HEALTH BENEFITS OF FRUITS AND VEGETABLES

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INTRODUCTION

Fruits and vegetables are an indispensable part of any diet, not only for vegetarians, but also for non-vegetarians. They are plant derivatives and generally are matured ovaries, fruits, flowers, stems and leaves of plants. Fruits and vegetables are important sources of vitamins and minerals for the body. Now a days special emphasis is being paid to the consumption of fresh fruits and vegetable and juices and salad, as they are the important sources of essential minerals and vitamins. Epidemiological studies have shown the importance of a diet rich in fruits and vegetables in the prevention of illness, such as heart disease, cancer, metabolic disorder, nutritional anaemia etc. Low plasma level of micronutrients with antioxidant properties, often found in fruits and vegetables are associated with increase risk for these diseases.
The nutritive value of fruits and vegetables (Range of values per 100 gm)

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Green leafy vegetable</th>
<th>Roots and tubers</th>
<th>Other vegetables</th>
<th>Fruits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture (g)</td>
<td>79-92</td>
<td>59-94</td>
<td>72-96</td>
<td>75-90</td>
</tr>
<tr>
<td>Calories (Kcal)</td>
<td>32-96</td>
<td>20-160</td>
<td>14-109</td>
<td>10-80</td>
</tr>
<tr>
<td>Carbohydrates (g)</td>
<td>4-14</td>
<td>4-38</td>
<td>4-20</td>
<td>2-20</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>1.9-6.7</td>
<td>0.7-3.0</td>
<td>0.4-7.0</td>
<td>0.2-2.0</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>0.1-1.7</td>
<td>0.1-1.3</td>
<td>0.1-0.4</td>
<td>0-1.0</td>
</tr>
<tr>
<td>Calcium (mg)</td>
<td>30-500</td>
<td>10-50</td>
<td>10-130</td>
<td>5-40</td>
</tr>
<tr>
<td>Iron (mg)</td>
<td>0.8-16.0</td>
<td>0.4-2.1</td>
<td>0.5-5.8</td>
<td>0.1-1.0</td>
</tr>
<tr>
<td>Carotene (µg)</td>
<td>1200-7500</td>
<td>30-3000</td>
<td>5-200</td>
<td>5-500</td>
</tr>
<tr>
<td>Ascorbic acid (mg)</td>
<td>48.220</td>
<td>3-24</td>
<td>2-66</td>
<td>2-300</td>
</tr>
<tr>
<td>Thiamine (mg)</td>
<td>0.05-0.06</td>
<td>0.05-0.10</td>
<td>0.04-0.25</td>
<td>0.05-0.2</td>
</tr>
<tr>
<td>Riboflavin (mg)</td>
<td>0.11-0.14</td>
<td>0.01-0.07</td>
<td>0.01-0.08</td>
<td>0.02-0.1</td>
</tr>
<tr>
<td>Nicotini acid (mg)</td>
<td>0.4-0.8</td>
<td>0.3-1.2</td>
<td>0.2-0.9</td>
<td>0.2-1.0</td>
</tr>
<tr>
<td>Folic acid (µg)</td>
<td>10-30</td>
<td>3-6</td>
<td>5-10</td>
<td>6-9</td>
</tr>
<tr>
<td>Potassium (mg)</td>
<td>250-370</td>
<td>200-370</td>
<td>200-400</td>
<td>86-250</td>
</tr>
<tr>
<td>Sodium (mg)</td>
<td>4-91</td>
<td>18-60</td>
<td>10-48</td>
<td>5-15</td>
</tr>
</tbody>
</table>
- Fair sources of protein
- Rich sources of provitamin A (carotene)
- Rich sources of ascorbic acid
- Good sources of folic acid
- Good sources of calcium
  It forms a good supplements to the poor cereal diets.
- Roots and tubers are in general
  - Good sources of starch
  - Poor to fair sources of protein
  - Poor to fair B-vitamins
  - Poor to fair Ascorbic acid
  It can be used as partial substitute for cereal in the diet.
- Other vegetable are –
  - Good sources of protein and B vitamin (Beans, peas etc.)
  - Fair sources of ascorbic acid and minerals (pumpkins, gourds, ladies finger, brinjal etc.)
  - Fair sources of carotene (green peas, yellow pumpkins)
Fruits are in general

