



Hop and Beer Sensory Analysis

Introduction and Workshop



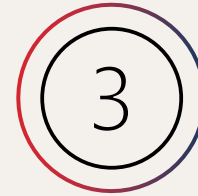
Agenda



Introduction – Why Sensory?



Lexicons and Ref Standards



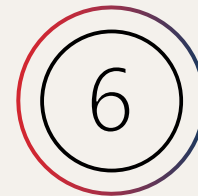
Ref Standard Training



Hop Sensory Evaluation



Beer Sensory Evaluation

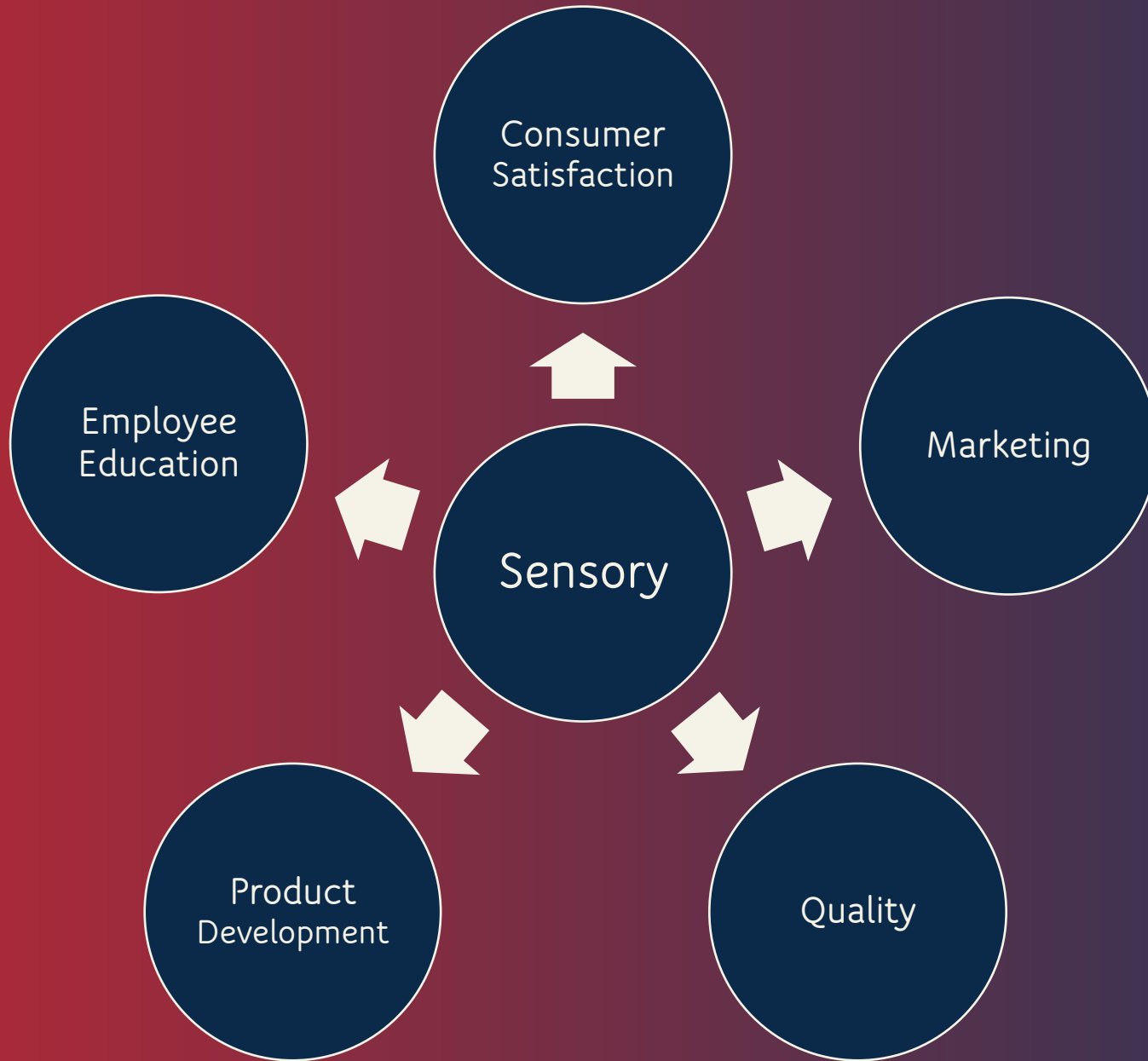


Conclusions and Questions

Why Sensory?



