

# Exploring Hausa Cuisine for Diabetes Management: Towards a Culinary Solution

Musa Alhaji Abdulrahaman PhD<sup>1\*</sup>, Abdullahi Haruna Imam<sup>1</sup>

<sup>1</sup>Department of Languages and Linguistics, Yobe State University, Damaturu

DOI: [10.36348/sijll.2024.v07i07.003](https://doi.org/10.36348/sijll.2024.v07i07.003)

| Received: 24.05.2024 | Accepted: 01.07.2024 | Published: 04.07.2024

\*Corresponding author: Musa Alhaji Abdulrahaman PhD

Department of Languages and Linguistics, Yobe State University, Damaturu

## Abstract

This paper explores the rich tradition of Hausa cuisine and its potential role in managing diabetes, focusing on traditional medicinal foods used by the Hausa people. Drawing from the abundant natural resources surrounding them, the Hausa people have long relied on a holistic approach to health, incorporating various trees, plants, roots, and herbs into their diet. Traditional remedies often blur the line between food and medicine, reflecting the Hausa belief that dietary choices play a crucial role in overall health. Through an extensive examination of traditional Hausa foods and their therapeutic effects on diabetes, this paper provides insights into potential culinary solutions for managing the condition. From fresh moringa leaves to baobab fruits, from hibiscus to fish and local fowls, the paper explores a wide range of traditional remedies used by the Hausa people to alleviate symptoms of diabetes. Furthermore, the paper discusses the harmful types of foods that diabetics should avoid and highlights non-harmful foods beneficial for diabetes management. By shedding light on the intricate relationship between Hausa cuisine and diabetes management, this paper contributes to our understanding of traditional medicinal practices and offers avenues for further research and exploration.

**Keywords:** Hausa cuisine, diabetes, traditional remedies.

**Copyright © 2024 The Author(s):** This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

## 1.0 INTRODUCTION

The Hausa people have long relied on the rich abundance of their natural environment for medicinal remedies, drawing from trees, grasses, and herbs that surround them. This traditional approach often involves the utilization of leaves, epiphytes, tree bark, and roots, as documented by Kura (2011:93). Many of these botanical resources serve dual purposes, not only as medicinal aids but also as integral components of the Hausa diet. Examples include moringa, bitter leaves, crane's bill, leptadania hastata, ipomoea triloba, pumpkin, okra, and balanites, among others. This holistic approach to health is reflected in Hausa proverbs such as 'cocoyam helps the stomach, but potato adds the Phlegm.' Moreover, traditional remedies often incorporate everyday foods, with treatments for ailments ranging from diarrhea to the common cold. For instance, ebony tree fruit or gum Arabic may be prescribed for diarrhea, while potash is administered for stomach ache, as documented by Bunza (1995:95). This integration of trees, plants, roots, and food highlights the depth of Hausa traditional medicine and sets the stage for exploring the potential of Hausa cuisine in managing conditions such as diabetes. *"Allah has not sent down a*

*disease except that He has also sent down its Cure"* Ibn Qayyim, (1999:24).

## 2.0 Types of Foods Beneficial for Diabetes Management:

Within the traditional Hausa diet, several foods are believed to offer therapeutic benefits for managing diabetes. These foods, ranging from fresh moringa leaves to baobab fruits, are often consumed in specific preparations or combinations to maximize their medicinal properties. For instance, mixing fresh moringa leaves with blackseed or incorporating baobab fruits with blackseed are common practices believed to help regulate blood sugar levels. Similarly, Lepta Dania hastata, when combined with black seed, is thought to have beneficial effects for diabetics. The therapeutic potential of these foods extends beyond mere folklore, with emerging scientific research supporting their efficacy in diabetes management. Studies have shown that certain compounds found in these traditional foods may help regulate blood glucose levels and improve insulin sensitivity, offering promising avenues for natural diabetes treatment.

