

# THE NIGERIA ECOOKBOOK



**First Edition:** January 2024

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This eCookbook has been funded by the UKAid from the UK government; however, the views expressed do not necessarily reflect the UK government's official policies.

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# ACKNOWLEDGEMENTS

Our sincere appreciation goes to God Almighty who made everything possible. We appreciate the project manager and project officer who contributed time, knowledge, and other resources to this eCookbook.

The efforts of Veronica Akpasoh and Anthony Akpasoh are particularly appreciated as the project leads for this eCookbook. We appreciate the 9 (nine) cooks, who were willing to carry out the cooking of the traditional dishes and provide their experiences which forms a huge part of this eCookbook.

We appreciate the food tasters who graciously tasted the meals and gave their honest feedback that contributes to the eCookbook. We also express our appreciation to the MECS team, Alicia Butterfield and Jacob Fodio Todd who relentlessly provided guidance throughout the process of developing this eCookbook.

Furthermore, we thank Modern Energy Cooking Services (MECS) for funding this study with the aim of narrowing the clean cooking gap in Nigeria by showing that it is possible to cook Nigerian traditional meals with electric pressure cookers.

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# ABBREVIATIONS

CCT	Controlled Cooking Test
EPC	Electric Pressure Cooker
KWh	Kilowatt Hour
LPG	Liquified Petroleum Gas
NDC	Nationally Determined Contribution

# INTRODUCTION

This edition of the Nigeria eCookbook is a publication by the Modern Energy Cooking Service Programme of Loughborough University, and forms part of its series of eCookbooks. Cooking with polluting biomass wood has become one of the biggest sources of household air pollution in the Global South leading to increasing deaths caused by diseases such as pneumonia, asthma, lung cancer, acute respiratory infections, etc. In Nigeria, about 60% of the population depend on wood as a source of cooking fuel. After Malaria and HIV/AIDS, smoke from open fire is the next biggest killer as it results in over 95,000 deaths annually in Nigeria.

As per its Nationally Determined Contribution (NDC) commitments, the Nigeria Energy Transition Plan 2021 advocates the replacement of traditional cooking fuels particularly firewood and charcoal with cleaner biomass fuels and LPG as a transition, and with electric and biogas stoves to reduce emissions. Cooking with electricity is unarguably the cleanest form of cooking.

This eCookbook builds on the Controlled Cooking Test (CCT) study carried out by Tovero Energy Ltd and published by Modern Energy Cooking Services. The controlled cooking test was carried out with the following objectives.

1. Determine the cost of cooking the same meals across different cooking technologies.
2. Evaluate the time of cooking the same meals across different cooking technologies.
3. Investigate the energy consumption of cooking the same meals across different cooking technologies.

The controlled cooking test showed that cooking with electricity is the cheapest and fastest form of cooking.

The controlled cooking test study further revealed that cooking with EPC requires less water than cooking with Kerosene stove and LPG stove. More details of the controlled cooking test study can be found on the MECs website. One of the recommendations of the CCT study was the development of a Nigerian eCookbook to show the possibility of cooking traditional Nigerian meals with an electric pressure cooker.

This eCookbook aims to explore the following;

1. The possibility and convenience of cooking traditional Nigerian meals with an electric pressure cooker.
2. The taste of traditional Nigerian meals cooked with an electric pressure cooker.
3. The energy consumed and energy cost of cooking traditional Nigerian meals with an electric pressure cooker.

# KEY FINDINGS FROM CCT STUDY

## COOKING COST

It is averagely over two times (2x) cheaper to cook with an EPC.

## COOKING TIME

It is generally faster to cook with an EPC than kerosine stoves or LPG stoves.

## CONVENIENCE

There is no smoke, fumes or external heat from the EPC. It is also very easy to move around.

## COMPATIBILITY

So many Nigerian foods can easily be prepared with an EPC.

## TASTE

The food taste is generally great and in some cases better than using firewood.

## SAFETY

No burns from heat or shocks from electricity because the pot is properly insulated. There is also no smoke or gas fumes making it a healthier option.



# TESTIMONIALS

Have you ever wondered how possible it is to make your favourite traditional meals using an EPC?

*Let's find out from these amazing people, shall we?*

**Here's Adebimpe's experience;**



**Q: Kindly Introduce yourself**

*"My name is Dada Adebimpe Bilkis"*

**Q: What do you want to Cook?**

*"I'm here to cook Amala, Ewedu and buka stew with the mixture of palm oil and vegetable oil and orishirishi, with goat meat using EPC"*

**Q: What method of cooking do you use at your residence?**

*"I use LPG stove to cook at my house"*

**After cooking;**

**Q: How is your experience with the EPC?**

*"It was a nice experience, infact i never knew something like this can be used to make Amala, honestly, because I felt Amala can only be made with gas burner or other electric burner"*

**Q: What advantages have you observed?**

*"It does not emit heat because when I'm using it to Cook everywhere is just calm, if somebody enters my house when I'm using it, nobody will even know I'm cooking because it conceals the smell of the food too"*

*"You can use it to Cook anywhere"*

*"It is fast and cheap. Cooking Gas in Nigeria today is expensive. So this is preferable to Gas".*

## ***Doubting Adebimpe? Hear what Chidinma has to say;***

***“I love this EPC machine, it is one in a million and I would recommend it to everybody”***



**Q: Kindly introduce yourself**

*“My name is Chidinma Okwum and I’m from Abia State”*

**Q: What did you cook?**

*“I prepared beans pudding or what we call Moi Moi in Nigeria”*

**Q: How is your experience with the EPC?**

*“I totally enjoyed making this meal with the EPC”*

*“I saves a lot of stress, that time you would be running up and down checking the food, you don’t need to worry yourself, just allow it cook and it will off by itself”*

**Q: What advantages have you observed?**

*“It saves a lot of time, it is very easy and simple”*

*“The food tastes great and better than gas, the taste is intact”*

*“After cooking the EPC will go off by itself”. It is very convenient.*

**Q: What difference have you noticed?**

*“I think there is a big difference, normally it takes 30 to 45 minutes to Cook on gas but as you can see, it’s not even up to 25 minutes and it is done”*

*“The food required less water to cook, hence, there were no issues of leakages or water sipping into the moi moi. This reserved the taste of the meal. It also took less time to cook compared to other cooking methods and was more convenient as it did not require constant monitoring.”*



**Edna and Affiong also think making their traditional meals with EPC have been so easy and convenient!**

**Q: Introduce yourself**

*"My name is Edna Dogon-Yaro and I'm from Adamawa State, Lafian Margi Local government area"*

**Q: What did you cook?**

*"Today I used EPC to prepare Margi Special and Tuwo Masara"*

**Q: What is your experience with the EPC?**

*"It is very very easy, it doesn't waste time"*

**Q: What advantages have you observed?**

*"The vegetables are evenly cooked without continuous stirring. This allows the fish to remain whole while being cooked. It also takes less time to cook. Gas is very expensive, with this, no need for gas"*

**Q: What challenges do you think you may have with the EPC?**

*"Power, if i don't have a source of Gen, I don't have any other challenges"*

**Q: Would you be willing to own an EPC for your family?**

*"infact, I don't mind, I love EPC"*



## Affiong's Experience

**Q: Introduce yourself**

*"I'm Affiong Imeh"*



**Q: What do you want to Cook?**

*"I Want To Cook Afang Soup"*

**Q: What method of cooking do you use at your residence?**

*"Gas And Sometimes Firewood"*



**Q: How is your experience with the EPC?**

*"it is very easy, I don't have any stain like others maybe if you use firewood before you finish you will see stain all over your body but this one nothing like stain, very easy to use and cook"*

**Q: What challenges do you think you may have using the EPC?**

*"If I can have a bigger one to contain my food in my church, I will like it"*



**Q: Would you be willing to own an EPC for your family?**

*"Yes"*



**Bethel also enjoyed making Ofe onugbu with the EPC, here is her testimony**

**Q: Kindly introduce yourself**

*"My name is Bethel Okoro and I'm from Ebonyi state in Nigeria"*

**Q: What do you want to Cook?**

*"I'm here to Cook Ofe Onugbu using an EPC"*

**Q: What is your experience with the EPC?**

*"It makes the cooking easier, it cooks fast"*

**Q: What advantages have you observed?**

*"There is no heat coming out, we all know how heat is dangerous our skin, you can conveniently open it without fear of being burnt but with charcoal you will be afraid that it will burn you."*  
*"you can leave the food and go and relax but if it is firewood, if the firewood is not lighting well, you have to be present constantly to make it light well, and it will be bringing out smoke that will change the taste of the food"*

**Q: Now that the food is cooked, and you have tasted it, how can you rate the taste of the soup?**

*"The soup tastes excellent. I never knew that there is a device like this that can cook Ofe Onugbu so well, with such an excellent taste."*

**Making meals using an EPC is extremely convenient, and guess what? The taste of your food remains amazing!**

**Let's journey through their recipes shall we?**







**FOOD RECIPES**

**LET'S COOK!**





## COCONUT RICE





# COCONUT RICE

Coconut Rice is a common Nigerian delicacy. It is a unique recipe for cooking rice and is made by extracting coconut juice and using it to cook rice.. The meal is eaten across all cultures in Nigeria.



