



Using Beer Sensory for Recipe Development

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Agenda



Our Systems

.and how you can apply them



Factors Affecting Design

Dosing rates, times, and more



Tasting

Compare beers in real time



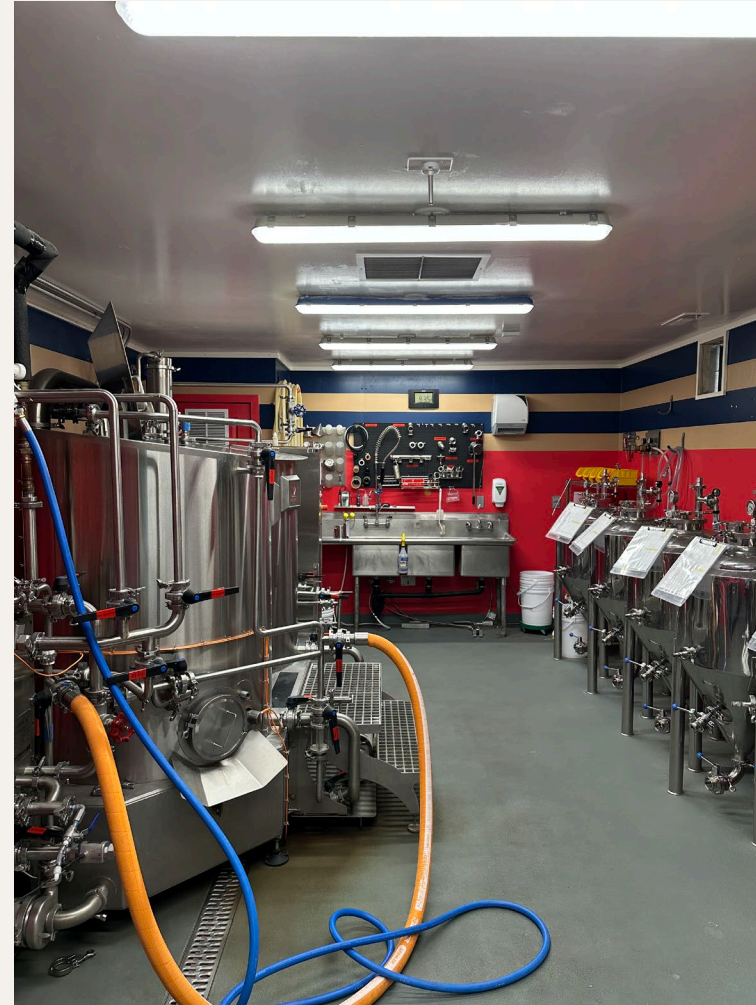
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Our Brewery

5 hL brewhouse

8 – 1 hL fermenters

Lab Scale Equipment



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YCH Sensory Program

Hops

- Intake (Harvest Panel) – QDA
- Finished Goods (QC Panel) – CATA
- Research Projects - QDA

Beer

- Roundtable - Qualitative
- Research Projects – QDA + CATA
- Discrimination
- Preference

Use Sensory to Fit Your Needs

- Descriptive analysis – to describe and track over time
 - Does this new hop make tasty beer?
 - Has our process drifted and caused our brand profile to change?
- Discrimination testing – to assess ingredient and process changes
 - Does this new hop change our beer's flavor?
- Preference Testing – to determine which beer is better
 - Is this new recipe better or worse than the previous one?

Descriptive Analysis

- Develop a lexicon
 - Everyone needs to speak the same language
- Train a panel
 - Give all panelists the same points of reference
- Record results
 - Make it fit your brewery
- ASBC Resources

Descriptive Analysis

QDA

- Attributes and their intensities

CATA

- Attributes only

True to Brand

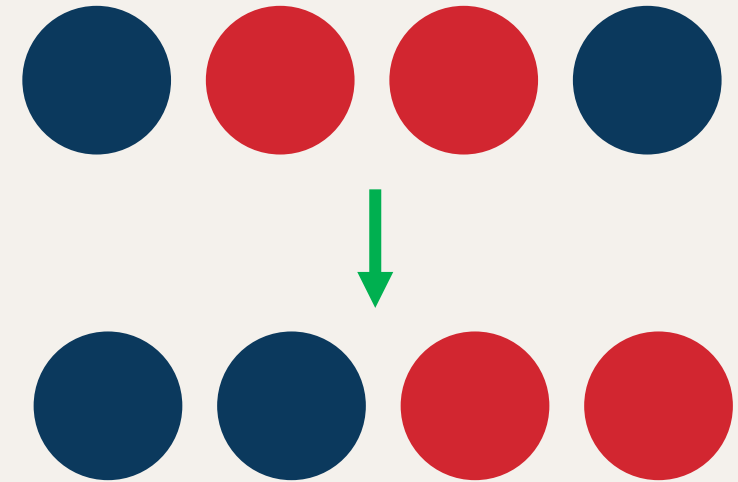
- Specific lexicon for each brand

Discrimination Testing (Tetrad)

- Tetrads are very simple!
- Use employees or customers (if that's allowed)
- Use these tests to confirm a change to the beer won't be detected by your consumers

Discrimination Testing (Tetrad)

- Pour 2 pairs of matching samples and see if tasters can re-pair them
- Paper ballots and disposable cups work best
- Use a label gun if you want to be efficient



Preference Testing

- Great opportunity to interact with customers in the tap room
- Simple testing – which sample do you like most?
- Build a 'panel' of committed tasters



Hop Products vs Beer Recipes

Similar Processes for Different Goals

Product Development

- Understand how the product really works
- Conversion from T-90
- Optimal dosing location
- Optimal usage rate

Recipe Design

- Understand how the product affects my beer
- How much should I use?
- Which variety should I use?
- Where should I use it?

