

# **YOUR NANO BREWERY LAB – EQUIPMENT & TESTS YOU NEED**

November 5th 2022

Nanocon 2022

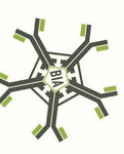
Presented by Amy Todd of Zymology Labs by Bia Diagnostics

# Agenda

- what is a nano beer lab
- decision making
- pH meter
- hydrometer or density meter
- microscope selection
- data analysis
- where to buy
- resources



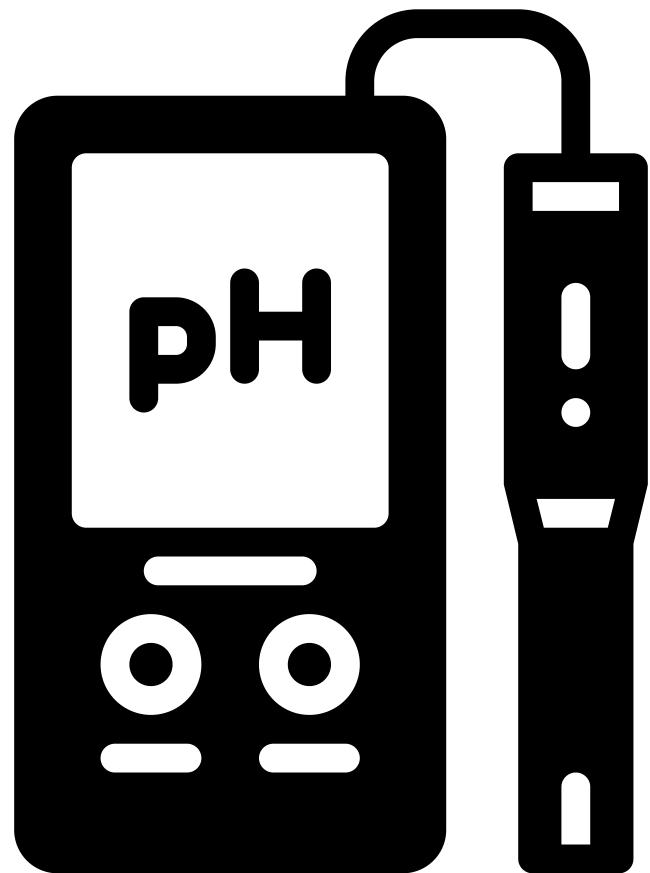
# your nano beer lab



# decision making



# pH options



# Caring for your pH meter

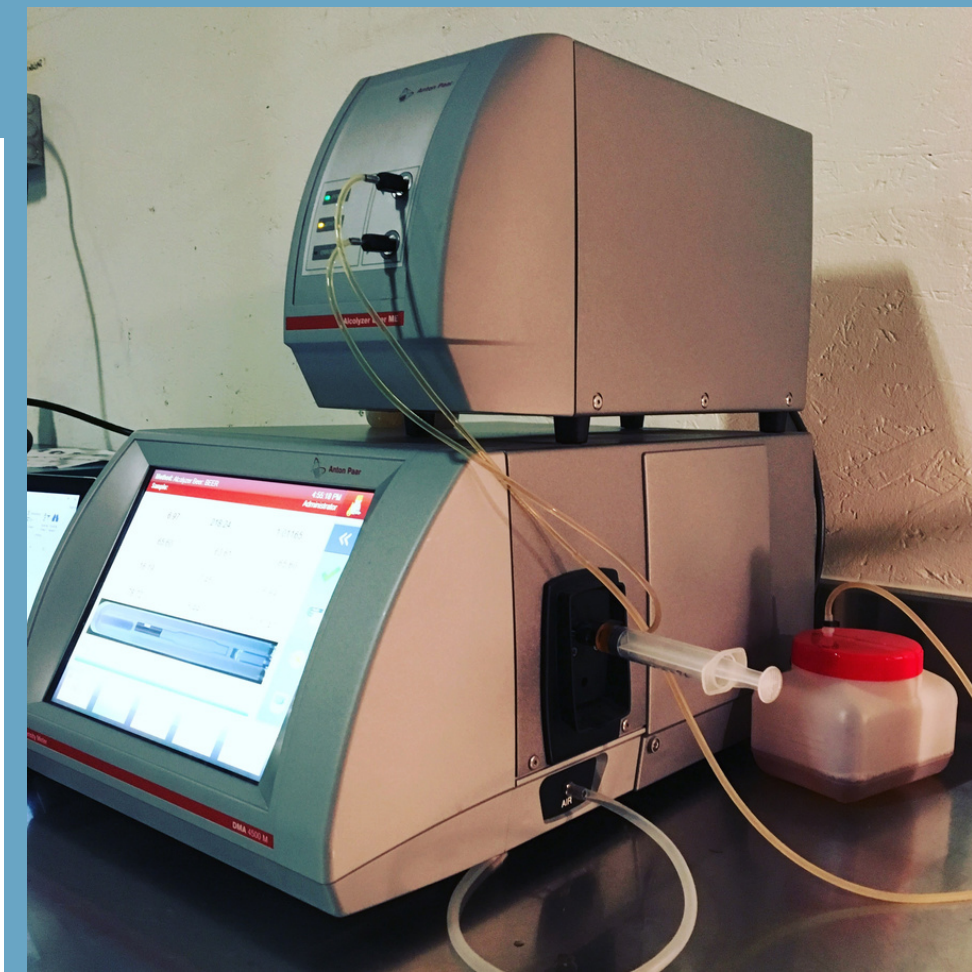
- Don't test very hot liquids
- Don't leave your sample in contact with the probe for an extended period of time
- Don't allow your probe to dry out, or store in water
- Calibrate frequently
- Clean probe and avoid wiping
- Proper calibration
- Check electrolyte fill level and check cap when using
- Stir liquid and ensure proper submersion
- Don't use an old or expired probe/pH solution





# gravity options

- hydrometer
- refractometer
- digital
- NIR
- sample size
- accuracy
- calibration
- equipment care





