

THE COMBINATION OF HEALTHY INGREDIENTS IN MAINTAINING GLUCOSE METABOLISM***Dr. Raymond L. Venter**

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ABSTRACT

The combination of multiple ingredients, as mentioned in this paper, helps to maintain the glucose metabolism that is naturally present in the human body. The consumption of these ingredients can help embrace the nutrients that are required to carry out one's daily routine.

Index Terms—Healthy, diet, ingredients.**INTRODUCTION**

These ingredients help to maintain various functions of the human body. They help to keep the glucose metabolism at a normal level, along with exercise and a healthy diet. They help to normalize the insulin response during routine activities and help in overcoming fatigue that the body may suffer. Finally, they aid in balancing metabolism.

II. BENEFITS OF INGREDIENTS**1. Malabar Tamarind (fruit)**

Weight loss can be a very difficult and problematic goal to achieve, but it is also worth mentioning that if appropriate diet is incorporated into one's daily life, it can help facilitate faster weight loss. There are multiple fruits and vegetables that help with weight loss, as they block the ability of the human body for storing fat and suppressing appetite. Malabar tamarind, or *Garcinia Cambogia*, is one of these fruits that possess the aforementioned features. Kudam puli or Malabar tamarind is a fruit that has gained distinguished attention for its relation to weight loss. In appearance, it resembles a small pumpkin, and its colors vary from green to yellow. This fruit is largely used for making supplements. It has received a lot of fame in Kerala, coastal Karnataka, and Southeast Asia. The fruit is popularly known for its culinary use. It is very much similar to the regular tamarind. It is also called *Tamarindus indica*.

Malabar Tamarind is conventionally used for its sour taste in the preparation of various kinds of curry. A number of different recipes use the rind and extract.

It is widely used in various countries such as Burma, Thailand, Malaysia, and other Southeast Asian countries

as well. The features of Malabar Tamarind as a major source for weight loss were discovered in 2012, when an American doctor (Dr. Oz) used the fruit extracts for achieving weight loss naturally. Some other benefits that the fruit offers are energy boosting, promotion of digestive and cardiovascular health, and even detoxification of the human body. By including tamarind in daily diet, the consumer can receive the following health benefits:

- Anti-inflammatory properties
- Balanced blood sugar levels
- The release of happy hormones
- A balance in insulin levels
- Digestive regularity
- Protection against stomach ulcers
- A boost in cardiovascular health
- Body detoxification
- A boost in energy
- Stronger bones
- Lower cholesterol
- Deeper sleep

The effects and benefits offered by the fruit in terms of weight loss are credited to the presence of HCA (Hydroxyctic acid), a phytochemical. According to multiple studies, it was shown that the phytochemicals are responsible for suppressing appetite and burning fats. It blocks an enzyme known as citrate lyase, used for making for making fats in the body. It also secretes the hormone serotonin in the brain and helps to prevent hunger cravings. According a study conducted by the Journal of Obesity, the people who consumed supplements composed of *Garcinia* lost approximately 2 pounds of weight, compared to those who did not consume any supplements. Although the difference may not be drastic, it is still considerable; hence, more

research and studies are being conducted in order to find its effects on weight loss.

According to the experiments conducted on mice using tamarind supplements, it was observed that the supplement was able to lower the insulin level in body. In some studies, it was also observed that it lowered triglycerides and blood cholesterol levels in the body. Malabar tamarind is truly a gift from nature, not just because of its culinary applications, but also for the benefits it has on weight loss.^[1]

2. Siberian Ginseng (root)

Siberian Ginseng (Siberian Eleuthero) is in the branch Araliaceae. The active constituent in Ginseng is claimed to be ginsenosides. It is an exclusive compound that is found in Ginseng. In terms of class, ginsenosides show a wide range of qualities that are difficult to characterize in isolated studies. It is observed that these ginsenosides are capable of increasing antioxidant enzymes, so they possess antioxidant features. These also act as free radical scavengers.