T-90 Conversion Rate

Our Process

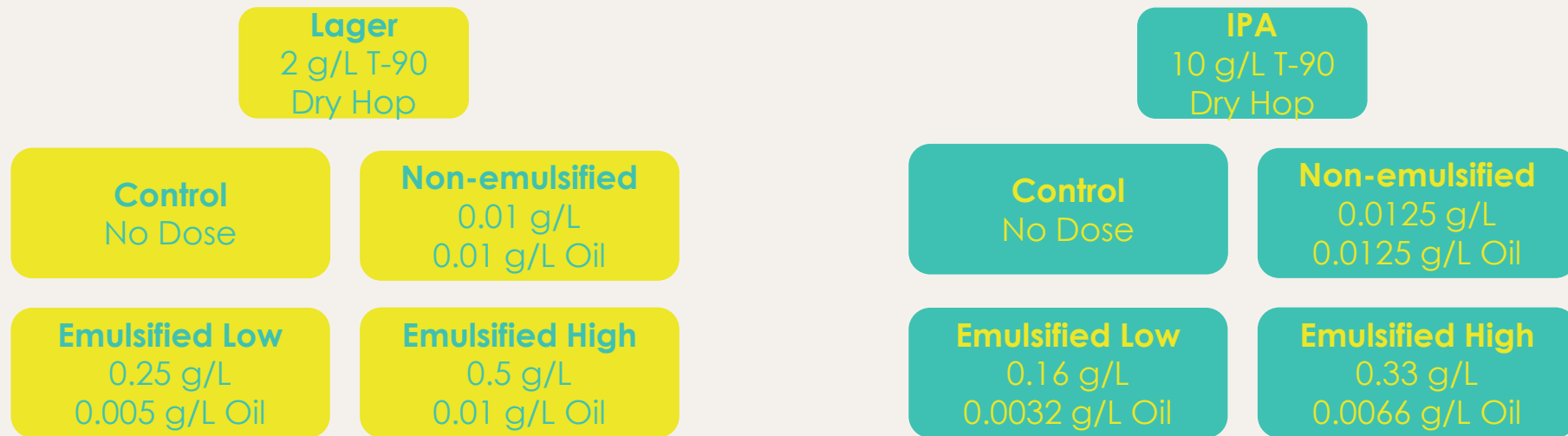
- Dose beers with various ratios of new products
- Assess via descriptive panel and / or tetrad tests
- Use practical data as a starting point
 - Oil or alpha concentration
 - Production yields
- Get feedback from brewers

To Emulsify or Not?

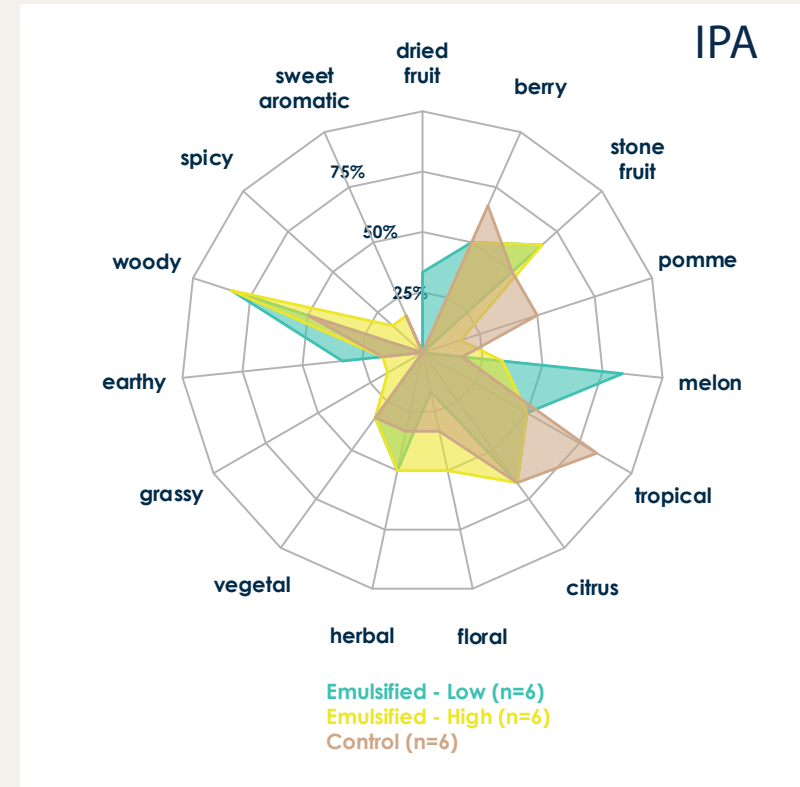
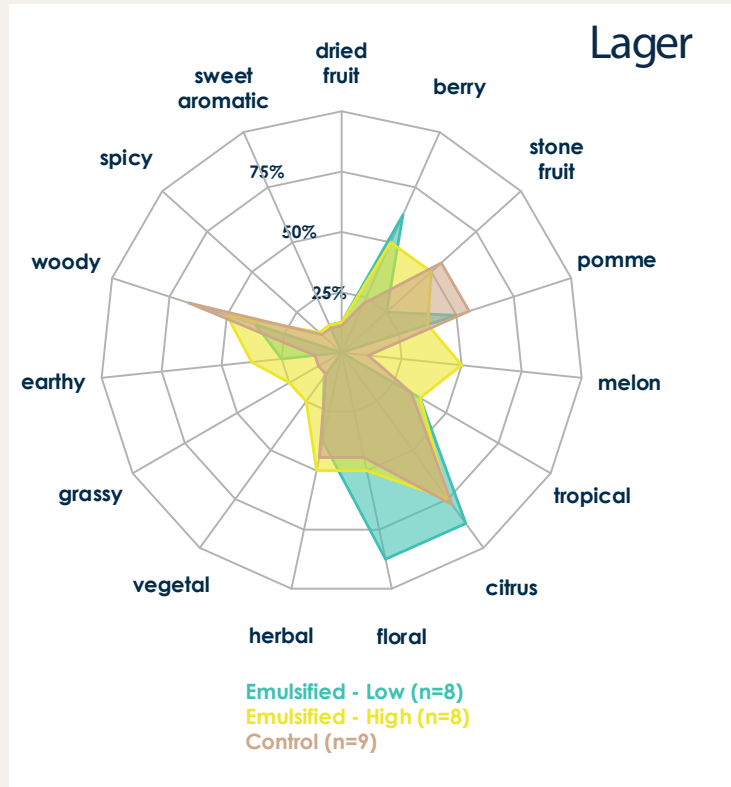
Product Considerations

