



## Exploring the Nutritional value of Moringa Oleifera leaf to enhance the Health of internally displaced persons (Idps) in Yola Adamawa State

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### Abstract

*The internally displaced persons, despite all the circumstances have the right to basic nutritional requirements. This paper explores the potentials that abound in Moringa oleifera plant parts; leaves, stems, roots, pods and seeds as source of food, proteins, vitamins, minerals which are basic requirements of a balanced diet. The seeds are also used as coagulants, antibacterial, hence its role in water purification. The Moringa plant can also survive on a very little water which is an adequate advantage in the present affected areas where violent conflict and desertification is well pronounced, leading to displacement of residents. Moringa prepared in powder and juice has the greatest impact on those who are more vulnerable malnourished children, pregnant or lactating women, Hiv/Aids patients and the elderly. The paper recommended an enlightenment campaign; exploring Moringa oleifera nutritional and health benefits to internally displaced persons (IDPs).*

**Key words:** Internally Displaced Persons, Nutrition, Moringa, Conflicts, Disasters.

### Introduction

Violent conflicts throughout the world have left millions of people displaced, some within their own country (the internally displaced) and some across international borders (refugees). An internally displaced person (IDPs) is someone who is forced to flee his or her home but who remains within his or her country's borders.

There are 3.3 million internally displaced persons in Nigeria recording the highest number in Africa (Global Overview, 2014). People are internally displaced by conflict, disasters, communal clashes and violence. Resettling is not an easy process, as many internally displaced persons experience numerous problems in their new host communities. Some of these problems include "poverty, illiteracy and prolonged dependence on government aid, cultural differences, social isolation, the language barrier, and loss of status. The most affected area is the North Eastern part of Nigeria, which has been devastated by boko haram activities despite the richness of that area in relation to dairy production. Although during the dry season milk, vegetables and fruits become inaccessible. However, internally displaced persons (IDPs) have the right to health and other basic services including the right to a standard of living adequate to maintain health and well-being.

Health as a human right does not mean the right to be healthy nor does it assert an unlimited right to be treated for every medical condition. Rather, the right to health may be seen as having two components: a right to health care and a right to healthy conditions. The right-based approach to health incorporates both a clinical, curative perspective focusing on health care and health services, and a public health, preventive perspective focusing on the social determinants of health- including water, sanitation, nutrition, and health education. IDPs have the right to an adequate standard of living and that “at the minimum, regardless of the circumstances, and without discrimination. Competent authorities shall provide internally displaced persons with and ensure safe access to; essential food and potable water, basic shelter housing, appropriate clothing, essential medical services and sanitation.

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Mothers may feel compelled to use any means to obtain food for their children, including by agreeing to sexual favours or prostitution in exchange for food or the means to obtain it. Inadequate nutrition among children can seriously affect their physical and mental development, may prevent them from attending school, and push them into child labour to contribute to the family's income.

The Millennium Development Goals (2015) declarations include undertakings to reduce poverty, malnutrition, and lack of access to water, as well as to reduce maternal and child mortality and halt the spread of major diseases such as HIV/AIDS and malaria. Also to ensure that people affected by disasters have access to at least the minimum requirement (water, sanitation, food, nutrition shelter, and health care) to satisfy their basic right to live with dignity. Researches have shown that the International Rescue Committee (IRC) spends approximately \$7.5 per child per month to purchase fresh vegetables and fruit, milk and eggs in the Kenya local market (Lam, et al 2009) to the nutritional requirement of internally displaced persons (IDPs).

### **Botany of Moringa Oleifera**

*Moringa Oleifera* also known as Drumstick in English, zogale in Hausa, Ewe ile in Yoruba, Kabije/Bisa in Fulfude and Mlonge in Swahili is a widely cultivated species of the genus *Moringa*, which is the only genus in the family Moringaceae. It is a fast-growing, drought-resistant tree, native to the southern foothills of the Himalayas in northwestern India, and widely cultivated in tropical and subtropical areas where its young seed pods and leaves are used as vegetables. It can also be used for water purification and hand washing, and is sometimes used in herbal medicine.

### **Scientific classification**

**Kingdom:** plantae/Angiosperm, **Order:** Brassicales, **Family:** Moringaceae, **Genus:** *Moringa*  
**Species:** *Oleifera*

### **Moringa Leaf**

The leaves of the *Moringa oleifera* plant have been used as food and in medicinal preparations for centuries. Modern medical research also bears out the value of these versatile leaves, making them a valuable natural resource for a wide range of uses in the medical and nutritional field.

