



Development of active packaging solutions for the extended shelf life of sensitive food products

Duration: 2019–2022

Highlights

- The trend of natural foods without additives or preservatives has gained momentum in recent years. The rise of clean labelling requires food processors to make a special effort.
- A number of recent studies have demonstrated active packaging's potential in various uses related to shelf life. The release of antioxidants, gaseous compounds and antimicrobial agents and the absorption of specific molecules are just some examples of potential types of activation.
- The use of these technologies could limit food waste as well as contamination and poisoning risks in addition to prolonging the shelf life of packaged foods.
- However, releasing such packaging solutions to market is a sizable challenge in the food industry. The increased costs associated with these technologies remain an obstacle to widespread use.
- The potential benefits of this project for the food industry are considerable. Perishable and high value-added products could benefit from any active packaging technologies developed as part of this project. For example, fresh cuts of meat and fish could last longer because of the use of antibacterial film.

Objectives

- Develop active packaging solutions enabling the prolonged shelf life of sensitive food products
- Reduce food waste

Results and potential benefits

This project will focus on the development and testing of packaging materials (paper-, textile- or polymer-based or a mix) containing various functional components (e.g., antimicrobial, agents and antioxidants). The solutions developed will take into account legal constraints in terms of migration limits, the environment (through the use of biodegradable polymers) and commercialization potential (industrial feasibility and associated costs). This active packaging will act as an alternative to food additives resulting in shorter and healthier ingredient lists (clean labels).

- Economic aspects: Financial advantage for the adopting industry through the extended shelf life and freshness of fresh products
- Environmental aspects: Reduced food deterioration and food waste
- Social aspects: Reduced potential risks to food safety



Innovative aspects

- Development of flexible multi-layer packaging solutions containing “active” molecules
- Immobilization of active molecules (e.g., antioxidants, antimicrobial agents, drying agents and moisture-control agents) in different types of packaging materials (e.g., paper or polymer) and different controlled-release strategies
- Nanomaterials (metal and/or composites) incorporated in packaging materials with improved and sustainable features in terms of antimicrobial and antioxidant properties, freshness retention, and gas barriers.

Professionals trained

- **Satwik Majumder**, PhD student at McGill University, under the supervision of Dr. Saji George

The expertise acquired is in animal handling, analytical equipment, microscopy, and data analysis. His research interests are sustainable agriculture and the environmental and food applications of nanotechnologies.

For further information

Knowledge transfer to industry partners: The results will be presented to corporate partners of the research project. There will be talks at Polytechnique. In addition, a talk may be given at Novalait’s Forum Techno. The students involved in the project will write articles.

Financial contributions

RITA Recherche Innovation Transformation Alimentaire: a consortium mandated by MAPAQ at McGill University in collaboration with CTAQ and MEI. Below is the total budget for the 13 activities of the RITA network.

Budget total : 2 765 828 \$

Contact persons

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