



# Achieving High Alcohol Content Through Fermentation



Tyler King – Director of Brewing Operations / Head Brewer

*The  
Brewery*<sup>TM</sup>

## Findings From Black Tuesday





## In the Brewhouse

- Try to eliminate all adjuncts in the brewhouse
  - Add any sugar, etc... directly to the ferment
  - Most adjuncts are low in nutrients
- Low Osmotic Pressure – lower original gravity into the FV
  - High sugar concentrations can cause yeast stress
- OXYGEN – higher than normal dissolved oxygen levels
  - Oxygenate or aerate using a pump/compressor
  - I like to see at least 9ppm, 15ppm at the most



- Wort Composition
  - pH 5.0 to 5.3
  - “OG” of less than 25plato or approx 1.100
  - Use a yeast nutrient high in Zinc (Yeastex)
- Start with a lower fermentation temperature
  - Regulating the temperature can stress the yeast
  - Future agitation and feedings throw esters - so don't worry

- Yeast Selection
  - Choose a yeast with high alcohol tolerance
  - Should be a very attenuative yeast
  - Multiple strains?
  - MUST be viable and ready to ferment (vitality)
    - yeast needs oxygen not wort...
- Pitching
  - Resist the urge to over pitch!
  - Pitch around  $15-20 \times 10^6$  for a 25plato wort
  - Wyeast has a good tool for calculating this



## Fermentation

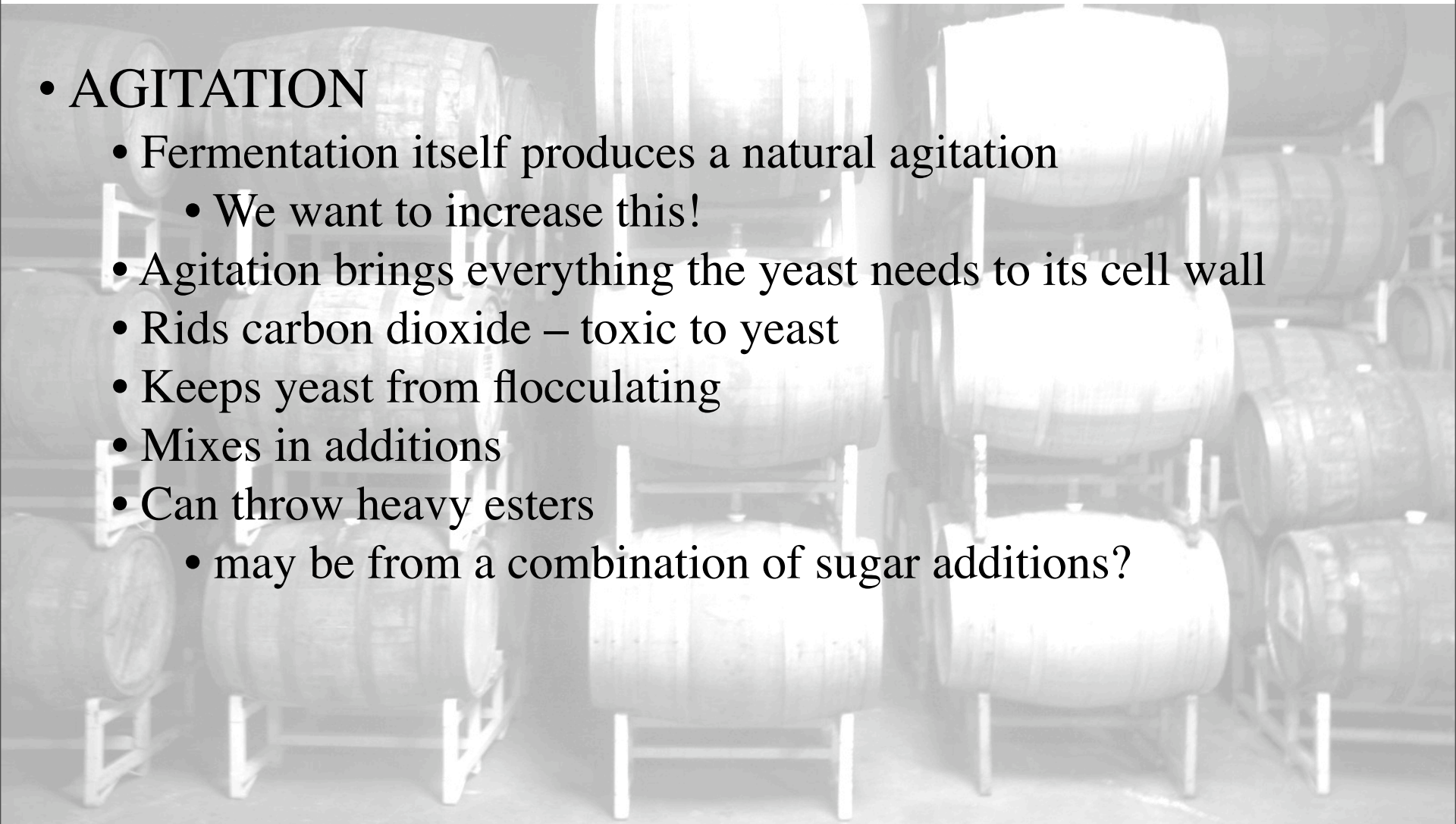
- Feeding – make up for the lost gravity in the brewhouse
  - Feed the ferment 2 to 3 times a day in low amounts
  - Slow or stop feedings when signs of yeast stress occur
- Nutrients
  - While adding sugar to the ferment add nutrients – Yeastex
  - Only add to healthy yeast – flavors unknown
- Oxygen
  - Dose small amounts of oxygen during feeding periods
  - Only add to healthy yeast that can uptake the oxygen in a matter of minutes! Very Important!!





- AGITATION

- Fermentation itself produces a natural agitation
  - We want to increase this!
- Agitation brings everything the yeast needs to its cell wall
- Rids carbon dioxide – toxic to yeast
- Keeps yeast from flocculating
- Mixes in additions
- Can throw heavy esters
  - may be from a combination of sugar additions?







## Know Your Yeast

- Things to watch for & Things we watch for
  - Attenuation rate – 4 degrees plato a day on average
  - Cell growth rate – we usually see complete growth by day 4
  - pH – it should remain between 4.5 and 5.0
  - Dissolved Oxygen – only should be present if we are adding it
  - Yeast Vitality & Viability
  - Taste!

*The  
Brewery*<sup>TM</sup>

**Questions?**



*The  
Brewery*™

**THANK YOU**

