



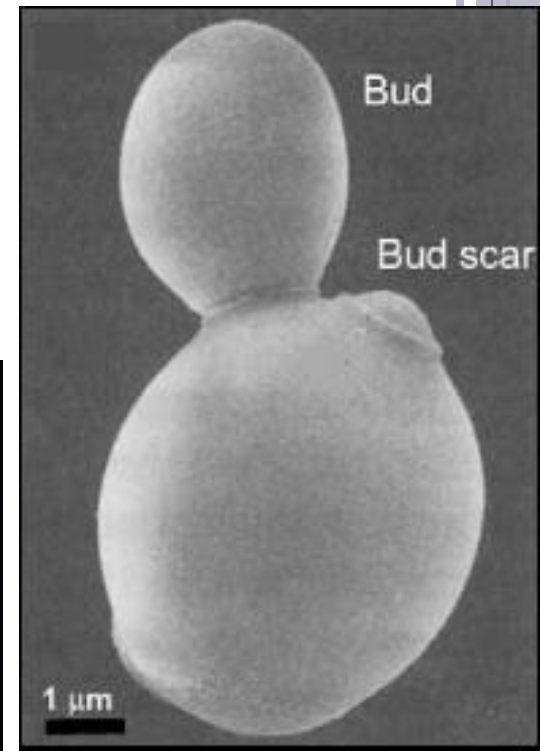
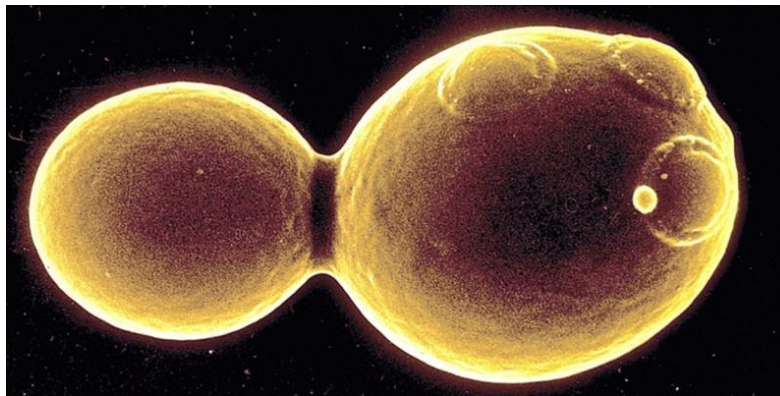
DIY STIR PLATES

James White



ROLE OF OXYGEN

- Only necessary nutrient not naturally found in wort
- Yeast use oxygen for cell membrane synthesis
 - Produce sterols and unsaturated fatty acids necessary for cell growth
- Inadequate oxygen can lead to:
 - Poor attenuation
 - Inconsistent or long fermentations
 - Undesirable flavor and aroma compounds
 - Yeast not fit for harvesting and re-pitching



BENEFITS OF STARTER

- Proof yeast is still viable
- Builds up cell count
- Recommended ale yeast pitching rate:
 - 1 million cells/ liter of wort/ per degree Plato
 - Ales: 0.75 million/L-°P, Lagers: 1.5 million
- Both White Labs and Wyeast ~ 100 billion cells
- For 20L of ale @ 1.048 OG, 75% yeast viability (1 month old)
 - 178 billion = 2.4 vials or packs w/o starter



ADVANTAGES OF A STIR PLATE

- Constant stirring
 - Keep yeast in suspension
 - Good gas exchange
- Better yeast growth
 - Around 2x amount of yeast vs. non-stirred starter



