



Coop Research Program | Call 3

Non-thermal plasma as a sustainable intervention technology to improve shelf life and safety of sprouted seeds

Background

The consumption of fresh fruit and vegetable products has dramatically increased during the past few decades and contributes substantially to consumers' health. However, inherent to all minimally processed products is a short shelf life which causes high product loss of estimated 20-30% per year, and the risk for presence of foodborne pathogens. In particular sprouts represent ambivalent products because seeds used for sprouting may already be contaminated and the sprouting procedure provides favorable conditions for growth of microorganisms. Non-thermal plasma, a partly ionized gas applied at $<100^{\circ}\text{C}$, represents a novel and sustainable disinfection technology because it inactivates microorganisms without the use of hazardous chemicals.

Objective

This project aims to investigate and evaluate the application of non-thermal atmospheric pressure plasma as a novel approach for disinfection of sprout seeds in order to reduce food loss and increase food safety in sprout production.

Research Approach

Design and evaluation of non-thermal atmospheric pressure plasma systems for treatment of seeds; optimization of treatment parameters for inactivation of microorganisms on seeds; and evaluation of the impact of plasma treatment on seed and sprout properties.

Relevance and Expected Outcomes

This project will develop and evaluate a novel, sustainable technology for inactivation of microorganisms on seeds and the characterization of the impact of plasma treatment on germination properties and other relevant quality attributes of seeds and sprouts. The results will provide important knowledge for a better understanding of the applicability of non-thermal atmospheric pressure plasma as a novel food processing technology in sprout production that will contribute to i) increase of shelf life by reduction of contaminating spoilage microbiota, ii) improvement of food safety by elimination of pathogens, and iii) production of sprouts with improved quality attributes.

Food System Challenges Addressed

Food safety, reduction of food waste and loss, food value chain optimization.

www.worldfoodsystem.ethz.ch/research/CRP →

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Project Cost 220'000 CHF

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