



HOMEBREWED HERO

SIERRA NEVADA BREWERY

NEXT STEPS FOR BREWPUBS TO MULTIPLE BREWERIES

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Sensory Manager
Sierra Nevada Brewing Co.

Sensory at Sierra Nevada Brewing Co.



Two Locations:

- Chico, CA
- Mills River, NC

Staffing:

- Manger
- Three Technicians

Five Panels:

- Chico Quality Release Panel
- Mills River Quality Release Panel
- Chico Discrimination Panel
- Chico Descriptive Panel
- Chico and Mills River New Brand Development Panel

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The Importance of Sensory



Quality

Enjoyment

Taste

Customers

Consistency

Loyalty

Reputation

Refreshment

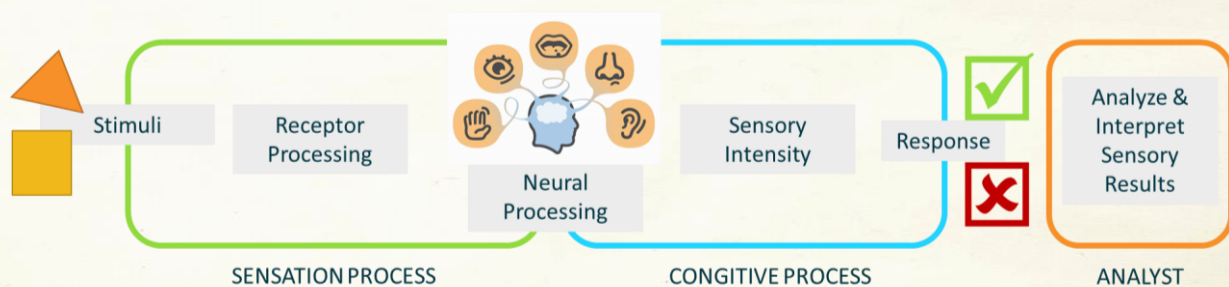
Repeat Purchases

Agenda

- **The Science of Sensory**
- **Getting Started**
 - Who tastes
 - When/Where to taste
 - How to taste
 - Serving considerations
- **Quality Assurance/Quality Control**
 - Methodology
 - Samples: Product, In-Process, Ingredients
 - Decisions and Reporting
- **Beyond QA/QC**

The Science of Sensory

Goal: Limit test biases!





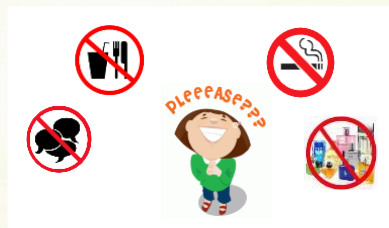
Getting Started – Panelists

- **Recruitment**
 - Identify requirements, if any
 - May depend on the panel...
 - Communicate why, the importance and the time commitment
 - Gauge interest
 - Communication channel
 - How many?
 - Depends on the test...
 - Quality >4, Discrimination = 34, Descriptive ≥ 8

Getting Started – Panelists

• Expectations

- Consumption rules
- No eating 30 mins prior
- No smoking 1 hour prior
- No talking or influencing others
- Show up on time



• Motivation

- Incentives
- Feedback



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Getting Started – Panelists

• Validation

- Consumption Policy
- Time/Punctuality
- Health
- **Testing:**
 - Basic tastes
 - Sweet, Sour, Bitter, Salty
 - Discrimination
 - Dosed triangle test

• Identification

- Diacetyl, Acetaldehyde, DMS
- Brand Recognition

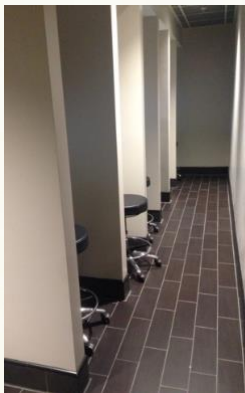
• Determine sensory acuity, impairments and descriptive ability

Add disc screening pic

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Getting Started – Spaces



• Ideal vs. Practical

- Dividers
- Neutral Colors
- Good Air Flow
- Quiet
- Free of Smells
- Water Proof / Tight



Cellar pic?



