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## A REVIEW STUDY ON TOMATO AND ITS HEALTH BENEFITS

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### ABSTRACT

*Tomatoes may make individuals healthier and reduce the risk of diseases such as cancer, osteoporosis and cardiovascular disease. Tomato is also excellent for liver health. Tomato has detoxifying action in the body. Probably it is due to the presence of chlorine and sulfur in tomatoes. According to certain research, 51 mg of chlorine and 11 mg of sulfur in 100 grams size of tomato play a significant function in detoxifying process. Natural chlorine helps in boosting the liver and its role for filtering and detoxifying bodily wastes. Sulfur in tomatoes protects the liver against cirrhosis, too. Tomato juice is regarded as excellent energy drink and for revitalizing the health of people on dialysis. Herbalists recognized that eating tomatoes and tomato products may decrease the risk of cardiovascular illnesses because of lycopene in it. Some research indicate that tomatoes and garlic should be eaten together at the same time to have its cancer preventative benefits. Take tomato, it will prevent hardening of the arteries. Therefore, tomato may decrease high blood pressure, too. Red ripened tomato is a strong antioxidant. Vitamin E and lycopene in tomato inhibits LDL oxidation efficiently. Bean sprouts, cabbage or barley malt contain vitamin E. Tomato is a great fruit or vegetable for fast skin cell renewal. Tomato juice may be utilized for treating sunburn due of its particular vitamin C.*

**KEYWORDS:** Health, Lycopene Medicine, Tomato, Vitamin.

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### 1. INTRODUCTION

Starting with the fundamentals, tomatoes contain significant quantities of vitamin C, giving 40 percent of the daily value (DV) (DV). They also include 15 percent DV of vitamin A, 8 percent DV of potassium, and 7 percent of the recommended dietary allowance (RDA) of iron for women and 10 percent RDA for males. The red pigment found in tomatoes is called lycopene. This chemical seems to function as an antioxidant, eliminating free radicals that may harm cells in the body. Only lately, researches have shown that lycopene may carry double the punch of another well-known antioxidant beta-carotene. Studies performed by Harvard researchers have found that males who eat 10 servings of tomatoes a week, or the equal to 10 slices of pizza, may reduce the chance of getting prostate cancer by a daunting 45 percent. However, its advantages are not restricted to the prostate. Italian researchers have discovered that individuals who eat more than 7 servings of raw tomatoes reduce the chance of getting rectal colon or stomach cancers by 60 percent. Israeli researchers have discovered that lycopene is a strong inhibitor of lung, breast, and endometrial cancer cells. Research has also shown that the lycopene in tomatoes may help elderly individuals remain active longer. New research is starting to suggest that tomatoes may be utilized to help prevent lung cancer. Two strong chemicals present in tomatoes-coumaric acid and

chromogenic acid-are believed to inhibit the effects of nitrosamines. These are chemicals that not only are produced naturally in the body, but also are the greatest carcinogen in cigarette smoke. By inhibiting the effects of these nitrosamines, the risks of lung cancer are decreased substantially[1]–[3].

When selecting your tomatoes, make careful to choose ones with the most vivid hues of red. These represent the greatest levels of beta carotene and lycopene. Though raw tomatoes are excellent for you, cooking them unleashes even more of the advantages. Lycopene is found in the cell wall of the tomato, therefore by heating in a little of oil, this therapeutic ingredient is more completely released. In addition heating the tomato in olive oil helps your body to absorb the lycopene better. Don't worry about the availability of fresh tomatoes. Tomatoes don't lose any of their nutritional content in the high heat processing; making canned tomatoes and tomato sauce are both just as viable and useful as fresh tomatoes. The researchers discovered that tomatoes are the largest source of dietary lycopene; a strong antioxidant that, unlike components in most fresh fruits and vegetables, has even higher bioavailability after heating and processing. Tomatoes also include additional protective mechanisms, such as antithrombotic and anti-inflammatory properties. Research has also shown a connection between consuming tomatoes and a reduced risk of some malignancies as well as other diseases, including cardiovascular disease, osteoporosis, UV light-induced skin damage, and cognitive impairment[4]–[6].