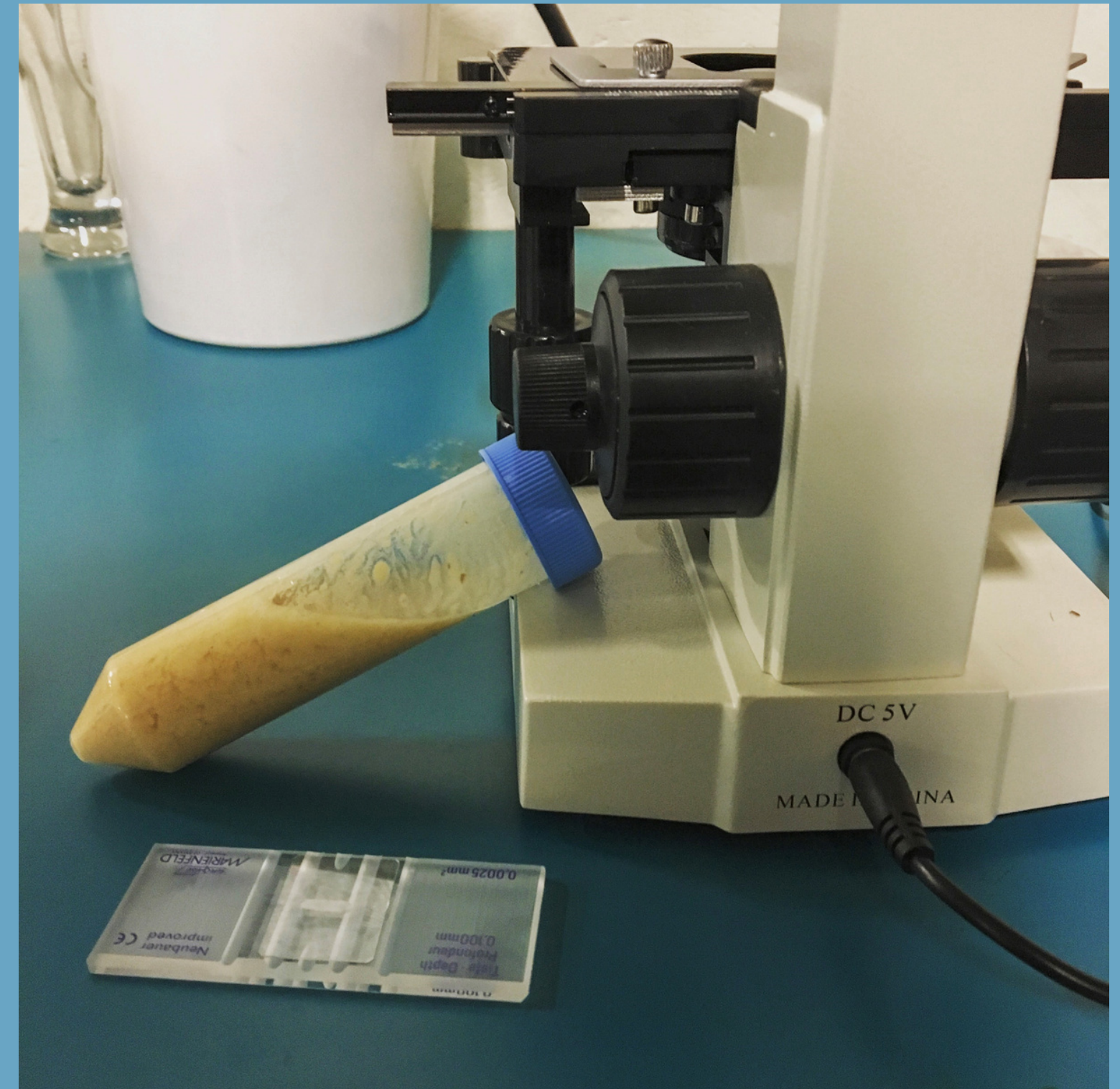
# cell