

Department of Food Science Nutrition and Technology
College of Agriculture and Veterinary Services, University of Nairobi



Front view of Department of Food Science, Nutrition and Technology Building

Annual Report 2012/2013

Message from the Chairman, Department of Food Science Nutrition and Technology



Prof. Wambui Kogi-Makau, Chairman, Department of Food Science Nutrition and Technology

Welcome to the Department of Food Science Nutrition and Technology (DFSNT) where we not only manufacture or produce food but also qualified graduates as our contribution towards ensuring that the University community and the larger public are able to access nutritious and safe food and achieve optimal utilization through nutrition and dietetics. The department is endowed with numerous resources, especially human resources: 12 teaching staff with PhDs out of which 5 are associate and full professors. Five of the staff members are under staff development as PhD students. We train both graduate and undergraduates in the fields of Food Science, Food Nutrition and Dietetics, Applied human Nutrition, and Food Safety and Quality. The Department is also a proud producer of milk products including and not limited to cheese, yoghurt, fermented milk (Mala), pasteurized milk and ice cream. Visitors can also sample meat and pork products among others from our pilot plant. We are also happy to announce that we are innovating in rabbit meat products. For more information, welcome and sample some of our programmes at www.foodtech.uonbi.ac.ke.

1.0 Introduction

The Department of Food Science, Nutrition and Technology (DFSNT) is among the four Departments in the Faculty of Agriculture, College of Agriculture and Veterinary Sciences (CAVS) that is located off Kapenguria Road, 15 Kms to the Northwest of Nairobi. DFSNT degree programmes have evolved from one to six; both in undergraduate and postgraduate with a certificate level course in food safety and quality waiting to be launched. DFSNT serves a wide range of students within Kenya and all over the world. Our programmes have remained competitive as the department attracts students from across Africa including Nigeria, Malawi, Uganda, DRC, Somalia and Mozambique. A number of research activities are carried out by the academic staff and students ranging from food security, value addition, processing, and food safety and quality management. DFSNT research and development activities address both national and regional issues which leads to achievement of key aspects of Kenya's vision 2030 and Millennium Development goals.

1.2 Vision, mission, core values and objectives

1.2.1 Vision

To be a global leader in training, research, outreach and consultancy services in post-harvest handling and value addition of agricultural produce, food bioprocessing and technology, food nutrition and dietetics, food safety and quality and natural resource sciences in order to realize sustainable and secure livelihoods.

1.2.2 Mission

To pursue, excel and maintain a world-class leadership role in the quest for knowledge by way of quality research, capacity building, consultancy and innovative outreach in order to contribute to food productivity and safety and secure livelihoods through sustainable value addition and natural resources management.

1.2.3 Core Values

The Department operates within certain treasured beliefs, which have contributed to its success. The Department as part of the College of Agriculture and Veterinary Sciences shall endeavor to uphold the following values:

- Uphold professionalism and ethics in all its dealings with its stakeholders.
- Be accountable and transparent in all its operations.
- Uphold integrity, honesty and quality in training and all other activities.
- Promote participatory management and effective teamwork in all its activities and operations.
- Promote and maintain linkages with industry, other institutions and alumni.
- Uphold dignity of all members of staff and students.
- Recognize and esteem ideas and innovations.

2.0. Summary of Teaching Staff in the Department

Category	Number in Post
Professor	2
Associate Professor	3
Senior Lecturer	2
Lecturer	6
Assistant Lecturer	1
Tutorial Fellow	2
Graduate Assistant	0
Part-Time	

3.0. STUDENT ACADEMIC STATUS in 2012/2013

Programme	Number of Students in 2012/2013 Academic Year					Number of student who graduated 2012/2013
	Year 1	Year 2	Year 3	Year 4	Total	
BSc. Food Science and Technology	42	41	29	34	146	38
BSc. Food Nutrition and Dietetics	36	44	33	29	142	31
Postgraduate Diploma Food Safety & Quality	4	-	-	-	4	1
MSc. Food Science and Technology	9	0	-	-		1
MSc. Food Safety and Quality	5	5	-	-	10	4
MSc. Applied Human Nutrition	13	12	-	-	25	14
PhD	22		-	-	22	0

4.0. Latest innovations

4.1. Departmental Journal

The department's latest innovation, is the launch of The *Journal of Human Nutrition Dietetics Food Sciences and Technology (J.HNDFST)*. This biannual open access peer reviewed international journal, is a University of Nairobi scientific product that is published under the aegis of the Department of Food Science Nutrition and Technology.

Journal of Human Nutrition Dietetics, Food Sciences and Technology (J.HNDFST)

DFSNT is proud to announce its latest innovation, The *Journal of Human Nutrition Dietetics Food Sciences and Technology (J.HNDFST)*. This biannual open access peer reviewed international journal, is a University of Nairobi scientific product that is published under the aegis of the Department of Food Science Nutrition and Technology. Articles are submitted to the Executive Editor at j.hndfst@uonbi.ac.ke and then sent to reviewers whose opinion form the base on which they are accepted, rejected or returned to the author(s) for enhancement. In keeping with the Departments Performance Contract, the journal transmits new knowledge on various dimensions of *nutrition, dietetics, food science, safety and processing* without discrimination.