**HOP &
BREW
SCHOOL**



Sensory Challenges

- Time
- Money
- Gap between subjective and objective
- Repeatability



Developing a Lexicon

Lexicon: The vocabulary of a person, language, or branch of knowledge

- Best Practices:
 - Develop a lexicon based off the full range of aromas and flavors in your product
 - Use distinct, universally-understood terms and define them
 - Utilize reference standards to represent those terms for training
 - Try to use whatever is easiest to get:
 - Essential Oils
 - Candy/Candy Flavorings
 - Whatever works and is the closest representative thing that you can get
- The Yakima Chief Sensory Panel utilizes a sensory lexicon very similar to the list published by American Society of Brewing Chemists to maintain alignment with the rest of the U.S. industry

AROMA



DRIED FRUIT

Date • Dried Apricot
Dried Fig • Raisin



BERRY

Black Currant • Blueberry
Grape • Raspberry • Strawberry



STONE FRUIT

Apricot • Cherry
Peach • Plum



POMME

Apple • Pear



MELON

Cantaloupe • Cucumber
Honeydew • Watermelon



TROPICAL

Banana • Coconut • Guava • Lychee
Mango • Passion Fruit • Pineapple



CITRUS

Grapefruit • Lemon
Lemongrass • Lime • Orange



FLORAL

Cherry Blossom • Geranium
Jasmine • Rose • Soapy



HERBAL

Black Tea • Dill • Green Tea
Mint • Rosemary • Thyme



VEGETAL

Cabbage • Celery
Green Pepper • Tomato Plant



GRASSY

Green Grass • Hay



EARTHY

Barnyard • Compost • Geosmin
Leather • Mushroom • Soil



WOODY

Cedar • Pine • Resinous • Sawdust
Tea Tree • Tobacco



SPICY

Anise • Black Pepper
Cinnamon • Clove • Ginger



SWEET AROMATIC

Bubblegum • Caramel • Chocolate
Creamy • Honey • Vanilla



ONION / GARLIC

Garlic • Green Onion • Onion



DANK

Cannabis • Skunky



NUTTY

Almond • Peanut • Walnut



BREADY

Biscuit • Dough
Graham Cracker • Oatmeal • Rye



ROASTED

Coffee • Dark Malt



OFF-NOTES

Burnt Rubber • Cardboard • Catty
Cheesy • Diesel • Musty • Plastic/Waxy
Smoky • Sulfur • Sweaty

* Acetaldehyde • Butyric Acid
Diacetyl • DMS • Lactic Acid
Light Strike • Metallic

**Off notes occurring in beer*

TASTE

BITTER

SALT

SOUR

SWEET

UMAMI

MOUTHFEEL

ALCOHOL

Warming • Boozy

ASTRINGENCY

Drying • Grippy

BODY

Thickness • Fullness

CARBONATION

Bubble Size • Density

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Reference Standards and Training

Practices makes perfect!

- Start by assessing standards with labels, then advance to blind identification tests
 - Link those standards to a core memory, something that's easiest for you to come back to when that aroma is right on the tip of your tongue!
- Train with partner(s)
- Incorporate duplicates or dilute concentrations of standards to truly put yourself to the test
- Look for cues, especially to distinguish between minor aromas
 - How is Lemon different from Lime?
 - How is Cedar different from Pine?
- Informal training helps too
 - Practice describing what you're tasting/smelling to yourself or a partner over a meal

LET'S GET SMELLY!





