PFAS in Food Packaging Alternatives Assessment Project Update: 6-30-2020

EZView Website:
PFAS in Food Packaging AA Agenda

- Intro/Welcome
- Background
- AA Process
- Products Review/CBI
- Timelines
COVID-19 & State Furloughs Update

- PFAS AA team members are continuing to work from home through the end of the year.

- Some stakeholders have indicated their ability to engage at this time is limited.

- WA State furloughs.
PFAS Alternatives Assessment
Public Comment Website

http://hwtr.ecology.commentinput.com/?id=a8U4i
Legislature passed toxics law that bans perfluorinated and polyfluorinated substances in paper food packaging.

Ecology will determine whether alternatives are available for specific packaging applications. A peer review process is required.

Ecology reports to legislature and ban will take effect two years later.

Based on the Interstate Chemicals Clearinghouse (IC2) modules: Hazard (L2); Exposure (L1); Cost & Availability (L1) & Performance (L1).
1. Chemical of Concern

2. Identify Alternatives

3. Hazard Assessment

4. Performance

5. Cost and Availability

6. Exposure

Unknowns

Known not safer alternatives

Preferred Alternatives

Repeat steps as needed
The Interstate Chemicals Clearinghouse (IC2) Alternatives Assessment Guide
Technical Documents

- New documents have been posted to the website and are available for stakeholder comment:
  
  - [Product and Alternatives Scoping Paper (2/24/2020)](#)
  - [Hazard Methodology (3/19/2020)](#)
  - [Exposure Methodology (3/19/2020)](#)
  - [Performance Methodology (6/18/2020)](#)
IC2 Guidelines: Level 2 Hazard

GreenScreen evaluation

- Created by Clean Production Action in 2007
- Based on EPA Safer Choice hazard criteria
- 18 endpoints for human and environmental health
- Translates into four benchmarks from 1 Avoid to 4 Prefer

**Table 1. Example GreenScreen Hazard Summary Table for a Chemical**

<table>
<thead>
<tr>
<th>Group I Human</th>
<th>Group II and II* Human</th>
<th>Ecotex</th>
<th>Fate</th>
<th>Physical</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>N N*</td>
<td>AA</td>
<td>P</td>
<td>F</td>
</tr>
<tr>
<td>ST</td>
<td>N* SnS*</td>
<td>CA</td>
<td>B</td>
<td>Rx</td>
</tr>
</tbody>
</table>

**Glossary of GreenScreen Hazard Endpoint Abbreviations**

- AA: Acute Aquatic Toxicity
- AT: Acute Mammalian Toxicity
- B: Bioaccumulation
- C: Carcinogenicity
- CA: Chronic Aquatic Toxicity
- D: Developmental Toxicity
- E: Endocrine Activity
- F: Flammability
- IrE: Eye Irritation
- IrS: Skin Irritation
- M: Mutagenicity and Genotoxicity
- N: Neurotoxicity
- P: Persistence
- R: Reproductive Toxicity
- Rx: Reactivity
- SnS: Sensitization (Skin)
- SnR: Respiratory Sensitization
- ST: Systemic/Organ Toxicity

* Repeated exposure
IC2 Guidelines: Level 1 Exposure

Qualitative comparison for substantial differences

Preliminary questions on hazard

Compare Physicochemical properties

Compare Exposure pathways

Additional questions, if needed
• Environmental monitoring and biomonitoring
• Manufacturing
• Life cycle
### Selected physiochemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Reason</th>
<th>Guidelines (NAS, 2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatility/ vapor pressure</td>
<td>Volatility/vapor pressure influence how likely the chemical is to be found in the air or how likely it is to enter the body</td>
<td>&gt;10-8 mmHg; considered likely to found in the air. &gt; 10-4 mmHg; considered to be more likely to enter the body.</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>Generally, as molecular weight and size increase, bioavailability decreases (leading to a lower toxicity potential)</td>
<td>&gt;1,000 amu is less likely to be bioavailable</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Generally, a chemical that is highly soluble in water will have more bioavailability and toxicity and is more likely to be found in water bodies and precipitation.</td>
<td>&lt;1 ppb generally have lower water solubility</td>
</tr>
<tr>
<td>Log Kow</td>
<td>The log of the water-octanol coefficient (Log Kow), is an indicator of potential for bioaccumulation and bioavailability.</td>
<td>&lt;5 for mammals &lt;4 for aquatic species</td>
</tr>
<tr>
<td>Boiling and melting points</td>
<td>These help to determine if the chemical will be a solid, liquid or gas at a certain temperature.</td>
<td>&lt;25 C will be a gas at room temperature &lt;25 C will be a liquid at room temperature</td>
</tr>
<tr>
<td>Density/ specific gravity</td>
<td>Has implications for where the chemical might partition when with other liquids or gases.</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>A measure of free hydrogen. Has implication for water solubility and potential damage to cells.</td>
<td>For certain products, a pH of &gt;2 and &lt;11.5 is safest for eyes and skin (Safer Choice 2015)</td>
</tr>
<tr>
<td>Environmental Partitioning</td>
<td>A measure of how easily molecules or salts will break apart in under certain conditions (primarily in solution)</td>
<td>The higher the constant (Kd), the more likely the molecules or salts will break apart.</td>
</tr>
</tbody>
</table>
IC2 Guidelines: Level 1 Performance