- Non-emulsified products are more consistent – the math is simple
- Emulsified products increase aroma more effectively, but also change the aromatic profile, so brand-specific testing needs to be done

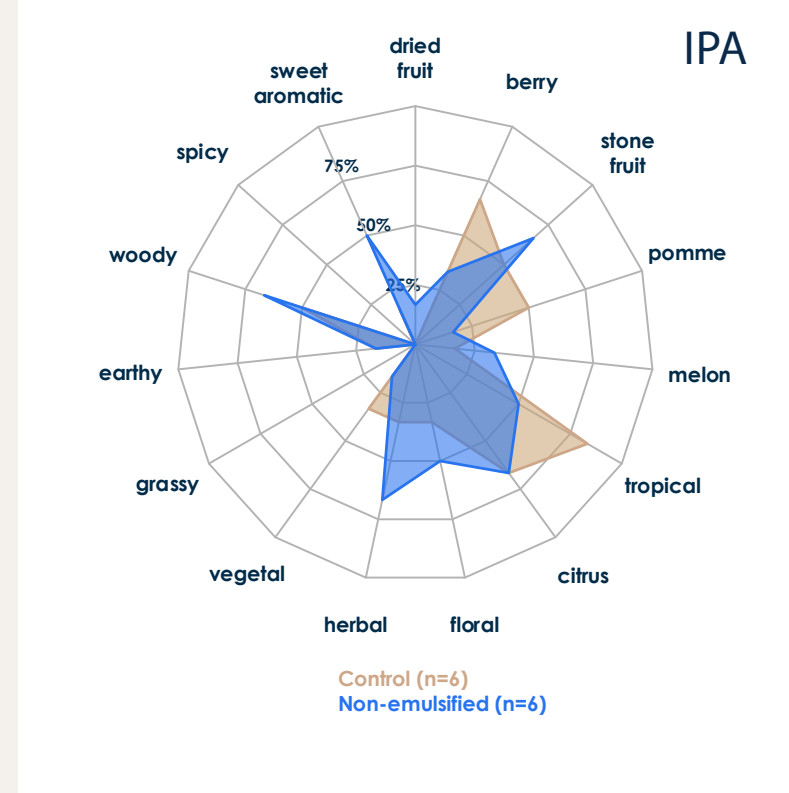
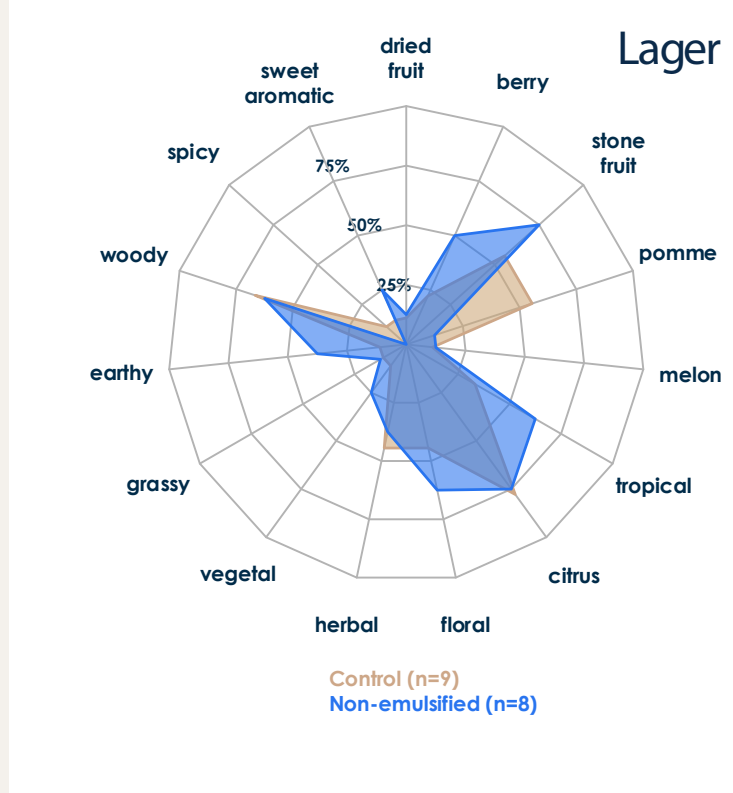
We think non-emulsified products are more true-to-type



