

# All Things Moringa

The Story of an Amazing Tree of Life

[www.allthingsmoringa.com](http://www.allthingsmoringa.com)



100 grams of dry Moringa leaf contains:



By Hakim Bey

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“ Moringa shows great promise as a tool to help overcome some of the most severe problems in the developing world—malnutrition, deforestation, impure water and poverty. The tree does best in the dry regions where these problems are worst.”

- Andrew Young, former Atlanta Mayor and United Nations Ambassador<sup>6</sup>

“Among the wide range of Green Leafy Vegetables, Moringa is the richest source of Beta-Carotene [vitamin A], apart from providing other important micronutrients.”

- Dr. Kamala Krishnaswamy, former Director, Indian Council of Medical Research, Hyderabad<sup>7</sup>



“ Although few people have ever heard of it today, Moringa could soon become one of the world's most valuable plants, at least in humanitarian terms.”

- Noel Vietmeyer, US National Academy of Sciences, Washington D.C.<sup>8</sup>

***...traditional practice has long suggested that cancer prevention and therapy may be achievable with native plants.***

***In the recent past, more than 750 studies, articles and other publications have included Moringa.***

# All Things Moringa

## The Story of an Amazing Tree of Life

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## Introduction



The Moringa tree is one of the most incredible plants I have ever encountered. This may sound sensationalist, but Moringa's nutritional and medicinal properties have the potential to end malnutrition, starvation, as well as prevent and heal many diseases and maladies

worldwide. Moringa is truly a miracle plant, and a divine gift for the nourishing and healing of man. This plant has so many uses and special features, it is hard to know where to begin sharing what I have learned about this wonderful plant. This book is the result of my research on Moringa. I have read many books, research papers, seen many videos and have visited many websites. In this book I have distilled the best and most useful information from all of these sources in order to save you the reader from have to wade through all of the information out there about Moringa. This book will give you the key information in a concise way so that it will be easy to read and share its content with others. I plan to write more in the future about Moringa, but for now this book will serve as an excellent introduction to Moringa.

**Moringa** is the sole genus in the flowering plant family **Moringaceae**. The genus Moringa in turn is made up of 13 species. The species most common, and which is the main subject of this book is the species called "**Moringa Oleifera**." Moringa Oleifera is found in many tropical and sub-tropical regions. Moringa can be grown in the even the harshest and driest of soils, where barely anything else will grow. In fact, one of the nicknames of Moringa is "never die" due to its incredible ability to survive harsh weather and even drought.

***All parts of the Moringa tree are edible and have long been consumed by humans. (Jed W. Fahey, 2005)***

Jed W. Fahey, Sc.D., is a nutritional biochemist at the Johns Hopkins School of Medicine.

The most incredible thing about Moringa is the amount of nutritional and medicinal chemicals and compounds found in this plant. The chart below will give you a quick view of some of the notable nutrients contained in this plant.



Figure 1: Fuglie LJ (1999) *The Miracle Tree: Moringa oleifera: Natural Nutrition for the Tropics*. Church World Service, Dakar. 68 pp.; revised in 2001 and published as *The Miracle Tree: The Multiple Attributes of Moringa*, 172 pp.

As seen in the chart above, not only does Moringa contain vitamin A, vitamin C, Calcium, Potassium, Iron, and Protein, it contains it in high amounts that are easily digested and assimilated by the human body. The chart above highlights some of the commonly known nutrients needed by the human body. Moringa also contains, not one, not two, not three, but over 40 anti-oxidants. Moringa is said to contain 539 known compounds which according to traditional African and Indian medicine (Ayurvedic) is said to prevent of 300 diseases and maladies.

Below are two more charts which give a little more detailed view of the vitamins, minerals and amino acids (proteins), contained in Moringa's fresh leaves and dried leaf powder.

**Every part of the Moringa tree is said to have  
beneficial properties that can serve humanity.  
People in societies around the world have  
made use of these properties.  
([www.treesforlife.org](http://www.treesforlife.org))**

## Vitamin & Mineral Content of Moringa

All values are per 100 grams of edible portion.

	Fresh Leaves	Dried Leaves
Carotene (Vit. A)*	6.78 mg	18.9 mg
Thiamin (B1)	0.06 mg	2.64 mg
Riboflavin (B2)	0.05 mg	20.5 mg
Niacin (B3)	0.8 mg	8.2 mg
Vitamin C	220 mg	17.3 mg
Calcium	440 mg	2,003 mg
Calories	92 cal	205 cal
Carbohydrates	12.5 g	38.2 g
Copper	0.07 mg	0.57 mg
Fat	1.70 g	2.3 g
Fiber	0.90 g	19.2 g
Iron	0.85 mg	28.2 mg
Magnesium	42 mg	368 mg
Phosphorus	70 mg	204 mg
Potassium	259 mg	1,324 mg
Protein	6.70 g	27.1g
Zinc	0.16 mg	3.29 mg

\*Figures shown for vitamin A are carotene content for fresh leaves and beta-carotene content for dried leaves.<sup>1, 5</sup>



## Amino Acid Content of Moringa\*

All values are per 100 grams of edible portion.

	Fresh Leaves	Dried Leaves
Arginine	406.6 mg	1,325 mg
Histidine	149.8 mg	613 mg
Isoleucine	299.6 mg	825 mg
Leucine	492.2 mg	1,950 mg
Lysine	342.4 mg	1,325 mg
Methionine	117.7 mg	350 mg
Phenylalanine	310.3 mg	1,388 mg
Threonine	117.7 mg	1,188 mg
Tryptophan	107 mg	425 mg
Valine	374.5 mg	1,063 mg

\*While Gopalan, et al. expressed amino acid content per g N (nitrogen), these figures have been converted to mg per 100g leaves for clarity.