### 3.0 Harmful Types of Foods for Diabetics:

While traditional Hausa cuisine offers many beneficial options for diabetes management, there are also foods that diabetics should avoid. Peanuts, corn, rice, and potatoes are among the foods that may negatively impact blood sugar levels and exacerbate diabetes symptoms. Additionally, processed foods containing added sugars or high levels of carbohydrates should be consumed in moderation or avoided altogether. Understanding which foods to avoid is essential for diabetics to effectively manage their condition and maintain optimal health.

### 4.0 Types of Food Recipes That is Good for a Diabetic

In the traditional Hausa diet, numerous medicinal properties are attributed to everyday foods, including those believed to be beneficial for managing diabetes. Despite the absence of a definitive cure or standardized treatment in modern medicine, Hausa culture has long recognized the therapeutic potential of certain foods. Reflecting this belief, Hausa wisdom suggests that 'there is a cure and a disease in the food one consumes,' highlighting the importance of dietary choices for overall health. For instance, the saying 'Cocoyam is healthy for the stomach but sweet potatoes bring phlegm' underscores the notion that food should not only nourish but also possess medicinal qualities.

Among the traditional Hausa foods known for their therapeutic effects in managing diabetes are:

#### 4.1 Fresh Moringa Leaves

Mix 1 cup of fresh moringa leaves in 5 cups of water and drink a cup of the mixture in the morning and one cup in the evening. mix with blackseed and drink.

#### 4.2 Leptadania Hastata and Blackseed

Mix 2 cups of battered lepradania hastata leaves in six cups of water, and take a cup in the morning and a in the evening, but mix it with blackseed.

#### 4.3 Baobab Fruits and Blackseed

Mix two (2) teaspoons of baobab fruits (the white pulp) and 1 teaspoon of blackseed) in a cup of water which should be taken after three hours and should be taken three times a week.

#### 4.4 Hibiscus and Blackseed

Mix 1 tablespoon of powdered hibiscus in a cup of water and put half a teaspoon of blackseed and drink after an hour four times a week.

#### 4.5 Moringa and Blackseed

Get a powdered moringa in water and drink daily with blackseed.

#### 4.6 Fish, Local Fowls and Pigeons

Eat a lot of fish and local chickens and pigeons. It helps the diabetic to gain energy and stamina, as well as body health.

### 4.7 Zamzam Water, Well Water and Rainwater

Drink plenty of zamzam, well water and rainwater. This is very useful for a diabetic in the field of medicine.

Every Hausa man or any person living in Hausaland is familiar with moringa, leptadania hastata, baobab fruits (white pulp), hibiscus, fish, domestic chicken, pigeons, well water and rainwater, as Hausa foods and they are among the foods that the Hausas use daily, but blackseed is not widely known in Hausaland, and they have been a cure for a diabetic person.

Also, anyone with diabetes can put these things on hold for treatment:

### 4.8 Sesame, Grinded Pepper and Watermelon Seeds

Get the following: jute leaf, blackseed, pumpkin seed, grinded sesame, powdered pepper, watermelon seed, leptadania hastate, cassia occidentalis, fetid cassia, cloves, chili and ginger.

Jute leaves powder three (3) ladles, black seed powder three (3) tablespoons, pumpkin seeds three (3) tablespoons, sesame powder 4 ladles, pepper powder and watermelon seeds 3 tablespoons, leptadania hastata 4 ladles, foetid cassia 4 ladles, a tablespoon of cloves and small portion of chili powder and ginger – mixed together thoroughly until they become one in taste and colour. Use 2-3 tablespoon in food 2-3 times daily.

All of the above, as a treatment for diabetes, are things that Hausa people manage in the field of their own strength, daily in addition to habbatussauda, for their Hausa diet and for their treatment especially for the diabetic.

### 4.9 Ipomoea Tribola and Moringa:

Ipomoea tribola and moringa are steeped in boiling water and consumed morning, noon, and night to treat diabetes. The Hausa people also use these plants.

