

2020 11th Annual Hop Conference

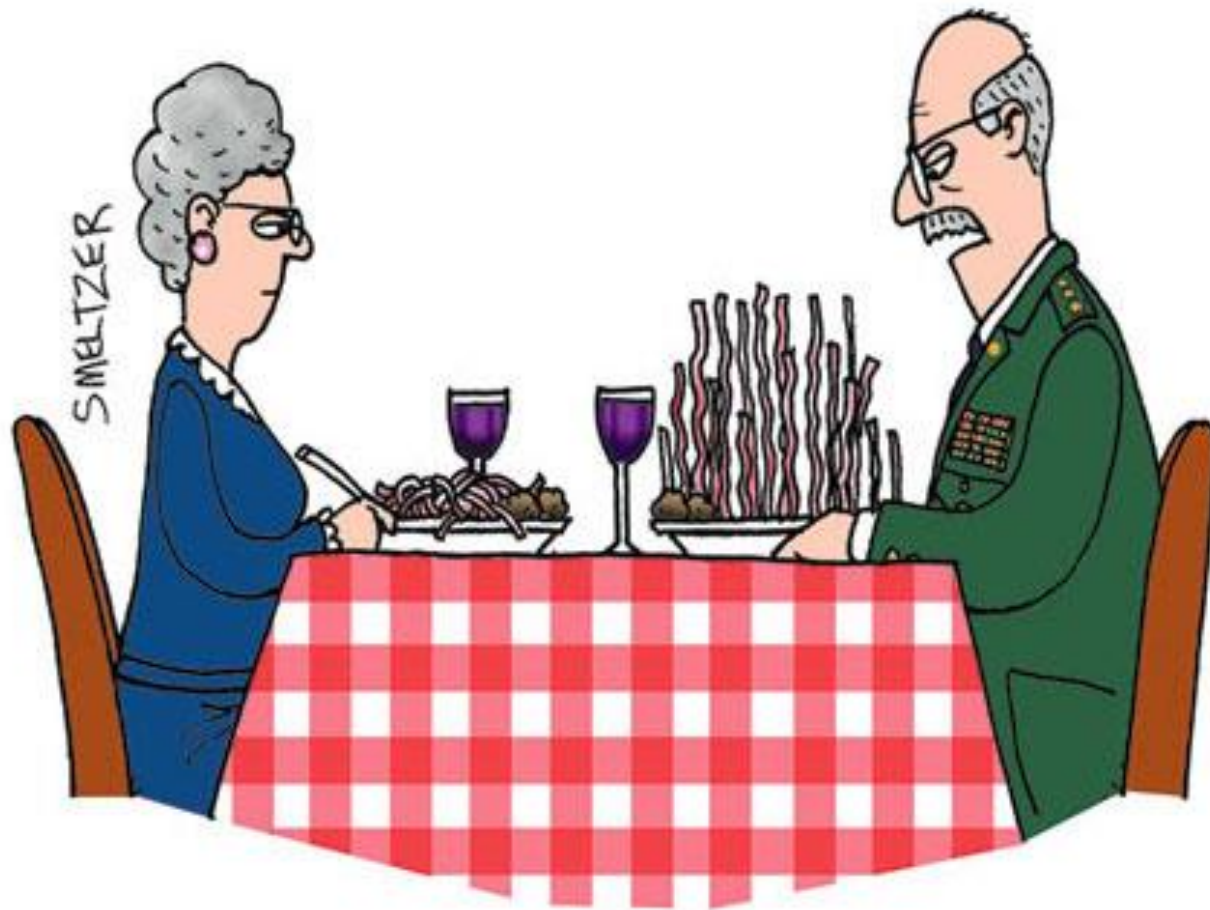
Sensory Quality Impacts for End Users

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THE UNIVERSITY OF VERMONT
EXTENSION

Northwest Crops and Soils Program



"At ease!"



Today's Agenda

- Introduction and Overview
- A Review of the Basics of Sensory Analysis
- Aroma Characteristics of Hops
- Brewing and Beer Flavor
- Flavor Standards
- Research Opportunities



Everyone Must Be Customer Focused, and Hops Contribute to All Four Areas of Success.

Communicating a promise/image of an appealing product

Delivering
flavor the
consumer
wants

Quality
and
Consistency



Providing the
“right”
package

Attractive
and
Functional

Producing and distributing the product economically



Information Needs and Gaps

Environment



- What factors out of my control affect hop quality and how?
- How can I manage these factors?

Hops



- What hops will deliver to my customer/brewer needs?
- How can I adjust my farming practices to maximize hop quality?
- How do we measure hop quality?

