Block 2 Poster 8

Orange-fleshed Sweetpotato Purée for Bakery Applications in Kenya

RESEARCH PROGRAM ON Roots, Tubers and Bananas

Rationale

Provitamin A β-carotene rich Orange Fleshed Sweetpotato (OFSP) particularly if it is shelf-storable, would play an important role in combating global food insecurity. A shelf-storable OFSP purée would allow millions of households (HH) to have a relatively low-cost purée year-round to use in daily recipes and cooking (e.g., in breads, pies, soups, casseroles, beverages, porridges, and side dishes). OFSP purée also outperforms alternative products as a base ingredient, binding agent and source of β-carotene. The major current bottleneck to expanding use of fresh purée is the inconvenience of having to prepare and store the purée. Moreover, if the purée has to be stored, it must be frozen, which requires a reliable cold chain that is unavailable in many communities, particularly in sub-Saharan Africa (SSA). Hence, our research is focused on developing a high-quality OFSP purée that is shelf-storable at room conditions for at least three to six months. In our experiments we initially aimed to develop a cost-effective OFSP purée product for use in bakeries in SSA, then expanded its use into other parts of the world.

Developing a commercially viable prototype

From 2010 to 2014, CIP gained considerable experience in Rwanda in the manufacturing and marketing of bakery products in which 20–45% of wheat flour was replaced with OFSP purée [J. Low, et al., eds. 2015. *Potato and Sweetpotato in Africa: Transforming the Value Chains for Food and Nutrition Security*, pp. 478–490. CABI: Oxfordshire, UK]. Baked products made with OFSP purée are well accepted by consumers [Okello, Julius J., et al. 2014. Consumer perceptions and demand for biofortified sweet potato-based biscuit: the case of Akarabo golden power biscuit in Rwanda. *African Journal of Food, Agriculture, Nutrition and Development* 14:3]. Similarly, in Kenya CIP initiated similar project as in Rwanda with the goal of developing a public-private sector partnership with at least one major agro-processor in Kenya to produce an economically viable processed product with OFSP as a major ingredient.

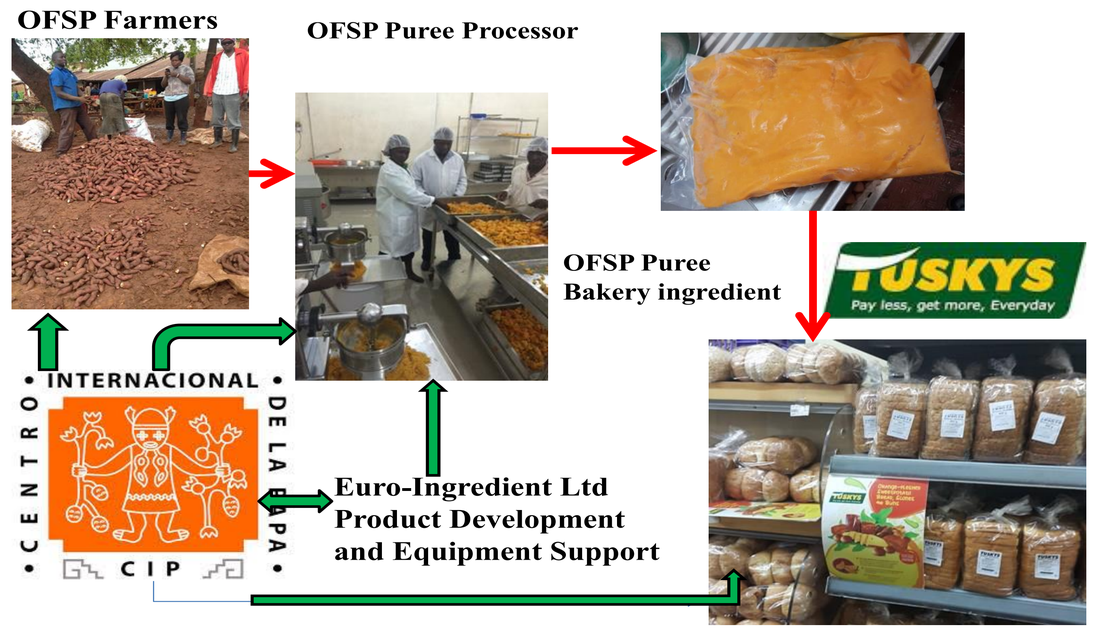
Implementation Phase

Phase 1 (2014): the preparatory period. CIP identified the key product, OFSP bread, and the key private sector partner for marketing it—Tuskys supermarket chain with 52 stores throughout Kenya. CIP food and social scientists collaborated closely with Euro-Ingredients Ltd in developing OFSP purée bakery formulations. CIP assessed consumer acceptability of improved OFSP-baked products in four Tuskys stores, and the results convinced Tuskys to engage in the partnership. Soon thereafter, Organi Ltd was selected as the purée processor partner based in a major sweetpotato-growing area.

Phase 2 (2015): the start-up period. The factory for purée and a laboratory for carotenoid analysis were established, and farmers were engaged to start producing OFSP varieties. By January 2016, roots from the second 2015 season began to come to the factory in significant amounts.

During Phase 3 (January–June 2016), emphasis shifted to improving efficiency and lowering the cost of the product, which was based on peeling the roots prior to cooking. Another major innovation was to improve root washing and use a stronger puréeing machine so that unpeeled roots could be used to make a high-fiber, quality OFSP purée. This increased the OFSP yield from 65% to about 95%, thus improving productivity and profitability for the purée processor.

Partnership-Business Model



Evidence and Implications

By July 1st 2016, the major technical bottlenecks in the value chain had been resolved through innovation and improved management. Since June 2015, Organi Ltd has produced 71,958 kgs of purée over 15 months. As of 1st September 2016, Tuskys is selling more than 3,000 loaves of OFSP bread per day in 18 stores. Lab analysis has found that OFSP purée bread is a good source of pro-vitamin A (beta-carotene) providing 50 Retinol Activity Equivalents (RAE) per 30g slice. A child needs 400 RAEs of vitamin A per day.

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