King's Rye Porter - #153

Description

Based on many AHA & other recipes, with dry Safale US-05 yeast. Makes ~5.4 gal, 57 IBU (65 per BeerSmith). 6.0% (v/v) alcohol, and 211 calories in 12 oz.

Brew (Brew day takes ~8hr, see page 2 for mashing details)

1) **Yeast**, use Chico yeast, this one was 2 packs Safale US-05, rehydrate*
2) **C filtered** 14 gal. H_2O day before. Also, add 1 Campden tablet per 20 gal. the night before.
3) **Grain Bill** (17.25 lb. total grain) based on 70% extraction efficiency, got 63%?
   11.5 lb. Marty's 2 Row 2 lb. Rye (11%) ½ lb. Acidulated (2.7%) 1 lb. Munich, Light (6L, 5.5%)
   ½ lb. CaraBrown (55L, 2.7%) 1 lb. Pale Choc. (200L, 5.5%) ¾ lb. Chocolate (340L, 4.1%)
   1.25 lb. Cane Sugar (5.5%) ~$26.00
4) **Mash-In** – 1x infusion, 147-150°F, use 1.25 qt./lb., 5.6 gal of 161°F strike H_2O, heat to 173°F, for 17 lb. base malt, hold 40 min. (this one was 173°F in the kettle, and 1??°F strike, needed 0 pt. RT, got 149-147°F mash.
5) **Water Adjustment** – 2 min. into Mash, add 3 gm. Gypsum, $CaSO_4$, & 0 gm. Epsom Salts, $MgSO_4$, 2.9 gm. added to mash remaining 5.5 gal. of 11.1 gal. mash water (7.5 gal. in brew pot), so;
   84 ppm Ca, 10 ppm Mg, 79 ppm SO_4, 60 ppm Cl, 35 ppm Na. SO_4/Cl=1.3 See Palmers-Water-Calc-VanillaRye Porter153.xlsx . Took pH sample 18 min. in, got pH = 5.0, after mash, pH = 5.2, also pH = 5.3 after boil. OK,. EZ_water_Calculator_3.0.2-VanillaRyePorter153.xls says 5.33.
5) **Mash-Out** Add 5.5 gal. 180F H_2O, for 165-170°F. I got 163°F. Recirc. to clarify, 7 min..
6) **No Sparge** – At 165-170°F, collect **7.5 gal.,** got 8gal. Expect 70% extr., got 63%.
   I.G. target = 1.062. Adjust for S.G = 1.055, so get S.G. = 1.045 avg. runnings, plus table sugar (+7 pts) & yeast (-1pts), got 1.048 avg. 3 pt. high. Post boil 1.052, without cane sugar, so I added 0qt. H_2O. Got 3 pts. low, due to ????.
7) **Boil Adds** (78 min. total boil of full volume)

1 oz **Magnum (3.2%)** pellets, no bag	**57** min. boil left
1 tsp **Irish Moss,** 4 tsp **Yeast Nutrient & ½ Zn tablet**	**14** min. boil left
1 oz **EK Goldings (4.5%)**, pellet hops, no bag	**12** min. boil left

8) **Rehydrate the Yeast** – (slightly foamy, 8"x8" Pyrex pan to rehydrate 2 packs US-05).
7) **Hop Back**, loaded with 3.1 oz. **HG,** 2013 & 2015, ~2.5% AA, whole.
9) **Whirlpool for** 7 min., oops, also 15 min. late due to slow Hop Back & cooler setup.
10) **Counterflow Cool** wort to 78, wanted 66°F, into 6.5 gal. carboy (grnd water 73°F, took overnight w/ wet towel)
11) **Oxygenate**, 20 hrs later, 1.5 min. 0.7 liter/min. pure O_2, add blow-off. pH = 5.3 (5.3 expected.)
12) Carboy with blow-off, 67°F, w/wet towels, RT = ~70°F

Fermentation

1) **Primary** @66-68°F for 6days with wet towel, then let raise to 70°F for 3 days. 5 days in added 1.25 lb. sugar, 1 day later (9 so far) heat on in chamber, to 72°F for 2 days, then wet towel to 63°F for 4 days.
2) **Kegged** 9/19/16 (2.0 hr), no dry hop. . Set for 7 days in Brewery, fridge for 3 days & hops out. Got 5.4 gal. pH = 4.6
3) **Vanilla Added**, 510 drops of extract 9/27/16, after 2/3 of that was "OK" by John B., little if any vanilla flavor.

Results

1) Brewed 9/3/16, got 63% grain extraction.
2) 1.061 to 1.017 is 72% apparent attenuation, good atten., low I.G., lots of dark malts, sugar, & healthy yeast
3) Good chocolate flavor, smooth, not bitter enough

***Rehydrate Dry Yeast**

Per John Palmer pg 72. Warm **11.5 gm**. yeast pack to RT. Prepare **115 ml** of sterile H_2O at **105°F**. Sprinkle yeast onto H_2O surface, wait **15 min.** Stir into a cream, wait **15 min., should foam up.** Adjust temperature to within **15°F** of wort, pitch.