



Planning a Brewery Quality Control Program

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Agenda

- What
- Why
- Document control
- Sensory
- Micro
- Chemistry
- Packaging
- Safety
- Planning your program
- Resources



What is Quality?

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**Consistently meeting your
customers needs and
expectations**

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document control

sensory


chemistry

micro

packaging

safety

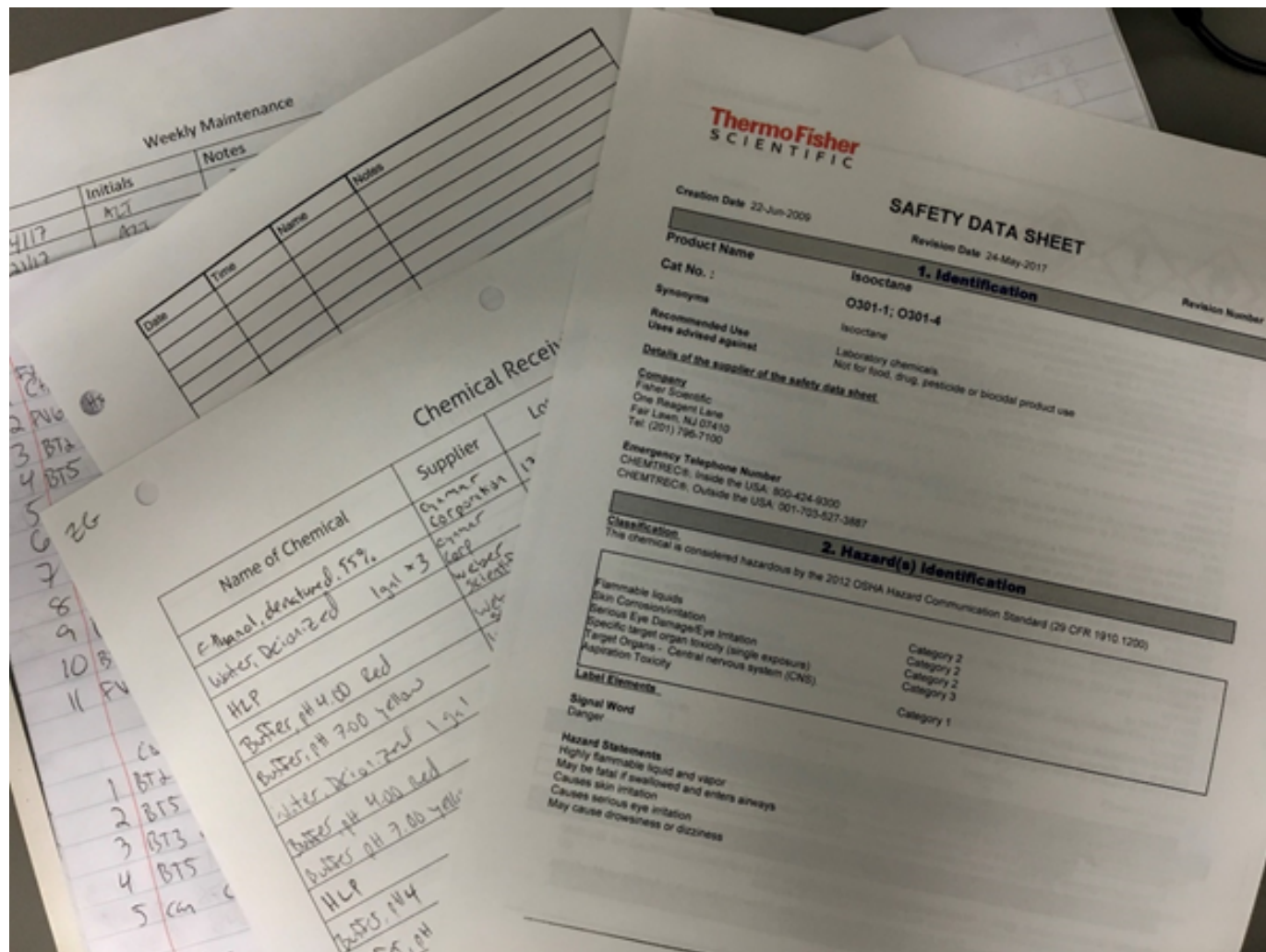




Why start a quality program

- **ensure consistency**
- **identify inefficiencies**
- **improve process control**
- **save money**
- **more control**
- **make better decisions**
- **competition**
- **involve staff/sense of pride**
- **make better beer**
- **peace of mind**
- **consumer safety/FDA/TTB guidelines**

document control



- SDSs
- GMPs
- SOPs
- Record keeping
- Chemical receiving log
- Cleaning/maintenance/calibration logs
- Consumer feedback
- QA/QC manual



Why

- Trouble shooting
- True to brand consistency
- R&D
- Bottle release
- Shelf life stability

Training

- true to brand
- ingredients
- off/on flavors

Cost

- glassware, training material, time, software (optional)

sensory



chemistry

- pH meter \$150-850
- Hydrometers \$75
- Hotplate w/ stirrer \$250-500
- Basic glassware \$200
- Flammable Cabinet \$500
- Consumables/miscellaneous



