Analysis of aldehydes released by rice flour using sorbent adsorption and thermal desorption - gas chromatography/mass spectrometry:

**Development and validation**

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**Introduction**

Odor is an essential characteristic and a quality marker in baby foodstuff, like a partially hydrolyzed and pregelatinized rice flour. The rice flour studied by active sampling and TD-GC/MS highlighted the presence of three aldehydes: Hexanal, Octanal, Nonanal. These compounds are known to be caused by lipid oxidation, one of the major alteration reactions in food. The method was developed and validated on a large range for the three aldehydes. It was then applied to the rice flour to determine if it can be used to follow the effect of ageing on the aldehydes production.

**Experimental**

**Material and Method**

**Sampling**

**TD-GC/MS**

**Method Validation**

Calibration curves

Hexanal (R² = 0.9978)

Octanal (R² = 0.9973)

Nonanal (R² = 0.9964)

**Rice flour samples**

**Samples description**

<table>
<thead>
<tr>
<th>Compounds</th>
<th>Sample A</th>
<th>Sample B</th>
<th>Sample C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexanal</td>
<td>Octanal</td>
<td>Nonanal</td>
<td></td>
</tr>
<tr>
<td>Rice flour sample (B)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample A</th>
<th>Sample B</th>
<th>Sample C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexanal</td>
<td>0.4-2</td>
<td>0.4-2</td>
</tr>
<tr>
<td>Octanal</td>
<td>27.8-176.9</td>
<td>28.1-176.9</td>
</tr>
<tr>
<td>Nonanal</td>
<td>16.8-13.2</td>
<td>12.6-13.2</td>
</tr>
</tbody>
</table>

**Conclusions**

The TD-GC/MS method was suitable for a qualitative and quantitative evaluation of rice flour volatile compounds. Among them, three aldehydes were considered as easily changing with rice evolution. For the three studied samples, level of Hexanal was always the highest. Conditions of storage and conditioning seem to have an influence mostly on the Hexanal level.