

Dietary Benefits of Incredible Plant *Moringaoleifera* Leaves

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Abstract: *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 give a healthy life and to end the many severe problems like malnutrition. It is a good source of nutrition specially in poor communities in tropics and sub tropics because this tree is in full leaf at the end of the dry season when other foods are typically scarce. The objectives of this study are: to study the nutritional properties of moringa leaves & to know the dietary benefits of moringa leaves. In this study products- Moringa Nachos and Moringa Khakhra are analysed for proximate composition. These tests are determined at the RFRAC centre (regional food analysis centre) Lucknow. Results shows that the products- Moringa Nachos and Moringa Khakhra are rich in carbohydrate, protein, fat and energy.*

Keywords: Moringa oleifera, malnutrition, nutrition, dietary benefits

1. Introduction

The Moringa was claimed to be 'the most nutrient-rich plant yet discovered' (Khawaja et al., 2010). The Moringa's incredible medicinal usage which is claimed by many cultures and communities based on real-life experiences are now slowly being confirmed by science. Through research, the Moringa was found to contain many essential nutrients, for instance, vitamins, minerals, amino acids, beta-carotene, antioxidants, anti-inflammatory nutrients and omega 3 and 6 fatty acids (Fahey, 2005; Hsu et al., 2006; Kasolo et al., 2010). The leaves of four of the Moringa species were rich in nutrients and antioxidants (Price, 2007) in which the nutrient content varied with a few factors such as preparation method, leaf age and harvest season. As commonly known, most vegetables lose their nutrients upon cooking. However, it was observed that Moringa leaves whether fresh, cooked or stored as dried powder for months without refrigeration, did not lose its nutritional value (Hsu et al., 2006). Among commoners, it has earned its name as 'the miracle tree' due to its amazing healing abilities for various ailments and even some chronic diseases. (Guevara et al., 1999).

Antioxidant Properties of Moringa

Naturally occurring antioxidants, particularly polyphenols, are the main plant compounds that are able to decrease oxidative damage in tissues by indirect enhancement of a cell or by free radical scavenging (Du et al., 2010). The leaves of the Moringa oleifera tree have been reported to demonstrate antioxidant activity due to its high number of polyphenols (Sreelatha and Padma, 2009; Verma et al., 2009). Moringa oleifera extracts of both mature and tender leaves exhibit strong antioxidant activity against free radicals, prevent oxidative damage to major biomolecules and give significant protection against oxidative damage (Sreelatha and Padma, 2009).

Anti-inflammatory Effects

Moringa has been partially used in medicinal field throughout the decades to heal a huge amount of acute and chronic conditions. In vitro and in vivo studies with the plant have recommended its effectiveness in treating inflammation, hyperlipidaemia, and hyperglycaemia (Bennett et al., 2003; Fahey, 2005; Mbikay, 2012).

Anti-hyperglycemic of Moringa

Diabetes Mellitus (DM) is a chronic metabolic disorder. Diabetic patients exhibit a stage of chronic hyperglycemia and glucose tolerance impairment (Tiwari and Roa, 2002). Moringa oleifera is well known for its pharmacological actions and is used for the traditional treatment of diabetes mellitus (Bhishagratna, 1991; Babu and Chaudhuri, 2005). The anti-diabetic effects of some medicinal plant were strengthened by scientific data as herbal remedies for diabetes are recognized in different societies (Grove and Altman, 2002). Hypoglycemic and anti-hyperglycemic activity of the leaves of Moringa oleifera may be probably due to the presence of terpenoids, which appears to be involved in the stimulation of the β -cell and the subsequent secretion of preformed insulin (Tende et al., 2011).

Anti-cancer Properties of Moringa

The presence of fatty acids could have attributed to the chemopreventive effect of boiled Moringa oleifera which modulates apoptosis in colon carcinogenesis. In addition, the presence of niazimicin and glucomoringin which have been reported to inhibit tumour cell proliferation, were also mentioned as possible compounds contributing to the anti-colon carcinogenic effects of boiled Moringa oleifera. For the effect of boiled Moringa oleifera on several protein expression, it was reported that in a dose dependent manner, all three PCNA, iNOS and COX-2 gene expressions were down-regulated which concluded the chemopreventive effect of boiled Moringa oleifera (Budda et al. 2011).

Anti-fibrotic/ulcer

Major contributors to the treatment of liver fibrosis discovered to date are natural drugs. constant efforts and studies on these natural drugs to treat liver fibrosis are being carried out in search for effective anti-fibrotic agents. It was recently discovered that the Moringa oleifera seed extract exhibited anti-fibrotic effects on liver fibrosis in rats (Hamza, 2010).

Prevent Malnutrition

Leaves of Moringa oleifera could serve as a valuable source of nutrient for all age groups. In some parts of the world for example Senegal and Haiti, health workers have been treating malnutrition in small children, pregnant and nursing women with Moringa leaf powder (Price, 1985)

Men and women who have made moringa a regular part of their diets point out that they have a keen awareness of improvement in their health and energy. at one health post, the pharmacy is now selling moringa leaf powder to mothers with malnourished children(price, 1985).

Objective

- 1) To study the nutritional properties of moringa leaves.
- 2) To know the dietary benefits of moringa leaves in alleviating malnourishment.

2. Methodology

Nutritional Analysis

In this study, the products were analysed for proximate composition. In this phase it involves nutritional analysis in different parameters.