counting

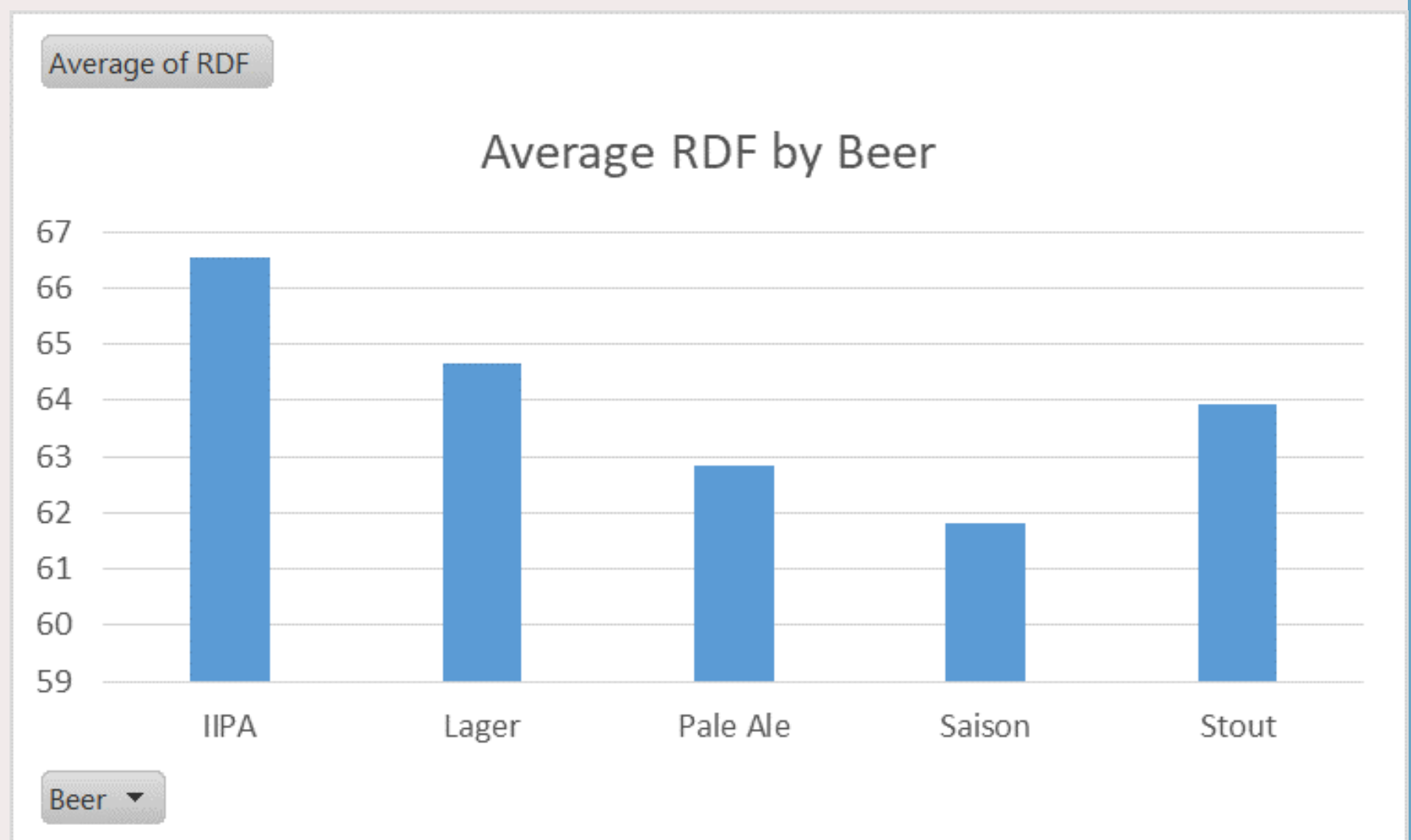
