

## DRAGONFRUITAS AFUNCTIONAL FOOD

Meddiati Fajri Putri

(Department TJPFT Semarang State University,  
mediatifp68\_unnesstaff@yahoo.co.id)

**Abstract-** *In addition of to requiring nutritional ansupan-protein, fats, carbohydrates, vitamins and mineralsto support life and everyday health, our bodies also require the active substance content in the 'Functional Food'. The active substances are: Antioxidants in asorbatacid, carotenoids and anthocyanins, as well as dietary fiber in the form ofpectin. Among fruits and vegetables, dragon fruit is one of the fruits which has benefits as functional food providers. Dragon fruit has beneficial properties for human health such as balancing blood sugar levels, protecting oral health, preventing colon cancer, reducing cholesterol, preventing bleeding and treating complaints whitish. Dragon fruit which is rich of in potassium, ferum, protein, fiber, sodium and calcium are good for health compared to other imported fruits. According to ALLeong from Johncola Pitaya Food R&D, an organization that examines these dragon fruits, honey cactus fruit is quite rich with a variety of vitamins and mineral substances which help increase endurance and beneficial for metabolism in the human body. "Research shows red dragon fruit is very good for the circulatory system, and also gives the effect of reducing the emotional pressures and neutralize toxic in the blood." The research also shows that this fruit can prevent colon cancer, in addition to prevent high cholesterol content in the blood and to decrease fat levels in body, "every red dragon fruit contains a protein that can increase metabolism and maintain cardiovascular health; fiber (to prevent colon cancer, diabetes and diet); carotene (eye health, strengthen the brain and prevent the entry of disease), calcium (bone strengthening). dragon fruit also contains iron to increase the blood, vitamin B1 (to prevent fever body), vitamin B2 (add to taste), vitamin B3 (lowers cholesterol) and vitamin C (add slipperiness, smoothness of skin and prevent acne).*

**Keyword-** *Dragon Fruit, Nutrition, Antioxidants, Functional Food*

---

### I. INTRODUCTION

The term Functional Food is not so familiar in Indonesia. The new branch of the science of food and health is indeed introduced in Indonesia in the early 2000's. The term functional food was created in Japan, where the concept of food used specifically for health called the FOSHU was formulated in 1991. Dragon fruit is considered new in Indonesia. The appearance of the fruit is very unique and interesting. Its size is similar to an mango, and the color is bright red. The skin is like a large snake scales (dragon), but not because the fruit is known as dragon fruit.



The portion of fiber in the dragon fruit is excellent, reaching 0.7 to 0.9 grams per 100 grams. Fiber is needed by the body to decrease cholesterol levels. In the digestive tract fibers will bind bile acids (end products of cholesterol) and then excreted with faeces. Thus, the higher the consumption of fiber, the more bile and fat body incurred. In addition to preventing cholesterol, fiber dragon fruit is also very useful in the digestive system. Dietary fibers were able to shorten transit time, ie the time during food taking from the mouth until the food producing in the form of feces. Meanwhile, food fiber will bind carcinogenic substances. Thanks to the short transit time, the time of carcinogenic substances in the living body is also getting shorter, so that the small chances of bodily harm (Goldberg, 1994). Dietary fiber is very good for preventing diabetes mellitus, heart disease, stroke, cancer, and other cardiovascular diseases. Unfortunately, fiber consumption in Indonesia is still

very low, about 10 grams per person per day. In fact, the recommended dietary fiber intake is 20-30 grams per person per day.

## **II. DEFINITION OF FUNCTIONAL FOOD**

Functional foods can be defined in three terms. (1) Functional Foods has exciting appearance with conventional food consumed as well as in general proven to have physiological benefits and/or reduce the risk of chronic diseases, beyond its basic function as a provider of nutrients. (2) It is a product that contains special ingredients which offer medical benefits to consumers that can be included in the daily diet. (3) A food can be regarded as "a functional food" if it can be satisfactorily demonstrated that the influence of one or more beneficial to the function of the body, beyond the full nutritional value, by improving the health and fitness or reduce the risk of disease. If the active ingredient is fruitful, Functional Food is taken and collected later formalized early as drug powder, syrup, capsule or pill-it is a new form called nutraceutical. Nutraceutical comes from the word nutrition and pharmaceutical. It was introduced in 1989 by Stephen De Felice, MD, founder and chairman of the Medical Innovation Foundation. Nutraceutical which is defined as a result of product isolation and purification of foods, which are generally sold in the form of a similar drug, is usually not considered as food. As a hallmark of nutraceutical indicated by physiological benefits or having to fight chronic diseases (Retnaningsih, 2007).