Brewing



- What hops will give me the aroma and flavor I need?
- How do I measure hop quality before brewing?
- Brewing parameters?

Consumer



- What hop aroma and flavor drives drinker overall liking?
- Beer Specifications?
- How do we monitor changing needs?



Sensory Analysis is helping to fill
the informational gaps.

Review of the Basics of Sensory Analysis



Sensory analysis is:

**The use of people as
instruments to measure
sensory response to stimuli**



Everything is Safe to Smell and Taste



Flavor is comprised of three components:

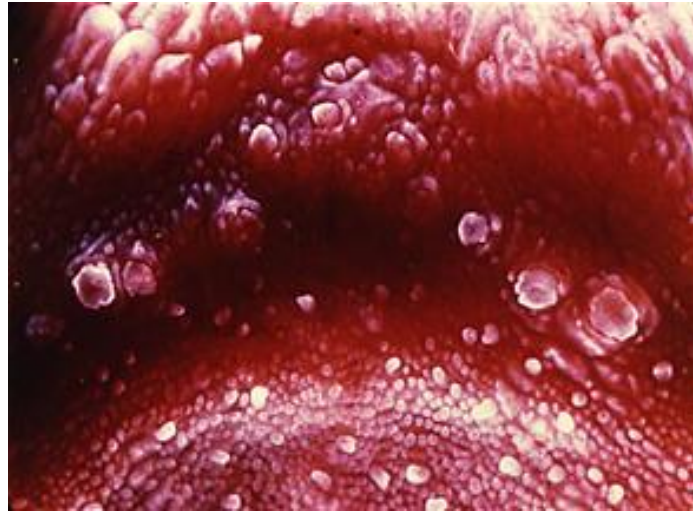
- 1 Basic tastes
- 2 Aromatics
- 3 Mouthfeels



1

Basic tastes

Taste refers to those sensations perceived through the stimulation of the receptor cells enclosed within the taste buds on the tongue.

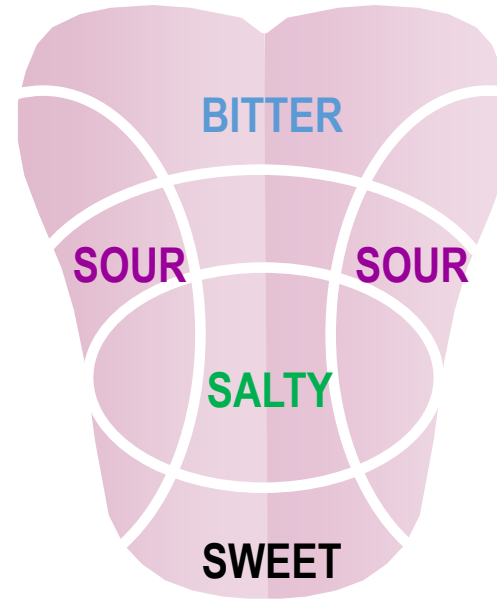


1

Basic tastes

Basic Taste	Sensed more on...
Sweet	...tip of tongue
Sour	...back sides of tongue
Salty	...all over tongue
Bitter	...back of tongue
Umami	... middle of tongue

We have all the taste buds all over the tongue...



however, we sense the different basic tastes more in some regions than others.



2

Aromatics





Aroma Aromatics are perceived through stimulation of the olfactory receptor cells and the free nerve endings of the trigeminal nerve.



Flavor aromatics are compounds volatilized in the mouth, travel up the back passage, and are detected in the olfactory region of the nose.



Mouthfeels are chemical or physical sensations which are detected in the mouth, nose, or throat.



Astringent

- Dry
- Tannin
- Harsh
- Bite and burn
- Yeasty



Hops

Aroma Characteristics of Hops



Common Hop Descriptors

Fruity

Citrus
Lemon
Grapefruit
Orange
Tropical

Cheesy

Stinky
Rancid
Sweaty
Body odor
Vomit

Herbal

Piney
Sage
Basil
Oregano
Thyme
Minty

Floral

Perfumy
Rose
Geraniol
Lavender
Tobacco

Vegetable

Cabbage
Broccoli

Green

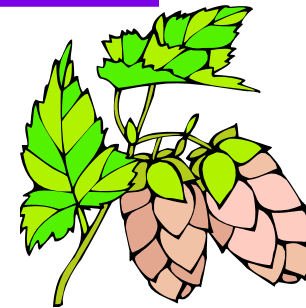
Grassy
Stemmy
Leafy
Tea

Spicy

Peppery
Ginger
Onion

Other

Skunky
Brothy
Urine
Briny
Musty
Earthy
Dirt
Hay
Resinous



The Brewing Process



- Malt
- Mill
- Mash Tun
- Wort
- **Brew Kettle**
- Cool Liquid
- Pitch Yeast
- Fermenter
- Lager
- Pasteurize/CF and/or Fill



Beer Flavor



BASIC TASTES

Sweet
Sour
Bitter*
Salt (rare)

AROMATICS

Hops*
Yeast
Grain
Fruity

MOUTHFEELS

Astringent
Dry/Tannin*
Yeasty



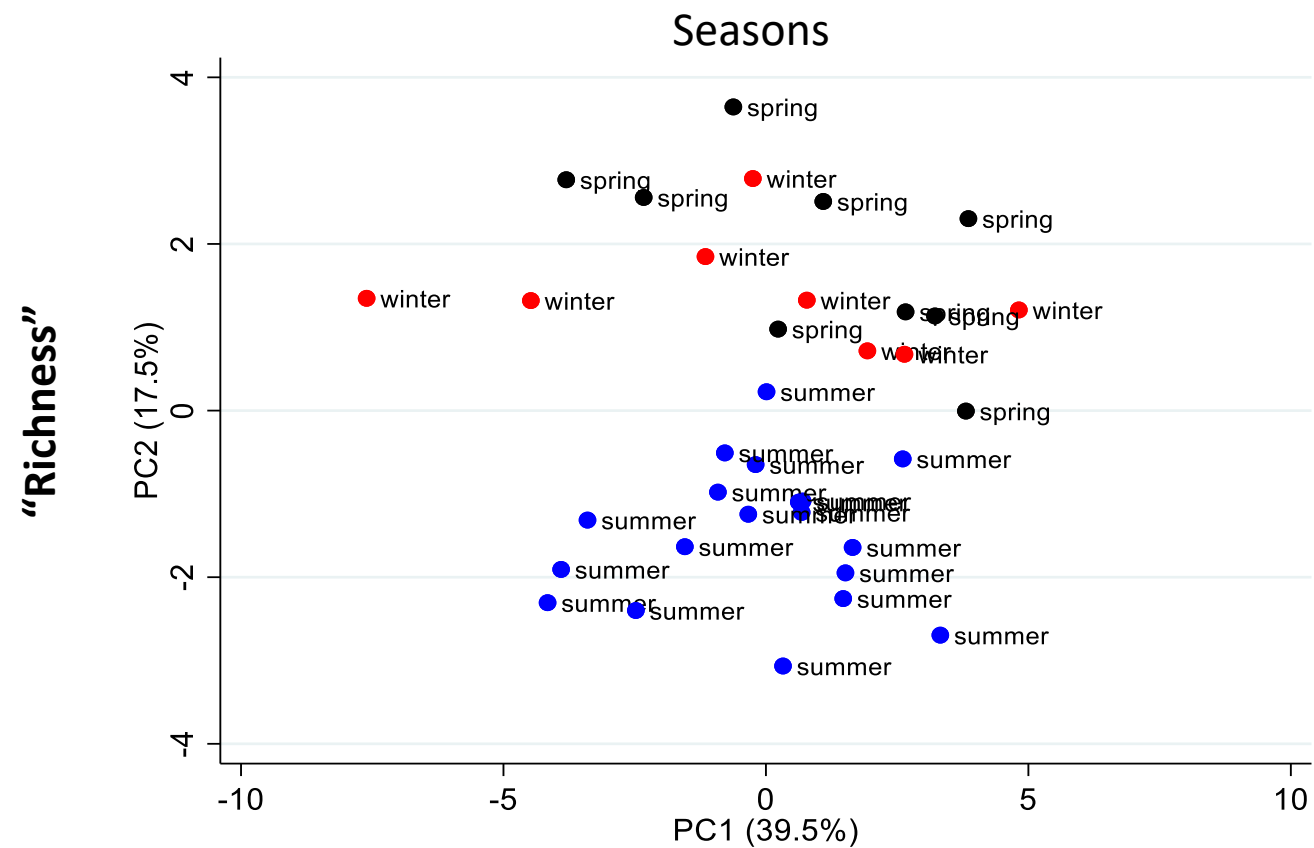
Flavor Reference Standards



Grass-fed Milk Grant Example

- Quality of Milk In The Market (Using trained sensory panel)
- Consumer Research (Overall Liking)
- Develop a Quality Index
- Quality of Milk at Farms
- Correlations to Farm Practices
- Guidance to Produce High Quality Milk (Consumer Focused)





Winter = Jan/Feb
Spring = Apr/May
Summer = Aug



What can you do?

Education (Sensory, Brewing, and Customers and Consumer)

Share information (Hop and Brewing Industry)

Participate in Research

Have Fun! There is plenty of passion to go around.



Questions?