**Energy Spent Cooking  
Coconut Rice**  
0.4337 KWh



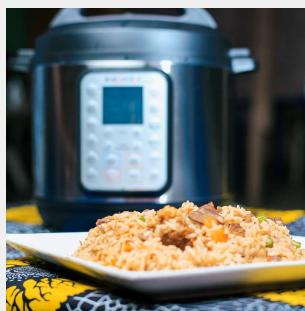
**Time Spent Cooking  
Coconut Rice**  
33 minutes



**Cost of Energy for Cooking  
Coconut Rice**  
32.24 NGN

## Ingredients

- Coconut juice (60cl)
- Dry fish (136g)
- Crayfish (25g)
- Fresh scotch bonnet Pepper (97g)
- Green beans (75g)
- Fresh carrot (73g)
- Beef (200g)
- Chopped Onions (87g)
- Seasoning Cubes (5 cubes)
- Table salt (3/4 teaspoon)
- Nutmeg Powder (5g)
- Water





## **Process for Cooking Beef**

01 Wash the beef thoroughly with table salt and warm water.

02 Put the washed beef in the EPC inner pot. Add 2 seasoning cubes, 1/4 teaspoon of table salt, sliced onions, blended scotch bonnet pepper, and water to be at the same level as the washed beef. Pressurise the EPC to cook for 13 minutes.

03 After 13 minutes, depressurise the EPC, pour out the cooked beef, and beef stock and keep aside.



## **Recipe for Cooking Coconut Rice**

1. Unshell one big size coconut and chop the flesh into tiny bits.
2. Blend with 70cl of water and pour the blended coconut into a sieve to extract the coconut juice. Keep the extracted coconut juice aside.
3. Peel the onions, wash and chop them into tiny bits, and keep aside.
4. Wash the fresh scotch bonnet peppers and blend, and keep aside.
5. Wash the green beans and carrots properly with salt and then chop them into small bits, and keep aside.
6. Wash the dried fish with warm water and salt and remove all the bones.
7. Put the rice into an empty EPC inner pot, and add the coconut juice. Add the beef and beef stock, dry fish, crayfish, blended scotch bonnet pepper, chopped onions, nutmeg powder, 1/2 teaspoon of table salt, 3 seasoning cubes and then stir. Pressurise the EPC to cook for 12 minutes using the rice function.
8. Depressurize the EPC, open the lid, then add chopped carrots and green beans and stir for an even mix.
9. The Coconut rice is ready to be served.



A woman with a warm smile, wearing a white headwrap with a purple and white checkered band and a white apron over a green and blue patterned top, holds a white plate. The plate contains a mound of brown beans porridge, garnished with sliced red tomatoes and yellow fried plantain. The background is a blurred outdoor setting with a wooden structure and a blue cloth. The image is framed by diagonal overlays of sliced tomatoes and fried plantain on the left and right sides.

## **BEANS PORRIDGE AND FRIED PLANTAIN**



# BEANS PORRIDGE & FRIED PLANTAIN

Beans porridge and fried plantain commonly called *Ewa agayin ati Dodo* in the West and Wake in the North of Nigeria is a common meal eaten across the country. It is prepared from beans and ripe plantains. The food is prepared in two steps: cooking the beans porridge and frying the plantain.



## *Ingredients*

- Beans (3 cups)
- Ripe plantain, (6 fingers, 1902g)
- Dry fish (332g)
- Chopped onions (120g)
- Fresh scotch Bonnet pepper (113g)
- Table Salt (Half teaspoon)
- Seasoning Cubes (4 cubes)
- Fresh tomatoes (103g)
- Ground Crayfish (2 teaspoons)
- Groundnut Oil for frying the Plantain (806g)
- Palm Oil (10cl)
- Water

## *Process For Frying Plantain*

1. Wash plantain and remove the skin
2. Slice the plantain to desired size.
3. Pre-heat the empty EPC inner pot using the Saute function until the inner pot is dry.
4. Add the vegetable oil into the preheated pot and allow to heat for 15 minutes.
5. Add the sliced plantain and fry until it's golden brown.
6. Remove the fried plantain from the oil and serve.

## **Recipe for Cooking Beans Porridge**

1. Pick the beans to remove all the debris
2. Peel the onions, wash and chop them, and keep it aside.
3. Wash the fresh tomato and slice it, and keep it aside.
4. Wash the dried fish thoroughly and remove the bones and keep it aside.
5. Wash the already picked beans and put it into the empty inner pot of the EPC.
6. Add 70cl of water and pressurise the EPC to cook for 10 minutes.
7. Depressurise the EPC, remove the cooked beans from the inner pot, and drain.
8. Put the half cooked beans back in the inner pot, add chopped onions, scotch bonnet pepper, 2 tablespoons of ground crayfish, half teaspoon of table salt, 4 seasoning cubes, dried fish, 10cl of palm oil and 30cl of water. Stir the contents to mix it properly and pressurise the EPC to cook for 10 minutes.
9. After cooking, depressurise the EPC, and serve it with sliced fresh tomato as garnishing.



**Energy spent cooking Beans Porridge and Fried Plantain**  
0.7178 KWh



**Time spent cooking Beans Porridge and Fried Plantain**  
1 hour 3 minutes



**Cost of energy to cook Beans Porridge and Fried Plantain**  
53.41 NGN







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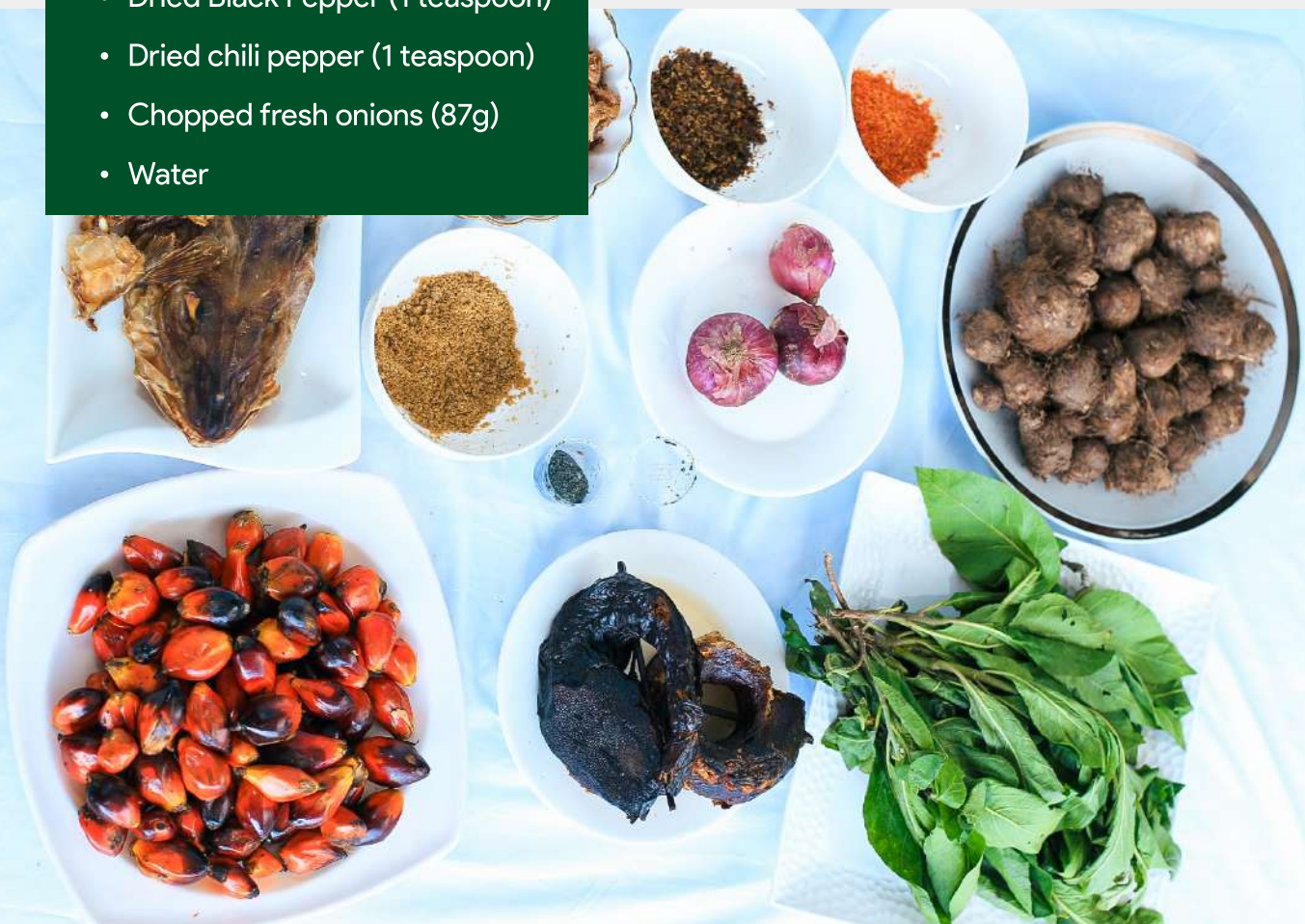
## OFE ONUGBU (Bitterleaf Soup)

## Ingredients

- Cocoyam (544g)
- Seasoning cubes (6 cubes)
- Stock fish (312g)
- Dried fish (487g)
- Table Salt (1 teaspoon)
- Palm fruit juice (50 cl)
- *Ogiri* (8g)
- Onugbu (Washed Bitterleaf) (150g)
- Beef (500g)
- Cow skin (403g)
- Ground Crayfish (3 teaspoon)
- Dried Black Pepper (1 teaspoon)
- Dried chili pepper (1 teaspoon)
- Chopped fresh onions (87g)
- Water

*Ofe Onugbu* is a traditional Nigerian soup native to the Igbo tribe of South Eastern Nigeria. The major ingredients are Cocoyam, Bitterleaf and Palm fruit juice. This traditional meal is popular in the Southeast geopolitical zone of Nigeria (Enugu, Anambra, Ebonyi, Abia and Imo States). The Soup is mostly prepared as an occasional delicacy and is served with *fufu*, *akpu* or any other swallow as desired.

