



Business Opportunities in Sweet Potato Production

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Sweet potato value addition

From sweet potato flour and chips to beverages and bakery products. Read about the wide array of options entrepreneurs have to explore in the value-addition sector. **PAGE 6**

PRODUCTION

Why venture into sweet potato production

They have high productivity compared to other staple food crops like maize. The current average yield for sweet potato in Western Kenya is 7t/ha

Kenya is one of the largest, sweet potato (*Ipomoea batatas* (L.) Lam) producers in sub-Saharan Africa with an output of approximately 650,000 tons.

Reasons/ Importance of sweet potato cultivation

Sweet potatoes have a short maturity period of approximately 3-5 months. They are productive even in poor soils and in dry conditions and can withstand stresses and only prone to a few pests and diseases.

They have high productivity compared to other staple food crops like maize. The current average yield for sweet potato in Western Kenya is 7t/ha. With increasing research on improved varieties, Kenya Agricultural and Livestock Research Organi-

zation (KALRO) projects a higher potential yield of 17.5t/ha.

Sweet potatoes can be grown in a wide range of environments with minimal inputs. Unlike cereal crops, which must be harvested at the same time, sweet potatoes offer flexibility. They can be harvested piecemeal or stored unharvested in the ground after reaching maturity. They provide many benefits including fodder for animals.

Farmers can benefit from the increasing demand for value-added sweet potato products by engaging in value addition. This process allows them to create higher-value goods, such as sweet potato flour, which can be used to produce confectionery items and other baked products.

Sweet potato farmers can explore various business opportunities, including vine multiplication, selling fresh tubers, and creating value-added meals and consumable products from the tubers to sell at a higher price.

VINE MULTIPLICATION

Vine multiplication and selling business

Healthy and disease-free sweet potato plants are carefully pruned to produce vine cuttings, typically 20–30cm in length, each containing at least 2–3 nodes

THE PROCESS OF sweet potato vine multiplication begins with the selection of healthy and disease-free plants. Once identified, these plants are carefully pruned to produce vine cuttings, typically 20-30cm in length, each containing at least 2-3 nodes. The cuttings are planted directly into the soil in beds or placed in a rooting medium to encourage root development. Two of the three nodes should be submerged in the rooting medium. The beds should be 1 meter wide and 5 meters long for easier management. Additionally, there should be 50 cm of spacing between beds, or 5 meters if the varieties differ.

Rooting medium options include moist sand, vermiculite, or water. By providing optimal conditions such as adequate moisture and sunlight, the vine cuttings will develop roots within a few weeks, signalling their readiness for transplanting into the field.

Things to consider when doing vine multiplication:

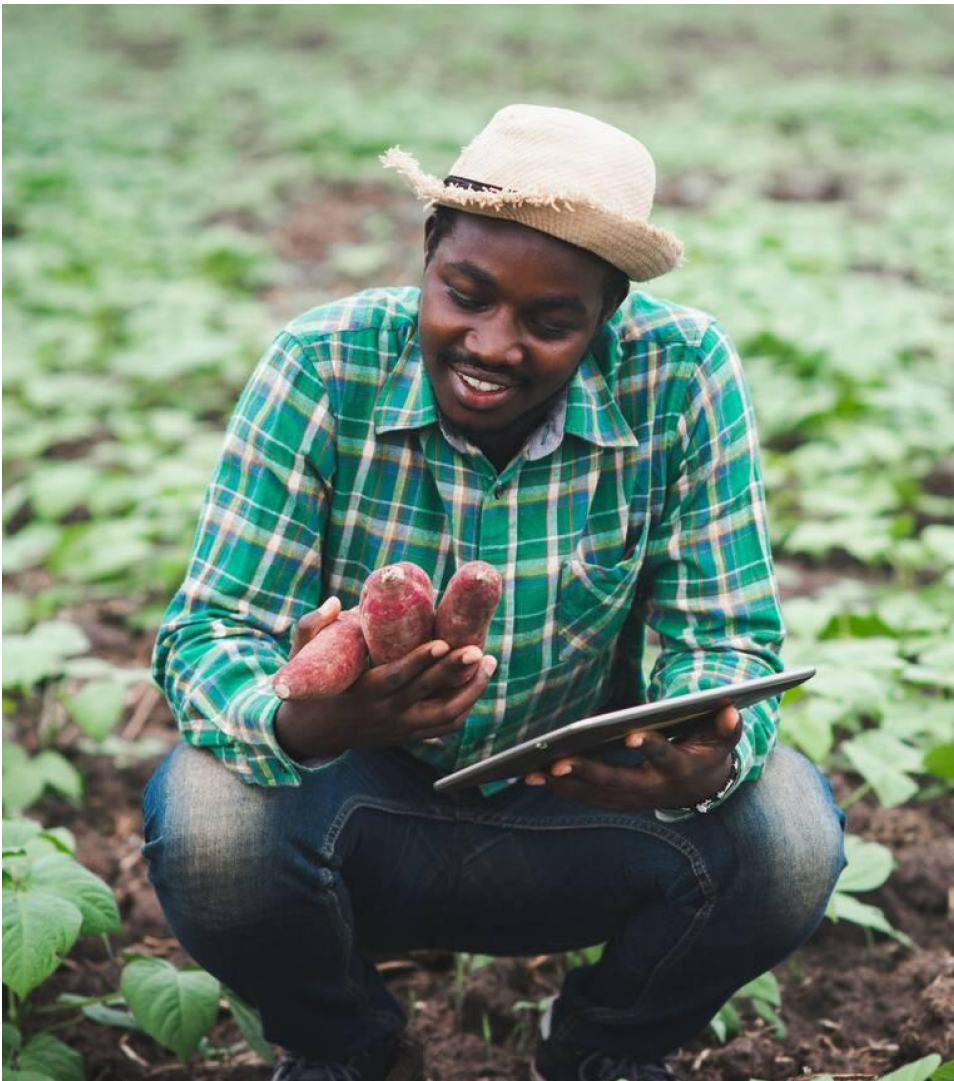
While sweet potato vine multiplication offers numerous benefits, organic farmers must consider several factors to ensure successful implementation:

