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Jump Starting

Orange-Fleshed Sweetpotato
in West Africa through Diversified Markets

Training of Trainers' Module for Orange-Fleshed Sweetpotato (OFSP) Utilization and Processing



Training of Trainers' Module for Orange-Fleshed Sweetpotato (OFSP). Utilization and Processing

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Training of Trainers' Module for Orange-Fleshed Sweetpotato (OFSP) Utilization and Processing

Preface

This training module was prepared to enrich the knowledge of trainers about utilizing and processing orange-fleshed sweetpotato.

The document was initially used in Malawi where it was successfully used for 4 years (2010 to 2014) as a resource for the training of more than 24,000 farmers and 4000 trainers. The principal author has revised and adapted it for use in Ghana and elsewhere in West Africa. The training module contains valuable information about vitamins, micro-nutrient and mineral content of storage roots and sweetpotato leaves, utilization of orange-fleshed sweetpotato in various recipes including for Infant and Young Child Feeding (IYCF), information on best processing methods to ensure β -carotene retention and bioavailability, where the β -carotene is found in a storage root and leaf, how β -carotene can be degraded, etc. We have enhanced this document with various recipes from Malawi, CIP's recipes for East Africa, as well as from the local cuisine of Ghana (West Africa). A recipe of "Vitabread" made from orange- or purple-fleshed sweetpotato developed by the University for Development Studies has also been included.

This manual comprises two sections, interactive lecture and practical. This follows an adult education approach of "learning by doing".

I would like to express my acknowledgement to Dr. Erna Abidin, who initiated the write up of this manual, Dr. Amagloh, Eric Dery, Kwabena Asare, and Mrs. Esi Foriwa Amoafu who were involved in preparing this module.

Tamale, 30 Oct 2014

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Project Leader, Jumpstarting Orange-Fleshed Sweetpotato in West Africa through Diversified Markets.

INTRODUCTION

The role of sweetpotato is becoming more important and substantial. The orange-fleshed sweetpotato varieties can contribute to combating vitamin A deficiency (VAD) and can also serve as a wheat flour substitute in processed products. OFSP is a bio-fortified crop, in that it is a staple food whose micronutrient content has been enhanced to the point where impact on micronutrient status can be achieved.

Just 100 g (1/2 cup) supplies the daily vitamin A needs of young children under 5 years of age and vulnerable women, the group most at risk of VAD (Hotz et al, 2011). All sweetpotato varieties are good sources of vitamins C, E, K, and several B vitamins but only OFSP has pro-vitamin A. Research in South Africa (Jaarsveld et al., 2005) has demonstrated the efficacy of OFSP as a bioavailable source of vitamin A, and community-level research in Mozambique (Low et al., 2007) demonstrated that an integrated approach using OFSP can reduce VAD in a resource-poor population. Compared to many other crops, sweetpotato requires few inputs and relatively lower labor, making it particularly suitable for households threatened by migration, civil disorder, or diseases such as HIV and AIDS (Jayne, et al., 2004). The ability of sweetpotato to produce relatively good yields under marginal conditions, its flexible planting and harvesting times that provide roots and leaves during the hungry season, and its good yield response to better management are factors driving its expansion in Sub-Saharan Africa (SSA) (Low et al., 2009). Since women are responsible for preparing food for their families, and are the primary caregivers for young children, the likelihood of OFSP uptake by the two groups most susceptible to vitamin A deficiency – young children and women of reproductive age – is vastly enhanced.

Promoting the utilization of OFSP roots and leaves will foster household food and nutrition diversification. Additionally, diversified OFSP products can also significantly contribute to generating additional household income, through the establishment and improvement of small-scale businesses. Thus, sweetpotato product diversification can strongly contribute to improving livelihoods of poor families in rural areas. Women are crucial and they are the primary focus of the Jumpstarting OFSP project since they are the primary managers of household meals and are the primary caregivers in most households.

Demand creation campaigns have focused on the “minus 9 months to 24 months” period and on the key “essential nutrition actions” (ENA) that OFSP can contribute to. Further work should continue with locally based nutritionists and health workers to incorporate OFSP as a “doable action” into the relevant essential nutrition actions and messages. This includes continued development of complementary multi-mix feeding recipes which use at least three food groups. These recipes should reflect the seasonal availability of different foods including sweetpotato roots and leaves, specific age-group needs, and should incorporate relevant care practices (e.g. meal and snack frequency, feeding style). Since vitamin A is a fat-soluble vitamin that is stored in the liver, Haskell (2004) advised that a small amount of oil should be included with OFSP recipes. Additionally, from the research done by Bechoff et al. (2011), it is suggested that a serving of porridge (one mug), boiled root (half a root), mandazis (two), or chapatti (one) would provide a significant part of the daily vitamin A requirements of a child under 6 years, i.e. one mug of porridge is 20% of daily vitamin A requirements, half a boiled root 46% , two mandazis 75%, or one chapatti 100%.

Ghana is rich with various meals which are strongly influenced by many ethnic groups with their distinctive eating habits. Food like “fufu” and “ampesi” (originally for Ashantis), “kenkey” (for Gas), “Tuo Zaafi” (for northern tribes) are the main meals in Ghana, and they are now eaten by everyone, no matter where this ethnic group comes from. These Ghanaian main meals are usually taken with stew and soups which vary in their preparation methods. Introducing the OFSP included in the preparation of the meals could enrich the Ghanaian collection of local and existing recipes.

Sweetpotato products can be made from sweetpotato flour, mashed boiled sweetpotato roots, or fresh sweetpotato roots. Some products from OFSP can be prepared, such as:

- Sweetpotato Bread/scones/buns
- Sweetpotato Doughnuts
- Sweetpotato Juice
- Sweetpotato “malt” drink
- Mixed sweetpotato vegetables
- Sweetpotato leaf stew with “egusi” (sweetpotato palaver sauce)
- Multi-mix feeding recipes: roots with cowpeas, tomatoes, fish, meat, etc.
- Boiled sweetpotato in a peanut sauce, etc.

LEARNING OBJECTIVES

To encourage creativity in cooking skills so a variety of nutritious dishes can be prepared using OFSP storage roots and leaves. The recipes in this training module were brought from Ghanaian local recipes as well as from other countries in Sub-Saharan Africa.

At the end of the modules participants should be able to:

- Understand the value of using OFSP in their multi-mix meals
- Create a variety of dishes that are made from OFSP roots and leaves
- Be able to teach others recipes that may assist them to develop a small business selling OFSP products to generate household income

This training module contains 2 main sessions: an interactive lecture to develop knowledge of OFSP nutritional value and use, and instructions for preparing recipes.

MODULE: Understanding of Food Processing and OFSP Nutritional base-food

Background

Food processing is the set of methods and techniques used to transform raw ingredients into food or to transform food into other forms for consumption by humans or animals, either in the home or by the food processing industry. For business purposes, the Ghana Bureau of Standards should be involved to ensure that sweetpotato puree, sweetpotato flour, the hygienic preparation of OFSP products, etc. is of high standard.

The various purposes and advantages of processed products may be listed as follows:

- Products are easier to market and distribute
- Preservation
- Toxin removal, e.g. in Cassava and soybeans
- Increases seasonal availability of a variety of foods
- Enables transportation of delicate perishable foods over long distances
- Makes foods safer to eat by reducing micro-organisms that cause spoilage and pathologies

For sweetpotato, advantages of processing are:

- Improved palatability
- Extended storage time
- Easier transportation and marketing
- Increased seasonal availability of sweetpotato products

Carotenoids are found in nature as trans-carotenoids. Under stressful conditions such as heating and UV-light exposure, trans-carotenoids are isomerised into cis-carotenoids (9-cis; 13-cis and 15-cis for β -carotene). Isomerisation could be considered as a negative effect of processing since cis-isomers have less pro-vitamin A activity (about half) than trans-carotene. Isomerisation can occur in pro-vitamin A carotenoids at temperatures above 35°C. 9-cis is predominantly formed above 100°C whereas 13-cis and 15-cis are formed below 100°C (Doering et al. 1995).

