Non-Thermal Sterilization Technologies

DESCRIPTION

An American Fortune 500 company is seeking non-thermal sterilization technologies for the treatment of manufactured foods and beverages.

BACKGROUND

As consumers desire reduced thermal treatment of their beverages and foods, the company seeks to identify technologies that can still achieve the required level of sterilization and safety without thermal inputs. Non-thermal sterilization technology increases shelf-life while creating foods and beverages with nearly the same taste, feel, appearance and nutritional profile of unsterilized, fresh foods and beverages. However, the technology often costs more to purchase and operate than thermal sterilization technologies. In addition, the shelf-life of non-thermally sterilized foods and beverages is less than similar heat-sterilized foods and beverages. Nevertheless, consumer demand for non-thermally sterilized foods and drinks is increasing. New technologies are needed to increase the shelf-life of non-thermally sterilized foods and beverages while decreasing the cost of acquisition and operation.

The company's ultimate goal is to develop technologies that can produce sterilization kill rates equivalent to conventional thermal sterilization, but at room temperature. Current technology scouting has identified intriguing technologies in sterilization tolerant probiotics and aseptic filling with particulates (fruit, grains, probiotics, etc.). Furthermore, technologies capable of reduced time and/or temperature sterilization are also of interest. Additionally, technologies that can handle multi-phase products (liquid and solids) are of significant interest for applications across the company's growing food and beverage portfolio.

KEY SUCCESS CRITERIA

The successful technology will:

- Sterilize finished packaged goods at a rate in excess of 400 packages/min.
    - Fluid treatment rate 25-100 kL/hr)
    - Continuous flow technologies are preferred over batch processing
- Achieve desired microbial kill without detriment to naturally present enzymes in the food or beverage.
- Sterilization must work for pH < 4.6
    - Prefer to work for pH >4.6

- Materials/ingredients used preferred to be edible and characterized as edible and safe by authorized regulatory body
    - For example, GRAS materials in the US; materials listed as safe to consume by EFSA or by Codex Alimentarius
    - At a minimum the ingredients must be non-toxic

Technologies to achieve lower cost aseptic filling are also of interest

POSSIBLE APPROACHES

Possible approaches might include, but are not limited to:

- In-package sterilization technologies
- Non-thermal sterilization of product that is then aseptically filled

APPROACHES NOT OF INTEREST

The company has conducted extensive research into alternative sterilization technologies. The list below details some of the technologies that have been explored so far. Individual technologies that utilize only one form of sterilization from the list below should be avoided unless the inventor can offer a step-change in the existing technology to dramatically change its cost or performance.

- High Pressure Processing (HPP)
- Chemical treatments
- Pulsed Light (PL) and Ultraviolet (UV) Light
- Ultrasound
- Ionizing Irradiation
- Pulsed Electric Field
- Electric Arc Discharges
- Oscillating Magnetic Field
- Enzymes
- Bacteriocins and Antimicrobial Ingredients
- Dense Phase Carbon Dioxide (DPCD)
- Ozone/Cold Plasma

PREFERRED COLLABORATION TYPES:

☒Joint Development
☒Contract Research
☒Technology Acquisition
☒Technology Licensing
☒Supply Agreement
☒Consulting
☒To Be Negotiated

If you are interested, please respond to:

Ms Katarína Nagyová
Technology Transfer Manager,
Head of TT Department
LC Innoconsult International

innovacio@lcinnoconsult.com
nagyova.katarina@lcinnoconsult.com