Moringa plant can be grown in semi-arid and tropical areas, its leaves can serve as a nutritional supplement to people in regions where naturally occurring food sources are scarce. The Moringa plant can also survive on very little water; a definite advantage in many areas where desertification and climate change are creating widespread malnutrition among the inhabitants (Fuglie, 2001).

### **Nutritional value**

Moringa Oleifera is one of the most underutilized tropical tree crops, leaves of Moringa could serve as a valuable source of nutrients for all age groups. (Babayo, Nafisatu, Leatu, Mahmoud & Hauwau, 2010). Moringa leaves are especially useful in combating hunger since they can be dried and transported easily and provide much needed protein and Vitamin C, along with numerous other nutrients, vitamins and minerals. The leaves are particularly useful for infants, young children and nursing mothers, since they contain significant amounts of calcium, proteins and other vital elements for growth and health development. Study reveals that fresh leaf samples have high nutritional and minerals composition as compared to dried samples but all are within the acceptable limit by Food and Agriculture Organization. The United Nation (2006), World Health Organization (2005) confirmed that a sample of Moringa Oleifera leaf contains high values of iron, Calcium and protein. Nutritional analysis has shown that Moringa leaves are extremely nutritious. In fact, they contain larger amounts of several important nutrients than the common foods often associated with these nutrients. These include vitamin C, which fights a host of illnesses including colds and flu; vitamin A, which acts as a shield against eye disease, skin disease, heart ailments, diarrhea, and many other diseases; Calcium, which builds strong bones and teeth and helps prevent osteoporosis; Potassium, which is essential for the functioning of the brain and nerves, and Proteins, the basic building blocks of all our body cells. Where fresh Moringa leaves are available, they are typically cooked in a similar way with spinach or other greens, and served as a side dish with other foods. They can also be used raw as salad and combined with other leafy vegetables or grains. Dried leaves are usually sprinkled on other foods to increase their nutritional value or taken in supplement form or as tea.

### **How Moringa can Enhance the Health of IDPs:**

Some of the challenges faced by internally displaced persons are; poverty, illiteracy, diverse illnesses, social isolation and cultural differences. The health challenges of the IDPs can be greatly reduced or managed using moringa leaves prepared in various ways.

**Moringa soup:** The leaves of moringa can be cooked as soup. The leaves should not be over-cooked and too much potash should not be added to taste. Too much potash and boiling of the leaf can reduce the nutrients.

**Moringa leaf salad:** The leaves of moringa can be used to prepare salad by mixing it with other vegetables like tomatoes, red pepper, onions and maybe salad cream can be added but the moringa leaf should be slightly boiled before mixing with other vegetables.

**Moringa tea:** The fresh or dried leaves of moringa can be boiled and filtered and taken as tea. Honey can be added also.

**Using moringa leaf powder:** Moringa Leaf Powder can be added to any food or beverage and it will increase the vitamin, mineral and protein content. For healthy individuals, a few spoonful of Moringa Leaf Powder can be added to any meal to make it more nutritious. Since the nutrient content of Leaf Powder decreases if exposed to heat, add the powder after the food or drink has been prepared, just before serving. Leaf Powder has the greatest impact on those who are more vulnerable: malnourished children, pregnant or lactating women, children at weaning age, HIV/AIDS patients, and the elderly. Malnourished children ages 1-3 years should consume three rounded tablespoons (25g) of Moringa Leaf Powder each day. Pregnant or lactating women should consume six rounded tablespoons (50g) of Moringa Leaf Powder each day (Food and Agriculture Organization of the United Nation, 2006; World Health Organization, 2005). Nutrient content in percentage per 25g and 50g were presented in Table 1.