Tomatoes are widely accessible, people of all ages and cultures enjoy them, they are cost-effective, and are available in various forms. "Leveraging new knowledge regarding tomatoes and tomato products may be one easy and successful approach to assist people boost vegetable consumption, leading to improved overall eating habits, and ultimately, better health. Tomatoes are the most significant non-starchy vegetable in the American diet. Research underlines the connection between eating tomatoes and decreased risk of cancer, heart disease, and other diseases," the authors conclude. "The data also indicates that eating of tomatoes should be encouraged because of the nutritional advantages and because it may be a simple and effective approach for boosting total vegetable intake[7]–[9].

### **1.1. Chemical Composition of Solanum Lycopersicum:**

Chemical Composition Of Solanum Lycopersicum: There are known varieties of tomato, round, oval, "cherry", but have same nutritional characteristics, being a good contributor of: potassium, nutrients, magnesium, iron, so necessary to the everyday activities of nerves and muscles; vitamins as A, B and C - tomatoes is the 3rd source of vitamin C in our diet and the fourth for vitamin A, throughout its content in beta-carotene or pro vitamin A; phytosterols, compounds that help to keep cholesterol under control; folic acid, which helps eliminate homocysteine, an amino acid whose metabolism is dependent on the metabolism of vitamins from B complex, especially that of folic acid.

### **1.2. Health Benefits:**

Tomatoes, which are actually a fruit and not a vegetable, are loaded with all kinds of health benefits. Tomatoes, which are really a fruit and not a vegetable, are filled with all sorts of health advantages for the body. They are in reality, a very diverse health product and owing to its equally varied preparation choices, there's really no excuse to ignore the tomato as part of a healthy diet. One of the most well-known tomato eating advantage is its' Lycopene content. Lycopene is a crucial anti-oxidant that assists in the battle against malignant cell development as well as other types of health problems and illnesses. Free radicals in the body may be flushed out with large quantities of Lycopene, and the tomato is so abundantly laden with this essential anti-oxidant that it literally gets its deep crimson from the vitamin. Lycopene is not a naturally generated element inside the body and the human body needs sources of Lycopene in order to make use of this potent anti-oxidant. While other fruits and vegetables do include this essential health component, no

other fruit or vegetable has the high concentration of Lycopene that the tomato takes pleasure in. Studies concerning the tomato have popped up all across the field of Medical science[10].

There are more health advantages gained from eating a tomato than the scientific community is able to publish, at least yet. These studies have shown not only the advantages in avoiding cancer, heart disease as well as excessive cholesterol are also in the tomato's sights. This is very interesting information. The health advantages of tomatoes are being more and more documented every day as we discover new applications of this wonderful fruit. Malignancies such as prostate cancer, cervical cancer, colon cancer, rectal cancer, and cancers of the stomach, mouth, throat, and esophagus have all been shown to be staved off by high amounts of Lycopene.

### **1.2.1. Tomatoes Help Prevent Several Types Of Cancer:**

A lot of research have been performed that suggest that the high amounts of lycopene in tomatoes helps to decrease your risks of getting prostate, colorectal and stomach cancer. Lycopene is a natural antioxidant that works well to inhibit the development of malignant cells. Cooked tomatoes contain even more lycopene, so go ahead and make up a pot of your mom's famous tomato soup.

### **1.2.2. Tomatoes Help Maintain Strong Bones:**

Tomatoes contain a significant quantity of calcium and Vitamin K. Both of these nutrients are important in reinforcing and conducting small repairs on the bones as well as the bone tissue.

### **1.2.3. Tomatoes Help Repair Damage Caused By Smoking:**

No, eating tomatoes is not the latest current craze to help you stop smoking. However, tomatoes may decrease the amount of harm done to your body by smoking cigarettes. Tomatoes include coumaric acid and chlorogenic acid that act to protect the body against carcinogens that are generated by cigarette smoke.

### **1.2.4. Tomatoes provide essential antioxidants:**

Tomatoes contain a significant quantity of Vitamin A and Vitamin C. This is mainly because these vitamins and beta-carotene act as antioxidants to neutralize damaging free radicals in the blood. Free radicals in the blood stream are hazardous since it may lead to cell damage. Remember, the redder the tomato you eat is, the more beta-carotene it contains. In addition, you also want to bear in mind that heating destroys the Vitamin C, thus for these advantages, the tomatoes need to be consumed raw.

