League George (AG)

Best Bitter (11 B)

Type: All Grain
Batch Size: 23.00 L
Boil Size: 28.50 L
Boil Time: 60 min
Final Bottling Vol: 22.00 L
Fermentation: Ale with Diacetyl Rest

Date: 18 Mar 2021
Efficiency: 75.00 %
Est Mash Efficiency: 81.5 %



Brewing Notes:
The suggested mineral additions assume an average NZ water profile and should be fine for most NZ water sources. The target water profile in ppm is Ca - 75, Mg - 10, Na - 10, SO4 - 100, Cl - 50.

Add the dry hops once fermentation slows but while there is still active fermentation to ensure the yeast cleans up any oxygen that is introduced.

1. If flavour minerals are available, add to boil only as mash pH is taken care of with acid malt. The target mash pH is 5.2 - 5.4.
2. If available, add sufficient lactic acid to the sparge water to lower the pH to 5.6 prior to heating (~ 0.5 - 1.5 ml depending on water source).
3. If available, add kettle finings and yeast nutrient 15 min before the end of boil.
4. At flameout, cool the wort to 90C, add the whirlpool hops and maintain for 20 min. When complete, cool to pitching temperature.
5. It is recommended that the yeast be rehydrated per the manufacturer's instructions. Pitch at 18C, maintain for 48 hours then allow to rise to 20C.
6. Once fermentation slows (~7 days), add the dry hops and raise the temperature to 22C for a diacetyl rest. Maintain until fermentation is complete.
7. If possible, cold crash to 2C and let settle for at least 48 hours before packaging.
8. Carbonate to 1.9 - 2.2 volumes of CO2.

Mash or Steep Grains

Mash Ingredients

Amt	Name	Type	#	%/IBU	Volume
3.700 kg	Pale Malt, Maris Otter (Thomas Fawcett) (5.9 EBC)	Grain	1	83.6 %	2.41 L
0.200 kg	Gladfield Dark Crystal Malt (190.0 EBC)	Grain	2	4.5 %	0.13 L
0.200 kg	Gladfield Gladiator Malt (10.0 EBC)	Grain	3	4.5 %	0.13 L
0.175 kg	Gladfield Sour Grapes Malt (acid malt) (4.0 EBC)	Grain	4	4.0 %	0.11 L
0.075 kg	Gladfield Medium Crystal Malt (100.0 EBC)	Grain	5	1.7 %	0.05 L
0.075 kg	Gladfield Toffee Malt (10.5 EBC)	Grain	6	1.7 %	0.05 L

Mash Steps

Name	Description	Step Temperature	Step Time
Saccharification	Add 15.45 L of water at 72.1 C	67.0 C	60 min
Mash Out	Heat to 76.0 C over 10 min	76.0 C	10 min

◯ Fly sparge with 17.48 L water at 76.0 C
◯ Add water to achieve boil volume of 28.50 L
◯ Estimated pre-boil gravity is 1.039 SG

Boil Ingredients

Amt	Name	Type	#	%/IBU	Volume
50.00 g	Willamette [4.50 %] - Boil 60.0 min	Hop	7	25.8 IBUs	-
5.60 g	Gypsum (CaSO4) (Boil)	Water Agent	8	-	-
2.90 g	Calcium Chloride (CaCl2) (Boil)	Water Agent	9	-	-
0.50 Items	Whirlfloc Tablet (Boil 15.0 mins)	Fining	10	-	-
1.50 g	Yeast Nutrient (Boil 15.0 mins)	Other	11	-	-

Steeped Hops

Amt	Name	Type	#	%/IBU	Volume
25.00 g	Goldings [4.50 %] - Steep/Whirlpool 20.0 min, 90.0 C	Hop	12	3.7 IBUs	-
25.00 g	Willamette [4.50 %] - Steep/Whirlpool 20.0 min, 90.0 C	Hop	13	3.7 IBUs	-

◯ Estimated Post Boil Vol: 26.00 L and Est Post Boil Gravity: 1.044 SG

Cool and Transfer Wort

◯ Cool wort to fermentation temperature
◯ Transfer wort to fermenter
◯ Add water if needed to achieve final volume of 23.00 L

Pitch Yeast and Measure Gravity and Volume

Fermentation Ingredients

Amt	Name	Type	#	%/IBU	Volume
2.0 pkg	SafAle English Ale (DCL/Fermentis #S-04) [0.02 L]	Yeast	14	-	-

◯ Measure Actual Original Gravity _____ (Target: 1.044 SG)
◯ Measure Actual Batch Volume _____ (Target: 23.00 L)

Fermentation

◯ 18 Mar 2021 - Primary Fermentation (2.00 days at 18.0 C ending at 18.0 C)
◯ 20 Mar 2021 - Secondary Fermentation (5.00 days at 20.0 C ending at 20.0 C)
◯ 25 Mar 2021 - Tertiary Fermentation (5.00 days at 22.0 C ending at 22.0 C)

Dry Hop and Bottle/Keg

Dry Hop/Bottling Ingredients

Amt	Name	Type	#	%/IBU	Volume
25.00 g	Goldings [4.50 %] - 5.0 Days Before Bottling for 5.0 Days	Hop	15	0.0 IBUs	-
25.00 g	Willamette [4.50 %] - 5.0 Days Before Bottling for 5.0 D…	Hop	16	0.0 IBUs	-

◯ Measure Final Gravity: _____ (Estimate: 1.011 SG)
◯ Date Bottled/Kegged: - Carbonation: Bottle with 111.74 g Corn Sugar