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Getting Started – Tasting Methodology

- **Training**
 - Use all sense
 - Deliver a framework
 - Share best practices
- **Ultimately, Aim for Consistency**



Focus

Clear your mind

Visual (Clear Glassware ONLY)

Color, Clarity, Foam

Wait 10 sec... Foam Collapse

Smell First

Natural Sniffs

Gentle Swirl

(Covering OPTIONAL)

1 sec (short) Sniffs

2 sec (long) Sniffs

Taste Second

Flavor Deviations Sip

Mouthfeel/Body/Carbonation Sip

Bitterness Intensity Sip

Bitterness Quality/Linger Sip

Concentration but recognize this is the best part of your job in the eyes of your jealous friends!

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Getting Started – Serving Samples

- **Sample Uniformity**
 - Temperature
 - Pour height
 - Foam
- **Serving**
 - Blind / Coding
 - Randomized
 - Maintaining carbonation
- **Storage/Shipping**
 - Time
 - Temperature



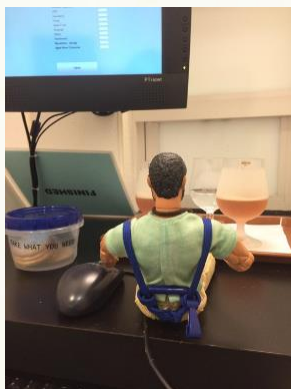
Add shipping boxes

Good Sensory Practices

Goal: Limit test biases!



Quality Assurance/Quality Control



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QA/QC – Methods

- Accept/Reject
- In/Out
- Difference from Control
- Discrimination
- Acceptability Scaling
- Descriptive

- Comments
- CATA


Add pics

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QA/QC – Recommended Method

- TTB/Not TTB

 <small>AMERICAN SOCIETY OF Brewing Chemists</small>	AMERICAN SOCIETY OF BREWING CHEMISTS, INC. Report of Subcommittee ¹
SENSORY PRODUCTION RELEASE	
Subcommittee Members: I McLaughlin, <i>Chair</i> ; S. Bennett; M. Peltz; A. Schultz; L. Barr (<i>ex officio</i>)	
Keywords: Production release, go/no-go, ttb/not ttb	
CONCLUSIONS	
1. TTB/not TTB sensory assessments are the most straightforward way to routinely evaluate a large number of fresh samples in a production brewery. It is often the last, and most comprehensive, quality check performed on products before they begin their journey to the consumer. The use of a standardized methodology and adequately trained panelists is critical to consistent success. The method outlined below represents the scientific brewing community's most up-to-date approach to this crucial Quality Control assessment which should be considered a foundational aspect of a sensory lab in a production environment	


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QA/QC – Recommended Method

True to Brand Evaluation

For each attribute description, is the sample reasonably true to brand?

VISUAL	FLAVOR	
<input checked="" type="checkbox"/> <input type="checkbox"/>	Fermentation	<input checked="" type="checkbox"/> <input type="checkbox"/>
	Hop	<input checked="" type="checkbox"/> <input type="checkbox"/>
	Malt	<input checked="" type="checkbox"/> <input type="checkbox"/>
	Bitterness	<input checked="" type="checkbox"/> <input type="checkbox"/>
	Mouthfeel	<input checked="" type="checkbox"/> <input type="checkbox"/>
	Additional Notes	<input checked="" type="checkbox"/> <input type="checkbox"/>

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QA/QC – Recommended Method

Pale Ale (21+ Day)



True to Brand Profile

Color: Amber to dark amber

Clarity: Bright

Foam: Creamy white to off-white foam



Fermentation: (fresh fruit, apple, pear)

3.5

Hop: (citrus, pine, rose)

3.5

Malt: (grapeanuts)

4

Bitterness: (clean)

4

Mouthfeel: (RE balanced with bitterness)

3

Additional Notes: diacetyl is NOT acceptable in 21+ day beers

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QA/QC – Samples

- Product
 - Same Day
 - 1 Day
 - 9-12 Day
 - 21+ Day
- Consumer Concerns
- Stability Testing
- Multi-location Checks

Add FPA photo



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QA/QC – Samples

- In Process
 - BBT
 - Fermenter
 - Primary Fermentation (VDK)

