Eat For Health - The Anti-Cancer Diet

By Joel Fuhrman M.D.

As reported by the U.S. government and Center for Disease Control (CDC), cancers of the colon, breast, prostate and lung are the top four deadliest cancers in the modern world. After billions of dollars devoted to researching drug treatments for cancer and minimal increases in life expectancy for those undergoing chemotherapy for most common cancers, many authorities such as the National Institute of Health and the American Cancer Society, have been issuing a stronger voice advocating more preventive measures to reduce cancer incidence. Diet has become a key element in the fight against cancer.

The most recent scientific advancement in the anticancer research is the identification of specific foods and food elements that offer powerful protection against cancer. These foods are essential for both prevention of cancer and also increased odds of survival after diagnosis. Harmful foods and supplements have also been identified, and avoiding or minimizing these is equally as important. Though most people would prefer to take a pill and continue their eating habits, this will not provide the desired protection. Unrefined plant foods, with their plentiful anti-cancer compounds, must be eaten in abundance to flood the body's tissues with protectivesubstances. Vegetables and fruits protect against all types of cancers if consumed in large enough quantities. Hundreds of scientific studies document this. The most prevalent cancers in our societies are plant-food-deficiency diseases. The benefits of lifestyle changes are proportional to the changes made. As we add more vegetable servings, we increase our phytochemical intake and leave less room in our diets for harmful foods, enhancing cancer protection even further. Let's review some of these research findings and then review what a powerful, anti-cancer diet will look like.

Meat and cancer

Accumulating epidemiologic evidence indicates that high consumption of red meat and processed meats increases the risk of colorectal cancer. At least three meta-analyses have identified red meat consumption as a risk factor for colorectal cancer.1 There is a clear dose-response relationship between red and processed meats and colorectal cancer, higher intake corresponds with more cancers and a lower intake with less.2 A prospective study of over 175,000 men similarly identified consumption of red, processed, and barbecued meats, as risk factors for prostate cancer.3 The consumption of red meat and processed meats on a regular basis more than doubled the risk of some cancers. Even ingesting a small amount of red meat, such as two to three ounces a day, was shown to significantly increase the risk of cancer.4 Red meat and processed meats contain more saturated fat and trans fat than other animal products, and, therefore, are poorer food choices. However, the fat issue does not tell the whole story. Toxic nitrogenous compounds (called N-nitroso) occur in larger concentrations in red meat and processed meats. Red meat also has high haem (also spelled heme) content. Haem is an iron-carrying protein, and it has been shown to have destructive effects on the cells lining our digestive tract.5 Processed meats, luncheon meats, barbequed meats also contain cancer-causing heterocyclic amines.6 These foods must not be a regular part of your diet if you are looking to maintain excellent health into your later years of life, because they promote heart disease and dementia too. The too frequent consumption of animal products in general increases the risk of many cancers, including bladder cancer, brain cancer, breast cancer, colon cancer, endometrial cancer, intestinal cancer, kidney cancer, leukaemia, lung cancer, lymphoma, oropharyngeal cancer, ovarian cancer, pancreaticcancer, prostate cancer, skin cancer and stomach cancer.7

To achieve optimal health, we require a significant exposure to a full symphony of antioxidants and phytochemicals in unprocessed plant matter. Minimizing or removing animal products from the diet leaves more calories that can be derived from plant foods. Also, since animal products contain no fiber, they remain in the digestive tract longer than plant foods, slowing digestive transit time and allowing heightened exposure to toxic compounds. Red meats are not the only cancer-causing animal products. Excess consumption of eggs and poultry with skin have been shown to increase the risk of recurrence of prostate cancer after initial diagnosis.8 In addition, women should be aware that fish consumption increases the risk for breast cancer.9 Remember that any type of meat cooked at a high temperature (for example barbecued, grilled, or fried) will also contain carcinogenic heterocyclic amines - among meats, chicken was found to be the greatest contributor of heterocyclic amines.10

The goal is to gradually reduce even the non-red meat animal products in your diet until you're only consuming them two to three times per week, but even at that low level of consumption the choice of animal products should exclude or only very rarely include processed meat and barbequed meat.