### 4.10 Okra

The use of okra in the treatment of diabetes is highly effective. To prepare the remedy, carefully wash five ladyfingers (okra pods). Then, fill a water bottle with a cup of water and add the ladyfingers, allowing them to soak overnight. In the morning, before consuming anything else, filter the water and drink it. Repeat this process daily for a week, ensuring to filter the water before each use. Okra is known to be effective in balancing blood sugar levels, among its effects in the field of medicine for which a magazine faxed:

In one study, published in the Journal of Pharmacy & Bio Allied Sciences, researchers in India found that diabetic mice fed dried and ground okra peels and seeds experienced a reduction in their blood glucose levels, while others showed a gradual decrease in blood glucose following regular feeding of okra

extract for about ten days. (The Healthy Indian, 2016:1).

#### 4.11 Carrots and Honey

A diabetic eats carrots daily in the morning before breakfast, and after eating, he drinks two tablespoons of honey. This will be done daily for two months without break (Kura, 2011:118).

#### 4.12 Onions

To find a white onion with a single spoon, eat it every day with a spoonful of cabbage like a single finger, Kura, (2011:118). Onions, which belong to the spicy pepper family along with Hausa mushrooms, are highly effective in treating diabetes by reducing blood sugar levels (Kamusun Hausa, 2006:11). Consuming just one medium onion daily can significantly lower the risk of developing diabetes by helping the body manage sugar levels more effectively.

Researchers from the department of pharmacology at the University of Gezira published the results of a preliminary study on the anti-diabetic properties of red onion (*allium cepa*) in the journal, Environmental Health Insights. The purpose of their study was to investigate the hypoglycaemic properties of red onion in patients with Type 1 and Type 2 diabetes. They also noted that the sample size in their study was too small to reach conclusive conclusions but it seems obvious that *Allium cepa* or red onion does indeed have glucose-lowering properties that may be beneficial to those with diabetes (Jarret Morrow, 2010).

#### 4.13 Ipomoea Tribola

Dry the leaves of the plant in a shaded area until completely dehydrated. Then, soak them in water. Consume the soaked leaves by incorporating them into your meals or drinking the infused water either in the morning before eating or at night before bedtime. This method serves as a treatment for diabetes.

#### 4.14 Baobab Fruits (Kwalba da Nono)

Incorporate baobab fruits into your daily routine by steeping them in a cup of tea before showering and consuming the infused water at night before bedtime. In the morning, before eating anything, filter the water and drink it. Wait at least half an hour before consuming any food or drink to allow the medicinal properties to be absorbed more effectively by the body. Continue this regimen for a month to experience its full benefits."

My friend Alhaji Isa, from Kangalafaya Neighborhood in Gashua, attributed his freedom from diabetes to the regular consumption of baobab fruits. He never failed to mention his improved condition every time he visited the hospital for weighing.

#### 4.15 Acacia Seeds

The fruit of the acacia tree is used to treat diabetes by first making it very fluffy and then applying

it with a spoon to food. According to an interview with Mal. Abraham, who was a man of faith, this treatment is highly effective.

Modern scientific research also confirms that elderberries possess various medicinal properties, including anti-diabetic effects.

According to Egyptian Nubians, diabetics can consume unlimited carbohydrates without consequences as long as they also ingest the pods in powdered form. Extracts from these pods have been found to inhibit at least four species of pathogenic fungi (Orwa C, 2009:3).

#### 4.16 Moringa Seeds

Moringa seeds are known to effectively reduce sugar levels in the body. According to an interview with Malam Sama'ila Umar, they are typically consumed as three pills daily for a period of seven days.

A well-known traditional medicine dispensary with multiple branches in northern Nigeria, including Kano, Maiduguri, Damaturu, Haxeja, and Gashua, is Dr. Guburo Malam Dauda's Na-yi-dace Traditional Medicine. In an interview, Dr. Dauda, who is also the Chairman of the National Association of Nigerian Traditional Medicine Practitioners, Bade Local Government Chapter, Yobe State, described treatments for diabetes as follows:

#### 4.17 Hippocratea Guineensis Leaves and Bark

The leaves and bark of the Hippocratea Guineensis plant are dried in the shade, then combined and consumed as a tea in the morning and afternoon for seven days to treat diabetes. Alternatively, the leaves can be boiled and consumed similarly as a remedy for diabetes.