Variety Selection: Choose sweet potato varieties that are well suited to local growing conditions and market preferences. Consider factors such as drought tolerance, pest resistance, and culinary attributes when selecting varieties for vine multiplication.

Site Preparation: Prepare the planting site by ensuring proper soil fertility, drainage, and weed management. Incorporating organic amendments such as compost or aged manure can improve the soil structure and nutrient availability, promoting healthy vine growth and root development. Consideration of water access for irrigation is important, as vines should be ready by the start of the rainy season. Therefore, vine multiplication should take place during the dry season, making it essential to ensure the availability of water during this period.

Vine Cutting Preparation: Handle vine cuttings with care to prevent damage to nodes and stems. Use sharp, sterilized cutting tools to make clean cuts, and remove any leaves from the lower portion of the cutting to promote root formation.

Rooting Medium: Choose a suitable rooting





medium based on local availability and environmental conditions. Maintain consistent moisture levels and avoid water logging to prevent rotting of vine cuttings.

Transplanting and Care: Transplant rooted vine cuttings into the field at the onset of the rainy season or during periods of optimal soil moisture. Provide adequate spacing between plants to facilitate air circulation and minimize competition for resources. Regularly inspect plants for signs of pests, diseases, or nutrient deficiencies, and take prompt action to address any issues that arise.

Farmers should note that vines should only be used for three growing cycles. Using them beyond this limit will result in reduced yields, both in quality and quantity.

Estimates of gross margin in vine multiplication

The recommended seed rate for sweet potato is 11-13bags of vines per acre. A 50 kg bag carries about 1,000 pieces of vines that measure 30cm in length with 2-3 nodes.

By multiplying 2-3 bags of vines on a small piece of land, a vine multiplier harvests about 10 bags of cuttings hence earning between Ksh11,000 and Ksh13,000 from a seed capital of between Ksh2000 and Ksh3000. The vine

multiplier should source the starter material/vines from institutions such as KALRO and KEPHIS that guarantee clean, virus free vines and only needs a bag or two to multiply the vines. Therefore, the only cost that the multiplier incurs is costs to procure the starter seed for multiplication and maybe, fuel costs if they are not using solar powered irrigation kits.

Please note: The above case is premised on the assumption that this vine multiplier only received one customer intending to put just one acre of their land under sweet potato production. In the opportunity of more customers, the seed multiplier will make much more. For steady markets, multipliers should



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establish and market themselves as suppliers of clean and disease-free vines that guarantee sweet potato producers of good quality and quantity yields.

Market Demand: Kenya has a high demand for sweet potatoes due to their nutritional value and culinary versatility. Consumers in both urban and rural areas seek sweet potatoes for various purposes, including consumption, processing into value-added products, and livestock feed. As a result, there is a constant need for high-quality planting materials to meet this demand, presenting a significant market opportunity for sweet potato vine multiplication.

Target Market:

Smallholder Farmers: Small-scale farmers form the backbone of agriculture in Kenya. By offering affordable, accessible clean planting materials through vine multiplication, these farmers can enhance their productivity and income levels.