chemistry

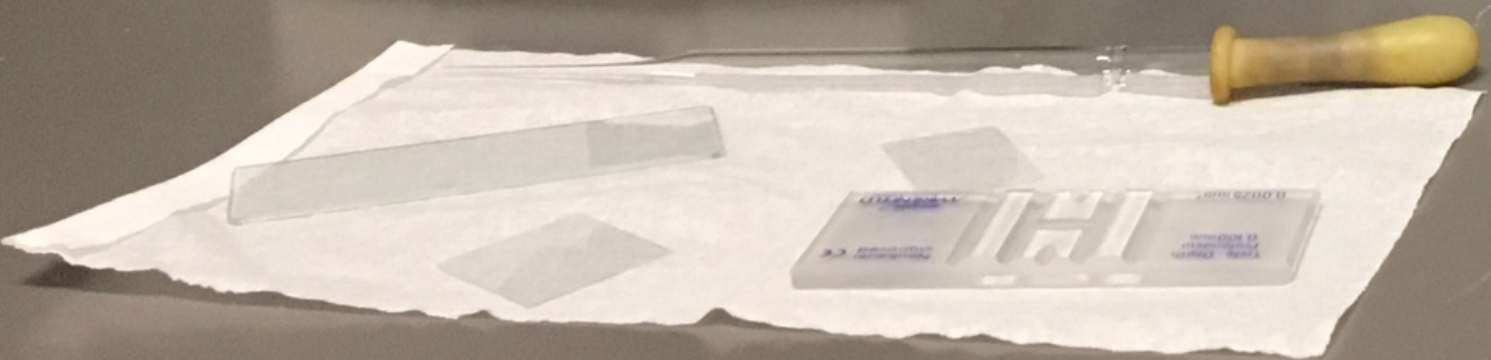
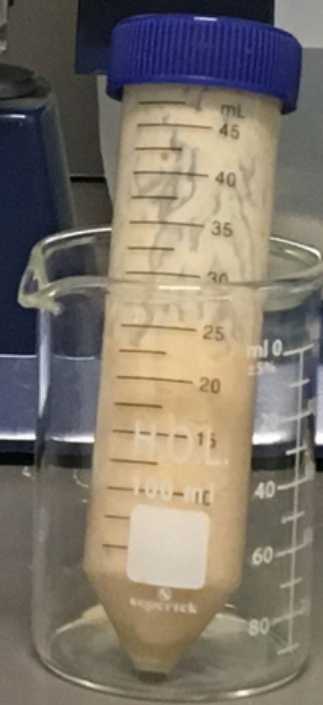
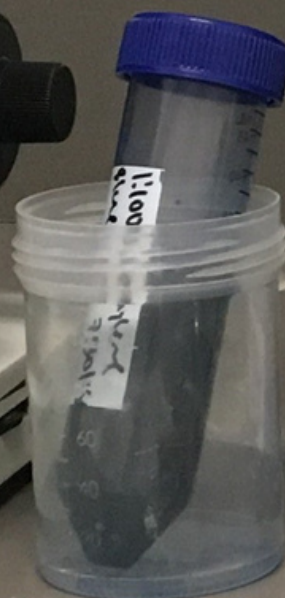
