BEER AND BREAD

A comparison in yeast

Or how to irritate your yeastie beasties with winter

QUICK FACTS

- Brown ale and bread using same 3 yeasts
- Safale US – 05 : 2.1% alcohol
- Bread yeast: 2.1% alcohol
- Sourdough starter: 3.9% alcohol
- Bread is very forgiving.
- Yeast + flour + water = bread

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Beer

In the interest of building up a basic understanding of how different variables changed the beer I was making, I decided to examine yeast. I brewed with with modern all grain techniques (Brew in a bag). I prefer to work in 1 gallon batches for my experimentation, that way when it all goes horribly wrong, I haven't got all that many bottles of terrible beer to dump. This batch of beer has been trying to be that horribly wrong batch at every step.

I decided on a fairly basic English Brown ale recipe, lightly modified. ("1-Gallon Brown Ale Recipe - BeerCraftr," n.d.)

2.3 lbs Marris Otter
16 oz Caramel Malt 30L
3 oz Chocolate Malt

My original plan was to compare two yeasts, and I calculated my grain bill to reflect doing a 2 gallon batch. (More on this later.) I aimed for a 162F strike temperature (the temperature of the water when you put your grains in) and a 156F steep temperature, with a 60 min steep time. I brought the temp back up to about 168F for my mash out (wort brought to higher temperature for a short time before taking the grain out) and at that point, out came the bag of grain and let the bag drip without squeezing. The spent grain was set aside, and ultimately frozen to be used later. My recipe called for a 90 min boil, with 0.40 oz of Fuggles added at the start, and 0.60 oz of East Kent Goldings added in the last 5 mins.

Far too much water, and not nearly enough evaporation later, and I had way more than 2 gallons of wort at not even close to the OG specified in the recipe (1.048 per the recipe). After a panic trip to google for advice, and acknowledging that not only was the brew store closed, I did not have time to just

boil the daylights out of it, I added as much dry malt extract as I had in the house (not quite a pound), got the OG up to 1.038 and called it good enough.

The first gallon jug of wort got half a packet of Safeale US 05 as suggested by the brewstore. The second gallon jug of wort got 100g of Wilma, my active sourdough starter, cultivated from Pennsic wild yeast. At this point, I easily had another 2 gallons of wort, and rather than toss it down the sink, it went into the 5 gallon fermentation bucket with a generous sprinkle of Fleischmann's instant bread yeast from the fridge.

All three went to go hang out in my back room for a month, where it is quite cool. Especially in the bitter cold we have had this winter, the back room probably sits at about 16 - 18C. Bubbles in the airlocks gave a clue that fermentation was happening, but they stopped long before bottling day. Bottling day sees all three brews put into glass bottles with 15 g / gallon of cane sugar as priming sugar. My bottling day technique involves dissolving the priming sugar in a bit of water at the bottom of a bucket, and then siphoning all the beer out of the primary fermenter into that bucket, letting the swish of the beer itself mix the sugar in. From the bucket, it gets bottled into glass bottles and capped.

As predicted by the crazy low OG, the alcohol levels are also low. I got the same FG from both the bread yeast and the brew store yeast, and a lower FG from the sourdough.

Yeast	Original Gravity	Final Gravity	Alcohol %
Safale US 05	1.038	1.022	2.1%
Sourdough (Wilma)	1.038	1.008	3.9%
Bread Yeast	1.038	1.022	2.1%

Almost all brewing and baking yeast is of the species Saccharomyces cerevisiae (Fleischmann's included ("History of Yeast - Breadworld by Fleischmann's®," n.d.)), although within that species many strains can and do exist. Most bread recipes recommend about a 25C room, and the brewing guidelines suggest 18-28C for optimal fermentation. ("SafAle-US-05.pdf," n.d.)

When thinking this through, Wilma has been long established in the house, and is very well familiar with the fact that our house is cold. She stays in the fridge between feedings, but even when fed and active

and bubbly, I don't take any special measures to warm her up, so she's accustomed to hanging out in a house that tops out at 18C. It is unsurprising that in a cold back room, she did the best with fermentation. She is also made from wild yeast, and probably has multiple strains if not multiple species of yeast. I do not have any realistic method of working out what strains are present in my various samples of yeast.

Tasting will happen for the first time at KA&S, so stay tuned on the truly important part, how things taste.

Bread

The next half of the experimentation involved using the three yeasts to make bread. There's a lot of consideration in the modern brew community for what to do with the spent grain after brewing, and many make bread from it. While much of the sugar has been removed, it is still highly nutritious, containing protein, fibre and plenty of vitamins. (Ikram, Huang, Zhang, Wang, & Yin, 2017) I am of the opinion that in period, it was very likely given to animals as an indirect food source for humans. Dried and ground, it makes quite adequate barley flour, and used as is, adds good texture to bread. My spent grain was frozen to keep it from going off before I baked with it, and it was thawed before being added to the bread, as I've no handy collection of pigs to feed it to.

Basic bread recipe, as used for all three breads (generally).

2 tsp yeast (100 g sourdough starter)
400 g all purpose flour (350 g for sourdough)
100 g spent grain, unground
Water sufficient to make a slightly sticky dough

Mix flour and grain and water together (and sourdough starter for the sourdough), let sit for 45 mins. Add yeast (if required) and a pinch of salt and knead in the stand mixer for 7 mins. (an ongoing arm injury prevents me from kneading by hand) Let rise in an oiled bowl for 1.5 hr. Punch down, shape and let rise on a parchment paper covered cookie sheet for an hour. Bake on a tray at 425F for about 40 mins.

This methodology was not kind to the sourdough. It requires a whole lot more rise time than either of the dry yeasts, and it showed at every step. See Appendix A for all the bread progress photos, a timeline of Wilma being left behind. All three, however, managed to produce bread. Perfectly functional bread, although why my sourdough didn't brown I have absolutely no idea. The bread yeast rose the most (as is hardly surprisingly out of a yeast designed precisely for that purpose), the sourdough the least (and was the wettest dough), but yeast + flour + water = bread. The taste is very similar for all three, there was not enough sitting time for the sourdough to give very much sour flavour at all.

Bread is a very forgiving medium, if you are willing to work with your yeast, just about anything will give you bread. The fact that all three sources of yeast gave perfectly serviceable bread is hardly surprising. It is nice to have confirmation that yeast from the brew store doesn't somehow magically balk at being turned into bread.

I have to take steps to keep my bread warm enough to rise, and it seems clear that I need to start also taking steps to keep my beer warm enough to ferment properly in the winter. This is hardly the last batch of winter beer I'm going to brew, and bread is an eternal in my life.

Bibliography

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Appendix A

The progression of bread rising. Sourdough is at the top of the picture, brew store yeast in the bottom left and bread yeast in the bottom right, unless otherwise specified.

After mixing.

After 45 min rest.

After first 90 min rise

After second 60 min rise

Brew store yeast is on top, sourdough in bottom left and bread yeast bottom right.

Fully baked.

Bread yeast left, sourdough back right, brew store yeast front right.