As part of University of Nairobi platform, the journal supports the scientific invention, innovation and progress in nutrition, dietetics food and related agriculture (food security, and consumer disciplines). It provides a forum for researchers, academicians, practitioners and food industry workers to disseminate their findings. Its purpose is to provide a platform for transmitting and sharing highly scientific cutting edge research products, allow young scientists (students) to manifest their potential as researchers and also reach out to make visible community knowledge and innovations. Engaging communities, hence inclusion of articles in Swahili, in contributing to the journal is poised to cause a paradigm shift in perception of generation and utilization of knowledge as communities actively engage in producing, demanding and utilising research products while showcasing their innovations. The community outreach on a continuous plane targets demystifying scientific research and empowering citizens as they increasingly recognise the need and usefulness of research and understand better their role in demanding and creating relevant research for their wellbeing hence actively engage in generation, and utilization of research products. Young scientists will get a platform to publish abstracts from their research work hence enhance their visibility as scientist.

"DFSNT takes this opportunity to invite you to submit articles that you desire to have manifested in a high quality publication platform and thus book your space in its first issue to become part of DFSNT's history making".

Correspondence and Submissions: All correspondences are sent to the Chief Editor at the address given below. Manuscripts are submitted electronically as e-mail attachments.

E-mail: j.hndfst@uonbi.ac.ke

Access: <http://journals.uonbi.ac.ke/index.php/JHNDFAST>

Editorial Board

Executive Editor: Prof. Samuel K Mbugua

Editor and Journal Manager: Prof. Wambui Kogi-Makau

Editor: Dr. Patrick Kamau

Assistant Editor: Dr. Catherine Kunyanga

Assistant Editor: Dr. G.O. Abong'

Assistant Editor: Dasel W.M.Kaindi

4.2. Monitoring and Evaluation Committee (DFSNT M&E Committee)

The department has established a monitoring and evaluation committee to monitor and evaluate departmental performance in various activities. The membership of the committee is as stated in the University's strategic plan. It is constituted of Chairman and all Heads of Units who include:

Prof. Wambui Kogi-Makau	Chairman, DFSNT
Prof. S.K. Mbugua	Head, Microbiology Unit
Prof. J.K. Imungi	Head, Chemistry Unit
Prof. E.G. Karuri	Head, Engineering Unit
Mr. Peter O. Lamuka	Head, Food Safety Unit
Ms. J.N. Njenga	Ag. Head ANP Unit
Ms. R.W. Kamau	In charge Technical Staff

The functions of the Committee are:-

- The performance of the committee will be guided by ISO standards
- Customize the procedures to the DFSNT Strategic Plan and calibrate the goals to DFSNT's standards.
- The Chairman observed that she had previously circulated both hard and soft copies of the DFSNT's strategic plan and the guidelines on performance targets (CAVS doc) to be followed and met by the department as a bench mark
- Align DFSNT's objectives to the DFSNT's strategic plan, performance contract and staff appraisal

5.0. Research Activities

The research activities in the department are either through student projects, thesis and dissertations or academic staff research activities. The academic staff are very aggressive in sourcing for research grants from Deans' research grants (JoN), National Council of Science and Technology (NCST) and external donors like USAID, EU, World Bank

5.1. SPIRIT Project

Strengthening Potato Innovation through Research and Innovative Technologies (SPIRIT) is a capacity building project involving 4 East Africa countries. This project, coordinated by Dr. George Abong' brings four East African countries (Uganda, Rwanda, Tanzania and Kenya) and two European organization and is funded by the European commission.

5.2. PREPARE-BSc Project

Enhancing the Quality of graduates of agriculture to meet tomorrow's food security challenge (PREPARE-BSc) funded under the ACP-EU Co-operation Programme in Higher Education (EDULINK II) - Reference: EuropeAid/132023/D/ACT/ACPTPS. 2013 - 2015. Dr Catherine Kunyanga is Co-investigator in the project.

