1. Hoppers for "dosing" hops at different stages of the cook.

step 5: The best bit...

The actual fermentation.

The yeast that was fed up on wort is added to the hopped wort, and warmed - the temperature is maintained in the region of 20°C. The exact temperature of the fermentation controls the fruitiness of the final flavour; slightly higher temperatures increase the fruitiness, slightly lower temperatures decrease it.

The beer spends three days being warmed, then is cooled to around 6°C for four days to mature.



Image Notes

1. Yeast propagation tanks. Remember that baby beer? This is where it grows up. Extra yeast is fed to local pigs. Being alcoholic, they tend to be 'happy' pigs.



Image Notes

1. Fermentation tanks.



Image Notes

1. 20,000 pints of Gunhill beer fermenting. The smell is AMAZING.

step 6: Firkin!

Beer travels to pubs in barrels.

Well, it used to. Actual barrels are quite large - 288 pints - so the vast majority of beer gets transported and sold in *firkins*, which hold 72 pints.

The barrels are all recycled - flushed with hot water, blasted with steam, and refilled whilst still hot.

The barrels are then moved to the edge of Southwold, to their warehouse with a living roof, ready for distribution all over the country.



Image Notes
1. A freshly-cleaned firkin.



Image Notes
1. The filling nozzle.
2. Tightly sealed.



Image Notes
1. Firkins.
2. Pins - 32 pints for the smaller venue.

step 7: The fun part

Sorry, I mean *quality control*...

All the brews are tasted as soon as they are ready. The process is very like wine-tasting, *except that you have to swallow*, because much of a beer's flavour is after-taste. No pansy slurp-and-spit here!

Samples from bottled batches are also tasted regularly through their shelf-life, and a month beyond; this is a non-pasteurised beer, and it is *potentially* possible for the flavour to alter with time.



Image Notes

1. Happy in their work.



step 8: Art and science

Brewing is one of those processes, like papermaking and smithing, that is equal parts precise science and black art.

Careful records of what goes in and what comes out have to be maintained for customers, food authorities, the customs and excise...

Samples are taken all through the system and monitored. Swabs are taken regularly to check for microbial incursion (remember, this beer is not pasteurised, so the whole system has to be scrupulously clean).

But, at the same time, the unexpected happens, like the Belgian-style beer that absolutely *refused* to settle its fines, no matter what they did...

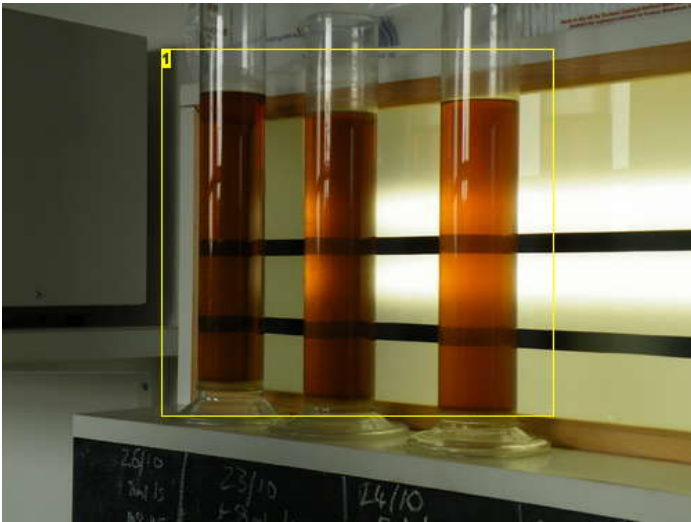


Image Notes

1. Visual inspection to check fines are settling.



Image Notes

1. Tests for alcohol content and calories at the same time. The most common question they get from the general public is "Which of your beers has the least calories?"
2. As well as showing me around, Belinda had her proper job to do at the same time.



step 9: And a little history.

The brewing house was refurbished in 2008, but Belinda took me to see what was left of the old methods.

"Proper" copper tuns and vats that were a pig to keep clean. Steam valves that had to be turned by hand. Wobbly steps that had to be climbed with sacks of hops. Picturesque, but unpredictable.

But... look at that view!





Image Notes

1. Just an old advert, but stuff like this is valuable. And haven't times changed? Beer brewed to make invalids feel better...

step 10: Credit where credit is due.

Naturally, I owe a massive debt of thanks to everybody at the Adnams brewery, especially:

- **Fergus Fitzgerald**, Chief Brewer, who gave permission for the whole thing (but, unfortunately, could not be there the day I visited)
- **Belinda Jennings**, Quality Manager, who looked after me on the day, giving me access-all-areas and fitting me around her proper job and a visit by shareholders.
- **Graham Gilbert** and **Colin Chambers**, who kindly allowed me to take their photo whilst about their work.
- Thanks also to all the other staff at the brewery who put up with me trailing around the place like a lost drunk.

I know this whole thing looks like an advert for Adnams, but it really isn't meant to be, it's just an insight into how the Big Boys go about the craft of brewing.

Oh, I do recommend that you favour them with your business - Adnams beers are all in my top-ten favourite brews, and I tend to be fussy about what I drink. They are also very environmentally aware as a company, producing a carbon-neutral brew, pioneering thinner bottles, and building a green-roofed warehouse, all of which got them crowned 'Carbon Innovator of the Year' by the Carbon Trust.

Oh, and about that field...

On the way to the brewery, I had a small, er, *incident*, and my Mini ended up in a field. Belinda and a colleague, Paul Hester, very kindly came and pulled me out of the field (which is more than the AA would do, despite me being a member for twenty-five this December!). If they hadn't done that, then this Instructable would probably never have happened.



Image Notes

1. Beer has been brewed in Southwold for almost six centuries.



Related Instructables



How to Make Beer (Cheaply, Simply): Step-By-Step Guide by tyghe



How to pour a beer by bhunter736



Ale Bread by cookingbytheseato



[Video] Homebrew Beer by trebuchet03



Beer Float by aqua_scummm



tap Cornelius Kegerator by g0mikese



How to make nettle beer by lemonie



How to Make Beer by imarunner2

