Assessment of current drying practices for South American pepper varieties (Capsicum spp) with respect to final product quality

Christian Halle, Marcus Nagle, Dimitrios Argyropoulos, Edwin Serrano, Karla Peña Pineda, Carlos Bejarano Martínez, Matthias Jäger, Joachim Müller

Background
• Chilis are used worldwide as a flavoring and coloring agent for foods
• Traditional open-air sun drying of chili in Bolivia and Peru leads to essential losses in product quality
• Final products are often not marketable
• To avoid quality losses, factors influencing the quality have to be determined and controlled
• Within the project ‘Unravelling the potential of neglected crop diversity for high-value product differentiation and income generation for the poor: The case of chili pepper in its centre of origin’, the process of drying local South American varieties will be optimized

Material and Methods
• Experiments were conducted with local small-scale farmers in Padilla (Chiquisaqua province) in Bolivia and around Lima, Peru from May to August 2010
• The drying process was monitored at 2-5 day intervals by sampling the drying bulk
• Moisture content of whole fruits and individual fruit parts as well as surface color (CIELAB), extractable color (ASTA value), and aflatoxin content were determined
• Crops were the common red and yellow cultivars in Bolivia and ‘Panca’ in Peru

Results

Fig. 2: Moisture content (% wet basis) of chili during open-air field drying in Bolivia and Peru.

• Drying lasted 24 d in Bolivia and 12 d in Peru (Fig. 2)
• Moisture content was most variable at harvest (Table 1)
• Moisture content of individual parts varied (Table 2)
• Hue angle decreased during drying for each variety
• ASTA values ranged from 70-155 with a mean of 126.1
• Initial and final samples all tested positive for aflatoxins meaning contamination does not occur during drying

Table 1: Moisture content (% wet basis) at different points during the production process

<table>
<thead>
<tr>
<th></th>
<th>Ripened</th>
<th>Harvest</th>
<th>Dried</th>
<th>Stored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>75.99</td>
<td>69.34</td>
<td>20.33</td>
<td>18.05</td>
</tr>
<tr>
<td>Deviation</td>
<td>4.84</td>
<td>12.34</td>
<td>8.09</td>
<td>2.76</td>
</tr>
<tr>
<td>Range</td>
<td>66-82</td>
<td>45-81</td>
<td>12-42</td>
<td>16-20</td>
</tr>
</tbody>
</table>

Table 2: Moisture content of individual fruit parts of Peruvian ‘Panca’ at the beginning and end of drying

<table>
<thead>
<tr>
<th></th>
<th>Stem</th>
<th>Seed</th>
<th>Flesh</th>
<th>Placenta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning</td>
<td>59.5</td>
<td>51.0</td>
<td>83.5</td>
<td>85.1</td>
</tr>
<tr>
<td>End</td>
<td>14.4</td>
<td>9.7</td>
<td>21.9</td>
<td>23.2</td>
</tr>
</tbody>
</table>