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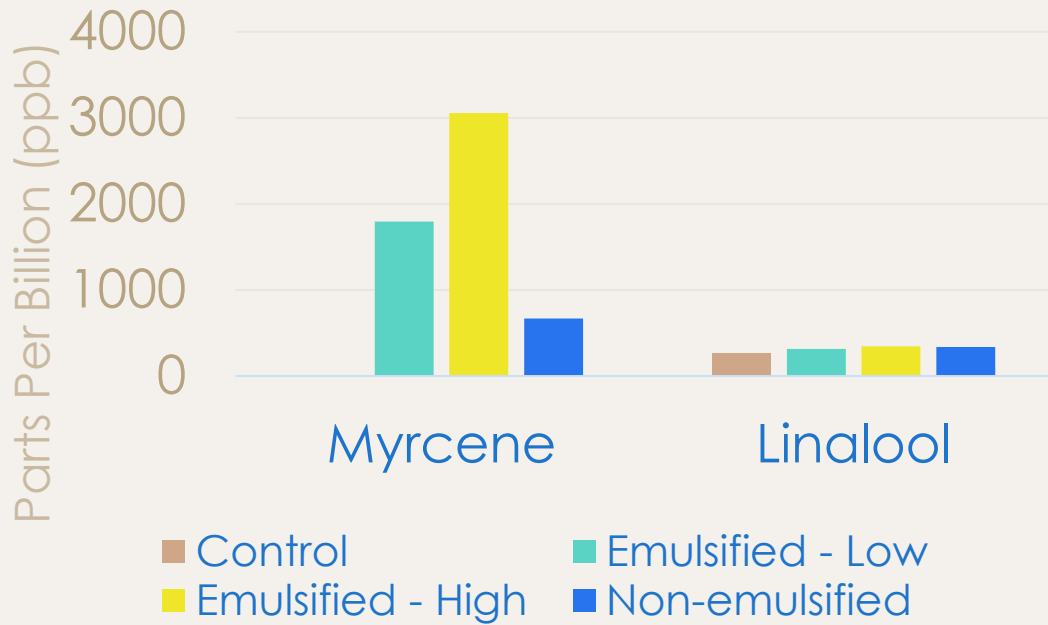


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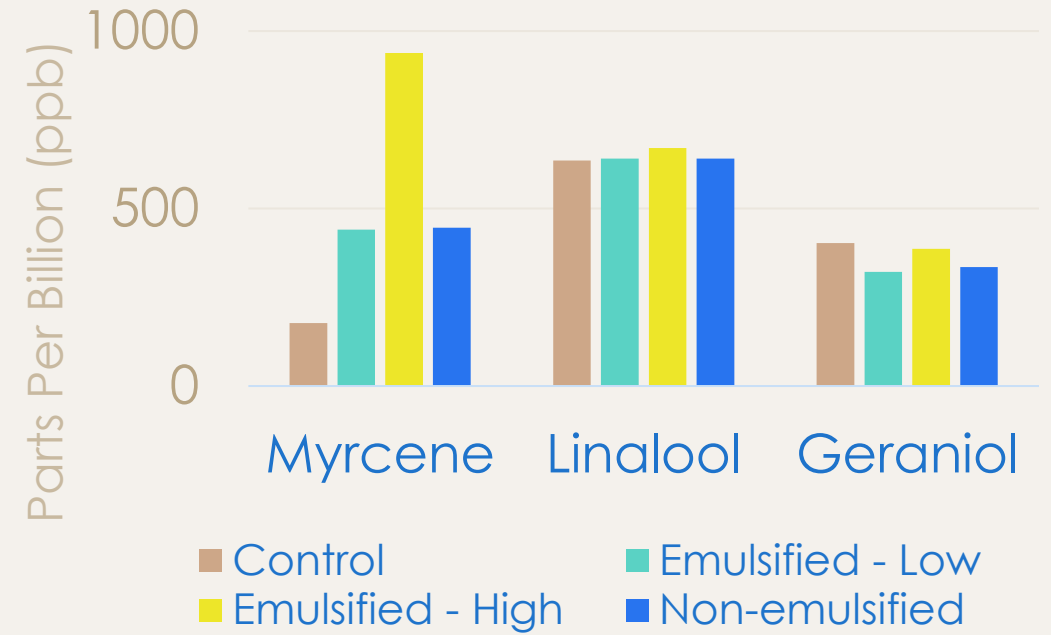


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Beer GC/MS Results for Selected Compounds - **Lager**



