What is acerola?

- Identity: *Malpighia glabra*
- Crop native from the American tropics and subtropics
- Produce edible cherries with a high ascorbic acid content
- 2 main cultivation areas: Brazil (85%) and Vietnam (15%)
- In Central and South America, acerola was mostly cultivated to fulfill the local demand until the 90s
- Since the mid-90s: growing demand from North America, Europe and Japan has led to a considerable expansion of cultivated areas, large quantities are now dedicated to export markets
Our innovation – Acerola Cherry 36

Acerola Cherry 36 is an acerola cherry juice powder

- produced by spray drying
- without carrier
- standardized to 36-38% naturally occurring ascorbic acid (vit. C)

Competitive advantages

- acerola cherry powder with the highest naturally occurring ascorbic acid content available : 36-38% vs. 17% for the market standard

- no carrier : clean & shorter labels (no maltodextrin, modified starch… to be declared)

- cost-in-use
Acerola Cherry 36 – Process

21kg green acerola cherries → processing & concentration → juice concentrate → spray drying → 1kg Acerola Cherry 36

QC → QC → QC
Acerola Cherry 36 – Main applications

• Health benefits as natural source of vitamin C
  – Food supplements
  – Beverages
  – Confectionery
  – Snacks

• Technological properties as clean label alternative to ascorbic acid, ascorbate or erythorbate
  – Antioxidant
  – Dough improver
  – Natural curing
Acerola Cherry 36 – Main applications

**Food & Beverage**

- Health benefits
  - Natural source of vitamin C

- Beverages
  - Confectionery
  - Snacks

**Nutrition & Health**

- Food supplements

**Technological properties**

- Clean label alternative to ascorbic acid, ascorbate or erythorbate

**Bakery products**

- Meat products
- Fruit preparations
Acerola Cherry 36 for health benefits
Acerola Cherry 36 – Health benefits

• Main interest due to its high amount of vitamin C

• Vitamin C is recognized to be involved in many health benefits:
  – Antioxidant benefit
  – Energy
  – Immunity
**C-pulse** : caffeine-free Energy Drink concept

**NATURAL ENERGY BOOSTER**

**C-pulse** Energy Drink offers a jolt effect with high level of natural vit C from **Acerola** (36% NOC)

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Weight in g (2 servings of 250 ml/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sparkling water</td>
<td>228</td>
</tr>
<tr>
<td>Sugar</td>
<td>13</td>
</tr>
<tr>
<td>Lemon 225 juice granule S12</td>
<td>4</td>
</tr>
<tr>
<td>Citric acid (50% dry extract)</td>
<td>2.8</td>
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<tr>
<td><strong>Maca PE WS</strong></td>
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<tr>
<td><strong>Ginseng extract</strong></td>
<td>0.3</td>
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<tr>
<td><strong>Acerola 36% vit C NOC</strong></td>
<td>0.23</td>
</tr>
<tr>
<td>Sea buckthorn PE 5% vit C</td>
<td>0.1</td>
</tr>
<tr>
<td>Szechuan Pepper Oleoresin EZ-caps</td>
<td>0.1</td>
</tr>
<tr>
<td>Turm’brite 0.7% WS</td>
<td>0.1</td>
</tr>
<tr>
<td>Quillaia extract</td>
<td>0.02</td>
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</tbody>
</table>
Acerola Cherry 36
for food preservation
Acerola Cherry 36 – A natural food antioxidant

refrigerated ground beef (MAP 80% O₂ : 20% CO₂) – day 15

control with no antioxidant  sample protected with acerola

a natural solution to improve color stability in raw meat products
## Acerola Cherry 36 – A natural food antioxidant

### green apple puree – aerobic storage at refrigerated temperature

<table>
<thead>
<tr>
<th>day</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>6</th>
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<tbody>
<tr>
<td>control with no antioxidant</td>
<td><img src="image1.png" alt="image" /></td>
<td><img src="image2.png" alt="image" /></td>
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<td><img src="image4.png" alt="image" /></td>
<td><img src="image5.png" alt="image" /></td>
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<tr>
<td>protected with acerola</td>
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<td><img src="image8.png" alt="image" /></td>
<td><img src="image9.png" alt="image" /></td>
<td><img src="image10.png" alt="image" /></td>
</tr>
</tbody>
</table>

A natural solution to delay enzymatic browning in processed fruits
Acerola Cherry 36 – A natural meat curing enhancer

Acerola Cherry 36 can be used as curing enhancer in cured meat products. It is an alternative to erythorbate and ascorbate.

Thanks to its reducing properties and to its mild acidic impact, it promotes the reaction leading to the production of nitric oxide (NO) from nitrite ions (NO$_2^-$), thus fastening and enhancing the curing.

**Benefits**
- enhancement of cured color formation
- improvement of color stability
- reduction of residual nitrite levels (which contribute to nitrosamine formation)
- clean label

\[
\text{nitrite} \rightarrow \text{nitric oxide} \rightarrow \text{nitroso-myoglobin}
\]

*the curing reaction*
Acerola Cherry 36 – A natural dough conditioner

Acerola Cherry 36 can be used as an oxidizing agent in bakery products.

The natural ascorbic acid it delivers promotes the formation of crosslinks (disulfur bonds) between gluten molecules in the dough.

**Benefits**

- enhancement of weak flours
- Improvement of dough’s resistance to extension and deformation
- improvement of the crumb structure and of the baking volume
- clean label

![Diagram showing glutathione disulphide and reduced glutathione forming disulfur bonds with gluten](image-url)
Acerola Cherry 36 – A natural dough conditioner

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Benefits
• enhancement of weak flours
• Improvement of dough’s resistance to extension and deformation
• improvement of the crumb structure and of the baking volume
• clean label

\[
\frac{1}{2} O_2 \xrightarrow{\text{ascorbate oxidase}} \text{ascorbic acid} \xrightarrow{\text{glutathione dehydrogenase}} \text{glutathione disulphide} \xrightarrow{\text{reduced glutathione}} \xrightarrow{\text{dehydro-ascorbic acid}} H_2O
\]
Acerola Cherry 36 – A natural dough conditioner

Ingredients:
- Wheat flour, water, hydrogenated vegetable oil, vegetable oils, salt, yeast, emulsifiers (E471, E472e), preservative (calcium propionate), flour treatment agent (ascorbic acid)

A natural solution to achieve clean labeling in baked products
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