

IAFNS Food Packaging Safety and Sustainability Committee Request for Proposals

Project title: Identify safety barriers to broad adoption of recycled polyolefins for food packaging. How clean is clean enough?

The Institute for the Advancement of Food and Nutrition Sciences (IAFNS) is a non-profit, 501(c)(3) scientific organization that pools funding from industry collaborators and advances science through the in-kind and financial contributions from public and private sector participants. IAFNS adheres to strict procedures to maintain scientific integrity in all work we support. These requirements include adherence with [TOP Guidelines](#) and are summarized in our [Code of Conduct](#).

The IAFNS Food Packaging Safety and Sustainability Committee funds innovative research and convenes scientific conferences and expert roundtables to identify and address knowledge gaps packaging safety and sustainability. The Committee is comprised of experts from academic institutions, US government and food and packaging industries.

Background:

Recycled packaging is an integral component of a sustainable future. Despite significant advances in recycling science, there remain hurdles to broad utilization of recycled plastics including the need for reliable and predictable sources of safe post-consumer products.

Polyethylene terephthalate (PET) is presently the dominant packaging material for many types of beverages such as water, carbonated soft drinks, and juices. Multiple PET collection and recycling processes are available ranging from conventional mechanical recycling to super-clean processes such as chemical upcycling, in addition to new end-markets for PET recyclates. PET has a long history of safe use and recycled PET has been shown to be generally resistant to degradation and release of harmful elements.

Another group of plastic polymers, polyolefins, have experienced increased use in packaging because of their shrinking properties, clarity, and absence of chloride. Polyolefins, however, present safety concerns in recycling streams since not all polyolefins that enter waste streams are produced in specifications that are appropriate for use in food contact applications, in contrast to PET. Furthermore, due to the lower diffusion coefficient of PET compared to olefins, PET does not sorb nor release contaminants as readily as polyolefins.

Safety concerns can arise from misuse of containers, such as for storage of garden chemicals which are then introduced into a food-contact container recycling stream. There are also concerns over unapproved additives being introduced into the recycling stream when non-food contact containers are commingled with food contact containers. The current PET recycling infrastructure is considered less susceptible to migration events due to ease of sorting and uniformity of source material when compared to different densities, grades, and additives in olefins (e.g., high density, low density, and linear low-density polyethylene).

This proposal seeks an in-depth review paper that will survey the recycling landscape and identify safety issues and potential solutions to enable wide-scale production and adoption of recycled plastic. This proposal will leverage current frameworks for PET recovery and recycling to identify gaps in olefins recovery, recycling, and safety for food and beverage packaging.



Objective 1: Identify key elements in generating clean recycled PET and use these as a model to develop a framework for generating safe recycled polyolefins with consistency and predictability

Draw comparisons between PET and polyolefin source material and recycling processes, identify science and logistical gaps and propose pathways to address

Include analysis of existing collection systems in the US for High-Density Polyethylene (HDPE) containers, poly propylene containers, single-ply (monolayer) films, and multi-layers and multi-material packaging substrates

Objective 2: Identify restricted substances (RS), non-intentional added substances (NIAS) and intentionally added substances (IAS) in recycled PET and polyolefins and mitigation options

Identify substances of concern found in recycled PET and polyolefins, including the basis for concern (e.g., endocrine disruptors, bioaccumulation, etc.)

Identify potential sources of RS, NIAS, and IAS (e.g., misused household chemical containers, co-mingling of non-food with food contact containers, etc.) and prioritize in order of impact

Describe recycling barriers and traditional and new technologies/options (e.g., sorting, analytical monitoring, chemical mitigation) for recovery and reprocessing of polyolefins to generate food-grade material

Objective 3: Survey US domestic and major international recycling requirements, such as certification rules and regulations pertaining to “clean” recycled plastic

Identify points of agreement and points of departure between schemes

Include discussion on certification methodologies, rationale for divergent rules, metrics, and standards for assessing safety, as well as analytical testing requirements to support standards

Discuss best practices for contaminant surveillance and the different roles and responsibilities within the supply chain to deliver safe, and “clean” recycled plastic.

Project deliverables

- Comprehensive review of technical and regulatory frameworks pertaining to safety of PET and polyolefins for food contact applications.
- Overview of technical and regulatory barriers and potential solutions for broader adoption of recycled polyolefins.
- Framework for enhanced safety and adoption of recycled polyolefins including gaps and how they might be addressed.
- Present findings at appropriate scientific meeting
- Participate in expert roundtable sponsored by IAFNS

Proposal Content:

Applicants should address the following components in their proposal:

1. **Overview:** Please provide a short description of the proposal.
2. **Research Approach:** Please provide your approach to the research design elements as described above. Identify key research questions, primary and secondary outcomes,



methodology, and analysis plan. Where appropriate, please reference the validation of proposed methods.

3. **Research Team:** Please indicate the primary and secondary investigators, plus any additional contributors or collaborators including ones from outside organizations.
4. **Anticipated Challenges**
5. **Investigator Credentials:** Please describe the experiences that make you and your team a candidate for carrying out this project. In addition, the CV of the principal investigator(s) is required.
6. **Resources:** Please describe the resources available to you to complete the project.
7. **Budget:** Please provide a budget summary indicating allocation of the requested funds to specific tasks, as well as a corresponding timeline to completion.
 - a. IAFNS will directly pay publication fees for open access.
8. **Timeline and Key Deliverables:**
 - a. Review plan of work with Committee
 - b. Deliver interim progress report
 - c. Periodic updates to the Committee via webinar
 - d. Publication in a peer reviewed journal
 - e. Presentation at appropriate scientific forum (name)
 - f. Participate in IAFNS expert roundtable via webinar
 - g. Timeline to completion: 10 months.
9. **Potential Conflicts of Interest:** List any potential conflicts of interests for all investigators, co-investigators, collaborators. We suggest using the Conflict-of-Interest Guidelines as set forth by the American Society for Nutrition:
<https://nutrition.org/publications/guidelines-and-policies/conflict-of-interest/>

Page Limit: No more than 5 pages excluding references and investigator bios and CV.

Proposal Deadline: August 25, 2021

Submission Instructions: Please submit completed proposals to:

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Proposal Review Process:

- a) Proposals will be reviewed promptly by the IAFNS Food Packaging Safety and Sustainability Committee. Only projects meeting requested criteria will be considered.
- b) Applicants will be notified in writing if additional information is needed.
- c) Once the proposal review is over, all applicants will be notified of the disposition of their proposals in a timely manner.
- d) Upon project initiation, the project summary, principal investigator, and budget will be published on our funded projects portal: <https://iafns.org/funded-projects/>