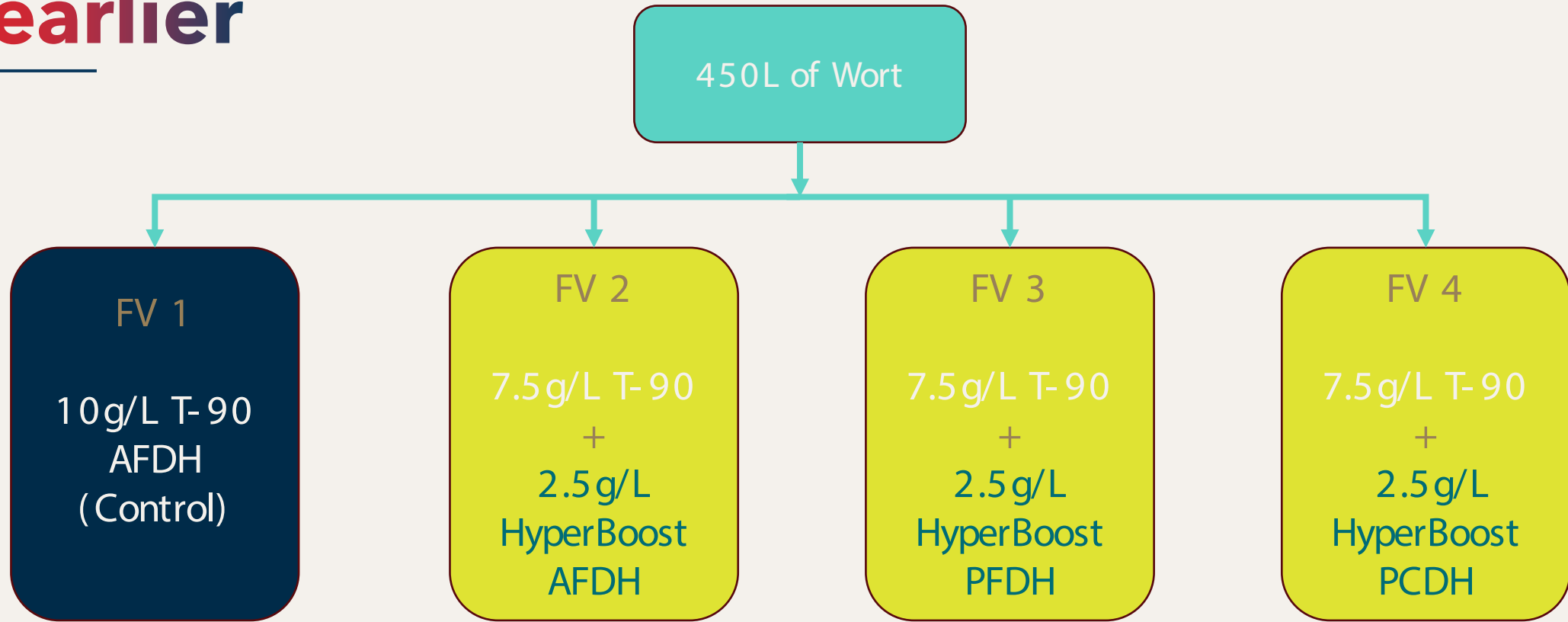
Beer GC/MS Results for Selected Compounds - **IPA**



Dosage Timing

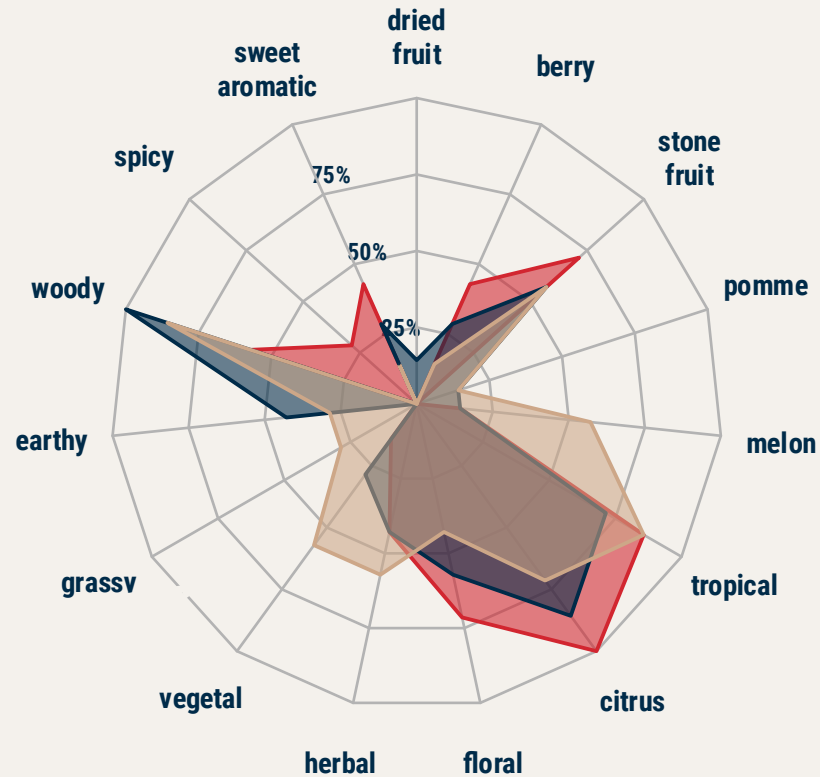
- Where will this product work best for your beer?
- Split batches provide the most information

HyperBoost works better when dosed earlier



HyperBoost works better when dosed earlier

Post crash dosing led to terpene-derived aromas



HyperBoost at Pitch (Day 0) (n=7)