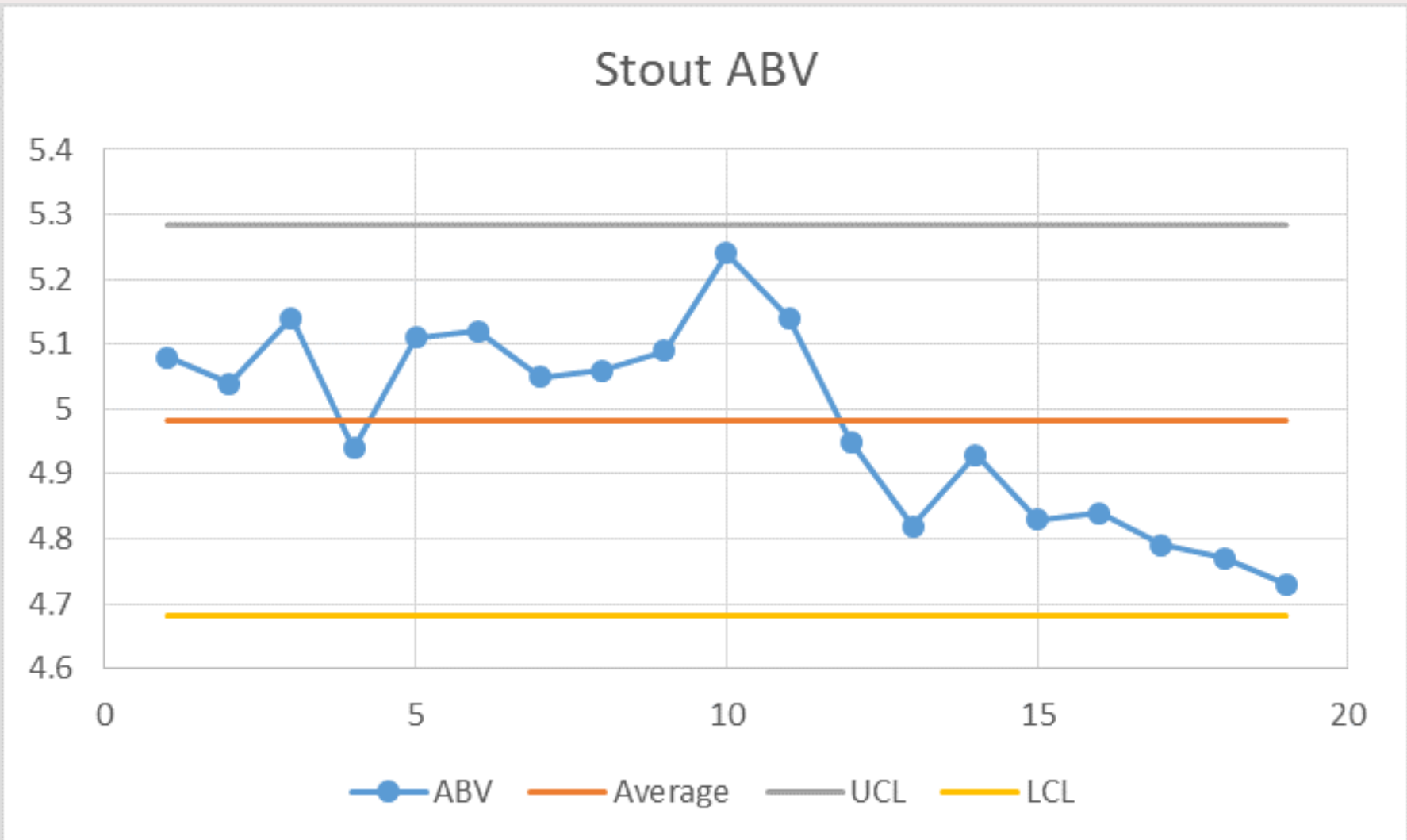