## The Moringa Solution to Worldwide Malnutrition

Looking at the abundance in the number of different vitamins, minerals and amino acids, as well as the high concentration of many of these nutrients it is easy to understand why Moringa has been said to prevent 300 diseases.

***“Although few people have ever heard of it today, Moringa could soon become one of the world’s most valuable plants, at least in humanitarian terms.”***

Noel Vietmeyer, US National Academy of Sciences, Washington D.C.

***In the recent past, more than 750 studies, articles and other publications have included Moringa. ([www.treesforlife.org](http://www.treesforlife.org))***

Dr. Martin Price did a great job in his book "The Moringa Tree" in reporting the results of the administration of Moringa in various so-called "developing nations," especially the great work done by Lowell F. Fuglia in Senegal. Below are a few quotes from his book on the efficacy of Moringa in combating malnutrition, and in providing nourishment to breast feeding mothers and children.

*Successful treatment of malnourished children has been well-documented. Interviews with men and women who have made Moringa a regular part of their diets point out that they have a keen awareness of improvements in their health and energy. At one health post, the pharmacy is now selling Moringa leaf powder to mothers with malnourished children. (Price, 1985)*

*The supervisor of the primary health department at a hospital said, "We have always had problems with the classical approach to treating malnourished children. This was based on industrial products: whole milk powder, vegetable oil and sugar. All these things are expensive. When you tell a parent to go out and buy them—this can be truly costly for them." A nurse in charge of pediatrics at a hospital keeps dried leaf powder on hand to give out to mothers of malnourished children. (Price, 1985)*

*An administrator at another general hospital is a diabetic. "I have for the past three years been controlling my blood sugar by periodically drinking a tea made from Moringa leaves." He decided to plant a thousand trees around the hospital complex. "This way we will always have a ready supply of leaves to treat the cases of malnutrition we receive. (Price, 1985)*

*At first, when I tried to nurse my son, I was not producing enough milk. Then I started to eat Moringa. After a short while I had enough milk again. We now eat Moringa sauces at least three times a week. Every other time I had a baby, I lost weight during the months I was breast-feeding. This time I have been gaining weight.*



## The Johns Hopkins School Research on Moringa



Jed W. Fahey, Sc.D. , Johns Hopkins School of Medicine, Department of Pharmacology and Molecular Sciences produced a very important research paper titled: “***Moringa oleifera: A Review of the Medical Evidence for Its Nutritional, Therapeutic, and Prophylactic Properties. Part 1.***” In this seminal work, they began the process of sifting through the scientific work on Moringa, as well as the traditional, as well as anecdotal evidence for Moringa’s nutritional, therapeutic and prophylactic. In doing this, they found that much of the scientific evidence is

beginning to support much of the traditional and anecdotal information. I will first present some of the traditional information on the use of Moringa in treating various diseases and maladies.

Below are quotes as well as a chart given in the Johns Hopkins research paper on the scientific evidence regarding Moringa’s nutritional value, as well as it’s Medicinal properties.

***... the nutritional properties of Moringa are now so well known that there seems to be little doubt of the substantial health benefit to be realized by consumption of Moringa leaf powder in situations where starvation is imminent. (Jed W. Fahey, 2005)***

Jed W. Fahey, Sc.D. , is a nutritional biochemist at the Johns Hopkins School of Medicine.

Moringa preparations have been cited in the scientific literature as having antibiotic, antitrypanosomal, hypotensive, antispasmodic, antiulcer, anti-inflammatory, hypo-cholesterolemic, and hypoglycemic activities, as well as having considerable efficacy in water purification by flocculation, sedimentation, antibiosis and even reduction of Schistosome cercariae titer.

**Antibiotic Activity:** This is clearly the area in which the preponderance of evidence—both classical scientific and extensive anecdotal evidence—is overwhelming. The scientific evidence has now been available for over 50 years, although much of it is completely unknown to western scientists. (Jed W. Fahey. 2005)

Jed W. Fahey, Sc.D. , is a nutritional biochemist at the Johns Hopkins School of Medicine.

**Rhamnose & Phytochemicals** -Phytochemicals are chemical compounds produced by plants through interaction with the sun (photosynthesis) and which have an effect on health and healing.

**Phytochemicals and 6 Carbon Sugar Rhamnose:** An examination of the phytochemicals of Moringa species affords the opportunity to examine a range of fairly **unique compounds**. In particular, this plant family is rich in compounds containing the simple sugar, **rhamnose**, and it is rich in a fairly unique group of compounds called glucosinolates and isothiocyanates. For example, specific components of Moringa preparations that have been reported to have **hypo-tensive, anticancer, and antibacterial** activity include 4-(4'-O-acetyl- $\alpha$ -L-rhamnopyranosyloxy)benzyl isothiocy-anate, 4-( $\alpha$ -L-rhamnopyranosyloxy)benzyl isothiocy-anate, niazimicin, pterygospermin ], benzyl isothiocyanate [5], and 4-( $\alpha$ -L-rhamnopyranosyloxy) benzyl glucosinolate [6]. While these compounds are relatively unique to the Moringa family, it is also rich in a number of vitamins and minerals as well as other more commonly recognized phytochemicals such as the carotenoids (including  $\beta$ -carotene or pro-vitamin A).