OFSP is an excellent source of bio-available β -carotene. Nevertheless, the fact that β -carotene bio-availability is affected by processing is something that we must consider. Processing can lead to a decrease in the amount of all-trans- β -carotene, and an increase in 13-cis-beta-carotene. Processed OFSP has significantly higher bio-available β -carotene than raw OFSP. Bio-availability varied with processing treatments: **raw<baked<steamed/boiled<deep fried**. Heat processing improves the accessibility of β -carotene in OFSP by disrupting cell walls and breaking the protein complexes in which the carotenoids are embedded (Tumuhimbise et al., 2009). Chandler and Schwartz (1988) reported that processes that most induce cis-isomerisation in OFSP were (in order of less to more damaging): **steaming<blanching<pureeing<microwaving<canning<baking<drum drying**. Shade and sun drying did not initiate cis-isomerisation in the examples found in literature on OFSP or leafy vegetables respectively (Mulokozi and Svanberg 2003).

β -carotene Biosynthesis in Leafy Green Vegetables and OFSP Roots

β -carotene is the carotenoid with the highest provitamin A activity (100%) because it can be entirely converted into two molecules of vitamin A (retinol) (Bechoff, 2010). All-trans- β -carotene represents about 80-90% of the total carotenoid in OFSP (Bengston et al. 2008). In plant cells, carotenoids are contained in semi-autonomous organelle structures. In leafy green vegetables, carotenoids are present in the chloroplasts and are bound with protein and chlorophylls that are green, and mask the orange colour of the carotenoids (Galston et al., 1980; Bartley and Scolnik 1995; Vishnevetsky et al. 1999). Chromoplasts usually derive from chloroplasts. During the transformation of chloroplasts into chromoplasts, the photosynthetic apparatus disintegrates and carotenoids accumulate in the novel plastid. This transformation can be observed, for instance, in autumn leaves or during fruit ripening (Galston et al., 1980).

Plants accumulate storage substances such as starch, lipids and proteins in certain phases of development in different organs and tissues such as seeds, shoot tubers (potato) and root tubers (sweetpotato). The primary function of storing is to provide a reservoir to be used in later stages of plant development as a source of energy and/or nitrogen providing appropriate conditions for embryo development in seeds and for root formation in shoot and root tubers. In sweetpotato storage roots, the accumulation of carbohydrates (starch) and proteins (Sporamins and Cystatin) provide the possibility for the plant to survive adverse environmental conditions. This accumulation occurs in parenchyma cells of the root. In sweetpotato, the carbohydrates (starch) and proteins (Sporamins and Cystatin) are deposited in the sink tissues of storage roots. Two genes, Beta-amylase and DnaJ-like Protein, are found to be responsible in the transformation of amyloplast to chromoplast, regulating the accumulation of starch and β -carotene in Sweetpotato storage root (Desai, 2008).

The potential health benefits of the sweetpotato sporamins in helping prevent oxidative damage to our cells should not be surprising since sweetpotato produces sporamins whenever subjected to physical damage to help promote healing (<http://www.whfoods.com/genpage.php?tname=foodspice&dbid=64>).

In OFSP, initial levels of carotenoids are influenced by variety, root maturation and location (Kósambo et al. 1998). Sweetpotato varieties can be grouped into four general categories based on their β -carotene content on a dry weight basis: non-detectable (<1 $\mu\text{g/g}$), low β -carotene (1-39 $\mu\text{g/g}$) – pale orange, moderate β -carotene (40-129 $\mu\text{g/g}$) – orange, and high β -carotene (>130 $\mu\text{g/g}$) – dark orange (Simonne et al. 1993).

For further reading, please see the Facilitator Resource in this module as well as other valuable resources elsewhere.

Through the sessions of this module, we are focusing on simple processing practices that most rural households can easily learn and adopt. Ingredients are locally available.

SESSION 1: Interactive Lecture

Time	30 minutes
Learning Objectives	<ul style="list-style-type: none">• To be familiar with the 4 food groups using examples from Ghana• To understand the importance of food processing related to nutritional values in daily diets• To understand how to use OFSP in processed foods at the household level• To develop complementary multimix feeding recipes which use at least three food groups.• To create awareness of opportunities for use of OFSP in home industries and school meal programs
Preparation	<ul style="list-style-type: none">• Read through the sessions and familiarize yourself with the process and activities• Prepare photocopies of the background information (Handout, ppt)• Do simple bookkeeping of expenditures for ingredients
Materials	<ul style="list-style-type: none">• Photocopies of background information• Plain paper• Prepared flip chart papers• Facilitator Resource• Projector (if available)• Pictures/diagrams• Ingredients of recipes to be practised

Activity: Interactive lecture

- Ask participants to briefly explain their backgrounds and knowledge of food processing in general, and sweetpotato in particular.
- Interactive discussion should be initiated by using the Facilitator Resource related to the learning objectives (e.g. showing the schematic processing, pictures of OFSP products, examples of the 4 food groups, some ingredients for OFSP products).
- Clearly emphasize that β -carotene can be more available for the body when used with a little fat/oil.

TIPS for Preparing Sweetpotato:

- You can eat the entire storage root, flesh and skin, or just peel it after cooking.
- As the flesh of sweetpotato will darken upon contact with the air, you should cook them immediately after peeling and/or cutting them. If this is not possible, to prevent oxidation, keep them in a bowl covered completely with water until you are ready to cook them.
- Sweetpotato can be eaten in savoury dishes cooked in a similar way to Irish potato, or enjoyed in doughnuts, buns, relish, etc.

FACILITATOR RESOURCE

FOUR FOOD GROUPS FOR GHANA

Different foods contain a mixture of nutrients, but no one food contains all the nutrients needed by the body. Some foods have more of some nutrients and different nutrients than others, for example green vegetables are more nutritious than pale green or white vegetables like cabbage. Proper food selection and combinations helps the body to get the needed balance of nutrients. Proper food combination also helps the body to get more total nutrients and improve the absorption of various nutrients. For example, fats facilitate absorption of vitamin A from vegetables and fruits while vitamin C helps in absorption of iron from vegetables. Therefore diets should be made from a variety of foods from the four food groups which include staples; vegetables and fruits; legumes, nuts and animal foods; and fats.



1. Staples: Foods in this group include cereals such as sorghum, millet, maize, rice and wheat. Starchy roots such as cassava, sweetpotato, potato and yam, and starchy fruits such as banana and plantain are also in this group. Staples mostly provide carbohydrates. They also provide other nutrients such as proteins and minerals depending on how they are processed.

2. Vegetables and Fruits, including green leaf and yellow vegetables such as amaranth, common bean leaf, pumpkin leaf, sweetpotato leaf, rape, Chinese cabbage, carrot, eggplants, pumpkin, tomato, mushroom, pawpaw, pineapple, table banana, mango, watermelon, guava, apples, etc., mostly provide vitamins, minerals, and water. Vegetables also contain fiber that is necessary for proper digestion. Fruits provide mostly carbohydrates, vitamins and water.

3. Legumes, Nuts, Animal Foods: This group includes groundnuts, soybeans, beans, peas, cowpeas, groundnut, Bambara nuts, etc. They provide mainly protein and carbohydrate. Soybeans and nuts also contain high proportions of fat in addition to protein and carbohydrate.

Animal foods include meat, eggs, milk products, fish, and insects (e.g. flying ants, grasshoppers). They provide protein, fats, vitamins and minerals.

4. Fats: This group includes oil seeds (soybeans, groundnuts, and sunflower seed), avocado, cooking oil, meat, fish, poultry, and milk and milk products such as butter, margarine and yogurt. These mainly provide fat.

