### Planning a Brewery Quality Control Program

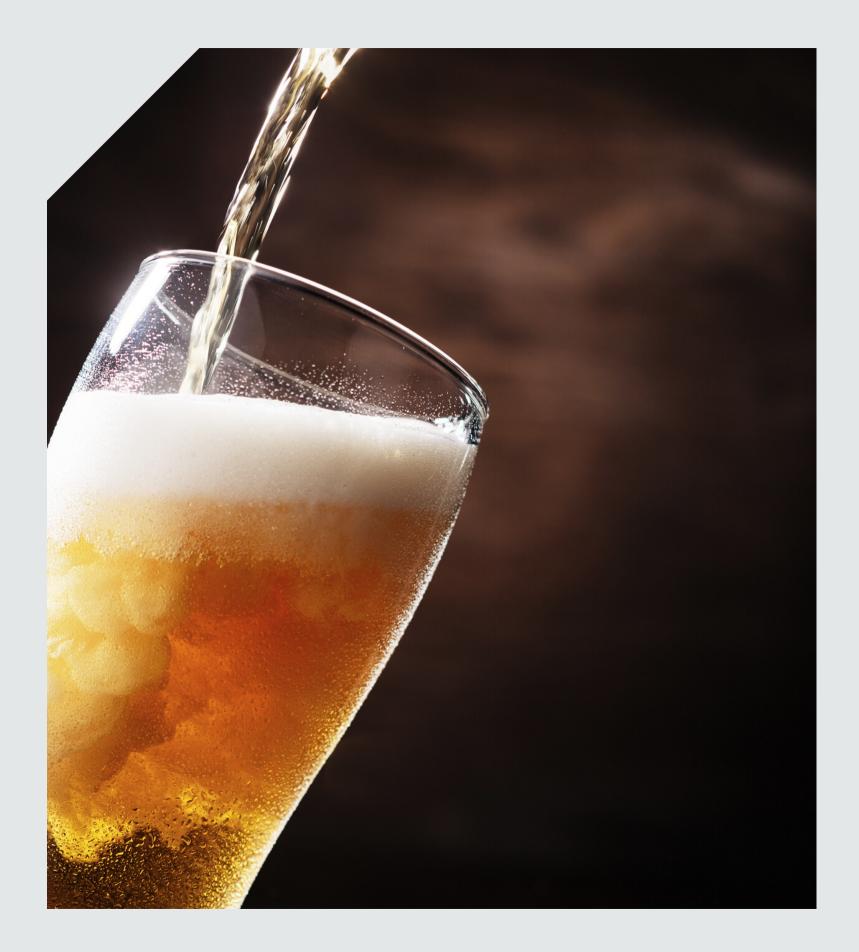
BYO NanoCon Dec 3, 2021 Presented by Amy Todd of Zymology Labs, LLC





### Agenda

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







### What is Quality?



## Consistently meeting your customers needs and expectations

### document control

sensory chemistry

micro

packaging

safety





### Why start a quality program

- more control
- make better decisions
- competition

  - pride
- make better beer
- peace of mind
- consumer safety/FDA/TTB guidelines

• ensure consistency • identify inefficiencies • improve process control save money

involve staff/sense of



### document control

Weekly Maintenance Notes	Thermo Fisher S C I E N T I F I C
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- SDSs
- GMPs
- SOPs
- Record keeping
- calibration logs
- QA/QC manual

• Chemical receiving log • Cleaning/maintenance/ • Consumer feedback



#### 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 +

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





#### 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





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#### 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+

