

Aluminum foil alternatives for sustainable food packaging

Background

Kraft Heinz aims to achieve 100% recyclable, reusable, or compostable packaging by 2025. However, finding sustainable materials that maintain the structural integrity required for our manufacturing requirements and food products presents a significant challenge. Many sustainable alternatives either fall short on performance or are not fully compatible with recycling/composting processes, hindering our progress towards this goal. For example, conventional replacements for aluminum foil do not possess the required structural properties such as dead fold and stiffness at higher temperatures to effectively form, fill and seal in a manufacture environment.

What we're looking for

We are seeking aluminum foil alternative materials that deliver against structural requirements (ex. dead fold and stiffness at higher temperatures) for use with dairy-based food products. Solutions may include, but are not limited to, the following:

Material / Manufacturing Needs	Consumer Performance need	Out of Scope
<ul style="list-style-type: none"> • Dead fold (like foil) • Moisture / Oxygen barrier (see below) • Retain stiffness at higher temps (see below) • Grease / oil barrier • Acid / chemical resistant Scalable 	<ul style="list-style-type: none"> • Easy open • Product release • Recyclable or Industrial compostable (see below) • Printable (food contact safe inks) • Reclose • Embossing 	<ul style="list-style-type: none"> • Wax (also combination of wax and polyolefins and paper) • PET based film

Solutions of interest include:

- Home or Industrial compostable biopolymer films
- Advanced or mechanical recycling compatible polymers

Our must-have requirements are:

- Provide the required dead fold and stiffness at higher temperatures (above 150 – 180F) to efficiently manufacture with existing machinery.

- Achieves our target oxygen transmission rate (OTR) OR water vapor transmission rate (WVTR) rates and maintains through distribution
- Capable of receiving compliance with direct or indirect food contact requirements per the Federal Food, Drug and Cosmetic Act/FDA 21 CFR/EFSA FCM (dairy), or capable of receiving FDA clearance for food contact.
- Compatible with plastic or paper recycling, or industrial composting streams. Depending on application and region of use, potential end-of-life scenarios for packaging with high barrier are: 1) Recyclable in the plastics stream per APR critical guidance, CEFLEX or equivalent (dry and aqueous food products); 2) Recyclable in the fiber/paper stream per the FBA voluntary standard, 4ever green guidelines or equivalent (dry food products); and 3) Industrial composting per ASTM D6400, EN 13432, ISO 17088 or equivalent industrial composting standards; home compostable desired if able to meet performance criteria (aqueous food products)

	WVTR (38°C/ 90% RH)	OTR (23°C/ 0%RH)
	g/(m²·day)	cc/(m²·day)
Preferred	< 0.03	< 0.03
High	0.03 – 1.5	0.03 – 1.5

Our nice-to-have requirements are:

- Compatible with commercially available processes (e.g., blown film, cast film, co-extrusion, lamination (adhesive or extrusion), roll coating processes, etc.)
- Ability to use material in any of the following ways: emboss, printable, reclose.
- Acid / chemical resistant.

What's out of scope:

- Materials that migrate into the food products.
- Materials with health and environmental hazards, per ASTM standards.
- Materials containing common allergens as defined by the FDA (e.g., shellfish, latex, etc.).
- Materials that contain PFAS, phthalates, or bisphenols
- Materials that are detrimental to the recycling streams and/or composting.
- Solvent cast film technologies
- Wax (combination of wax and polyolefins and or paper) and, PET based films

Acceptable technology readiness levels (TRL): Levels 2-9

1. Basic principles observed
2. Concept development
3. Experimental proof of concept

4. Validated in lab conditions
5. Validated in relevant environment
6. Demonstrated in relevant environment
7. Regulatory approval
8. Product in production
9. Product in market

What we can offer you

Eligible partnership models:

- **Sponsored research**

Benefits:

Sponsored Research

Funding is proposal-dependent starting with proof-of-concept, typically ranging from \$25,000 to \$100,000 for a six-month length project with the potential for expansion based on results and opportunities.

Expertise

We offer the expertise of our team of scientists for collaboration and guidance during the development of the project.

Who we are

We are driving transformation at The Kraft Heinz Company, inspired by our Purpose, Let's Make Life Delicious. Consumers are at the center of everything we do. With 2021 net sales of approximately \$26 billion, we are committed to growing our iconic and emerging food and beverage brands on a global scale. We leverage our scale and agility to unleash the full power of Kraft Heinz across a portfolio of six consumer-driven product platforms. As global citizens, we're dedicated to making a sustainable, ethical impact while helping feed the world in healthy, responsible ways. Learn more about our journey by visiting www.kraftheinzcompany.com or following us on LinkedIn and Twitter.

Reviewers

Maxine Roman

Lead, Innovation Collaboration & Partnerships

Mirjam Spreeuwenberg

R&D Technology Lead

Clay Ladd

Pkg Engineer

Please contact the University of South Florida Technology Transfer office representative for submission - Roisin McNally at rmcnally@usf.edu.