NUTRIENT CONTENT OF OFSP STORAGE ROOTS

Considering its fiber content, complex carbohydrates, protein, vitamin A and C, iron, and calcium, the sweetpotato ranked highest in nutritional value. Sweetpotatoes with dark orange flesh have more β -carotene than those with light-colored flesh (Simonne et al., 1993). Despite the name "sweet", it may be a beneficial food for diabetics, as preliminary studies on animals have revealed it helps to stabilize blood sugar levels and to lower insulin resistance (<http://www.whfoods.com/genpage.php?tname=foodspice&dbid=64>; the world's healthiest foods: Sweetpotatoes, 2001-2012, the George Mateljan Foundation).

Sweetpotato is among crops containing soluble fiber. The total of fiber in half a medium-size root of sweetpotato is 3 grams and 1 gram is soluble fiber (<http://ocw.tufts.edu/data/47/531408.pdf>). Research has shown that for every 1-2 grams of daily soluble fiber intake, LDL (bad) cholesterol is lowered 1% (Nelson, L., 14th July 2009 at <http://www.lisanelsonrd.com/blog/lower-ldl-cholesterol-diet-%E2%80%93-step-2>)

The table below presents information on nutritional value of sweetpotato and other food staples. While sweetpotato provides less edible energy and protein per unit weight than cereals, it is a higher density source of most vitamins and minerals than cereals.

Staple	Maize/ corn	Rice	Wheat	Potato	Cassava	Soybean	Sweet- potato	Sor- ghum	Yam	Plantain
Component (per 100g portion)	Amount	Amount	Amount	Amount	Amount	Amount	Amount	Amount	Amount	Amount
Water (g)	76	12	11	79	60	68	77	9	70	65
Energy (kJ)	360	1528	1419	322	670	615	360	1419	494	511
Protein (g)	3.2	7.1	13.7	2.0	1.4	13.0	1.6	11.3	1.5	1.3
Fat (g)	1.18	0.66	2.47	0.09	0.28	6.8	0.05	3.3	0.17	0.37
Carbohydrates (g)	19	80	71	17	38	11	20	75	28	32
Fiber (g)	2.7	1.3	10.7	2.2	1.8	4.2	3	6.3	4.1	2.3
Sugar (g)	3.22	0.12	0	0.78	1.7	0	4.18	0	0.5	15
Calcium (mg)	2	28	34	12	16	197	30	28	17	3
Iron (mg)	0.52	4.31	3.52	0.78	0.27	3.55	0.61	4.4	0.54	0.6
Magnesium (mg)	37	25	144	23	21	65	25	0	21	37
Phosphorus (mg)	89	115	508	57	27	194	47	287	55	34
Potassium (mg)	270	115	431	421	271	620	337	350	816	499
Sodium (mg)	15	5	2	6	14	15	55	6	9	4
Zinc (mg)	0.45	1.09	4.16	0.29	0.34	0.99	0.3	0	0.24	0.14
Copper (mg)	0.05	0.22	0.55	0.11	0.10	0.13	0.15	-	0.18	0.08
Manganese (mg)	0.16	1.09	3.01	0.15	0.38	0.55	0.26	-	0.40	-
Selenium (mg)	0.6	15.1	89.4	0.3	0.7	1.5	0.6	0	0.7	1.5
Vitamin C (mg)	6.8	0	0	19.7	20.6	29	2.4	0	17.1	18.4
Thiamin (mg)	0.20	0.58	0.42	0.08	0.09	0.44	0.08	0.24	0.11	0.05
Riboflavin (mg)	0.06	0.05	0.12	0.03	0.05	0.18	0.06	0.14	0.03	0.05
Niacin (mg)	1.70	4.19	6.74	1.05	0.85	1.65	0.56	2.93	0.55	0.69
Pantothenic acid (mg)	0.76	1.01	0.94	0.30	0.11	0.15	0.80	-	0.31	0.26
Vitamin B6 (mg)	0.06	0.16	0.42	0.30	0.09	0.07	0.21	-	0.29	0.30
Folate Total (mcg)	46	231	43	16	27	165	11	0	23	22
Vitamin A (IU)	208	0	0	2	13	180	14187	0	138	1127
Vitamin E, alpha- tocopherol (mg)	0.07	0.11	0	0.01	0.19	0	0.26	0	0.39	0.14
Vitamin K (mg)	0.3	0.1	0	1.9	1.9	0	1.8	0	2.6	0.7
Beta-carotene (mcg)	52	0	0	1	8	0	8509	0	83	457
Lutein+Zeaxanthin (mcg)	764	0	0	8	0	0	0	0	0	30
Saturated fatty acids (g)	0.18	0.18	0.45	0.03	0.07	0.79	0.02	0.46	0.04	0.14
Monounsaturated fatty acids (g)	0.35	0.21	0.34	0.00	0.08	1.28	0.00	0.99	0.01	0.03
Polyunsaturated fatty acid	0.56	0.18	0.98	0.04	0.05	3.20	0.01	1.37	0.08	0.07

Notes: corn (sweet, yellow), wheat (durum), rice (white, long-grain, regular), potato (flesh and skin), soybeans (green). Source: Sweetpotato Wikipedia: en.wikipedia.org/wiki/Sweet_potato; Nutrient Data Laboratory, United States Department of Agriculture.

NUTRIENT CONTENT OF SWEETPOTATO LEAVES (RAW)

Sweetpotato leaf is an excellent source of lutein. Kachathrian et al. (2003) concluded from their research that sweetpotato leaves may help in the fight against age-related macular degeneration (AMD).

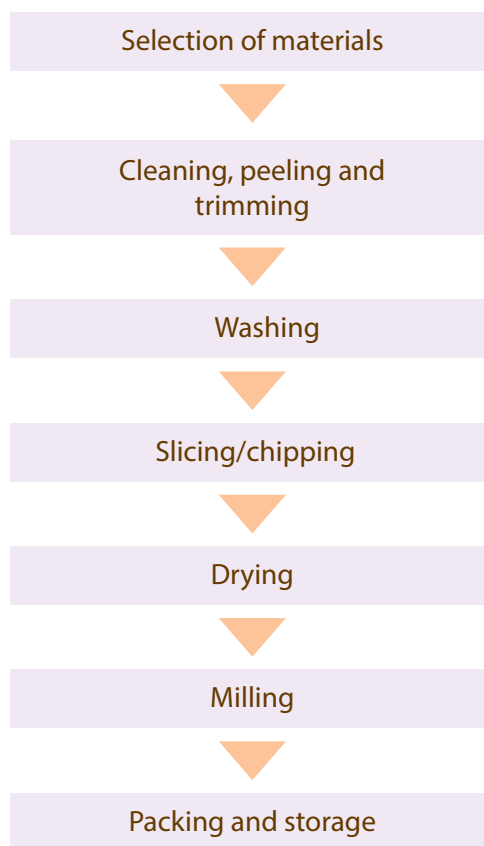
Risk factors for macular degeneration include age of 75 beyond, diabetes and all its complications (hypertension, retinopathy, arteriosclerosis), smoking, chronic sunlight exposure, nutritional deficiencies, and blue/green eyes. As standard therapies for macular degeneration are limited, costly, and often associated with undesirable pathological side effects, the role of nutrition in protecting against degenerative diseases is under intensive scientific investigation. Lutein (3,3'-dihydroxy- α -carotene) has been identified as a dietary component that can delay the onset of age-related macular degeneration (AMD). Major sources of lutein are green vegetables and marigold flower. Sweetpotato roots are known for their high content of β -carotene. However, sweetpotato leaves are often considered to have no economic value and are discarded following sweetpotato harvest. From their research, they found that lutein concentrations in sweetpotato leaves were: 54 mg/100 g (Beauregard); 60-68 mg/100 g (Tanzania/Kenya/Osukut); 53 mg/100 g (94-96); 34 mg/100 g (Jonathan); and 42-46 mg/100 g (Webaligae). These values rank sweetpotato leaves second in lutein content after marigold flowers, and number one among edible vegetables.