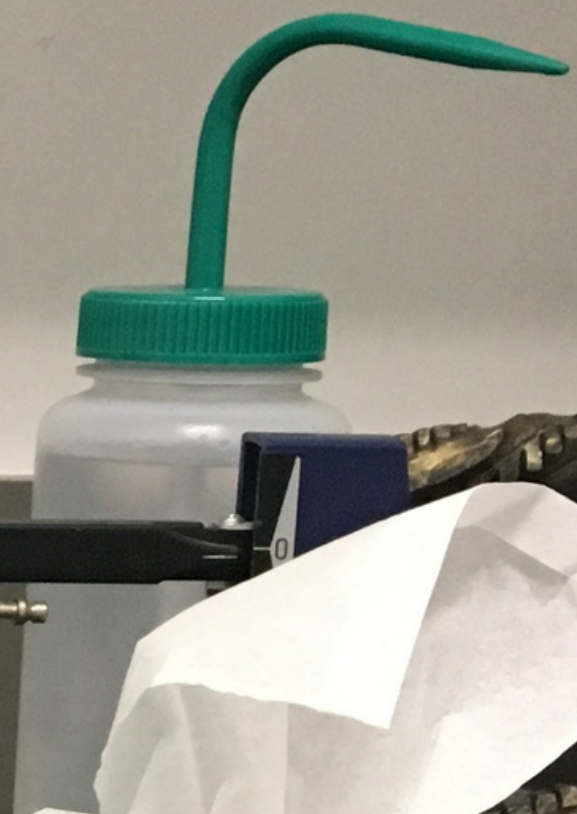
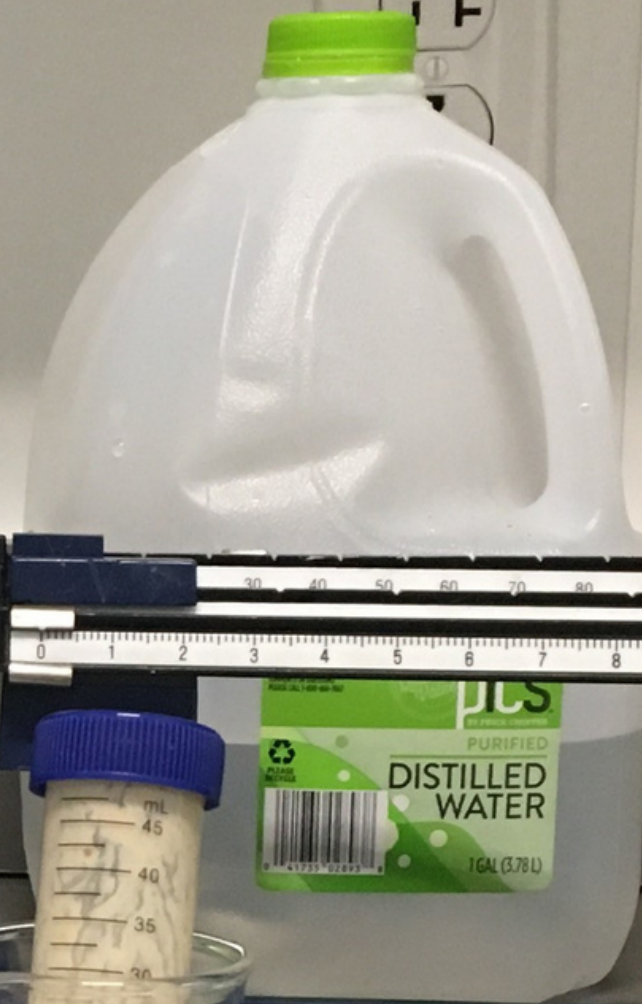
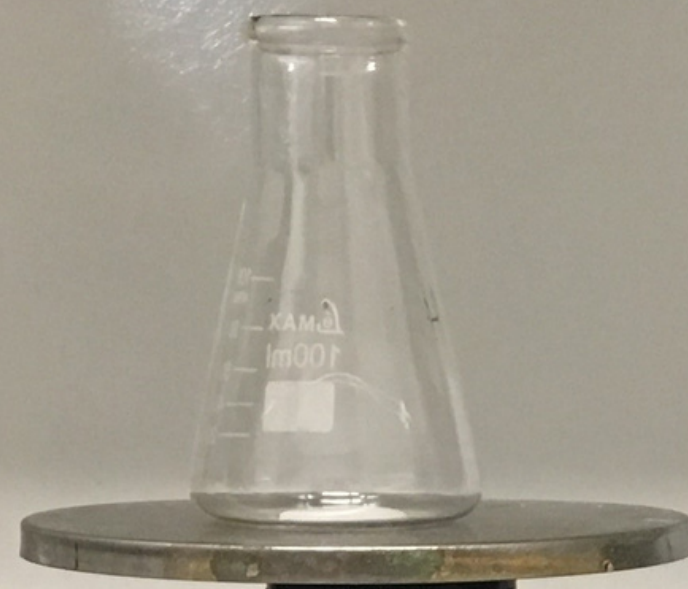
15,000-30,000bbls

