Sensory evaluation of fruits

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Josefa de Óbidos (Sevilha 1630- Óbidos 1684)
Fruits from Alentejo region

- **Sweet Cherry**
  - ‘Sunburst’
  - ‘Sweatheart’

- **Plum**
  - ‘Rainha Claudia’
  - ‘Black’
  - ‘Diamond’

- **TABLE GRAPE**
  - ‘Palieri’
  - ‘Red Globe’
  - ‘Crimson’

- **MELON**
  - ‘Branco da Lezíria’
Fruits with values less than 9.6 ° Brix are of poor quality.

The relationship between stimulus / intensity of sensation of sweetness between 10 ° Brix and 14 ° Brix saturation threshold.

Overall quality depends on the sweetness.

80% of people say that if it is sweet is good.

Fruits of excellent quality are in general extremely sweet.

Fruits with low sweetness level are not always bad and very sweet are not always great.

Following evaluation of sweetness, consumers consider evaluation of texture.
Soluble Solid Content

By refractometry

Be careful about the location of the sample
Very important differences!
Sweetness

CLASSIFICATION OF MELON:
Soluble Solid Content X Sensory Evaluation

- 6.9 °Brix (POOR)
- 9.4 °Brix (MIDDLING)
- 11.4 °Brix (GOOD)
- 12.3 °Brix (VERY GOOD)
- 12.7 °Brix (EXCELLENT)
Key achievements and outcomes RITECA and University of Évora

Red de Investigación Transfronteriza de Extremadura, Centro y Alentejo (RITECA)
Objective: Constitution of two panels of tasters for fruits

1st panel of tasters fruit, INTAEX, fruit stone 2009

Fruits:

- Plums
  - ‘Crisson globe’;
  - ‘Fortune’;
  - ‘Golden globe’;
  - ‘Angelex’ (‘Suplumsix’);
  - ‘Black Diamond’ (Suplumeleven)

- Nectarine
  - ‘Big Top’

- Peaches
  - ‘Elegant Lady’
  - ‘Summer Rich’
Fruits:

- **Sweet cherry**
  - ‘Sweet heart’;
  - ‘Sunburst’;

- **Table grape**
  - ‘Red Globe’
  - ‘Crimson’

TASTERS

- **Expert judges**
  (expert sensory assessors)

- **Trained judges, from 3 to 10**
  (selected assessors)

- Semi-trained judges from 8 to 25
  (selected assessors)
STUDIES OF "SHELF LIFE"

- How long can the fruits be stored until they are noticeable changes in the sensory qualities?

- How the sensory characteristics change during storage?

- What is the maximum period of storage from which is unacceptable from a sensory point of view?
Sensory evaluation of fruits

**Development scale and sheet for taste proof**

With panelists collaboration

- To describe the product that will be studied

  **“Free Choice Profiling”**

- To generate descriptors!
- Vocabulary
- Open and free discussion with participation of everyone

Several sessions in order to get familiarised with vocabulary and scales

**Scales entrainment**

ISO 11036:1994

Use of reference products for intensity definition.
Goals and results of entrainment of the pannel.
One exemple...

<table>
<thead>
<tr>
<th></th>
<th>Session 1</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pairing (≥80%)</td>
<td>Triangular (100%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Set I</td>
<td>Bitter</td>
<td>Set II</td>
<td>Salty</td>
<td>Set III</td>
<td>Acid</td>
<td>Set IV</td>
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<tr>
<td>total number of</td>
<td>17</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>tasters</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of correct</td>
<td>14</td>
<td>9</td>
<td>13</td>
<td>13</td>
<td>11</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>answers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of wrong</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>answers</td>
<td></td>
<td></td>
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</tbody>
</table>

Objectivos

1 - Familiarize the panel with some theoretical concepts relating to sensory analysis;
   Detect impairments by performing the pairing test.
   **All the candidates should have 80% of correct associations**

2 - Determine the sensory acuity of candidates by conducting triangular tests.
   **All todos os candidates should obtain 100% correct answers.**
### Goals

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<th>6</th>
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<td>14</td>
<td>16</td>
<td>18</td>
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<tr>
<td>n° respostas incorrectas</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

- Increase n.° of correct answers by repeating triangular tests.  
  - Evaluate the potential of assessors in the description of sensory perceptions through the use of cherries.  
  - Preparation of a list of descriptors cherry.

