

Title	Innovations to Enhance Participation of Rural Women Agri-entrepreneurs in Cassava Value Chain in North and North-Eastern Uganda
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Purpose	The project seeks to enhance rural women agri- entrepreneurs' potential to participate in cassava value chain in North and North-Eastern Uganda through innovation in nutritious cassava value-added products targeting primary schools food niche market
Project Summary	It is known that adequate nutrition has a strong positive impact on educational performance of primary school children. Undoubtedly, in Uganda, poor socio-economic conditions in disadvantaged areas such as North and North-Eastern regions of the country imply that primary schools in these regions are less likely to afford conventional nutritious and high quality foods that are accessible to schools in economically advantaged areas. This situation provides opportunities for agri-innovations that can offer cheaper alternative nutritious foods to such economically disadvantaged regions of the country. The anticipated development pathway is that smallholder farmers, especially women groups in such areas if organized and provided with optimized and well-targeted agri-technologies should be able to exploit the primary schools food market in the two regions. Considering the impact of child under-nutrition are long-term, irreversible and negatively affect human capital and economic

	<p>development, agri-innovations targeting school food market should critically consider proper nutrition of the school children. “Gari” (a granulated food product designed for making instant porridge) is a cassava based food product with potential for application in school feeding in primary schools in North and North-Eastern Uganda. It is cheap, can be produced easily under rural settings, and above all, the main raw material (Cassava) for its production is widely cultivated in North and North-Eastern Uganda both as a food security and commercial crop. A major limitation with gari is that the product is basically starch and very low in protein and other micronutrients, and without nutritional improvement, is unsuitable for feeding school children as a base diet. In partnership with selected rural women groups and primary schools in North and North-Eastern Uganda , this proposal seeks to: (1) to improve the nutritive value of ‘Gari’ and optimize process design for its production in a rural setting; (2) to determine the acceptability of the nutritionally improved ‘Gari’ by primary school children in North and North-Eastern Uganda; (3) to determine the economic viability and competitiveness of nutritionally improved ‘Gari’ in North and North-Eastern Uganda; (4) to determine factors that predispose rural women’s participation in upstream cassava value chain activities in North and North-Eastern Uganda.</p>
Country and specific location(s)	Uganda, North and North –Eastern Uganda
Participating Institutions	Gulu University Makerere University Cassava Regional Center of Excellence (CRCoE)
Start Date	August 2014
End Date	July 2016
Amount of Funding	USD 64,994



Duncan Ongeng (PhD)



Dr. Duncan ONGENG is the current Dean of Faculty of Agriculture, Gulu University in northern Uganda. Duncan completed his Post-Doctorate (2012) from the Catholic University of Leuven, Belgium. He holds a PhD in Bioscience Engineering (2011) from the Catholic University of Leuven, Belgium, Master of Science in Food Technology (2004) from Catholic University of Leuven, Belgium and Bachelor of Food Science and Technology (2000) of Makerere University, Uganda. Duncan has grown through the academic ranks from a Research Assistant at the National Agricultural Research Organization to a Senior Lecturer in the Department of Food Science and Postharvest Technology, Gulu University, Uganda. He has also demonstrated great resource mobilization and research skills a summary of which is provided below.

Scientific publications

- Ongeng, D., Haberbeck, L.U., Mauriello, G., Ryckeboer, J., Springael, D., & Geeraerd, A.H. (2014). Modelling the Fate of Escherichia coli O157:H7 and Salmonella enterica in the Agricultural Environment: Current Perspective. *Journal of Food Science*. doi: 10.1111/1750-3841.12392
- Ongeng, D., Muyanja, C., Ryckeboer, J., Geeraerd, A.H., Springael, D., & Mauriello, G. (2013). Fate of Escherichia coli O157:H7 and Salmonella enterica in the manure-amended soil-plant ecosystem of fresh vegetable crops: a review. *Critical Reviews in Microbiology*. doi:10.3109/1040841X.2013.829415.
- Ongeng, D., Muyanja, C., Ryckeboer, J., Geeraerd, A.H. & Springael, D. (2011). Rhizosphere effect on survival of Escherichia coli O157:H7 and Salmonella enterica serovar Typhimurium in manure-amended soil during cabbage (*Brassica oleracea*) cultivation under tropical field conditions in Sub-Saharan Africa. *International Journal of Food Microbiology* 149, 133-142.
- Ongeng, D., Muyanja, C., Ryckeboer, J., Springael, D., & Geeraerd, A.H. (2011). Survival of Escherichia coli O157:H7 and Salmonella enterica serovar Typhimurium in manure and manure-amended soil under tropical climatic conditions in Sub-Saharan Africa. *Journal of Applied Microbiology* 110, 117-1022.
- Ongeng, D., Muyanja, C., Ryckeboer, J., Springael, D., & Geeraerd, A.H. (2011). Kinetic model-based prediction of the persistence of Salmonella enterica serovar Typhimurium under tropical agricultural field conditions. *Journal of Applied Microbiology* 110, 995-1006.
- Ongeng, D., Vasquez, G.A., Muyanja, C., Ryckeboer, J., Geeraerd, A.H., & Springael, D. (2011). Transfer and internalization of E. coli O157:H7 and Salmonella enterica serovar Typhimurium in cabbage cultivated on contaminated manure-amended soil under

tropical field conditions in Sub-Saharan Africa. *International Journal of Food Microbiology* 145, 301-310.

Ongeng, D., Muyanja, C., Ryckeboer, J., Geeraerd, A.H., & Springael, D. (2011). Development and validation of a culture-based method suitable for monitoring environmental survival of *Escherichia coli* O157:H7 and *Salmonella enterica* serovar Typhimurium in developing countries. *Annals of Microbiology* 61, 809-817.

Ongeng, D., Ryckeboer, J., Vermeulen, A., & Devlieghere, F. (2007). The effect of micro-architectural structure of cabbage substratum and or background bacterial flora on the growth of *Listeria monocytogenes*. *International Journal of Food Microbiology* 119, 291-299.

Ongeng, D., Devlieghere, F., Debevere, J., Coosemans, J. & Ryckeboer, J. (2006). The efficacy of electrolysed oxidising water for inactivating spoilage microorganisms in process water and on minimally processed vegetables. *International Journal of Food Microbiology* 109, 187-197.

Resources mobilized

- 2012-2013: Manager for a sub-contract project on “Strengthening Women Economic Associations in Northern Uganda”. Funded by World Bank. USD 600,000.
- 2012-2014: Leader for the project on “Enhancing capacity for agricultural research and training in Gulu University”. Funded by NUFFIC. EURO 1.3 Million.
- 2012-2015: Senior Researcher for the project on “improving household nutrition and food security in Northern and South-Western Uganda”. Funded by USAID. USD 20 Million.
- 2007-2010: Principal investigator for the project on “Understanding the behavior of enteric pathogenic bacteria in tropical agricultural environment in Sub-Saharan Africa”, Funded by IFS. USD 12,000.
- 2007-2011: Principal investigator for the project on “Developing models for predicting survival of enteric pathogenic bacteria in the agricultural environment”. Funded by Belgian Development Agency. EUROS 8,000.