- Determination of total energy
- Determination of moisture percentage
- Determination of ash percentage
- Determination of fat percentage
- Determination of protein content
- Determination of carbohydrate percentage

Source: the following tests were determined at the RFRAC centre (regional food analysis centre) Lucknow.

3. Result and Discussion

Determination of Nutrient composition of products

Determination of phytonutrient and nutritional analysis of moringa products were tested by 6 parameters such as-

- Fat
- Protein
- Carbohydrate
- Energy
- Moisture
- Ash Contain

Determination of Nutrient composition of Moringa Nachos

Nutritive value of experimental sample (100g). The result shown in the form of table below.

Table 1: Nutrient contents in Moringa Nachos

Parameters	Experimental
Fat (g)	7.15
Protein (g)	9.96
Carbohydrate (g)	76.64

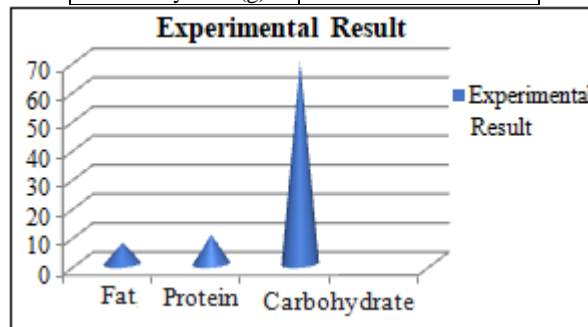


Figure 1: Graphical representation of Fat, Protein, Carbohydrate in experimental product

Table 2: Energy, Moisture and Ash contents in Moringa Nachos

Parameters	Experimental
Energy(Kcal)	411
Moisture	2.68
Ash Content	3.57

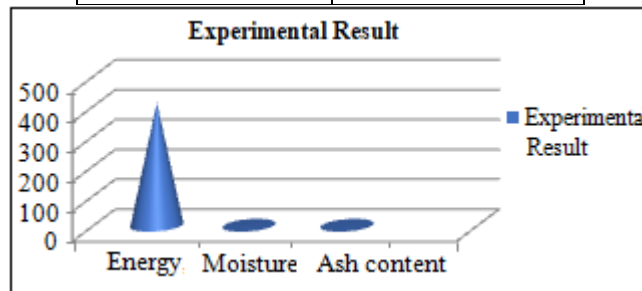


Figure 2: Graphical representation of Energy, Moisture, and Ash content in Experimental product

Table 3: Nutrient contents in Moringa Khakhra

Parameters	Experimental
Fat (g)	7.05
Protein (g)	15.39
Carbohydrate (g)	67.8

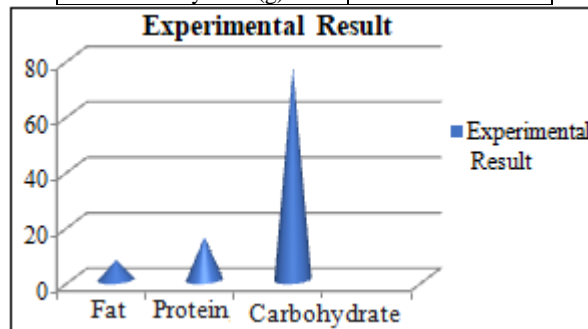


Figure 3: Graphical representation of Fat, Protein, Carbohydrate

Table 4: Energy, Moisture and Ash contents in Moringa Khakhra

Parameters	Experimental
Energy(Kcal)	396
Moisture	5.62
Ash Content	4.14

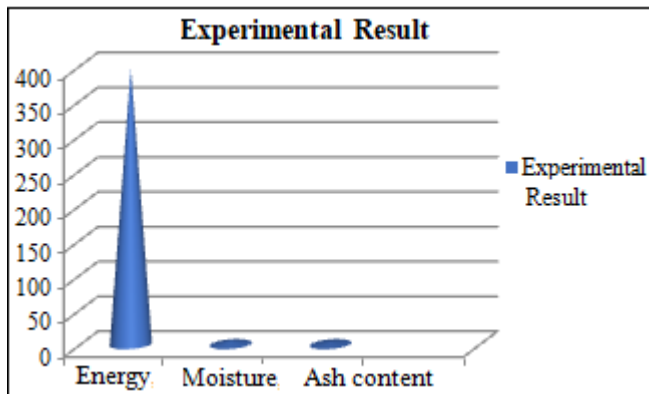


Figure 4: Graphical representation of Energy, Moisture, and Ash content in Experimental product

4. Conclusion

Result shows that these Moringa products are rich in energy, carbohydrate & protein.

Nutritional composition of Moringa Nachos

Moringa Nachos contains 2.68 moisture%, 9.96 protein, 76.64 carbohydrate%, 411 (Cal/100g) energy, 3.57 total ash%, 7.15 Fat%.

Nutritional composition of Moringa Khakhra

Moringa khakhra contains 5.62 moisture%, 15.39 protein%, 67.8 carbohydrate%, 396 (Cal/100g) energy, 4.14 total ash%, 7.05 Fat%.

5. Recommendation

- This product could not only be used by malnourished children but also by patients with diabetes, cardiovascular disease anaemia, cancer and hypertension.
- The moringa khakhra & Nachos are cheap in cost and can be used daily to overcome deficiency of nutrients.
- These Nachos & khakhra are not only for children but also for all age group.

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