Women will worship you as a supreme
beer god





PITCHING RATES

20L @ 1.048, 75% viability

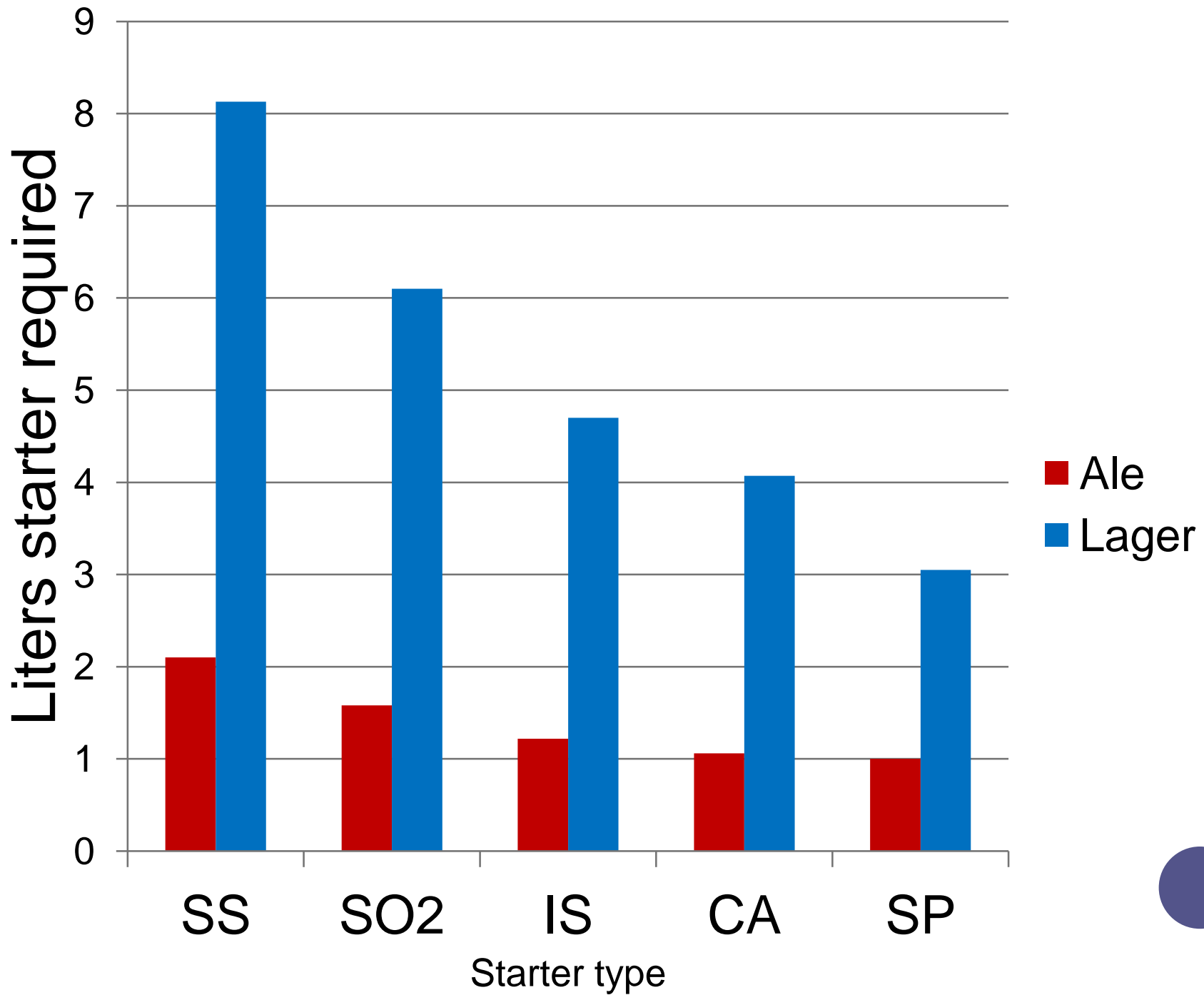
Ale = 178 billion

- No starter = 2.4 packs
- Simple starter
 - 2.1L, 1 pack
- Simple w/ O2 start
 - 1.58 L, 1 pack
- Intermittent shaking
 - 1.22 L, 1 pack
- Continuous aeration
 - 1.06L, 1 pack
- Stir plate
 - 1L, 1 pack

Lager = 356 billion

- No starter = 4 packs
- Simple starter
 - 8.13L, 1 pack
- Simple w/ O2 start
 - 6.1L, 1 pack
- Intermittent shaking
 - 4.7L, 1 pack
- Continuous aeration
 - 4.07L, 1 pack
- Stir plate
 - 3.05L, 1 pack





MY PROCESS

- Real Wort Starter
- Brew beer, make extra few liters
 - Freeze extra for later batches if keen
- No-chill remainder in cube
- Dilute if needed (1.030-1.040 SG)
- Make appropriate sized starter
- Stir plate until see krausen ring
- Cold crash overnight in fridge
- Decant starter wort
 - Additional steps if needed
- Allow to warm, pitch



12V DC STIRPLATE

- Cheap and easy
- Salvage from old computer
- Power: Old cell phone charger
- Magnet from hard drive
- Rocker/flip switch
- Potentiometer/variable voltage power supply





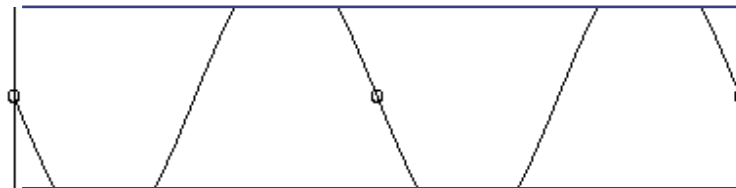
AC STIR PLATE

Pros

- More torque
- Can handle starters $>2L$
- Can daisy-chain multiple stir plates off one controller

Cons

- Hard to source triac speed controller in AU
- More bulky
- More expensive



AC STIR PLATE

- Shaded pole motor
- Magnets
- Speed control
- Exhaust fan
 - \$19 Bunnings
- Rare earth magnets
 - \$15 Ebay
(overkill)
- Solid state speed controller
 - \$20 amazon.com



8L20L

50 mL



- Mr. Malty Pitching Rate Calculator
 - <http://www.mrmalty.com/calc/calc.html>
- Any questions? Contact me at:
 - james.ryan.white@gmail.com