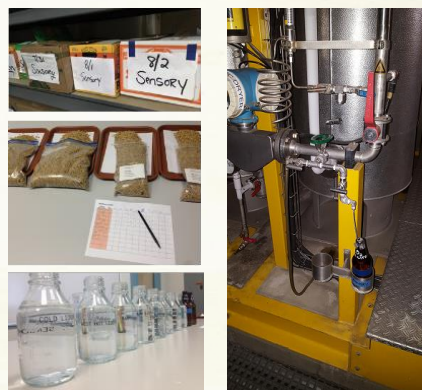
Add Collection Photos

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QA/QC – Samples

- Ingredients
 - Water
 - Malt
 - Hops
 - CO2
 - Other Ingredients – N2, Dextrose



- Methodology
 - Simple vs. Complex
 - Raw form vs. Sample prep

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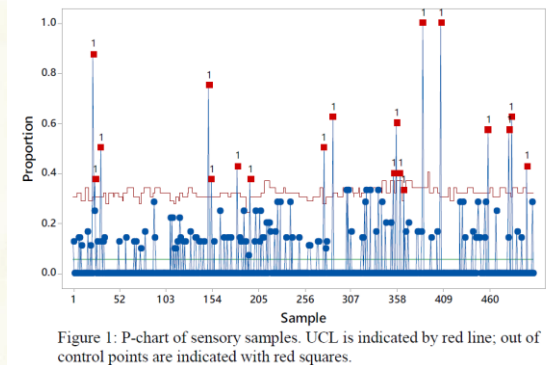
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QA/QC – Decisions/Reporting



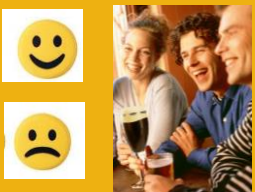
- Round table discussion
- Action log
- SPC

Add Round table pic

ACTION LOG							Missing	PSA
							Missing Date	PSA Date
Distribution								
CT	Date	Topic	Action	Comments	Accountability	Due Date	Status	
26	7/26/18	H2T Flavor Stability	Review Age Rate and Flavor data to address H2T flavor stability		Sensory	7/20/18	Complete	
32	8/24/18	Hop Year Changes	Discussion plan and coordination for incorporating fresh hops into blends		Brewing Raw Materials	9/28/18	In Progress	



Beyond QA/QC

Discrimination	Descriptive	Consumer
Is there a difference?	What is the difference?	Does the difference matter?
Difference tests such as the Triangle Test	Attribute scaling	Preference, acceptance, focus groups tastings
Trained or untrained panelists	Highly trained panelists	Untrained panelists only
		

Discrimination – Power of Numbers

• Methods

Duo – Trio



Tetrad



Triangle



2 of 5



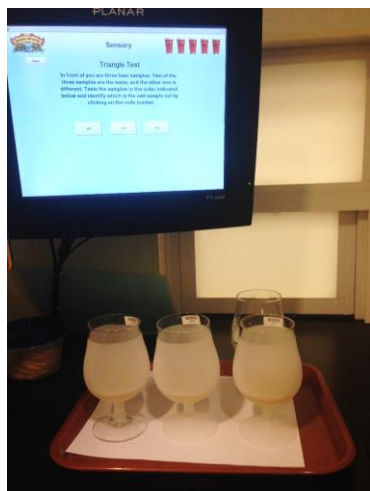
x of X

Is there a difference?

• Considerations

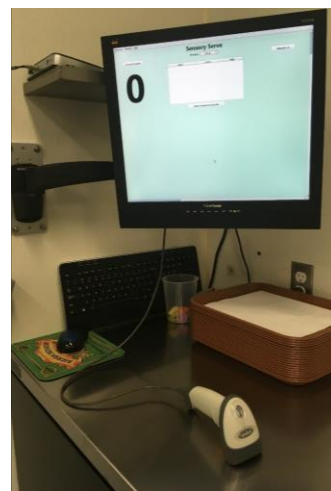
- Training
- Set Up
- Statistics
- *Note: Directional difference utilizes different statistics!*

Discrimination – Triangle Testing



Which is **not** like the others?