#### 4.18 Lepta Dania Hastate, Moringa and Hippocratea Guineensis

The dried leaves of the plants are mixed with wheat flour and consumed to treat diabetes.

#### 4.19 Mango Bark, White Hibiscus and Balma

Prepare a concoction by cooking mango bark, white hibiscus, and balma casserole in a frying pan until it cools and turns brown. Drink a cup of this mixture in the morning and afternoon for up to seven days to treat diabetes.

#### 4.20 Wild Papaya Leaves and Kattakara Stem and Leaves

The leaves of the wild papaya, parts of the kattakara plant, and its leaves are cooked for seven days and consumed in the morning and evening as a tea. Wild walnut leaves are also used to treat diabetes by boiling them and drinking the decoction three times a day for seven days, as explained by Dr. Guburo Malam Dauda.

Professor Hadiza Nuhu, a renowned expert in both traditional and modern medicine and a pioneer of traditional medicine at Ahmadu Bello University in Zaria, mentioned in an interview that many elements of Hausa cuisine are effective in treating diabetes. She also noted that numerous treatments have been validated by modern science, including:

#### 4.21 Bitter Leaves

Bitter leaves have been shown in studies to reduce sugar levels in the human body, regardless of how they are prepared. Whether used in soup, pressed to extract the juice, consumed directly, or ingested in any other form, they are effective in managing diabetes.

#### 4.22 Moringa

Moringa contains various beneficial chemicals, including proteins and minerals, which can greatly assist in alleviating pain and managing conditions like diabetes.

#### 4.23 Bitter Melon

Bitter melon is not a traditional medicine, but scientific research has shown it significantly reduces blood sugar levels in diabetics. It is effective whether cooked or chewed. Additionally, it treats diarrhea and boosts breast milk production for breastfeeding mothers. In Hawaii, women consume it postpartum to increase milk supply. It also soothes children in pain or illness when given as a drink.

Bitter melon is particularly beneficial for pregnant women, helping with diarrhea and breastfeeding issues. As childbirth approaches, women consume bitter melon either raw or cooked. According to Professor Nuhu, this practice, with God's will, ensures their health and well-being without any complications.

This research highlights the benefits of bitter melon in managing diabetes. According to the findings:

Some studies have shown that bitter melon lowers blood sugar through increased metabolism of glucose. Drink one cup every day. Try [this recipe](#) to receive the full benefit of the fruit. As with any changes to your diet, be sure to consult your physician. Stop using if you are experiencing abdominal pain, diarrhea, or fever. Monitor blood sugar regularly and adjust medications as needed, with the assistance of your doctor. (Willie, 2016:3).

A study published in the British Journal of Nutrition demonstrated the benefits of bitter melon in treating diabetes, confirming its effectiveness in a clinical trial (Mini, 2009).

#### 4.24 Hippocratea Guineensis

Hippocratea Guineensis is also known as the "sweet killer" because if a person consumes it and then

eats sugar, they won't taste the sweetness. Research has shown that it is effective in the treatment of diabetes.

#### 4.25 Soybeans

Soybeans are an effective treatment for diabetes, and anyone suffering from diabetes should consistently include them in their diet. Regardless of how they are prepared—whether cooked, made into oatmeal, or processed in other ways—soybeans have beneficial effects in managing diabetes.

#### 4.26 Wheat

If a diabetic person is going to use wheat as a treatment, it is important not to remove the bran. The wheat should be prepared and consumed with the bran to effectively treat diabetes. When properly controlled, this method can help manage diabetes. It is the bran from whole wheat which is beneficial for diabetes treatment, but when removed, its consumption could only reduce hunger for the diabetic.

