

Extending and predicting the shelf life of fresh meat-based products

Background

We are excited to announce the launch of our latest innovation project, which aims to preserve the freshness of products containing animal protein, grains, vegetables, fruits, and other perishable items as inclusions. Maintaining the freshness of these products is a significant challenge due to factors such as microbial growth, oxidation, degradation, and more. These issues not only affect food safety but also compromise product quality, leading to substantial economic losses and environmental impact. We invite innovators, researchers, and industry experts to submit their groundbreaking ideas and technologies to address these challenges. Whether it's through advanced packaging, natural preservatives, innovative storage solutions, or any other method, we are eager to explore a wide range of approaches. Your contributions will play a crucial role in enhancing food safety, reducing waste, and improving the overall quality of consumable products. Selected solutions will have the opportunity to be developed and implemented on a larger scale, making a tangible impact on the industry.

What we're looking for

We are seeking innovative technologies to preserve the freshness of refrigerated consumable products, ensuring they meet safety and quality standards. These products are based on animal protein and may contain various inclusions such as fruits, vegetables, grains, meat pieces, eggs, and other essential ingredients (like vitamins and minerals) to provide complete and balanced nutrition and maintain product quality throughout their shelf life. We are particularly interested in solutions that extend shelf life without compromising taste, texture, and nutritional value. Alternatively, we are also interested in technologies/models that can provide high-accuracy prediction of a product's shelf-life for such products.

Solutions of interest include:

- Natural preservatives and antioxidants that can extend the shelf life of refrigerated consumable products.
- Innovative packaging materials and technologies that provide superior barrier properties against moisture, oxygen, light, temperature regulation, and other contaminants, as well as atmosphere modification (e.g. vacuum sealing or inert gas flushing) thereby preserving freshness and extending shelf life.
- Processing methods such as high-pressure processing, cold-pressing, cold plasma, pulsed electric fields, radio frequency, or others that enhance product stability and safety while maintaining quality.
- Formulations that incorporate natural ingredients or preservatives to maintain products' freshness, taste, and nutritional value.
- Technologies that efficiently manage moisture levels within the product and packaging to prevent spoilage and maintain texture (e.g. humidity control pads or moisture absorbers).

- Technologies to preserve the natural nutrients of the ingredients, ensuring they remain beneficial throughout the product's shelf life.
- Technologies that predict and simulate product shelf life based on the product formulation, physical and chemical compositions, processing parameters, and environmental conditions.

Our must-have requirements are:

- Achieve a 150-day shelf-life through refrigeration alone or a combination of freezing and refrigeration. For example, short-term freezing (up to 30 days) followed by 120 days of refrigeration.
- Ingredient solutions must sustain the necessary production processes, including medium to high shear conditions, heat up to 170°F, freezing (<0°F), and refrigeration(<40°F) while remaining stable and active throughout the targeted shelf-life.
- Ingredient solutions should comply with AAFCO pet food regulations and meet the "Natural" and "Fresh" definitions.

Our nice-to-have's are:

- Solutions that have been proven to extend the shelf-life of similar products to up to 180 days under refrigeration.
- Solutions that support sustainability initiatives, such as reducing carbon footprint, using upcycled materials, and employing energy-efficient processes.
- Packaging solutions that incorporate sustainable materials.

What's out of scope:

- Artificial/synthetic ingredients or preservatives
- Ingredients that do not meet AAFCO standards
- Solutions that negatively impact flavor, taste, appearance or texture

Acceptable technology readiness levels (TRL): Levels 6-9

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

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

Benefits:

Sponsored Research

Funding is available to support solutions for achieving the desired outcomes. The funding amount will be determined through a mutually agreed-upon statement of work and will align with the existing funding range for the project. High TRL solutions may be integrated into the company's supplier network, leading to potential purchase contracts.

Expertise

Partners will gain access to the internal teams and experts for co-development, mutual learning, and broader business collaboration opportunities.

Tools and Technologies

Partners may have access to pilot and production scale equipment for solution implementation.

Please contact the University of South Florida Technology Transfer office representative for submission – Karla Schramm at kschramm@usf.edu