Dairy and cancer
Dairy products contain many hormone-containing and-promoting substances. U.S. cheese consumption has increased 182% (almost 3-fold) in the past 30 years11, and the incidence of our hormone sensitive cancers has also increased. There are strong associations between dairy consumption and prostate cancer.12,13,14 Interestingly, some studies have found that prostate cancer risk was elevated with increased consumption of low-fat milk specifically, suggesting that the potential threat to prostate health may be more closely linked to dairy protein than dairy fat.15,16 Ovarian cancer risk is also elevated by consumption of dairy products equivalent to three glasses of cow's milk per day.17,18 Butter use is associated with an increased risk of bladder cancer in women.19 Eating larger amounts of dairy products during childhood is associated with adult testicular and colorectal cancer.20,21
Cow's milk is the perfect food for the rapidly growing calf, but foods that promote rapid growth promote cancer. Consuming dairy protein on a regular basis elevates blood levels of insulin-like growth factor (IGF-1).22 IGF-1 is known to stimulate the growth of both normal and cancer cells, and there is a strong and consistent association between serum IGF-1 concentrations and prostate cancer risk.23 One study showed that men who had the highest levels of IGF-1 had more than four times the risk of prostate cancer compared with those who had the lowest levels.24 If you choose to consume dairy, minimize your intake to small amounts - dairy products are not essential for good health and carries potential health risks.

Sugar, white flour, and cancer
It has been hypothesized that levels of triglycerides, glucose, and insulin are associated with increased risk of colon cancer and that diets high in simple sugars and white flour increase risk of colon cancer because of their impact on these factors. There are interesting similarities in the epidemiology of colorectal cancer and adult onset diabetes. In a number of studies, diabetic patients have been shown to have an elevated risk of colorectal cancer and non-diabetics with elevated postprandial glucose levels also have a higher risk of colorectal cancer than individuals with normal glucose tolerance.25 One explanation for these associations is that both diseases are linked to becoming overweight and the resultant metabolic effects and heightened inflammation that results, but it is interesting to note the evidence supporting the possibility that chronic exposure to diets rich in rapidly assimilated carbohydrates may act directly as a promoter of colorectal carcinogenesis. Considering that both animal products and processed foods supply us with a rich caloric load, but not with antioxidants and phytochemicals necessary for the normal function of cells and the immune system, it may also be the lack of these nutritional elements that are important (as low-nutrient carbohydrates make up a higher percentage of total caloric intake). Free radical production increases and chronic disease develops as the level of produce decreases in the diet and the combined consumption of animal products and processed foods increases. Similarly, there is evidence that cancers of the breast, stomach, thyroid, upper digestive tract, and respiratory tract are linked to increased consumption of refined foods.26

Unrefined plant foods and cancer
According to the CDC, only one-third of U.S. adults eat two or more servings of fruit per day, and only one-quarter of adults eat three or more servings of vegetables per day.27 These minimal amounts cannot be expected to provide disease protection. I recommend a far more substantial intake of fruits and vegetables with 90 percent of calories coming from nutrient rich plant material, lots of it raw and green. I recommend about two pounds of vegetables and at least 4 fresh fruits per day. Most importantly, attention should be paid to the highly cancer protective plant foods, greens, onion, berries, beans and seeds. Cruciferous vegetables including kale, cabbage, collards, broccoli, and several others contain the most potent anti-cancer substances of all types of vegetables. Although they contain many different bioactive compounds, the anti-carcinogenic actions of cruciferous vegetables are commonly attributed to their content of glucosinolates. Glucosinolates are relatively biologically inert but can be hydrolysed to a range of bioactive compounds such as isothiocyanates (ITC) and indoles by the plant-based enzyme myrosinase. A number of mechanisms whereby ITC and indoles may protect against cancer have been identified including including inhibition of angiogenesis (blood vessel formation; important for tumor growth), detoxification or removal of carcinogens (like heterocyclic amines), inhibition of cancer cell growth, promotion of cancer cell death, and prevention of DNA damage by carcinogens.