In addition, the information provided by USDA SR-21 shows that the sweetpotato leaf is low in Saturated Fat and Sodium, and very low in Cholesterol. It is also a good source of Protein, Niacin, Calcium and Iron, and a very good source of Dietary Fiber, Vitamin A, Vitamin C, Thiamin, Riboflavin, Vitamin B6, Folate, Magnesium, Phosphorus, Potassium and Manganese.

(<http://nutritiondata.self.com/facts/vegetables-and-vegetable-products/2664/2#ixzz1uyfrdSXq>; read on 15 May 2012)

FLOUR PROCESSING

Sweetpotato flour processing is set out schematically in Fig 1 below.



It is noted that drying is a critical process, more than the other traditional methods of processing (boiling and steaming). Indeed, the removal of water affects the internal cell structure of the vegetable food leading to higher losses of micronutrients such as pro-vitamin A (Bechoff, 2010).

Drying technologies suitable for farming areas should have a low initial capital cost, be easy to construct with available natural materials and be easy to operate and maintain (Chua and Chou 2003). There are two types of dryers, artificial and natural (solar or sun). Artificial drying can be conducted in a cabinet or tunnel dryer where air is heated by a fuel or electricity but is expensive. Solar and sun dryers are environmentally friendly systems with low operating costs. However, open air sun drying involves a number of risks for product quality, including dust, insects, mammals, rain, and pro-vitamin-A-damaging ultra violet (UV) sun radiation because of poor control over environmental factors. Clean smooth raised platforms, blackened surfaces (Fig 3) that absorb solar radiation more efficiently, or woven mats and mesh trays that facilitate the air movement around the product are recommended for farmers and producers. The lowest cost models of dryers are passive direct solar dryers using natural convection. The simplest one is the tent dryer (Fig 4) (Bechoff, 2010).



Fig 2. Chipping machine (credit E. Abidin)



Fig 3. Air sun drying method that is recommended (taken at Soroti Sweetpotato Producers Association (SOSPPA) in Uganda in Sep 2011. Credit E. Abidin).

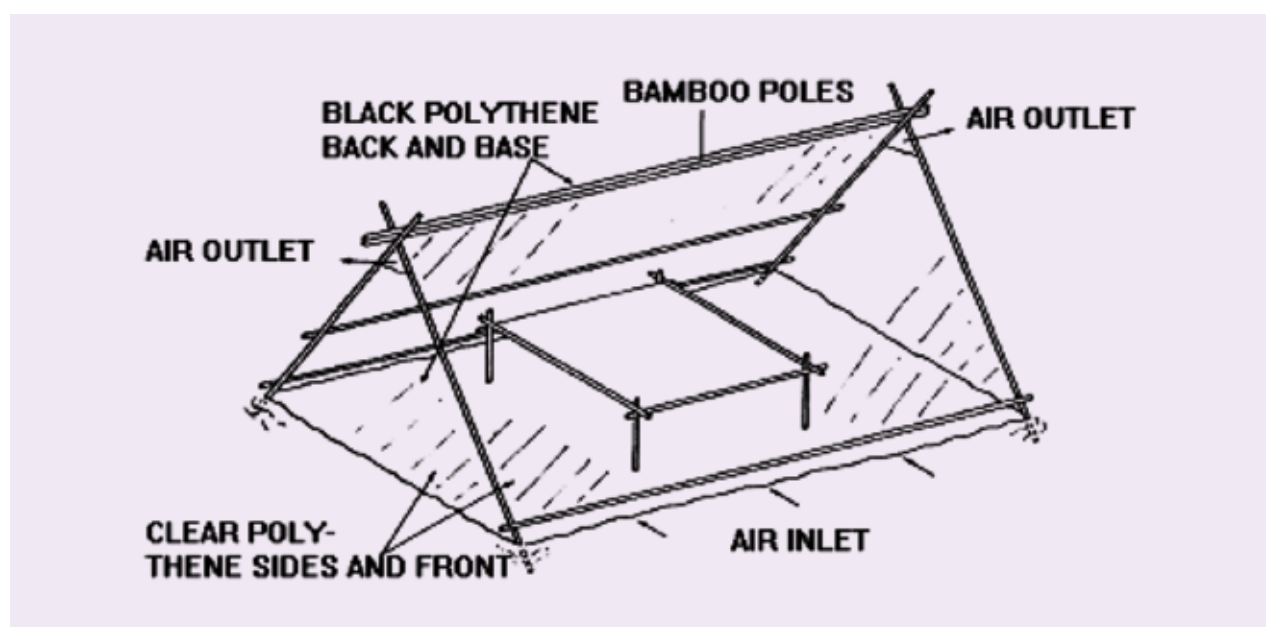


Fig 4. Tent dryer (source: Intermediate Technology Development Group (ITDG), 1988)

Stir-Frying Method

Multiple studies have shown better absorption of the beta-carotene from sweetpotatoes when fat-containing foods are consumed along with the sweetpotatoes. (It doesn't take much fat for this better absorption to take place—only 3-5 grams.) What fat makes possible is the conversion of beta-carotene into a special form called micellar form. Micelles are specialized collections of molecules that allow fat-soluble substances (like beta-carotene) to move around comfortably in non-fat environments (like our water-based bloodstream). They can also make it easier for fat-soluble substances to get absorbed from our digestive tract. Among several studies that have shown the benefits of a fat-containing meal for absorption of beta-carotene from sweetpotato foods, one study has shown that stir-frying in oil is one specific cooking technique for sweetpotatoes that can enhance the bioavailability of their beta-carotene. It's interesting to note that the sweetpotato stir-fry in this study used a very low stir-frying temperature of 93°C and that only 5 minutes of stir-frying were required to achieve the beta-carotene bioavailability benefits (source: <http://www.whfoods.com/genpage.php?tname=foodspice&dbid=64>; The world's healthiest foods: Sweet potatoes; 2001-2012, the George Mateljan Foundation).

DISHES FROM OFSP STORAGE ROOTS



Fig 5. Stir-fry - sweetpotato chips. (credit E. Abidin, 2012)



Fig 6. A variety of multi-mix meals prepared by Malawians during several events (credit E. Abidin, 2010-2011)

DISHES FROM SWEETPOTATO LEAF



Fig 7. Sweetpotato leaf with peanut sauce, fried with onion, tomato, chili and dried fish (credit E. Abidin, 2011) and sweetpotato leaf stew with egusi (credit E. Dery, 2013).

REFRESHMENTS AND SNACKS



Fig 8. Sweetpotato juices: leaves and roots and malt/sweetbeer from the peel (credit E. Abidin, 2012)



Fig 9. Orange and Purple vitabread (credit F. Amagloh) and African cake (credit E. Abidin)



Fig 10. Muffins, golden doughnut and mandazi (credit E. Abidin).

