

Ingredients for flavor modulation and sensory improvement

Background

Conventionally, cocoa beans are fermented in a wild fermentation on the field, sun dried and shipped to the cocoa processors, where they are roasted and milled. An optional process, known as alkalization (the so-called "Dutch process"), has been used since the 19th century to improve solubility, darken color and accentuate flavor through the use of alkalizing agents such as potassium carbonate, sodium carbonate or sodium hydroxide.

The degree of alkalization can be adjusted in order to deliver different hues of color. However, the relatively high concentrations of alkalizing agents needed to produce dark/black cocoa also introduce undesirable aromas, mouthfeels and tastes, often described as "rubber-like", "burnt", "astringent", "bitter" or "chemical".

What we're looking for

We are looking for materials or processes that can modulate the flavor profile of alkalized cacao (includes chocolate and cocoa powder) by masking the bitter taste, off-flavors and/or astringent mouthfeel.

Solutions of interest include:

- Taste modulators
- Flavor inhibitors
- Taste blockers
- Mouthfeel enhancers
- Receptor blockers
- Cocoa liquor deodorizers
- Flavor maskers

Our must-have requirements are:

- Dosage below 0.5% w/w in the final product formulation
- Process-related solutions should be "bolt-on" and not require significant modifications to the standard cocoa production process
- Heat-stable up to 140°C
- No lingering/carryover effects
- Functionality must remain stable over the self life of chocolate (2 years) and/or cocoa powder (3 years) at room temperature

Our nice-to-have's are:

- Clean label
- Not classified as "novel food" under EU law
- Cost in-use under 200 USD/MT contribution to finished product

What's out of scope:

- Polyphenol extracts

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

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.

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.

Reviewers

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