General Mills ✓

In-line imaging technologies for ice cream quality monitoring

Food & nutrition

Background

Ensuring the quality and stability of ice cream across production, storage, and distribution presents significant challenges. Factors such as ingredient consistency, process variations, and environmental conditions impact texture, crystallization, and shelf life. Traditional quality control methods may not provide the timely or detailed insights needed to proactively manage these complexities. To address this, General Mills is seeking instrumentation-based solutions for in-line imaging that enable the acquisition of high-resolution, multimodal data during production. These data will support computer vision models and predictive analytics already under development. The objective is to capture raw imaging data (e.g., hyperspectral, thermal, multi-spectral, RGB) that can detect variations in product structure, appearance, and stability-related properties. These technologies would enable real-time diagnostics, enhance quality control, reduce waste, and improve product consistency and shelf-life across diverse storage and distribution conditions.

What we're looking for

We are looking for in-line imaging instruments capable of acquiring high-quality data to support computer vision–based quality monitoring of ice cream during manufacturing.

Solutions of interest include:

- In-line hyperspectral and thermal imaging systems
- High-resolution RGB or multi-spectral cameras
- 3D surface scanning (laser or structured light)
- Near-infrared (NIR) imaging
- Ultrasound imaging
- Multimodal imaging rigs combining multiple imaging modes into a single platform

- Sensors that detect texture or crystallization patterns in frozen products

Our must-have requirements are:

- Delivers high-quality raw imaging data (e.g., RGB, thermal, hyperspectral, etc.) suitable for post-processing
- Operates in-line within manufacturing environments under variable temperature and humidity conditions
- Clear rationale for how acquired imaging data will inform product consistency, texture, ingredient distribution, potential instability, and/or shelf-life estimation

Our nice-to-have's are:

- Real-time monitoring
- Modular or scalable hardware configurations adaptable to different line setups
- Imaging systems with minimal calibration and maintenance requirements
- Synchronized capture with environmental sensors (temperature, humidity, etc.)

What's out of scope:

- Development of AI, computer vision algorithms, or predictive software

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
- Supply/purchase
- Licensing
- Material transfer

Benefits:

Sponsored Research

Funding opportunities to be discussed depending on the technology with possibility for long term partnership.

Expertise

Partners will have access to ice cream industry experts.

Data

Access to company data to be discussed depending on partnership model.

Facilities and Services

Partners may access our R&D and production facilities.

Who we are

General Mills is committed to making food with passion and putting people first by delivering the tastes they love while improving the nutrient density, affordability, and accessibility of our products. We collaborate with scientists, universities, companies, and organizations around the world to strengthen our impact and bring our purpose to life.

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