**Antibacterial and Antifungal:** Subsequent elegant and very thorough work, published in 1964 as a PhD thesis by Bennie Badgett (a student of the well known chemist Martin Ettlinger), identified a number of glycosylated derivatives of benzyl isothiocyanate [5] (e.g. compounds containing the 6-carbon simple sugar, rhamnose) (8). The identity of these compounds was not available in the referred scientific literature until “re-discovered” 15 years later by Kjaer and co-workers (73). Seminal reports on the antibiotic activity of the primary rhamnosylated compound then followed, from U Eilert and colleagues in

Braunschweig, Germany (33, 34). They re-isolated and confirmed the identity of 4-( $\alpha$ -L-rhamnopyranosyloxy)benzyl glucosinolate [6] and its cognate isothiocyanate [2] and **verified the activity of the latter compound against a wide range of bacteria and fungi.** (Jed W. Fahey, 2005)

This is clearly the area in which the preponderance of evidence—both classical scientific and extensive anecdotal evidence—is overwhelming. The scientific evidence has now been available for over 50 years, although much of it is completely unknown to western scientists.

***H. pylori* is an omnipresent pathogen** of human beings in medically underserved areas of the world, and amongst the poorest of poor populations worldwide. It is a major cause of gastritis, and of gastric and duodenal ulcers, and it is a major risk factor for gastric cancer (having been classified as a carcinogen by the W.H.O. in 1993). Cultures of *H. pylori*, it turned out, were extraordinarily susceptible to [2], and to a number of other isothiocyanates (37, 60). **These compounds had antibiotic activity against *H.pylori* at concentrations up to 1000-fold lower than those which had been used in earlier studies against a wide range of bacteria and fungi.** The extension of this finding to human *H. pylori* infection is now being pursued in the clinic, and the prototypical isothiocyanate has already demonstrated some efficacy in pilot studies. (Jed W. Fahey, 2005)

## Cancer Prevention

***...traditional practice has long suggested that cancer prevention and therapy may be achievable with native plants. (Jed W. Fahey, 2005)***

Jed W. Fahey, Sc.D. , is a nutritional biochemist at the Johns Hopkins School of Medicine.

Since *Moringa* species have long been recognized by folk medicine practitioners as having value in tumor therapy, we examined compounds for their cancer preventive potential. Recently, these compounds were shown to be potent inhibitors of phorbol ester (TPA)-induced Epstein-Barr virus early antigen activation in lymphoblastoid (Burkitt's lymphoma) cells.

In one of these studies, they also inhibited tumor promotion in a mouse two-stage DMBA-TPA tumor model. In an even more recent study, Bharali and colleagues have examined skin tumor prevention following ingestion of drumstick (*Moringa* seedpod) extracts. In this mouse model, which included appropriate positive and negative controls, a dramatic reduction in skin papillomas was demonstrated. **Thus, traditional practice has long suggested that cancer prevention and therapy may be achievable with native plants.** (Jed Fahey, 2005)



***...antibiosis and cancer prevention as just two examples of areas of Moringa research for which the existing scientific evidence appears to be particularly strong. (Jed Fahey, 2005)***

Jed W. Fahey, Sc.D. , is a nutritional biochemist at the Johns Hopkins School of Medicine.



***A plethora of traditional medicine references attest to its curative power... p.3***

***...In many cases, published in-vitro (cultured cells) and in-vivo (animal) trials do provide a degree of mechanistic support for some of the claims that have sprung from the traditional medicine lore. For example, numerous studies now point to the elevation of a variety of detoxification and antioxidant enzymes and biomarkers as a result of treatment with Moringa or with phytochemicals isolated from Moringa. (Jed W. Fahey, 2005)***

Jed W. Fahey, Sc.D. , is a nutritional biochemist at the Johns Hopkins School of Medicine.

## **Malnutrition and Disease**

Many people, believe it or not, are not fully aware of the connection between malnutrition and disease. The body intrinsically has the ability to both prevent disease as well as fight disease as long as it has the nutrients it needs to do this work. The body, its organs and its immune system need certain nutrients in certain amounts in order to function properly. If the body does not have these nutrients, its full and most efficient functioning is deteriorated and even lost. For instance, many children in the so-called “developing nations” suffer from night blindness and other eye diseases and afflictions simply because they do not get enough vitamin A. Due to the high vitamin A content of Moringa, this could be alleviated by mixing a few tablespoons of Moringa into the food of these children. Many disease and afflictions affecting millions of people, especially children around the world due to nutrient poor diets can be alleviated by just adding Moringa leaf powder to their foods.