Human studies show a huge protective effect; people who were regular consumers of these foods had approximately 60 percent less cancer.28 All vegetables are not equally protective. Epidemiological studies suggest that cruciferous vegetables, onions, and mushrooms are far more protective against cancer than vegetables overall - inverse relationships between cruciferous vegetable intake and breast, prostate, lung, and colorectal cancers have been found.29 For example, in one prospective study, one or more servings per week of cabbage reduced the risk of pancreatic cancer by 38%.30 This was only one serving a week, which demonstrates that dramatic protection is available and real when a diet is ideally designed. The regular consumption of mushrooms has been demonstrated to decrease risk of breast cancer by over 60 percent.31 Onions, berries, seeds and beans also have dramatic beneficial effects.32 Beans in general, not just soy, are beneficial for protecting against reproductive cancers such as breast and prostate cancer.33

Vitamin D and cancer

Vitamin D regulates several genes and cellular processes related to cancer progression. Some of the most ground breaking findings in nutrition science in recent years have been evidence of the powerful protection provided by vitamin D against common cancers. A 2009 meta-analysis of 19 studies established a strong inverse relationship between circulating vitamin D levels and breast cancer - women in the highest vitamin D range reduced their risk of breast cancer by 45%.34 The cells of the colon, are capable of converting 25(OH)D to its active form 1,25(OH)2D. It is likely unidentified actions specific to the cells of the colon. The potential importance of vitamin D for these cells is reflected in the very strong links between vitamin D insufficiency and colorectal cancers.35 A 2009 review of 25 studies found that sufficient vitamin D levels were consistently associated with reduced risk of colorectal cancer. Even after a diagnosis of colon cancer, vitamin D levels are associated with increased survival - in colon cancer patients, higher vitamin D levels were predictive of a decreased risk of death from any cause, not only colon cancer.36 In the largest and most recent study on vitamin D levels and colorectal cancer, subjects with 25(OH)D levels greater than 40 ng/ml had a 40% risk reduction compared to those whose levels were less than 10 ng/ml. For colon cancer specifically, the risk reduction was even greater - 60%.37 Cancers of the prostate, pancreas, lung, and endometrium are also associated with vitamin D insufficiency.38 About 50% of the U.S. population is deficient in vitamin D and cannot rely on sun exposure because of indoor jobs, skin color, and their climate. Plus, with the depletion of the ozone layer, the amount of sun most people would require to achieve these level may result in too much skin damage and skin cancer.39 For these reasons, it is appropriate to supplement with vitamin D - however, the doses in standard multivitamins (400 IU) are insufficient. For most supplementation with 800 to 2000 IU's optimizes serum 25(OH)D levels (35-55 ng/ml) for protection against cancer and osteoporosis.

Supplements and cancer

Certain supplements can be harmful as well. Betacarotene was at one time thought to be a beneficial supplement for cancer prevention - this was because populations with high circulating levels of betacarotene had lower rates of cancer. However, vegetables and fruits rich in beta-carotene are also rich in hundreds of other carotenoids and phytochemicals. Taking isolated beta-carotene did not have the same beneficial effects - in fact, a study investigating beta-carotene supplements as a preventive measure for lung cancer was halted early because the researchers found increased cancer rates in the subjects that took the supplements.40 Folic acid is the synthetic form of folate, a member of the family of B vitamins that is involved with DNA synthesis and DNA methylation, playing important roles in fetal development and nerve tissue health as well as cancer initiation and progression. Supplemental folic acid has been linked to breast, prostate, and colorectal cancers.41 A six-year study in Norway study on the homocysteine-lowering effects of B vitamins in patients with heart disease found that the patients whose supplement included folic acid had a greater risk of cancer incidence and cancer mortality. These patients were 43% more likely to die from cancer.42 This is especially troubling because most conventional multivitamins contain folic acid, and pregnant women especially are urged to take folic acid during pregnancy to prevent neural tube defects. However, folate is abundant in green vegetables, and supplements are not necessary for those who eat adequate greens.

Childhood diets and adult cancers

The foundation of adult cancers is most often built in childhood or early adulthood - childhood diets are the major cause of adult cancers.43 For example, higher intake of red meat during adolescence, when cells are rapidly dividing, is associated with higher rates of premenopausal breast cancer.44 The protective substances contained in fruits and vegetables are more effective if they are consistently present in the diet starting in childhood. Making moderate changes later in life is not likely to make much of an impact on cancer risk. For later life changes to dramatically reduce cancer risk a total dietary makeover is required. My nutrient dense, vegetable-based diet style offers people real protection from an ideally designed diet that is adopted later in life.