### micro











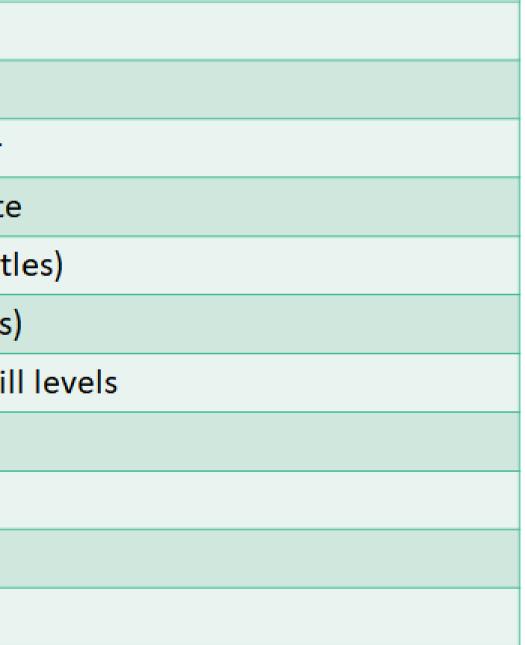
### packaging

- 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 (Bott
Microscope	Seam Gauge (Cans
Hemocytometer	Scale or flask for fil
Packaged beer archive shelving	Incubator
Refrigerator	Outside Testing
Sensory Program	
C0 <sub>2</sub> Meter	



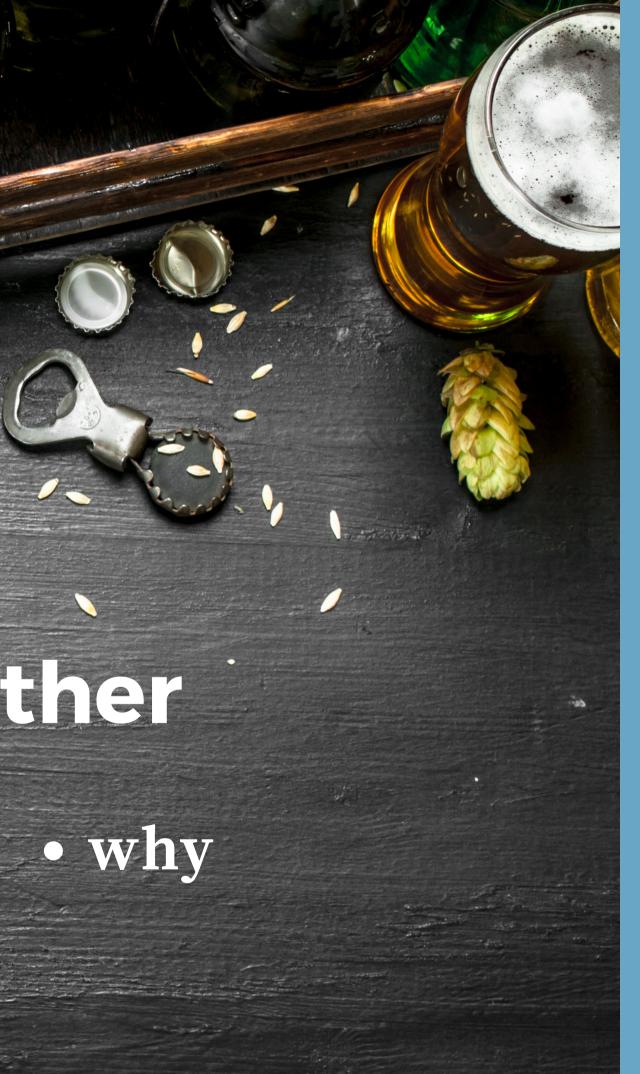




### putting it all together

whowhat

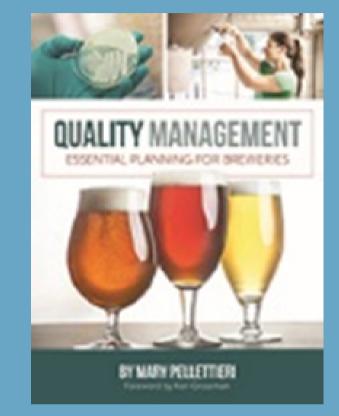
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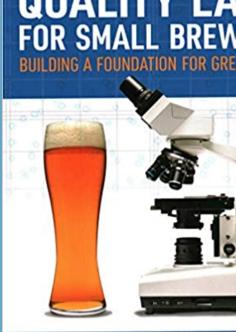


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### resources

- ASBC
- MBAA
- **BA**
- EBC
- **BYO**





**MERRITT WALDRON** 



- Beer Quality Handbook series
- BA Quality Management
- Fellow Brewers
- Amy@Zymologylabs.com







# THE SCIENCE OF BEER





