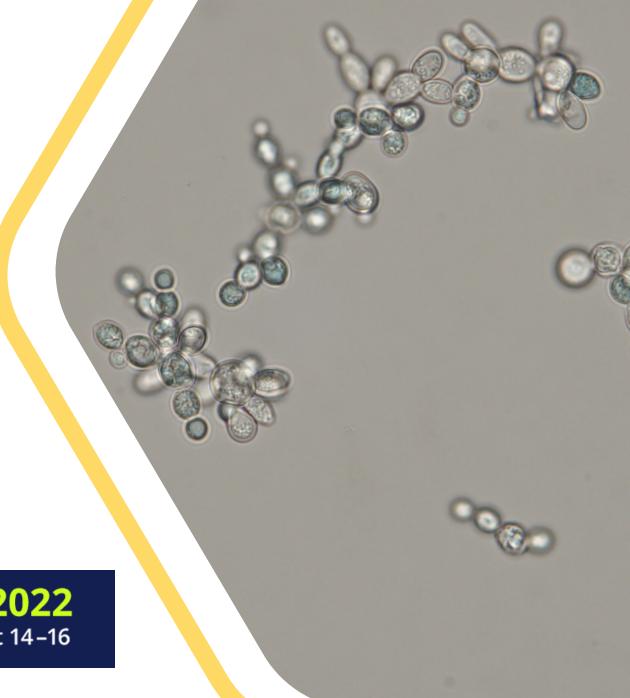
Planning and Managing an Efficient Lab at a large scale

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Firestone Walker Brewing Company





BREWING SUMMIT 2022

Providence, Rhode Island | August 14–16

Firestone Walker Brewing Company

- 600 BBL / year brewery
- 45 Fermenters
- 14 Bright tanks
- 2 bottle lines, 1 can line (2nd in commission), 1 keg line
- 500 employees company wide
- Quality team of 13 employees
- 4 Separate Labs
 - 2x packaging quality
 - Micro/analytical lab
 - Sensory Lab



Firestone Walker Lab Organizational Chart



Oversees all operations, personnel, budget, new equipment/methods

Quality Assistant Manager

Supervises leads, technicians, data analysis, yeast management

Packaging Quality Lead

Oversees all packaging quality operations and technician, data trending and reporting, problem solving

Quality Technician Quality Technician Quality Technician Quality Technician

Routine package testing on a shift work schedule

Sensory Research Analyst (Lead)

Oversees sensory panel and technician, runs descriptive and consumer panels. Research and reporting

Quality Technician

Set up and run sensory panel

Micro and Analytical Lab Lead

Oversees micro/analytical technicians and operations, reporting

Quality Technician Quality Technician Quality Technician

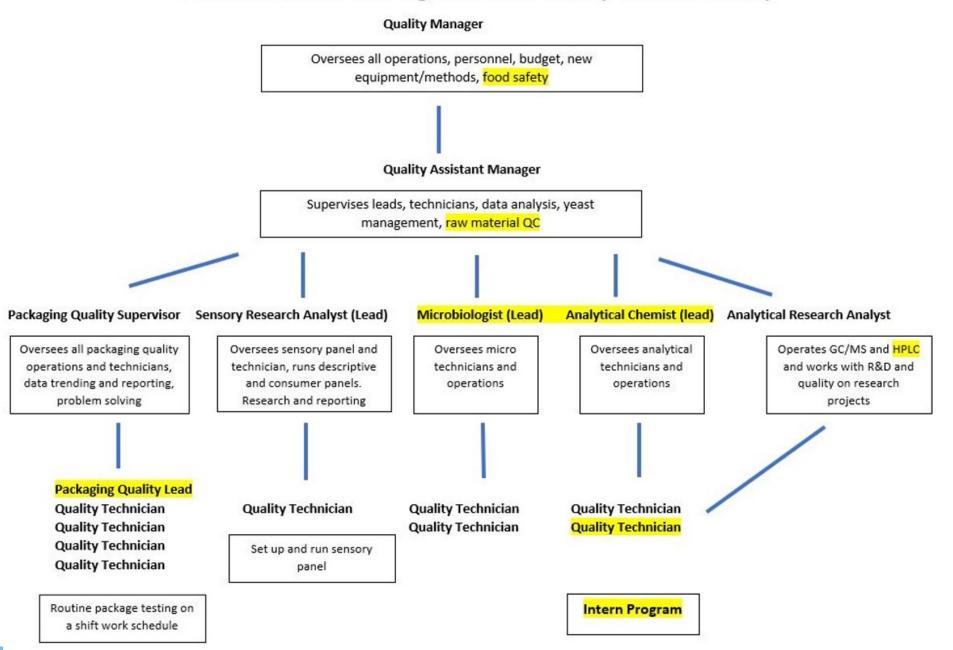
one dedicated micro, one dedicated analytical, one floater

