Made to Deliver: A Comparison of Lead Contamination in Imported and Non-imported Spices

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Background

• Many US studies have reported lead poisoning in children and pregnant women who had used imported spices.
• The US Food and Drug Administration (FDA) is overwhelmed by imports arriving at US shores; they are only able to inspect <2% solely by smell and taste without laboratory analysis.
• Sri Lanka is the 11th leading exporter of spices in the world, and retains the same position for US spice imports.
• We compared lead concentrations between imported and non-imported spices.

Methods

• Samples of curry, turmeric or chili powder were collected by random market-basket survey from seven of the nine provinces of Sri Lanka.
• Two convenience samples of curry powder purchased in the US and originating from other countries were sent to Sri Lanka by air.
• All samples were assigned numerical identifiers prior to analysis by atomic absorption spectrophotometry (AAS).
• Blanks and standards for appropriate instrument calibration and measurement accuracy were utilized.
• Acid digestion of the samples in a lead-free vessel produced an analytical solution for measuring lead concentrations.
• Two different laboratories validated the results.

Results

<table>
<thead>
<tr>
<th>Lead concentration (ppm)</th>
<th>Sri Lanka n = 28</th>
<th>United States n = 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.055</td>
<td>6.062</td>
</tr>
<tr>
<td>Range</td>
<td>0.009-0.087</td>
<td>1.979-10.145</td>
</tr>
</tbody>
</table>

Limitations

• This small study provides evidence that some spice samples exceed the FDA action level for lead. However, clinical relevance is uncertain.

Conclusion

• Sri Lankan samples were found to have lead levels below the FDA action level of 0.1 ppm, whereas US samples exceeded this level.
• Manufacturing and exportation processes should be evaluated for lead contamination.
• With the CDC’s recent drop in the lead level of concern, it is important that we limit lead in non-essential food.
• Further studies are needed to assess larger and more representative samples of both imported and non-imported spices.