Although it is in the same classification as Korean ginseng, Siberian Ginseng is quite different, due to the presence of Eleutherosides. It has been claimed that Siberian Ginseng offers a plethora of benefits, such as improvement in memory and learning abilities, stress management, and a reduction in symptoms related to Bronchitis.

According to some studies, Panax Ginseng is also capable of performing multiple functions, and it has been used for over 2,000 years in Chinese traditional medicine. It is evident that Ginseng's fame has been increasing exponentially in the modern era. Due to its memory related benefits, Ginseng is a helpful supplement.^[2]

3. Gurmar (leaf)

Gurmar (*Gymnema Sylvestre*) is a woody shrub native to the tropical forests of Africa, Australia, and India. Gurmar leaves have been used in Indian medicinal practices (such as the lifestyle system Ayurveda) for 5,000 years. Gurmar has also been used conventionally for the treatment of multiple issues, including snakebites and malaria.^[3] It is considered to be an herb that is able to prevent sugar absorption and it has also become a very famous subject to study in the Western medicine. One of the basic compounds that it contains is known as Gymnemic acid, a chemical compound that helps to suppress sweetness. In cases where it is consumed before drinking sugary beverages, Gymnemic acid is used to block sugar receptors in the subject's taste buds. According to multiple studies, its extracts are used to reduce the capability of tasting sweetness, thus making sweet foods less appealing.

In one experiment, the participants fasted for a period of time; half were given the *Gymnema* extract, while half

were not. Those who were not given the supplement were shown to consume a larger portion of food, while those who were given the supplement were able to more effectively manage their appetite.

According to the World Health Organization, approximately 420 million people all around the world are suffering from diabetes, and it is expected that this number will increase exponentially.^[4] Diabetes is a metabolic disease that can be characterized by high blood sugar levels. It is usually caused by the inability for the human body to produce or effectively utilize insulin.

Fruit extracts (such as those of the *Gumar* leaf) are reported to possess anti-diabetic features that may help to keep the blood sugar levels within a nominal range. In supplements, *Gymnema* extract is used in combination with various other beneficial ingredients for the purpose of lowering blood sugar levels. It is known as the sugar destroyer.

In addition to its effects on one's taste buds, *Gymnema* is also used for blocking receptors in the intestines as well as sugar absorption and to lower the post meal sugar levels. According to multiple studies, it shown that *Gymnema* is capable of lowering blood sugar, but this property is insufficient and it is not recommended to be used alone as a medicine for diabetes. It is also important to mention that, according to some studies, there is the potential for lowering glucose levels in the body.

Consumption of 200 to 400 mg of gymnemic acid can be used to reduce the sugar glucose in intestinal absorption.^[3] The leaves are used for the regulation of the immune system and result in a reduction in inflammation. It is also known to be an immunostimulant, which increases activity in the immune system.^[5]

Those who suffer from diabetes may also suffer from high blood sugar, a resistance to insulin, and a decrease in antioxidant levels. This can become a contributor to inflammation. Due to its properties concerning anti-inflammation and its great assistance to those who suffer from high blood sugar and diabetes, the *Gurmar* leaf is an excellent supplement to include in one's diet.^[4]

4. Balsam Pear (fruit)

Balsam pear (*Momordica balsamina*) is a vine native to certain parts of Africa, and is known for its bitter, but edible fruit. According to studies conducted on Balsam pears, it was reported that the fruit contains lectin, which is a sugar binding protein. It acts like an insulin and removes sugar from the bloodstream. Lectin is extremely useful for adults suffering from Type II diabetes. According to traditional medicine in South America and Asia, it can help prevent malaria and it also consists of various compounds that can affect malaria. More and more studies are being conducted about this fruit to

investigate its medicinal benefits.