STAPLE FOODS



Fig 11. Boiled sweetpotato roots, chapatti and nsima from OFSP. Right: sweetpotato soup (credit E. Abidin)



Fig 12. Porridge for infants – children in Salima, Malawi testing porridge (credit E. Abidin, 2012)

SESSION 2: Practical

Preparing juice from roots and leaves, doughnut, golden bread, cake and sweetpotato relish

Time	240 minutes
Learning Objectives	<ul style="list-style-type: none"> • Participants will gain knowledge and skills on how to prepare a variety of foods and drinks from sweetpotato
Preparation	<ul style="list-style-type: none"> • Read through the session and familiarize yourself with the process and activities • Prepare the budget and purchase the ingredients • Type the ingredients and budget for distribution to participants • Copy the recipes for participants
Materials	<ul style="list-style-type: none"> • Sweetpotato leaves and roots • Knives, basins, plates, stove, oven/village modified oven, buckets, firewood/charcoal, mortal • Ingredients • Recipes

Activity 1: Preparing sweetpotato juice from leaves and roots

- Divide the participants into small groups and delegate tasks
- Distribute the sweetpotato juice recipes (from roots and leaves)

Activity 2: Preparing golden bread or buns

- Divide the participants into small groups and delegate tasks
- Distribute and explain the recipe

Activity 3: Preparing golden doughnut

- Divide the participants into small groups and delegate tasks
- Distribute and explain the recipe

Activity 4: Preparing cakes

- Divide the participants into small groups and delegate tasks
- Distribute and explain the recipe

Activity 5: Preparing Sweetpotato Relish

- Divide the participants into small groups and delegate tasks
- Distribute and explain the recipe

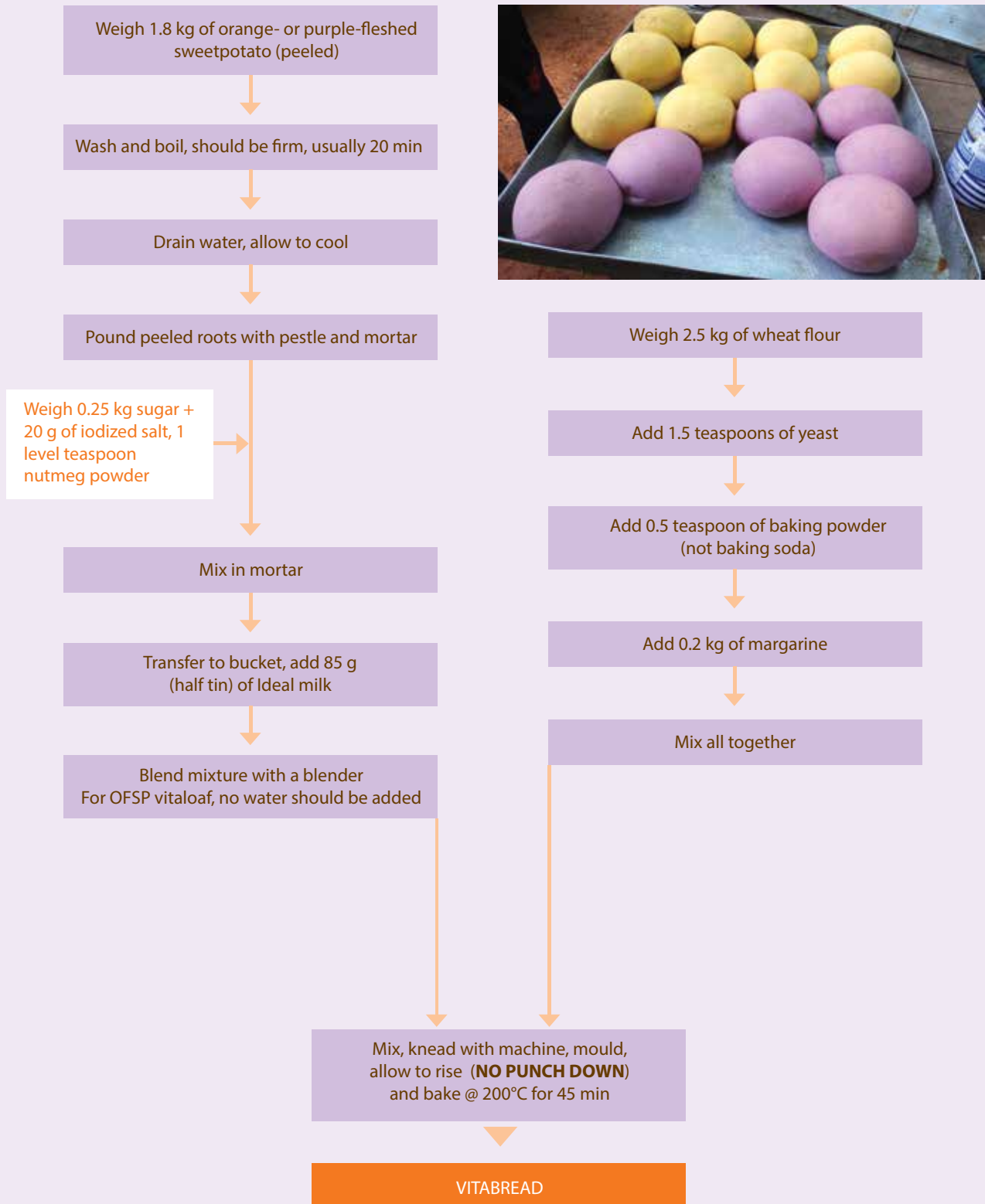


Pictures above are examples of equipment usually used in a village for preparing the OFSP products, including a modified oven: a pot covered by an iron sheet with charcoal on it (photo taken in Kasungu, Malawi – community under FAO, taken on 27 May 2012, credit E. Abidin)

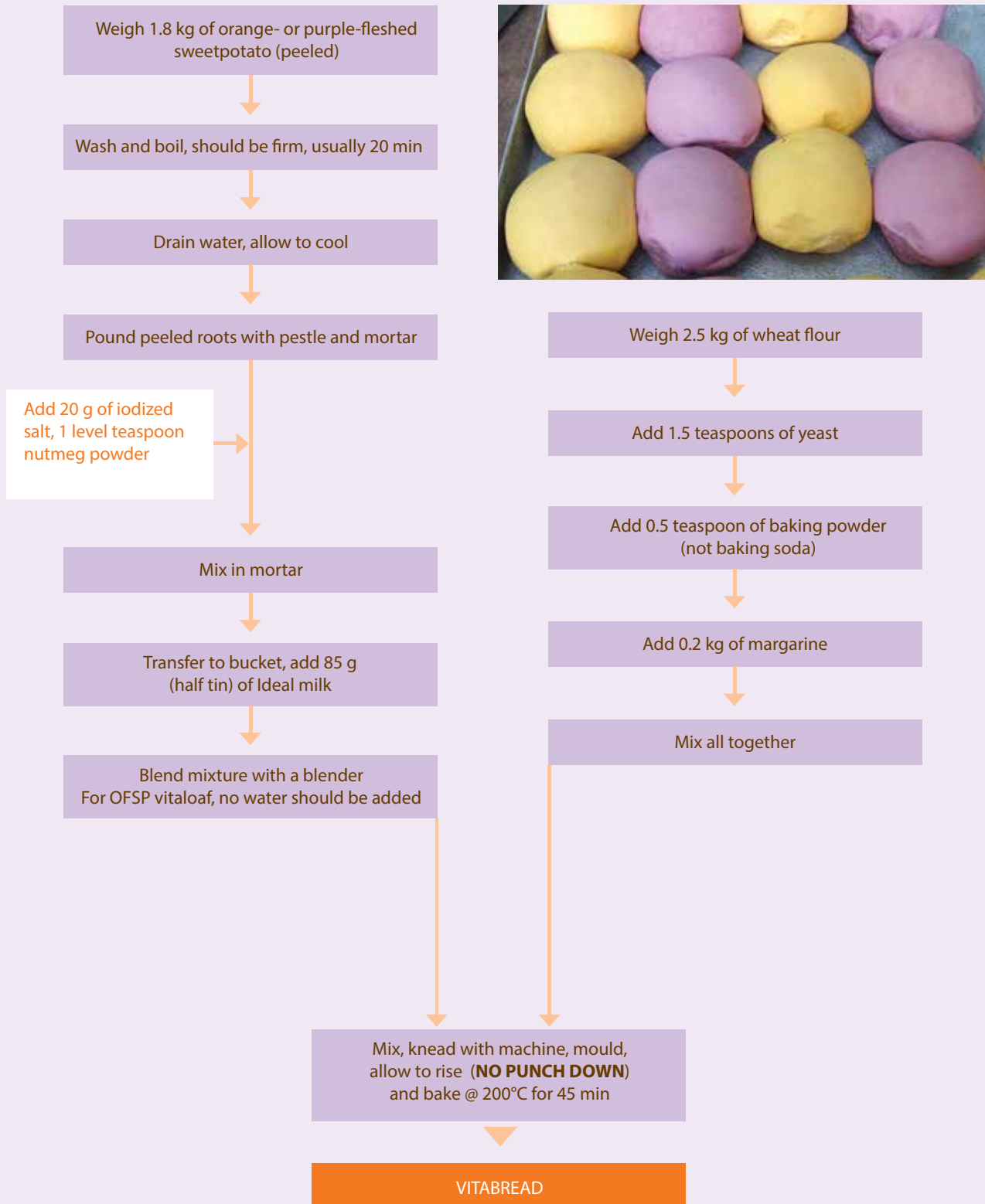
FACILITATOR RESOURCE

The following recipes have been used for training the trainers in Malawi and Ghana. However, to enrich knowledge on a variety of recipes, we advise searching the internet. One useful link is: <http://sweetpotatoknowledge.org/use-consumption/training-and-communication/recipe-booklets/sweetpotato-recipes.pdf/view>