- UV-Vis Spectrophotometer \$3,000-8,500
- Density meter \$3,800
- Chemical Fume Hood \$3,000-8,000
- Turbidimeter \$750-950

30,000bbls +

- Alcoalyzer \$35,000+
- Gas Chromatograph \$20,000-50,000+
- Mass Spectrometer \$10,000-50,000+
- High-Performance Liquid Chromatograph
- \$5,000-30,000+

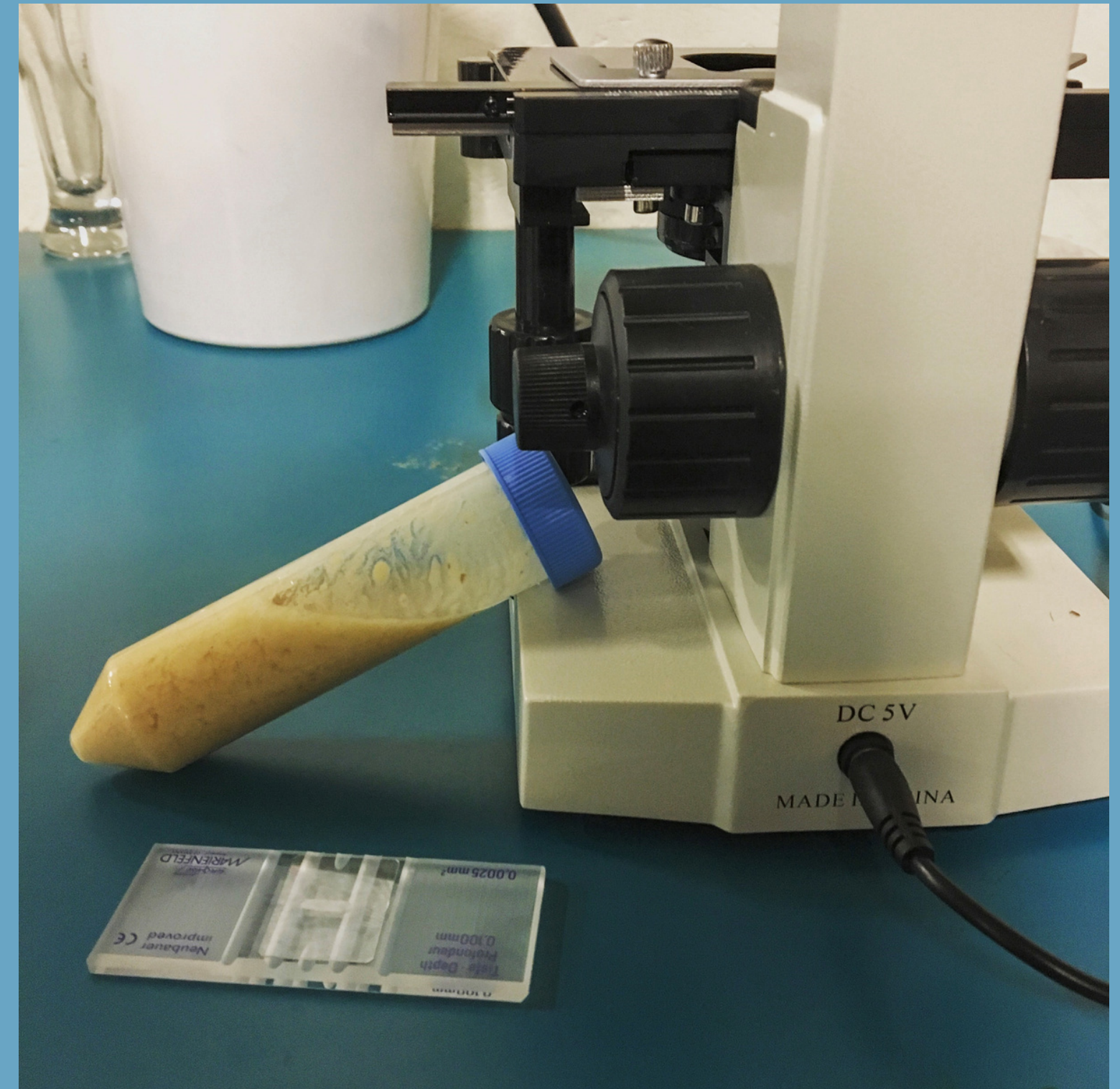




micro

1-15,000bbls

- Microscope \$200
- Hemocytometer \$100
- Miscellaneous \$100
- Glassware \$50-100
- Scale \$80-1000
- Consumables \$350+
- Trigger Start Torch/propane \$50
- Incubator \$100-1500
- Hotplate w/ stirrer \$250-500



micro

15,000-30,000 bbls

- Media \$100-200+
- Consumables \$350+
- Gram Stain Kit \$50
- Autoclave \$800-6000
- Vacuum set up \$500
- Laminar Flow Hood \$2000-8000
- Bunsen burner/alcohol lamp \$6-\$40
- 30,000+ bbls
- PCR \$10,000-25,000+





packaging

- DO Meter \$10,000
- CO2 Testing \$1,525-25,000
- Bottle/Can adaptor \$1,000+
- Zahm –Bottle/Can \$1,700
- Bottle Crimp Gauge \$190
- Scale or Volume Flask \$130
- ATP \$1,500
- Seam Checker
- Titration Kits
- Biofilms
- Date Coder
- Beer library

Must Have vs. Nice to Have
Less than 1,000 bbls per year

Must Have	Nice to Have
Thermometer	DO Meter
Hydrometer	ATP Luminometer
pH Meter	Stir Plate/Hot Plate
Glassware	Crimp Gauge (Bottles)
Microscope	Seam Gauge (Cans)
Hemocytometer	Scale or flask for fill levels
Packaged beer archive shelving	Incubator
Refrigerator	Outside Testing
Sensory Program	
CO ₂ Meter	





putting it all together

- who
- when
- why
- what
- where



resources

- ASBC
- MBAA
- BA
- EBC
- BYO
- Beer Quality Handbook series
- BA Quality Management
- Fellow Brewers
- Amy@Zymologylabs.com