5.3. Research thesis/dissertation of Students Who graduated in 2012/2013.

NAME AND REGISTRATION NUMBER	DEGREE AWARDED	TITLE OF THESIS/DISSERTATION
Cherylene Wambui A56/64861/2010	MSc. Applied Human Nutrition	Efficacy of Momordica Charantia Powder as an Antidiabetic Agent in Dietary Management of Type 2 Diabetes
Juliet Onyuma Omolo A56/64676/2010	MSc. Applied Human Nutrition	Factors Associated with Nutritional Rehabilitative Effectiveness of Corn Soy Blend in Children aged 6-36 months, Mukuru, Nairobi
Ms. Emma Apo Ouma A56/64118/2010	MSc. Applied Human Nutrition	Levels of Community Participation in Nutrition Programmes in Nairobi: The Case Study of Riruta Health Centre
Zinet Nezir Hassen A56/61053/2011	MSc. Applied Human Nutrition	Nutrition Knowledge, Household Dietary Diversity and Nutritional Status of Women in Reproductive Age Group: The Case of Addis Ababa City, Ethiopia.
Musyoki Ruth Mueke A56/7472/2001	MSc. Applied Human Nutrition	Performance of the Community Based Growth Monitoring Programme in Matuga Division of Kwale District.
Kondwani R. P. Mpeniwawa A56/64854/2010	MSc. Applied Human Nutrition	Role of Social Cash Transfer in Nutrition in Salima District of Malawi
Ringera Hellen Gatwiri A56/70350/2011	MSc. Applied Human Nutrition	Prevalence and Risk Factors of Malnutrition Among Under-Five's in Meru County: A Comparative Study of Khat (<i>CATHA EDULIS</i>) and non-khat Farming Households in Kenya
Gichana Margaret Bochaberi A56/69749/2011	MSc. Applied Human Nutrition	Nutritional Knowledge of Mothers and Nutrition Status of their Children Below Five Years under Malezi Bora Programme in Kawangware Sub-Location, Dagoretti, Nairobi County
Dinga Lynette Aoko A56/68801/2011	MSc. Applied Human Nutrition	Factor Associated with Adherence to Iron/Folate Supplementation During Pregnancy in Thika Municipality, Kiambu, County, Kenya
Muthike Caroline Wakuthie A56/69085/2011	MSc. Applied Human Nutrition	Nutritional Knowledge and Association with Dietary Practices of Cancer Patients: Case Study of Kenyatta National Hospital Cancer Treatment Centre
Oduor Francis Odhiambo A56/70114/2011	MSc. Applied Human Nutrition	Micronutrient and Macronutrient Malnutrition, Dietary Diversity and Morbidity burden among Schoolchildren in Rural Kibwezi District, Kenya
Kinyua Lucy Wanja A56/69489/2011	MSc. Applied Human Nutrition	Nutrition Knowledge, Attitudes, Dietary Practices and Nutritional Status of Female Undergraduate Students in Nairobi
Njoroge Anastasia Wanjiru A56/65152/2010	MSc. Food Safety and Quality	Effect of Solar Disinfestation and Purdue Improved Crop Storage in the Control of the Larger Grain Borer, <i>Prostephanus Truncates</i> Horn (<i>Coleoptera: Bostrichidae</i>) in Maize, <i>Zea mays</i> L.
Ogolla Jackline Akinyi A56/69892/2011	MSc. Food Safety and Quality	Levels of Acrylamide in Commercial Potato Crisps; Exposure Assessment and Processing on Local Cultivars

5.4 Thesis/Dissertations for 2012/2013 Year 1 MSc. students -

MSc. Applied Human Nutrition, MSc. Food Safety and Quality and Postgraduate Diploma in Food Safety and Quality			
	Student Name	Subject area	Proposed supervisors
1	Okoko F. O.	Nutritional Quality and Chemical Safety of Nile Tilapia and African Catfish: A Case of Freshwater Farm Raised Fish in Kirinyaga and Kisii Counties	Prof. E.G. Karuri Dr. J. Wangoh Dr. Joyce Maina
2	Rose Kihara	Levels of Aflatoxin in flours From Three Selected Millers in Nairobi and their Effect on Protein Digestibility	Prof. Imungi Mr. Lamuka
3	Evans Kosgei Toroitich	Effect of Seasonality and Location on the Nutritional Status of Pre-School Children. A Comparative Study of Kamendi and Kachibora Sub-Location in Trans Nzoia County	Dr. A. Mwangi Prof. O.L.E. Mbatia
4	James K. Gacheru	Nutritional Status, Morbidity Experience and Dietary Intake of Children Under Five Years Old Under Institutional Care: A Case Study of SCANN Children's Home, Nakuru County	Dr. Mwangi Prof. E.G. Karuri
5	Sarah Onsase	Knowledge and Perceptions on Commercial Fortified Flours and Oils Among Women of Reproductive Age in Nairobi County	Prof. Kogi-Makau Dr. Muchemi
6	Joy Miriti	Risk Assessment of Acrylamide in Chips in Nairobi County	Dr. G. Ooko Prof. M.W. Okoth
7	Njoroge Christine	The Nutrition Status, Dietary Patterns and Physical Activity of Church Members of Mothers' Union Aged 50 years and Above in Kikuyu District, Kiambu County	Dr. A. Mwangi Dr. G. Muchemi
8	Joyce Obulutsa	Prevalence and Determinants of Overweight and Obesity in Adult Residents of Kikuyu District, Kiambu County: A Hospital Based Study	Prof. Kogi-Makau Dr. G. Ooko
9	J. K. Mutie	Antimicrobial Activity of Differently Processed Tea Products in Kenya: A comparative study	Prof. S.K. Mbugua Prof. M.W. Okoth
10	Makori Shadrack	Development of Value Added Rabbit Meat Product and Assessing Their Microbiological Quality	Prof. E.G. Karuri Dr. C. Kunyanga Prof. Wanyoike
11	D. Kamunya	Knowledge and Attitudes of slum Dwellers on Genetically Modified Foods: A Case for Korogocho	Prof. O.L.E. Mbatia Prof. Kogi-Makau
12	S. M. Mwathi	Facts Knowledge and Public Perception of Genetically Modified Foods with Specific reference to Maize in Dagoretti, Nairobi County	Prof. S.K. Mbugua Dr. G. Ooko
13	E. Kirui	Consumption Patterns of Traditionally Fermented Milk, "mursik" among Preschool Children and the Nutritional Knowledge of Caregivers in Kapsaret Division, Uasin Gishu County, Kenya	Dr. J. Wangoh Dr. G. Muchemi
14	E. Nginya	Mother- Child (6-23 months) Dyads Iron Status in slum Settlements: A Case of Kangemi Slum, Nairobi County	Dr. A.M. Mwangi Dr. G. Ooko
15	C.W. Kihara	Nutrition Knowledge and Dietary Practices and Nutritional Status of Health Practitioners in Naivasha District	Prof. Kogi-Makau Dr. C. Kunyanga
16	P. K. Lang'at	Fruits and vegetable Consumption and Determining Factors among Pastoralists of Narok North	Prof. J. K. Imungi Dr. Kunyanga
17	I.O. Otieno	Dietary Exposure to Aflatoxins and Aflatoxins Levels in Breast-Milk among Lactating Mothers in Makueni County	Dr. A.M. Mwangi Mr. P. Lamuka Dr. G. Chemining'wa

