

Utilization of traditional/Indigenous foods and seeds

- Malnutrition is still high due to change of diets
- Need to diversify diets through conservation, multiplication and consumption (entire value chain) of indigenous crops e.g. grains
- Indigenous crops are more resilient, medicinal, and nutrient rich + several socio-cultural benefits
- ARU/URDT participated in seed and food fair events to document the utilization of local indigenous/traditional foods and seeds in Uganda

Methods

- Participatory approach
- In-depth interviews with exhibitors
- Observations

Indigenous fresh foods	Indigenous seeds
Ethnic group/tribe	Ethnic group/tribe
Name of traditional foods	Name of local seed
Recipe (preparation)	How seed is propagated
Ingredients added	How seed is processed
Equipment / utensils used	How seed is stored
Benefits obtained	Products obtained from seed



Results – Indigenous foods exhibited

Traditional foods	Propagation	Processing and benefits
Air potato or Wild climbing yam (<i>Dioscorea bulbifera</i>) Amasomi in runyoro or Kkobe in Luganda	Seed or whole fruit	Steaming unpeeled. Eaten like potatoes or yams, fiber. Source of carbohydrates. Consumed by Baganda and basoga
Pea nuts or ground nut (<i>Arachis hypogaea</i>) ebinyobwa	seed	Sun drying, roasting, boiling, pounding to make peanut butter by the most Ugandan tribes
Bitter berries (<i>solanum anguivi</i>) katunkuma	seed	Sundried, grinded, boiled with other foods, it's a spice and treats HBP, diabetes. It's mainly used by the bakiga, banyoro and baganda
Tree tomato (<i>Solanum betaceum</i>) (ebidodoima)	seed	Sliced and added onto sauce as spice, squeezing to make juice by batooro and bakonjo
Black night shade <i>Solanum nigrum</i> (enswiga)	seed	Steaming, drying and grinding leaves mainly by the bakiga
Pigeon peas <i>Cajanus cajan</i> (entendeigwa)	seed	Sun drying, milling beans into powder, for making local porridge. The pigeon pea leaves treat stomachache. Its is preferred by batooro and banyoro
Oyster nuts (<i>Telfairia occidentalis</i>) (ebinyobwa bwomuti)	seed	Sun Drying, pounding nuts, making pasted sauce after removing hard cover. Contains oils, proteins, and heals wounds. Grown and eaten by the banyoro and batooro tribes.
Pumpkin - <i>Cucurbita</i> spp. empambo	seed	Sun drying and roasting seeds. Young fruits can be sliced and dried (ebikeke). Roasted seeds are eaten as snacks – empambo. They are mainly eaten by Banyoro, Batoro, Basoga and Bagwere
Sorghum <i>Sorghum bicolor</i> (omugusa)	seed	Sun drying, milling, grinding grains to makes porridge, bread and alcohol. Preferred by bakiga, banyankole, banyoro and batoro
Millet (<i>Panicum miliaceum</i> (oburo)	seed	Sun drying, milling, grinding, pounding the grains
Turmeric (<i>Curcuma longa</i>) (ebinzari)	Rhizomes	Washing, sun drying, pounding rhizomes to treat cancer, diabetes, heart diseases. Mainly consumed by Bagisu, Bakonjo, Banyankole, Batooro