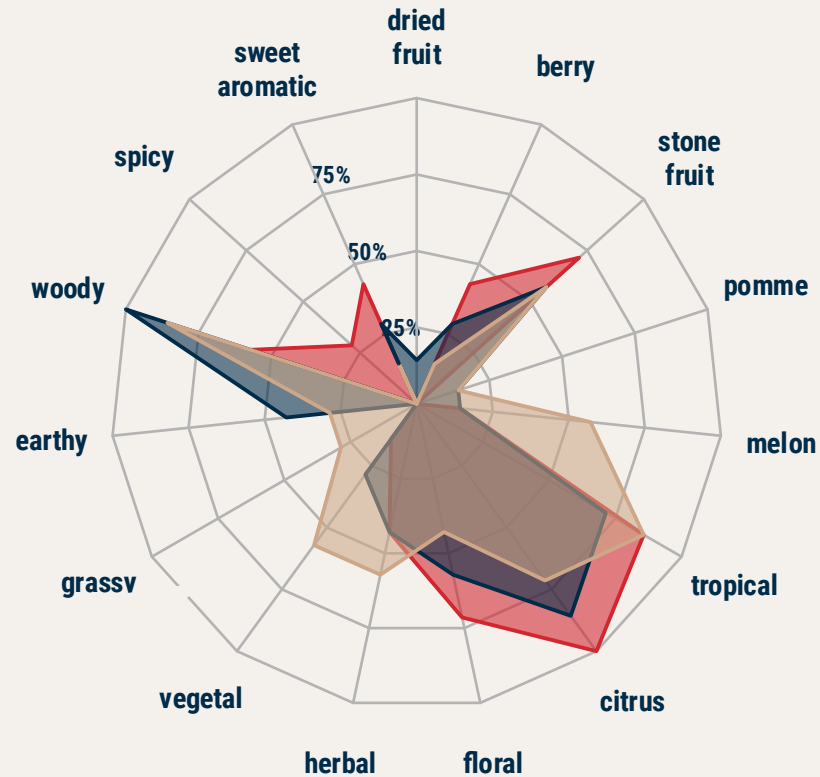
HyperBoost Post-Ferm (Day 6) (n=7)

HyperBoost Post-Crash (In Keg) (n=7)



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Active ferm dosing led to the most positive flavors

HyperBoost at Pitch (Day 0) (n=7)

