Impact of Melamine Pet Food Contamination on the Meat Industry

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James H. Hodges
President
American Meat Institute Foundation
Melamine (C₃H₆N₆)
Melamine Toxicological Profile

- Toxic effects only occur at high dose
- Differential toxicity observed in different animal models
- Metabolically inactive or inert
- Readily excreted
- Melamine and analogues assumed equally potent
Cyanuric Acid (C₃H₃N₃O₃)

Ammelide (C₃H₄N₄O₂)

Ammeline (C₃H₅N₅O)
Contamination Incidences

Imported Wheat Gluten → Pet Food → Chickens
Imported Rice Protein → Pet Food → Hogs
Concentrate
Imported Wheat Gluten → Fish Meal → Fish
Binding Agent → Pelleted Feed → Fish and Shrimp
<table>
<thead>
<tr>
<th>Product</th>
<th>Importers</th>
<th>Manufacturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat Gluten</td>
<td>ChemNutra</td>
<td>Xuzhou Anying</td>
</tr>
<tr>
<td>Rice Protein</td>
<td>Wilbur-Ellis</td>
<td>Binzhou Futian</td>
</tr>
<tr>
<td>Binding Agent</td>
<td>Tembec</td>
<td>Uniscope</td>
</tr>
</tbody>
</table>
Timeline

March 16: Menu Foods recalls pet food
March 30: FDA reports melamine found in pet food
April 3: ChemNutra recalls wheat gluten
April 18: Wilbur-Ellis recalls rice protein
April 24: Contaminated feed traced to hogs
April 30: Contaminated feed traced to chickens
Timeline

May 7: FDA/USDA issue safety assessment
May 8: Contaminated meal traced to fish
May 15: USDA releases hogs for processing
May 18: USDA releases chickens for processing
May 30: Tembec and Uniscope recall feed ingredients
Federal Meat Inspection Act
Poultry Products Inspection Act

• Mark of inspection can be applied if meat and poultry are “not adulterated”
• Product is adulterated if it bears or contains any poisonous or deleterious substances that may
  - Render it injurious to health
  - Render it unfit for human consumption
Initial USDA Actions

- State quarantine or voluntary hold
- Animals processed if feed tests negative
- Quarantine or hold remains if
  - Feed test positive
  - Feed sample not available
- No recall of meat or poultry
Scope

- 18,000 reports of pet illnesses
- 56,000 hogs in CA, KS, NY, NC, SC, VT and IL
- 20 million chickens in IN, AR and MO
Interim Melamine and Analogues Safety/Risk Assessment (FDA, USDA, CDC, EPA, DHS)

“Based on currently available data and information, the consumption of even large amounts of pork, chicken, fish, and/or eggs from animals that had been inadvertently fed animal feed contaminated with melamine and its analogues is very unlikely to pose a human health risk”
<table>
<thead>
<tr>
<th>Category</th>
<th>No. of Samples</th>
<th>No. Positive</th>
<th>Range</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pet Food Scraps</td>
<td>57</td>
<td>30</td>
<td>3-2180</td>
<td>352</td>
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<tr>
<td>Swine Feed</td>
<td>17</td>
<td>9</td>
<td>6-120</td>
<td>50</td>
</tr>
<tr>
<td>Poultry Feed</td>
<td>21</td>
<td>3</td>
<td>2-14</td>
<td>3</td>
</tr>
<tr>
<td>Fish Feed</td>
<td>7</td>
<td>5</td>
<td>2-400</td>
<td>125</td>
</tr>
<tr>
<td>Swine</td>
<td>15</td>
<td>0</td>
<td>&lt;50</td>
<td></td>
</tr>
<tr>
<td>Chicken</td>
<td>6</td>
<td>0</td>
<td>&lt;50</td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>2</td>
<td>0</td>
<td>&lt;10</td>
<td></td>
</tr>
</tbody>
</table>
Safety/Risk Assessment
(Worse Case Scenario)

Exposure:

- Melamine compounds (MC) in all solid food at 100 ppb (µg/kg)
- Person consumes 1.5 kg of solid foods per day
- MC Intake = 150 µg/kg bw/day or 2.5 µg/kg bw/day for a 60 kg individual
Safety/Risk Assessment
(Worse Case Scenario)

Level of Concern:

• No observed adverse effect level (NOAEL) of 63 mg/kg/day from rat bioassay
• Safety/uncertainty factor of 100
• Tolerable Daily Intake (TDI) = 0.63 mg/kg bw/day or 630 μg/kg bw/day
Safety/Risk Assessment
(Worse Case Scenario)

Margin of Safety:

- 2.5 μg/kg bw/day MC intake compared to 630 μg/kg bw/day TDI
- 252 times lower than TDI
- Must consume 800 pounds of food per day to cause health concerns
Subsequent USDA Actions

- Safety/Risk Assessment released
- Tissue test methods validated
- All pork and chicken samples below validated 50 ppb melamine
- All hogs and chicken released for processing
Key Learnings

• Difficult to protect against unknown
• Impact with widely used raw material significant
• Traceability will expedite consumer protection and decrease containment actions
• High dependence on cooperation from suppliers and exporting countries
Key Learnings

- System approach will reduce risks
- Need rapid testing capabilities to investigate for root cause
- Risks exist when using salvaged pet food
- Greater emphasis needed on quality and safety of raw materials, feed and foods
- Both government and industry have roles to play