Indigenous foods exhibited cont'd

Ginger <i>Zingiber officinale</i> (tangahuzi)	Rhizome	Sun drying, grinding, put in hot water/tea. Ginger powder adds flavor, cleanses the body and treats cancer by most Ugandan tribes
Hard green cover passion fruits (<i>Passiflora</i> spp.)	seed	The pulp is removed and squeezed to make juice
Chayote Fruit, <i>Sechium edule</i> (Surisuti in Runyoro or Ensusuti in Luganda or munete in runyankole)	Whole fruit	Steaming, or slice and boil with sauce. Source of protein and fiber and improves eye sight. Eaten by baganda, Banyankole, banyoro and batoro Slice cook with other foods, cures ulcers and cleanses the body
Guava (<i>Psidium guajava</i>) (amapera)	seed	The whole fruit is squeezed to make juice
Lima beans <i>Phaseolus lunatus</i> (amaijalero)	seed	Sun dried and boiled as the usual beans by the banyoro and batoro tribes of Uganda
Amatehe (<i>afraimonium angustifolium</i>)	Suckers, seed	Wash and eat as snack or dissert. The pulp may be squeezed to make juice rich in iron, fiber, vitamin C, treats cancer. It was exhibited by the batoro
Cape Goose berry <i>Physalis peruviana</i> (entuutu)	seed	Fruits eaten as snack or dissert. Whole fruit smashed to make juice rich in vitamin C and fiber, treats cancer. Exhibited by the Batoro
<i>Mondia whitei</i> (mulondo)	Rhizome	Wash and eat roots. Dry roots, pound and put in tea to enrich it with vitamin C. it was brought by banyoro, batooro, bakiga
Moringa (<i>Moringa oleifera</i>)	seeds	Leaves are dried, pounded and put on warm water or porridge by the Batooro and Bakonjo
Red pepper <i>Capsicum annum</i> (kamurali)	seed	Put in sauce to boost appetite, eye sight and cleanse the body. Used by most Ugandan tribes
Rosary peas, <i>Abrus precatorius</i> Amarunga	Seeds	Sun dried and pounded. Put on tea when fresh or in grinded. Known to cure allergy, increase appetite and flavors. Eaten by Batooro and Bakonjo
Karanda rugo	Seeds	Mix smashed leaves with raw eggs and water to cure cough. Used by Karanda rugo

Indigenous foods exhibited cont'd

Akagombe	Seeds	Mix smashed leaves with raw eggs and water to cure cough. Consumed by Akakombe
Rose marry Rosmarinus officinalis		Squeeze out juice and put on food as flavor. You may alternatively pound dry leaves and add on tea. This plant also repels snakes. Used by batoro and bakonjo tribes
ekimonko	seeds	Planted as beans in banana plantations. Fixes N in the soil. Its beans give first aid for snake bite. Used by batoro and bakonjo
Ekisisi - mirankwongere	seeds	Grown as pumpkin, harvested when young, sliced, cooked and eaten. Its rich in fiber, iron, zinc. Used by batoro, banyoro and bakonjo tribes
Kafumbe + tobacco	seeds	Planted around gardens to repel pests. Tobacco powder preserves grain. Used by bakonjo tribe
Chia seeds Salvia hispanica	seeds	Seeds are put in hot water or any hot drink. Used by bakonjo tribe
Okra Abelmoschus esculentus	seeds	Slice the young fruits and add water. Leave the mixture to stand for a night. Treats ulcers and increases women fluids. Consumed by bakonjo, Acholi, langi and ateso tribes
ebijumankuba	Seeds planted beside a tree	The plant treats ulcers, cancer, pressure and diabetes. Preferred by the bakonjo tribe
Colored maize (Zea mays)	seeds	Can be roasted, steamed, cooked, milled, makes posho, porridge, pop corn
Enterere	seeds	Sun dried, roasted, pounded. Preferred by the bakiga
Solanum anguivii Lam., Obutakara/Obujambura	seed	Sundried and pounded into powder. Treats HBP and strengthens bile. Preferred by the bakonjo tribe
Bamya beans	seeds	Can be dried and mixed with tea. Chopped and prepared as sauce or vegetable. Preferred by Bagisu, Bakonjo, Banyankole, Batooro

Indigenous foods exhibited cont'd

Sim-sim or Sesame (entungo) Sesamum indicum	seeds	Roasting, grinding to make paste (odi) or roasted seeds, eaten as snack. Makes natural cooking oils. Mainly consumed by langi and Acholi by also liked by Bagisu, Bakonjo, Banyankole, Batooro
Engabu ya kabaka	seeds	Crash or slice and mix in cold water
Eshogi in rukiga or eyobyoy in runyoro Cleome gynandra	seeds	Harvested leaves are known to fight ulcers and improve eye sight. Preferred by bakiga
Sun flower Helianthus	seeds	Sun drying, roasting, pounding to make oils and paste. Eaten by batoro
Cow peas Vigna unguiculata (omugobe)	seeds	Leaves are boiled and dried, pounded and pasted with pea nut butter. Preferred by the banyoro, batooro
Eshaga	seeds	Slice, add in beans, cook with foods as green vegetables. Consumed by bakiga
Ekicuragenyi	Seeds & cuttings	Harvest and boil. Mainly eaten by the bakiga
Ebyamba (ananna)	seeds	Harvest, wash and eat. Consumed by the bakonjo
Sim-sim or Sesame (entungo) Sesamum indicum	seeds	Roasting, grinding to make paste (odi) or roasted seeds, eaten as snack. Makes natural cooking oils. Mainly consumed by langi and Acholi by also liked by Bagisu, Bakonjo, Banyankole, Batooro