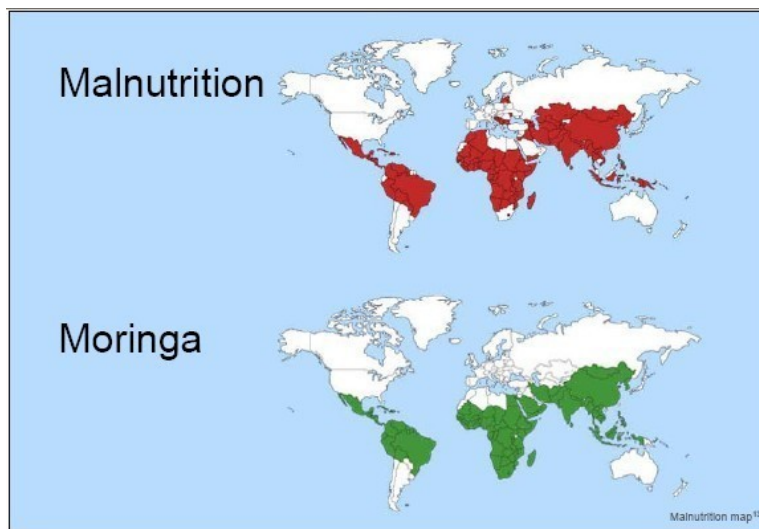
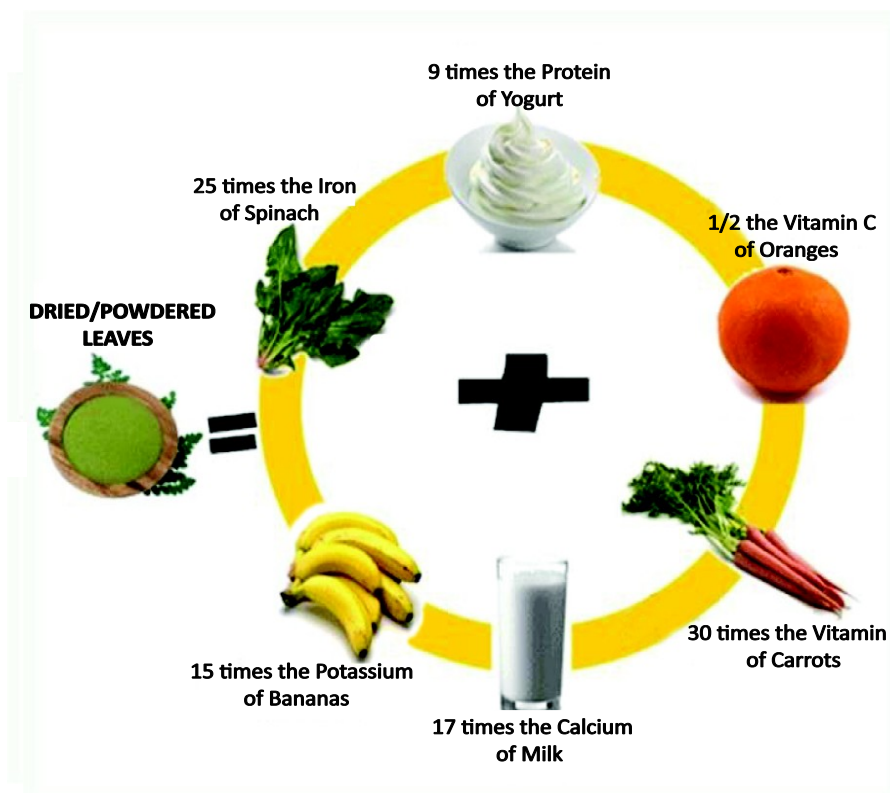
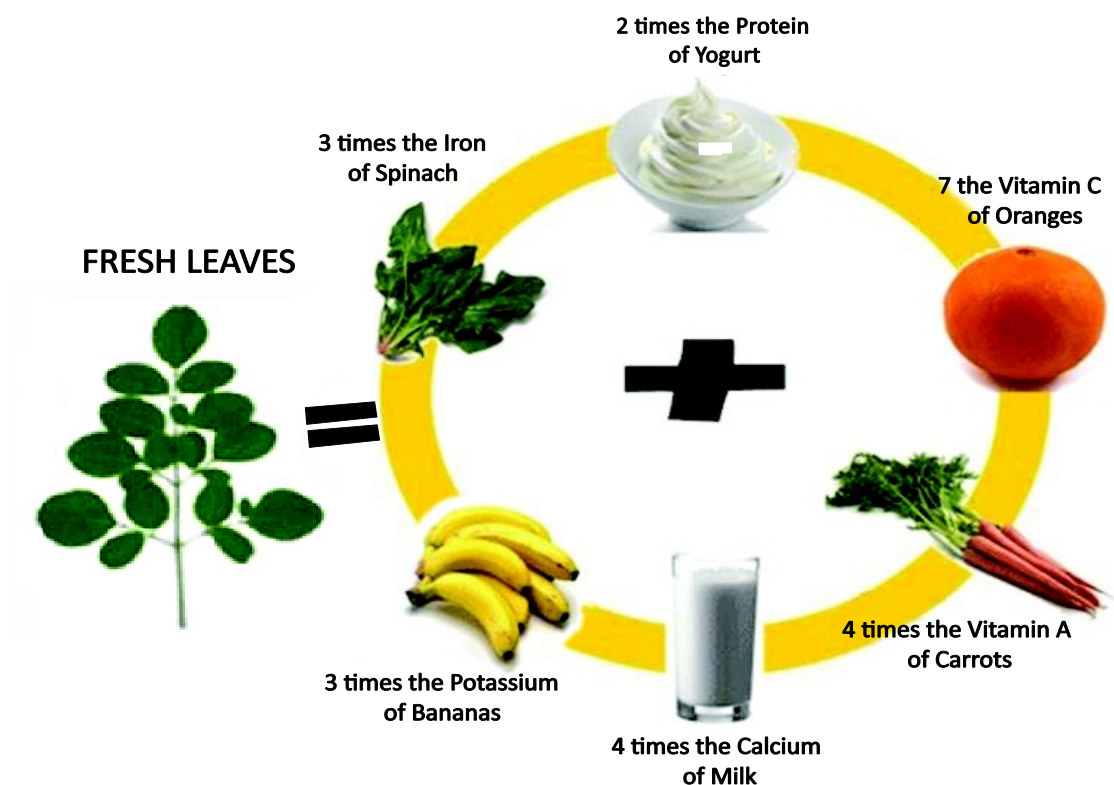


Figure 2: The map of the places where malnutrition is a major issue is the same as the map of where Moringa grows wild. Wherever there is a human problem, nature usually provides the cure close at hand.



## Key Nutrients in Moringa and Disease Prevention

Let's look at some of the nutrients in Moringa (see illustration above and preceding charts) and how the lack of these nutrients often leads to various disease and maladies. Moringa supplies a wide variety of nutrients in a non-toxic and easy to digest form. Moringa also contains these nutrients in combinations that are easy for the body to assimilate and digest. No wonder Moringa is considered a "miracle tree" with the ability to save your life and Lives worldwide.



