OLIVE OIL PROCESSING COURSE

Solid - Liquid Phase Separation
Extraction efficiency

Very good efficiency: >90.0%
Benchmark efficiency: >85.0%
Unacceptable: <70.0%

E.E. = 1 - (Oil pomace * (100 - Oil fruit)) / (Oil fruit * (100 - Oil pomace))

Or

< 8.0% oil/dry matter in the pomace
With 50% moisture fruit = 3.0% oil/fresh in pomace
With 60% moisture fruit = 2.0% oil/fresh in pomace
Extraction efficiency

[Graph showing the relationship between fruit moisture and extraction efficiency.]

Fruit and moisture levels

[Graph showing fruit moisture vs. extraction efficiency for Plant A.]
Fruit and soil moisture

Fruit moisture vs. extraction efficiency - Plant B

Processing

Evolution of processing efficiency
Decanter

Decanter
Decanter

- Capacity.
- Efficiency.
Capacity of the Decanter

- Viscosity (Temperature).
- Length.
- Diameter.
- Differential between screw and bowl.
- Particle size (Crushing).
Efficiency of the Decanter

- Density difference between phases (Talc – Water - Crushing).
- Speed of rotation.
- Size of phases (Decanter plates).
- Separation time (Pumping speed).

Capacity vs. Equipment

Theoretical processing capacity of the different series operating in two-phase

[Graph showing processing capacity vs. moisture levels in fruit (%)]
Capacity vs. Equipment
Capacity vs. Equipment

Processing efficiencies: Lines 1 & 2

- Line 1
- Line 2
Pumping speed

- Speed 1 (65% TC)
- Speed 2 (80% TC)

Oil in pomace (%)

Samples

Processing

- Oil losses
- Pump speed
- Fruit moisture

Variations in speed, oil losses & fruit moisture
Pumping speed

- How do I know if I am pumping too fast?
  - Oil losses above limit.
  - Oil comes out dirty (Not always).

- How do I know if I am pumping too slow?
  - No problems apart from increased costs.
  - Do not go under 40% NC of the Decanter.
Pumping speed

Decanter plates
Decanter plates

Decanter plates

Decanter plates
Decanter plates

- How do I know when to change the plate?
  - Once you have tried everything else and the oil still comes out very dirty and with very low Decanter capacity. Put an smaller plate.
  - Or if there is too much oil in the decanter. Stop the feeding pump into decanter, flush it with water and the amount of oil that is obtained should not exceed 1.5 % of the TC of the decanter. E.g.: 5 tn/hr should not produce more than 50-75 litres. Put a larger plate.
Differential speed

Extraction efficiency vs. bowl/screw differential

- Variable differential area

Differential speed
Processing

Fruit Processing Chart

<table>
<thead>
<tr>
<th>Grid size</th>
<th>Paste</th>
<th>Coadjuvant</th>
<th>Oil</th>
<th>Pomace</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>T° Speed</td>
<td>Tac</td>
<td>Enzymes</td>
<td>T°</td>
<td>Flow</td>
<td>Acidity</td>
</tr>
</tbody>
</table>

Processing

Especificaciones técnicas

- Unifilae motorizada y calefactores.
- Equipo para pesado del aceite.
- Módulo control humedad y riqueza grasa cruda.
Processing

- Temperature sensor
- Level sensor
### Extraction efficiencies per plant and operator

<table>
<thead>
<tr>
<th>Operator</th>
<th>&lt; 1 year</th>
<th>1-2 years</th>
<th>&gt;2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant A</td>
<td>-</td>
<td>84.67%</td>
<td>90.10%</td>
</tr>
<tr>
<td>Plant B</td>
<td>75.93%</td>
<td>83.20%</td>
<td>-</td>
</tr>
<tr>
<td>Plant C</td>
<td>-</td>
<td>89.31%</td>
<td>92.15%</td>
</tr>
</tbody>
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