*Ofe Onugbu* cooking preparation is done in several stages which include; Preparing the *Onugbu* leaves (bitterleaf), preparing the cocoyam, extracting the palm fruit juice and eventually cooking the soup.



## Preparation of the Onugbu

Pick the bitterleaf from its stalk, rinse it in salt water to remove dirt. Use ordinary water to wash the leaves by scrubbing them between the palms vigorously to extract its bitter juice. Scrub the leaves between palms vigorously and rinse off the bitter juice for about 5 times to get the desired mild bitter taste of the shredded bitterleaf. This step is important to avoid the whole soup to be unpleasantly bitter. Keep the *Onugbu* aside after it is prepared.



**Energy spent Boiling Palm fruit**  
0.3293 KWh



**Time spent cooking Palm fruits**  
30 minutes



**Cost of energy to cook Palm fruits**  
24.50 NGN

## Extraction of the Palm Fruit Juice

- 01 Wash the raw palm fruits with running water to remove dirt. Put it in an empty EPC inner pot and add water to the same level as the fruits inside the pot. Close the EPC lid and set the EPC for 10 minutes cooking, pressurise and allow to cook.
- 02 After cooking, depressurise the EPC, open the lid and strain the cooked palm nuts and put into a mortar.
- 03 Pound the cooked palm nuts until the fleshy part of the palm pulp detaches from the nut. Ensure that the Palm fruits are pounded when they are still hot.
- 04 Remove the contents from the mortar into a bowl and separate the palm pulp from the nuts. Add about 50cl of warm water to the palm pulp and squeeze until all the juice is extracted
- 05 Sieve the juice to ensure that there are no strands of chaff in the juice. Keep the extracted juice aside, and it should be kept open so that it does not lose its taste.





## Preparation of the Cocoyam

- Wash unpeeled cocoyam thoroughly to remove the sand from the skin. Put the cocoyam into an empty EPC inner pot and add some water to be at the same level as the cocoyam in the pot.
- Close the EPC lid and set the EPC for 10 minutes cooking, pressurize and allow to cook.
- After the Cocoyam is cooked, depressurise the EPC, strain the boiled Cocoyam from the pot, set it aside for it to cool a bit and then peel them.
- Pound the peeled cocoyam in a mortar until it becomes a fluffy dough.
- Keep the Cocoyam fluffy dough aside.



**Energy Spent Boiling  
Cocoyam**  
0.3303 KWh



**Time Spent Boiling  
Cocoyam**  
30 minutes



**Cost of Energy to Boil  
Cocoyam**  
24.58 NGN





## Recipe for Cooking Ofe Onugbu

- 01 Rinse the fresh beef in running water.
- 02 Put the washed beef inside the EPC inner pot, add 30cl of water to the beef. Add chopped onions, 1 teaspoon of table salt, 6 seasoning cubes, 1 teaspoon of dried chili pepper and 1 teaspoon of dried black pepper.
- 03 Close the lid of the EPC and pressurise the EPC for 10 minutes cooking.
- 04 Once the beef is cooked, depressurise the EPC and open the lid to add other ingredients.
- 05 Pour the palm fruit juice into the cooked beef, add the stockfish, dry fish, *ogiri* and 3 tablespoons of ground crayfish, and pressurize to cook for 10 minutes.
- 06 When the contents inside the pot is boiled, add the fluffy Cocoyam in a smaller bolus to the boiling mixture to give the soup the desired thickness. Choose the Saute function in the EPC, and set to cook for 5 minutes. The Saute function allows you to cook with the EPC kept open. Stir the contents of the pot as it is being cooked.
- 07 Add the washed bitterleaf and stir. Allow to cook for another 2 minutes (with open EPC lid) and the food is ready to be served.



**Energy spent cooking  
Ofe Onugbu**  
0.3644 KWh



**Time spent cooking  
Ofe Onugbu**  
37 minutes



**Cost of energy to cook  
Ofe Onugbu**  
27.1131 NGN



# YAM PORRIDGE

## Ingredients

- Diced fresh yam (418g)
- Chopped Onions (46g)
- Blended red bell pepper (45g)
- Chopped fluted pumpkin leaves (57.83g)
- Palm oil (111g)
- Dried Oyster mushrooms (11g)
- Salt (1/2 teaspoon)
- Locust bean powder (1 teaspoon)
- Seasoning cubes (8g)
- Chopped Scent leaves (5g)



**Cost of Energy for Cooking  
Yam Porridge**  
23.2 NGN



**Energy Spent Cooking  
Yam Porridge**  
0.3133 kWh



**Time Spent Cooking  
Yam porridge**  
27 minutes 12 seconds





## Recipe For Cooking Yam Porridge

01

Put the chopped yam in the inner pot of the EPC and add water to same level as the yam.

02

Add the seasoning cubes, blended red bell pepper, locust bean powder, salt, and dried oyster mushroom to the pot.

03

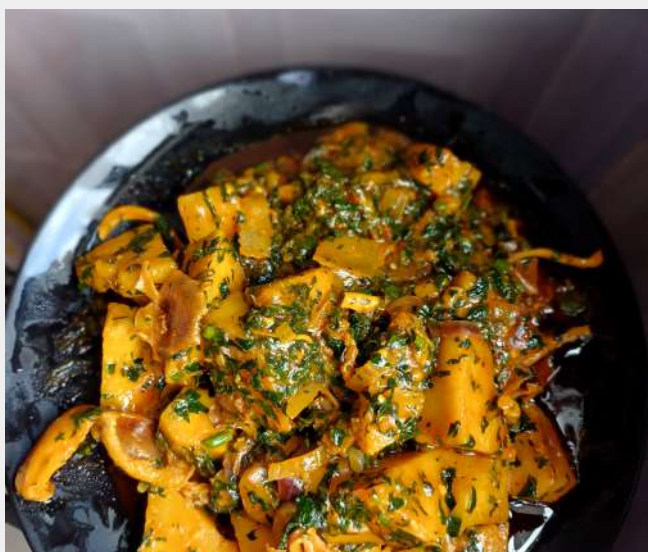
Cover the lid of the EPC and set to cook for 12 minutes cook.

04

When the food is cooked, depressurise and open the EPC then add the chopped onions, chopped fluted pumpkin leaves, chopped scent leaves, and palm oil to the food. This time, stir the food to evenly mix the ingredients.

05

Cover the lid of the EPC and allow to simmer for 5 minutes, and it is ready to be served.







# A F A N G S O U P



# AFANG SOUP

*Afang* Soup is a traditional Nigerian meal made from a specie of wild Spinach leaves (*Gnetum africanum*) locally called *Afang* or *Ukazi* in Nigeria. The soup is native to the Efik and Ibibio people of Southern Nigeria. It is commonly cooked in the Southsouth geopolitical zone of the country but is gradually accepted by other regions and is usually served with *Eba* or *fufu*.