Obesity and cancer

Obesity is the second leading preventable cause of death in the United States - second only to smoking. In November 2009, the American Institute for Cancer Research released new estimates on obesity and cancer risk based on the work of their researchers - they concluded that excess body fat is responsible for 100,500 new cancer cases in the U.S. each year. They further estimated the percentages of several of the most common cancers that can be attributed to overweight and obesity: 49% of endometrial cancers, 35% of esophageal cancers, 24% of kidney cancers, 21% of gallbladder cancers, 17% of breast cancers, and 9% of colorectal cancers.45 Worldwide, about 25% of all cancer cases can be attributed to excess weight and/or sedentary lifestyle. Since overweight and obesity are associated with the development of all these different cancers, scientists have also suggested that excess weight would reduce the efficacy of cancer treatments and therefore increase the risk of mortality from these cancers. Indeed, the AICR presented additional data showing that overweight and obesity also decrease rates of survival in those already diagnosed with cancer. Once diagnosed with cancer, obese patients may face a 50- 60% increased risk of death. In particular, obese women with breast cancer are twice as likely to die from the disease as normal weight patients. Scientists suggest that this link between obesity and cancer is due to excess fat increasing levels of sex steroids and other hormones that promote cancer growth. Also the reduced immune function and elevated oxidative stress associated with excess body fat may contribute to the initiation of cancer by damaging DNA.

Eat for Health: The Anti-Cancer Diet

The foundation of nutritional science can be explained by my simple formula:

H = N / C or Health = Nutrients / Calories.

This is a concept I call the nutrient density of your diet. The key to longevity, healthful weight loss, and cancer protection is to eat predominantly those foods that have a high proportion of nutrients (non-caloric food factors) compared to calories (carbohydrates, fats and proteins).

A food is healthy or not-so-healthy based on how much fiber, phytochemicals, antioxidants, minerals, omega-3 fatty acids, vitamins and other unnamed (or yet to be discovered) nutrients it contains in proportion to its calories. Based on this N/C criterion, you can grade food quality, construct menus, and make food choices to support excellent health. Once you know which foods have the highest nutrient density, you will become an expert in nutrition. It is that simple. Eating large quantities of high-nutrient foods is the secret to optimal health, disease prevention and maintaining a healthy slim waistline. The health equation describes a way of eating that is truly a longevity diet, yet it effortlessly has you achieve an ideal weight and it is an anti-cancer and anti-heart disease diet-style. A typical anti-cancer diet should contain at least 4 fresh fruits daily, at least one large raw green salad, as well as a two other cooked (steamed) vegetables, such as broccoli, carrots and peas, squash or other colorful vegetables. A huge pot of soup laden with vegetables, herbs and beans can be made once a week and conveniently taken for lunch. Raw nuts and seeds are another important, but often overlooked, group of foods with documented health benefits contributing to longevity. Many individuals are choosing to modify their lifestyle to improve their health or reverse diseases. I urge you to learn more about healthful eating, and try some great tasting high-nutrient recipes in your regular diet, the effort is worth it and it may even save your life. Remember, the prescription is nutrition.

References:

1. Santarelli RL, Pierre F, Corpet DE. Processed meat and colorectal cancer: a review of epidemiologic and experimental evidence. Nutr Cancer. 2008 ; 60(2): 131?144.
2. Larsson SC ; Wolk A. Meat consumption and risk of colorectal cancer: a meta analysis of prospective studies. Int J Cancer. 2006; 119(11):2657-64.
3. Sinha R, Park Y, Graubard BI, et al. Meat and meat-related compounds and risk of prostate cancer in a large prospective cohort study in the United States. Am J Epidemiol. 2009 Nov 1;170(9):1165-77.
4. Chao A, Thun JT, Connell CJ, et al. Meat Consumption and Risk of Colorectal Cancer JAMA 2005;293:172-182.
5. Sesink AL, Termont DS, Kleibeuker JH, Van der Meer R. Red meat and colon cancer: dietary haem-induced colonic cytotoxicity and epithelial hyperproliferation are inhibited by calcium. Carcinogenesis 2001;22(10):1653-1659. Hughes R, Cross AJ, Pollock JR, Bingham S. Dose dependent effect of dietary meat on endogenous colonic N-nitrosation. Carcinogenesis 2001; 22(1):199-202.
6. Zheng W, Lee S. Well-done Meat Intake, Heterocyclic Amine Exposure, and Cancer Risk. Nutr Cancer. 2009 ; 61(4): 437?446.
7. Fraser GE. Association between diet and cancer, ischemic heart disease, and all cause mortality in non-Hispanic white California Seventh-Day Adventists. Am J Clin Nutr 1999;70(3 supp.):532-38S. Sarasua S, Savitz DA. Cured and broiled meat consumption in relation to childhood cancer. Cancer Causes Control 1994;5(2):141-48. Favero A, Parpinel M, Franceschi S. Diet and risk of breast cancer: major findings from an Italian case-control study. Biomed Pharmac other 1998;52(3):109-15. Levi F, Pasche C, La Vecchia C, Lucchini F, Franceschi S. Food groups and colorectal cancer risk. Br J Cancer 1999;79(7-8):1283-87. Steinmetz KA, Potter JD. Food-group consumption and colon cancer in the Adelaide Case-Control Study: meat, poultry, seafood, dairy foods and eggs. Int J Cancer 1993;53(5):720-27. Levi F, Franceschi S, Negri E, La Vecchia C. Dietary factors and the risk of endometrial cancer. Cancer 1993;71(11):3575-81. Negri E, Bosetti C, La Vecchia C, et al. Risk factors for adenocarcinoma of the small intestine. Int J Cancer 1999;82 (2): 171-74. Chow WH, Gridley G, McLoughlin JK, et al. Protein intake and risk of renal cell cancer. J. Nat. Cancer Inst. 1994;86: 1131-39. Kwiatkowski A. Dietary and other environmental risk factors in acute leukemias: a case- control study of 119 patients. Eur J Cancer Prev 1993;2(2):139-46. National Institutes of Health, National Cancer Institute. 1996. Cancer rates and risks: cancer death rates among 50 countries (age adjusted to the world standard), 4th ed. U.S. Department of Health and Human Services. Lung cancer, p. 39. Source: World Health Organization data as adapted by the American Cancer Society. Deneo- Pelligrini H, De Stefani E, Ronco A, et al. Meat consumption and risk of lung cancer; a case- control study from Uruguay. Lung Cancer 1996;14 (2-3):195-205. Zhang S, Hunter DJ, Rosner BA, et al. Greater intake of meats and fats associated with higher risk of non-Hodgkins lymphoma. J Nat Cancer Inst 1999;91(20):1751-58. Cunningham AS. Lymphomas and animal-protein consumption. Lancet 1976;27:1184-86. Franceschi S, Favero A, Conti E, et al. Food groups, oils and butter, and cancer of the oral cavity and pharynx. Br J Cancer 1999;80(3-4):614-20. Tominaga S, Aoki K, Fujimoto I, et al. Cancer mortality and morbidity sta- tistics. Japan and the World. Boca Raton, Fla.: Japan Scientific Soci- eties Press, CRC Press, 1994;196. Soler M, Chatenoud L, La Vecchia C, et al. Diet alcohol, coffee and pancreatic cancer: final results from an Italian study. Eur J Cancer Prev 1998;7(6):455-60. Sung JF, Lin RS, Pu YS, et al. Cancer 1999;86 (3):484-91. Black HS, Herd JA, Goldberg LH, et al. Effect of a low-fat diet on the incidence of actinic keratosis. New Eng J Med. 1994;330: 1272-75.
