A SURVEY ABOUT ACRYLAMIDE IN DRIED FRUITS COLLECTED ON ITALIAN MARKET

INTRODUCTION
As acrylamide is considered a carcinogen and neurotoxic, its level in food raises great concern although it still does not exist a legal limit for its concentration in foodstuffs. Acrylamide is a process contaminant, absent in raw foods and only formed during thermal processing due to Maillard reaction among reducing sugars (glucose, fructose) and L-asparagine (Mottram et al., 2002; Stadler et al., 2002). This work focuses on the development of a method for acrylamide determination in dried fruits based on a QuEChERS (Quick, Easy, Cheap, Effective, Rugged, and Safe) approach for sample preparation (Schenck et al., 2004) and HPLC-ESI-MS-Triple Quadrupole for sample analysis.

MATERIALS AND METHODS
A screening on dried fruits of the Italian market was carried out in order to evaluate the acrylamide risk associated with this kind of food. Matrix effect, linearity, recovery, sensitivity, and repeatability of the method were studied. Then, the method was applied to dried prunes and raisins, but also to pistachios, peanuts, almonds, walnuts, hazelnuts, and pine nuts.

RESULTS AND DISCUSSION
The relative standard deviations were good. Results showed that only dried prunes (from 14.7 to 124.3 μg/Kg) and peanuts (from 10.0 to 42.9 μg/Kg) were contaminated with acrylamide. The other samples were below the detection or quantification limit.

Prunes are not subjected to high temperature during drying (70-80 °C) but the exposure time is quite long (24-36 h), while peanuts undergo the roasting process (160-180 °C; 25-30 min). These conditions are critical promoting the formation of acrylamide.

<table>
<thead>
<tr>
<th>Samples</th>
<th>Recovery (%)</th>
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<tbody>
<tr>
<td>Almonds</td>
<td>70</td>
</tr>
<tr>
<td>Pistachios</td>
<td>62</td>
</tr>
<tr>
<td>Peanuts</td>
<td>77</td>
</tr>
<tr>
<td>Pine nuts</td>
<td>63</td>
</tr>
<tr>
<td>Hazelnuts</td>
<td>76</td>
</tr>
<tr>
<td>Raisins</td>
<td>61</td>
</tr>
<tr>
<td>Walnuts</td>
<td>82</td>
</tr>
<tr>
<td>Dried prunes</td>
<td>61</td>
</tr>
<tr>
<td>Mean</td>
<td>69</td>
</tr>
<tr>
<td>SD</td>
<td>8</td>
</tr>
<tr>
<td>RSD</td>
<td>12</td>
</tr>
</tbody>
</table>

Chromatographic parameters
Phase A [Formic acid 0.1% in H2O] 99.5 %
Phase B [Formic acid 0.1% in MeOH] 0.5 %
Run isocratic
Flow (mL/min) 0.25
Acrylamide RT 4.02 min
Total run 7.00 min
Column temperature ambient
Source ESI (+)

Sensitivity of the method
LOQ = 2.0 μg/Kg 3
LOQ = 5.0 μg/Kg 6

REFERENCES

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