## **III. DRAGONFRUIT CHARACTERISTICS**



Dragon fruit plants came from Mexico. Initially this fruit is not edible. However, after being taken by France to China, its name was changed into dragon fruit. The fruits were then planted extensively in Vietnam, before finally evolved in other countries, including Malaysia.

Originally, dragon fruit was prohibited to be eaten because it was considered as the god of food and it gained no attention in its home country. However, it now become famous throughout the world. In fact, on an international flight, dragon fruit juice is included into an exclusive dish. Currently, Vietnam and Thailand are the largest suppliers of dragon fruit in the world. However, the demand can be met only 50 percent. Dragon fruits that circulated in Indonesia, generally, come from these two countries. Internationally, dragon fruit called dragon fruit for its name in each country is different, for example Feuy Long Kwa (Chinese), Thanh Long or Clever Dragon (Vietnam), Mangkorn Kaew (Thailand), Shien Mie Kuo Taiwan), Pitahaya (Mexico), Melano (Hawaii),

Dragon fruit is considered as tropical plant. This plant grows well in rainfall 600-1300 mm per year. The heavy rain and prolonged damage can cause a faster decay process. The maximum temperature range is 38-40 degrees Celsius. Dragon fruit is also called sweet cactus or cactus honey. Dragon fruit cactus plants are included in the family characteristics which have spines on each segment of the trunk.

Dragon fruit which produces plants is cactus *Hylocereus undatus* climber. It is called climber, because when it was first discovered in the growth of the original in the shady jungle, the trunk is climbing stems of other plants. When it was pulled out of the ground, it still lived on as epiphytes, absorbed water and minerals through aerial roots. The special characteristic of dragon fruit plants are its triangular stems since they are in form of very short spines and inconspicuous. The flowers of this fruit will bloom at night around July to November.

There are four kinds of dragon fruit, white flesh dragon fruit (*Hylocereus undatus*), red flesh dragon fruit (*Hylocereus polyrhizus*), super red flesh dragon fruit (*Hylocereus costaricensis*), and dragon fruit yellow skin and white flesh (*Selenicereus megalanthus*). Among four kinds of dragon fruit, dragon fruit with white meat

is the most popular and most demanded. While the shape and size is larger and the other three types of dragon fruit, white flesh dragon fruit also feels fresh because it contains a distinctive sour taste.

In Malaysia and Singapore, red dragon fruit is the most preferred species because it tastes sweeter than other types. Dragon fruit, even though the plant is now easily found, is not popular for its hidden benefits. The highlight feature of this fruit is that the form is different from other fruits. In its development, the presence of dragon fruit is also often chalked in various other roles.

Ancient Chinese society considers dragon fruit more than just a fruit with a variety of benefits. Fruit with skin that resembles a large snake scales are often made as a companion of two statues on the altar table offerings. This fruit is also served in every Lunar New Year celebrations, and it becomes one of the required presentation because it is believed that the fruit will bring blessings.

In its original place, Mexico, dragon fruit is considered one eye. Once it was brought to Vietnam, dragon fruit crop was widely cultivated before eventually expanded to the Southeast Asian country. In Vietnam dragon fruit is often called Thanh Long or clever dragon, while the Chinese call it Feuy Long Kwa. In Mexico, dragon fruit comes with the title Pitahaya. Dragon fruit itself has a light skin color, while the skin is not smooth, but covered with scales that looked like a large serpent or dragon. The content of the fruit is white, red or purple with a sprinkling of black seeds. The texture is as sweet as basil like a kiwi fruit. Dragon fruit or *Hylocereus undatus* (Latin name) which is the fruit of the forest is said to be originated from Mexico, South America, which is developed, and then expanded in Israel, Thailand and Australia. The fruit is then planted extensively in Vietnam before expanded to Asia. Indeed, the dragon fruit is included in the cactus family characteristics have spikes on each side of the trunk

Each country has a different title for this fruit, as Feuy Long Kwa (Chinese), Thanh Long or Clever Dragon (Vietnam), Mangkornkaew (Thailand), Shien Mie Kuo (Taiwan), Pitahaya (Mexico), Melano (Hawaii), Rhino Fruit (Australia), and Dragon Fruit, Sweet Cactus, Cactus Honey (Indonesia). Internationally, it is called Dragon Fruit.

### **Types**

There are four kinds of dragon fruit: white flesh dragon fruit (*Hylocereus undatus*), red flesh dragon fruit (*Hylocereus polyrhizus*), super red flesh dragon fruit (*Hylocereus costaricensis*) and yellow skin and white flesh dragon fruit (*Selenicereus megalanthus*).

