Technology Development and Process Modification for Ensuring Safety and Prolonging the Shelf-life of Fermented Vegetables Produce by Small and Medium Enterprises (SMEs) in Cambodia

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Abstract

Over 75% of population in Cambodia is depending on agriculture though, farmers in rural areas are still struggling and considered as poor due to low productivity and income. Therefore, strengthening of agricultural sector especially introduction of value-added agricultural products such as agroprocessing which will contribute to livelihood improvement of rural people as well as economy of the country is urgently necessary.

Fermented vegetable, which is one of the most important products of processing, is a very popular dish in Cambodia. These include, but not limited to, cucumber pickles, radish pickles, mustard/green cabbage pickles and ginger pickles. Although these products are commercially available, many Cambodian consumers still prefer locally produced fermented vegetables as it is fresher and much cheaper than the commercial ones which are costly and mostly imported products. However, the former tends to be more susceptible to spoilage and pathogenic microbial contamination and thereby has to be consumed and sold shortly after processing. As a result, the profit from home-made or small-scale fermented vegetable processors/farmers will depend on other factors, i.e., the number of consumers and their trust, marketability, availability and quality of raw materials and climatic conditions under which fermented vegetable is produced. These factors may discourage the processors from continuing and/or expanding their business. As such, product and process development, which can be easily adopted by small-scale processors for ensuring the safety and prolonging the shelf-life stability and marketability of fermented vegetables, to a greater extent, could help the manufacturers sustain the business, thus generating household incomes.

The goal of this proposed project is, therefore, to provide technical support to small-scale local producers of fermented vegetables by developing innovative methods (modifying heat treatment methods in combination with safe chemical preservative) to ensure the safety while also extending the quality and storage shelf-life of the products. The specific objectives of this proposed project are to: 1) determine the combined effects of heat treatments (pasteurization) and generally regarded as safe chemical preservatives such as sodium benzoate and sorbic acid on spoilage and pathogenic microorganisms present in fermented vegetables; 2) determine the effects of heat treatments and addition of chemical preservatives on the sensory properties of the derived fermented vegetables; 3) evaluate the effects of storage conditions on the quality and acceptability of fermented vegetables; 4) determine the consumers attitudes (modes of consumption) and preferences regarding the consumption of fermented vegetables and the final products; 5) identify an appropriate marketing strategy for the improved product, including quality indicators such as label or geographic indicators; 6) conduct interdisciplinary research together with students of RUA; and 7) conduct lecture and hands-on training on the developed selected fermented vegetables processing technologies to small-scale processors and/or farmers and stakeholders.

The proposed project will have five phases of operation: (1) laboratory experimentation; (2) consumers survey; (3) lecture and training courses; (4) evaluation at producers' and traders' level; and (5) reporting and publication. The project will be implemented for 3 years, with the total cost amounting to US$30,000. It is expected that the project outcomes would provide useful technical and

marketing support to existing micro-, small- and medium-scale agro-processing enterprises at village level specifically, and Cambodian agro-industrial sector, which is still poorly developed, as a whole.