Energy spent cooking  
Afang soup

0.3875 KWh



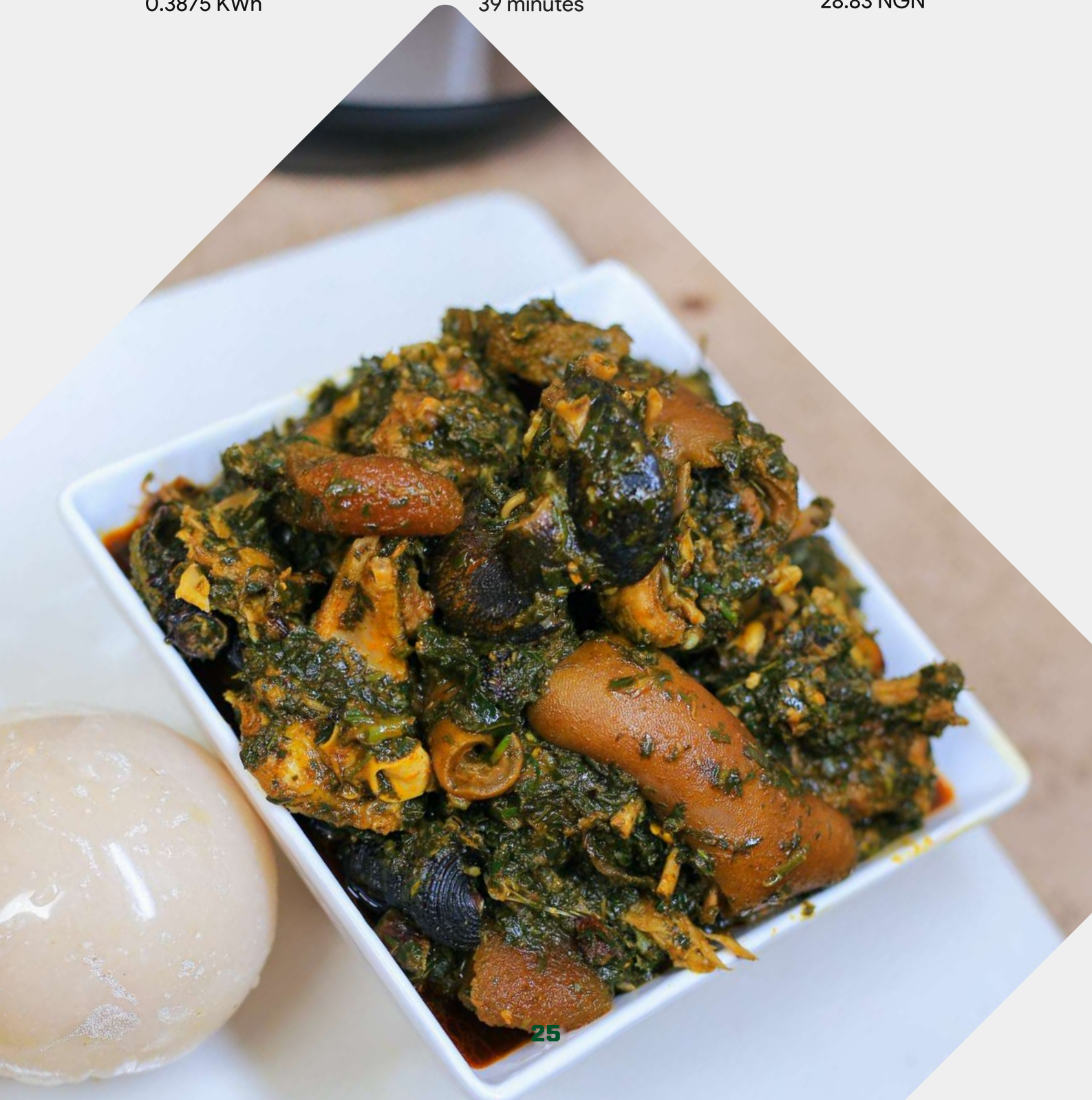
Time spent cooking  
Afang soup

39 minutes



Cost of energy to cook  
Afang Soup

28.83 NGN





### *Ingredients*

- Pounded Afang leaves (113g)
- Chopped Water leaves (700g)
- Stock fish (225g)
- Dry Fish (380g)
- Goat meat (500g)
- Ground Crayfish (4 tablespoons)
- Snails (60g)
- Periwinkle (517g)
- Seasoning cubes (6 cubes)
- Table Salt (1 teaspoon)
- Palm oil (20cl)
- Cowskin (211g)
- Fresh scotch bonnet pepper (3 teaspoons of blended pepper)
- Chopped Onions (80g)
- Water





## Recipe for cooking Afang Soup

01

Pick all the vegetables (water leaves and *Afang* leaves) from their stalk and remove the bad leaves from them.

03

Blend or Pound the sliced *Afang* leaves in a mortar to further reduce its size and get a thick mold, and set it aside.

05

Wash the beef under running water. Wash the dry fish, stockfish, snails and cow skin with table salt and warm water. Keep them aside after washing.

07

Close the lid of the EPC and pressurise to cook for 10 minutes. After cooking the beef, dry fish, stockfish, snails, and cowskin, depressurise the EPC and remove the contents from the EPC inner pot to keep aside.

09

After the waterleaf is cooked, depressurise the EPC, and open the lid to add the beef, dry fish, stockfish, snails, and cowskin and beef stock to the boiling waterleaf and stir properly.

11

Serve with *akpu* or *fufu*, or any other kind of swallow.

02

Wash the *Afang* leaves and water leaves thoroughly and slice them into very tiny bits differently, and set it aside.

04

Break the periwinkle in half (to remove the lower sharp edge). Wash the periwinkle after breaking, add 1 teaspoon of table salt and 1 litre water in washing the periwinkle, and wash for about 4 times to ensure it is clean and free from dirt. Keep the washed periwinkle aside.

06

Put the washed beef, stockfish, snails, cowskin, and dry fish into the EPC inner pot. Pour water 60cl of water into the pot and add 1 teaspoon of table salt, 6 seasoning cubes, 2 tablespoons of grounded crayfish, chopped onions, and blended or pounded scotch bonnet pepper.

08

Add the chopped waterleaf in an empty EPC inner pot, add blended red bell pepper, 2 tablespoons of grounded crayfish, washed periwinkle and palm oil and pressurise to cook for 5 minutes only.

10

Add the *Afang* leaves immediately after stirring and stir until you get an even mix. Allow to cook for 5 minutes.







# PATE

Pate is a local Nigerian meal popular to the North-Central People of Nigeria. It is made from either corn, acha or rice and is highly nutritious.



**Energy Spent Cooking  
Pate**

0.5492 KWh



**Time Spent Cooking  
Pate**

48 minutes



**Cost of Energy for Cooking  
Pate**

40.86 NGN

## Ingredients

- Alefo (African Spinach/Green leaves) (132g)
- Crushed fresh Groundnuts (189g)
- Saaki (Crushed Rice/ Crushed Dried Corn/acha) (300g)
- Beef (500g)
- Dried catfish (103g)
- Fresh chili pepper (76g)
- Fresh scotch bonnet pepper (160g)
- Fresh onions and scallions (225g)
- Fresh tomato (553g)
- Cabbage (127g)
- Ground dawadawa (locust beans) (29g)
- Table salt (one and half teaspoons)
- Seasoning cubes (7 cubes)
- Yakuwa (132g)
- Palm oil (10cl)
- Water



## Recipe for Cooking Pate

1. Pick the *Alefo* leaves and *Yakuwa* from its stalk and wash them properly, and keep it aside.
2. Peel and wash the cabbage, onions and scallions. Chop all the *Alefo*, *Yakuwa*, cabbage, scallions and onions and set it aside.
3. Wash the dried catfish and remove the bones, and set it aside.
4. Wash the fresh tomato and dice them, and set it aside.
5. Wash all the fresh scotch bonnet pepper, and fresh chili pepper; blend them with some onions and tomato, and set it aside.
6. Wash the beef properly with salt and running water and put it inside an empty EPC inner pot.
7. Add some chopped onions, one teaspoon of table salt and 4 seasoning cubes. Add 50cl of water and allow the beef to cook for 10 minutes.
8. Wash the *Saaki* and add it to the meat stock.
9. Add the crushed fresh groundnuts and stir.
10. Add all the *dawadawa*, 1/2 teaspoon of table salt and 3 seasoning cubes to taste. Add 70cl of water and pressurise to cook for 5 minutes.
11. Open the EPC lid after 5 minutes, add dried fish, blended pepper mix, diced fresh tomato and 10cl palm oil. Pressurise to cook for 10 minutes.
12. Depressurise the EPC, and open the lid, add your chopped Cabbage, *Alefo*, *Yakuwa* and scallions and allow to cook for 3 minutes with the lid slightly open.
13. Stir the pot till you have an even spread of ingredients and serve.









# MARGI SPECIAL

Margi Special is a Northern Eastern Nigerian delicacy peculiar to the Margi People of Adamawa State in Nigeria. This traditional meal is often prepared for occasions as it depicts the culture of the Margi people.



**Energy Spent Cooking  
Margi Special**  
0.3354 KWh



**Time Spent Cooking  
Margi Special**  
31 minutes



**Cost of Energy for Cooking  
Margi Special**  
24.96 NGN

## Ingredients

- Fresh fish (500g)
- Fresh scotch bonnet pepper (49g)
- *Alefo* (African spinach/green leaves) (195g)
- Fresh onions and scallions (239g)
- Vegetable oil (10cl)
- Potash paste (3g)
- Fresh tomato (381g)
- *Yakuwa* (Hibiscus leaves) (171g)
- Seasoning cubes (7 cubes)
- Water





## Recipe for Cooking Margi Special

1. Wash the fresh fish thoroughly with salt and running water, and keep it aside.
2. Pick the *Yakuwa* and *Alefo* leaves from the stalk. Wash and chop them separately and keep them aside.
3. Peel, wash and chop all your onions and scallions, and keep them aside.
4. Wash all your fresh tomatoes and chop them, and keep it aside.
5. Wash and blend fresh scotch bonnet pepper with some tomato and onions to make a paste.
6. Dissolve 4 seasoning cubes in the blended pepper paste.
7. Pour the chopped *Alefo* into an empty EPC inner pot, add a layer of *Yakuwa*, add some onions, add the washed fresh fish and pour some more *Alefo*, *Yakuwa*, scallions and onions on the fresh fish.
8. Add the vegetable oil and pour the pepper mix on it.
9. Sprinkle 3 seasoning cubes over the mix in the pot.
10. Cover the EPC, and pressurise to cook for 5 minutes.
11. Depressurise the EPC, open the lid, and dissolve potash in little water and pour it into the pot. Cover the lid and allow it to cook for another 3 minutes.
12. Stir the pot gently to mix properly. Serve with *Tuwo* or any swallow of your choice.







# MOI MOI





# MOI MOI

Moi-Moi is a Nigerian delicacy prepared from beans. This delicacy is rich and cuts across all the tribes in Nigeria. It is easy to prepare and is often sold in the streets due to its popularity. Moi Moi can be served with *Akamu*, *Garri* and even bread. It is prepared in three stages: Making and saucing the beans paste, boiling the eggs and eventually cooking the moi moi.