- Ability to discriminate between different levels of intensity for some tastes and odors;

- Ability to discriminate between different levels of intensity for some tastes;

- Ability to describe textural properties of some food.

- Brief discussion of the difficulties and limitations encountered during the previous phase.

- Repetition of procedure to clarify questions.
Another product: table grapes

| Aspecto do cacho | 0____________________________________________________________________9 |
| Aspecto do baga | 0____________________________________________________________________9 |
| Cor exterior do baga | 0____________________________________________________________________9 |
| Firmeza da pele | 0____________________________________________________________________9 |
| Firmeza da polpa | 0____________________________________________________________________9 |
| Sabor doce | 0____________________________________________________________________9 |
| Acidez | 0____________________________________________________________________9 |
| Flavour | 0____________________________________________________________________9 |
| Suculência | 0____________________________________________________________________9 |
| Apreciação global | 0____________________________________________________________________9 |

Outras observações:

Nome ou código do provador:
Data:
SENSORIAL EVALUATION OF FRUITS

Objectives

Parameters to measure

Samples

Selection and training of tasters

Experimental design

REALIZATION

PLANIFICATION

PLANNING

STUDY AND INTERPRETATION OF RESULTS

STATISTICAL

FINAL RESULTS

TECNOLOGICAL
Quality evaluation of ‘Sunburst’ and ‘Sweetheart’ “Associação de Produtores do Norte Alentejano - Serra de S. Mamede”.

Looking for high quality products, considering organoleptic and nutritional evaluation.
Quality Evaluation of Cherry ‘Sweetheart’ Under Different Storage Conditions

1) cold conditions (1ºC and high humidity 95%),
2) cold conditions and polypropylene film bags (MA)
3) controlled atmosphere (CA) (1ºC, 95% H.R., 10% Co2 and 8% O2).

Values of SSC decrease for fruits storage in CA and remained stable for the other two modalities. During storage SSC values of fruits that remained at cold and MA conditions are higher what should be an advantage for quality evaluation by consumers.

Panellists noticed the increase of SSC from the 14 storage days ahead, giving significantly different values for sweetness attribute.
The panel of tasters devalued fruits stored for 14 days in controlled atmosphere, compared to fruits of normal cooling and modified atmosphere. CA helps with better texture and L* higher, better conservation of stems, however the values of TSS and acidity are lower.
Notice the similar evaluation of same parameters and global classification.
**Quality of ‘Rainha Cláudia verde’ plums.**
Instrumental methods and sensorial evaluation.

<table>
<thead>
<tr>
<th>Aspecto exterior</th>
<th>r (X/Y)</th>
<th>r²</th>
<th>p</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cor da pele</td>
<td>-0.48</td>
<td>0.23</td>
<td>0.007</td>
<td>30</td>
</tr>
<tr>
<td>Cor da polpa</td>
<td>-0.57</td>
<td>0.33</td>
<td>0.001</td>
<td>30</td>
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<tr>
<td>Doce</td>
<td>0.91</td>
<td>0.82</td>
<td>0.000</td>
<td>30</td>
</tr>
<tr>
<td>Ácido</td>
<td>-0.83</td>
<td>0.68</td>
<td>0.000</td>
<td>30</td>
</tr>
<tr>
<td>Sabores/aromas</td>
<td>0.89</td>
<td>0.80</td>
<td>0.000</td>
<td>30</td>
</tr>
<tr>
<td>Firmeza</td>
<td>-0.62</td>
<td>0.38</td>
<td>0.000</td>
<td>30</td>
</tr>
<tr>
<td>Suculência</td>
<td>0.92</td>
<td>0.85</td>
<td>0.000</td>
<td>30</td>
</tr>
</tbody>
</table>

*X= AVALIAÇÃO GLOBAL*
The plums ‘Rainha Claudia' are best evaluated globally when present
• very juicy,
• with high levels of sweetness,
• great intensity of flavors / aromas characteristic,
• low acid value and
• an intermediate firmness
Characterization of instrumental and sensory quality of papaya 'Solo' and 'Local' produced in Santiago, Cape Verde, and critical analysis on the importation of papaya.