Dragon fruit is usually consumed as fresh fruit for relieving thirst, because it contains high moisture which is about 90 percent of the weight of the fruit. It was pretty sweet because they contain sugar which reaches 13-18 Brix. Dragon fruit can be presented in the form of juice, fruit juice, candy and jam or various other forms of presentation. In general, experts agree and acknowledge that dragon fruit which is rich in potassium, iron, protein, fiber, sodium and calcium is good for health compared to other fruits. According to AL Leong from Johncola Pitaya Food R & D, an organization that examines the red dragon fruit, cactus fruit honey is quite rich with a variety of substances of vitamins and minerals that help increase endurance and beneficial for metabolism of the human body. "Research shows red dragon fruit is excellent for the circulatory system, also gives the effect of reducing emotional stress and neutralize toxic in the blood. Research also shows this fruit can prevent colon cancer, in addition to preventing high cholesterol content in the blood and lower levels of fat in the body," said Leong, explained. Overall, every red dragon fruit contains a protein that can increase metabolism and maintain cardiovascular health, fiber (to prevent colon cancer, diabetes and diet), carotene (eye health, strengthen the brain and prevent the entry of disease), and calcium to strengthen bones and overcome constipation. Dragon fruit also contains iron which is useful to increase blood, vitamin B1 (to prevent fever body), vitamin B2 (add to taste), vitamin B3 (decrease cholesterol) and vitamin C (add slipperiness, smoothness of skin and prevent acne).

1. White pulp, red skin (*Hylocereus undatus*) is the most common varieties which has the lowest sweetness compared to two other varieties.

2. White fruit flesh, yellow skin (*Selenicereus megalanthus*). This is the sweetest variety of other varieties with the smallest fruit size.

3. Red/purple Pulp, red skin: *Hylocereus polyrhizus*/*H. costaricensis* (super purple or red meat). It is the fruit with the largest flower crown, among the two types of red-skinned dragon fruit, this variety is sweeter. It generates the greatest fruit of all varieties of dragon fruit. Its weight can be more than 1 kg.

Dragon fruit is easily developed, by doing propagation through cuttings. It is able to grow well by the available of enough organic material and three main requirements: a porous soil, full sun intensity (12-14 hours), and the support beams. As a family member of succulent plants, dragon fruit does not need much water. Excessive water can cause stem and root rot.

Dragon Fruit which contains the active substance concentrations are included in the category of functional foods. The active substances are: (1) Antioxidants in ascorbic acid (vitamin C), carotene (vitamin A) and anthocyanins. (2) Dietary fiber in the form of pectin.

#### **IV. DRAGONFRUIT NUTRITION CONTENT**



Fiber available in the dragon fruit is excellent. It reaches 0.7 to 0.9 grams per 100 grams. Fiber is needed by the body to decrease cholesterol levels. In the digestive tract fibers will bind bile acids (end products of cholesterol) and then excreted with faeces. Thus, the higher the consumption of fiber, the more bile and fat body is incurred. In addition to preventing cholesterol, fiber dragon fruit is also very useful in the digestive system. Dietary fiber is able to shorten transit time, ie the time during food taking from the mouth until the Food Producing in the form of feces. Meanwhile, food fiber will bind carcinogenic substances. Thanks to the short transit time, the time of carcinogenic substances in the living body is also getting shorter, so that the small chance of bodily harm (Goldberg, 1994). Dietary fiber is very good for preventing diabetes mellitus, heart disease, stroke, cancer, and other cardiovascular diseases. Unfortunately, fiber consumption in Indonesia is still very low. It is about 10 grams per person per day. In fact, the recommended dietary fiber intake is 20-30 grams per person per day.

Dragon fruit is known as a source of beta-carotene. Beta-carotene is a pro vitamin A in the body which is converted into vitamin A and very useful in the process of vision, reproduction, and other metabolic processes. It is estimated that every 6 micrograms of beta-carotene has a biological activity equivalent to 1 microgram of retinol. FAO-WHO group has calculated that only about half of the absorbed beta-carotene is converted into vitamin A. Approximately, there is only 1/6 of the content of carotenoids in foods that will eventually be used by the body. Beta-carotene is also a type of antioxidant that may play an important role in reducing the concentration of peroxy radicals. The ability of beta-carotene works as an antioxidant derived from its ability to stabilize carbon-core radicals. Since beta-carotene is effective at low concentrations of oxygen, it can complete the antioxidant properties of vitamin E which is effective at high oxygen concentrations. Beta-carotene is also known as an element of cancer prevention, especially skin and lung cancer. Beta-carotene can reach more parts of the body in a relatively longer time compared to vitamin A, thus providing more optimal protection against cancer

