Sub-theme 3.4. Postharvest Technology, Processing, and Food Analysis

Rationale

Estimates of postharvest losses reach 30% or more of food harvests. Poor postharvest practices, in turn, can affect incomes, food quality, and the long-term abilities of families and communities to escape from poverty. There is a need for the development of new technologies and practices that tackle sites of loss and contamination throughout the postharvest value chain, and identification of avenues for spreading the best existing technologies and practices. A core component is connecting farmers to appropriate markets so that sustainable intensification and reductions in crop losses can yield real returns.

Food analysis involves the development, application and study of analytical procedures for characterising properties of foods and their constituents. The analytical procedures are used to provide information about a wide variety of different characteristics of foods, including composition, structure, physicochemical properties, and sensory attributes.

Supplying adequate quantities of grains and other food items to the ever increasing world population is a challenge to humankind. Hunger and malnutrition still exist in many countries in spite of adequate food production. This is a result of uneven distribution, post-harvest losses, and deterioration of available food resources. For cereals, the overall postharvest losses are usually estimated at 5–20% whereas for fruits and vegetables, they vary from 20% to 50%. If the losses can be minimized, more food may become available to humankind.

Therefore, postharvest crop and animal product losses are an important aspect of food production, processing, distribution and marketing. Losses caused by poor post-harvest management of agricultural produces reduce yield, quality, and cause malnutrition and hunger. These problems can be tackled though developing appropriate post-harvest technologies. In eastern Ethiopia in particular farmers stores grains in pits, predisposing the produce to serious

post-harvest losses with contamination with myco-toxins. This results in huge yield and quality losses as well as health hazards to humans and animals.

Aims

This sub-theme aims at analysing the process of food production from plant and animal products; developing and improving postharvest technologies for plant and animal products, and designing, developing and evaluating new food products and improving the existing traditional food product storage and processing techniques.

Description

This sub-theme focuses on development of food quality standards; improvement of quality of fresh produce, grains and animal products; development of new food products from indigenous and traditional food resources; improvement of storage and processing methods of traditional and indigenous foods and drinks; improvement of traditional processing equipment (technologies); and solving problems of nutrient deficiencies. Exploration of non-conventional food resources for the potential to develop into acceptable processed food products is also a focus of this sub-theme. The sub-theme also deals with postharvest management, product development, and storage and processing technologies of industrially and economically important crops.

Potential Collaborators

Universities conducting research in agriculture and food related activities, federal and regional agricultural research institutes, food processing industries and NGOs involved in development programmes focusing on food related issues are potential organisations for possible cooperative research work.

Expected Output

- Improved and efficient processing methods and techniques
- Quality, safe, nutritious and healthy food products

- Demand driven product development from existing traditional foods and drinks as well as newly developed/formulated foods and food ingredients

- Minimized postharvest losses for contribution in fostering food security

- Improved traditional post-harvest technologies

- Characterized and authenticated non-conventional food products for improvement of food security

- Modelled food process technologies and controls for end users

- Efficiently utilized food wastes and by-products for energy supply and environmentally friendly applications.

Research Areas

3.4.1. Postharvest technology, processing, and food analysis for plant/crop products

The main focus of this research area will be developing and improving technologies to minimize postharvest losses of fruits and vegetables. In addition, it addresses issues on food analysis, value addition and product development as well as storage, processing, and preservation of fruits, vegetables, tubers and root crops. The research area also addresses issues related with agro-industry.

The research area also include storage and processing technologies of raw grain crops into value added foods, grain quality characterisations, raw material and product utilisation and packaging technologies to address challenges faced by food processing industries. Moreover, this research area focuses on studies including processing of functional foods to deliver nutritious and healthy food stuff.

3.4.2. Postharvest technology, processing, and food analysis for animal products

The main focuses of this research area are analysis, processing, and developing technologies for animal products including traditional and modern meat/dairy and meat/dairy/skin and

hides based food products and processing and preservation practices; honey handling, processing, quality evaluation and characterisation; fish handling, processing, quality evaluation and characterisation; starter culture developments and improvements for dairy fermented foods and beverages; animal foods based processing of functional foods; and the safety and quality of animal products evaluation and analysis.

Beneficiary

Scientific community, farmers, industries, policy makers, and the wider community