5.5. Cassava Post-harvest Value Addition Project

The cassava post-harvest value addition project is a collaborative multi-institution research project funded by the World Bank through East Africa Agricultural Productivity Programme (EAAPP). The project seeks to elevate cassava from a subsistence crop to an important commercial crop by identifying post harvest value addition interventions and exploiting market opportunities for new and improved food, feed and industrial raw material products through market and consumer analysis and product development. The sites of project are Busia, Migori and Kwale Counties. The collaborating institutions are University of Nairobi, Egerton University, Maseno University, Kenya Agricultural Research Institute (KARI), Kenya Industrial Research and Development Institute and Embrace Change Management. KARI - Kitale centre head the team handling research activities in Busia County, Egerton University heads the team handling research activities in Migori county, while the University of Nairobi heads the team handling research activities in Kwale county. The University of Nairobi team includes Prof. S. Shibairo (overall PI for entire Project), Mr. P. Lamuka (Co PI -UON), Prof. M.W. Okoth, Dr. G. Abong' and Mrs. Christine Masha Katama (KARI- Mtwapa).



Prof. M.W. Okoth, a member of UON research team during EAAPP mini conference at KARI, Naivasha



EAAPP Cassava team (Prof Okoth and Mr. Lamuka) with Mtwapa ATC principal and Mr. Karuiki of Agricultural Technology Development centre (ATDC), Mtwapa and visits Mtwapa ATC Cassava seed multiplication fields

The University of Nairobi research team is funding 6 postgraduate students to do their thesis/dissertation research activities. The students their thesis/dissertation research titles are shown below

Student Name / Degree	Department/School	Thesis Title and Supervisors
Christine K. Katama PhD in Food Science and Technology	Food Science, Nutrition and Technology	Development of Process Technology for Production of Cassava Roots and Leaves Flakes. Supervisors: Okoth M.W; Ooko G and Shibairo S
Zipporah C. Keter MSc in Engineering	Environmental and Biosystems Engineering	Development of a Solar Assisted Cold Storage Facility for Storage of Fresh Cassava. Supervisors: Lamuka, P.O; Mbuge, D; Okoth, M. W and Shibairo, S.
Carolyn Nekesa Waluchio MSc in Applied Human Nutrition	Food Science, Nutrition and Technology	Anti-Nutrient Content of Different Cassava Cultivars' Leaves at Different Maturity Stages and Its Utilization as a Vegetable in Coastal Region, Kenya. Supervisors: - Lamuka, P.O; Abong', G.O and Wanjekeche E.
Patrick Kamau Gacheru MSc Food Safety and Quality	Food Science, Nutrition and Technology	Impact of an improved Solar Drier on Quality and Safety of dried Cassava. Supervisors: - Abong' O G; Lamuka P.O and Okoth M.W
Evangeline Wangari Nginya MSc. Applied Human Nutrition	Food Science, Nutrition and Technology	The Role of Cassava in Nutritional Status of Households in Coastal Kenya. Supervisors: Abong' O G, Lamuka P. and Okoth M.W;
Douglas Kereu Nyabaro Master of Arts (Economics)	School of Economics	Analysis of Cassava supply Chains and the Potential for Commercialization in Kenya: A Case of Coast and Western Regions. Supervisors: - Mugo M; Lamuka P.O and Shibairo S
Selina Rajab Muhamed	Environmental and Biosystems Engineering	Improvement of performance of locally fabricated cassava products baking oven.

5.6. ERAfrica-IC-025:- FBRE-PRO Project

The project title is "Tailored fermentation for delivery of whole grain and fiber rich cereal products: promoting dietary fiber intake in Africa and Europe. The project coordinated by Prof Samuel Mbugua , is funded by ERAfrica group of funding parties (GFP) under the EU' s 7th Framework program. The project is conceptualized and designed on the basis of bio-functional and health enhancing properties associated with dietary fibers as pre-biotics and modulators for gut' s microbe. In-vitro bio-modification of dietary fiber in food systems through appropriate fermentation and particularly whole cereal grains like sorghum and millet can lead in development of nutritionally enhanced and healthy therapeutic products that are acceptable in Africa and Europe taking cultural constraints into consideration. Such products would take advantage of rapidly growing global niche market for healthy foods, as well as have a definitive and verifiable healthy impact on deserving population both in Europe and Africa.