I. PREPARATION OF VITABREAD (With sugar)



II. PREPARATION OF VITABREAD (No sugar)



III. RECIPES FROM GHANA (All photos here credited to Eric Dery)

A. HOUSEHOLD RECIPES

1. SWEETPOTATO LEAF STEW (with egusi) (sweetpotato palaver sauce)

INGREDIENTS

- 2 ladles of cooking oil (palm oil or refined oil e.g. Frytol)
- 1 smoked fish or dried fish (optional)
- 1 small chopped onion
- ¼ tsp garlic powder (optional)
- 4 cups of sweetpotato leaves (chopped)
- 5 medium-size fresh tomatoes
- 4 medium-size fresh peppers
- ¼ tsp of dawadawa
- 1 tbsp salt
- 2 tbsp egusi (can use egg)

METHOD

- 1) Select young and tender sweetpotato leaves of the plant
- 2) Remove stalks from the leaves
- 3) Wash the destalked leaves in cold water
- 4) Chop sweetpotato leaves with a knife
- 5) Measure 2 ladles of cooking oil into a cooking pot (saucepan)
- 6) Add chopped onions, garlic, and dawadawa to fry
- 7) Blend tomatoes, pepper, onions and add to oil
- 8) Add chopped sweetpotato leaves
- 9) Mix egusi powder in salt solution and add to stew
- 10) Cover and allow to boil for 5min
- 11) Add smoked or dry fish
- 12) Adjust salt content and a little water
- 13) Cover and simmer until nearly all the liquid evaporates
- 14) Serve with boiled, fried or steamed sweetpotatoes, rice, eba (stirred gari), noodles, banku and other "ampesi"

Note: enough for 5 people



2. SWEETPOTATO LEAF SOUP (“OKRA”)

INGREDIENTS

- 5 medium-size okra
- 1 smoked fish or dried fish
- 1 pound beef (any other meat) (optional)
- 1 small chopped onion
- 4 cups of sweetpotato leaves (chopped)
- ¼ tsp dawadawa
- 5 medium-size fresh tomatoes
- 4 medium-size fresh peppers
- 1 tbsp salt
- ½ tsp saltpeter (cooking soda)
- 150 ml of palm oil



Sweetpotato leaf soup with banku

METHOD

- 1) Select young and tender sweetpotato leaves of the plant
- 2) Remove stalks from the leaves
- 3) Wash the destalked leaves in cold water
- 4) Chop sweetpotato leaves with a knife
- 5) Bring one liter of water to the boil and place the chopped leaves and okra into the pot. Add ½ tsp of saltpeter and allow to boil for 15 minutes from the time it starts to boil
- 6) Season chopped meat with onions, dawadawa and salt
- 7) Add boiled leaves and okra
- 8) Add smoked fish and palm oil and adjust salt level
- 9) Cover pot and cook for 15 minutes
- 10) Serve with akpele, banku, Deehuo and T.Z.

3. DRY SWEETPOTATO LEAF SOUP

INGREDIENTS

- 1 smoked fish or dried fish
- 1 pound beef (or any other meat)
- 1 small chopped onion
- 4 cups of sweetpotato leaves (chopped)
- 5 medium-size fresh tomatoes
- 4 medium-size fresh peppers
- 1 tbsp salt
- 1tbsp dawadawa (*Parkia speciosa*)



METHOD

- 1) Select young and tender sweetpotato leaves of the plant
- 2) Remove stalks from the leaves
- 3) Wash the destalked leaves in cold water
- 4) Dry leaves and pound to a powder
- 5) Season chopped meat with dawadawa, onions and salt
- 6) Blend tomatoes, pepper, onions and add
- 7) Add dried powdered sweetpotato leaves (can also add dried okra powder if slipperiness is desired)
- 8) Add about 1 liter of water and allow to boil
- 9) Add smoked fish and adjust salt level
- 10) Cover pot and cook for 15 minutes
- 11) Serve with akpele, banku, Deehuo and T.Z.

4. SWEETPOTATO “MPOTOMPOTO”

INGREDIENTS

- 2 medium-sized fresh sweetpotato roots
- 2 large peppers (blended)
- 1 medium-size onion (blended)
- 2 large-tomatoes (blended)
- ¼ tsp dawadawa
- Smoked fish
- Palm oil
- Salt to taste



METHOD

- 1) Wash and peel sweetpotato roots.
- 2) Cut into small cubes (2.5 cm).
- 3) Wash and put into pot.
- 4) Add a little water to boil the sweetpotato cubes.
- 5) Allow to boil till sweetpotatoes are semi-cooked.
- 6) Add enough palm oil and the blended pepper, onions and tomatoes.
- 7) Add the smoked fish and salt to taste.
- 8) Cover and cook on medium heat until sweetpotato cubes are cooked (about 20 minutes).
- 9) Reduce and stir with a wooden spoon.
- 10) Serve hot with rice or eat alone.

5. SWAKYE (SWEETPOTATO “WAKYE”)

INGREDIENTS

- 2 medium-sized fresh sweetpotato roots
- ½ cup of beans
- ¼ saltpeter
- Water



METHOD

- 1) Put water into saucepan to boil.
- 2) Add beans and saltpeter to boiling water.
- 3) Allow beans to be fully cooked.
- 4) Grate sweetpotatoes and add to cooked beans.
- 5) Stir mixture well and allow to cook for about 10 min.
- 6) Serve with any sauce.

6. SWEETPOTATO PORRIDGE

INGREDIENTS

- Orange-fleshed sweetpotato (OFSP) – a small size of root (about 100 gr) (i.e. Apomuden)
- Soya flour - 2 heaped tablespoons (can be replaced with bambara beans)
- 1 tea spoon Vegetable oil
- Fish powder (i.e. Keta school boys; anchovies) – 1 heaped table spoon fish
- Add water to taste (consistency that will not fall/drip off spoon)



METHOD

- 1) Wash, peel and cut OFSP into smaller pieces.
- 2) Measure oil directly into cooking pot and heat up
- 3) Add soybean flour and fish powder and small amount of water to heat up..
- 4) Add the OFSP pieces to the mixture in the pot and add water to the level of the pieces of roots
- 5) Cover to boil.
- 6) Mash the sweetpotato with cooking spoon when soft, and add sufficient amount of water that will be sufficient for your baby
- 7) Allow to simmer.

Notes:

- It should not take more than 30 minutes to prepare.
- consistency that will not fall/drip off spoon

B. COMMERCIAL PRODUCTS

7. SWEETPOTATO PIE

INGREDIENTS

- ½ cup of sweetpotato flour (¼ pound of mashed roots)
- 1 ½ cup of wheat flour (Soft)
- 1 cup oil
- 2 handfuls of margarine
- ½ pound meat
- ½ onion
- 1 tin milk



METHOD

- 1) Measure sweetpotato flour and mix with wheat flour.
- 2) Add mixture to oil and margarine and mix well.
- 3) Press through a sieve to make a smooth paste.
- 4) Knead with extra flour and press into flat discs.
- 5) Prepare mincemeat with onions.
- 6) Put minced meat on top of the kneaded pastry and fold into pasties.
- 7) Spread a little milk on top of the pie.
- 8) Bake at a baking temperature for about 30 mins .