Series of questions based on qualitative data and promotional materials:

What are the performance needs at the chemical, material, product, and process level?

Has the alternative already been identified as favorable with respect to performance?

Has an authoritative body demonstrated that the alternative functions adequately for both the process and product?

Is the alternative considered favorable but there are indications that it does not perform as well as the current chemical?

Has the proposed alternative been identified by expert sources as unfavorable?
IC2 Guidelines: Level 1 Cost and Availability

Basic Cost and Availability

Is the alternative currently used and offered for sale?

Is the price competitive?
IC2 Guidelines: Level 2 Stakeholder Involvement

- Seek input from external stakeholders

Contact stakeholders → Identify potential concerns → Address/mitigate concerns if possible → Incorporate concerns into decision making
Stakeholder Involvement

- Monthly Webinars (Jan to May)
- Comments on draft modules
- Small meetings
Product Categories in Scope

- **Category 1:** Paper Wraps, Liners, Bags & Sleeves
- **Category 2:** Dinnerware
  - Plates, bowls, trays
- **Category 3:** Food Service Containers
  - “Take-out” cartons or containers for storage and transport
## Proposed Alternative Chemicals for Hazard Evaluation

<table>
<thead>
<tr>
<th>Low Concern</th>
<th>EPA Safer Chemical</th>
<th>Hazard Evaluation Candidates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncoated paper</td>
<td>Petroleum wax(^1)</td>
<td>Silicone coatings</td>
</tr>
<tr>
<td>Aluminum foil</td>
<td>Bio-based wax(^2)</td>
<td>Polyvinyl alcohol coatings</td>
</tr>
<tr>
<td>Kaolin clay (CAS 1332-58-7)</td>
<td>Polylactide (foam, plastic, coating) (CAS 9051-89-2)</td>
<td>Polyethylene coatings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Polyethylene terephthalate coatings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Additives, residuals, contaminants, degradation products</td>
</tr>
</tbody>
</table>

1. Related [EPA SCIL](#) listings may include Paraffin waxes, petroleum, clay-treated (CAS 64742-43-4) and Paraffin waxes, petroleum, hydrotreated (CAS 64742-51-4)

2. Related EPA SCIL listings may include Soybean oil and soybean oil derivatives that could be hydrogenated to produce waxy substances: soybean oil (CAS 8001-22-7), soybean oil fatty acids (CAS 68308-53-2), soybean oil, methyl esters (CAS 67784-80-9), and soybean oil, sulfated, sodium salt (CAS 61790-16-7)
CBI Submission Update

- Ecology collaboration with product manufacturers to conduct hazard assessments of potential alternatives.

- Two Options: 1) Submit product info directly to Ecology, or 2) Submit GreenScreen for product.
  - GreenScreen must be conducted by a Licensed GreenScreen® profiler.
  - Ecology must have access to full report.

- Ecology staff working with companies to facilitate timely CBI reviews & information sharing.

More information can be found in the CBI Process for PFAS AA 4-8-20 document on the ezview website.
Current Timeline

June - July 2020 – CBI Submission from Stakeholders

June-Early August 2020 - SRC Final Report & Ecology/DOH Review

Late August - Early October 2020 – Peer Review by WA State Academy of Sciences

Late October - November 2020 – Final AA Review

December 2020 – Submit potential notice to WA State Register

August-September 2020: Public Comment Period
Contacts:

Rae Eaton, Ecology, rae.eaton@ecy.wa.gov
Cathy Rudisill, SRC, Inc., Rudisill@srcinc.com
Ken Zarker, Ecololgy, ken.zarker@ecy.wa.gov

EZView Website: