Building Capacity for Value Addition: The case of the Faculty of Food and Agriculture, University of the West Indies, St. Augustine, Trinidad and Tobago

Neela Badrie, Faculty of Food and Agriculture, the University of the West Indies, St. Augustine, Trinidad and Tobago

Introduction

The 15 country member states of the Caribbean region have become net importers of food. Approximately $US4.75 billion has been spent on food imports since 2008. Jamaica is the largest importer of agricultural products (US$997.5 million; 21% of the total regional import bill), followed by Trinidad and Tobago at US$950 million (20%) and Haiti US$902.5 million (19%) (Sanders, 2014). Limited financing and inadequate levels of new investments, outdated and inefficient agricultural health and food safety (AHFS) systems, inadequate research and development and insufficient skilled quality human resources were among the constraints to increased agricultural production and productivity identified by the Jagdeo Initiative (2003).

The region's response to the decline in traditional agriculture has resulted in the implementation of programmes to raise productivity, differentiate the mix within traditional agriculture and introduce new crops (Pemberton, 2006), but the increasing food import bill shows that there has been little success. At the same time, non-communicable diseases are now the most important underlying cause of death (CARICOM, 2007) and constitutes a public health and financial challenge because of its associations with obesity, rising levels of cardiovascular disease, type 2 diabetes, hypertension and some cancers. Through value addition, the economic value and consumer appeal of convenience foods can be increased while ensuring that nutrition and food safety concerns are adequately addressed (Boland, 2009). However, this will require strong backward and forward linkages in the agri-food system and the necessary infrastructure; both human and physical, adequate levels of investment, and an enabling policy environment and regulatory framework.

Faculty of Food and Agriculture, University of the West Indies

In 2012, the Faculty of Science and Agriculture was divided into the Faculty of Science & Technology (FST) and the Faculty of Food & Agriculture (FFA). The enduring mission of the Faculty of Food and Agriculture UWI is to "*advance agricultural, geographical, food and nutritional and family sciences education and create knowledge through excellence in teaching, research, innovation, public service, intellectual leadership and outreach in order to support the inclusive (social, economic, political, cultural, environmental) development of the Caribbean region and beyond"* (FFARS, 2014). The Faculty is committed to making a significant contribution to sustainable development and meeting the food and nutritional needs in the region. The new Faculty will allow the university to develop the technologies and systems that are needed to revolutionise Caribbean agriculture.

A recent European Union report on technical assistance for training of micro and small enterprises in Trinidad and Tobago in *International Quality Standards* highlighted the UWI's strengths in academia and in research, noting that it has the required tools to facilitate research as well as build linkages with other departments and offers courses in agro-processing (Merx *et al.,* 2014). UWI also boasts of the Food Technology Unit, which is managed within the Faculty of Engineering, which offers programmes in food science and food technology and historically has championed the processing of locally grown produce. In close proximity to both the Food Technology Unit and FFA agro-processing facilities at UWI St Augustine Campus, is the Caribbean Industrial Research Institute which has been building food-processing capacities of Caribbean small and medium-sized enterprises (SMEs) for over thirty years.

A survey (Badrie, 2013) of food processing companies in the Caribbean indicated that there is need to improve agro-processing capability and that this could be achieved through: (i) contract farming so as to ensure a consistent supply of quality local raw materials; (ii) judicious use of inputs, higher yielding and disease resistant cultivars and traceability schemes for tracking raw materials from field to table; (iii) introduction of modern processing equipment such as automatic bottling, facilitating easy access to processing centres, better lay-out of processing operations; (iv) adherence to quality standards, improving analytical capacity to ensure conformance to national, regional and international standards and reducing the cost of implementing food safety management systems such as ISO 22000 HACCP (Hazard Analysis and Critical Control Points) and quality management schemes; and (v) more attractive terms for accessing finance to allow growth of small and medium-size businesses. Continuous training must be seen and valued by governments and SMEs as an integral part of a comprehensive programme of developing the agro-processing sector if the Caribbean is to make any inroads in reducing the food import bill.

The UWI Strategic Plan, 2012-2017, addresses teaching and research. The Faculty of Food and Agriculture's programmes emphasise nutrition, food safety and quality, tropical crop protection and utilisation, agribusiness and entrepreneurship. It has science laboratories (microbiology, food biology and food production) and is equipped

with a range of small-scale equipment suitable for the systematic study of operations involved in the food industry.

The blended learning policy has expanded teaching and learning, reaching more students offering a better fit to student needs in today's dynamic, technologically-driven society where open education, self-directed learning and instant internet access to information are the norm for course delivery. Through a European Union-funded /Edulink 11 project on "Strengthening Capacity for Food Science and Technology Teaching, Learning and Research to Add Value to Indigenous Foods for Food Security in Africa and the Caribbean (FSTinAC)", some of the current courses of the present blended-format of the post-graduate Diploma/M.Sc. Agri-Food Safety and Quality Assurance are to be delivered on-line (Table 1). This EU-funded project is led by the University of Botswana.

Table 1: Programmes offered in the Faculty of Food and Agriculture, UWI (see also: http://sta.uwi.edu/ffa/programmes.asp)

Department/Faculty	Level	Programmes
Food Production/FFA	UG[1]	B.Sc. Agriculture with major in Agricultural Technology and tropical landscaping
Agricultural Economics and Extension /FFA	UG	B.Sc. Human Nutrition and Dietetics ; B.Sc. Human Ecology; B.Sc. Agribusiness Management with major and minor in Entrepreneurship
Food Production/FFA	PG[2]	Diploma/M.Sc. Agri-Food Safety and Quality Assurance; M.Sc. Tropical Commodity Utilisation; Diploma/M.Sc. Tropical Crop Protection; M.Sc Tropical Animal Science and Production; M.Phil. and Ph.D in Food Safety, Quality Tropical Crop Protection, Crop Science, Soil Science and Livestock Science
Agricultural Economics and Extension /FFA	PG	Diploma Institutional and Community Dietetics and Nutrition
Chemical Engineering /Faculty of Engineering	PG	M.Sc. Food Science and Technology

[1]UG-undergraduate; [2]PG-post-graduate;

Areas of current research (Boxes 1 and 2) include food analysis, food preference and sensory studies, food fermentations, milk, meat, fish, fruit and vegetables microbiology and technology, root crop processing - dehydration and extrusion, and food product development (food formulation from novel components).

Box 1: Examples of research projects:

- Crop Science (production of tropical food crops and creation of protected agriculture production systems)
- Horticulture (tropical landscaping and tree crop production systems)
- Livestock Science (livestock production/neotropical animal production and forage production)
- Soil Science (soil fertility and conservation, composting and waste management, natural resource management)
- Agri-Food Safety and Quality (Food safety management systems, application of project management approach to quality assurance, estimating the prevalence of food-borne illnesses, safety of processed foods)
- Post-production technology (Postharvest and product development)

Box 2: Examples of some specific research projects:

- Anthropometry and Blood Pressure Changes in a Caribbean Adolescent Population of African Ancestry: An Evaluation of Longitudinal Data Using a Multilevel Mixed Regression Approach;
- Chili Plum (*Spondias purpurea* var. Lutea): Postharvest Biology and Technology Of Tropical and Subtropical Fruits;
- Quality Assurance along the Agri-Food Chain - From Farm to Table. In Sustainable Food Production Practices in the Caribbean;
- Cassava (*Manihot esculenta* Crantz)/Wheat Flour Composite Muffins: Effects on Quality and Sensory Characteristics.
- Determination of the Prevalence of the Burden of Food-borne Disease in Trinidad and Tobago in Respect to Food Safety;
- Breadfruit Cultivar Characterisation and Utilisation for Food and Nutrition Security;
- Biological Control and Molecular Characterisation of Plant Pathogens for Tropical Crop Production And Protection;
- Increasing the Efficiency in Feeding Systems for Production of Ducks and Small Ruminants, and on Rabbits;
- Consumer Safety in Respect to the Consumption of Oysters, and Pesticide Usage in Vegetables
- Bioaccumulation and Exposure Assessment of Heavy Metals in Leafy Green Vegetables.

External collaboration: the establishment of partnerships

In addition to the EU funded projects that focus on food and agriculture, the FFA has recently completed a UWI/McGill University Canada project which was initiated as part of UWI's mission to improve food and nutrition security in the Caribbean. The project applied an 'integrated and systems approach' to the issues of agriculture, food and health in the Caribbean and adopted the 'farm-to-fork' approach that links agriculture and food to human health and wellness. The results are promising and will be used to inform the university's future interventions in this area especially as it relates to value addition of locally produced agricultural commodities and the link to healthy, nutrient dense convenience foods which do not exacerbate the obesity problem.