## Values for African Grown Fresh Moringa Leaf

### Vitamin A



By providing abundant **Vitamin A**, Moringa helps prevent:

- 1) Blindness (night blindness and complete)
- 2) Maternal mortality
- 3) Pregnancy and lactation (breast milk) production problems
- 4) Weak immunity and inability to fight infections

**NOTE:** Approximately 250,000 to 500,000 malnourished children in the developing world go blind each year from a deficiency of vitamin A, approximately half of which die within a year of becoming blind. The United Nations Special Session on Children in 2002 set the elimination of vitamin A deficiency by 2010. (Wikipedia, 2010)

It is unfortunate that over 100 million children around the world may go blind simply because they are not getting enough vitamin A. What makes it even more ironic is that in many of the countries where this is a problem, Moringa often grows wild. Just a few spoonfuls in the children's food could easily save them from going blind. "

**Even though Americans are some of the most obese people in the world, Americans, especially children still suffer from malnutrition because the food has been robbed of nutrients as a result of processing the food.**

**"...among the leafy vegetables, one stands out as particularly good, the horseradish tree (Moringa). The leaves are outstanding as a source of vitamin A..."** [Survival and Subsistence in the Tropics by Frank Martin]

## Vitamin C



By providing **Vitamin C**, Moringa helps prevent:

- 1) **Scurvy** -Scurvy leads to the formation of spots on the skin, spongy gums, and bleeding from the mucous membranes. The spots are most abundant on the thighs and legs, and a person with the ailment looks pale, feels depressed, and is partially immobilized. In advanced scurvy there are open, suppurating wounds and loss of teeth.

**High Blood Pressure (Hypertension)**

**Weakness Lassitude**

**Swollen gums, nosebleeds**

**NOTE:** Scurvy does not occur in most animals because they can synthesize their own vitamin C, but humans, other primates, guinea pigs, and a few other species lack an enzyme necessary for such synthesis and must obtain vitamin C through their diet. Vitamin C is widespread in plant tissues, with particularly high concentrations occurring in citrus fruits (oranges, lemons, limes, grapefruits), tomatoes, potatoes, cabbages, and green peppers.

(Wikipedia, 2010)

## Iron



By providing abundant **Iron**, Moringa helps prevent:

- Anemia
- Fatigue
- Irritability
- Weakness
- 5) Shortness of Breath
- 6) Dizziness
- 7) Pale skin color
- Sore tongue
- 9) Brittle nails
- 10) Decreased appetite (especially in children)
- 11) Headache – frontal

**NOTE: Iron deficiency (sideropenia or hypoferremia)** is one of the most commonly known forms of nutritional deficiencies. In the human body, iron is present in all cells and has several vital functions—as a carrier of oxygen to the tissues from the lungs in the form of hemoglobin, as a transport medium for electrons within the cells in the form of cytochromes, and as an integral part of enzyme reactions in various tissues. Too little iron can interfere with these vital functions and lead to morbidity and death.

The direct consequence of iron deficiency is iron deficiency anemia. Groups that are most prone to developing this disease are children and pre-menopausal women.

**Moringa is especially useful for children & women who are anemic due to their menstrual cycles.**

# Calcium

Moringa Leaf Powder



17 times the Calcium  
Of Milk

Fresh Moringa Leaf



17 times the Calcium  
Of Milk

By providing abundant **Calcium**, Moringa helps prevent:

- 1) Anemia
- 2) Osteoporosis -Bone weakness and damage
- 3) Muscle damage / impairment
- 4) Nerve damage / impairment
- 5) Abnormal heartbeat and functioning

**NOTE:** Calcium is the most abundant mineral found in the human body. The majority (99%) is stored in the bones and teeth; the rest is stored in muscle tissue and blood. In addition to bone building and remodeling, calcium is also responsible for muscle contraction, central nervous function and hormone secretion.

## The importance of calcium increases with age:

Calcium deficiency is of major concern in the United States. An estimated 44-87% of Americans don't get enough. An easy way to think of calcium and bone health is to imagine the bones as a savings account at a bank. You see, until the ages of 30-35 the body stores calcium in the bones. However, after this time calcium is no longer stored in bones. As a result, when the body tries to remodel bones its only source of calcium is ingested calcium. If you're not eating enough calcium, the body has nothing to use. Thus, the body cannot remodel the bones, and bone density subsequently decreases. The calcium you consume early in life is deposited into your "bone" savings account. If little calcium is saved, then there will be little to spend when retirement comes (i.e. when the body tries to remodel your bones). (By Dena McDowell, 2006)

**Moringa is especially useful for low amounts of calcium in the blood serum. Moringa can deliver to your body the calcium you need in a safe way.**



# Protein (Amino Acids)



By providing abundant **Protein**, Moringa helps prevent:

- 1) **Edema** – A collection of fluid under the skin, which most commonly affects the legs, feet, and ankles, but can occur anywhere on the body.
- 2) **Weight loss**
- 3) **Thinning or brittle hair, hair loss**
- 4) **Ridges or deep lines in finger and toe nails**
- 5) **Skin becomes very light, burns easily in the sun**
- 6) **Reduced pigmentation in the hair on scalp and body**
- 7) **Skin rashes, dryness, flakiness**
- 8) **General weakness and lethargy**
- 9) **Muscle soreness and weakness, cramps**
- 10) **Slowness in healing wounds, cuts, scrapes, and bruises**
- 11) **Bedsores and other skin ulcers**
- 12) **Difficulty sleeping**
- 13) **Headache**
- 14) **Nausea and stomach pain**
- 15) **Fainting, crankiness, moodiness**
- 16) **Severe depression**
- 17) **Anxiety**
- 18) **Lack of energy, no desire to do things** (Grosvenor, 2010)

**NOTE:** Protein deficiency is a serious cause of ill health and death in developing countries. Protein deficiency plays a part in the disease kwashiorkor. War, famine, overpopulation and other factors can increase rates of malnutrition and protein deficiency. Protein deficiency can lead to reduced intelligence or mental retardation, see nutrition disorder.