**Energy Spent Cooking  
Moi Moi**

0.4472 KWh



**Time Spent Cooking  
Moi Moi**

36 minutes



**Cost of Energy for Cooking  
Moi Moi**

33.27 NGN



## Ingredients

- Beans (1,372g)
- Uma leaves (Moi Moi leaves)
- Fresh chili pepper (75g)
- Fresh red bell pepper (78g)
- Fresh scotch bonnet pepper (72g)
- Chopped onions (312g)
- Fresh turmeric (29g)
- Salt (1 teaspoon)
- Fresh garlic (34g)
- Fresh ginger (62g)
- Grounded crayfish (2 teaspoons)
- Fresh eggs (5 eggs)
- Smoked fish (392g)
- Tomato paste (117g)
- Water
- Vegetable oil (262g)
- Seasoning Cubes (4 cubes)
- Spices (curry powder, rosemary) (13g)

## **Preparing the Beans Paste**

01 Firstly pick the beans to remove debris and stones

02 Wash beans thoroughly with lukewarm water. Scrub the grain hard between your palms to peel off the chaff from it.

03 Once the chaff is removed completely from the beans, rinse it properly until the beans are clean and chaff free.

04 Blend the already washed beans with the fresh red bell pepper, fresh chili pepper, fresh scotch bonnet pepper, and some onions until you have a smooth paste. Set this beans paste aside.



## **Cooking the Eggs**



Rinse your eggs, put the eggs in an empty EPC inner pot and pressurise to cook for five minutes. Once cooked, remove the eggs from the EPC, put inside cold water for 10 minutes, and peel off the shell.



## **Preparing the Sauce for the Beans Paste**

**01**

Wash the smoked fish using salt and lime to remove all forms of dirt and germs. Also remove the bones from the fish. Set it aside.



**02**

Peel all the fresh garlic, fresh ginger, fresh tumeric and onions and wash them. Grate or blend the ginger, tumeric and garlic and chop the onions. Set it aside.

**03**

Set the EPC to Saute, preheat the EPC inner pot, and pour the vegetable oil in the preheated pot and allow to heat for about 5 minutes. Shallow fry the tomato paste with some chopped onions, blended mix of garlic, ginger, and turmeric for 5 minutes. Add crayfish, 1 teaspoon of table salt as well as all your spices and 4 seasoning cubes. Then add the fish, and stir until properly mixed to make a fish sauce.



## Cooking the Moi Moi

01

Pour the fish sauce into the beans paste and stir until the mixture is evenly seasoned. Add half cup of water to reduce the thickness and give the paste a fine consistency.

02

Fold the plantain leaves into cones (lying one leaf onto another), pour the paste into the cone and add the peeled cooked egg to it. Wrap the cone to seal it and place it in the empty pot.

03

After all the wraps have been placed in the pot, add 30cl of water, cover the EPC lid and pressurise to cook for 10 minutes.

04

After cooking, unwrap the moi moi and serve.





# PLANTAIN PORRIDGE

## Ingredients

- Chopped half ripe plantain (419g)
- Seasoning cubes (8g)
- Salt (1 teaspoon)
- Grounded locust bean powder (1 teaspoon)
- Chopped fluted pumpkin leaves (58g)
- Chopped onions (38g)
- Dried pepper (Grounded) (1 teaspoon)
- Palm oil (111g)
- Chopped scent leaves (5g)



**Energy Spent Cooking  
Plantain Porridge**  
0.2396kWh



**Time Spent Cooking  
Plantain Porridge**  
19 minutes 2 seconds



**Cost of Energy for Cooking  
Plantain Porridge**  
17.74 NGN



## Recipe for Cooking Plantain Porridge

Put the chopped half ripe plantain in the inner pot of the EPC and add water to same level as the plantain.

Add the seasoning cubes, blended red bell pepper, locust bean powder, salt, and dried oyster mushroom to the pot.

Cover the lid of the EPC and set to cook for 12 minutes cook.

When the food is cooked, depressurise and open the EPC then add the chopped onions, chopped fluted pumpkin leaves, chopped scent leaves, and palm oil to the food. This time, stir the food to evenly mix the ingredients.

Cover the lid of the EPC and allow to simmer for 5 minutes, and it is ready to be served.







## AMALA & EWEDU SOUP





# AMALA & EWEDU SOUP

*Amala and Ewedu* Soup is one of the traditional meals native to the Yoruba tribe of South Western Nigeria. It is prepared from Yam flour and *Ewedu* (jute) or *Lalo* leaves and is common among all the states in the Southwest region of Nigeria.



## Ingredients

- *Ewedu* (jute) leaves (118g)
- Fresh *Iru* (locust beans) (10g)
- Fresh tomato (123g)
- Seasoning cubes (9 cubes)
- Fresh chili pepper (shombo) (53g)
- Fresh red bell pepper (tatashe) (64g)
- Chopped fresh onions (87g)
- Palm oil (20cl)
- Water
- Goat meat (500g)
- *Kpomo* (Cowskin) (300g)
- Vegetable oil (4 tablespoons)
- *Kawun* (Potash) (3g)
- Table Salt (1.5 teaspoon)
- Fresh Scotch bonnet pepper (4 teaspoon of blended pepper)
- *Amala* (1 mudu)
- *Saki* (Cow intestines) (300g)



Ewedu Soup is prepared in two stages which include preparing the *omoigbe* (buka stew), and preparing the ewedu leaves



## Recipe for Cooking Omoigbe (Buka Stew)



Energy spent cooking  
*Omoigbe*  
0.4817 KWh



Time spent cooking  
*Omoigbe*  
53 minutes



Cost of energy to cook  
*Omoigbe*  
35.84 NGN

1. Wash the *shombo*, *tatashe*, scotch bonnet pepper, and fresh tomatoes and blend it to get a smooth and thick paste; and keep it aside.
2. Pre-heat the empty inner EPC pot using the Saute function.
3. Pour the palm oil into the preheated pot and let it heat for about 7 minutes (bleaching) then add the vegetable oil to it. Use the Saute function to heat the oil. The lid of the EPC can be slightly open or totally open for this process.
4. Add 2 tablespoons of vegetable oil into the bleached palm oil (to calm the palm oil bleaching process). This stage of the process is optional.
5. Pour the blended tomato, *shombo*, *tatashe*, and scotch bonnet pepper mixture into the bleached palm oil and allow to cook for 26 minutes with the lid of the EPC open.
6. Keep the *Omoigbe* aside.

## Recipe for Cooking the Goat Meat, *Saki*, and *Kpomo*



01

Wash the goat meat, *Saki* and *kpomo* thoroughly with table salt and warm water.

02

Put the washed Goat meat, *Saki*, and *kpomo* in the EPC inner pot. Add 5 seasoning cubes, three-quarter teaspoon of table salt, sliced onions, and water to be at the same level as the washed Goat meat, *Saki*, and *kpomo*. Pressurize the EPC to cook for 10 minutes.

03

After 10 minutes, depressurize the EPC, pour out the cooked Goat meat, *Kpomo*, and *Saki* and keep aside.



Energy spent cooking Goat,  
*Saki* and *Kpomo*  
0.4231 KWh



Time spent cooking Goat,  
*Saki* and *Kpomo*  
30 minutes



Cost of energy to cook Goat,  
*Saki* and *Kpomo*  
31.48 NGN





## Recipe for Cooking the Ewedu soup



Energy spent cooking  
Ewedu soup  
0.4033 KWh



Time spent cooking  
Ewedu soup  
33 minutes



Cost of energy to cook  
Ewedu Soup  
30.01 NGN

01

Pick the ewedu leaves and wash them thoroughly. Put them into a blender with little water, add your fresh *iru* and then blend properly for about two minutes, and keep it aside.

02

Put the *Omoigbe* into an empty EPC inner pot, add all the beef stock (cooked meat water) to the *Omoigbe* and add 2 seasoning cubes and one quarter teaspoon of table salt. Seal the EPC lid and pressurise to cook for 5 minutes.

03

Depressurise the EPC, open the lid and add the cooked Goat meat, cooked *Saki*, and cooked *kpomo* to the boiling *Omoigbe* in the step above, cook for another 2 minutes. Keep this aside after it is cooked.

04

Pour the blended ewedu and *Iru* into an empty EPC inner pot, add the 3g of *kawun* and cook for 3 minutes. Stir the mixture vigorously until you achieve an even mix. Add half tablespoon of salt and two seasoning cubes and allow to cook for another 3 minutes.

## Recipe for Cooking Amala

Put about two litres of water into an EPC inner pot and pressurise the EPC for 10 minutes for the water to boil.

Depressurise the EPC for the lid to open, and add two tablespoons of vegetable oil to the boiling water.

Pour the *Amala* (Yam flour) and stir simultaneously until you have a thick and fluffy dough.

Stir vigorously until you get a smooth desired texture. You can add water to the mixture as you stir, until the desired texture is achieved. Close the EPC lid and allow it to steam for 5 minutes.



**Energy spent cooking  
*Amala***  
0.4301 KWh



**Time spent cooking  
*Amala***  
45 minutes



**Cost of energy to cook  
*Amala***  
32.00 NGN







# TUWO-MASARA AND MIYAN KUKA



# TUWO-MASARA AND MIYAN KUKA

Miyan Kuka is a Hausa delicacy peculiar to Northern Nigeria. The main ingredients are highly nutritious as they are made from Baobab leaves. This meal is usually prepared for occasions as it is culturally significant.



