HISTAMINE AND TYRAMINE IN CHEESE

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AIMS:
1. Describe chemical and microbiological factors involved in histamine and tyramine synthesis in cheese.
2. Describe histamine and tyramine toxicological aspects in cheese.
3. Define control methods of histamine and tyramine synthesis before, during, and after the elaboration process.
4. Discuss aspects which condition the establishment of maximum legislative concentrations of histamine and tyramine in cheese.

TABLE 1 \(^{1,3,4}\) | Amounts of tyramine and histamine that don’t present adverse effects on health, depending on the type of population in which they are found. It’s also presented the % of exposure, calculated with the maximum concentration found of each biogenic amine in cheese:

<table>
<thead>
<tr>
<th>Biogenic amine</th>
<th>Population group</th>
<th>Amount that not show adverse effects on health</th>
<th>Maximum concentration found</th>
<th>Exposure (21g/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tyramine</td>
<td>Under non-specific MAOI drugs</td>
<td>6 mg/person and meal</td>
<td>2130 mg/kg</td>
<td>750%</td>
</tr>
<tr>
<td></td>
<td>Under RIMA drugs</td>
<td>50 - 150 mg/person and meal</td>
<td>30-90%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Healthy population</td>
<td>600 - 2000 mg/person and meal</td>
<td>2-8%</td>
<td></td>
</tr>
<tr>
<td>Histamine</td>
<td>Intolerant population</td>
<td>&lt; to detectable values</td>
<td>1850 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Healthy population</td>
<td>50 mg/person and meal</td>
<td>78%</td>
<td></td>
</tr>
</tbody>
</table>

*Current maximum legislated concentration → particular fishery products (enzyme maturation) n=9, c=2, m=200 mg/kg and M=400 mg/kg

CONCLUSIONS:
1. During ripening increases the proteolytic activity in cheese. Consequently, histidine and tyrosine amino acids become free, being able to be decarboxylated forming histamine and tyramine due to microbiologic activity.
2. These biogenic amines are a hazard. The risk depends on the population group.
3. Several methods could be applied to control and prevent the formation of histamine and tyramine, being the most effective the properly selection of the starter cultures.
4. More data are necessary to perform a risk assessment and to evaluate the significance of histamine and tyramine in cheese.

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