### **1.2.5. Effect of Homocysteine on Health:**

Increased levels of homocysteine increase the risk of cardiovascular illness, especially myocardial infarction and brain and vascular accidents or hands and legs vascular disease. Homocysteine is also implicated in the development of arteriosclerosis, a process which creates agglomerations of fat and minerals in the arteries, which eventually acquire a characteristic hardness and cause harm to blood vessel elasticity. People with high blood levels of homocysteine exhibit additional related risk factors such as hypertension or increased cholesterol levels that induce thrombosis.

### **1.2.6. Lycopene, a Compound with Exceptional Properties:**

The tomato is a food extremely rich in lycopene, a vegetal pigment from carotenoid family, a chemical discovered in 1873, which provides color to the vegetable, but also has remarkable qualities since lycopene is a strong antioxidant. Numerous studies have demonstrated that by frequent intake of tomatoes, the resistance to cancer of the prostate, lung, digestive, but also heart disease is enhanced. Also, tomatoes assist to fight against atherosclerotic syndrome and muscular degeneration, the major causes of pain in individuals over 65 years.

### **1.2.7. Antioxidants:**

Antioxidants are chemicals (vitamins, minerals, natural colors) that protect body cells from the damaging effects of free radicals, molecules that develop in the body via interaction with oxygen. Free radicals are partially responsible for the processes of aging, cardiovascular illnesses and cancer and operate by damaging the cell membranes and the cellular DNA. Cellular oxidation is a natural process that affects all tissues, is unavoidable, but certain variables such as environmental pollution, smoking, diets rich in saturated fats, excessive sun exposure and extreme physical activity lead to increased generation of free radicals. Most antioxidants are present in plants, which is why it is so important to consume more fruits and vegetables since they protect us from free radicals naturally.

### **1.2.8. Contraindications for Tomatoes:**

It should also be noted the high concentration in oxalic acid of tomatoes (5.3 mg / 100 g), chemicals which create insoluble calcium salts (calcium oxalate) which may precipitate in the form of kidney stones. Also, owing to its acidity, a 5. Moderate intake is recommended and in the event of gastro duodenal disorders, the consumption should be discontinued.

When purchasing tomatoes, you have to select the 6. Freshest ones, with smooth, soft skin, of medium consistency (neither too strong nor too soft) or too green, but not too mature. Tomatoes may be kept for longer durations in their natural form by putting them on their tail or the green region 7. Corresponding to the tail and divided between them. The fridge can keep them in excellent condition between 6 to 8 days, if maintained whole and no more than 2 days if they are stored in the form of fresh juice.

### **1.3. Benefits of Tomato:**

#### **1.3.1. Lower Cholesterol:**

A Tomato- cholesterol free and a healthy source for diet; it won't add cholesterol to the diet. A cup of tomato offers 9 percent of fiber that assists you to reduce the elevated cholesterol levels. Tomatoes also includes niacin (vitamin B3).

#### *1.3.2. Lower Blood Pressure:*

The tomatoes offer substantial decrease in blood pressure. After 8 weeks, continuing monitoring of daily tomato intake (in the form of lycopene complex - a tomato extract) revealed a decrease in both the blood pressure top number (systolic) by 10 points and the bottom number (diastolic) by 4 points.

#### **1.3.3. Protection from cell Damage:**

The tomatoes are great source of antioxidant lycopene. Antioxidants move through the body, neutralizing harmful free radicals that otherwise damage cells and cell membranes. Free radicals increase the development or severity of atherosclerosis, diabetic problems, asthma, and colon cancer. High intakes of lycopene have been found to help decrease the risk or severity of all of these diseases.

#### **1.3.4. Counteract Acidosis:**

Acidosis, is a major cause of calcium loss, tiredness, headaches, insomnia, muscular pains, acne, dermatitis, arteriosclerosis, sexual dysfunction, hormone imbalance, depression, and degenerative diseases. Our bodies are intended to maintain an alkaline equilibrium with a pH of 7.365. By adding enough of alkaline minerals in our meals calcium, magnesium, potassium and salt we assist our body maintain its alkaline balance naturally. Tomatoes are great providers of calcium, magnesium, and potassium and may help in avoiding acidosis.