5.7. East Africa Targeted Investment for Research Impact (EATIRI)

Peter Obimbo Lamuka, a Food Safety Lecturer, Department of Food Science, Nutrition and Technology, University of Nairobi was among 10 [East Africa TIRI scholars](#) (picture) under the **EATIRI, East Africa Targeted Investment for Research Impact** (Ethiopia and Kenya) who attended LCC CRSP All Scientists Research Meeting in East Africa, in Addis Ababa on 23-24, May, 2013. The aim of the meeting was to bring all scientists with research projects in East Africa funded by Livestock Climate Change Collaborative Research systems programme (LCC CRSP) (now renamed Innovation Lab for Livestock Research), under Colorado State University to foster networking and map out collaboration areas. **TIRI, Targeted Investment for Research Impact**, open to early-career researchers in Nepal and East Africa is a LCC CRSP Programme that identifies early-career researchers who are interested in tackling livestock production problems with innovative approaches and from fresh perspectives with assistance from research mentors. EATIRI scholar Peter Obimbo Lamuka research is titled "Prevalence and antimicrobial resistance of zoonotic organisms in camel ecosystem and consequences on pastoralists' public health and livelihoods". Follow link: <http://lcccrsp.org/2013/06/profiles-of-early-career-researchers-in-east-africa/>

EATIRI scholars with project coordinators Prof Richard Bowen Director, Feed the Future Innovation Research Lab and Hoag Dana, East African Coordinator (Colorado State University) and Solomon Desta (MARIL, Ethiopia), Peter Obimbo Lamuka (University of Nairobi) is on front row extreme right

5.8. RELAOD Project

Reduction of Post Harvest Losses and Value Addition in East African Food Value Chains (RELOAD) Project is funded by the Federal Ministry of Education Research (BMBF), Germany for period of 5 years. The objectives of the project are i) to increase the amount and quality of locally available foods by successfully avoiding losses in both quantity and quality; ii) Reducing rural poverty through increasing productivity in food production and supporting creation of employment in rural areas. Project partners are Germany (University of Kassel, German Institute for Tropical and Subtropical Agriculture, HTWG Konstanz, Rhine-Waal University), Kenya (University of Nairobi, Egerton University and Kenya Resource Centre for Indigenous Knowledge (KENRIK- Museum of Kenya)), Uganda (Mbarara University, Makerere University, The National Agriculture Research Organization, Presidential Initiative on Banana Industrial Development) and Ethiopia (Ambo University, Jimma University). The food chains covered are Meat (University of Nairobi), Milk (Egerton University), (Fruits and Vegetable (Uganda) Cereals and Tubers (Ethiopia). The University of Nairobi collaborators are Prof M. W. Okoth, Dr Catherine Kunyanga, Peter Lamuka and Dr Oliver Wasonga. Prof Okoth heads the Sub-project on Technology, which deals :- Appropriate processing & preservation Cooling Technology Renewable energy in Food Processing,; while Da Kunyanga heads the sub-project on Meat value chain. The sites for meat value chain are Marsabit, Isiolo, Garissa, Narok, Kajiado, Nairobi counties.. Follow link: <http://www.reload-globe-net> . The Reload project which commenced in October 2013 has provided full scholarships to 4 PhD students and 6 MSc students. The students and their proposed research project are listed below:-

Student Name/ Degree	Department/School	Thesis Title and Supervisors
Josephat Njenga PhD Food Science & Technology	Food Science, Nutrition and Technology	Integrating traditional and conventional processing techniques during product development to reduce post-harvest losses along formal beef value chains in selected regions in Kenya. Supervisor :- Imungi J. and Kunyanga C.
Michael Mukolwe PhD Food Science & Technology	Food Science, Nutrition and Technology	Performance of a solar drying process for meat. Supervisor - Okoth M.W
Sharon Chepkemoi MSc Food Safety and Quality	Food Science, Nutrition and Technology	Assessment of Hygiene, Quality and Post-Harvest Losses in Small and Medium Enterprises Handling Meat in Kenya Supervisors: - Lamuka P. O; Abong' G. O and Kunyanga C.
Joseph Mwaniki Wambui MSc Food Safety and Quality	Food Science, Nutrition and Technology	Assessment of Hygiene practices and Beef Carcass Quality of Small and Medium Enterprise Slaughterhouses in Kenya Supervisors: - Lamuka P.O; Matofari, J; Kunyanga C. N; Karuri, G.E
Nicanor Obiero Odongo MSc Food Safety and Quality	Food Science, Nutrition and Technology	Quantification of Quality and Safety Post-Harvest Losses in the Camel Milk Value Chain in Isiolo, Kenya Supervisors: Lamuka P.O; Matofari J and Abong' G. O

Pius Mathu MSc Food Science and Technology	Food Science, Nutrition and Technology	Utilization of sinews as sausage binders to reduce post harvest losses along meat value chain in Kenya. Supervisor :- Imungi J. and Kunyanga C.
Felix Shiundu MSc in Enviromental Enginnering	Environmental and Biosystems Engineering	Assessment of biogas production from abattoir wastes Supervisor - Okoth M.W

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EATIRI scholars with project coordinators Prof Richard Bowen Director, Feed the Future Innovation Research Lab and Hoag Dana, East African Coordinator (Colorado State University) and Solomon Desta (MARIL, Ethiopia), Peter Obimbo Lamuka (University of Nairobi) is on front row extreme right