#### 4.27 Bitter Eggplant

Bitter eggplant is highly beneficial as a medicine for diabetic patients due to its chemical composition. Whether consumed directly or processed in specific ways, bitter eggplant effectively reduces sugar levels in the human body.

#### 4.28 Gum Arabic, Wheat, Black seed, and Barley

Mix 100g each of gum Arabic, wheat, black seed, and barley in a pot. Bring five cups of water to a boil, and then simmer the mixture for ten minutes. Let it cool, and then strain the water. Drink this filtered water every morning on an empty stomach for seven days. Repeat this process, resting for two weeks between cycles. This regimen is believed to help manage diabetes effectively, with the hope of achieving long-term relief from the condition.

#### 4.29 Mango Leaves

Mango leaves are known to treat diabetes mellitus. According to Hassan Musa, they can be used by either cooking them to make a tea or drying them in the shade and then brewing them as a tea for a period of two to three months.

Scientific research also supports the effectiveness of mango leaves in managing diabetes. Researchers have confirmed their beneficial effects on diabetes mellitus.

These leaves are very beneficial for our overall health, because they are rich in vitamins, enzymes, antioxidants and many other minerals. Diabetes is a common condition that affects many people all around the world. It happens when your pancreas stops producing insulin or when your body is unable to use the insulin that is present in the body properly. It's as common as it is deadly. The number of diabetic people increases by the day. So, what can we do to cure diabetes

if we don't have money for medicine? A few mango leaves, and a pot of water. First take 10 to 15 tender mango leaves, then boil them in a glass of water and leave them to stay overnight. In the morning alter the water and drink it on an empty stomach. For the best result you should use this method for two or three months. You can also dry the leaves in a dark place and ground them. Use half a teaspoon of this powdered mango leaves twice a day. Mango leaves tea can be beneficial to our overall health. They can treat many health conditions such as: fever, diarrhea, insomnia, varicose veins, asthma, bronchitis, and cold. Also this leaves can lower your blood pressure and strengthen your blood vessels. (The Guardian, 21 September 2016 by Prof. Moses Adeniji Consultant Plant Pathologist).

#### 4.30 Ginger, Bitter Melon and Moringa Powder

Combine ginger, bitter melon, and moringa by cooking them together and drinking the resulting mixture as a beverage three times daily for one month. It's recommended to consume this drink on an empty stomach, waiting about half a minute to a minute before eating anything else. This regimen is known to effectively treat diabetes.

Modern scientific research has also validated ginger's potential in treating diabetes. According to the authors of the study:

A study published in the August 2012 edition of the natural product journal *Planta Medica* suggested that ginger may improve long-term blood sugar control for people with type 2 diabetes. Researchers from the University of Sydney, Australia, found that extracts from Buderim Ginger (Australian grown ginger) rich in gingerols - the major active component of ginger rhizome - can increase the uptake of glucose into muscle cells without the use of insulin, and can therefore help in the management of high blood sugar levels". Treatment with the extracts led to a 35 per cent drop in blood glucose levels and a 10 per cent increase in plasma insulin levels (Diabetes Kookbook, 2016).

#### 4.31 Tomato, Cabbage and White Onion Roots

Slices of tomatoes, cabbage, and onion roots are dried and soaked in water for two weeks, repeated twice, as a treatment for diabetes.

#### (4) Tomato, Ipomoea Tribola and Bitter Melon Roots

According to Abdullahi Alhaji Umaru Yellow, tomatoes, Ipomoea tribola, and bitter melon roots should be cooked three times a day for seven days to treat diabetes.

Similarly, modern scientific research has also confirmed the effectiveness of tomatoes in managing diabetes. Researchers explain:

Tomatoes it is rich in medicinal value. In many studies have shown that daily eating of one tomato, reduce the 60-70% positivity of diabetes. ([www.agrihealthcare.com/health-value-and-nutrient-content-in-tomato](http://www.agrihealthcare.com/health-value-and-nutrient-content-in-tomato)) (Ninsiima, R. 2012).