## *Ingredients*

- Kuka (Powdered Baobab leaves) (80g)
- Beef (1kg)
- Dawadawa (Locust beans) (40g)
- Fresh scotch bonnet pepper (106g)
- Chopped onions and scallions (139g)
- Ground crayfish (12g)
- Kanwa (Potash) (3g)
- Table salt (1 teaspoon)
- Fresh garlic (5g)
- Fresh ginger (23g)
- Seasoning cubes (5 cubes)
- Water
- Palm oil (10cl)
- Garin-tuwo (Corn flour) (790g)





## Recipe for Cooking Miyan Kuka

01

Peel and wash all the fresh onion bulbs, garlic and ginger, and keep it aside.

02

Wash all the fresh scotch bonnet pepper and blend it with some fresh onions, and keep it aside.

03

Grate all the fresh garlic and ginger. Also slice the onions and scallions, and keep it aside.

04

Wash the beef thoroughly with salt and running water to remove germs, and keep it aside.

05

Put the washed beef into an empty EPC inner pot, add 1 teaspoon of table salt, sliced onions and 5 seasoning cubes. Add 50cl of water and pressurise the EPC to cook for 12 minutes.

06

After the beef is cooked, depressurise the EPC, open the lid and add the blended scotch bonnet pepper, grounded crayfish, palm oil, and dawadawa then allow to cook for another 3 minutes.

07

Add another 30cl of water and add the *kuka* to it. Stir the soup properly for a smooth consistency to prevent lumps and allow to cook for another 2 minutes.

08

Add very little potash and leave to cook for 5 minutes with the EPC lid open, and the soup is ready to be served.



**Energy Spent Cooking  
Miyan Kuka**  
0.4887 KWh



**Time Spent Cooking  
Miyan Kuka**  
38 minutes



**Cost of Energy for Cooking  
Miyan Kuka**  
36.36 NGN

## Recipe for Preparing Tuwo-Masara



- 01 Add 1 litre of water to an empty EPC inner pot and pressurise to boil for 10 minutes.
- 02 Add some *Garin-tuwo* into an empty bowl and add 30cl of water. Stir until you get a slightly watery paste of a uniform consistency without lumps.
- 03 Depressurise the EPC, open the lid and pour the *Garin-tuwo* paste into the pot of boiling water.
- 04 Stir continuously until you get a thick liquid without lumps. Close the EPC lid, and leave to boil for about 7 minutes.
- 05 Pour dried *Garin-tuwo* generously into the pot and stir continuously. Keep adding the garin-tuwo until you have a fairly hard dough. Mix thoroughly to remove lumps.
- 06 Cover the EPC pot lid and allow it to cook for another 5 minutes.
- 07 Serve hot alongside any soup of desire.



Energy Spent Cooking  
Tuwo-Masara  
0.4661 KWh



Time Spent Cooking  
Tuwo-Masara  
35 minutes



Cost of Energy for Cooking  
Tuwo-Masara  
33.19 NGN



# FOOD TASTERS TESTIMONIES

Do you think the food taste will be altered? Let's hear from the food tasters

## Ofe Onugbu

The food is very delicious, very nice, I enjoyed the food.

~ Silaa Godsgift

## Coconut Rice

*"The food over make sense, the food is sumptuous"*

~ Eze

## Margi Special

"There is no difference in the taste of this Margi special prepared with the EPC device and the one prepared using other cooking technologies"

~ Edna

## Afang Soup

*"The taste is okay because if you use firewood the smoke will enter your food and give you another different taste from what you prepare but this one there's nothing like another taste, it gives me what I prepare"*

~ Affiong

## Moi- Moi

*"...there were no issues of leakages or water sipping into the moi moi. This reserved the taste of the meal. The food tastes great and better than gas, the taste is intact"*

~ Chidinma



# **CONTROLLED COOKING TEST RESULTS**



# WHY OWN AN ELECTRIC PRESSURE COOKER?

**BECAUSE, IT IS MORE EFFICIENT!**

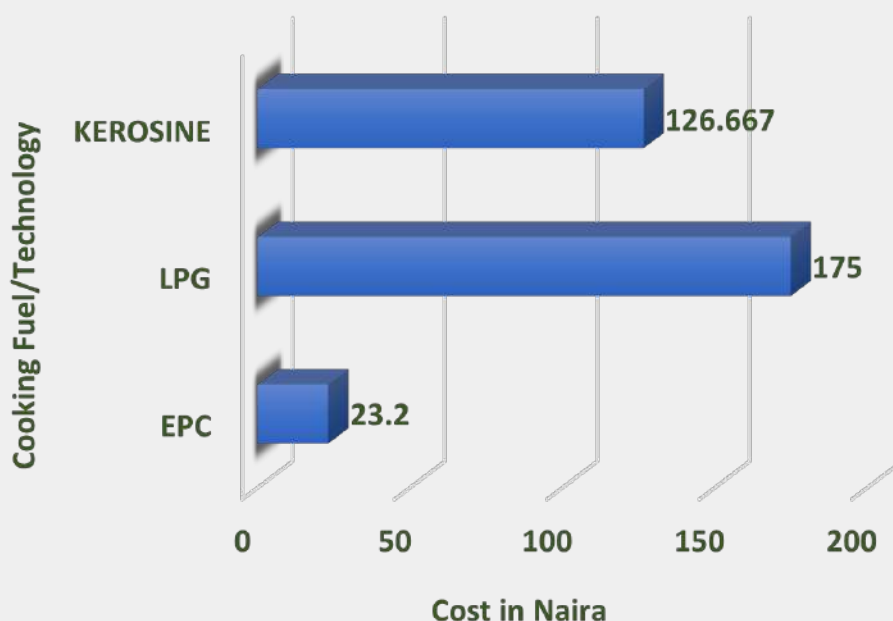
A Controlled Cooking Test study was conducted by Tovero Energy Ltd to compare the cost of cooking some Nigerian traditional meals with EPC, LPG stove, and Kerosine stove and also to compare the time spent in cooking traditional meals with EPC, LPG stove and Kerosine stove.

As at the time of the study (January 2024), the market price per litre of kerosine was 800 NGN, the market price per kilogram of LPG was 1000 NGN, and the market price for 1KWh of electricity was 74.04 NGN. These prices were used to determine the cost of energy spent in cooking with kerosine stove, LPG stove and EPC respectively. The cooking time for each meal was measured with a stopwatch.

**THE RESULTS OF THE STUDY REVEAL THAT EPC IS GENERALLY CHEAPER AND FASTER THAN LPG AND KEROSENE STOVES.**

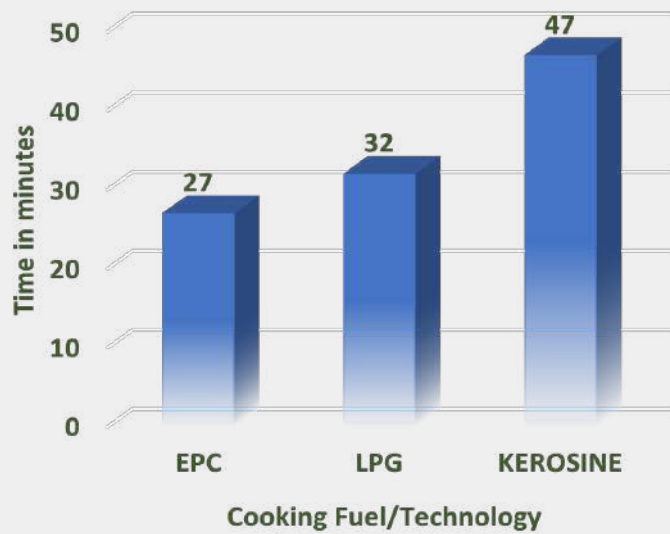
## YAM PORRIDGE

### COST OF ENERGY SPENT IN COOKING YAM PORRIDGE



Cooking yam porridge with EPC was **151.8 NGN cheaper** than cooking with LPG and **103.47 NGN cheaper** than cooking Kerosine stove.

## COOKING TIME FOR YAM PORRIDGE

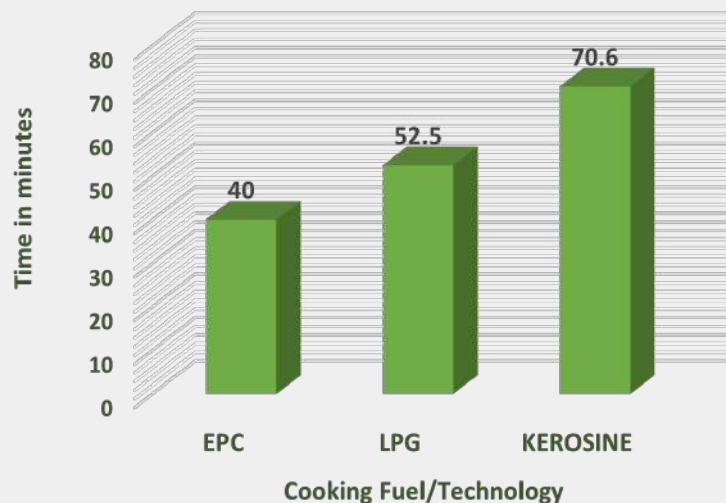


Cooking yam porridge with EPC was **20 minutes faster** than cooking with kerosine and **5 minutes faster** than cooking with LPG stove.

