ISSN 0975- 2633
Review Article
Arch Pharm Sci& Res Vol 9 No 1 1-3 April 2017

Create a Rainbow on Your Plate for Better Health

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Over the past few decades, the number of studies relating an association between fruit and vegetable intake and reduced risk of chronic diseases has continued to grow. Vegetables and fruits are clearly part of a healthy diet. Fill half your plate with fruits and vegetables and eat a rainbow of color every day. Fruit and vegetable intake may reduce oxidation, inflammation, cell proliferation, and other important disease-related processes
Key words: Fruits, Vegetables, Rainbow color.

INTRODUCTION

There is a lot of evidence showing that eating plenty of fruits and vegetables is good for our health. Diets high in vegetables are fruits contribute to anti oxidants which are associated with a reduced cancer and cardiovascular risk. Fruit and vegetables fall into rainbow colour categories: red, blue, yellow, orange, green, indigo/violet and white. Each colour carries its own set of unique disease fighting chemicals called phytochemicals. It is these phytochemicals that give fruits and vegetables their vibrant colour and of course some of their healthy properties. Thus eating plenty of fruits and vegetables can help to ward off heart disease and stroke, control blood pressure and cholesterol, prevent some types of cancer, avoid diverticulitis and guard against cataract and macular degeneration, two common causes of vision loss

Red

Red foods contain lycopene that helps rid the body of damaging free radicals, protect against prostate cancer, as well as heart and lung disease. The red foods are loaded with antioxidants thought to protect against heart disease by preventing blood clots and may also delay the aging of cells in the body. Red foods also contain anthocyanins (red berries, including strawberries), ellagic acid (strawberries, raspberries and pomegranate). Red fruits and vegetables support heart health, memory function, and healthy urinary tract function.

Orange

Orange colored foods contain alpha carotene, which protects against cancer, but also contain beta-carotene, which the body converts to vitamin A to protect the skin against free-radical damage. Beta-carotene is also good for night vision. In the past, population studies suggested vitamin A (along with vitamins C and E) could help prevent heart attacks. However, large trials of vitamin A supplementation either alone or in combination with other vitamins haven't confirmed this. The relationship observed in the original studies may have been a coincidence, or the benefits of consuming nutrients in food may not always be replicated by supplements.

Green

Green foods contain chemicals like carotinoids, indoles and saponins which can prevent cancer by inhibiting carcinogens. Chlorophyll is the component that makes plants green, and is purifying in the body. Many green foods also contain calcium and minerals. Leafy greens such as spinach and broccoli are also excellent sources of folate. Broccoli, cabbage, Brussels sprouts, kale and pak choi are all sources of sulforaphane and glucosinolate. Studies suggest that sulforaphane may help protect against blood-vessel damage and certain cancers. There is evidence to suggest lutein and zeaxanthin-rich vegetables, like kale, spinach, broccoli and peas, may help prevent and slow the progression of an eye disease, age-related macular degeneration.

List of Rainbow colored fruits and vegetables

	Green	White	Yellow/ Orange	Red	Blue/Purple
Vegetables	Broccoli Asparagus Zucchini Cabbage	Cauliflower Onions Mushrooms Garlic Shallots	Carrots Pumpkin Yellow peppers Sweet potatoes	Tomatoes Red onions Red bell peppers Radishes Beets	Purple cabbage Purple potatoes Eggplant
Fruits	Apples Grapes Pears Limes Honeydew	Bananas Brown pears White Peaches	Mangoes Oranges Papayas Pineapple Lemons	Cherries Guava Raspberries Red grapes Strawberries	Blackberries Blackcurrants Plums Prunes Figs

Blue, Indigo and Violet

Blue, indigo and violet foods contain the compound anthocyanins that not only give food their color but also have been shown to reduce the risk of high blood pressure, stroke, heart disease and increase heart health. Anthocyanin also has antioxidant properties that protect cells from damage and can help reduce the risk of cancer. Blue and violet coloured fruits and vegetables support memory function and have anti-aging benefits.

White

Though while is not part a color of the rainbow, white foods contain properties that have anti-tumor qualities, such as allicin in onions as well as other health-improving antioxidants such as the flavanoids. The white foods, bananas and potatoes, contain potassium as well. Anthoxanthins are the pigments that create white or cream colours. Some studies have suggested that anthoxanthins may reduce the risk of CVD and inflammatory conditions such as arthritis

Yellow

Yellow fruits contain carotenoids including beta-carotene and beta-cryptoxanthin. Carotenoids give this group their vibrant colour. A well-known carotenoid called Betacarotene is found in sweet potatoes, pumpkins and carrots. It is converted to vitamin A, which helps maintain healthy mucous membranes and healthy eyes. Foods like sweetcorn, peach, papaya and egg yolk are also rich in the antioxidant beta-cryptoxanthin. Like beta-carotene, our bodies can convert beta-cryptoxanthin into vitamin A Another carotenoid called lutein is stored in the eye and has been found to prevent cataracts and age-related macular degeneration, which can lead to blindness.

