Background

Cocoa butter and cocoa butter equivalents based on tropical oils are important ingredients for confectionery, giving the structure and melting behavior to support the pleasant taste and overall eating experience. The unique composition of cocoa butter, dominated by symmetric SUS triglycerides (Saturated-Unsaturated-Saturated), contributes to its steep melting profile, which gives chocolate its signature smooth mouthfeel and the "melt-in-your-mouth" experience. As chocolate and confectionery consumption continues to rise, the demand for cocoa butter and cocoa butter alternatives is increasing. At the same time, sustainability has become an increasingly critical consideration. While current alternatives derived from palm mid fraction and shea butter perform relatively well in replicating the functional properties of cocoa butter, these sources are produced predominantly in tropical regions far from major confectionery markets, which not only increases the carbon footprint associated with long-distance transport but also exposes supply chains to potential disruptions. Addressing these challenges with a regional supply approach that reduces CO2 emissions while ensuring more resilient and sustainable sourcing is a key driver behind this request for proposals.

What we're looking for

We are looking for cocoa butter alternatives usable in combination with cocoa butter or as a full substitute. Ideal solutions would mirror the structure of cocoa butter, specifically symmetric di-saturated triglycerides (SUS type: Saturated-Unsaturated-Saturated). However, we are also open to considering other structures that would lead to a steep melting profile, such as those found in certain lauric oils, like palm kernel stearin.

Solutions of interest include:

- Fermentation (conventional or precision)
- Molecular farming
- Edible oil refining
- Interesterification
- Plant based oil alternatives
- Enzymatic or chemical modification methods
- Supercritical fluid processing and other advanced extraction methods
- Oil fractionation (e.g., lauric oils to extract specific fractions)
- Novel sources (algae, micro-algae, yeast, new plant sources/growing methods)

Our must-have requirements are:

- Melting behavior similar to that of cocoa butter (Sharp melting curve, melting point around 39C).
- Neutral taste/aroma
- Clear path to industrial scale production (1000 MT fat per year)

Our nice-to-have's are:

- Cost parity to existing Cocoa butter equivalents (when at scale).

What's out of scope:

- Hydrogenation of current commercial products.

Acceptable technology readiness levels (TRL): Levels 4-9

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
- Co-development
- Equity investment
- Supply/purchase
- Licensing
- Material transfer
- Capstone project

Benefits:

Sponsored Research

We will offer research funds up to 100k USD for early stage solutions. Additionally, for later stage solutions, we could fund the co-development to finalize the invention and license / purchase the technology

Expertise

Access to Cargill Cocoa and Chocolate and edible oil scientists, engineers and operations experts, as needed.

Compounds and Reagents

Fats/Oils for testing solutions up to 1MT, depending on TRL of proposed solution.

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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