7. SWEETPOTATO SCONES

INGREDIENTS

- ½ cup of sweetpotato flour (¼ pound of mashed roots)
- 1 ½ cup of wheat flour (Soft)
- 1 cup oil
- 2 handfuls of margarine
- 1 ½ tsp baking powder
- ½ onion
- 1 tin milk
- 2 eggs
- ½ cup sugar
- ½ tsp nutmeg



METHOD

- 1) Put sweetpotato flour into a bowl and mix well with wheat flour.
- 2) Add oil and margarine and mix thoroughly.
- 3) Beat 2 eggs in milk and mix with sugar.
- 4) Add baking powder and nutmeg to the mixture.
- 5) Knead properly, flatten and mark with a fork.
- 6) Cut with scone cutter into desired discs.
- 7) Bake at a baking temperature for 30 mins.

8. SWEETPOTATO MEAT BREAD

INGREDIENTS

- ½ cup of sweetpotato flour (¼ pound of mashed roots)
- 1 ½ cup of wheat flour (Hard)
- 1 cup oil
- 2 handfuls of margarine
- 1 ½ tsp baking powder
- ½ onion
- 1 tin milk
- 2 eggs
- ½ cup sugar
- ½ tsp nutmeg
- 1 ½ tsp yeast
- 0.5 pounds mincemeat



METHOD

- 1) Mix sweetpotato flour with wheat flour in a bowl.
- 2) Add oil and mix well.
- 3) Grate nutmeg into mixture and mix well.
- 4) Add about 4 tbsp of sugar to ½ bowl of water.
- 5) Add a little salt to taste.
- 6) Add yeast to the mixture.
- 7) Add baking powder to mixture and mix well.
- 8) Roll on a table and knead well.
- 9) Prepare mincemeat and which is then stuffed into the rolls.
- 10) Prepare baking pans by coating with oil.
- 11) Beat an egg and use it to spread on top of the bread before baking.
- 12) Bake properly in a hot oven.

10. MAKING SWEETPOTATO BALLS

INGREDIENTS

- 5 medium-sized sweetpotato roots
- 5 tablespoons chopped onions
- 5 tablespoons cabbage
- 5 tablespoons green pepper
- 1 teaspoon of salt
- 3 eggs
- Breadcrumbs/ flour
- Refined oil (Frytol)
- 2 teaspoons margarine
- ¼ teaspoon of mixed spices, nutmeg and curry powder



METHOD

- 1) Wash 5 medium-sized sweetpotato roots with water.
- 2) Peel and wash.
- 3) Slice the roots into smaller chunks for quicker cooking.
- 4) Put the washed roots into a saucepan and add water to cover.
- 5) Add 1 teaspoon of salt and allow to boil till it's cooked.
- 6) Drain water from cooked roots.
- 7) Mash the cooked sweetpotato, add 5 tablespoons of chopped onion, cabbage and green pepper and 2 teaspoons of margarine.
- 8) Add 1/2 teaspoons of curry powder, nutmeg and mixed spices and stir.
- 9) Add one beaten egg and mold the mixture into small ball shapes.
- 10) Dip molded balls into beaten egg before deep frying.
- 11) Coat molded sweetpotato with bread crumbs one after the other.
- 12) Deep fry.

11. SWEETPOTATO ROLLS

INGREDIENTS

- 1 cup sweetpotato flour
- Refined oil (Frytol)
- 1 medium-size onion
- 1 medium-size fresh green pepper
- 1 tablespoon of salt
- 1 medium-size fresh tomato
- 1 tin of fish or 1 smoked fish
- ¼ teaspoon of mixed spices, nutmeg and curry powder



METHOD

- 1) Mix 300ml of water with 1 cup (100%) of sweetpotato flour (Can add wheat flour to strengthen it a bit).
- 2) Add 3 tablespoons of refined oil (Frytol).
- 3) Add 1 teaspoon of salt and mix the mixture vigorously.
- 4) Put a flat saucepan cover or an inverted frying pan on fire or burner to heat it up.
- 5) Spread the mixture on the back of the frying pan or on the flat saucepan cover with your hand (care must be taken to avoid burning the hand) OR a knife to ensure a thin sheet-like layer.
- 6) Remove the dry flour (thin sheet) with a knife carefully.
- 7) Chop sweetpotato leaves, onion, fresh green pepper and fresh tomato.
- 8) Add ¼ teaspoon of mixed spices, nutmeg and curry powder and half teaspoon of salt.
- 9) Add fish to the chopped vegetables.
- 10) Put the vegetables into a saucepan and steam for 10 minutes.
- 11) 1 tablespoon of the steamed vegetables (as fillings) onto the thin dried flour sheet and roll or fold into a rectangular shape.
- 12) Seal the edges of the folds with wet flour mixture and deep fry for 20 minutes.

II. RECIPES FROM MALAWI AND CIP - EAST AFRICA (all photos here credited to Erna Abidin)

1. SWEETPOTATO BUNS

INGREDIENTS

- 1 cup sweetpotato mash
- 3 cups bread flour
- 1 tablespoon sugar
- Pinch Salt
- 1.5 teaspoons yeast
- 3 tablespoons oil/fat
- Water as needed



METHOD

- 1) Begin warming the oven (180° Centigrade) or light the charcoal in charcoal oven.
- 2) Take 1 teaspoon of sugar in a cup with the yeast. Add 1.5 tablespoon of warm water and leave to rise.
- 3) Put mashed sweetpotato in mixing bowl and sift in the dry ingredients.
- 4) Add oil/fat and rub it till crumbles.
- 5) Add risen yeast, salt, improver and mix.
- 6) Add water and knead till done to required texture (5-10 minutes).
- 7) Roll into a ball, knead the dough till smooth.
- 8). Divide the dough into equal small balls and roll out to make desired shapes.9). Cover the buns with a cloth and leave to rise for 25 minutes – 1 hr (preferable) in a warm place, for example in the direct sunlight outside
- 10) Grease a bun pan
- 11) Put a small amount of wheat flour on the base of the sheet where the breads will be baked before placing the raw buns on top. Cook in a hot oven (180° Centigrade) for 25 minutes or till brown.

2. SWEETPOTATO CAKE

INGREDIENTS

- 1 cup sweetpotato flour
- 3 cups wheat flour
- 4 eggs
- 5 teaspoons margarine
- 3 tablespoons baking powder
- 1 teaspoon lemon/vanilla
- 3 tablespoons sugar
- Milk as necessary

METHOD

- 1) Put margarine and sugar into a mixing bowl and mix them well.
- 2) Beat the eggs and add to the bowl.
- 3) Grate lemon rind and add to the bowl and mix.
- 4) Sieve sweetpotato flour, wheat flour and baking powder together and then add milk.
- 5) Add a little water and vinegar to the mixture; it should to make a good paste, it should not be watery or hard.
- 6) Grease baking pan and pour in contents.
- 7) Bake in oven for 30 minutes or till brown.
- 8) Serve.

3. SWEETPOTATO RELISH

INGREDIENTS

- 1kg tender sweetpotato leaves
- 2 medium onions
- 4 medium tomatoes
- 4 tablespoons flavor*
- Oil/fat
- 1 tablespoon salt
- Half container of warm water

METHOD

- 1) Clean leaves by removing dirt.
- 2) Prepare the onions and tomatoes and slice into separate dishes.
- 3) Shred the leaves.
- 4) Wash twice in warm water to remove the anti-nutrients.
- 5) Heat the oil and fry onions till they start to brown.
- 6) Add tomatoes and let cook for while.
- 7) Add the vegetables and let cook for 5 minutes.
- 8) Add the flavor and stir the contents and let cook till done.
- 9) Serve with bananas, "tsima" or rice as desired.