6.0. Publications

1. Aberi D.M, **Lamuka P. O**, Okoth M.W. 2012. Yield, Safety and Functional Properties of Starch from Different Kenyan Cassava Cultivars. *East African Agricultural & Forestry Journal* , 78 (1): 55-62
2. Lamuka P.O. (2014) Public Health Measures: Challenges of Developing Countries in Management of Food Safety. In: Motarjemi Y. (ed.) *Encyclopedia of Food Safety*, Volume 4, pp. 20-26. Waltham, MA: Academic Press
3. Njoroge, A.W; Affognon, H. D; Mutungi, C.M; Manono, J; **Lamuka, P.O** and Murdock, L.L. 2014. Triple bag hermetic storage delivers a lethal punch to *Prostephanus truncatus* (Horns) (Coleoptera: Bastrichidae) in stored maize. *J Stored Product Research*. (In press - Available online 6th March, 2014)
4. Emukule J. I; Ngigi M[†]; Guliye A.Y and **Lamuka P.O** 2012. Comparative Analysis of Acceptability of Camel Milk among Rural and Urban Consumers in Kenya. *East African Agricultural & Forestry Journal*, 78 (4)
5. Maina JG; Mbutia PG; Ngugi JN; Karuri EG; Owiti GO; Omolo B; Orina P; Wangia SM. "Effects Of Management"s Practices And Economic Stimulus Program On Fish Production In Mwea Division Of Kirinyaga County.".; 2012.
6. Gathu EW, Karuri EG, Njage PMK. "Physical characterization of new advanced drought tolerant common bean (*Phaseolus vulgaris*) lines for canning quality". 2012.
7. TN T, EK K'ethe, W K-M, AM M. "Diversity and immune boosting claims of some African indigenous leafy vegetables in western Kenya." *AJFAND*. 2014;14(1):8529-8544.
8. Kakota T, Nyariki D, Mkwambisi D, Kogi-Makau W. "Determinants of household vulnerability to food insecurity: a case study of semi-arid districts in Malawi (2013)." *Journal of international development*. 2013.
9. Kogi-Makau W; Kaindi, DWM. "Towards small and medium entrepreneurs micronutrient capacity development in knowledge and product formulation in Kenya."; 2012.
10. Lore TA, Imungi JK, Mubuu K. "A Framing Analysis of Newspaper Coverage of Genetically Modified Crops in Kenya." 2013
11. Kunyanga CN, Imungi JK, Okoth MW, Biesalski HK. "Total phenolic content, antioxidant and antidiabetic properties of methanolic extract of raw and traditionally processed Kenyan indigenous food ingredients." 2012.
12. MORAA DRONYANGOCECILIA, K PROFIMUNGIJASPER, ONWONGA DRRICHARDNDEMO. "Effect of Nitrogen Source, Crop Maturity Stage and Storage Conditions on Phenolics and Oxalate Contents in Vegetable Amaranth (*Amaranthus hypochondriacus*).". In: *Journal of Agricultural Science*. Canadian Center of Science and Education; 2012.
13. MORAA DRONYANGOCECILIA, K PROFIMUNGIJASPER, S PROFIGONSANGWASHIBAIRO. "Influence of organic and mineral fertilization on germination, leaf nitrogen, nitrate accumulation and yield of vegetable amaranth.". In: *Journal of Plant Nutrition*. Taylor & Francis; 2012
14. Maina, JG; Mbutia PG; Ngugi JN; Karuri EG; Owiti GO; Omolo B; Orina P; Wangia SM. 2012. Effects Of Management"s Practices And Economic Stimulus Program On Fish Production In Mwea Division Of Kirinyaga County..
15. Gathu, EW, Karuri EG, Njage PMK. 2012. Physical characterization of new advanced drought tolerant common bean (*Phaseolus vulgaris*) lines for canning quality
16. J G Maina, P G Mbutia, J Ngugi*, B Omolo**, P Orina***, S M Wangia, E G Karuri, T Maitho and G O Owiti Influence of social-economic factors, gender and the Fish Farming Enterprise and Productivity Project on fish farming practices in Kenya, 2014
17. P S Orina, J G Maina*, S M Wangia*, E G Karuri*, P G Mbutia*, B Omolo**, G O Owiti***, S Musa**** and J M Munguti
Situational analysis of Nile tilapia and African catfish hatcheries management: a case study of Kisii and Kirinyaga counties in Kenya, 2014

18. Abong' GO, Kabira JN. The current status of potato value chain in Kenya. Hotel intercontinental, Nairobi: TUD press; 2013.
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7.0. Workshops

1. Abong G.O, Lamuka P.O, Shibairo S. A, Okoth M.W and Katama C. Post-Harvest Practices, Constraints and Opportunities along Cassava Value Chain in Coastal Region of Kenya. The 8th Egerton University International Conference, 26-28 March 2014, Egerton.
2. Jackline A. Ogolla, George O. Abong', Michael W. Okoth, Jackson N. Kabira and Paul N. Karanja. Effect of Variety, Frying Temperature and Slice Thickness on Color and Acrylamide in Potato Crisps from selected Kenyan cultivars. The 8th Egerton University International Conference, 26-28 March 2014, Egerton.
3. George O. Abong' and Jackson N. Kabira (2013). Potential food safety concerns in fried potato products in Kenya. Mount Kenya University, First international Research and Innovation Conference 28-30 August, Safari Park Hotel, Nairobi, Kenya.
4. Jane Muthoni, Jackson N. Kabira, David Kipkoech, George O. Abong' and John Nderitu (2013). Yield performance of potato seed tubers after long storage in diffused light store. Mount Kenya University, First international Research and Innovation Conference 28-30 August, Safari Park Hotel, Nairobi, Kenya.
5. George O. Abong'¹-Jackson N. Kabira Michael W. Okoth, Jackline A. Ogolla and James Ouma (2013). Potential of processing potato flakes from popular Kenyan potato varieties. Ninth Triennial African Potato Association conference held on 30th June-5th July, Great Rift Valley Lodge, Naivasha, Kenya.
6. George O. Abong'¹-and Jackson N. Kabira (2013). Diversity and characteristics of potato flakes in Nairobi and Nakuru, Kenya. Ninth Triennial African Potato Association conference held on 30th June-5th July, Great Rift Valley Lodge, Naivasha, Kenya. “

