



## Novel Probiotics Edible Films/ Coating with Higher Shelf-life

### TECHNOLOGY AVAILABLE FOR TRANSFER

#### BACKGROUND & UNMET NEED

The commercially available probiotics in the Indian market are either sold in the form of lyophilized dried form, or spray dried form and as dietary supplements in liquid form added in products like yoghurt, curd, or ice-cream. However, the viability of different probiotic bacteria within above mentioned formulations varies a lot and certain strains of the microorganisms have been observed as low viability. The stability of the lactic acid bacteria in different food matrix and in the natural gastrointestinal tract of the human being is poor. To confer its health benefits in modulating the immune system, the survival of probiotic strain is a key factor. Encapsulation of probiotic bacterial starter strains within edible films is a promising approach that may solve this factor but survival of lactic acid bacteria for a prolonged period in edible film is still a challenge. Therefore, there is a need of potent matrix which can provide a higher survival rate for the lactic acid bacteria with relative ease.

#### TECHNOLOGY

The invention involves integration of lactic acid starters in a food grade edible strip/ coating (a thin layered structures of biopolymer composition). The key components of the film are milk proteins and plant based mucilaginous substance which promote and protect the lactic acid bacterial starters embedded in the film. The technology provides a film with the combination of both have enhanced mechanical properties, higher structural integrity and prolonged shelf-life. Therefore, the developed biopolymer greatly facilitates the maintenance of active probiotic cultures throughout its shelf life i.e. stable for 1 month at 4°C.

#### STAGE OF DEVELOPMENT

- Proof of concept is established in lab set-up.
- In-house Lab Validation complete

#### MARKET POTENTIAL

Global Edible Packaging Market was valued at \$697 million in 2016, and is projected to reach \$1,097 million by 2023, growing at a CAGR of 6.81% from 2017 to 2023, while the Probiotics global market is estimated to grow at USD 49.4 billion in 2018 and is projected to grow at a CAGR of 7.0% from 2018, to reach a value of USD 69.3 billion by 2023. The probiotic market in India is projected to register a CAGR of 19.80% during the years 2014-19, in revenue terms.

With high potential in both edible film and probiotic domain, the present technology offers an opportunity for tapping the market.

#### APPLICATIONS

- Milk protein based thin layered edible film can be use in
- Production of dairy by-products such as Yogurt, Dahi
  - Edible coating for fresh fruits and bakery products to maximize their shelf life.
  - Probiotic products for non-dairy users

#### ADVANTAGES

- Ready-to-use for directly inoculating the milk
- Bacteriophage free curd when probiotic edible film is used as a started culture
- Completely biodegradable
- Higher shelf life
- Non-dairy probiotic product

#### LICENSING OPPORTUNITY

BCIL is looking for a suitable industrial partner for commercialization of novel Probiotic Edible Film

#### INTELLECTUAL PROPERTY

Patent application filed in India

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