- Good sources of vitamin C and potassium
- Some fruits are good sources of sugars
- It is a good source of acids (tartaric acid and malic acid, citric acid)
- A small quantity of organic acid
- Fruits are good sources of pigments and polyphenols
- Fruits contains several enzymes
- Fruits are rich in pectic substances
The concept of consumption of fruits and vegetable from nutrition point of view was in earlier day as –

- It adds variety in diets by adding flavour and colours.
- It supply adequate micronutrients both minerals and vitamins
- It is essential for maintenance of wide variety of metabolic functions critical for health.
- It is an inexpensive source of alternative for micronutrient
- It provides bulk to the diet
- It provides enough of dietary fibre and crude fibre
The concept of consumption of plenty of fruits and vegetables in dieters has been a growing recognition not only essential nutrients needed for life but also other bioactive compounds for health promotion and disease prevention.

Now question arises what are the bio-active compounds.

These compounds are –

- Variety of antioxidants (Phenolics flavonoids)
- Antitoxins and blocking agents inhibiting carcinogenesis, phytochemicals)
The benefit of a diet rich in fruit and vegetables is attributed to the complex mixture of phytochemicals strongly associated with

Health benefits and nutrient contribution of some of the fruits and vegetables.

<table>
<thead>
<tr>
<th>Name of the fruit</th>
<th>Nutrient contribution</th>
<th>Health benefits</th>
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</table>
| Amla              | Good source of vitamin C                 | ➢ Help as strong antioxidant  
➢ Helps in iron absorption                                                       |
| Apple             | High in soluble fibre and pectin         | Reduce blood cholesterol (LDL)  
➢ Counters constipation and diarrhoea  
➢ Traditionally believed in control of arthritis, rheumatism and gout. Improves digestion and absorption. It also improves defence mechanism against illness. |
| Apricot           | Good sources of vitamin C and carotenoid | Lower risk of heart diseases  
➢ Stroke, cataract  
➢ Reduced formation of cancer  
➢ Steadies blood sugar level  
➢ Reduced iron def. anaemia                                                  |
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| Banana            | It is rich source of carbohydrates, potassium, magnesium, ascorbic acid and vitamin A | - It regulate blood pressure  
- Provide energy  
- Provides good stamina  
- Prevent constipation (ripe banana)  
- Raw banana  
- Prevent diarrhoea  
- It help in sleep  
- Excellent fruit to treat anaemia |
| Beet              | Rich in carbohydrate fibre, minerals and vitamin | - Oxidant, laxative, digestible, blood cleanses  
- Help in Hb formation |
<p>| Blue berry        | It is a good source of iron, fibre and vitamin C | - It helps in the reduction and control of cholesterol level |
| Broad beans       | Rich in starch high in fibre and polyphenolic compounds, rich in protein, moderate iron and B vitamins | - Good for controlling diabetes |</p>
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| Broccoli          | High in vitamins, vitamin C, vitamin A, rich in phytochemicals | ➢ It protect against diseases  
➢ It has multiple cancer fighting properties  
➢ It helps in control of diabetes  
➢ It plays a role in preventing heart diseases |
| Cabbage           | Good source of vitamin C and fibre contain provitamin A. It also contain folate and phytochemicals | ➢ Helps in controlling diabetes  
➢ Protect against infection  
➢ Prevention from cancer  
➢ Help in reducing hypertension |
| Capsicum          | Excellent source of vitamin C, contains provitamin A | ➢ It is good for hypertensive patient  
➢ It helps to absorption  
➢ It also help to improve immune function |
<p>| Carambola         | It is a good source of vitamin C | ➢ Ripe sweet carambola is good for treating jaundice patient |</p>
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| Carrot           | Rich in carotene      | ➢ Protect against infection  
➢ Provide immune strength to fight against cancer  
➢ Prevent cataract |
| Cauliflower      | High in vitamin C good source of folate | ➢ It reduce the blood pressure  