7. Workshop for experienced lecturers: Improving and internationalizing University courses” sponsored by the Swedish Ministry of Finance held in Kasangati Hotel under Makerere University and Swedish University of Agricultural Sciences (SLU) in Kampala, Uganda on 10th to 12th June 2014.
8. “Africa Days” of BMBF (Federal Ministry of education and Research) and RELOAD Project held on 16th to 18th March, 2014 in Berlin Germany.
9. Study tour at the Department of Science Education, University of Copenhagen, Denmark under PREPARE BSc project supported by EU through ACP-EDULINK II programme on 8th – 16th February, 2014.
10. Inception workshop meeting Project with partners under EU project on “Enhancing the Quality of graduates of agriculture to meet tomorrow’s food security challenge (PREPARE-BSc)” funded under the ACP-EU Co-operation Programme in Higher Education (EDULINK II) - Reference: EuropeAid/132023/D/ACT/ACPTPS held on 9th to 11th January, 2014 at Chak Guest House.
11. Postharvest handling of vegetables in Kenya. 20th -21st August, 2013, Kenya Utalii Hotel, Nairobi AVRGC The World Vegetable Centre/USAID collaboration with Jomo Kenyatta University Agriculture and Technology.
12. All Scientists Research Meeting in East Africa, *East Africa Targeted Investment for Research Impact (EATIRI)*, Addis Ababa on 23-24, May, 2013. Innovation Lab for Livestock Research [formerly Livestock Climate Change Collaborative Research systems programme (LCC CRSP)]
13. Post-harvest Technology of Fresh Produce” 8th May 2012 at The African Institute for Capacity Development (AICAD), Department of Food Science and Technology, Jomo Kenyatta University of Agriculture & Technology in collaboration with Amiran Kenya Ltd.
14. Post-Harvest Losses in Africa - Analytical Review and Synthesis. IDRC Post Harvest Project Inception Workshop 24-25th April 2012 at the International Centre for Insect Physiology and Ecology (Icipe), Nairobi, Kenya.
15. RELOAD: Reduction of Losses and Value Addition by strengthening Small and Medium Enterprises (SME) in Food processing to sustain Food Value Chains in East African Post Harvest Systems. College of Agriculture and Veterinary Sciences (CAVS), University of Nairobi, from the 26th to the 28th of March 2012. University of Kassel, Department for Agricultural Engineering in the Tropics and Subtropics (consortium leader) – AGT UNIK; German Institute for Tropical and Subtropical Agriculture – DITSL; HTWG Konstanz & University of Nairobi.

8.0. Outreach activities

Every year, the department reaches out either to the communities, hospitals or industries in order to maintain important linkages as well as contribute towards national development. This year the department had a number of outreach activities but we elaborate on two major ones which largely involved our student

8.1 Western Crescent

The BSc. Food Science and Technology students, class 2013/2014 made the much coveted visit to many processing industries which stretch towards the western Kenya. The students visited canning industries, vegetable processing and tea industries, beverage, sugar and fish industries among others. This visit remains important part of the food science curriculum where students manage to link what is taught in class to realities in industry.



Students visit Njoro Canning Factory and Wheat Research Centre, KARI in Njoro-Nakuru



A visit to James Finlays Tea Factory in Kericho and Agrochemicals of Muhoroni



A visit at Peche fish factory in Kisumu and Dominion rice fields and factory in Siaya

8.2 Community nutrition problem diagnosis and outreach 2013, Kibwezi

This year DFSNT Community Outreach and Training Programme was conducted on the 7th to 12th April 2013 in Kikumulyu Location in Kibwezi District. The events involved a community survey which

determined the nutrition and food safety problems in the area. Piloting for this exercise was carried out in Ndeiya in Kikuyu.

The main objective of the survey was to;

- i. Course work for the students: Community Nutrition Problem diagnosis
- ii. To determine the demographic characteristics of households,
- iii. To assess household food safety, food security and livelihoods as well as dietary intake of the children
- iv. To assess the morbidities, nutritional status, immunization coverage, supplementation, worm infestation, haemoglobin iron status of children aged 6 to 59 months.
- v. Referral of malnourished and sick children
- vi. Deworming of children
- vii. Community education and dissemination of survey findings through a Chief's Baraza

Outcomes:

- During the survey 158 households were visited.
- Preliminary results of survey:
 - 47% of households were farmers while 27% were casual labourers
 - 60% of households bought food from the market while 3% depended on food aid.
 - 9% of households lacked toilet facilities and hence shared with their neighbours.
 - 1 out of 10 children had worm infestation.
 - 3% of the mothers exclusively breastfed their children.
 - Global Acute Malnutrition was 3%, moderate stunted children were 48% while prevalence of Iron Deficiency Anaemia was 33%.
- 400 children below 5 years were dewormed
- Final report of the findings will be submitted to the area of study as part of feedback.





Community members, University staff and students during the Kibwezi outreach meeting

8.3. Tree planting



CIC Chairman, Mr. Charles Nyachae addressing participants, Dr. G. Abong' of DFSNT (Centre) among those who planted trees

8.4. Capacity building and personal development

1. In this period, a number of DFSNT staff attended courses and trainings within and outside Kenya. Dr. Kunyanga attended Food Safety course in Europe while Dr. Abong' was in Belgium and Germany for training and exchange programme



Dr. G. Abong' (back right) during a get together for food safety trainees in University of Ghent, Belgium. Left is Dr. Abong' in the Technical University of Dresden labs in Germany during Mundus exchange programmes.