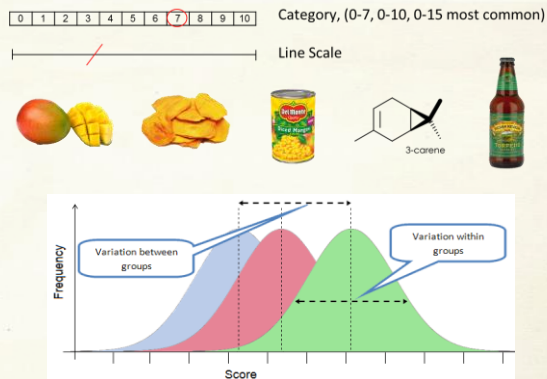
Testing	Samples	Results
Triangle Day 21	RP042-11 D vs. C PAL Pale Ale Can vs. Bottle	Not significantly different
Triangle Day 60	RP042-11 D vs. C PAL Pale Ale Can vs. Bottle	Not significantly different
Triangle Day 90	RP042-11 D vs. C PAL Pale Ale Can vs. Bottle	Not significantly different
Triangle Day 120	RP042-11 D vs. C PAL Pale Ale Can vs. Bottle	Not significantly different
Triangle Day 21	RP042-11 F vs. E TOR Torpedo Ale Can vs. Bottle	Not significantly different
Triangle Day 60	RP042-11 F vs. E TOR Torpedo Ale Can vs. Bottle	Not significantly different
Triangle Day 90	RP042-11 F vs. E TOR Torpedo Ale Can vs. Bottle	Not significantly different
Triangle Day 120	RP042-11 F vs. E TOR Torpedo Ale Can vs. Bottle	Not significantly different
Sensory Profile	Pale Ale Can vs. Bottle	Not significantly different
Sensory Profile	Torpedo Ale Can vs. Bottle	Not significantly different



Descriptive – Power of Training

What is the difference?

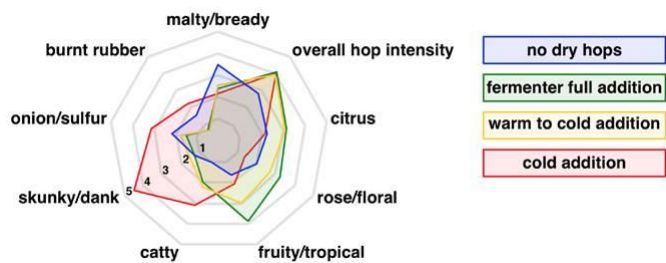
- **Methods**
 - Quantitative Descriptive Analysis (QDA)
 - Spectrum (Universal Scale)
- **Considerations**
 - Training
 - Set Up
 - Statistics
 - **Note: Ongoing training and performance feedback is critical!**



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Descriptive – QDA



	No Hops	Fermenter Full	Warm to Cold	Cold	p value
Malty/Bready	3.5 A	2.4 B	2.5 B	2.2 B	0.006
Overall Hop Intensity	2.8 B	4.1 A	4.0 A	4.1 A	<0.001
Citrus	2.2 B	3.1 A	3.1 A	2.1 B	<0.001
Rose/Floral	2.0 B C	3.2 A	2.7 A B	1.4 B	0.001
Fruity/Tropical	1.6 D	3.9 A	3.0 B	2.0 C	< 0.0001
Catty	1.0 C	2.0 B	2.2 A B	3.1 A	0.001
Skunky/Dank	1.3 B	1.3 B	1.5 B	4.5 A	< 0.0001
Onion/Sulfur	2.2 A B	1.5 B	1.8 B	3.1 A	0.014
Burnt Rubber	1.6 A B	0.7 B	0.7 B	2.2 A	0.025
Bitter	2.7	2.9	2.7	3.1	0.266
Harsh	1.7	1.7	1.8	2.2	0.160



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Consumer – Power of Judgement

- **Methods**

- Liking
- Attribute Scaling
- Purchase Intent

- **Considerations**

- Training
- Set Up
- Statistics
- *Note: Do not mix descriptive and liking questions!*



*Does the
Difference
Matter?*



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The Importance of Sensory



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Growing a Sensory Program Conclusions

Beyond QA/QC – Discrimination,
Descriptive and Consumer Testing

QA/QC – Sensory should be the first and final
line of defense in a quality program.

Getting Started – Just Taste! We covered the basis of
selecting and motivating panelists, choosing an
appropriate space, training and servings samples.

Additional Resources

- **Professional Organizations**

- MBAA – The Practical Brewer – Beer Quality and Taste Methodology
- ASBC MOA's – Webinars, Databases, Calculators

- **Sensory Texts**

- **Sensory Evaluation of Food** – Lawless and Heymann
- **Sensory Evaluation Techniques** – Meligaard, Carr and Civille
- **Tools and Applications of Sensory and Consumer Science** – Ennis, Rousseau and Ennis

- **Sensory Workshops**

- OSU, UC Davis, Siebel, Spectrum

