



Coop Research Program | Call 3

Soft Matter Approach to Effective Preservation of African Leafy Vegetables by Drying by Desiccant/Solar Hybrid System

Background

Malnutrition in Sub-Saharan Africa, particularly in women and children, increases under drought-induced reduction of food supply. Yet in the same region, post-harvest losses of vegetables are very high, up to half the produce, mainly due to lack of appropriate packages for preservation. With increasing urbanization, there is rising demand for packaged food. African leafy vegetables (ALVs) have been found to have high levels of nutrients and phytochemicals. ALVs sprout in large volumes during the rainy seasons and require very little inputs. Therefore, these vegetables have potential for upscaling to address food insecurity and nutrient deficiency as packaged foods for urban consumption. Despite their potential, these ALVs are only available to consumers during the rainy season due to the lack of technologies to extend their shelf life. Existing indigenous knowledge suggests that these vegetables may be dried and stored for several months. Therefore, proper processing and packaging will extend the shelf life which will help the population in getting food supplies during droughts.

Objective

This project aims to determine optimal drying conditions for processing vegetable amaranth, cowpeas leaves, African nightshades and jute mallow using a hybrid desiccant/solar drier.

Research Approach

Magnetic resonance and microscopic optical methods will be used to understand structural changes the vegetables

undergo during processing. This will help to predict optimal processing conditions that preserve the important properties of the dried vegetables. Optimum storage conditions, shelf life and appropriate packaging material will be determined through sorption isotherms.

Relevance and Expected Outcomes

The project will establish optimal drying conditions for ALVs at which the color, nutrients and phytochemicals will be retained. It will also determine appropriate packaging materials for the dried vegetables. Once packaged, it will become essential to monitor the microbial activity of the packaged product to avoid food safety issues. The drying and packaging will contribute to addressing food shortage during seasons of low availability (e.g. droughts) and therefore decrease nutritional deficiencies in the population.

Food System Challenges Addressed

Post-harvest losses, malnutrition, nutrient deficiency, food packaging, shelf life.

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

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