Agro-Processors: Agro-processing companies in the region require a steady supply of high-quality sweet potatoes for processing

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into products such as chips, flour, and snacks. Vine multiplication ensures a reliable source of raw materials, fostering partnerships between farmers and agro-processors.

Livestock Farmers: Sweet potato vines serve as nutritious fodder for livestock, particularly dairy cattle and pigs. By promoting vine multiplication, livestock farmers can access a sustainable source of feed, thereby improving animal health and productivity.

Benefits of Sweet Potato Vine Multiplication

1. **Rapid Multiplication:** Unlike traditional seed purchase or germination, which can be time-consuming, sweet potato vine multiplication allows for rapid multiplication of planting material. This enables farmers to quickly expand their sweet potato cultivation areas and meet growing market demands.
2. **Cost Effectiveness:** By eliminating the need for seed purchase or germination, sweet potato vine multiplication significantly reduces production costs for farmers. Additionally, the use of vine cuttings reduces the risk of seed-borne diseases, minimizing the need for chemical inputs and promoting organic farming practices.
3. **Improved Yield and Quality:** Sweet potato vine multiplication produces robust and healthy plants with well-established root systems. As a result, farmers can expect higher yields and superior crop quality compared to conventional seed propagation methods. Furthermore, the enhanced vigour of plants propagated through vine multiplication increases their resilience to environmental stressors and pest attacks.
4. **Resilience in the face of climate change:** Sweet potatoes are inherently resilient to adverse environmental conditions such as drought, heat, and poor soil fertility, making them well-suited to climate-affected regions. Additionally, by utilizing vine multiplication, farmers can quickly recover from crop losses and adapt their production systems to changing climatic conditions. Furthermore, sweet potato vine multiplication promotes soil health and conservation by enhancing soil structure, organic matter content, and nutrient cycling. The extensive root system of sweet potato plants helps prevent soil erosion, improve water infiltration, and suppress weeds, thereby mitigating the impacts of climate-induced soil degradation.



SWEET POTATO ROOTS

Efficient ways to make the most out of sweet potato roots

SWEET POTATOES CAN be sold fresh, dried or in powder form. The first step in determining how and when to sell the products is conducting a market survey.

This is carried out to analyze product pricing, quantities to produce, desired quality of the product, varieties required for the specific market, market segments, market industries and the expected income. When selling fresh tubers, consider the following marketing tips:

- **Season-Timing-** Produce when the product is highly needed in the market. (Refer to calendar) Avoid producing when everyone else is doing it. In the months of January and February for instance, there are few farmers taking sweet potatoes to the market so this would be a good time to sell. To produce out of season, use irrigation or grow the sweet potatoes near a river.
- **Understand competing products and where your competitive advantage is.** For example, is the variety you are selling of superior qualities? Are they organically produced? If so, find a way to make the potential buyers aware of these qualities.



- When transporting ensure that the potatoes are not dented. Use transport vehicles that keep them safe, such as cargo lorries. Farmers can come together to source for transport.
- Identify market opportunities and be proactive to seek them. These could be hospitals, schools, supermarkets, farmers markets, neighbours, households, other farmers, export market.
- When targeting institutions or large organizations, it is important to aggregate produce with other farmers to ensure consistency in supply and save on transport cost.

Before taking the surplus to the market, ensure your family enjoys the nutritious value of your produce. There are various ways of preparing sweet potatoes for home consumption.

Sweet potato recipes

In addition to boiled potatoes, which are commonly consumed with tea, sweet potatoes can be used to make other delicious African meals as follows:

a) Mukimo

Ingredients

- 6 Medium-sized sweet potatoes
- 2 handful of vegetables
- 250 gms raw maize/green grams

- 1 table spoon of cooking oil
- 1 teaspoon salt

Method:

- Peel the sweet potatoes.
- Boil them then add washed vegetables with salt while cooking then add cooked green grams/cooked maize while mixing till ready.
- Pound/mash all the mixed ingredients and serve while hot/cold.

b) Githeri

Ingredients: Maize, beans, chopped sweet potatoes.

Method:

- Mix maize and beans then cook.
- Add freshly chopped sweet potatoes when ready then serve while hot/cold.

c) Mushenye

Ingredients: Sweet potatoes and beans

Method:

- Boil beans then add sweet potatoes then mix and mash.
- Serve while warm/cold.