#### 4.32 Balanites

Balanites is used as a treatment for diabetes, whether eaten as a fruit or consumed as a gruel. According to Suleiman Adam from Potiskum, a friend experiences symptoms of diabetes relief when consuming Balanites. After consumption, he feels a notable reduction in bodily discomfort associated with the condition.

#### 4.33 Groundnut

Groundnut (peanut) treats diabetes by helping regulate blood sugar levels in diabetics, whether consumed in a raw, cooked, or processed form, according to Malam Mansur Musa Daura.

Modern scientific research supports this claim, affirming the benefits of groundnuts in managing diabetes. Here's what this scholar asserts:

Ground Nut is one of the vegetables that keep the glucose level under control in addition to monitoring the level of vascular complication. It is also a great remedy for malnutrition. Water extract from the Bengal Gram is a good remedy for diabetic patients to achieve a desirable glucose level (Pitts, 2017).

#### 4.34 Millet

Millet is effective in treating diabetes as long as its bran is not removed. According to Malam Muhammad Prince, the medicinal properties that help manage diabetes are primarily found in the bran of millet. Therefore, individuals with diabetes can benefit from consuming millet in any form or preparation method, as long as the bran is retained and not discarded.

#### 4.35 Tamarind

Tamarind treats diabetes effectively when its seeds and bark are utilized, whether they are cooked, soaked, or incorporated into gruel. Dr. Jeremiah Moses discussed how increasing its consumption in everyday meals can assist in managing diabetes.

### 5.0 Types of Foods Harmful to Diabetics

Certain types of Hausa foods can be harmful to individuals with diabetes due to their chemical composition and potential sugar content. These include: Millet, corn, dairy products, rice, *alkaki* (a certain wheat cake soaked in sugar syrup), *Nakiya* (a sugary cake made from millet or rice), cheese, potatoes, mangoes and other fruits high in sugars, legumes related to beans, lemons and other acidic fruits.

These foods can negatively affect diabetics because they may contain high levels of sugars or may be processed with sugary ingredients. It's important for diabetics to be cautious with their consumption of these foods.

### 6.0 Types of Foods Non-Harmful to Diabetics

On the other hand, there are several types of Hausa foods that are generally considered safe for diabetics. These include: herbal-based foods like balanites, millet and sorghum, pomegranate, millet porridge, bitter leaf, okra, tamarind, moringa, *ingidido*, *lansir* and lettuce.

Additionally, soybeans and soybean products, when consumed without excessive sugars, are beneficial for diabetics. These foods are also recognized for their dual role as both food and medicine in the Hausa culture. Fruits and Vegetables Beneficial for Diabetics Certain fruits and vegetables are particularly beneficial for diabetics due to their high fiber content and nutrients. These include: Apples, Pears, Berries, vegetables such as cucumbers, carrots, and garden eggs (eggplants).

Leafy vegetables are especially recommended and should ideally be consumed raw or minimally cooked to retain their nutritional value.

Dietary Recommendations for Diabetics. In managing diabetes, it's advisable for diabetics to focus on consuming foods like tomatoes, carrots, spices, garlic, and other non-harmful ingredients. Meals that include sliced tomatoes, onions, cucumbers, and carrots can be beneficial for managing diabetes effectively.

In summary, a diet rich in herbal-based foods, legumes, certain fruits, and vegetables, while avoiding foods high in sugars or processed with sugars, can significantly aid in managing diabetes. Modern scientific research supports the benefits of these dietary choices in the treatment and prevention of diabetes within the Hausa community.

