“SENSORY BEST PRACTICES FOR THE PRODUCTION OF BEER MIXES”

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Beer-mix beverages

- pH 3.1 – 4.8
- Ethanol 0 – 6
- Simple sugars (%): 0.1 – 7.2

Bacteria

- Vinegar
- Astringent
- Sweet pineapple
- Sweet butter
- Yeasty
- Aldehyde
- Petroleum
- Cheesy
- Sour
- Green apple
- Antiseptic
- Smoky...

Yeast

Hygiene

Packaging

Storage Conditions...
• Nielsen: 1 of 49 USA consumers will complain; rest will just stop buying your products

• 21,286 consumer complaints (23% of all) in USA in 2010 were taste related
Contents

• Sensory Evaluation

• Sensory Evaluation Results

• Sensory Best Practices for Beer Mixes (in-process and finished product)

• Conclusions
Beverage Sensory Evaluation

• Sensory perception – not standardised

• Requires effective training and evaluation tools

• To provide good results sensory evaluation must be:
  – Standardised
  – Consistent
  – Simple
The Role of Sensory in Quality

• Objective measure of product quality

• Last chance to ensure quality to customers and consumers

• May prevent product failure and loss
Sensory Evaluation Currently

Trained Sensory Panel

Reference Standards

Training

Validation
Good Sensory Practice Requires Attention to…

- Environment
- Tasters
- Samples
- Methods & Techniques
What can go wrong with beer mixes during production?

• Dilution

• Contamination – with other products, with taints

• Off-flavour generation – from loss of process control, from the activities of contaminant microorganisms, from chemical reactions in the product...
Sensory Evaluation of Beer Mixes

Samples

3 brands (Lemon, Orange & Grapefruit)

324 samples (216 in-process & 108 finished product)

1296 samples in 12 months
Overall flavor non-conformances – all samples

<table>
<thead>
<tr>
<th>Flavor</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldehyde</td>
<td>17</td>
</tr>
<tr>
<td>Astringent</td>
<td>15</td>
</tr>
<tr>
<td>Sour</td>
<td>11</td>
</tr>
<tr>
<td>Bitter</td>
<td>10</td>
</tr>
<tr>
<td>Sweet</td>
<td>8</td>
</tr>
<tr>
<td>Vinager</td>
<td>7</td>
</tr>
<tr>
<td>Sweet butter</td>
<td>7</td>
</tr>
<tr>
<td>Yeasty</td>
<td>6</td>
</tr>
<tr>
<td>Green apple</td>
<td>4</td>
</tr>
<tr>
<td>Sweet pineapple</td>
<td>4</td>
</tr>
</tbody>
</table>
In & Out Methodology

• Panel of 3 qualified tasters familiarized with:
  – product profile
  – uncharacteristic products including products with off-notes
  – principles of the ‘in/out’ method

• Samples:
  – A series of samples may be assessed in one session
Why In & Out Method?

- Incoming Inspection of raw materials
- Process monitoring
- Final product release
- Robust to protect quality
- Fairly simple and easily understood
- High number of samples can be evaluated
- Allows for acceptable product variation
- Fast
2 or more tasters rate as out or if re taste 1 or more tasters rate as out

1 or more tasters rate as out, retest the sample with additional 3 tasters

3 tasters rate as in
The status of the beer mixes samples tasted in XXX brewery

Number of incidences per month

- Green
- Orange
- Red
GMP Flavour Standards for Beer-Mixes & Ciders
# In/Out Validation - Report sample

**Correct Answers:**

<table>
<thead>
<tr>
<th></th>
<th>IN</th>
<th>IN</th>
<th>IN</th>
<th>Musty</th>
<th>Metallic</th>
<th>IN</th>
</tr>
</thead>
</table>

**Taster Responses:**

<table>
<thead>
<tr>
<th>Taster Name</th>
<th>IN</th>
<th>IN</th>
<th>IN</th>
<th>Musty</th>
<th>Metallic</th>
<th>IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panellist 1</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Panellist 2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Panellist 3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Bar Charts:**

- **In Out Score For Round (%):**
  - In: 92%
  - Out: 50%
  - Average: 78%

- **Off-Note Score For Round (%):**
  - Musty: 33%
  - Metallic: 0%

- **Taster Score for Round (%):**
  - Panellist 1: 67%
  - Panellist 2: 67%
  - Panellist 3: 100%
Aligning Sensory with Analytical

• Human experience vs. Providing absolutes

• How the flavour interacts with the beverage vs. Correct specified intensity
Good Sensory Practice

- Trained Sensory Panel
- Sensory Educated Distributors
- Sensory Market Inspectors
- Analytical Investigation
Conclusions

• Sensory Evaluation of Beer Mixes – lower risk for quality complaints

• Assuring Batch-to-Batch consistency

• Recognise major flavour non-conformances

• Improved product packaging, shelf-life, overall quality & Sales
Acknowledgments:

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and

FlavorActiV’s Global Customers

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