The FFA plans to develop a 200-acre agricultural innovation park through a strategic cooperation agreement between UWI and China Agricultural University (CAU). The project would demonstrate technology and business-driven, efficient and protected agriculture in an urban attractive setting and promote agricultural technologies, appropriate machinery and equipment, testing and adopting technologies, enhanced production of local crops and joint research and innovation.

Conclusion

UWI once boasted of being the premier institution in tropical agriculture and the institution will continue to advance education and research in support of the developmental needs of the food processing industries of the Caribbean region and beyond. It is strategically repositioning itself to do so. Small and medium agro-enterprise development is a response to addressing the food and nutrition security challenge in the Caribbean and providing a pull for growth in agricultural productivity. UWI's success in this new thrust will be measured by the number of successful SME's producing locally manufactured agro-based products, the human capacity developed and the research outputs that are transformed into commercially viable products.

References

Badrie, N. 2013. Survey and synthesis report and lead paper on agro-processing enterprises in the Caribbean. CTA/CCST/NCST/CARDI/UWI Caribbean workshop: 'Adding value to local foods food and nutrition security: myth or strategic option', 26th-28th November, 2012, Wyndham Hotel, Kingston, Jamaica. http://www.egfar.org/news/imported/survey-and-synthesis-report-and-lead-paper-agro-processing-enterprises-caribbean Accessed 13th September, 2014.

Boland, M. 2009. Importing food is damaging the Caribbean: Why no action? Agricultural Marketing Resource Center (AgMRC) at Iowa State University, Ames, Iowa, USA. http://www.agmrc.org/business_development/getting_prepared/valueadded_agriculture/articles/ Accessed 13th September, 2014.

CARICOM. 2007. Caribbean Unity to fight chronic diseases epidemic: Obesity as a major target. Press release 194/2007. 28th August, 2007. http://caricom.org/jsp/pressreleases/pres194_07.jsp. Accessed 13th September, 2014.

Faculty of Food and Agriculture Regulations and Syllabuses (FFARS), 2014-2015 (2014). The University of the West Indies, St. Augustine, Trinidad and Tobago, West Indies, http://sta.uwi.edu/resources/documents/facultybooklets/FoodAgriUndergrad.pdf Accessed 13th September, 2014.

FAO World Food Summit. 1996. Rome Declaration on Food Security. Food and Agriculture Organisation, Rome, Italy. http://www.fao.org/docrep/003/w3613e/w3613e00.HTM Accessed 13th September, 2014

Henry, F.J. 2007. Combating obesity and NCDs in the Caribbean: The policy perspective. Caribbean Food and Nutrition Institute (CFNI), PAHO/WHO. https://sta.uwi.edu/conferences/salises/documents/Henry%20F.pdf. Accessed 13th September, 2014.

Jagdeo Initiative. 2003. Target 2015: The Jagdeo Initiative. A Caribbean partnership to alleviate major Key Binding Constraints to Agriculture. http://www.euacpcommodities.eu/files/04_Target_2015.pdf Accessed 10th September, 2014.

Merx, R., Ortiz, A. and Philgence, E. 2014. Final report –Technical Assistance for Training of Micro and Small Enterprises in Trinidad and Tobago in International Quality Standards. Leading Consulting Group with a 360° Approach. 95 pp.

Pemberton, C. 2006. Agricultural development and employment in the Caribbean: Challenges for the future. Tripartite Caribbean Employment Forum. Responding to Globalisation. A decent work agenda for the Caribbean in the context of Regional Integration. http://www.ilocarib.org.tt/cef/background%20papers/agriculture.pdf. Accessed 27th September, 2014.

Sanders, R. 2014. Importing food is damaging the Caribbean: Why no action? Commentary. Sir Ronald Sanders Blog. http://www.sirronaldsanders.com/viewarticle.aspx?ID=447 Accessed 10th September, 2014.

The University of the West Indies Strategic Plan 2012-2017 (2012). The University Office of Planning and Development https://sta.uwi.edu/principal/documents/uwi_strategic_plan.pdf. Accessed 10th September, 2014.

Published by CTA, http://knowledge.cta.int/
Edited by J.A. Francis, CTA
Citation: CTA 2014. http://knowledge.cta.int/, "author" accessed on "date."