Your Health Matters

Nutrition & Prostate Cancer

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Scientific evidence suggests that differences in diet and lifestyle may account in large part for the variability of prostate cancer rates in different countries [1].

Good nutrition may reduce the incidence of prostate cancer and help reduce the risk of prostate cancer progression. There are many studies currently being conducted to help further understand how diet and prostate cancer are related. We do know, however, that improved nutrition reduces risk of heart disease, diabetes, and obesity, and usually improves overall quality of life. It is estimated that one-third of cancer deaths in the U.S. can be attributed to diet in adulthood, including diet's effect on obesity [2]. Additionally, a healthy diet helps to increase energy levels, facilitate recovery, and enhance the immune system.

Guidelines for a Healthy Diet

- Primarily a plant-based diet
  - Plenty of fruits and vegetables
  - High fiber – whole grains and beans/legumes
- Low fat diet
- Limit simple sugars
- Adequate fluids
- Be physically active to help achieve and maintain a healthy weight

FRUITS AND VEGETABLES

- Contain vitamins, minerals, and fiber as well as various cancer-fighting phytochemicals (examples: carotenoids, lycopene, indoles, flavonols).
- Vibrant, intense color is one indicator of phytochemical content.

- There is extensive and consistent evidence that high fruit and vegetable intakes are associated with decreased risks of many cancers [3-13], and while results for prostate cancer risk are not yet conclusive, they are promising [14-17].
- Men who consumed at least 28 servings of vegetables per week had a reduced risk of prostate cancer compared with those who ate fewer than 14 servings per week [15].
- There is some evidence that vegetables, particularly cruciferous vegetables, such as broccoli, cauliflower, cabbage, kale, Brussels sprouts, and bok choy have been associated with a reduced risk of prostate cancer [15-16,18-20].
    - ❍ Men who ate three or more servings of cruciferous vegetables per week had a 41% decreased risk of prostate cancer compared with men who ate less than one serving per week [15].
- The benefit of fruits and vegetables in regards to cancer protection may be related to high amounts of carotenoids in certain fruits and vegetables, according to some key population studies [16, 19, 21-28].
- Additionally, organic fruits and vegetables have fewer pesticides, lower levels of total pesticides, and less overall pesticide toxicity than fruits and vegetables grown with chemicals. Although more research is needed, recent evidence indicates a significant increase in antioxidants in organic and sustainably grown foods versus conventionally grown foods [29-31].
- Consume at least five, preferably eight to ten, servings of fruits and vegetables daily for their cancer protective effects [32].

  One serving equates to:

  - ❍ ½ cup fruit or vegetable
  - ❍ 1 cup raw leafy greens
  - ❍ ¼ cup dried fruit or vegetable
  - ❍ 6 fl oz fruit or vegetable juice

FIBER – A PLANT-BASED DIET IS NATURALLY HIGH IN FIBER

- Fiber binds to toxic compounds and carcinogens, which are then later eliminated from the body [33].
- A high fiber diet works to reduce hormone levels that may promote prostate cancer progression [34-36].
- