Balázs Herzog
Coordination Centre of Fruit and Vegetables
Quality Inspection Service
Budapest, Hungary
The gene center of peppers is
Central-America, South-Mexico

Name: ‘pepper’ coming from pepper (Piper Nigrum)

1493: first pepper plant brought by Columbus to Europe

XVI-XVII. century: pepper as a spice spread in Europe

1831: in the colera plague as medicine (paprika pálinka ‘schnaps’)

XIX. century: industrial processing of paprika spice

1928: first sweet spice pepper variety at Szeged
SWEET PEPPERS - Origin and history

Traditional drying of red peppers

Number of shiny hour in 2005

Map showing the number of shiny hours in 2005 with locations of Szeged and Kalocsa highlighted.

Legend:
- <1800
- 1800-1900
- 1900-2000
- 2000-2100
- 2100≤
Sweet peppers in Hungary

Greenhouse with thermal heating at Szentes

End of XIX. century: Bulgarian vegetable growers starts to produce sweet peppers intensively at South-Hungary

In the ‘20s: Sweet peppers producing area evolved (Csongrád, Bács, Békés county)

In the ‘30s: Start to grow sweet peppers in greenhouse

Nowadays: Most of sweet peppers for fresh consumption growth in usual or plastic covered greenhouse
Albert von Szent-Györgyi, professor of Szeged University won Nobel Prize in medicine (1937) for research about vitamin C. He extracted vitamin C from sweet peppers.
SWEET PEPPERS - Capsicum species

Capsicum annuum:
sweet peppers, Jalapeno, Pepperoni, Serrano
Capsicum frutescens:

Tabasco, Malagueta
Capsicum chinense:

Habanero,

Rocotillo
Capsicum pubescens:

Rocoto Cuencano, Rocoto Manzano
Capsicum baccatum:

Periperi, Aji Cuencano, Criolla Serra
Dried red peppers on market (Mexico)

The largest pepper (sweet and hot) producers are:

- China
- Mexico
- Turkey
- Spain
- Nigeria
- USA
## SWEET PEPPERS - Capsicum species

<table>
<thead>
<tr>
<th>Scoville-units</th>
<th>Variety</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 000 000 – 16 000 000</td>
<td>Clear capsaicin</td>
</tr>
<tr>
<td>2 000 000 – 5 300 000</td>
<td>Standard „US Grade” tear-gas</td>
</tr>
<tr>
<td>855 000 – 1 041 427</td>
<td>Naga Jolokia</td>
</tr>
<tr>
<td>876 000 – 970 000</td>
<td>Dorset Naga</td>
</tr>
<tr>
<td>350 000 – 577 000</td>
<td>Red Savina™ Habanero</td>
</tr>
<tr>
<td>100 000 – 350 000</td>
<td>Habanero Chile</td>
</tr>
<tr>
<td>100 000 – 350 000</td>
<td>Scotch Bonnet</td>
</tr>
<tr>
<td>100 000 – 200 000</td>
<td>Jamaica Hot Pepper</td>
</tr>
<tr>
<td>50 000 – 100 000</td>
<td>Thai pepper, Malagueta, Chiltepin</td>
</tr>
<tr>
<td>30 000 – 50 000</td>
<td>Cayenne-pepper, Ají</td>
</tr>
<tr>
<td>10 000 – 23 000</td>
<td>Serrano</td>
</tr>
<tr>
<td>7000 – 8000</td>
<td>Tabasco sauce (Habanero)</td>
</tr>
<tr>
<td>5000 – 10 000</td>
<td>wax pepper (hot fresh pepper)</td>
</tr>
<tr>
<td>2500 – 8000</td>
<td>Jalapeño</td>
</tr>
<tr>
<td>2500 – 5000</td>
<td>Tabasco</td>
</tr>
<tr>
<td>1500 – 2500</td>
<td>Very hot hungarian peppers, Rocotillo</td>
</tr>
<tr>
<td>1000 – 1500</td>
<td>Poblano</td>
</tr>
<tr>
<td>600 – 800</td>
<td>Tabasco sauce (green pepper)</td>
</tr>
<tr>
<td>500 – 1000</td>
<td>Hot hungarian peppers, Anaheim</td>
</tr>
<tr>
<td>100 – 500</td>
<td>Pimento, Pepperoncini</td>
</tr>
<tr>
<td>0 – 400</td>
<td>Bell</td>
</tr>
<tr>
<td>0</td>
<td>Sweet peppers</td>
</tr>
</tbody>
</table>

Two measurement systems for the hotness:
- **Scoville** (organoleptic)
- **Gillett** (HPLC)
This standard applies to sweet peppers of varieties from *Capsicum annuum L.* to be supplied fresh to the consumers.

Sweet peppers for industrial using being excluded.
Elongated sweet peppers
SWEET PEPPERS - Commercial types

Square sweet peppers (blocky type)
SWEET PEPPERS - Commercial types

Square sweet peppers (blocky type)
More fantastic colours
SWEET PEPPERS - Commercial types

Square sweet peppers (lamuyo type)
SWEET PEPPERS - Commercial types

Square tapering sweet peppers
SWEET PEPPERS - Commercial types

Flat sweet peppers (tomato peppers)
SWEET PEPPERS - Minimum requirements

Intact

Not intact, not allowed
SWEET PEPPERS - Minimum requirements

Sound

Deterioration, not allowed
Clean

Contaminated with soil, not allowed
Clean

Remains of pesticide, not allowed
Fresh in appearance

Shrivelled, not allowed
### SWEET PEPPERS - Minimum requirements

#### Storage life of different types

<table>
<thead>
<tr>
<th>Commercial type</th>
<th>Optimal condition</th>
<th>Shelf without cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>White square tapering</td>
<td>1-2 weeks</td>
<td>Less than a week</td>
</tr>
<tr>
<td>Hungarian white blocky</td>
<td>1 week</td>
<td>Less than a week</td>
</tr>
<tr>
<td>Square type</td>
<td>2-3 weeks</td>
<td>1-2 weeks</td>
</tr>
<tr>
<td>Flat type and Kapia</td>
<td>3-4 weeks</td>
<td>1-2 weeks</td>
</tr>
</tbody>
</table>
SWEET PEPPERS - Minimum requirements

Practically free from pests

Caterpillar, not allowed
SWEET PEPPERS - Minimum requirements

Practically free damage caused by pests

Serious damage caused by Thrips tabaci, not allowed

foto: Stanislav TRDAN
SWEET PEPPERS - Minimum requirements

Well developed

Not developed, not allowed

Well developed, allowed
Ripeness and colour

Consuming ripeness

Biological ripeness
SWEET PEPPERS - Minimum requirements

Ripeness and colour

Consuming ripeness is equal with biological ripeness
SWEET PEPPERS - Minimum requirements

Shape
SWEET PEPPERS - Minimum requirements

Free of damage caused by frost

Damages caused by frost, not allowed
SWEET PEPPERS - Minimum requirements

Free from unhealed injuries

Unhealed injuries, not allowed
SWEET PEPPERS - Minimum requirements

Free of sunburn

Sunburn, not allowed
SWEET PEPPERS - Minimum requirements

Attached with peduncle

Removed peduncle and damaged calyx, not allowed
SWEET PEPPERS - Minimum requirements

Free of abnormal external moisture
Free of any foreign smell and/or taste
• Good quality

• Shape and colour are characteristic of the variety or commercial type

• Firm

• Practically free from blemishes
SWEET PEPPERS - Class I

The peduncle may be slightly damaged or cut with the calyx intact

- Break at knot, allowed
- Cut peduncle, limit allowed
- Damaged peduncle, limit allowed
- Cut peduncle and damaged calyx, not allowed
- Damaged peduncle and damaged calyx, not allowed
- Removed peduncle and calyx, not allowed
In Class II small defect in shape or other smaller defects are allowed
SWEET PEPPERS - Class II

Defect in shape and development

Defect in shape, limit allowed
SWEET PEPPERS - Class II

Sunburn, and slight healed injuries
max. 2 cm or 1 cm²

Healed injury, limit allowed
Sunburn, and slight healed injuries
max. 2 cm or 1 cm²
SWEET PEPPERS - Class II

Slight dry superficial cracks max. 3 cm

Slight dry crack, limit allowed
SWEET PEPPERS - Class II

Slight dry superficial cracks max. 3 cm

Slight dry crack, limit allowed
Size is determined by the width of shoulder. For sized sweet peppers, the difference not exceed than 20 mm in the same package. Sizing is not compulsory in Class II, subject to the minimum sizes.

Minimum sizes:

- Elongated: 20 mm
- Square: 40 mm
- Flat: 55 mm
Quality tolerances:

Class I - 10% (number or weight) not satisfying requirements of this class, but meeting those of Class II.

Class II - 10% (number or weight) not satisfying requirements of this class nor the minimum requirements, but mustn’t be unfit for consumption.
Size tolerances:

Class I - 10% (number or weight) ± 5mm. Including max. 5% below the minimum size.

Class II - Sized: 10% (number or weight) ± 5mm. Including max. 5% below the minimum size. Not sized: 5% (number or weight) up to 5 mm smaller than the minimum size.
SWEET PEPPERS - Uniformity

The contents of each package must contain only sweet peppers of the same origin, variety (comm. type), quality, size (if sized), and in the case of Class I, of appreciably the same degree of ripeness and colouring.
The sized elongated sweet peppers should be sufficiently uniform in length.
A mixture of sweet peppers of different colours is allowed as long as origin, commercial type, quality and size (if sized) are uniform.
SWEET PEPPERS - Uniformity

Uniformity of colouring is not compulsory in Class II.
SWEET PEPPERS - Uniformity

For packages of sweet peppers with a maximum weight of 1 kg, uniformity is only required with respect to origin and quality. Where sweet peppers of different colours are marketed, uniformity of origin is not required.
Sweet peppers may be mixed in sales packages of net weight under 3 kg-s with different types fresh fruit and vegetables on the conditions laid down Comm. Reg. 48/2003 EC.
SWEET PEPPERS - Packaging

Sweet peppers in carton and wooden box
SWEET PEPPERS - Packaging

Prepacked sweet peppers
Prepacked sweet peppers in carton
- Packer and/or dispatcher
- „Sweet peppers” and colours*
- Commercial type*
- „Country of origin
- Class
- Size (min. and max. diameters)
- Netto weight or number of unit (opt.)

*If the contains are not visible
SWEET PEPPERS - Marking

Size marking is missing, not allowed
The marked product is not matched with the content, not allowed.
There is not Class Extra in the standard of sweet peppers, not allowed.
Lecsó  
Sweet pepper filled with meat in tomato sauce
SWEET PEPPERS - Gastronomy

Sweet peppers filled with spiced curd cheese

Sweet peppers filled with cabbage (pickled)