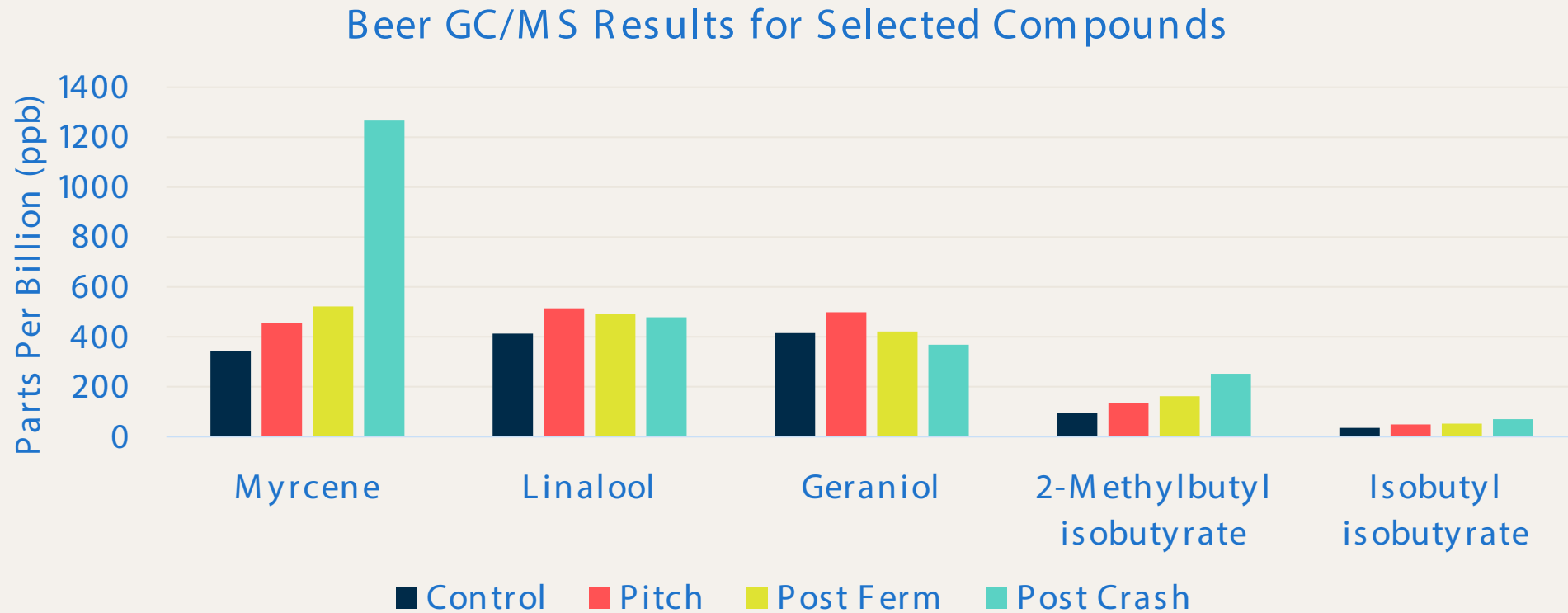
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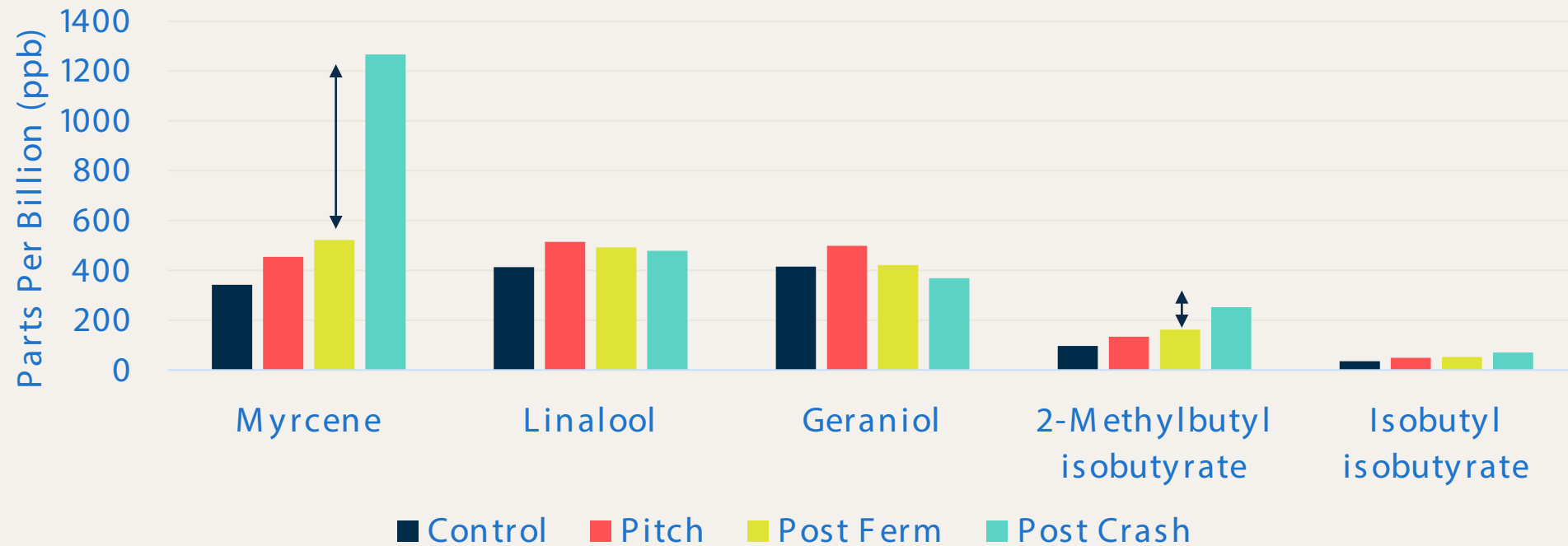
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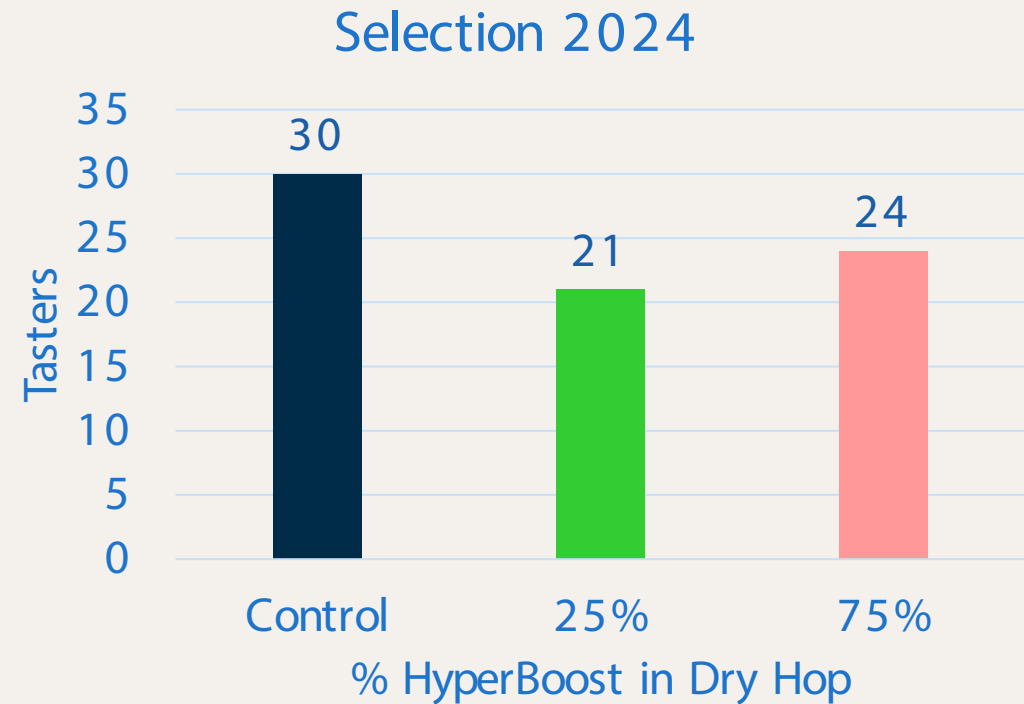
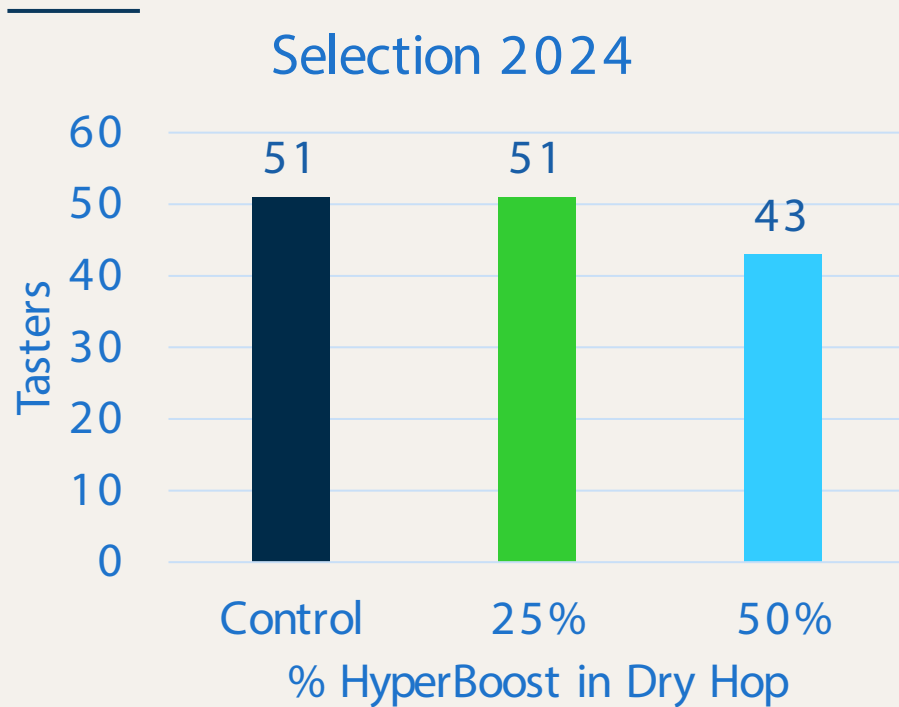