## AFANG SOUP

### COOKING TIME FOR AFANG SOUP

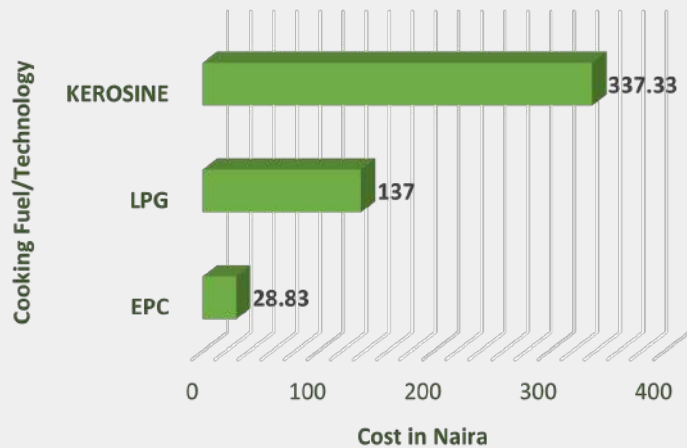
Cooking Afang soup with EPC was **12 minutes faster** than cooking with LPG and **30 minutes faster** than cooking with kerosine stove.



*It was averagely one and a half times faster to cook Afang Soup with EPC!*



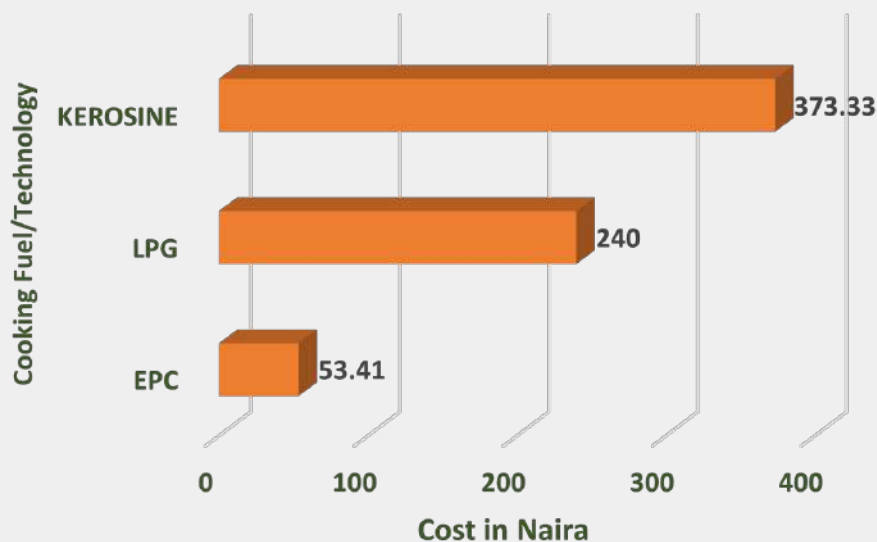
## COST OF ENERGY SPENT IN COOKING AFANG SOUP



Cooking Afang soup with EPC **saved 108.17 NGN** compared to cooking with LPG and **308.5 NGN** compared to cooking with kerosine stove.

## BEANS PORRIDGE & FRIED PLANTAIN

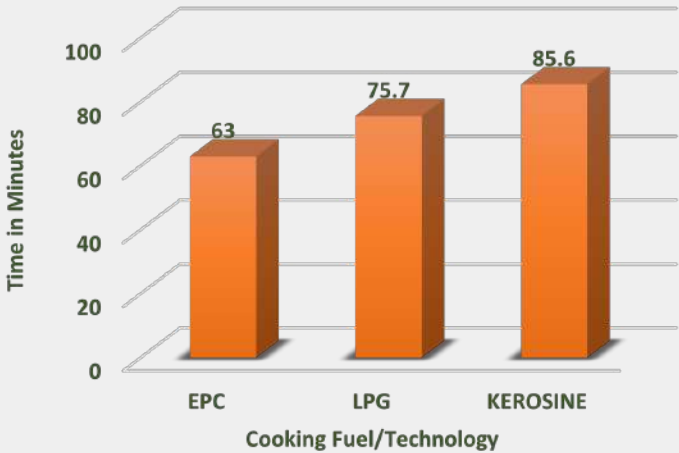
### COST OF ENERGY SPENT IN COOKING BEANS PORRIDGE AND FRIED PLANTAIN



Cooking beans and fried plantain with EPC **saved 186.59 NGN** compared to cooking with LPG and **319.92 NGN** compared to cooking with kerosine stove.

***It was approximately 7 times cheaper to cook beans porridge and fried plantain with EPC compared with Kerosine stove and 4 times cheaper compared with LPG stove!***

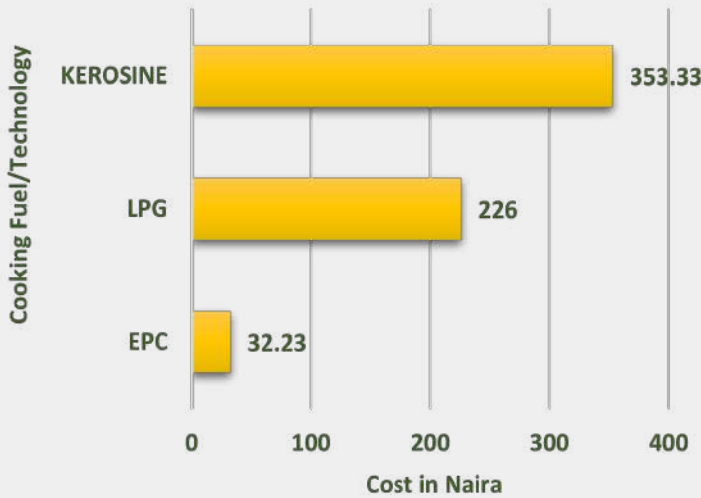
# COOKING TIME FOR BEANS PORRIDGE AND FRIED PLANTAIN



Cooking beans porridge and fried plantain with EPC was **12.7 minutes faster** than cooking with LPG and **22.6 minutes faster** than cooking with kerosine stove.

## COCONUT RICE

### COST OF ENERGY SPENT IN COOKING COCONUT RICE

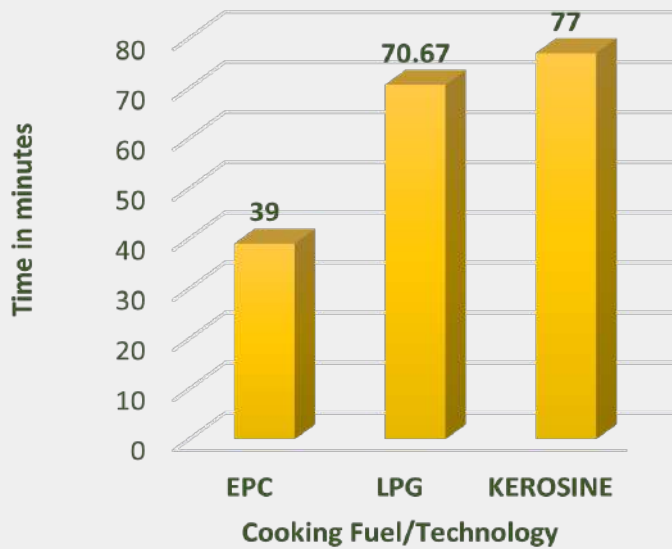


Using the EPC to cook Coconut Rice **saved 321.10 NGN** when compared to cooking with kerosine stove, and **194 NGN** when compared to cooking with LPG stove .



***It was 7 times cheaper and 2 times faster cooking Coconut Rice with an EPC!***

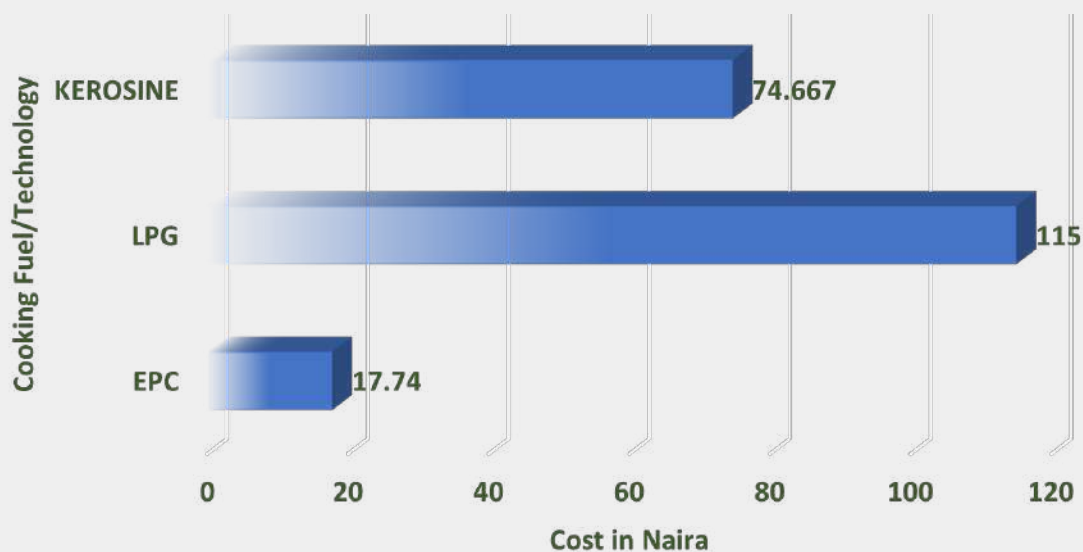
### COOKING TIME FOR COCONUT RICE



Cooking Coconut rice with EPC was **38 minutes faster** than cooking with kerosine stove and **31.67 minutes faster** than LPG.

