



## SOURCE NY: RAW GRAIN PROJECT

### RAW GRAIN SESSION IV: RAW SPELT SOUR BEER

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Today's experiment is threefold:

- 1) How will raw spelt, hull on, behave in a mash?
- 2) Can a large percentage of raw spelt be used in the mash?
- 3) Can we brew an exciting fresh sour beer with spelt?

The beer is modeled on an American-style kettle sour Berliner Weisse, but with local raw spelt standing in for the usual wheat.

### INGREDIENTS

The spelt comes from Wrighteous Organic, a grower close to Helderberg Brewery whose raw red wheat we've used many times. On first inspection, the grain is beautiful-shimmering and flaxen, but there is a LOT of hull! With the lil' barley crusher we have here, the grain would only pass with the rollers spaced out as far as possible. Inside each cluster there are two small kernels- though the grain did not seem to mill at first, when I ripped open the hulls, the kernels inside were crushed. I proceeded after passing the spelt through the mill twice.

### RECIPE

To maximize the impact of the spelt, I wanted a very high percentage, but fear of a very gummy mash or low extract owing to scarcity of amylases led me to only use 50% spelt. At Captain Lawrence I have had lautering trouble with as little as 10% spelt (albeit huskless spelt from Germany). I proceeded with a recipe of 25# spelt and 25# Argyle pale 2-row malt, with a medium liquor:grist ratio (around 2.5l:1kg).

### PROCESS

**Mashing:** The grain bed was quite strange during mash tun- the spelt is buoyant, so the top of the mash appeared dry. Certainly the top bit of grain did not have access to water. I considered flooding the mash tun with more water but was concerned that would reduce extract as well. I ended up accepting the mash as it was and hoping I'd get some extract from the dry grain during sparge. This problem could have potentially been solved by mashing in the spelt first and weighing it down with malt.

I gave the mash a good long rest in order to allow water to penetrate the spelt and to give more time for the starch in the spelt to gelatinize.

**Vorlauf:** I had vorlaufed twice, once for 15 minutes at the one hour mark, once for ten minutes at the 2 hour mark. The wort clarified surprisingly well, turning a hazy straw hue.

**Runoff:** I ended up seeing minimal change in gravity between 1.5 hours and 2 hours of rest, so I began runoff with 2 hours, 10 minutes of rest.

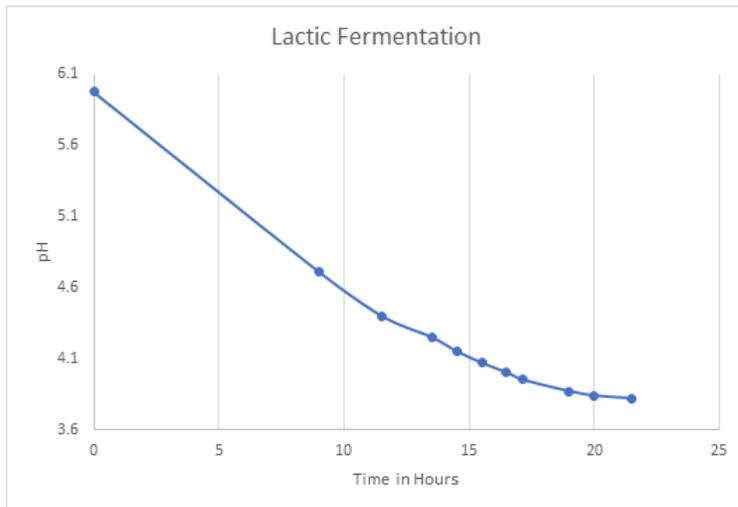
**Boil:** The wort boiled for ten minutes, then I recirculated it through the heat exchanger, cooling it to 125 F. Then the fun: in went a quart of Hudson Valley plain yogurt. I fed a hose bleeding CO2 into the kettle and left the building for the night.

What a surprise that the pH had already dropped significantly and the temperature had only dropped to 85 F 8 hours later at 6:30 AM! I monitored the pH and taste throughout the day, occasionally raising the temperature back to 95 F. Below is a graph of the pH over time:





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Brewery to try it for yourself! It looks like it'll end up a bone-dry, hazy straw-colored lemonade of a sour beer, around 4% ABV!

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At 21.5 hours, I determined the lactic acid bacteria had done the bulk of their work and started to raise the wort to a boil. I proceeded with the negligible hop addition,

## FERMENTATION

I had some dry Pasteur champagne yeast handy so I pitched it for *Saccharomyces* fermentation, knowing that yeast is quite acid tolerant and hoping some of its fruity characteristics will be a fun complement to the wort.

## CONCLUSIONS

1) How will raw spelt, hull on, behave in a mash?

The raw, hulled spelt floated on top of mash. This likely reduced the extract. The problem might have been solved by mashing in the spelt before the malt.

2) Can a large percentage of raw spelt be used in the mash?

Based on this trial and Helderberg Brewery's equipment, it appears that 50% was as acceptable percentage of raw spelt.

3) Can we brew an exciting fresh sour beer with spelt?

I'll let you know how it turns out, or come by Helderberg



# HELDERBERG BREWERY BREWHOUSE LOG

Brew Date: 12/08/17 Brew Name: Sour

Brewed By: Henry / Sturges Batch ID: 120817

## GRAINS

Amount	Malt	Batch/ Farm
25	Pale malt	Argyle
25	Speltz	apt light color
	1 qt. HUDSON VALLEY plain YOGURT	
Total:		

Mill Setting: Varied

Crushed Grain Temp: ~70  
 KETTLE SOUR: 1 hr REST - 15 MIN VORLAUF  
45 MIN REST - 10 MIN VORLAUF

## MASH

Initial Mash Water Temp: 172  
 Adjusted Mash Temp: 153  
 Initial Mash pH: 5.71  
 Adjusted Mash pH: —  
 Iodine Conversion Test: — TASTE  
 Sparge Water Temp: 174  
 Sparge Start Time: —  
 Approximate Volume Used for Sparge: 12 GAL

Initial Mash Water Volume: ~19 ~10 MIN BOIL  
 Mash in start time: 5:25  
 Water Adjustment: — Lactic Acid 88% WALHILL  
 Mash Water Volume with grains: —  
 Mash Out Temp: 152 / 167 Time: 55 MIN to 135  
 Sparge Method: BATCH  
 Sparge End Time: —

## BOIL

Pre-Boil Kettle Brix: 1.054  
 Boil Start Time: 9:30 PM  
 Hop Additions:

Pre-Boil Kettle Volume: 22 GAL

Schedule	Variety	Type	Amount	Alpha	Time added	Batch/Farm
	CASCADE		2.02	~6	60	CON DEELLA

Boil Kettle End Time: 10:30 PM  
 Chilling Method: H. EX  
 Chill Start Time: 10:50  
 Ambient Temp: 71

Whirlpool: 10:10 10:6  
 Fermenter #: STEEL  
 Chilled Wort Temp: 66  
 Chill End Time: —

## FERMENTATION

Wort Volume: ~22 GAL  
 Wort Adjustment: —  
 OG 2: —  
 Pitching Volume: ~5 GAL  
 FG: —

Prebacteria Gravity: 1.032  
 OG 1: 1.034  
 New Wort Volume: —  
 Yeast: RED STAR PAVEUR CHAMPAGNE  
 Dry Hop/Additions Schedule: —

pH

MASH	5.71				
KETTLE	10 PM 12/8	5.98	125°F	PITCH	YOGURT
	7 AM 12/9	4.71	89°F		
	9:30	4.4	89		
	11:30	4.25			
	12:30	4.15	85	85	85