➢ Good for controlling diabetes |
| Cherry           | Good source of vitamin A, C and energy | ➢ It is good for hypertensive patient as it don’t contain fat, sodium or cholesterol |
| Cucumber         | Moderate in Vitamin C | ➢ Good for weight reduction programme because of its slow digestion |
| Figs             | Good source of vitamin and mineral | ➢ Oxidant, laxative, diuretic digestible, blood cleanser  
➢ It is excellent for liver |
| French bean      | They are the source of pro-vitamin A, vitamin C, fibre, potassium, folate and phytochemicals | ➢ Fight against diabetes.  
➢ Good for heart patient  
➢ Good for maintaining blood sugar level  
➢ It helps to prevent diseases  
➢ Reduce risk of cancer |
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<tr>
<td>Garlic</td>
<td>It contains flavonoids and organosulphur compounds</td>
<td>Helps to reduce the risk of cancer, cardiovascular diseases and diabetes</td>
</tr>
<tr>
<td>Gooseberry</td>
<td>It is a good source of provitamin A, vitamin C, potassium and flavonoid</td>
<td>Good for hypertensive and diabetic patient, Act as anti cancer substance</td>
</tr>
<tr>
<td>Grape fruit</td>
<td>Low in calorie. Good source of Fibre, Potassium, Flavonoids, Excellent source of vitamin C, Red and pink grapefruit contains carotenoid Lycopene</td>
<td>Anticancer effects, Cholesterol lowering action, Normalize hematocrit levels, It conducts sound sleeps, Help in prevention of constipation and stone formation, Excellent in reducing fevers from cold, Helps in hardening of body tissue like liver and arteries</td>
</tr>
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| Grapes            | Good source of pro-vitamin A, carotenoids, vit. C and flavonoids | ➢ Help in tumour reduction  
➢ Purify the blood  
➢ Activated immune system  
➢ Grapes promote the action of bowel  
➢ Clean the liver  
➢ Aid kidney functions  
➢ Activate nervous system  
➢ Good blood builders |
| Guava             | Good sources of vitamin C, carotenoid | ➢ It improves immune system  
➢ Helps in iron absorption  
➢ Helps in reduction in infection |
| Kiwi-fruit        | Rich in vitamin C | ➢ Activate immune system  
➢ Help in blood formation |
| Lemon             | Good source of potassium and vitamin C, high in soluble fibre, pectin | ➢ Antiseptic  
➢ Provide security against stomach and intestine fermentation  
➢ They destroy all microbes  
➢ During fevers and flues it acts as cleansing agent to the body  
➢ It is wonderful for throat trouble |
| Lettuce           | Provides carotenoids | ➢ Helps in improving immune system  
➢ Reduce the risk of cancer and heart diseases |
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| Mango            | Rich source of vitamin A and C. Rich in phytocemicals (Antioxidant Lutein) | ➢ It acts as depurative  
➢ It acts as diuretic  
➢ It can combat stomach acidity  
➢ It helps the reduction in incidences of cancer |
| Melons           | Good source of pro-vitamin A and C and carbohydrate | ➢ It is refreshing  
➢ Alkalising  
➢ Mineralising  
➢ Oxidant  
➢ Diuretic  
➢ Have an anticlotting action on the blood  
➢ Provide an excellent and finest mineral elements |
<p>| Olive            | Good sources of vitamin C | Recommended for tuberculosis and other chest infections like asthma |
| Onion            | It contains flavonoids | ➢ It has beneficial effect against heart disease and possibly cancer |</p>
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| Orange           | Excellent source of vitamin C. Good source of fibre, potassium. It also contain folate B-complex vitamin | ➢ It provides strong defences to the body  
➢ Resist infection  
➢ Helps in iron absorption  
➢ It has a strong antioxidant power  
➢ Anti cancer potential (specially of stomach)  
➢ Lowers cholesterol level  
➢ Can improve and strengthen blood vessels  
➢ Maintain cell wall strength  
➢ Aiding capillary circulation  
➢ Excellent for treating over acid body condition constipation |
| Papaya           | It is rich in enzyme (pepsin), vitamin C, vitamin A, calcium and carbohydrate | ➢ It helps in cleansing digestive organ  
➢ It is diuretic, laxative and refreshing  
➢ Helps in acid – alkaline balance in the body  
➢ Use in treatment of stomach, ulcer and fevers |
| Passion fruit    | It is a good source of potassium | ➢ It helps in relaxation  
