

Improving cocoa liquor packaging, transport and intake

Background

We are a leading company in the cocoa production industry with a robust but complex process to supply cocoa liquor from our production facilities in West Africa to our plants in Europe. Currently, the cocoa liquor is tempered, packaged in 25kg bag-in-box containers, palletized for shipping, and then transported via sea freight (6-8 weeks total, including time in harbors and during shipping). Upon arrival in Europe, the cocoa liquor is unpacked and melted for further processing. While this process ensures the safe transport of cocoa liquor, several key challenges exist at each stage. The process required for tempering, packaging, unpacking and melting is resource-intensive, and the sustainability performance of the single-use, recyclable, packaging materials could be improved. Additionally, the unpacking and melting process can introduce risks of contamination, posing a food safety concern. The overall process, although functional, also leads to some yield loss, currently estimated at 0.4%. We believe that a more streamlined, automated, and sustainable approach could not only improve efficiency but also address these challenges by reducing manual labor, minimizing contamination risks, and lowering the carbon footprint of the entire supply chain.

What we're looking for

We are seeking innovative technologies or solutions to improve or replace any aspect of our current supply chain (tempering, packaging, transport, unpacking and melting) required for bringing cocoa liquor from West Africa to Europe, which operates at a scale of 10k - 50k metric tons per year.

Solutions of interest include:

- Returnable or reusable packaging solutions that reduce single-use waste
- Tempering and melting solutions that prevent sedimentation and overheating
- Automated packaging/unpacking processes
- Solutions that effectively replace part or all of the current operational steps (tempering, packaging, unpacking, melting)

Our must-have requirements are:

- Maintain product integrity throughout transit, preventing spoilage, contamination, or yield loss.
- Packaging solutions must have a path to approval for direct food contact, designed for high-fat products like cocoa liquor.
- Any packaging solution that is returnable should consider the logistics of returning the empties to West Africa.

Our nice-to-have's are:

- Reduction of single-use packaging material.
- Cost-effective options for cleaning returned packaging.
- Reduce manual labor, improve speed, and minimize yield loss (current estimate: 0.4%).
- Compliance with the EU Packaging and Packaging Waste Regulation (Art.29 of PPWR).

What's out of scope:

- Any solution that requires modification of the cocoa liquor or results in a degradation in its quality.

Acceptable technology readiness levels (TRL): Levels 5-9

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
- Licensing

Benefits:

Sponsored Research

We will fund up to 100K USD for co-development to finalize the invention and can assist in the joint product launch of the technology, with the objective of eventually installing the solution in 4 plants (2 dispatching, 2 receiving), depending on performance.

Expertise

Access to Cargill cocoa & chocolate scientists, engineers and operations, packaging and sustainability experts.

Compounds and Reagents

Cocoa liquor of up to 1MT can be provided for testing, depending on the stage of the 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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