In countries that suffer from widespread protein deficiency, food is generally full of plant fibers, which makes adequate energy and protein consumption very difficult.<sup>[170]</sup> Protein deficiency is generally caused by lack of total food energy, making it an issue of not getting food in total. Symptoms of kwashiorkor include apathy, diarrhea, inactivity, failure to grow, flaky skin, fatty liver, and edema of the belly and legs. This edema is explained by the normal functioning of proteins in fluid balance and lipoprotein transport.<sup>[10]</sup>

**Moringa trees** are known to overcome protein deficiency in developing countries as the leaves and other parts of the tree contain comparably To soy bean high amount of crude proteins and amino acids.  
(Wikipedia, 2010)

***Moringa trees are known to overcome protein deficiency in developing countries as the leaves and other parts of the tree contain comparably to soy bean high amount of crude proteins and amino acids. (Wikipedia, 2010)***

**Moringa is an excellent non-animal source of protein for vegans and vegetarians!!!**

## Potassium

Moringa Leaf Powder



15 times the Potassium  
of Bananas

Fresh Moringa Leaf



3 times the Potassium  
of Bananas

By providing abundant **Potassium**, Moringa helps prevent:

- 1) Hypokalemia
- 2) Fatigue
- 3) Problems such as Myalgia and muscular weakness
- 4) Hyponatremia and also may experience confusion i.e. anxiety.
- 5) Acme problem
- 6) Skin related problems such as blistering, skin eruptions, dryness of skin etc.
- 7) Temporary memory loss or problems such as weak memory etc.
- 8) Heart related problems, such as heart deterioration.
- 9) Digestive system also may get affected due to potassium deficiency leading to hypertension, improper sleep, nervous system deterioration, depression, constipation etc.
- 10) Ringing/noise in ear.

**NOTE: Hypokalemia** (American English), or **hypokalaemia** (British English), or **hypopotassemia** (ICD-9) refers to the condition in which the concentration of potassium ( $K^+$ ) in the blood is low. The prefix *hypo*-means low (contrast with *hyper*-, meaning high). *Kal* refers to *kalium*, the Neo-Latin for potassium, and *-emia* means "in the blood."

## Moringa and Diabetes

*Moringa Oleifera is a nutrient plant that can help to maintain normal blood sugar levels. Moringa Oleifera holds so much promise for those who suffer from diabetes. This is primarily because of its many amazing, natural benefits. Moringa Oleifera has been shown to naturally boost the immune system, which usually becomes compromised in those who suffer from type 1 and type 2 diabetes. Moringa Oleifera has also been shown to possess many key anti-inflammatory benefits; diabetes often causes circulatory problems which can be managed through anti-inflammatory supplements. There are no negative side effects associated with Moringa Oleifera use, meaning that it is a safe, natural way for people to manage their blood sugar and care for their diabetes symptoms. It's just one more option for the many people who have to cope with this serious condition. (Admin, 2010)*

*Unexpected benefits of Moringa include an apparent cure for tapeworms and help in controlling diabetes and high blood pressure. (Fuglie, 2001)*



## Moringa has Antioxidants Galore

Moringa is said to have approximately 46 antioxidants and is one of the most powerful sources of natural anti-oxidants. Anti-oxidants supply the free atoms needed by the human body and mitigate the effect of free radicals. Moringa leaves are rich in Flavonoids, a class of anti-oxidants. The beta carotene present in Moringa leaves also acts as antioxidants. The antioxidants will have the maximum impact on the damage causing free radicals, only when it is ingested in combination with nutrients and a group of antioxidants. A combination of antioxidants is more effective than a single antioxidant on an equal weight basis due to antioxidant cascade mechanism. This is why Moringa tea acts as a more effective source of antioxidants than any other herbal tea or even a Green tea.

## Moringa's Anti-Aging Compound -Zeatin

*Moringa is jammed with a cytokinin called zeatin.*

*Cytokinins are plant hormones that help cells divide and protect against oxidation. Zeatin is the most powerful of all cytokinins. According to a 2004 Danish study, zeatin helps promote small cell size, a key component to more youthful skin. It also influences the structural and functional integrity of the cell, and prevents accumulation of macromolecular damage in the cell. The study found that zeatin increases the activity of some antioxidant enzymes, counteracting the free radical-induced oxidative damage incurred during cell aging.*

*So which plant has more zeatin than any other? Moringa not only contains thousands of times more zeatin than any other known plant, it is also the most nutritious plant discovered to date, with over 90 nutritional compounds including 46 antioxidants and 36 anti-inflammatories. (Aging, 2008)*

**Zeatin** is a plant hormone derived from the purine adenine. It is a member of the plant growth hormone family known as cytokinins. Zeatin was first discovered in immature corn kernels from the genus *Zea*. Zeatin and derivatives were discovered to be the primary active ingredient in coconut milk, which has long been known to actively induce plant growth.<sup>[1]</sup>

As in the case of kinetin, zeatin has also been reported to have several *in vitro* anti-aging effects on human skin fibroblasts.<sup>[2]</sup> (Wikipedia, 2010)

## List of Some Health Benefits of Moringa



**Several studies have shown Moringa's health benefits.**

- It is a strong antioxidant effective against prostate and skin cancers, an anti-tumor and an anti-aging substance.
- It modulates anemia, high blood pressure, diabetes, high serum or blood cholesterol, thyroid, liver, and kidney problems.
- It has strong anti-inflammatory properties ameliorating rheumatism, joint pain, arthritis, edema, and Lupus.
- It is effective against digestive disorders including colitis, diarrhea, flatulence (gas), ulcer or gastritis.
- As an anti-bacterial, anti-microbial, and anti-viral agent, it is effective against urinary tract infection, typhoid, syphilis, dental caries and toothaches, fungus, thrush, common cold, Epstein-Barr Virus, Herpes-Simplex, HIV AIDS, warts, parasites, worms, schistosomes, and trypanosomes.
- As a detoxifying agent, it is effective against snake and scorpion bites.
- It is effective against nervous disorders including headaches, migraines, hysteria, and epilepsy. (Richardson, 2009)