Nutrient composition per 100 grams of dragon fruit:

Water Levels (g): 82.5 to 83.0

Protein (g): 0.16 to 0.23

Fat (g): 0.21 to 0.61

Fiber/dietary fiber (g): 0.7 to 0.9

Beta-carotene (mg): 0.005 to 0.012

Calcium (mg): 6.3 to 8.8

Phosphorus (mg): 30.2 to 36.1

Iron (mg): 0.55 to 0.65

Vitamin B1 (mg): 0.28 to 0.30

Vitamin B2 (mg): 0.043 to 0.045

Vitamin C (mg): 8-9

Niacin (mg): 1.297 to 1.300

## **V. BENEFITS OF DRAGON FRUIT**

According to Al Leong from Johncola Pitaya Food R & D, dragon fruit is very good for the circulatory system. It is also very effective in reducing emotional stress and neutralize toxins in the blood. Indonesian Agency for Agricultural Research said that the dragon fruit can decrease cholesterol level, balance blood sugar, kidney function, strengthens the bones, and improve brain works. The savor the dragon fruit is still unknown by the public. In addition to research that is still very limited, the fruit is still very rare. Dragon fruit is a source of vitamins and minerals that are profitable for human body. The level of vitamin B1 in dragon fruit reaches 0.3 mg per 100 grams of fruit flesh. The consumption of vitamin B1 per person per day is recommended by the National Food and Nutrition Widyakarya (2004) to be 0.5 to 0.9 mg for children under 10 years, and 0.9 to 1.0 mg for adults. Pregnant women and nursing mothers should supply 0.3 mg per day above normal requirements.

In principle, thiamine (vitamin 131) acts as a coenzyme in reactions that produces energy from carbohydrates and transfers energy to form energy-rich compound called ATP. Thiamine deficiency causes polyneuritis (dry beriberi), which is caused by a disruption of nerve transmission or neural networks suffer from a lack of energy. Symptoms of thiamine deficiency originally are tired body, loss of appetite, weight loss, and indisgestion. Dragon fruit also contains potassium, iron, protein, calcium in the amount that is sufficient to improve endurance. These substances are also good to neutralize toxins in the blood, improve eye sight and prevent hypertension.

Dragon fruit's water is also quite high. It reaches 83 grams per 100 grams of fruit flesh. Therefore, the dragon fruit can also be used as a delicious dessert.

Simply said, dragon fruit can be eaten in a fresh condition, after cooked and tender. First, dragon fruit is cut into two, and then the white flesh dotted with tiny black seeds can be taken and eaten. Such way of eating has been traditionally carried out by the Indian community in South America. Some people who are reluctant to eat like an Indian, will cook the fruit into pies. Some will eat it as a dessert in the form of ice cream in a modern restaurant.

The seeds, which are similar to basil seeds, can be eaten without any harm to our health. The meat which feels very refreshing and sweet, is often promoted sweeter than watermelon, although it is a little sour. Aside from eating it directly, dragon fruit has also been known as a raw material for making wine. In Malaysia, a raw dragon fruit can be cooked as soup and mixed with meat and bone. Besides, dragon fruit is also used as raw materials for salad or fried with chili paste. Dragon fruit flowers are also used as a vegetable or dried to be used as flower tea.

To consume it directly, you should choose a ripe ragon fruit. A good does not have flaws on the skin. If the skin fruit has flaws, it is possible to affect the inside. If it is soft when we press the fruit, it means that the fruit is ripe enough to eat.

Fresh dragon fruit is usually still coated by tendrils or yellowish green scales, while the outer fruit is pink charming.



Agricultural Research Agency of the Republic of Indonesia said that the dragon fruit can lower cholesterol level, balance blood sugar, kidney function, strengthen the bones, and improve brain works. The phytochemical substances in these fruits can reduce the risk of cancer. Dragon fruit is also very good for the circulatory system. The fruit is very effective in reducing emotional stress and neutralize toxins in the blood. Dragon fruit which contains 80 percent of water, vitamin C, fiber, calcium, iron, and phosphorus are useful for overcoming high blood diseases. The meat of dragon fruit which reaches 0.7 to 0.9 grams in each gram is also very useful in the digestive system and lowers cholesterol levels. Dragon fruit (*Hylocereus undotus*) has a variety of benefits. The fruit is believed to cure diseases of the blood sugar to lower cholesterol. A sample that shows consuming fruit is free from these diseases is still have not been found. But, agricultural experts in Thailand believe that this fruit is indeed efficacious in preventing various diseases.