### 7.0 CONCLUSION

In conclusion, the traditional Hausa diet offers a wealth of potential remedies for managing diabetes, reflecting a deep understanding of the medicinal properties inherent in everyday foods. Through centuries of knowledge and practice, the Hausa people have cultivated a culinary tradition that not only nourishes but also heals. From the widespread use of moringa and baobab fruits to the lesser-known remedies like leptadania hastata and millet, Hausa cuisine provides a diverse array of options for diabetics seeking natural treatments. However, it is essential to exercise caution and moderation, as not all traditional remedies may be suitable for every individual. Furthermore, modern scientific research has begun to validate the efficacy of certain traditional foods in diabetes management, offering opportunities for integration with conventional

medical approaches. By embracing the synergy between traditional knowledge and modern science, we can harness the full potential of Hausa cuisine as a culinary solution for diabetes management. Continued exploration and collaboration in this field hold promise for improving the health outcomes of individuals living with diabetes in Hausaland and beyond.

### REFERENCES

- Bunza, A. M. (1995) "Magungunan Hausa A Rubuce: (Nazarin Ayyukan Malaman Tsubbu)". Kundin Digiri Na Uku, Kano: Sashen Koyar Da Harsunan Nijeriya, Jami'ar Bayero.
- Diabetes Cookbook (2016). <http://www.diabetes.co.uk/natural-therapies/ginger.html> [Accessed on 22<sup>th</sup> December, 2016].
- El-Shamy, H. (1976) "The Supernatural Belief Practice System In The Contemporary Arab Folk Culture of Egypt". Indiana University Folklore, Reprints Series, Bloomington, Indiana University.
- CNHN, (2006). *Qamusun Hausa*. Zaria: Ahmadu Bello University Press Limited.
- Jarret Morrow (2010). "Do Onion Lower Blood Sugar Levels In Diabetes": In The Journal, Environment Health Insights. University of Gezira, Sudan.
- Kachako, Y. M. (2006) Kabewa Da Amfaninta Ga Waraka, M. Arzai Print Production.
- Kura, G.Y.M. (2011). "Dalilin Samuwar Waxansu Cututtuka Da Maganinsu A Bahaushiyar Al'ada". Kundin Digiri Na Biyu. Kono: Sashen Koyar Da Harsunan Nijeriya, Jami'ar Bayero.
- Ninsiima, R. (2012). "Good Diet Will Control Diabetes" Journal Planta Medica. Kampala: Uganda
- Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. (2009) Agroforestry Database: a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/af/treedb/>) Oxford University Press.
- Pitts, J. (2017) "Vegetable For Diabetes" [Accessed on 29<sup>th</sup> January, 2017]. [www.healthguidance.org/entry/11373/1/Vegetables-for-Diabetes](http://www.healthguidance.org/entry/11373/1/Vegetables-for-Diabetes). The Guardian, 21 September 2016 by Prof. Moses Adeniji Consultant Plant Pathologist
- The Healthy Indian (2016) <http://thehealthyindian.in/2016/12/22/natural-and-herbal-ways-to-fight-diabetes/> [accessed on 25<sup>th</sup> November, 2016].
- Willie, B. (2016) "Health Benefit of Bitter Lemon" <https://mrtimchart.wordpress.com/2015/12/page/2>
- World Health Organization, (2013) Eat Your Way Out Of Diabetes. Shocking Facts About Diabetes In Nigeria. <http://healthylivingguy.com/reverse-diabetes/> [Accessed on 27<sup>th</sup> January, 2017].
- World Health Organization, (2016) "Global Report On Diabetes". Paris, France: MEO Design and Communication.

**List of Peoples Interview**

Adamu Abdulsalam  
Siba Abubakar  
Alamma Suntalma Bashir  
Alhaji Mansur Musa Daura  
‘Yar Baba Ingozoma  
Muhammed Yarima  
Dr. Yerima Musa  
Dr. Guburo Malam Dauda

Mal. Sama’ila Umar  
Mal. Ibrahim Abdullahi Mani  
Suleiman Adamu Potiskum  
Abdullahi Na Alh. Umaru Mai Yadi  
Mal. Tahir Tulde  
Alhaji Wanzam Girgir  
Hassan Musa  
Farfesa Hadiza Nuhu  
Alasan Abubakar Kano