Establishment of a regional reference food and nutrition laboratory for Sub-Saharan Africa: The Food and Nutritional Evaluation Laboratory (FANEL)

SEP 2016

Fig. 1 Food Scientist Tawanda Muzhingi at work in the FANEL lab. (credit S. Quinn)

FANEL built the infrastructural and human capacity of the nutrition platform at the Biosciences for east and central Africa (BecA) Research Hub, and moved a step further towards becoming a regional reference laboratory for nutritional quality and food safety assessment of sweetpotato roots and products.

What is the problem?

Regional capability to conduct high quality food chemistry and nutritional analysis is critical to the development of orange-fleshed sweetpotato (OFSP) and Roots, Tubers and Bananas (RTB) for nutritional improvement in sub-Saharan Africa (SSA). It is important to understand and constructively manage the many factors that can affect pro-vitamin A concentrations: cultivar differences and the effects of production practices, growing location, harvest maturity and postharvest handling and processing. The required analysis is complex, needs careful sampling, controls, sample storage and proper interpretation. Furthermore, food safety concerns are a growing focus in Africa, as elsewhere in the world, and a strong food science capability would also support work in this area. Because of a lack of capacity in SSA, most nutrition projects have been sending samples to western countries for nutritional, food safety and biochemical analysis. In response to this capacity gap, a suitable nutrition laboratory with the necessary equipment was established at the BecA Research Hub, at the International Livestock Research Institute (ILRI) in Nairobi, Kenya.

What do we want to achieve?

The Food and Nutritional Evaluation laboratory (FANEL), which began operating in August 2014, is now operational with key staff (Fig. 1) and has a medium-term plan to build a solid regional capacity capable of strengthening national laboratories in the region. This capacity will strengthen the support platform concept for sweetpotato and RTB crops to include capacity strengthening in the postharvest and nutrition quality arena.

Fig. 2 An extract of OFSP total carotenoids in an organic solvent being dried and concentrated before analysis on a High Performance Liquid Chromatography (HPLC) system for identification and quantification. (credit S. Quinn)

Where are we working?

FANEL is located at the BecA-ILRI Research Hub, on the ILRI campus in Nairobi.

How are we going to make it happen?

Our current activities include the enhancement of the infrastructural and human capacity of the nutrition platform at BecA to serve as a regional reference laboratory for nutritional quality and food safety assessment of sweetpotato roots and products. This includes establishing appropriate protocols with cost structures for nutritional analysis and safety. We are also engaging academic institutions and government partners, and training students and research fellows on nutrition, food product development, and food analysis and food safety in order to develop the regional capacity.

Who are we working with?

FANEL collaborates with BecA-ILRI, the Quality Nutrition Lab (QNL) at CIP Lima, HarvestPlus, Department of Food, Nutrition and Bioprocessing at North Carolina State University, University of Nairobi and the Natural Resource Institute (NRI, Greenwich University, UK) in the development and validation of analytical protocols, technical visit exchanges, and experimental design, resource mobilization and training initiatives in SSA.

What have we achieved so far?

CIP has one food scientist and two technicians based at FANEL. We have established appropriate protocols for analysis of roots and derived products at a reasonable cost to ensure that they have adequate nutritional quality and meet safety standards. We trained six graduate students (local, regional and international) who then conducted thesis work on food safety, food product development and food composition analysis in FANEL. The key outcome is the establishment and use of FANEL as a sustainable regional reference laboratory for assessment of nutritional quality and food safety of OFSP roots and products.

What´s next?

We are in the process of getting international accreditation of our analytical protocols for fat-soluble vitamins and phytonutrients; and we are also working with BecA to pursue ISO accreditation of the Nutrition Platform. We are developing a business plan for FANEL to ensure sustainability of the project by offering services for a fee (cost-recovery) to International Potato Center (CIP) projects, other CGIAR centres, international and local partners and private sector. We are also developing proposals to support more OFSP product development research.

Fig. 3 HPLC used to analyze beta-carotene content of OFSP puree and other products (credit S. Quinn)

Partners

- Natural Resource Institute (NRI), Greenwich University, UK
- Biosciences for east and central Africa (BecA) Research Hub
- University of Nairobi, Food Science Department
- North Carolina State University, Department of Food, Nutrition and Bioprocessing
- Tufts University, Antioxidant Research Laboratory, USDA ARS HNRCA, Boston, MA

CONTACT

Tawanda Muzhingi
t.muzhingi@cgiar.org

Daniel Mbogo
d.mbogo@cgiar.org