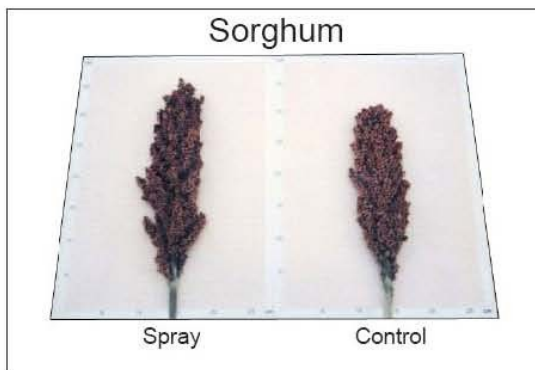
## Moringa Helps Plants to Grow & Nourishes Soil

Moringa also contain plant hormones (including Zeatin) that plants and crops to produce greater yields.

At Proyecto BIOMASA, an agricultural research program located in Nicaragua, Moringa has been studied for over six years. Researchers have found evidence, for example, that Moringa can be used as a foliar spray to increase plant growth and as a green manure to improve soil fertility.

Lowell Fuglie summarized some of BIOMASA's major findings in a report excerpted below.

1) BIOMASA has discovered that **Moringa leaf extract contains a plant growth hormone**. Fuglie writes, "Juice from fresh Moringa leaves can be used to produce an effective [spray containing] plant growth hormone, increasing yields by 25-30% for nearly any crop: onions, bell pepper, soya, maize, sorghum, coffee, tea, chili, melon. . . .One of the active substances is Zeatin: a plant hormone from the cytokinins group. This foliar spray should be used in addition to (and not in lieu of) other fertilizers, watering and sound agricultural practices. "In one trial, use of this hormone [spray] increased maize yields from 60 to 130 sacks per hectare. Using this hormone [spray], BIOMASA was able to grow coffee at 30 meters altitude. Coffee, shaded with *Jatropha curcas*, produced beans in just 17 months." (Price, 1985)



## Moringa Purifies and Clarifies Water



In the Sudan, dry *Moringa oleifera* seeds are used in place of alum by rural women to treat highly turbid Nile water (Jahn, 1986). In Northern Nigeria, the fresh leaves are used as a vegetable, roots for medicinal purposes and branches for demarcation of property boundaries and fencing. Studies by Eilert *et al.* (1981) identified the presence of an active antimicrobial agent in *Moringa oleifera* seeds. The active agent isolated was found to be 4a L-rhamnosyloxy-benzyl isothiocyanate, at present the only known glycosidic mustard oil. Madsen *et al.* (1987) carried out coagulation and bacterial reduction studies on turbid Nile water in the Sudan using *Moringa oleifera* seeds and observed **turbidity reduction of 80-99.5% paralleled by a bacterial reduction of 1-4 log units (90-99.9%)** within the first one to two hours of treatment, the bacteria being concentrated in the coagulated sediment.

***If scientists set out to design a tree that would be of maximum benefit to mankind, they would be hard put to do better than the Moringa Oleifera tree. (Fuglie, 2001)***

***By using Moringa daily, you can supply your body with the nutrients it needs to protect and heal it. The best medicine is preventative medicine. Moringa furnishes the body with the nutrients needed to prevent disease and illness.***

**“Moringa shows great promise as a tool to help overcome some of the most severe problems in the developing world—malnutrition, deforestation, impure water and poverty. The tree does best in the dry regions where these problems are worst.”**

-Andrew Young, former Atlanta Mayor and United Nations Ambassador<sup>6</sup>

**“Among the wide range of Green Leafy Vegetables, Moringa is the richest source of Beta-Carotene [vitamin A], apart from providing other important micronutrients.”**

-Dr. Kamala Krishnaswamy, former Director, Indian Council Of Medical ,Research, Hyderabad<sup>7</sup>

**“Although few people have ever heard of it today, Moringa could soon become one of the world’s most valuable plants, at least in humanitarian terms.”**

-Noel Vietmeyer, US National Academy of Sciences, Washington D.C.<sup>8</sup>

## **Moringa Claims of Traditional Medicine**

For centuries, people in many countries have used Moringa leaves as traditional medicine for common ailments. Clinical studies have begun to suggest that at least some of these claims are valid. With such great medicinal value being suggested by traditional medicine, further clinical testing is very much needed at this time. If studies conclude that even some of the claims are correct, these leaves could become an invaluable resource for people in areas where other forms of treatment are scarce.

**Guatemala**      skin infections, sores

**India**              anemia, anxiety, asthma, blackheads, blood impurities,  
bronchitis, catarrh,  
chest congestion, cholera, conjunctivitis,  
cough, diarrhea, eye and ear

<b>India cont.</b>	l blood pressure, hysteria, pain in joints, pimples, psoriasis, respiratory disorders, scurvy,  semen deficiency, sore throat, sprain, tuberculosis
<b>Malaysia</b>	intestinal worms
<b>Nicaragua</b>	headache, skin infections, sores
<b>Philippines</b>	anemia, glandular swelling, lactation
<b>Puerto Rico</b>	intestinal worms
<b>Senegal</b>	diabetes, pregnancy, skin infections, sores
<b>Venezuela</b>	intestinal worms  colitis, diarrhea, dropsy, dysentery, gonorrhea, jaundice,
<b>Other Countries</b>	malaria, stomach ulcers, tumor, urinary disorders, wounds  (Jed W. Fahey, 2005)

## Ancient and Traditional Uses of Moringa

Following is a chart from the “Johns Hopkins research paper” showing the traditional use of Moringa for a wide variety of diseases and maladies.