8. Richman EL et al. Intakes of meat, fish, poultry, and eggs and risk of prostate cancer progression. Am J Clin Nutr. 2009 Dec 30. [Epub ahead of print]
9. Stripp C, Overvad K, Christensen J, et al. Fish intake is positively associated with breast cancer incidence rate. J Nutr. 2003 Nov;133(11):3664-9.
10. Thomson B. Heterocyclic amine levels in cooked meat and the implication for New Zealanders. Eur J Cancer Prev 1999;8(3):201-06.
11. USDA Food Availability (per capita) Data System: http://www.ers.usda.gov/amberwaves/february05/findings/CheeseConsumption.htm.
12. Ma RW, Chapman K. A systematic review of the effect of diet in prostate cancer prevention and treatment. J Hum Nutr Diet. 2009 Jun;22(3):187-99; quiz 200-2. Epub 2009 Apr 1. Kurahashi N, Inoue M, Iwasaki M. Japan Public Health Center-Based Prospective Study Group. Dairy product, saturated fatty acid, and calcium intake and prostate cancer in a prospective cohort of Japanese men. Cancer Epidemiol Biomarkers Prev. 2008 Apr;17(4):930-7. Allen NE, Key TJ, Appleby PN, et al. Animal foods, protein, calcium and prostate cancer risk: the European Prospective Investigation into Cancer and Nutrition. Br J Cancer. 2008 May 6;98(9):1574-81. Epub 2008 Apr 1. Ahn J, Albanes D, Peters U et al. Dairy products, calcium intake, and risk of prostate cancer in the prostate, lung, colorectal, and ovarian cancer screening trial. CancerEpidemiol Biomarkers Prev. 2007 Dec;16(12):2623-30. Qin LQ, Xu JY, Wang PY, et al. Milk consumption is a risk factor for prostate cancer in Western countries:evidence from cohort studies. Asia Pac J Clin Nutr. 2007;16(3):467-76.
13. Chan JM, Stampfer MJ, Ma J, et al. Dairy products, calcium, and prostate cancer risk in the Physicians Health Study. Presenta- tion, American Association for Cancer Research, San Francisco, April 2000.
14. Bosetti C, Tzonou A, Lagiou P, et al. Fraction of prostate cancer attributed to diet in Athens, Greece. Eur J Cancer Prev 2000;9(2):119-23.
15. Tseng M, Breslow RA, Graubard BI, Ziegler RG. Dairy, calcium and vitamin D intakes and prostate cancer risk in the National Health and Nutrition Examination Epidemiologic Follow-up Study cohort. Am J Clin Nutr 2005;(81)1147-54.
16. Park S, Murphy S, Wilkens L, Stram D et al. Calcium, Vitamin D, and Dairy Product Intake and Prostate Cancer Risk: The Multiethnic Cohort Study. Am J Epid. 2007; 166(11)1259-1269.
17. Ganmaa D, Sato A. The possible role of female sex hormones in milk from pregnant cows in the development of breast, ovarian and corpus uteri cancers. Med Hypotheses. 2005;65(6):1028-37. Genkinger JM, Hunter DJ, Spiegelman D, et al. Dairy products and ovarian cancer: a pooled analysis of 12 cohort studies. Cancer Epidemiol Biomarkers Prev. 2006Feb;15(2):364-72. Larsson SC, Orsini N, Wolk A. Milk, milk products and lactose intake and ovarian cancer risk: a meta-analysis of epidemiological studies. Int J Cancer. 2006 Jan 15;118(2):431-41. Qin LQ, Xu JY, Wang PY, et al. Milk/dairy products consumption, galactosemetabolism and ovarian cancer: meta-analysis of epidemiological studies. Eur J Cancer Prev. 2005 Feb;14(1):13-9. Larsson SC, Bergkvist L, Wolk A. Milk and lactose intakes and ovarian cancer risk in the Swedish Mammography Cohort. Am JClin Nutr. 2004 Nov;80(5):1353-7. Fairfield KM, Hunter DJ, Colditz GA, et al. Aprospective study of dietary lactose and ovarian cancer. Int J Cancer. 2004 Jun 10;110(2):271-7.
18. Fairfield K.Annual Meeting of the Society for General Internal Medicine. Dairy products linked to ovarian cancer risk. Family Practice News, June 11, 2000, p. 8.
19. Keszei AP, Schouten LJ, Goldbohm RA, et al. Dairy Intake and the Risk of Bladder Cancer in the Netherlands Cohort Study on Diet and Cancer. Am J Epidemiol. 2009 Dec 30. [Epub ahead of print]
20. van der Pols JC, Bain C, Gunnell D, et al. Childhood dairy intake and adult cancer risk: 65-y follow-up of the Boyd Orr cohort. Am J Clin Nutr. 2007 Dec;86(6):1722-9.