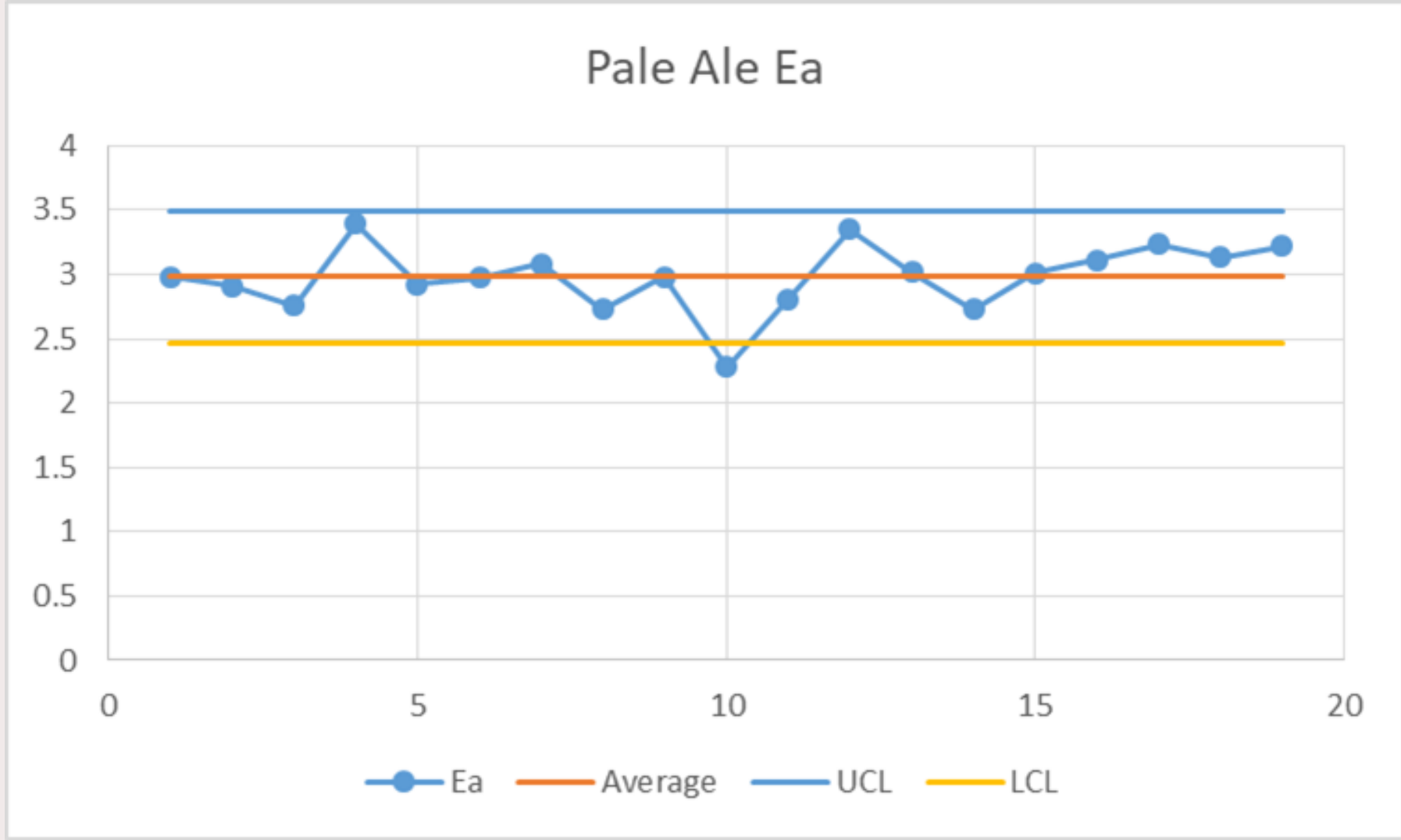
## Cell counting equipment