How Much Should You Use?

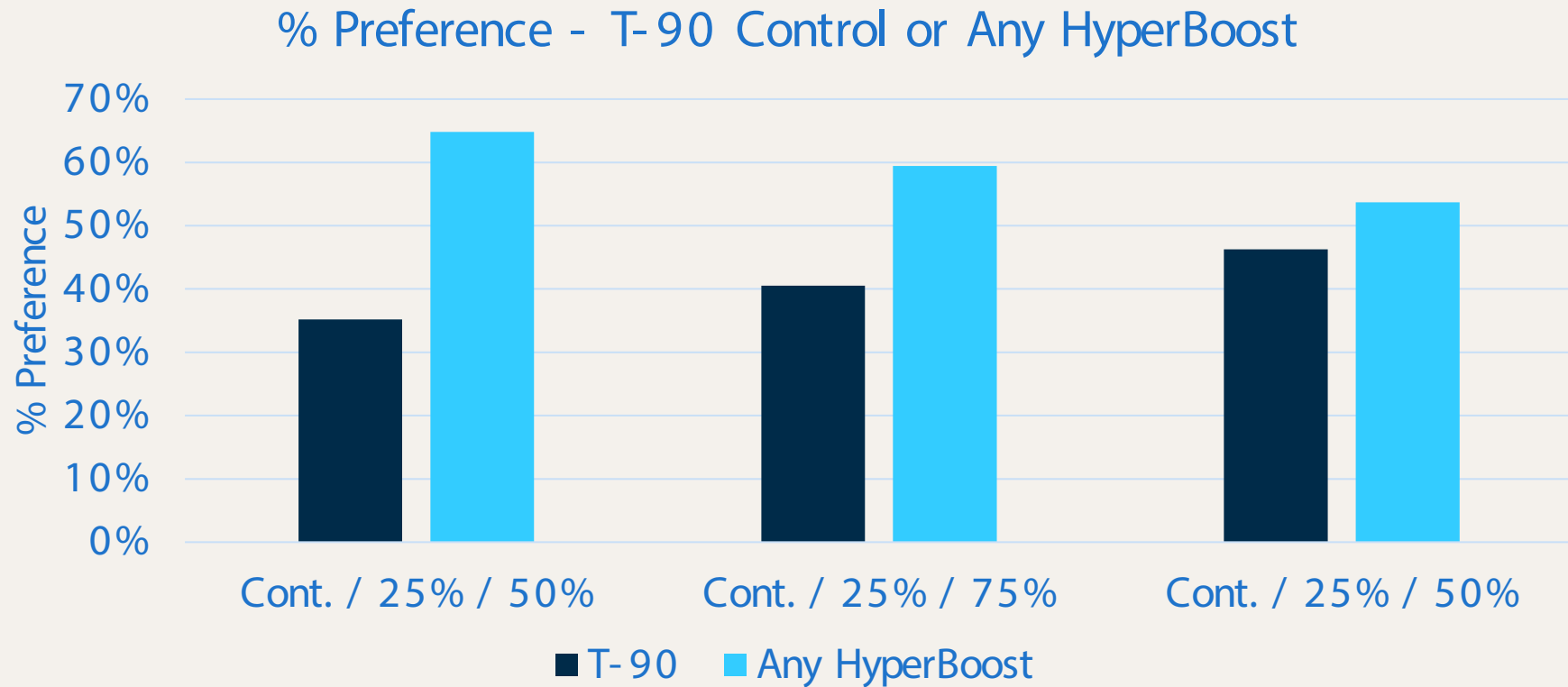
HyperBoost Preference Testing

- Same wort, different levels of HyperBoost in the dry hop
- What differences exist between beers?
- Which do you prefer?

Brewers have been split, preferring both 100% T-90 beers, and beers utilizing HyperBoost



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It's time to try it for yourselves!



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Which beer do you like the most?

248 –T-90 Control
357 –25% HyperBoost @ Pitch
679 –50% HyperBoost @ Pitch

Krush –T-90 / HyperBoost –50%
Talus –T-90 - 30%
Mosaic –T-90 –20%



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