VALUE ADDITION

Sweet Potato Value Addition

IN KENYA, SWEET potatoes have long been a dietary staple, cherished for their nutritional richness and versatility. However, beyond their traditional consumption, sweet potatoes present abundant business opportunities through value addition. Entrepreneurs in Kenya are increasingly recognizing the potential of sweet potato value-added products, tapping into diverse markets and creating innovative offerings. In this piece, we explore the vigorously growing landscape of sweet potato value addition in Kenya, examining the initial investments required, profit margins, and effective marketing strategies for success.

With rising consumer awareness of health and nutrition, coupled with a growing preference for locally sourced and sustainable products, the demand for value-added sweet potato products in Kenya is on the rise. From sweet potato flour and chips to beverages and bakery products, entrepreneurs have a wide array of options to explore in the value-addition sector. The versatility of sweet potatoes, coupled with their abundance and affordability, makes them an attractive raw material for innovative businesses seeking to cater to evolving consumer preferences.

Initial Investments and Profit Margins:

The initial investments required for venturing into sweet potato value addition can vary depending on the scale and complexity of the operation. However, here is a rough estimate of the initial investments required for some common sweet potato value-added products:

Sweet Potato Flour Production:

To make sweet potato flour, you will require a potato crusher and a miller.

Method:

- Wash the fresh potatoes with clean water.
- Drain the water.
- Place in a potato crusher, then crush into small pieces.
- Sun-dry/use a dryer for 2-3 days to maintain its original color.
- Mill the potato dried chips to get the flour.

The dried chips can be stored by using hermetic bag/airtight bag and can stay fresh for almost 2years. Ensure to place the packed potatoes in a cool and dry place, that is raised from the floor to avoid attracting moisture. The sweet potato flour is used to make cakes, bread, biscuits, doughnuts, porridge, mandazi, chapati, samosas.

Setting up a small-scale sweet potato flour production unit may require an initial investment ranging from KSH 200,000 to KSH 500,000. This includes the cost of equipment such as grinders, dryers, and packaging machines, as well as raw material procurement and facility setup. Profit margins for sweet potato flour production can range from 30%-

50%, and these profit margins can be achieved within 6-12 months of operation depending on factors such as production efficiency, market demand, and pricing strategies.

For example, a small-scale sweet potato flour production unit can produce approximately 500 kilograms of sweet potato flour per month. With a selling price of KSH 200 per kilogram, the monthly revenue could amount to KSH 75,000. After deducting production costs, including raw materials, labour, and overhead expenses, the monthly profit margin could range from KSH 25,000 to KSH 50,000.

Sweet Potato Chips and Snacks:

Crisps

Ingredients:

- 6 medium sized roots, 2 cups of oil, salt, or pepper.

Method:

- Remove soil from the roots, peel and place the roots into clean water.
- Slice into very thin pieces using a knife or a grater.
- Drain off then water.
- Heat the oil and deep fry till it turns golden.
- Remove and serve either warm or cold.

Crunchies/ crackies/ bhajia

Ingredients:

- 3 cups of mashed potato
- 1 cup of wheat flour
- 1 teaspoon of salt
- ½ Teaspoon hot pepper (optional)
- Cooking oil
- Lukewarm water

Method

- Sieve all the dried ingredients to a mixing bowl.
- Add oil.
- Add mashed potato.
- Add pepper optional.
- Mix to form smooth dough until it leaves the bowl clean.
- Add a little lukewarm water, keep mixing until hard and smooth.
- Cover it immediately with a clean cotton cloth
- Cut, stuff into the noddle machine, rotate the machine to get the desired shape and dip them in the heated oil.
- Cook, turn and remove when they are still yellow to let them cool.

Chips

Ingredients:

- 4 medium sized potatoes, oil

Method:

- Wash and peel potatoes and cut into desired shape.





- Soak in salty water for 10mins to remove excess starch.
- Drain water by drying off with paper/kitchen towel.
- Deep fry in hot oil for 2-3 mins.
- Sprinkle with salt to taste

N/B: You can prepare with non-peeled sweet potatoes.

For entrepreneurs looking to produce sweet potato chips and snack foods, the initial investment could range from KSH 100,000 to KSH 300,000. This includes the cost of slicing and frying equipment, packaging materials, and initial raw material procurement. Profit margins for sweet potato chips and snacks typically range from 40% to 60%, achieved within 3 to 6 months of operation depending on factors such as branding, distribution channels, and product differentiation.

For instance, a small-scale sweet potato chips production unit can produce approximately 200 kilograms of sweet potato chips per month. With a selling price of KSH 300 per kilogram, the monthly revenue could amount to KSH 60,000. After deducting production costs, including raw materials, labour, and packaging, the monthly profit margin could range from KSH 24,000 to KSH 36,000.