Indeed, the name is quite haunted. But the fruit which is starting to become the leading sectors in some areas is quite friendly to health. It is believed that this fruit is profitable, such as balancing blood sugar levels, protecting oral health, preventing colon cancer, reducing cholesterol, preventing bleeding, treating complaints whitish. Red dragon fruit is also very good for improving eyesight because it has carotenoids substance. Phytochemicals in these fruits can reduce the risk of cancer. Besides fruits, its flowers and stems, the dragon fruit species *Grandiflorus Selenicereus* is also used in the manufacture of useful drugs to regulate blood circulation. Fiber available in the dragon fruit is excellent. It reaches 0.7 to 0.9 grams per 100 grams. Fibre is needed by the body to lower cholesterol levels. In the digestive tract, fibers will bind bile acids (end products of cholesterol) and then excrete it with faeces. Thus, the higher the consumption of fiber, the more bile acids and fatty acids released by the body.

In addition to prevent cholesterol, fiber dragon fruit is also very useful in the digestive system. Dietary fiber is able to shorten transit time, ie the time during food taking from the mouth food releasing in the form of feces.

Dietary fiber contained in dragon fruit is very good for preventing diabetes mellitus, heart disease, stroke, cancer, and other cardiovascular diseases. Unfortunately, fiber consumption in Indonesia is still very low, which is about 10 grams per person per day. In fact, the recommended dietary fiber intake is 20-30 grams per person per day. Drug efficacy of dragon tree (*fn/ok/dt/tm*) is not only derived from the fruit but also the leaves and the skin of the fruit. Besides the taste is good, red dragon fruit (*Hylocereus polyrhizus*) or often called red pitaya also has properties which are to decrease blood sugar in diabetics and smooth the skin, while the skin of the fruit and leaf extracts can improve the flexibility of blood vessels and inhibit the growth of tumor cells.

#### Lowering Blood Sugar Levels

By eating one red dragon fruit (250 grams) every morning and evening for eight days in a row, it will lower blood sugar levels in diabetics. During their consuming of dragon fruit, people should stop eating rice because rice is a source of sugar which can cause diabetics.

#### Smooth Skin

According to Prof. Dr. Muhammad Yusuf, specialist of traditional Chinese medicine, in Chinese culture, the dragon fruit is believed to smooth the skin so it can be more beautiful, but it is not used to treat deadly diseases such as cancer or heart disease. Dragon fruit is good for overcoming heat because it is cool. Inhibit Tumor Cell Growth The savor of the dragon tree is not on the fruit, but the leaves and the skin of fruit. The results obtained by Rosario Vargas Sols Laboratorio de Investigacion de Universidad Autonoma Metropolitana Xochimilco Fitofarmacologia, Mexico showed that chloroform which was extracted from the leaves of white fleshed dragon fruit contains compounds taraxast pentacyclic triterpene-20-ene-3a-ol and taraxast-12, 20 (30)-dien-3a-ol. Both compounds were shown to protect rabbit blood vessel flexibility. Researchers estimated that the efficacy of the two compounds were almost equal to troxerutin on micro vascular protective drug on the market. The drug was beneficial to reduce the risk of blood vessel rupture. The results of in vitro assays performed by Li-chen Wu, Department of Applied Chemistry researchers National of Chi-Nan University showed that the extracts of red fleshed dragon fruit skin could potentially inhibit the growth of B16 F10 tumor cells at a dose of 25 grams.

### REFERENCES

- [1] Anonima. 2009. Manfaat Buah Naga. [www.buahnaga.us/2009/04/khasiat-buah-naga](http://www.buahnaga.us/2009/04/khasiat-buah-naga)
- [2] [Http://www.buahnaga.us](http://www.buahnaga.us)
- [3] [Http://kesehatan.kompas.com](http://kesehatan.kompas.com)
- [4] [Http://www.buahnaga.us](http://www.buahnaga.us)
- [5] <http://www.blogsehat.com/2010/03/07/khasiat-dari-buah-naga/>.  
[2007.finance.groups.yahoo.com/group/Perkebunan/message/13](http://2007.finance.groups.yahoo.com/group/Perkebunan/message/13)
- [6] **Anonim b.2011.Pratomo.** Superioritas Jambu Biji & Buah Naga sebagai Pangan Fungsional Lengkap
- [7] **Sumber: Taiwan Food Industry Develop & Research Authorities (2005)**