

## Preparation of *Moringa* Capsules

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### Introduction

*Moringa oleifera*, native to India, grows in the tropical and subtropical regions of the world. It is also known as 'horseradish tree'. It can be grown in both dry and mild ice conditions and hence widely cultivated across the world. With its high nutritive values, each fragment of the *Moringa* is suitable for nutritional or business purposes. Leaves have ample amount of minerals, vitamins and other essential plant chemicals. Extraction of leaves helps to reduce malnutrition, supplement milk in mothers. *Moringa* also acts as agent against oxidation, cancer, diabetes, bacterial and microbial properties. *Moringa oleifera* seed, acts as a inborn clotting agent which is used in water treatment. For business purpose *Moringa* is used a cure for diabetes and cancer. It is known as "Miracle tree" as *Moringa* has medicinal, commercial, nutritional and pharmacological properties.

*Moringa oleifera* belongs to the family of Moringaceae. *Moringa* leaves, pods and seeds has different varieties of phytochemicals present in them which makes them rich in nutrition. *Moringa* is said to provide (7x) more vit C than oranges, (10x) more vitamin A than carrots, (17x) more calcium than milk, (9x) more protein than yoghurt, (15x) more potassium than bananas and (25x) more iron than spinach. The fact that *Moringa* is easily cultivable. Children deprived of breast feeding tend to show symptoms of malnutrition. Lactogogues are generally prescribed to lactating mothers to augment milk production. The lactogogue, made of phytosterols, acts as a precursor for hormones required for reproductive growth. *Moringa* is rich in phytosterols like stigma sterol, sitosterol and campesterol which are precursors for hormones. These compounds increase the oestrogens production, which in turn stimulates the proliferation of the mammary gland ducts to produce milk. It is used to treat malnutrition in children younger than 3 years. About 6 spoonfuls of leaf powder can meet a woman's daily iron and calcium requirements, during pregnancy. This study provides an overview on the cultivation, nutritional values, medicinal

properties for business use and pharmacological properties of *Moringa*. There are no elaborate reports on treatment of diabetes and cancer using *Moringa*. This study aims to bridge the gap.

### Nutritive properties

- Each part of *M. oleifera* is a highly beneficial with its of important nutrients and antinutrients. The leaves of *M. oleifera* are rich in micro and macro nutrients such as Ca, K, Zn, etc.
- Vitamins like beta-carotene of vitamin A, vitamin B such as folic acid, pyridoxine and nicotinic acid, vitamin C, D and E also present in *M. oleifera*.
- Phytochemicals present as tannins, sterols, terpenoids, flavonoids, saponins, anthraquinones, alkaloids and reducing sugar present along with anti-cancerous agents like glucosinolates, isothiocyanates, glycoside compounds and glycerol-1-9-octadecanoate.
- The pods has fibrous property to treat digestion problems and intestinal cancer.
- A research shows that immature pods contain around 46.78% fibre and around 20.66% protein content. Pods have 30% of amino acid content, the leaves have 44% and flowers have 31%. The immature pods and flowers showed similar amounts of palmitic, linolenic, linoleic and oleic acids.
- *Moringa* has lot of minerals that are essential for growth and development among which, calcium is considered as one of the important minerals for human growth.
- While 8 ounces of milk can provide 300 - 400 mg, *Moringa* leaves can provide 1000 mg and *Moringa* powder can provide more than 4000 mg.
- *Moringa* powder can be used as a substitute for iron tablets, hence as a treatment for anaemia.

- Beef has only 2 mg of iron while *Moringa* leaf powder has 28 mg of iron.
- It has been reported that *Moringa* intake gives more iron than spinach.
- For a healthy diet consumption of zinc is essential for proper growth of spermatozoa and is also necessary for the synthesis of DNA and RNA. *M. oleifera* leaves show around 25~30 mg of zinc/kg, which is the minimum requirement of zinc in the diet.