- The objective of the study was to characterize the quality attributes of two varieties papaya varieties (Soil and Local) produced in Santiago, Cape Verde, and define the attributes that the distributors are looking for.
- Physicochemical assessments, sensory evaluation and a market study were carried out. The parameters evaluated were the weight, color interior and exterior, texture, thickness of the flesh, pH, titratable acidity, TSS, sensory evaluation was made and a questionnaire applied to importers of papaya. The parameters TSS, acidity, pH and weight vary significantly within varieties and papayas of Local variety are heavier. The texture varies depending on the degree of ripeness, firmness shows a decrease during ripening, for deformation a decrease is noticed with advancing of maturation. the external and internal color differences are in the interac

- In the sensorial evaluation, Solo va certification/seal quality and swee
Delayed storage and refrigeration of plums ‘Rainha Cláudia verde’: instrumental and sensorial analysis

The panel of sensorial evaluation was able to distinguish fruits stored at different modalities, giving a better classification to those stored with simple refrigeration, always superior to medium value, followed by those fruits that were subjected to curing and finally those stored under MA condition.

The results for Global evaluation indicated that there were significant differences in mean variation (p≤0,05) considering factor modality of storage and the factor storage time was no significant.
<table>
<thead>
<tr>
<th>Fruto inteiro</th>
<th>Cor</th>
<th>0._________________________9</th>
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<tbody>
<tr>
<td></td>
<td>Uniformidade</td>
<td>0._________________________9</td>
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<td>Firmeza</td>
<td>0._________________________9</td>
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<td></td>
<td>Defeitos</td>
<td>0._________________________9</td>
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<tr>
<td></td>
<td>Quais?</td>
<td></td>
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<tr>
<td></td>
<td>Aspecto geral</td>
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<tr>
<td>Fruto partido</td>
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<tr>
<td>Características visuais</td>
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<tr>
<td></td>
<td>Cor</td>
<td>0._________________________9</td>
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<tr>
<td></td>
<td>Defeitos</td>
<td>0._________________________9</td>
</tr>
<tr>
<td></td>
<td>Quais?</td>
<td></td>
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<tr>
<td>Sabor</td>
<td></td>
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<tr>
<td></td>
<td>Doçura</td>
<td>0._________________________9</td>
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<td>Amargor</td>
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<td>Sabor característico</td>
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<td>Sabores estranhos</td>
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<td>Quais?</td>
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<td>Firmeza</td>
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<td>Quais?</td>
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<tr>
<td>Avaliação global</td>
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</table>

Nome do provador: 
Observações: 
“Overall evaluation”

“Characteristic flavour”

Variedade Solo

Variedade Local
VAMOS CUIDAR BEM DA PAPAIA DE CABO VERDE!

Anexo ao PROTOCOLO DE QUALIDADE E PÓS-COLHEITA PARA A PAPAIA (Carica papaya L.)

Não amachucar as papaias durante os transporte. Pode colher mais maduro!

Apresentar bem nas bancas, separadas das outras frutas.
COLHER MUITO VERDE É VENDER MÁ QUALIDADE!

Escolha as papaias de acordo com a coloração dos frutos, conforme as imagens

<table>
<thead>
<tr>
<th>Grau de maturação</th>
<th>Descrição características visuais</th>
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<tbody>
<tr>
<td>Estágio 0</td>
<td>Verde <em>imaturo</em>[^1]</td>
</tr>
<tr>
<td>Estágio 1</td>
<td>Fruto com 10% - 25% de casca amarela</td>
</tr>
<tr>
<td>Estágio 2</td>
<td>Fruto com 25% - 50% de casca amarela</td>
</tr>
<tr>
<td>Estágio 3</td>
<td>Fruto com 50% - 70% de casca amarela</td>
</tr>
<tr>
<td>Estágio 4</td>
<td><em>Sobremaduro</em>[^2]</td>
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[^1]: Não se recomenda a colheita nessas fases