*The flavor can be ground nut paste, lemon, etc.

4. JUICE FROM ORANGE-FLESHED SWEETPOTATO STORAGE ROOTS

INGREDIENTS

- 3 cups mashed sweetpotato roots
- 1000 ml water
- 500 g sugar
- 2 tablespoons grated lemon rind and juice
- Orange or pineapple extract



METHOD

- 1) Wash sweetpotato roots and peel.
- 2) Mash to a fine mixture.
- 3) Put the mashed potato through a sieve.
- 4) Pour warm water over the mashed potato.
- 5) Add grated lemon rind and juice in the sieved potato juice.
- 6) Add orange or pineapple extracts as an essence.
- 7) Add sugar.
- 8) 8. Heat for 10 minutes.
- 9) Sieve to remove other debris.
- 10) Distribute and refrigerate to serve cold.

5. JUICE FROM SWEETPOTATO LEAVES

INGREDIENTS

- 3 handfuls tender sweetpotato leaves
- 1000 ml water
- 500 g sugar
- 2 tablespoons grated lemon rind and juice
- Orange or pineapple extract



METHOD

- 1) Boil the tender leaves till the color changes.
- 2) Remove from fire and sieve out juice.
- 3) Add grated lemon rind and juice as a color neutralizer.
- 4) Add orange or pineapple extracts as an essence.
- 5) Add sugar.
- 6) 6. Heat for 10 minutes.
- 7) Sieve to remove other debris.
- 8) Distribute and refrigerate to serve cold.

6. ONE POT DISH (OFSP MIXED WITH MEAT / EGGS / SMALL FISH / LEGUMES)

INGREDIENTS

- Boiled sweetpotato
- Meat
- Eggs
- Fish
- Legumes
- Tomato
- Onion
- Sweetpotato leaves
- Salt



METHOD

- 1) Mix boiled sweetpotato and cooked meat in one pot.
- 2) Add fried onion and tomatoes and salt to taste and let it simmer.
- 3) You can follow the same procedure when preparing small fish or legumes.
- 4) For eggs, you can scramble eggs or boil and add fried sweetpotato leaves.

Tips:

You may serve this as a complete dish.
Peel and cut into sizeable pieces and put in a basin of water to avoid darkening of the sweetpotato.
You can use any type of fish available, dry or fresh.



7. AFRICAN MUFFIN

INGREDIENTS

- 5 ripe bananas
- 4 medium OFSP roots
- 2 cups maize flour or sweetpotato flour or mashed sweetpotato
- 1 teaspoon salt
- Cooking oil



METHOD

- 1) Boil the roots until tender.
- 2) Mash boiled sweetpotato roots to a fine mixture.
- 3) Measure 2 cups mashed sweetpotato to one cup of maize flour and peeled bananas and mix.
- 4) Add half teaspoon salt and sugar if so desired.
- 5) Pound until smooth.
- 6) Take balls of the mix and press into a plastic mold.
- 7) Fry muffins in a pan or pot till brown. You can serve these as a snack.

8. CHINCHINS

INGREDIENTS

- 4 tomatoes
- 2 eggs
- 2 onions
- OFSP roots
- 2 cups wheat flour
- 1 teaspoon salt
- 1 teaspoon pepper (chili) powder
- Cooking oil



METHOD

- 1) Boil sweetpotato roots until tender.
- 2) Mash boiled sweetpotato roots till smooth.
- 3) Measure 2 cups mashed sweetpotato, one cup wheat flour, 2 eggs, tomato and onion.
- 4) Add salt and pepper.
- 5) Pound until they are well mixed.
- 6) Wash hands and make small balls.
- 7) Deep fry till golden brown and serve as a snack.

Note: this recipe can be used to make vegetarian sausages

9. MANDASI

INGREDIENTS

- 1 cup sweetpotato mash
- 2 cups bread flour
- 3 tablespoons sugar
- Pinch salt
- 2 teaspoons yeast
- 3 tablespoons oil/fat
- Water or milk as needed



METHOD

- 1) Mix all dry ingredients together.
- 2) Add milk or water little by little till you make a dough.
- 3) Roll into a ball and knead the dough till smooth.
- 4) Make small balls and roll into the desired shape.
- 5) Let the balls rise a little while before you start frying.
- 6) Deep fry mandasi till golden brown.
- 7) Serve as a snack.

10. OFSP PORRIDGE recommended for Infant Young Child Feeding (IYCF)

INGREDIENTS

- Sweetpotato mash
- Maize flour (from ground maize)
- Salt
- Sweetpotato leaves
- Cooking oil/groundnuts/ milk



METHOD

- 1) Boil and mash sweetpotato.
- 2) Boil water (any amount as desired).
- 3) Mix sweetpotato mash and maize flour in the ratio of 2 sweetpotato mash:1 maize flour.
- 4) Let the porridge simmer. When the porridge is cooked add a handful of pounded sweetpotato leaves. Add milk or eggs or cooking oil or groundnuts flour as desired and let it simmer.
- 5) Serve hot.

Note: Complete six food group porridge recommended for children and pregnant mothers.

11. SWEET BEER (THOBWA)

INGREDIENTS

- 2 cups sweetpotato flour or flour from sweetpotato peels
- 1 cup maize flour
- ½ cup fermented millet flour
- Sugar to taste
- Water as needed

METHOD

- 1) Put some water in a pot and bring to the boil.
- 2) As soon as it begins boiling, add 1 cup of maize flour and 2 cups of sweetpotato flour, stirring well with a cooking stick.
- 3) Stir frequently to avoid burning. When the porridge is well cooked, allow the porridge to cool before you add fermented millet flour and boil again until done.



Sweetpotato peels

12. OFSP CHIPS

INGREDIENTS

- Sweetpotato roots
- 1 liter cooking oil
- 2 tablespoons salt



METHOD

- 1) Peel and wash sweetpotato roots and cut into sizeable slices.
- 2) Put the slices in a bucket of water to avoid darkening of the slices.
- 3) Deep fry as chips.
- 4) Salt to taste.

Note: Can be served with cabbage salads and beef or chicken if so desired.

13. OFSP AFRICAN CAKE/ TRADITION CAKE

INGREDIENTS

- Maize flour
- Banana
- Salt
- Sugar
- Mashed sweetpotato
- Warm water or milk or cooking oil
- Soda



METHOD

- 1) Pound banana.
- 2) Mix with maize flour and sweetpotato in the ratio 1 maize flour: 1 sweetpotato mash: 0.5 banana
- 3) Add warm water or milk and soda. Mix thoroughly till you make a light porridge.
- 4) Smear margarine or cooking oil on the bottom of the cooking pot and pour the porridge into the pot.
- 5) Place charcoal on top and bottom of the cooking pot and bake till cooked.
- 6) Serve as a snack.

14. OFSP CHAPATTI (Indian Flat Bread)

INGREDIENTS

- Mashed sweetpotato
- Bread flour
- Salt
- Cooking oil



METHOD

- 1) Mix mashed sweetpotato with bread flour in the ratio of 1:2 (1 part mashed sweetpotato : 2 parts bread flour).
- 2) Add salt and a tablespoon of cooking oil.
- 3) Make a dough.
- 4) Make small balls and roll on a flat surface till you make a flat shape and put in a frying pan.
- 5) Take off chapatti when it is cooked and serve with any relish as desired.

15. FUTALI (Sweetpotato in peanut sauce)

INGREDIENTS

- Sweetpotato roots boiled
- Salt
- Groundnut flour or tomato

METHOD

- 1) Add groundnut flour to boiled sweetpotato and salt and let it simmer.

Note: You may also use tomato.

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