Smart Process to Produce Shelf-Stable Liquid, Semisolid Food Ingredients and Products (2023-041)

Preservative-, acids-, and flavor enhancers free processes to produce the finest flavor-odor-color profiles of food ingredients and products.

Market Overview

In today's market, food ingredients including protein and carbohydrate, are not shelf-stable, have off flavor-odor-color properties. Therefore, those ingredients cannot be used in food and beverage applications without preservatives, acids, and flavor enhancers. For instance, plant proteins and carbohydrate ingredients are primarily used for solid food applications, such as protein bars, powders, and burgers with dozens of chemical ingredients mask off flavors or enhance desirable flavors. This novel process develops shelf-stable liquid and semi-liquid ingredients and products for with superior flavor-odor-color profiles. Other benefits of the process include abilities for long term storages without refrigeration; hence reducing food prices and waste.

Technical Summary

The current technology utilizes extreme alkaline/acid and salt/sugar, range of preservatives, antioxidants to create shelf stable products. This invention's smart heat treatment uses liquid/solid food ingredients and solutions. This novel process also allows for the preservation of flavor-odor-color and sensory properties, as well as the enhancement of the food functional properties (e.g. texture) and retainment of nutritive value (e.g. digestibility). The technology enables producing shelf-stable (refrigeration free) liquid, semi-solid, and solid food products using the ingredients in the finest form while preserving sensory properties with no or added salts, sugars, acid, and any artificial or natural preservatives.

Applications

Shelf-stable liquid and semi solid food, No added sugar/salt, acidic and preservatives, and no added chemicals

Development Stage

TRL 4/5

Advantages

- Superior flavor-odor-color profiles and functional food properties of liquid protein and carbohydrate ingredients, and their combinations
- Provides shelf-stable liquid and semi-liquid dairy, alternatives.
- Preserves ingredients' native structure, and consquently, allows for better human digestibility.
- Enhances food functional properties, such as texture.
- No added sugar, salt, food preservatives and chemicals.

About the Inventors

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Dr. Dil Thavarajah is a Professor in the Department of Plant and Environmental Sciences and co-leader of the Phenomics component of the Feed the Future Innovation Lab for Crop Improvement at Cornell University. Dil is internationally recognized as a leader in pulse biofortification. Her research focuses on developing rapid and inexpensive analytical chemistry tools and finding whole-food-based solutions to combat global "hidden hunger."

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