**Table 1:** Nutrient content in percentage per 25g and 50g

Nutrient	25g children	50g pregnant women
Protein	42%	21%
Calcium	125%	84%
Magnesium	61%	54%
Potassium	41%	22%
Iron	71%	94%
Vitamin A	310%	162%
Vitamin C	22%	9%

World Health Organization ( 2005)

### **Moringa juice**

Juice from the leaves is believed to have a stabilizing effect on blood pressure and is used to treat anxiety. It is believed to control glucose levels in cases of diabetes. Mixed with honey and followed by a drink of coconut milk 2 or 3 times a day, leaves are used as a remedy for diarrhea, dysentery and colitis. Leaf juice, sometimes with carrot juice added, is used as a diuretic action. Leaves and buds are rubbed on the temples for headache. A poultice is made from fresh leaves and applied to reduce glandular swelling. Leaf juice is used as a skin antiseptic. Leaves are used to treat fevers, bronchitis, eye and ear infections, scurvy, and catarrh (inflammation of the mucus membrane) leaves are considered to be anthelmintic (able to kill worms).

### **The Kenya voucher process**

The value of the Kenya voucher was defined based on the 'ideal' complementary food basket and the value of items calculated based on market prices (October, 2007). The result amounted to 1494 KSh per child per month (as presented in Table 3). Each child in the nutrition programme was entitled to a voucher worth 600KSh per month that could be divided easily into two i.e 300 KSh vouchers. The Kenya Non- Governmental Organization spends 600ksh a Month per child, and all the nutrients found in the fruits, vegetables, eggs and milk are far less than what Moringa oleifera 50g powder can offer,



**Table 2:** Kenya voucher table for available food items

Food group	locally available	serving/month/g	cost/month/ksh	Cost/group
Fruits	mango	19.8	297	594
	Orange	19.8	198	
	Banana	19.8	99	
Vegetables	tomatoes	1.95	78	216
	Potatoes	1.95	78	
Protein	egg	8.4	84	84
Dairy	cow milk	30 cup	600	600

(ACF Capitalisation report, 2008).

### Modern medical uses

A number of peer-reviewed research studies support the use of Moringa leaves in therapeutic applications. The Moringa leaf contains powerful antioxidants that have proven their effectiveness against cancer cells in the laboratory. Additionally, Moringa leaves increase milk production and the nutritional value of the milk in nursing mothers and also used therapeutically to treat high blood pressure with good results. Other important uses of Moringa Oleifera leaves are as follows; As food for stock animals and even in fishery applications in order to provide more nutrition, High protein content of the Moringa leaf helps animals to grow more quickly, leaves are far cheaper than most other sources of protein for fish and farm animals and leaves have also shown great promise in enhancing the growth of other plants; extract of the leaves diluted in ethanol can increase the sturdiness of the plants as well as the number and size of the fruit produced, enhancing the overall harvest and improving the productivity of agricultural products. The potential value of Moringa leaves in diet and agriculture cannot be overestimated. The leaves of the plant offer a wide range of health and nutritional benefits while providing solid results for a number of other agricultural and livestock activities. The medicinal values of Moringa Oleifera are enormous as shown in table 3.



**Table 3:** Moringa Oleifera Leaves Medicinal Uses

Antimicrobial (biocidal)	Cancer Therapy	Circulatory disorders	General disorder
Bacterial Infection	Anti tumor	Anti anemic	Lactation
Urinary tract infection	Prostrate	Anti hypertensive	Catarch
Viral infection	Radio protective	Radio protective	Scurvy
Hiv/Aids		Diuretic	Toni
Helminthes	Hypochlostemia		Rheumatism
Brochitis			
External sore/ulcers			

(ACF Capitalisation report, 2008).

### Conclusion

The importance of Moringa Oleifera to all age groups including the aged and children cannot be overemphasized. Displaced persons have the right to adequate standard of living regardless of the circumstances, as such he/she has the right to a balanced diet. Moringa Oleifera proved scientifically to contain all the necessary and essential nutrients which are needed as a requirement of an individual. Hence the nutritional value of Moringa Oleifera can effectively enhance the nutritional requirement of an internally displaced person.

### Recommendations

Enlighten campaign on exploring Moringa oleifera nutritional and health benefits to IDPs

education was provided to all beneficiaries as part of the voucher distribution process.

Health education sessions focused on food hygiene and balanced diet and to include cooking demonstrations, juice processing as well as information on how to grow and propagate the Moringa oleifera plant. Government support in providing Moringa development project of federal college of education. Eating of the leaves is also used for gonorrhea treatment as well as diuretic action. Growing Moringa Oleifera plant is found to have potentials in both germination and production of leaves within a short period of time. Encourage the conservation club of the biology department to plant the Moringa Oleifera plant in their Go green project.



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