Orange

- ✓ 100 μ L orange essential oil
- ✓ 20mL 5% ethanol in water
- ✓ 2 drops brown food coloring



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Peach

- ✓ 20 drops peach candy flavoring
- ✓ 20mL water
- ✓ 2 drops brown food coloring



**HOP &
BREW
SCHOOL**



Raspberry

- ✓ 10 drops raspberry Aromaster oil
- ✓ 20mL 5% ethanol in water
- ✓ 2 drops brown food coloring



**HOP &
BREW
SCHOOL**



Rose

- ✓ 100 μ L geraniol
- ✓ 20mL 5% ethanol in water
- ✓ 2 drops brown food coloring



**HOP &
BREW
SCHOOL**



Pine

- ✓ 100 μ L pine essential oil
- ✓ 20mL 5% ethanol in water
- ✓ 2 drops brown food coloring



**HOP &
BREW
SCHOOL**



Guava

- ✓ 10 drops guava Aromaster oil
- ✓ 20mL 5% ethanol in water
- ✓ 2 drops brown food coloring



**HOP &
BREW
SCHOOL**

Hop Assessment Protocol

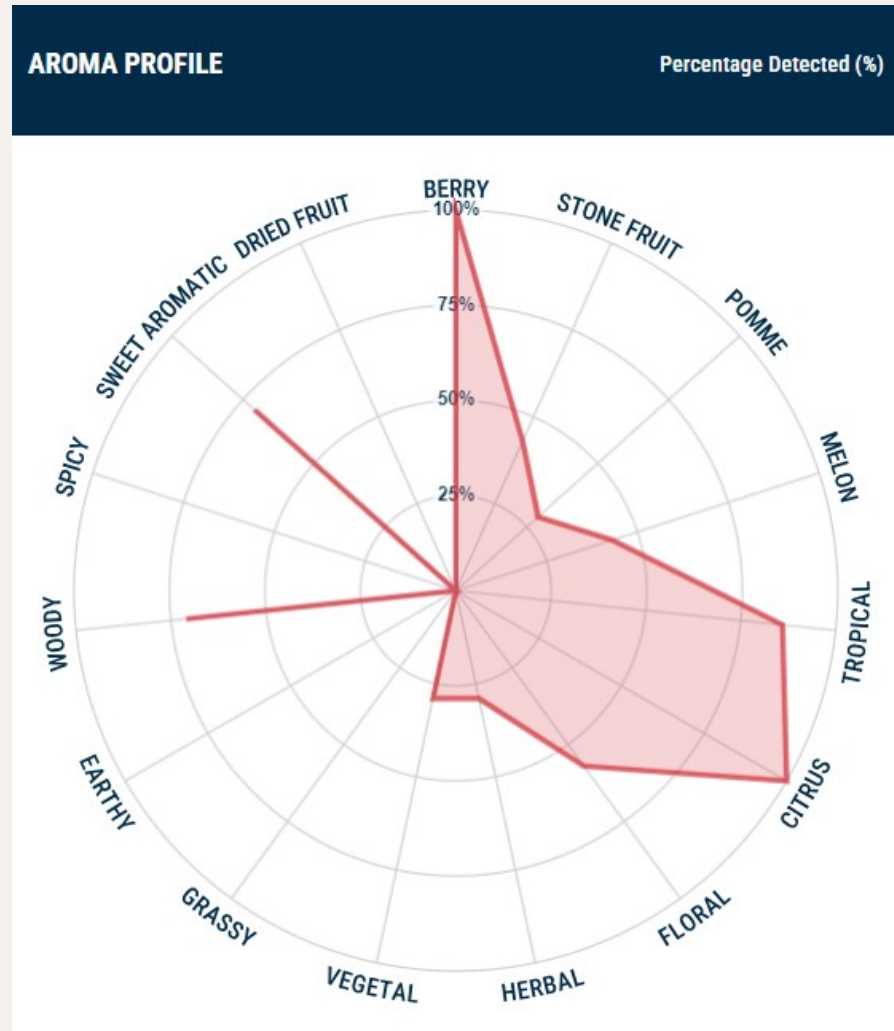


- When the time comes (not yet!)
- Give the pellets a little fluff to agitate aromas
- Tear into your bag
- Begin smelling from farther away, taking note of what you can smell from a distance
- Slowly work your way closer

