2017 American Sheep Industry
The road to success is always under construction---Lily Tomlin
# APHIS Toxicant Development

<table>
<thead>
<tr>
<th></th>
<th>Sodium Cyanide</th>
<th>1080</th>
<th>Sodium Nitrite</th>
<th>PAPP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Status</strong></td>
<td>APHIS Registered</td>
<td>APHIS Registered</td>
<td>Registration Submitted</td>
<td>Research Phase</td>
</tr>
<tr>
<td><strong>Mode of Action</strong></td>
<td>Krebs Cycle Inhibitor</td>
<td>Krebs Cycle Inhibitor</td>
<td>Oxygen Depletion</td>
<td>Oxygen Depletion</td>
</tr>
<tr>
<td><strong>Humaneness: Time to Death</strong></td>
<td>10 min</td>
<td>&lt; 12 hr</td>
<td>1-2 hr</td>
<td>???</td>
</tr>
<tr>
<td><strong>Humaneness: Awareness</strong></td>
<td>Transient</td>
<td>???</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Antidote</strong></td>
<td>Sodium nitrite, Amy nitrite</td>
<td>None</td>
<td>Methylene Blue</td>
<td>???</td>
</tr>
<tr>
<td><strong>Challenges</strong></td>
<td>Lost Registration</td>
<td>Lost Registration</td>
<td>Palatability Loading</td>
<td>Vomiting Loading</td>
</tr>
<tr>
<td><strong>Registration Costs</strong></td>
<td>Low: Maintenance</td>
<td>Low: Maintenance</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>
Sodium Nitrite - Swine Toxicant Development

- Lab Toxicity Trials
  - IACRC
  - NWRC/ACTA

- Non-toxic Bait Field Trials

- Literature Search

- Laboratory Efficacy Trial - Pig

- End-use Product Toxicity Trials

- Field Efficacy Trial

- Proof of Concept
- Efficacy Trials
- Authorization

- Prepare Experimental Use Permit Application

- EPA EUP Application Review

- EPA Registration Application Review

- NWRC/IACRC CRADA #1

- NWRC/IACRC CRADA #2

- DEVELOP COLLABORATIONS
  - IACRC, ACTA, WS Operations, State Offices

- NWRC
  - National Wildlife Research Center
Silencing Genes: siRNA Technology

DNA \rightarrow \text{transcription} \rightarrow \text{RNA} \rightarrow \text{translation} \rightarrow \text{Protein}