



NUTRIENT-RICH FISH PRODUCTS

KENYA CLIMATE SMART AGRICULTURE PROJECT

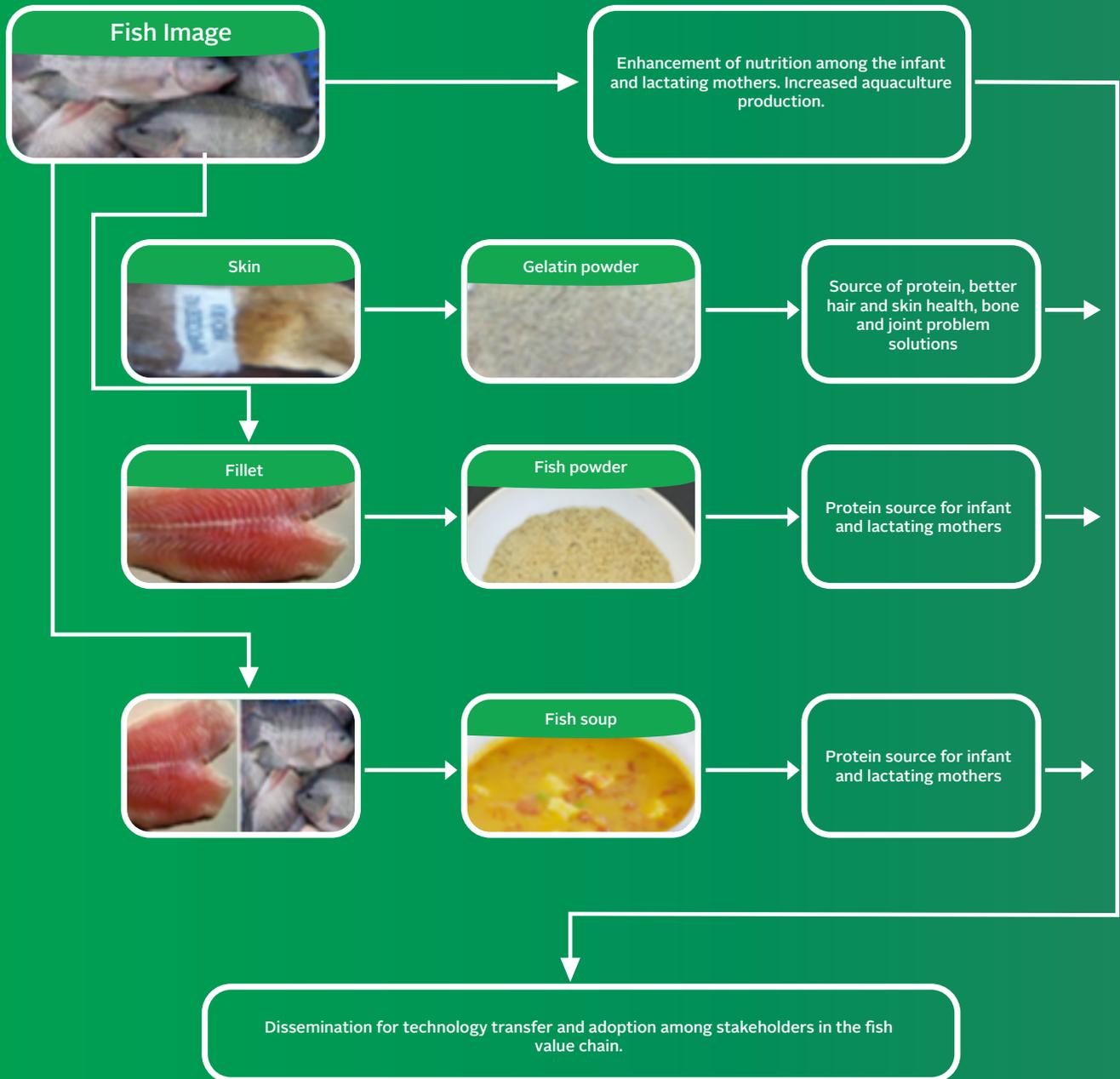
(KCSAP)

APPLIED RESEARCH

Development and Promotion of
Consumption of Novel
Nutrient-rich Fish Products for
Food and Nutritional Security

*A Climate-smart Method of
Producing Nutritious Fish
Products*

PRODUCTS' PROCESS FLOW AND EXPECTED OUTCOMES



FISH POWDER

Fish powder was obtained from each of the six fish species. Whole fish were processed for *omena* and *haplochromines* powder, whereas fillets were used for Nile perch, African catfish, lungfish, and Nile tilapia. *Omena* and *haplochromines* were sorted, cleaned, blended, dried and milled to make the powder. The remaining fish were partially boiled and deboned to obtain the fillet. The fillet was then dried and milled to obtain powder. The powder, rich in protein, fat and minerals, can be included in the diets of young children, pregnant and lactating women.

FISH GELATIN

Gelatin is a protein product derived from collagen. It has important health benefits due to its unique combination of amino acids. Skins from Nile perch and Nile tilapia were used to make gelatin through heat hydrolysis, sap concentration, drying and milling. The most gelatin is found in Nile perch, which is easily amenable for industrial processing. Addition of gelatin to food products helps integrate valuable nutrients from the skin and scales, which are typically discarded.

RECOMMENDATIONS

- The three products (fish powder, soup, and gelatin) contain nutrients that are beneficial to human health at desired concentrations and are recommended for inclusion in the diets of vulnerable groups in order to create a healthy society free from hunger and malnutrition.
- Utilizing previously discarded fish body parts (skin, bones, and skeletons) reduces post-harvest losses while increasing productivity and income.
- The standardized production technology developed by the research team is simple and adaptable for technological diffusion and adoption among smallholder farmer's households.

FISH SOUP

Fish soup was made by boiling the head, frames and skeletons of Nile perch, catfish and lungfish (these parts are usually thrown away). These fish components produce soup that is high in oils, omega-3 fatty acids, and polyunsaturated fatty acids. Fish soup is nutritionally important for infants aged nine months to two years, pregnant and breastfeeding women. Utilizing head, frames, and skeletons to produce soup is crucial in lowering post-harvest losses and boosting revenue for all stakeholders in the value chain.

NUTRITIONAL SIGNIFICANCE OF THE NOVEL FISH PRODUCTS

The novel fish products have the potential to help prevent malnutrition. Laboratory testing revealed that all critical nutrients, including minerals, fatty acids, and essential amino acids, are abundant in the three novel products. These amino acids are especially important for normal growth and development of young children. Because the body cannot produce these amino acids, they must be obtained through diet. When eaten whole, small fish are an excellent source of bioavailable micronutrients such as calcium, iron, and zinc. Calcium and potassium are both important for pregnant and nursing women, as well as for the formation of a baby's bones. The finished products had a moisture content ranging from 5% to 9%. This was low enough to prevent microbial growth, extending the shelf life of the products.

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