Indigenous foods exhibited cont'd

- Indigenous foods have been replaced with conventional foods but some communities have preserved (Muyonga, 2017) in Uganda e.g. black night shade (enswiga), fruits e.g. wild plums, gooseberries (Kikafunda & Kiremire, 2014) and other countries
- E.g. marama beans in SA, baobab, sesame, in TZ (Ochieng et al., 2016), and Nigeria - palm sap, African locust, beans, millet (Aworh, 2008)
- There were no edible insects yet 1900 spp. exist (Kinyuru et al., 2015).
- The absence of insects could have been due to season and limited preservation

Preparation / Processing of indigenous foods

Local name of dishes and description	Preparation	Preferences
Banana juice (ensande)	Yellow banana (fully ripened) is mixed with spear grass and squeezed until juice comes out. Water is then added and mixture filtered	Preferred by the banyoro, batoro, baganda – as an energy giving food
Empogola (Unpeeled steamed banana)	Clean unpeeled banana fingers steamed in a clay pot lined with spear grass and covered with banana leaves	Preferred by banyoro as an energy giving food
Omukubi gw'enyama (Fresh boiled meat)	Pieces of clean meat are boiled in a clay pot or saucepan covered with banana leaves. Spices like onions, tomatoes, salt, are added. Served on clay plates called ebibindi	Preferred by all tribes for body building
Eshabwe (ghee sauce)	Made from mushroom, cow ghee, onion, tomato, meat, and salt. Clean mature ghee is added to boiled warm water and salt is added. Wash ghee in cold water to impurities. Dissolve salt in water and add ghee to it until it (ghee) changes from yellow to white. Add water and stir until all turn white. Continue adding salt solution until you get the right thickness	Preferred by the batoro and banyankole
Firinda (bean paste)	Made from beans, ghee, eggplants, roasted meat, rock salt, pumpkin leaves and cowpea leaves. Beans are soaked in water to allow easy removal of seed coats. The threshed beans are boiled with African eggplants and cowpea leaves (eteke). The water is removed and the bean pound with a stick called ekibaya. Spices (salt, onions, tomatoes) are then added, water put back and boil. Ghee is then added.	Preferred by banyoro, batooro, as a body building food
nyamusiri/eteke Cow pea leaves	Made from beans, eggplants, tomatoes, onion, salt. Served in orucuba – wooden plate. The cowpea leaves – eteke and eggplants are boiled with rock salt added. It is left to cool and then steered with a forked stick to form a sticky substance. Add spices (onions, tomatoes, and ghee) and then boil.	Preferred by batooro and ateso as a vegetable relish – vitamin source
Akalo (Millet bread)	Made from cassava and millet flour and then mingled in hot water in a clay pan (entamu) until it is tender – tenderness indicated by the sound. Served in baskets	Energy giving food to the banyoro and batooro

Omubumbo (Smashed matooke)	Made using banana leaves, water, banana fingers. Peeled matooke are boiled wrapped in banana leaves. Smash them when ready and leave it on fire for it to generate flavor and aroma. It is served on a wide basket (orugali)	Preferred by banyoro and baganda
Omukaro (Roasted meat)	Prepared from roasted meat, white ants, mushroom, sim-sim, onions, tomato. Roasted meat is boiled in a clay pot, add previously soaked mushroom and smashed white ants, sim-sim paste and onions and tomatoes.	Preferred by banyoro as a body building food
Luwombo (Steamed meat)	Made using rock salt, onion, bell pepper, turmeric and meat pieces – mainly chicken. Wrap chicken pieces in young banana leaves and add all spices (salt, onions, tomato, green pepper, turmeric, water) Boil in clay pot or Aluminium saucepan lined with spear grass or banana leaves. Cover with many banana leaves, overlapping each other.	Preferred by baganda, banyankole and bakiga body building, energy giving, fats, etc.
Steamed ekirali, cassava, pumpkin, wild yam	Steamed with peels in clay pots lined with grass	Preferred by all tribes for energy giving
Obutuzi (Mushroom sauce)	Dried mushroom is mixed with omukaro pea nuts, or eshabwe	Preferred by banyoro batooro and bakiga for medicinal purposes – given to baby at birth against worms, increases breast milk
Sombe (Cassava leaves)	Chopped fresh mixed with pea nut butter and coked – eaten as sauce	Preferred by ateso for body building, energy, minerals etc.
Boo (Cowpea leaves)	Chopped boo leaves are boiled in water with Rock salt and okra added until it turns yellow. Add sim-sim paste.	Preferred by ateso, Acholi (boo) banyoro, batooro (omugobe) for body building, vitamins and carbohydrates
Omubumbo (Smashed matooke)	Made using banana leaves, water, banana fingers. Peeled matooke are boiled wrapped in banana leaves. Smash them when ready and leave it on fire for it to generate flavor and aroma. It is served on a wide basket (orugali)	Preferred by banyoro and baganda