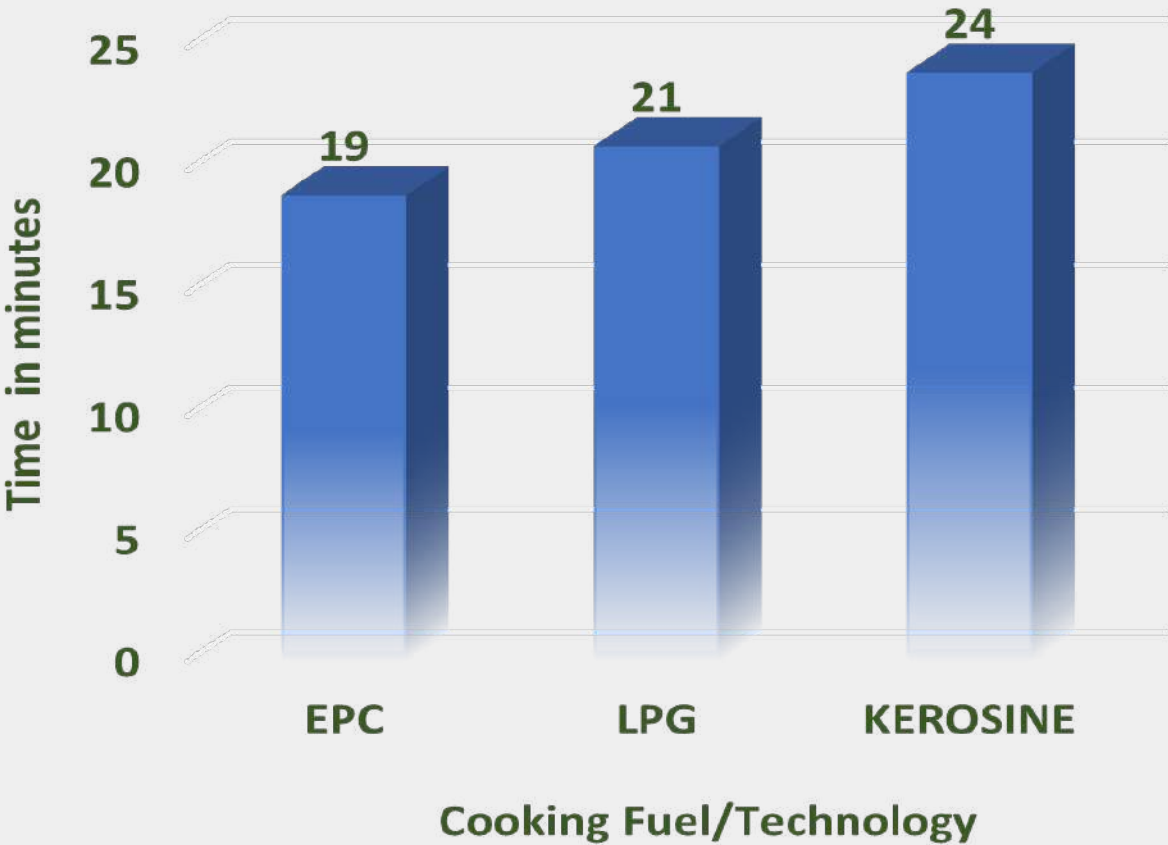
## PLANTAIN PORRIDGE

### COOKING TIME FOR PLANTAIN PORRIDGE



Cooking Plantain porridge with EPC was **5 minutes faster** than cooking same with Kerosine stove. It was also **3 minutes faster** than LPG stove. It also **saved 56.93 NGN worth of energy** when compared to cooking with Kerosine stove and **97.26 NGN worth of energy** when compared to cooking with LPG.

**COST OF ENERGY SPENT IN COOKING PLANTAIN PORRIDGE**





## CONCLUSION

The Nigerian eCookbook stands as a compelling testament to the feasibility and benefits of utilizing electric pressure cookers for preparing traditional Nigerian meals. The positive feedback from both food tasters and cooks emphasizes that not only do these meals maintain their authentic taste when prepared with an electric pressure cooker, but in many instances, they may even surpass the quality and retention of nutrients achieved through other cooking technologies.

Moreover, the eCookbook demonstrates that EPCs may be the most affordable method of cooking even for low- and middle-income households. This is because the energy consumption and associated costs of using an electric pressure cooker are notably lower than alternative cooking methods. Also, the initial cost may further decrease due to the influx of manufacturers especially to Nigeria and stakeholders who may consider the availability of affordable payment options.

Complex health issues have been reported to be caused from indoor air pollution, also WHO statistics estimates that premature deaths from indoor air pollution total nearly 3.2 million annually including about 237,000 children under the age of five who are prone to respiratory problems caused by smoke exposure. It has therefore become pertinent to embrace the least polluting cooking method for its health benefits as well as environmental friendliness.

It is also note-worthy that EPCs may be the safest cooking method yet considering that accidents occur annually from the transportation and use of these highly flammable transition fuels.

The study predominantly involved female cooks in urban and peri-urban areas of Port Harcourt, aged between 33 to 46 years old, with at least secondary school education. These cooks, who also perform the role of caregivers, engage in daily cooking routines for their families and as an occupation.

# RECOMMENDATIONS

## ***Utility Companies***

The study indicates that the cooking time with electric pressure cookers is influenced by electricity voltage. To optimize eCooking, collaboration among relevant stakeholders, such as the Transmission Company of Nigeria (TCN), Electricity distribution companies, and the National Electricity Regulatory Commission (NERC), is crucial. Strengthening the national grid infrastructure will enhance the support for eCooking, potentially leading to increased revenues for utility companies. Utility companies can adopt and promote innovative financing models to offer energy-efficient cooking solutions to clients without them facing the upfront costs, thus expanding their market reach.

## ***Cooks***

Cooks, both at the household and commercial levels, are encouraged to adopt modern electric cooking devices, as they offer energy efficiency, time savings, health benefits and convenience. The study affirms that electric pressure cookers, in particular, do not compromise the taste of food.

## ***Policymakers***

Given the health, environmental, economic, and social benefits associated with eCooking, policymakers are urged to craft a clean cooking policy that explicitly promotes cooking with electricity. Creating an enabling environment for investment across the entire value chain of electric pressure cookers and energy-efficient cooking devices is vital. Policymakers have an opportunity to support electricity infrastructure cooking through the national grid, mini-grid, or off-grid solutions. Government can focus on achieving both targets of SDG7 of increasing access to electricity and clean cooking fuels/technologies using electricity by driving both as a single goal going when national strategies are formed to address energy access challenges in the country.



Governments can play a crucial role in promoting the adoption of electric pressure cookers for clean cooking. They can offer incentives, subsidies, or tax breaks to manufacturers and consumers, encouraging the widespread use of this technology.

### ***Mini-Grid Developers***

For mini-grid developers, the Nigerian eCookbook study suggests several strategic recommendations. First, there is a strong indication to integrate electric cooking infrastructure within mini-grid projects, recognizing the rising demand for electricity in cooking applications. Voltage optimization is crucial, and collaboration with utility companies is recommended to ensure efficient electric cooking. We also recommend the development of off grid solutions for rural areas with little or no access to electricity. This will further expand the reach of eCooking methods across the nation. Establishing partnerships with appliance manufacturers can ensure the availability of affordable and reliable electric cooking devices. Developers should also design flexible business models, leverage data-driven decision-making, advocate for supportive policies, and collaborate with NGOs and development agencies to access resources. Community engagement and education efforts are essential for dispelling misconceptions and encouraging widespread adoption. By implementing these recommendations, mini-grid developers will not only meet the diverse energy needs of communities but also contribute significantly to the clean cooking transition and sustainable development goals.

### ***Private Sector***

With more than half of the population in Nigeria still relying on unsafe cooking fuels, there exists significant potential for private sector investment in the entire value chain of energy-efficient cooking devices. Opportunities span manufacturing, warehousing, distribution, repairs, maintenance, and recycling. Companies involved in the manufacturing of electric pressure cookers should explore innovative financing options to make their appliances more affordable for consumers.

This may involve partnerships with financial institutions or the development of flexible payment plans, or engaging with Government to capitalise on carbon credit initiatives. Banks and microfinance institutions can design specific financial products, such as low-interest loans or instalment plans, to facilitate the purchase of electric pressure cookers for clean cooking.

### ***Multilateral Organisations and NGOs***

We strongly recommend a collaborative effort among NGOs, multilateral organizations, advocacy groups, and community leaders to promote clean cooking through the widespread adoption of electric pressure cookers. This unified approach should involve joint advocacy for supportive policies, resource mobilization from philanthropic organizations and financial institutions, and targeted community outreach programs to educate households about the benefits of electric pressure cookers and available financing options. Additionally, partnerships with manufacturers, capacity-building initiatives, and shared monitoring and evaluation frameworks will collectively contribute to overcoming financial barriers and ensuring the success of clean cooking initiatives. This collaborative alliance aims to accelerate the transition to sustainable cooking practices, addressing the financial challenges associated with adopting electric pressure cookers and advancing the broader goal of clean energy adoption in communities.

### ***The Future***

The transition to eCooking holds immense potential, particularly for women, girls and children who are disproportionately affected by exposure to harmful fumes from unsafe cooking fuels. A cleaner, healthier, and more leisurely lifestyle is envisioned, as well as a reduction in household cooking fuel budgets. Embracing eCooking, especially with electricity, becomes a crucial strategy to ensure inclusivity and equitable benefits from cleaner air for everyone.



# Tovero **Energy**

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Cooking Services