#### **1.3.5. Treatment of Vasolidation:**

Vitamin C has successfully resulted in appropriate dilation of blood arteries in the instances of atherosclerosis, congestive heart failure, high cholesterol, angina pectoris, and high blood pressure. It has been observed that supplementation of vitamin C increase blood vessel dilatation.

#### **1.3.6. Lead Toxicity:**

Lead Toxicity is a serious health issue seen in youngsters, particularly in the metropolitan regions. Abnormal development and growth has been observed in children who are exposed to lead. They have behavioral difficulties, learning impairments and have low IQ. It may harm the kidney and raise blood pressure in adults. Vitamin C pills decrease the blood lead level. Hence by consumption of tomato lead poisoning may be decreased among the youngsters. Hence tomato is abundant in vitamin c owing to this it may able to decrease this risk factor.

#### **1.3.7. Eye Disorder:**

Cataracts are the most frequent causes of vision impairment. Decrease in the amount of vitamin C in the lens of the human eye leads to increased number of cataracts. Increase of vitamin C in tomato consumption improves the blood flow to the visual zones of the body and helps to treat this eye disease.

#### **1.3.8. Cancer:**

It has been discovered that increased intake of fresh vegetables and fruits have a connection with a reduced risk for the different kinds of cancer. The increased intake of vitamin C is linked with the reduced possibilities of malignancies of lung, mouth, vocal chords, throat, colon rectum, stomach, and esophagus the fruits such as tomato, orange, pomegranate are extremely rich in vitamin c.

#### **1.3.9. Combating Stroke:**

Vitamin C in tomato or Ascorbic Acid aids in decreasing the risk of stroke, a type of cardiovascular illness. A diet rich of vegetables and fruits generates good amount of vitamin C which maintains the proper blood pressure level. It also protects the body from free radicals which may be the cause for the stroke.

## **2. DISCUSSION**

Tomato juice maintains the blood stream alkaline and therefore retain a high resistance to illness. It is extremely rich in iron and potash salts. Half-ripe tomatoes provide a great treatment in many kinds of liver problems. Tomatoes promote torpid liver and are extremely helpful for dyspepsia, diarrhea and dysentery. Being a high source of vitamin A, it is a reliable preventative against eye problems. Tomato is a nervine tonic. It is extremely helpful in many kinds of neurological diseases. As it is a high source of vitamin C, it is extremely helpful in scurvy. Half ripe tomatoes are extremely helpful in summer diarrhea. But it should be eaten with musumbi (lime) juice. It is also extremely helpful in dysentery. But it should be eaten with garlic and musumbi (lime) juice. Half-ripe tomatoes are particularly helpful in hot summer months as it avoids sun-stroke or heat-stroke. Tomatoes are generally helpful in heartburn, gas or indigestion. Half-ripe tomatoes are frequently administered in dyspepsia.

## **3. CONCLUSION**

Tomato is described as "the most popular vegetable fruit". Tomato is prepared as vegetable alone or in conjunction with potato besides eaten raw when ripe. It is a fruit of excellent nutritional value since it is reasonably rich in vitamins (vitamin C), and other minerals like calcium, phosphorus and iron. Considering its cheap cost, it qualifies for inclusion in the daily diet of young and developing children. There are many misbeliefs linked with tomato intake. It is thought that tomato promotes hypertension. However, there are no scientific evidences available to link the consumption of tomatoes with hypertension. In fact, tomatoes are rich in gamma-amino butyric

acid (GABA), a chemical that may help bring down blood pressure.

A new research has shown that tomato and tomato sauce reduce blood pressure and the risk of heart disease. Effectiveness of tomatoes in reducing blood pressure is linked to lycopene, a molecule found in tomato. Tomato extract includes carotenoids such as lycopene, beta carotene, and vitamin E, (known as powerful antioxidants) to inactivate free radicals, and to delay the development of atherosclerosis. Consumption of tomato may cause development of gall bladder stones owing to presence of purine and oxalic acid in the fruit. Chemical study of tomato reveals that it contains less purine (11 mg/100g) than carrots (17 mg), potatoes (16 mg), cabbages (32 mg) and other vegetables. Oxalic acid concentration in tomato is significantly smaller than beets, potatoes, cucumber and lettuce. Experts now suggest inclusion of tomatoes in the diets of gall bladder sufferers. It may exacerbate gout issues and uric acid disorders. In reality, tomato is included in the diet since it has uric acid reducing impact.

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