- Microscope \$250-350
- Hemocytometer \$125
- Miscellaneous \$100
- Glassware \$50-100
- Scale \$80+

## Microscope Selection

- eye piece
- camera
- objective lenses
- mechanical stage
- light source





# Agar plates and slants

## What you need

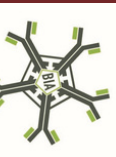
- 2-3g agar
- 2-3 grams DME or dilute wort (wort agar)
- 100mL water
- small flask
- 50 grams potato (potato dextrose)
- 1 cup water (potato dextrose)
- 2 grams sugar (potato dextrose)
- 2 gram agar (potato dextrose)
- sterile plates and test tubes
- alcohol lamp or bunsen burner
- autoclave (slants)



# Forced Fermentation

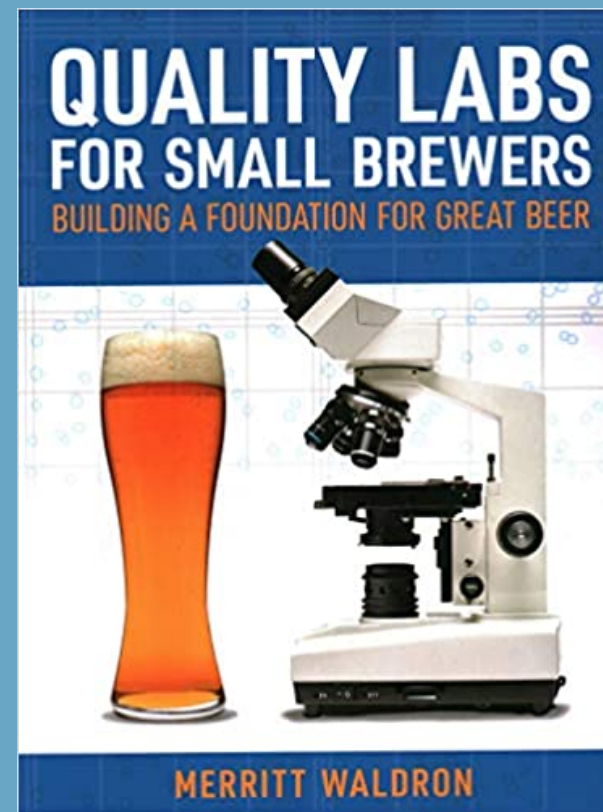
What you need

- 1L Erlenmeyer flask
- Tinfoil
- Stir/hot plate
- Magnetic Stir bar
- Hydrometer/graduated cylinder
- ~500mL of wort
- Yeast 25-50mL– use the same yeast that the main fermentation uses



# resources

- ASBC
- MBAA
- BA
- BYO
- Brewing Science Symposium
- Beer Quality Handbook series
- BA Quality Management
- Fellow Brewers
- Amy@biadiagnostics.com



## **Media/micro**

Siebel media guide - <https://www.mbaa.com/districts/EasternCanada/events/Documents/2012-11-21Goineau.pdf>

Premade plates - <https://www.s2cm.com/> - premade plates

escarpment labs youtube - [https://www.youtube.com/channel/UCyCSmOUfkp\\_QPH1PCIAxVQ/videos](https://www.youtube.com/channel/UCyCSmOUfkp_QPH1PCIAxVQ/videos)

aseptic sampling - <https://www.asbcnet.org/lab/webinars/Pages/MicrobiologyVideos.aspx>

plating methods -

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4846335/#:~:text=Procedures%20described%20include%20\(1\)%20streak,plate%20to%20another%20in%20an](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4846335/#:~:text=Procedures%20described%20include%20(1)%20streak,plate%20to%20another%20in%20an)

microwaving media - <https://oregonbrewlab.com/media/>

Agar Plates - <https://suigenerisbrewing.com/index.php/2015/03/18/new-video-casting-agar-plates/>