Processing and preservation of indigenous food

- Traditional processing methods - sun drying – for cereals, grinding, roasting e.g. meat, yams, etc., mashing, cooking and shelling.
- Combinations of methods e.g. drying + grinding, boiling + drying + grinding, chop + drying and drying + roasting (Adegoke & Olapade, 2012; Asogwa, Okoye, & Oni, 2017; Oluoch, Habwe, Ngegba, & Koskei, 2012).
- Preservation
- Sun drying, roasting, plant extracts (tobacco, chilli, hot water, urine)
- Use of anthill soil, ash, pepper, and tephrozia (Kikafunda & Kiremire, 2014) and (Adegoke & Olapade, 2012; Asogwa et al., 2017; Krishnan, V.Seervi, P., Bhati, A., Singhal., H., Sushil, I., S., Prazapati, 2014; Oluoch et al., 2012; Yousry & El-shafie, 2013).

Benefits of Indigenous foods

- Medicinal (Muyonga, 2017); Resilient and nutritious (Earle, 2013)
- Income (Kikafunda, 2014); For heritage and socio-cultural benefits (Marocco et al., n.d.), (Kuhnlein et al., 2009)
- Propagation
- Sexual and asexual means
- (Jaenicke, n.d.), (Megersa, 2017) (Yemataw et al., 2018)

Conclusions

- There is still a huge diversity of indigenous foods in Uganda.
- These are scattered with minimal conservation and utilization.
- indigenous/traditional fairs are a one stop center for the indigenous diversity and thus deserves more attention
- Integrated biodiversity conservation will enhance diversity of highly nutritious, cultural and medicinal foods

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References

- Abbasi, B. H., Ahmad, N., Fazal, H., & Mahmood, T. (2010). Conventional and modern propagation techniques in *Piper nigrum*. *Journal of Medicinal Plant Research*, (January).
- Adegoke, G. O., & Olapade, A. A. (2012). Preservation of Plant and Animal Foods: An Overview. *Progress in Food Preservation*, (January), 603–611. <https://doi.org/10.1002/9781119962045.ch28>
- Anne Vézina. (2019). Uganda | The banana knowledge platform of the ProMusa network. Retrieved from ProMusa website: <http://www.promusa.org/Uganda>
- Asogwa, I. S., Okoye, J. I., & Oni, K. (2017). Promotion of Indigenous Food Preservation and Processing Knowledge and the Challenge of Food Security in Africa. *Journal of Food Security*, 5(3), 75–87. <https://doi.org/10.12691/jfs-5-3-3>
- Aworh, O. (2008). The Role of Traditional Food Processing Technologies in National Development: The West African Experience. (January 2008), 1–18.
- Earle, L. (2013). Diet and Nutrition in Aboriginal Communities (Vol. 35). Vol. 35. Retrieved from http://www.nccah-ccnsa.ca/Publications/Lists/Publications/Attachments/44/diets_health_web.pdf
- FAO. (2013). Indigenous peoples' food systems and well-being interventions and policies for healthy. In H. Kuhnlein, B. Erasmus, D. Spigelski, & B. Burlingame (Eds.), *Indigenous Peoples' food systems and well-being: Interventions and policies for healthy communities*. Retrieved from <http://www.fao.org/3/a-i3144e.pdf>
- Jaenicke, H. (n.d.) Vegetative Propagation.
- Kamara, J., & Renzaho, A. (2014). The politics of food and the fight against hunger: Reflections and lessons from Uganda. *African Journal of Food, Agriculture, Nutrition and Development*, 14(4), 9016–9038.