Food Producer Challenges to Eliminate Chemicals of Concern in Food Packaging

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Outline

• Identifying chemical of concern
• Identifying suitable alternatives
• Qualification of alternatives
Identifying Chemicals of Concern

How do you determine what is a chemical of concern to then eliminate it from food packaging?

Three areas to evaluate:
Toxicological / food safety studies
Regulations from around the globe
Public concern
Determine if suitable alternatives exist

Are the alternatives…

• available from packaging suppliers?
• allowed by regulations?
• safe?
• work the same as the original?
Suitable alternatives – Substitution – How long?

How **long** does substitution take?

Is there a suitable alternative available?
• Supplier has already or develops new (0-3+ years)

Is the alternative allowed by regulation?
• Regulatory compliance approvals (2+ years)
Suitable alternatives – Substitution – How long?

At the food producer level:

• Evaluation of the new packaging material:
  − Confirm regulatory status (CoC/DoC)
  − Conduct safety evaluation
  − Production evaluation
  − Shelf-life study
Suitable alternatives – Substitution – How long?
At the food producer level:

Safety Evaluation
- Migration analyses: 10 days (minimum) at elevated temps
- Analysis by GC or LC
  - Review of data
- Review/Identification of NIAS
  - Evaluation by toxicologists
- These steps can total 6+ months
Suitable alternatives – Substitution – How long?
At the food producer level:

Production evaluation

• Production/filling trials with the new packaging structure
  – 6 months+

• Shelf-life Quality checks – up to 2 years
Suitable alternatives – Substitution – How long?
At the food producer level:

With all the steps:
Selection, Regulatory, Safety, Production, Shelf-life

• Qualified alternative(s) in 1-5 years
• If no problems along the way
Suitable alternatives: Example 1
Replacement of ITX photoinitiator in inks:

- Alternatives were known
  - Regulatory compliance (CoC/DoC)
  - Conduct safety evaluation (migration/set-off)
  - Production evaluation (scratch resistance, line-speed)
  - Shelf-life study (organoleptic)
  - Finished in <1 year
Suitable alternatives: Example 2
Replacement for BPA in can coatings:

Key difference: alternatives **not widely used/known**

- Regulatory compliance
- More than review of DoC/CoC
- Alternatives based on: polyester, acrylic, PVC, oleo resin
- Develop new materials (3+ years) to fill performance gaps
  - then regulatory approval takes 2+ years
Suitable alternatives: Example 2
Replacement for BPA in can coatings:

Conduct safety evaluation on new materials
• Migration analyses,
• Tox assessment of NIAS
• 6+ months to 1 year
Suitable alternatives: Example 2: Replacement for BPA in can coatings

Production Trials
- Obtain cans with new coating
- Fill with product on the production line
- Multiple coating formulations can be done in parallel
- Shelf-life is 2 years to complete
Suitable alternatives: Example 2: Replacement for BPA in can coatings

Challenges:

• Learning curve with new technology
• Coatings were not guaranteed for previous/full shelf-life
  – Shorter shelf-life = more food waste
• Failures of coating:
  – Sensory
  – Coating performance
  – Production performance
Suitable alternatives: Example 2: Replacement for BPA in can coatings

Challenges:

Performance failure – pitting, discoloration, corrosion

After 4 months  After 4 months  After 9 months
Suitable alternatives: Example 2: Replacement for BPA in can coatings

Challenges:
Performance failure – adhesion loss
Suitable alternatives: Example 2: Replacement for BPA in can coatings

With a failure during shelf-life, possible to lose 1+ year

Harvest pack (fruits/vegetables) there is a time window (once per year) to pack
  – If a problem, longer delays to restart than non-seasonal packed food (e.g. soups or milk)

With a failure,
Reset pack and shelf-life time lines
Summary - Challenges to eliminate chemicals of concern in food packaging

• Identification of alternatives can be straightforward
• Challenges to ensure the safety and compliance of alternatives to chemicals of concern
• Challenges to ensure that an alternative performs the same – for shelf-life and for production

• Substitution is a long process
QUESTIONS?

Thank you for your attention.