2. *Competence and skills training for PhD supervisors and established scientists*, College of Agriculture and Veterinary Science, **University of Nairobi**, 15-17 January, 2014: effective leadership, supervision skills and professional behavior in academia for scientists; scientific communication-the heart of communication, publishing for impact, literature search and management.
3. *Responsible conduct of local and international research* **Kenya School of Monetary Studies, Nairobi, Kenya**, 16-18 December, 2013: Research ethics - responsibility, advocacy and obligation to subjects and community; KNH/UON ERC perspectives; guidelines for developing a scientific research protocol (proposal); ethical issues on the use of human specimens for biomedical research; monitoring of approved clinical trials; Human Research Ethics: Focus On HIV/AIDS Research and Kenyan Perspectives; integrity in fiscal management in research ethical issues in data management; ethical responsibilities to mentorship institutionalization of research culture and ethical practices in institutions of higher learning and research responsible authorship, publication and peer review.
4. *LEAD 360 Global leadership programme*, **IFT Chicago, USA, July 11-17th July 2013**. Learning points: personal leadership style and relating to others through use of Leadership Inventory and Disc Assessment; Importance of food science and how leaders can help drive future innovations, developing global leadership mindset, leadership strategic discussions with renowned speakers, building networks, developing practical solutions related to food, water and energy security across food systems.

8.5. Laboratory analysis services

The Chemistry and Microbiology sections offer laboratory analysis in Food industries, private individual and any interested stakeholder.

Below is list of clients serviced in 2012/2013 year

8.5.1. Food Chemistry Laboratory

S/No.	CLIENT'S NAME	PRODUCT	PARAMETERS
1.	Farm Concern International	Cassavas	Cynide, moisture content
2.	Peter Akomo		Proximate analysis
3.	Teresa Tumwet	Kunde vegetables	Vitamin A
4.	Peter Akomo	Yam	Proximate Analysis
6.	Prof. J.K Imungi	Potatoes	Vitamin A, Moisture, fat
7.	KARI	Root cassavas	Cyanide/moisture
8.	Eldoret Farm	Yoghurt	Proximate
9.	Angela Andago	Flour	Ash, Proximate
10.	Peter Akomo	Flour oil	Peroxide value

11.	KARI	Cassava roots	Moisture, cyanide
12.	Angela Andago	Flour	Free fatty acids
13.	Dr. George Abong'	Cassava	Moisture, Vitamin A
14.	Ms. Jane Njenga	Vegetables	Moisture, Vitamin A
15.	Peter Akomo	Flour oil	Proximate Analysis
16.	Angela Andago	Flour	Moisture, peroxide value
17.	Peter Akomo	Flour oil	Plytic acid, iodine value, peroxide value, saporification value
18.	Mrs. Angela Andago		F.F.A., vitamin A moisture

8.5.2. Food Microbiology Laboratory

S/No.	CLIENT'S NAME	PRODUCT	PARAMETERS
1.	Bora Biotech Ltd	Fish meal	Salmonella
2.	Azuri Health Ltd	Dried pineapples	Yeast and molds
3.	Creadis Bungoma	Flour	Total viable count, E. coli, yeast and molds
4.	Azuri Health Ltd.	Flour	E. coli
5.	Valid Nutrition	Food supplements	Total viable count, Coliforms count
6.	The Gambia	The Gambia sms Rusf	Total viable count, Yeast and molds, Coliforms
7.	Valid Nutrition	Food supplements	Total viable count, Coliform count, Yeast and molds
8.	Azuri Health Ltd.	Mango pulp and Mango fruit drink	Total viable count, Coliform count, Yeast and molds
9.	Kitengela Chillies	Chilli sauce	Total viable count, Yeast and moulds
10.	Kitengela Chillies	Chilli sauce	Total viable count, Yeast and moulds
11.	Nai-Tea Enterprises	Ice tea	Total viable count, Yeast and moulds
12.	Eldoville Farm	Yoghurt samples	Total Viable count, Yeast and moulds, Coliforms count
13.	Soy Afric Co.	Soy flour	Total viable count, Coliform count, Yeast and molds
14.	Nai-Tea Enterprises	Ice tea	Total viable count, Coliform count, Yeast and molds
15.	Nai-Tea Enterprises	Ice tea	Yeast and moulds
16.	Nai-Tea Enterprises	Ice tea	Total viable count, Coliform count, Yeast and molds
17.	Soy Afric	Flour	Total viable count, Coliform count
18.	Terry Mukunya	Dried pineapple	Total viable, Yeast and molds
19.	Soy Afric	Flour	Total viable count, Coliform count
20.	Mrs. Angela Andago	Flour	Total count, Yeast and moulds, Coliforms, Staphylococcus aureus
21.	Valid Nutrition	Food Supplements	Total count, E. coli, Coliforms count
22.	Dr. Catherine N. Kunyanga/Dr. Cecilia M. Onyango	Green vegetables	Total viable count, Coliforms, Salmonella, E. coli, Staphylococcus aureus
23.	Dr. G.O. Abong'	Cassava flour	Staphylococcus aureus, Total viable count, E. coli
24.	Mercy	Fruits and fruit salads	Total viable count, coliforms, Yeast and molds