



Master Brewers' Association of Canada

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DISTRICT ONTARIO, CANADA

Sensory Defects of Beer and Their Origins

- Welcome
- Why do we need to taste?
- Sensory Overview
- Quality Beer Characteristics
- Beer Defects
 - Common Brewery/Production Defects
 - Common Trade Defects (home and tavern)
- Questions



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Why do we need to taste??

- Importance of Sensory
- Beer Costs Money \$\$\$
- You produce and sell the beer



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Sensory Overview

- We have 5 senses – use them all to taste beer?
- Exercise – Smell the glass vial
- What is it?
- Is it (Maraschino) Cherry??
- Wrong – It's **almond extract**
- How to taste beer
 - Pour, look, swirl, smell, sip, swallow



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Quality Beer Characteristics

- Estery
 - Fruity (banana, pear, plum, pineapple, other)
 - Floral (hop flower, fruit blossom, rose, geranium)
- Spicy (clove, coriander, Curacao)
- Hoppy (citrus, spicy, earthy)
- Alcohol (burn)
- Malty/Grainy (grain, toast, caramel, toffee, chocolate, coffee)
- Sulphury (yeasty, H₂S, SO₂, bready)
- Sweet, Sour, Bitter



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Common Brewery/Production Defects

- Acetaldehyde (green apple, grapefruit, unripe banana)
 - Hangover alcohol → alcohol dehydrogenase → acetaldehyde → acetaldehyde dehydrogenase → acetic acid
 - Causes – no breakdown of acetaldehyde by alcohol dehydrogenase in yeast (pyruvate → aa → alcohol)
- Diacetyl (buttery, butterscoth, movie popcorn)
 - Valine → α -acetolacte (which escapes the cell and is spontaneously **decarboxylated** into diacetyl)
 - Yeast absorbs diacetyl and reduces ketone to acetoin and 2,3-butanediol



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Common Brewery/Production Defects

- Sulfite (burning sulfur, struck matchstick, wine?)
 - Sulfite used as preservative
 - Natural during fermentation
 - Oxidizer (slows oxidation)
 - Allergies

- Sulfide (H₂S, rotten eggs)
 - Anaerobic breakdown of organic matter (bacterial etc.)
 - Cysteine broken down by enzymes



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Common Brewery/Production Defects

- DMS -- Dimethyl Sulfide (cooked corn, cabbage, cooked veg)
 - Naturally occurring in malt (more in bacterial infection)
 - Flashed off in brewhouse

- Musty/Earthy -- Ethyl Fenchol (mouldy, earthy, musty)
 - Mould presence in water

- Metallic -- Iron/Copper (aftertaste, no aroma)
 - Current in mouth
 - Unpasivated metal, beer soluble iron (DE)



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Common Brewery/Production Defects

- Rancid – Butyric or Isovaleric Acid (rancid, cheesy, sweaty)
 - Oxidation of fats/fatty acids
 - Mishandling of hops

- Phenolic (chlorine/sani, bandaid, rubber, shrimpy, clove)
 - Wild yeast, poor yeast health
 - Residual sanitiser
 - Other contamination

- Autolyzed Yeast (marmite, meaty, brothy)
 - Yeast death, cells break, chain reaction (lysosome leaches enzymes)



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Common Brewery/Production Defects

- Acetone (nail polish remover)
 - Bacterial fermentation, decarboxylation of ketone bodies
 - Similar pathway as ketosis in humans (liver breaks down fats into fatty acids, fa's then used in Krebs cycle in cells)



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Common Trade Defects (home and tavern)

- Plastic (contamination with soft plastic and plasticizers)
 - Bad beer line material
 - Crown liners, plastic bottles, etc.

- Lightstuck (skunky)
 - 3-methyl-2-butene-1-thiol from hop alpha acids
 - Brown bottle, green bottle, clear bottle, lightproof hops

- Infected (sour)
 - *Lactobacillus* – dill pickle, bubble gum, lactic acid, sour
 - *Pediococcus* – diacetyl, sour



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Common Trade Defects (home and tavern)

- Oxidation (many descriptors)
 - Beer is like bread
 - Old, stale, dull, papery, cardboard, burnt grain, stale bread, winy, sherry, meaty, brothy, leathery, caramel, cooked vegetable



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Questions / Discussion

- Any Questions?