➢ It helps in good sleep |
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</thead>
</table>
| Peaches          | Moderate concentration of Vit. C and fibre | ➢ It help in weight losses due to diuretic depurative and detoxifying action  
➢ Prevent lung, liver infections  
➢ Prevent cancer  
➢ Prevent ulcer  
➢ Prevent rheumatic pain  
➢ Prevent hypertension and anaemia  
➢ Lowered risk of heart diseases |
| Pears            | Good source of vitamin C and fibre | ➢ Prevent heart disease, diabetes and cancer |
| Peas             | Rich in protein. It contains some amount of provitamin A. It contains some amount of folate good source of vitamin C, iron and potassium | ➢ Help in curing anaemia  
➢ Fight against diseases  
➢ Good for heart disease |
| Pineapple        | It is rich in vitamin C. Moderate in vitamin A. Good source of dietary fibre | ➢ Used to cure rheumatoid arthritis  
➢ Used to cure diabetic ulcer and in general surgery  
➢ It help in digestion due to presence of enzyme “Bromelain” |
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<th>Health benefits</th>
</tr>
</thead>
</table>
| Plum             | Good source of vitamin C, provitamin A, fibre and flavonoids | ➢ Helps in prevention of diseases  
➢ Good for diabetic and heart patient |
| Pomegranate      | Low in calorie poor in vitamin C good source of vitamin C, potassium and flavonoids | ➢ Prevent the infection of heart, liver  
➢ Prevent cancer  
➢ Prevent diarrhoea  
➢ Prevent cancer |
| Potato           | Rich in energy. It also contain folate, vitamin C thiamine, potassium and iron | ➢ It can be substitute to cereal as staple food |
| Radish           | Low in energy provides bulk good source of vitamin C and iron | ➢ Acts as an antiseptic agent  
➢ Good for blood formation |
<p>| Spinach          | It is an excellent source of magnesium, potassium, provitamin A. It is a good source of vitamin C and fibre | ➢ Helps in controlling diabetes. Good for controlling anaemia. Prevent heart disease |</p>
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</thead>
</table>
| Strawberry        | They are rich in vitamin C, folic acid and fibre and no fat | ➢ Diuretic and excellent effect on kidney  
➢ Used to relieve rheumatism gout |
| Sweet potato      | Good source of carbohydrate contains vitamin C | ➢ It can be used as staple food. Helps in the regulation of body function  
➢ It can be used as baby food as it is easily digestible |
| Tomato            | It is good source of antioxidant. High in folic acid. It is the richest of all foods in vitamins (like A, B, C) | ➢ It help in better vision  
➢ It helps to fight against infection  
➢ Helps to maintain body lining  
➢ Helps in bone growth  
➢ Helps to improve reproductive function  
➢ Helps in cell development  
➢ Reduce the risk of heart disease  
➢ It is powerful to fight against cardiovascular diseases  
➢ Vitamin K in tomatoes helps to prevent hemorrhages |
| Water melon       | It contain energy and carotenoid | ➢ It act as anatioxidant reduce the risk of diseases |
Eating a balanced diet containing vegetables and fruits is considered the best way of ensuring good health. Fruits and vegetables are not just tasty and nutritious but they also enhance the immune system of our body.

The consumption of fresh fruit and vegetables are promoted as a first line of defense in the prevention of serious illness with the magic role of anti-oxidant and folate. With the sufficient consumption of fruits and vegetables reduce the risk for cancer and heart diseases, and other chronic diseases. Therefore, it is reasonable for scientists to identify the bioactive compounds responsible and hope to find the “magic bullet” to prevent the chronic diseases. Now the question is whether a purified phytochemicals (8000) has the same benefits as the phytochemicals present in whole fruits and vegetable – till then use the guidelines.
In diseased condition rather than whole fruit and vegetables use concentrated juices and soups.

To meet the fruit and vegetable consumption encourage in mixed fruit and vegetable salad.
Salad is nutritious

Good source of pure vitamin C

Rich in antioxidant prevent cancer, heart diseases arthritis

It supplies iron

It is rich in fibre

It is rich in vitamin and minerals
Thank You