

# **James L. Holly, M.D.**

## **Broccoli - The Crown Jewel of Nutrition**

**By: James L. Holly, MD**

Broccoli is known as the "Crown Jewel of Nutrition" because it is vitamin-rich, high in fiber, and low in calorie properties. Not only does broccoli give you the best vegetable nutrition available, it also gives you many ways to lead a healthier, longer life. Heart disease is the number one cause of death in the United States with cancer as the second, and broccoli gives you many ways to help fight and prevent these and other diseases.

### **Broccoli and Cancer**

Cancer is the second leading cause of death in the United States. Unfortunately, most cases go undetected for years before symptoms appear and that limits the amount of therapies available. The best medicine is preventive medicine, in the health outlook, and that is where nutrition plays the largest role. Eating a healthy diet, low in fat and high in fruits and vegetables, does not guarantee that you will not get cancer, but it definitely lowers your risk.

Broccoli has multiple cancer-fighting properties including vitamin C, beta carotene, and fiber. It is also rich in phytochemicals which appear to offer us protection against certain cancers and heart disease. Indole carbinol and sulforaphane are two different phytochemicals that are found in broccoli.

### **Antioxidants and Cancer**

A medium size stalk of broccoli provides 220% of your daily value of vitamin C. That same medium stalk of broccoli provides 15% of your daily value of vitamin A, in the form of beta carotene. Both vitamin C and beta carotene are antioxidants, which is a substance that can reduce and prevent the damage caused to human cells by free radicals. Free radicals are a "toxic" byproduct of everyday metabolism, but in excessive number, free radicals may be a factor in diseases as cancer, arthritis, Alzheimer's, and heart disease.

A study done by Dr. Harman of the University of Nebraska College of Medicine, suggests that free radicals play a significant role in the aging process: cataracts, heart

disease, and cancer. Dr. Robert Russell of the Center on Aging also stresses that foods, not pills, are the most reliable source of antioxidants.

### **Fiber and Cancer**

Colon and rectal cancers are the second leading cause of cancer deaths in the US. These types of cancers are also lower in countries where the diet is low in meat and high in fiber. Although there is no study showing exactly how fiber prevents cancer, there are a few theories which make a lot of sense. One is that food moves faster and with greater bulk, therefore reducing the concentration of carcinogenic substances in the bowel. The second theory is that fiber reduces transit time through the colon, thereby reducing contact time between fecal carcinogens and the colonic mucosa on the walls of the colon. The last theory is that increased fiber in the diet decreases the amount of bile acids in the intestines and bacterial metabolism to decrease carcinogen production.

### **Indole Carbinol and Cancer**

Broccoli is rich in indole carbinol, which is a substance that breaks down estrogen, and comes from the phytochemical family. Estrogen is a hormone which seems to promote the development of certain breast tumors, among many other physiological functions. Some researchers believe that a cup of broccoli a day is enough indole carbinol to help ward off these tumors.

### **Sulforaphane and Cancer**

Dr. Paul Talalay of Johns Hopkins School of Medicine developed a simple cell-culture test which showed that certain cruciferous vegetables increase the activity of protective enzymes that fight cancer, one in particular was quinone reductase. The responsible chemical in the broccoli that made this enzyme increase is sulforaphane. Sulforaphane is found in cruciferous vegetables, such as broccoli, kale, cauliflower, and brussels sprouts (as well as non-cruciferous vegetables, such as carrots and green onions).

### **Broccoli and Diabetes**

Diabetes mellitus is a disease which alters the endocrine system, which controls all of your hormones. It is characterized as an inability for cells to metabolize glucose effectively resulting in hyperglycemia (elevated blood glucose levels). The elevated glucose levels is a direct result of an absolute or relative deficiency in insulin.

Broccoli helps battle diabetes because of its high fiber content. Eating a diet high in fiber improves the control of blood sugar and can therefore decrease the need for insulin and other medications. Soluble fiber seems to delay the emptying of the stomach and therefore slows the absorption of glucose in the intestine. If you are diabetic or know anyone who is, eating a high fiber diet only helps control diabetes, it is not a replacement for insulin injections or medications. Please consult your medical doctor or registered dietitian if you have any questions.