DISCUSSION

We observed a strong inverse relationship between fruit and vegetable intake and all-cause mortality. Fruit and vegetable consumption was significantly associated with reductions in cancer and CVD mortality, with increasing benefits. When different types of fruit and vegetable were examined separately, increased consumption of rainbow colored fruits and vegetables, showed significant associations with lower mortality. However, frozen/canned fruit consumption was apparently associated with a higher risk of mortality.

CONCLUSION

Chemical compounds known as phytonutrients that occur naturally in plants and have a beneficial effect on human health. Some phytonutrients such as beta carotene (orange) and lycopene (red) are responsible for the

vibrant colors you see in fruits and vegetables. "Eating arainbow" of fruits and vegetables ensures we get a variety of phytonutrients to keep our body healthy. Some might strengthen our immune system to fight against diseases while others might help us develop and maintain strong bones and teeth. Phytonutrients also give fruits and vegetables a spectrum of vibrant colors so "eating a rainbow" of fruits and vegetables is a good way to ensure that we are getting all of the phytonutrients that we need to support good health.In general ,one third of our diet should be fruits and vegetables.one third carbohydrates and the final third protein rich foods and reduced fat dairy products.

REFERENCES

1)Rochford M. Eat a rainbow of color every day; vision published by rutgers cooperative extension .2011; 23(4).

2)Key T. Fruit and vegetables and cancer risk. Br J Cancer. 2011;104:6-11.

3)George S, Park Y, Leitzmann M, et al. Fruit and vegetable intake and risk of cancer:a prospective cohort study. *Am J Clin Nutr*. 2009;89:347-353.

4)Lof M, Sandin S, Lagiou P, Trichopoulos D, Adami H-O, Weiderpass E. Fruit and vegetableintake and risk of cancer in the Swedish women's lifestyle and health cohort. *Control*. 2010;published on line 02 December 2010. *Cancer Causes* Accessed December 20, 2010.

5)Butelli E, Titta L, Giorgio M, Mock HP, Matros A, Peterek S, Schijlen EG, Hall RD, Bovy AG, Luo J, Martin C (2008) Enrichment of tomato fruit with health-promoting anthocyanins by expression of select transcription factors. *Nat Biotechnol* **26**: 1301–1308

6)Dauchet L, Amouyel P, Hercberg S, Dallongeville J. Fruit and vegetable consumption and risk of coronary heart disease: a meta-analysis of cohort studies. J Nutr. 2006;136:2588–93.

7)Hornick BA, Weiss L. Comparative nutrient analysis of commonly consumed vegetables. Nutr Today. 2011;46:130–7.

8)Song W, Derito CM, Liu K, He X, Dong M, Liu RH. Cellular antioxidant activity of common vegetables. J Agric Food Chem. 2010;58:6621–9.

9)Slavin JL. Dietary fiber: classification, chemical analyses, and food sources. J Am Diet Assoc. 1987;87:1164–71.

10)Slavin JL. Position of the American Dietetic Association: health implications of dietary fiber. J Am Diet Assoc. 2008;108:1716–31.

11)Roe DA. History of promotion of vegetable cereal diets. J Nutr. 1986; 116:1355–63.

12)Southgate DAT. Nature and variability of human food consumption. Philos Trans R Soc Lond B Biol Sci. 1991;334:281–8.

13)Southgate DAT, Paul AA, Dean AC, Christie AA. Free sugars in foods. J Hum Nutr. 1978;32:335–47.

14)Liener IE. Toxic constituents of plant foods. New York: Academic Press; 1989.

15)Steinmetz KA, Potter JD. Vegetables, fruit, and cancer prevention: a review.J Am Diet Assoc. 1996;96:1027–39.

16)Mullie P , ClarysP. As sociation between Cardio- vascular Disease Risk Factor Knowledge and Lifestyle. *Food and Nutrition Science*, Vol. 2, No. 10, 2011.

17)Scott J, Releille F, Fletcher J. Folic Acid and Folates: The Feasibility for Nutricional Enhancement in Plant Foods.*Journal of the Science and Food Agricul-ture*, Vol. 80, No. 7, 2000, 795-824.

18)Southon, S. 2000. Increased fruit and vegetable consumption withinthe EU: potential health benefits.Food Res. Intl. 33:211-217.

19(Horowitz JM,the colors of health.Time 2002.