21. Davies TW, Palmer CR, Ruja E, Lipscombe JM. Adoles- cent milk, dairy products and fruit consumption and testicular cancer. Br J Cancer 1996;74 (4):657-60.
22. Voskuil DW, Vrieling A, van?t Veer LJ, Kampman E, Rookus MA. The insulinlike growth factor system in cancer prevention: potential of dietary intervention strategies. Cancer Epidemiol Biomarkers Prev. 2005(14)195-203.
23. Cohen P. Serum insulin-like growth factor 1 levels and prostate cancer riskinterpreting the evidence. J Natl Cancer Inst. 1998(90)876-9.
24. Chan JM, Stampfer MJ, Giovannucci E, et al. Plasma insulin-like growth factor -1 and prostate risk: a prospective study. Science. 1998(279):563-5.
25. Scharlau D, Borowicki A, Habermann N, et al. Mechanisms of primary cancer prevention by butyrate and other products formed during gut flora-mediated fermentation of dietary fibre. Mutat Res. 2009 Jul-Aug;682(1):39-53. Bordonaro M, Lazarova DL, Sartorelli AC. Butyrate and Wnt signaling: a possible solution to the puzzle of dietary fiber and colon cancer risk? Cell Cycle. 2008 May 1;7(9):1178-83. Pisani P. Hyper-insulinaemia and cancer, meta-analyses of epidemiological studies. Arch Physiol Biochem. 2008 Feb;114(1):63-70. La Vecchia C, D"Avanzo B, Negri E, Franceschi S. History of selected diseases and the risk of colorectal cancer. Eur J Cancer 1991; 27: 582-6. Schoen RE, Tangen CM, Kuller LH, et al. Increased blood glucose and insulin, body size, and incident colorectal cancer. J Natl Cancer Inst 1999; 91: 1147-54.
26. La Vecchia C. Mediterranean diet and cancer. Public Health Nutr. 2004 Oct;7(7):965-8
Larsson SC, Bergkvist L, Wolk A. Glycemic load, glycemic index and breast cancer risk in a prospective cohort of Swedish women. Int J Cancer. 2009 Jul 1;125(1):153-7. Wen W, Shu XO, Li H, et al. Dietary carbohydrates, fiber, and breast cancer risk in Chinese women. Am J Clin Nutr. 2009 Jan;89(1):283-9. Franceschi, S., Favero A, Conti E, et al. Food groups, oils and butter, and cancer of the oral cavity and pharynx. Br. J. Cancer 1999; 80 (3-4): 614-20;
27. U.S. Centers for Disease Control. Fruit and Vegetable Consumption Among Adults --- United States, 2005. Morbidity and Mortality Weekly Report March 16, 2007 / 56(10);213-217
28. Zhang M, et al. Dietary intakes of mushrooms and green tea combine to reduce the risk of breast cancer in Chinese women. Int J Cancer. 2009;124:1404-1408
29. Higdon JV et al. Cruciferous Vegetables and Human Cancer Risk: EpidemiologicEvidence and Mechanistic Basis. Pharmacol Res. 2007 March ; 55(3): 224?236
30. Larsson SC, Hakansson N, Naslund I, Bergkvist L, Wolk A. Fruit and vegetable consumption in relation to pancreatic cancer: a prospective study. Cancer Epidemiol Biomarkers Prev 2006;15:301?305.
31. Zhang M, et al. Dietary intakes of mushrooms and green tea combine to reduce the risk of breast cancer in Chinese women. Int J Cancer. 2009;124:1404-1408
32. Powolny AA, Singh SV. Multitargeted prevention and therapy of cancer by diallyl trisulfide and related Allium vegetable-derived organosulfur compounds. Cancer Lett. 2008 Oct 8;269(2):305-14.
33. Shu XO, Zheng Y, Cai H, et al. Soy food intake and breast cancer survival. JAMA. 2009 Dec 9;302(22):2437-43. Hwang YW, Kim SY, Jee SH, et al. Soy food consumption and risk of prostate cancer: a meta-analysis of observational studies. Nutr Cancer. 2009;61(5):598-606.
Aune D, De Stefani E, Ronco A et al. Legume intake and the risk of cancer: a multisite case-control study in Uruguay. Cancer Causes Control. 2009 Nov;20(9):1605-15. Epub 2009 Aug 4. Korde LA, Wu AH, Fears T, et al. Childhood soy intake and breast cancer risk in Asian American women. Cancer Epidemiol Biomarkers Prev. 2009 Apr;18(4):1050-9. Park SY, Murphy SP, Wilkens LR, et al. Multiethnic Cohort Study. Legume and isoflavone intake and prostate cancer risk:

The Multiethnic Cohort Study. Int J Cancer. 2008 Aug 15;123(4):927-32. Nothlings U,Schulze MB, Weikert C et al. Intake of vegetables, legumes, and fruit, and risk for all-cause, cardiovascular, and cancer mortality in a European diabetic population. J Nutr. 2008 Apr;138(4):775-81.
34. Chen P et al. Meta-analysis of vitamin D, calcium and the prevention of breast cancer. Breast Cancer Res Treat. 2009 Oct 23. [Epub ahead of print]
35. Zhou G et al. Optimizing vitamin D status to reduce colorectal cancer risk: an evidentiary review. Clin J Oncol Nurs. 2009 Aug;13(4):E3-E17.
36. Ng K et al. Prospective study of predictors of vitamin D status and survival in patients with colorectal cancer. Br J Cancer. 2009 Sep 15;101(6):916-23. Epub 2009 Aug 18.
37. Jenab M, Bueno-de-Mesquita HB, Ferrari P, et al. Association between prediagnostic circulating vitamin D concentration and risk of colorectal cancer in European populations:a nested case-control study. BMJ. 2010 Jan 21;340:b5500. High vitamin D levels linked to lower risk of colon cancer. ScienceDaily. Retrieved April 6, 2010, from http://www.sciencedaily.com /releases/2010/01/100122002340.htm
38. Holick MF and Chen TC. Vitamin D deficiency: a worldwide problem with health consequences. Am J Clin Nutr 2008;87(suppl):1080S? 6S. Peterlik M et al. Calcium, vitamin D and cancer. Anticancer Res. 2009 Sep;29(9):3687-98.
39. Terushkin V, Bender A, Psaty EL, et al. Estimated equivalency of vitamin D production from natural sun exposure versus oral vitamin D supplementation across seasons at two US latitudes. J Am Acad Dermatol. 2010 Apr 2. [Epub ahead of print]
40. Kolata G. Studies Find Beta Carotene, Taken by Millions, Cana??t Forestall Cancer or Heart Disease. New York Times, Jan. 19, 1996.
41. Stolzenberg-Solomon RZ et al. Folate intake, alcohol use, and postmenopausal breast cancer risk in the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial. Am J Clin Nutr. 2006 Apr;83(4):895-904. Kim YI. Does a high folate intake increase the risk of breast cancer? Nut Rev; 2006; 64(10PT1) 468-75. Figueiredo JC et al. Folic acid and risk of prostate cancer: results from a randomized clinical trial. J Natl Cancer Inst. 2009 Mar 18;101(6):432-5. Epub 2009 Mar 10. Fife, J et al. Folic Acid Supplementation and Colorectal Cancer Risk; A Metaanalysis. Colorectal Dis. 2009 Oct 27. [Epub ahead of print]
42. Ebbing M et al. Cancer Incidence and Mortality After Treatment With Folic Acid and Vitamin B12. JAMA. 2009;302(19):2119-2126.
43. Maynard M, Gunnell D, Emmett P, Frankel S, Davey Smith G. Fruit, vegetables, and antioxidants in childhood and risk of adult cancer: the Boyd Orr cohort. J Epidemiol Community Health. 2003 Mar;57(3):218-25. Erratum in: J Epidemiol Community Health. 2007 Mar;61(3):271. Fuemmeler BF, Pendzich MK, Tercyak KP.Weight, Dietary Behavior, and Physical Activity in Childhood and Adolescence: Implications for Adult Cancer Risk. Obes Facts. 2009;2(3):179-186.
44. Linos E, Willett WC, Cho E, et al. Red Meat Consumption during Adolescenceamong Premenopausal Women and Risk of Breast Cancer. Cancer Epidemiol Biomarkers Prev 2008; 17(8):2146?51.
45. American Institute for Cancer Research.