### The nutrient compositions of leaves, leaf powder, seeds and pods

Nutrients	Fresh leaves	Dry leaves	Leaf powder	Seed	Pods
Calories (Cal)	92	329	205	-	26
Protein (g)	6.7	29.4	27.1	35.97 ± 0.19	2.5
Fat (g)	1.7	5.2	2.3	38.67 ± 0.03	0.1
Carbohydrate (g)	12.5	41.2	38.2	8.67 ± 0.12	3.7
Fibre (g)	0.9	12.5	19.2	2.87 ± 0.03	4.8
Vitamin B1 (mg)	0.06	2.02	2.64	0.05	0.05
Vitamin B2 (mg)	0.05	21.3	20.5	0.06	0.07
Vitamin B3 (mg)	0.8	7.6	8.2	0.2	0.2
Vitamin C (mg)	220	15.8	17.3	4.5 ± 0.17	120
Vitamin E (mg)	448	10.8	113	751.67 ± 4.41	-
Calcium (mg)	440	2185	2003	45	30
Magnesium (mg)	42	448	368	635 ± 8.66	24
Phosphorus (mg)	70	252	204	75	110
Potassium (mg)	259	1236	1324	-	259
Copper (mg)	0.07	0.49	0.57	5.20 ± 0.15	3.1
Iron (mg)	0.85	25.6	28.2	-	5.3
Sulphur (mg)	-	-	870	0.05	137

Table

### Description

Most people intake fortified vitamins supplements. Certain vitamins, particularly those that are fat soluble, can be overdosed on. Overdoses can range from mild to severe, and include symptoms such as fatigue, nausea, vomiting, constipation, diarrhoea, insomnia, sweating, anxiety, depression, heart palpitations, difficulty breathing, kidney failure, and a whole slew of other things. Vitamins to watch out for are A, D, E and K which are all fat soluble. Another one that is often overdosed on is Iron, which is extremely dangerous when consumed in excess. It is necessary to develop natural vitamins and mineral enriched plant nutraceuticals in the

form of capsules make safe, healthy, and balanced nutrition from plant origin supplements. Every part of *M. oleifera* contains important nutrients. The leaves of *M. oleifera* are rich in essential minerals like calcium, magnesium, iron, copper etc. Vitamins like beta-carotene of vitamin A, vitamin B such as folic acid, pyridoxine and nicotinic acid, vitamin C, D and E. To prevent obesity leaves of *Moringa* can be consumed as it has less calorific value. It will be great beneficial when we give the value addition from the leaf based product from *Moringa* in the form of capsule for vitamin supplements for the nutritional security for the maximum consumer acceptability.

### Objectives:

- To produce capsules for both vitamins and medicinal properties
- To produce capsules of high quality, reduce weight gain
- Helps body convert fats into energy
- Prevent inflammation
- To produce capsules at cheaper rate
- Less investment and more profit in capsules.

### Milestones to achieve goals:

- Achieve customer loyalty
- Developing marketing strategies
- Profitable business model
- Reach significant number of sales
- First repeat client
- Realistic scalable marketing strategy
- Train a solid team for communication with consumer.

### Challenges and constraints

- Improper selection of leaves and plants
- Partial drying of leaves
- Improper grinding of leaves into powder
- Improper storage of leaves and powder
- Low & high dosage of capsules filling
- Partial packaging of capsules.

### Analysis of alternatives:

- Easily available
- Least price

- Improper drying method turns the into brown colour which affect the quality of final powder
- Grinding of leaves into very fine powder
- Keep the powder and leaves from diseases and pest free place
- Dosage of capsules ranges from 0.3 to 0.5 mg
- Using of high-quality package material, with proper packing.

### Summary

*Moringa* is believed to have many benefits and its uses range from health to beauty and it helps in curing diseases. Seed oil is beneficial for protecting hair against free radicals, helps in nourishing and gives shiny appearance. *Moringa* has a protein which helps in reduction of damage in skin cells. *Moringa* moistens and cures the skin and hair. It helps in rehabilitation of rashes, itchiness and dermatitis. *Moringa* safeguards the liver against damage caused by against drugs and in quick healing process. *Moringa* solutions prevent from cancer. It is an imperative to develop value added products by using *Moringa* leaves in the form of food supplements in order to prevent the all ailments in human being. In this project we focused in preparation of *Moringa* capsule with good organoleptic qualities with trade mark use as well as adopting good unit packaging system.

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