



Cargill

Oleogels for confectionery and fat-based food applications

Food & nutrition

Background

The food industry has witnessed significant advancements in texturization and stabilization technologies, with hydrocolloids transforming applications from dairy products to sauces and baked goods. Their ability to enhance texture, stability, and mouthfeel has fueled a thriving global market. Now, a parallel opportunity may exist in the form of oleogels: Oleogels provide functionality and sensory attributes of conventional fats used in different food products.

Oleogels function similarly, using a gelator to structure oil into a gel-like consistency. While research has explored oleogels for decades, their adoption in large-scale food manufacturing remains limited. Main barriers include oxidation risks leading to off-flavors and shorter shelf life, difficulty replicating key confectionery characteristics (e.g., snap, melt behavior), and the limited availability of scalable structuring agents. Looks like oleogels could offer tapped/untapped functional benefits in various food applications including confectionery. To transition from academic research to real-world food applications, advancements in oleogel formulation are required. We are interested in using oleogels in various food applications including confectionery, also interested to tap their functionalities in structuring and beyond.

What we're looking for

We are looking for collaborations with experts to advance the practical use of oleogels in food applications, with a primary focus on confectionery. Our goal is to develop oleogel formulations using widely available ingredients that not only match the functionality and sensory profile of existing fats but also ensure that the final product maintains its expected texture, mouthfeel, and stability. We are particularly interested in applications where oleogels can replace traditional fats, offering clear advantages in sustainability, health, or cost. We are also focused on more challenging uses, such fully replacing confectionery fats in compound coatings while maintaining key sensory and crystallization properties. While confectionery remains the primary focus, we welcome proposals exploring oleogels as viable replacements for traditional fats and structuring agents in bakery products, pastries, breakfast spreads, and meat alternatives, food service, frying and other applications.

Solutions of interest include:

- Oleogel formulations made from commodity oils and widely available ingredients
- Final product formulations containing oleogels for nut butters, chocolate spreads, fillings, pastries, ganaches, bakery glazes and compound chocolates
- Oleogels for fat replacement with nutritional (e.g., less saturated fat) and sustainability benefits

Our must-have requirements are:

- Final products must maintain texture, mouthfeel and stability comparable to versions made with conventional fat-based systems or structuring agents
- Formulations must use readily available oleogelators (e.g., sunflower wax, pectin, lecithin)
- Production methods with strong scaling potential for industrial feasibility

Our nice-to-have's are:

- Costs comparable to traditional commodity oils/fats current cocoa butter or cocoa butter equivalent (CBE) prices
- Impact of oleogels on the sensory & functional properties of chocolate
- Techno-economic assessment of production methods with estimated operational expenditure (OPEX) and capital expenditure (CAPEX) ($\pm 50\%$ accuracy)
- Consideration of oxidation stability and how it impacts final product shelf life

What's out of scope:

- Non-food applications of oleogels

Acceptable technology readiness levels (TRL): Levels 2-7

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
Co-development
Supply/purchase
Material transfer
Licensing
Equity investment

Benefits:**Sponsored Research**

Funding for research and proof of concept depending on the scope of the work.

Who we are

Our global team includes more than 1,500 research, development, applications, technical services and intellectual property specialists working in more than 200 locations. Together, they provide a spectrum of services encompassing technical service, applications, development, research, intellectual asset management, and scientific and regulatory affairs.

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