Sweet Potato Beverages:

Juice

Ingredients: 4 raw grated orange fleshed sweet potato, 5 cups of water, 5 tablespoons of lemon juice and ½ cup of sugar to taste.

Method:

- Grate the sweet potato
- Boil water and sugar to make syrup
- Add the grated sweet potato to syrup stir
- Let it cool, sieve and add the lemon juice

Smoothies,

Ingredients; Sweet potato (orange-fleshed varieties), milk, flavours (vanilla, strawberry), sugar.

Method:

- Boil the sweet potato and milk separately (optional).
- Mix all the ingredients and blend to your preferred texture.
- Serve.

Venturing into sweet potato beverage production may require an initial investment of KSH 300,000 to KSH 600,000. Profit margins for sweet potato beverages can vary widely but are generally around 50%-70%, and these profit margins are achieved within 6-12 months of operation.

For example, a small-scale sweet potato beverage (smoothie) production unit can produce approximately 1,000 litres of sweet potato juice/ smoothie per month. With a selling price of KSH 100 per litre (KSH 50 per 500ml glass), the monthly revenue could amount to KSH 100,000. After deducting production costs, including raw materials, processing, and packaging, the monthly profit margin could range from KSH 25,000 to KSH 40,000.

Bakery and Confectionery Products:

Producing sweet potato-based bakery and confectionery products may require an initial investment ranging from KSH 150,000 to KSH 400,000. Profit margins for bakery and confectionery products can range from 40%-60%, and these profit margins are usually achieved within 6 to 12 months of operation.

For instance, a small-scale bakery specializing in sweet potato muffins can produce approximately 150 muffins/day and package them into 25 half-dozen packs. That means per month, the bakery would do 300 packages of muffins. With a selling price of KSH 250 per package, the monthly revenue could amount to KSH 75,000 from just the half dozen packages of muffins, not including sales from single-piece customers. After deducting production costs, including raw materials, labour, and packaging, the monthly profit margin could range from KSH 20,000 to KSH 30,000.

Through weekly Kiswahili and local languages radio programmes, TOF Radio helps to improve awareness and knowledge of sound agroecological practices, strengthen the link between researchers and farmers to enhance food security, reduce poverty and increase household incomes among farmers in Kenya.

TOF Radio Stations

Emuria FM	Monday and Friday -10-11AM
Getembe FM	Monday 8PM
Milele FM	Tuesday 11-12AM
Mutongoi FM	Wednesday 10-11AM
Coro FM	Thursday 8.20-9PM
Ingo FM	Friday 8-9PM



Marketing Strategies for Sweet Potato Value-Added Products:

EFFECTIVE MARKETING IS crucial for the success of sweet potato value-added products in Kenya. Some strategies that entrepreneurs can adopt to promote their products and reach their target audience include:

Branding and Packaging: Invest in attractive and informative packaging that highlights the unique features and benefits of your sweet potato products. Use eye-catching labels, logos, and branding elements that resonate with your target market and differentiate your products from competitors.

Product Placement and Distribution: Identify strategic distribution channels such as supermarkets, grocery stores, farmers' markets, and online platforms to reach consumers. Establish partnerships with retailers and distributors to ensure optimal product placement and visibility on store shelves.

Sampling and Demonstrations: Organize sampling sessions and product demonstrations at high-traffic locations such as shopping malls, events, and food fairs. Allow consumers to taste and experience your products first-hand, and use these opportunities to gather feedback and generate buzz.

Digital Marketing and Social Media: Leverage digital marketing channels such as social media, websites, and email newsletters to promote your sweet potato products. Create engaging content, share recipe ideas, and interact with your audience to build brand awareness and loyalty.

Partnerships and Collaborations: Collaborate with restaurants, cafés, and food bloggers/influencers to showcase your sweet potato products and reach new audiences. Participate in food festivals, collaborations, and joint promotions to expand your brand presence and attract customers.

Health and Nutrition Messaging: Highlight the health benefits and nutritional value of sweet potatoes in your marketing communications. Emphasize key selling points such as gluten-free, higher fibre, vitamins, and antioxidants to appeal to health-conscious consumers looking for wholesome and nutritious food options.



Conclusion:

Sweet potato value addition presents a lucrative business opportunity for entrepreneurs in Kenya, offering a wide range of products with significant profit potential. By making strategic investments, adopting effective marketing strategies, and tapping into the growing demand for healthy and sustainable food products, entrepreneurs can carve out a niche in the competitive market landscape. With innovation, creativity, and a focus on quality, sweet potato value addition has the potential to drive economic growth, create employment opportunities, and contribute to the development of Kenya's agricultural sector.

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