**NOTE:** Plant parts are given by the first letters capitalized: (L) Leaves, (F) Flowers, (S) Seeds, (P) Pods (drumsticks), (R) Roots, (B) Bark, (G) Gum, (O) Oil (from seeds).

The extensive references are in “References” at the back of the book.

Condition/Effect	Plant Part	References
<b>ANT Antimicrobial / Biocidal</b>	LFSPRBGO	8, 13, 19, 24, 27, 31, 34, 64, 68, 100, 104, 114, 115, 126, 140, 151 160, 161,162



Condition/Effect	Plant Part	References
Bacterial	LFS	25, 26, 55, 63, 77 -81, 149
Dental Caries/Toothache	RBG	47
Infection	LF	47
Syphilis	G	47
Typhoid	G	47
Urinary Tract Infection	L	141
Fungal/ Mycoses	O	111

#### **VIRAL**

Common cold	FRB	47
Epstein-Barr Virus (EBV)	L	104
Herpes Simplex Virus (HSV-1)	L	84
<b>HIV-AIDS</b>	L	1, 124
Warts	S	47

#### **Parasites**

Dranunculiasis (guinea-worm) L		36
Helminths	LFP	47
Schistosomes	S	113

#### **Other / Not Attributed to a Specific Pathogen**

Bronchitis	L	47
Earache	G	47
External Sores/Ulcers	LFRB	15
Fever	LRGS	47
Hepatic	L	6
Skin (Dermal)	OS	15
Throat Infection	F	47
Water treatment	S	11, 50, 75, 86, 169



Condition/Effect	Plant Part	References
<b>AST</b> Asthma	RG	47
<b>CAN</b> Cancer Therapy / Protection	LFPBS	12, 17, 28, 39, 45, 59, 61, 64, 104, 115
Anti-tumor	LFSB	45,48,57,61,87
Prostate	L	47,48
Radioprotective	L	132
Skin	P	12
<b>CIR</b> Circulatory/Endocrine Disorders	LFSPR	56, 93
Anti-anemic	L	47, 125
Anti-hypertensive	LP	40, 41, 42, 43, 44, 53, 83, 137
Cardiotonic	R	47
Diabetes/hypoglycemia	LP	6, 45, 71, 87, 101, 167
Diuretic	LFRG	6, 14, 62
Thyroid	L	153
Tonic	F	47
Hepatorenal	LR	93, 120
<b>DET</b> Detoxification	BO	76, 135, 166
Antipyretic	SO	148
Purgative	O	47
Snakebite	B	47
Scorpion-bite	B	47
<b>DIG</b> Digestive Disorders	LSRBG	53
For treatment of:		
Digestif	B	47
Dysentery	LG	47
Flatulence	R	47
Ulcer / Gastritis	LS	3, 115, 136

Condition/Effect	Plant Part	References
<b>INF</b> Inflammation	LFSPRG	14, 28, 35, 45, 62, 64, 68, 110, 131 160, 161
Rheumatism	LFSPRG	28
Joint Pain	P	47
Edema	R	47
Arthritis	S	47
<b>IMM</b> Immunity	SO	69
Immune-stimulant	S	69
Lupus	O	28
<b>NER</b> Nervous Disorders	LFRBGO	58, 59, 62, 96
Anti-spasmodic	SR	14, 53
Epilepsy	RB	47
Hysteria	FRBO	47
Headache	LRBG	47
<b>NUT</b> Nutritional	LSBO	6, 7, 18, 22, 28, 30, 31, 32, 46, 47, 48, 51, 65, 66, 67, 70, 92, 102, 112, 116, 133, 163
Antinutritional factors	B	88, 89, 90, 110, 127, 128, 139, 156, 164, 165
Antioxidant	LO	110, 147
Carotenoids	L	29, 105, 152
Energy	LSO	85
Goitrogen	S	2
Iron deficiency	LS	16
Oil quality	O	5, 98, 110, 158, 159
Protein	LS	47
Vitamin/Mineral deficiency	LS	7, 9, 54, 56, 85, 119
<b>REP</b> Reproductive Health	LFPRBGO	44, 53, 64, 121, 122
Abortifacient	FRBG	106, 107, 155
Aphrodisiac	RB	47

Condition/Effect	Plant Part	References
Lactation Enhancer	L	47
Prostate function	O	47
<b>SKI</b> Skin Disorders	LRSB	160, 161
Antiseptic	L	47
Astringent	R	47
Pyoderma	S	15
Rubefacient	RG	47
Vesicant	R	47
<b>GEN</b> General Disorders / Condition	LFSPBO	4, 6, 8, 20, 21, 45, 48, 64, 66, 67, 68 73, 74, 82, 91, 92, 99, 102, 103, 109 116, 117, 118, 123, 125, 128, 129 130, 134, 150, 163
Bladder	OS	47
Catarrh	LF	47
Gout	RO	47
Hepatomegaly	R	47
Lactation	L	47
Low Back / Kidney Pain	R	47
Scurvy	LSRBO	47
Splenomegaly	R	47
"Tonic"	LFPSO	47

Many of the original citations have been collected by Lowell J. Fuglie, [and can be found in his excellent treatise entitled *The Miracle Tree*, (47)] and by Manuel Palada (116), Julia Morton (102), and *Trees for Life* (157). Most other compendiums in recent publications or on commercial websites appear to be highly derivative of these seminal works.

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