Balsam pears are also conventionally used in Asian cuisine and herbal medicines. They are very useful for people suffering from multiple gastrointestinal issues. The bitterness of this fruit plays a vital role in the stimulation of digestion, as the bitterness helps to cure bad digestion by treating constipation regulating bowel movements. The increase in digestion process may cause heart burn and may also worsen ulcers. The Balsam Pear works to keep all of the body's digestive functions at the optimal level.^[2]

5. Fenugreek (seed)

Fenugreek is an herb that belongs to the same family as the soybeans. It is often used in its dried seed or in fresh form. Its leaves, roots, and seeds can be used as a supplement, flavoring agent, or spice. It is also recommended that more research should be carried out regarding this herb. Current studies show that it offers multiple benefits to human health, and it is one of the oldest used medicines in multiple medicinal practices, such as that of the Indian and Chinese. Still, there is not enough information to support the usage of fenugreek for medicinal purposes. However, people have been using it in different forms and ways for thousands of years for the following benefits:

- Maintaining blood sugar levels
- Promoting breast milk production
- Raising libido and testosterone levels
- Supporting the overall digestive process
- Maintaining a healthy blood pressure
- Supporting flexibility among joints
- Providing assistance during pains in menstruation
- Supporting healthy lungs
- Facilitating faster recovery from wounds
- Alleviating pain during child birth
- Recovering muscular tissues
- Helping to maintain exercise performance

The drawback is that among the health benefits of fenugreek that have been reported, many are not supported by scientific evidence. Nevertheless, one of the primary benefits of Fenugreek is its ability to promote the feeling of fullness, thus suppressing appetite. This is largely due to the fiber that is present in the Fenugreek extract. Fenugreek helps to reduce overeating and may also lead to major weight loss. It has been extensively used for pain relief in the conventional medicine system.

As per the experiments conducted on overweight females, it was observed that the females who drank the fenugreek tea felt full and less hungry than when they consumed the placebo right before lunch. Researchers have also reported that the compound, alkaloids, helps to block the sensory receptors that send pain perception to the brain. According to a study conducted in 2014, it was found that when the women consumed capsules

containing fenugreek powder thrice a day on the first day of their periods for a consecutive number of months, they were more likely to experience fewer symptoms and shorter pain durations between those months.^[7]

6. Apple (fruit)

Apples contain a large quantity of phytochemicals and as per the epidemiological studies, by consuming apples, the human body can maintain considerable health as it builds up a better immune system in order to fight and prevent multiple health related issues.

It is evident that by consuming fruits, such as apples, the body can remain healthy. When tested in laboratories, it has been found out that apple possess high antioxidant activity and can help in lowering of cholesterol. Some very strong antioxidants, such as chlorogenic acid, catechin, quercetin, phloridzin, and a variety of phytochemicals, are all found in apples.^[3]

7. Lychee (fruit)

The health benefits of lychees have not been studied in their entirety. However, by the inclusion of lychee in daily diet along with other vegetable and fruits, it can help improve overall health, as lychees are a rich source of sodium, protein and dietary fibers.^[9] Lychees are reported to have multiple healthy vitamins, minerals, and antioxidants, such as rutin, Vitamin C, copper and potassium. Lychees are a rich source of vitamin C and account for 40% of the daily value recommended for a healthy human body. Yet, there is still need of further studies to know more about the benefits that they offer to health. Like many other fruits, lychees are considerable sources of multiple antioxidant plant compounds. They have also been reported to contain high levels of antioxidants polyphenols, in comparison to many other fruits. The antioxidants in the lychees include the following:

- Rutin: a flavonoid that provides protection against various health issues. It is a very healthy compound and essential for good health.
- Epicatechin: responsible for the improvement of heart health.^[10]

III. CONCLUSION

Glucose is an omnipresent energy source for all organisms. It is mandatory for fueling up both respirations, i.e. anaerobic and aerobic cellular. Glucose enters into the human body in multiple forms which include fructose, lactose, sucrose, galactose and starch. The glucose metabolism is the source of fuel for physiological brain functions via the ATP generation. It is the foundation for non-neuronal and neuronal cellular maintenance also the neurotransmitters' generation. Due to this, a tight regulation of glucose metabolism is important for the physiology of the brain as well as the disturbed glucose metabolism in brain that underlies multiple diseases.

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