## **Broccoli and Osteoporosis**

The University of California's Wellness Letter indicates that broccoli has as much calcium, ounce for ounce, as milk. As mentioned in Mann's Nutrition Report, calcium is an essential mineral in building and maintaining bone mass, as well as controlling muscle functions. It is critical to eat enough calcium rich foods during childhood and young adulthood to build up adequate bone mass. Many adults drink little to no milk at all and that is why there must be an awareness that there are many calcium rich foods other than milk--like broccoli.

At the age of thirty to forty the bone mass density begins to decline, even if you have built adequate bone mass in your younger years. This is even more critical for women because a lack of calcium in the diet, combined with the body's inability to absorb calcium efficiently, contributes to the onset of osteoporosis. Osteoporosis is a drastic loss of bone mass and density that increasingly makes bone more fragile.

During and after menopause, woman's estrogen production impairs the bones' ability to retain calcium. Many other lifestyle factors affect this bone mass reduction including exercise, heredity, and drugs. A recent study, according to University of California's Wellness Encyclopedia of Food and Nutrition, found that eating adequate amounts of calcium can help reduce the risk of hip fracture by 50 to 60%. For further inquiry, please consult your physician about other preventative measures or call the National Osteoporosis Foundation at 1-800-223-9994.

## **Broccoli and Obesity**

Broccoli helps fight obesity by being a low-fat, low calorie, highly nutritious vegetable option to any healthy meal plan. Eating lots of broccoli fills you up with the bulk of high-fiber, and without adding extra calories. Broccoli also plays a preventive role in many of the other chronic diseases that come with being obese: diabetes, hypertension, and heart disease. In the United States obesity is a growing concern for both adults and especially children, which is why a healthy well-rounded diet with an exercise program is so critical to follow. Remember, you can't go on a diet. ....you need to make lifestyle changes.

## **Broccoli and Hypertension**

Hypertension is the clinical term for high blood pressure. High blood pressure is defined as sustained elevated arterial blood pressure measured indirectly by an inflatable cuff and pressure. In correcting hypertension, most physicians will prescribe a diet low in sodium or medication, like diuretics, to control water balance in the body. Sodium restriction is only part of a program to lower your blood pressure.

Dr. Louis Tobian of the University of Minnesota believes that most people do not get enough potassium in their diet and says that a lack of potassium can also cause a weakening of arterial wall, leading to potential cardiovascular problems due to the

stresses of high blood pressure. Broccoli contains 15% of your daily value of potassium in a 2000 kcal/day diet. Weight reduction, restriction of alcohol, modification of fat intake, an exercise program, stress reduction, and avoidance of tobacco are other therapies for high blood pressure.

Broccoli's role is that it's a nutritious vegetable to add to a diet low in sodium, fat, and calories. The goal in controlling high blood pressure is to reduce diastolic blood pressure to below 90 mm Hg and to achieve and maintain arterial blood pressure below 140/90 mm Hg. Please contact your physician or local health clinic to check your blood pressure.

### **Broccoli and Heart Disease**

Heart disease consists of heart attacks, or congestive heart failure, when the heart fails as a pump and cannot deliver an adequate amount of oxygenated blood to body tissues. Loaded in broccoli, beta carotene lowers the risk of heart attacks. A study done by researchers at Harvard Medical School report that men with clogged arteries who were fed beta carotene supplements suffered half as many heart seizures and strokes as did men given placebo pills.

The high fiber content also helps reduce the total blood cholesterol levels, primarily by lowering the LDL or "bad" cholesterol. It has also been reported that the folate content in broccoli, along with the other B vitamin's, help protect against heart disease. They help control homocysteine, an amino acid, which is produced normally in the blood, but has currently been linked as a risk factor for heart disease.

Broccoli's role in preventing heart disease is mentioned in all of the articles above: it's full of vitamins and minerals; it's high in fiber, low in fat and calories; and high in calcium and potassium which help with cardiac and skeletal muscle functions. For more information on heart disease please call the American Heart Association at 1-800- AHA-USA1.

Remember, it is your life and it is your health.