American Society of Brewling Chemists

Analytical Research Analyst

Operates GC/MS and works with R&D and quality on research projects

Firestone Walker Lab Organizational Chart (Potential Future)

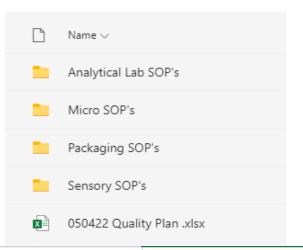


The Key to a Robust and Efficient Quality Program Lies in your Sample Plan

Sample plan: Detailed outline of which measurements will be taken at what times, in what manner, by whom, and where the data is logged.

- Documented and accessible to everyone inside and outside the department
- Tailored specifically to your breweries needs
- Reviewed annually and adjusted when needed
 - Do not be afraid to cut testing of data that is not being utilized for actionable decisions
- Contain written SOPs for all testing
 - Enforce SOPs with your staff
- Conscious of staffing limitations

Example of FW's Quality Plan Documentation



| w | QC Analytical SOP - Beer Analyzer.docx |
|---|--|
| w | QC Analytical SOP - Blank.docx |
| w | QC Analytical SOP - Color.docx |
| w | QC Analytical SOP - Daily Outline.docx |
| w | QC Analytical SOP - Data Entry.docx |
| w | QC Analytical SOP - Haze.docx |
| w | QC Analytical SOP - IBU.docx |

| Analytical Quality Plan Quality Control Checks | | | | | |
|--|---------------------|--|-------------------------------------|--------------------------|---------|
| | | | | | |
| Sample Point | Test | Frequency | Corrective Actions | Data locations | Done By |
| | | Crash day and within 3 days of | | | |
| | | filtration for clear beers or day before | | | |
| | | filtration for hazy beers, everytime | out of package TTB spec alert QC | | |
| | ABV/Gravity | VDK is rerun | and production manager | LIMs-Fermenter Analytics | QC |
| | рН | Crash day and everytime VDK is rerun | trending | LIMs-Fermenter Analytics | QC |
| | color | Crash day | trending | LIMs-Fermenter Analytics | QC |
| | IBU | Crash Day | trending | LIMs-Fermenter Analytics | QC |
| Fermenters | | | Do not crash cool tank, rerun tank, | | |
| | | | alert production manager if | | |
| | | Day 5, 7 or 10 depending on brand. | needed to filter within 2 days for | | |
| | VDK | Every day following until in spec | decision on how to proceed | LIMs-Fermenter Analytics | QC |
| | XTF- clear beer | Day 2 | rerun | LIMs-XTF page | QC |
| | XTF-hazy beer/lager | | | | |
| | beers | Day 5 | Rerun | LIMs-XTF page | QC |
| | Acetaldehyde | When requested | alert QC manager | LIMs-Fermenter Analytics | QC |
| | | | | | |

Use it or Lose it!

- Utilize your data collected or do not collect it
 - Example: Foam
 - FW does not use alginate or any other foam enhancers. We have not found any actionable decisions from foam testing data, so we cut testing from out daily routine and use it in special circumstances or R&D
 - Save >200 cases a year plus technician time
 - Example: Seam Checks
 - Realized that we can detect if a can is prone to leaking based on measurements from thickness gauge rather than cutting open the seam and inspecting the double seam.
 - Adjusted seam check protocol from cutting the double seams, thickness, and countersink every two hours to full seam check in the morning and only thickness/countersink every two hours following
 - Cans can be put back on the line post seam check saving >500 cases a year, 15 minutes of techs time every seam check, and wear on the saw blade
 - Example: Micro
 - High mix pack volume plus a second bottle line doubled amount of packaging changeovers
 - Cut plating scheme down (went from 7 plates and 2 broth jars → 6 plates)
 - Lost no data, technician can process in half the time, save \$\$ on consumables