Krush™ (HBC 586)

Alpha: 18-22%

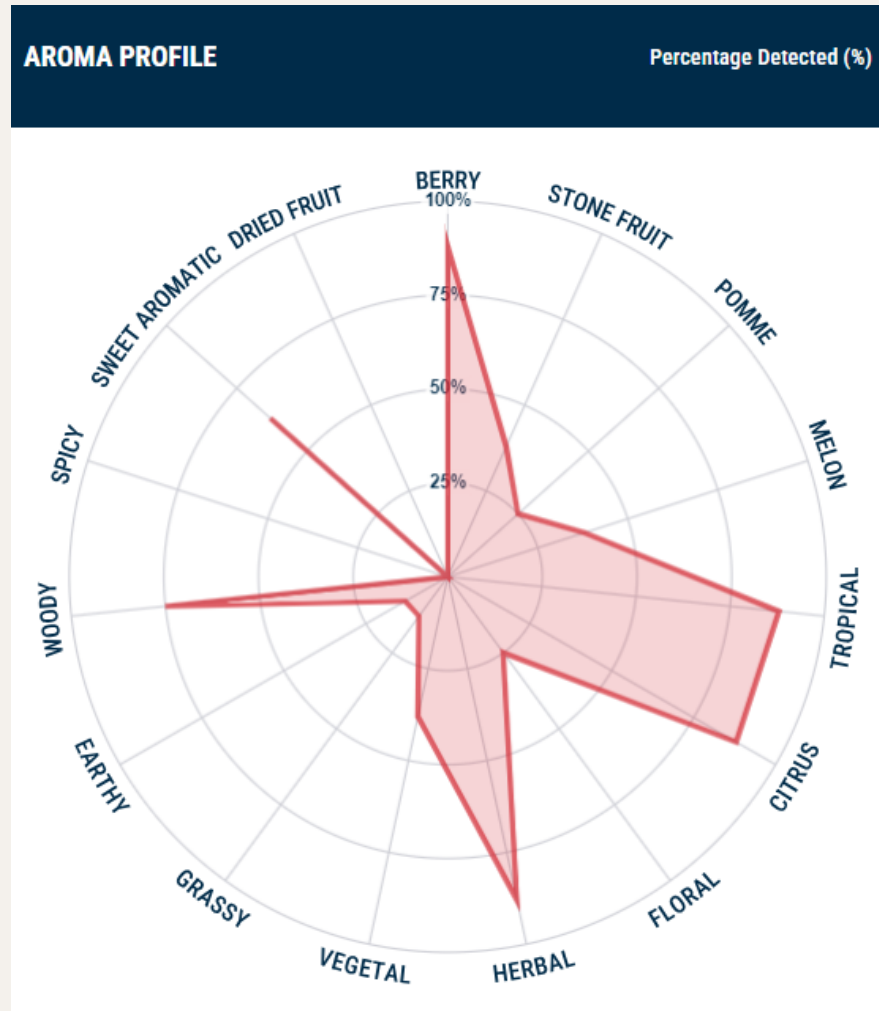
Aroma Profile: Citrus, Tropical, Stone Fruit, Woody



Talus™

Alpha: 7-10%

Aroma Profile: Grapefruit, Herbal, Pine, Rose, Tropical



Beer Assessment Protocol

- Open your cans and share around the table
 - Leave enough space at the top of the cup to swirl
- Gently swirl the beer, taking note of any aromas from 6 inches away
- Gradually get closer, taking note of how the aromas change
- Cover the cup with your palm, swirl gently, and smell the trapped aromas
- Take a sip, allowing the beer to touch all parts of the tongue.
- Swallow, and exhale through your nose



"Lateral A is the name of what is arguably the most prolific road in all of hops. A showcase for modern hop varieties, this IPA features Krush™ and Talus™ hops for flavors of lemon hard candy and guava."



THANK YOU!

Any Questions?

sensory@yakimachief.com



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SCHOOL**