## **chemistry**

<https://www.asbcnet.org/lab/webinars/Pages/BeerMethodsSeries.aspx>

## **lab suppliers**

<https://www.fishersci.com>

<https://www.weberscientific.com/>

<https://us.vwr.com/store/>

<https://yoursciencehub.com/>

## **pH**

The Power of pH - <https://byo.com/article/the-power-of-ph/>

The Role of pH - <https://byo.com/article/the-role-of-ph-homebrew-science/>

The Principles of pH - <https://byo.com/article/the-principles-of-ph/>

## **Podcasts**

Podcasts - "False Bottomed Girls," "Bean to Barstool," "Check Your Beer"

## **Zymology Labs resources**

<https://www.craftbrewingbusiness.com/featured/a-day-in-the-craft-brewery-lab-part-5-in-depth-guide-for-cell-counting/>

<https://zymologylabs.com/resources/f/forced-fermentation-test-how-to-perform-one-and-why>

QA/QC Manual - <https://docs.google.com/document/d/1v4ltdZZQ-LB830x9aAabok2G7gHluJg2FoyaeO9bjZQ/edit?usp=sharing>

**Used equipment** - american instrument supply, LabX, auctions, universities, ebay

photos

<https://www.hannainst.com/edge-dedicated-ph-orp-meter.html?hsLang=en>

<https://www.hannainst.com/hi98100-checker-plus-ph-tester.html?hsLang=en>

<https://www.hannainst.com/hi98100-checker-plus-ph-tester.html?hsLang=en>

[https://www.coleparmer.com/i/oakton-buffer-pack-500-ml-of-each-ph-4-01-7-00-and-10-01/0594210?PubID=UX&persist=true&ip=no&gclid=EAlaIQobChMIImcHll-zu-gIVR8DICh32JAGDEAQYASABEGLSZvD\\_BwE](https://www.coleparmer.com/i/oakton-buffer-pack-500-ml-of-each-ph-4-01-7-00-and-10-01/0594210?PubID=UX&persist=true&ip=no&gclid=EAlaIQobChMIImcHll-zu-gIVR8DICh32JAGDEAQYASABEGLSZvD_BwE)

[https://www.fishersci.com/shop/products/emd-millipore-mcolorphast-ph-test-strips-indicator-papers-2/M1095350001?gclid=EAlaIQobChMIxMaljfDu-gIVGPrICh3gHQeFEAQYBiABEGJ3dvD\\_BwE&ef\\_id=EAlaIQobChMIxMaljfDu-gIVGPrICh3gHQeFEAQYBiABEGJ3dvD\\_BwE:G:s&ppc\\_id=PLA\\_goog\\_2086145671\\_83549639408\\_M1095350001\\_\\_381695869883\\_145122955653560482&ev\\_chn=shop&s\\_kwcid=AL!4428!3!381695869883!!!g!815869859423!M1095350001](https://www.fishersci.com/shop/products/emd-millipore-mcolorphast-ph-test-strips-indicator-papers-2/M1095350001?gclid=EAlaIQobChMIxMaljfDu-gIVGPrICh3gHQeFEAQYBiABEGJ3dvD_BwE&ef_id=EAlaIQobChMIxMaljfDu-gIVGPrICh3gHQeFEAQYBiABEGJ3dvD_BwE:G:s&ppc_id=PLA_goog_2086145671_83549639408_M1095350001__381695869883_145122955653560482&ev_chn=shop&s_kwcid=AL!4428!3!381695869883!!!g!815869859423!M1095350001)

<https://pim-resources.coleparmer.com/item/l/anton-paar-dma-35-v4-172244-digital-density-specific-gravity-meter-2575060.jpg>

[https://www.morebeer.com/product\\_image/morebeer/500x500/38522.png](https://www.morebeer.com/product_image/morebeer/500x500/38522.png)

**Thank you!**

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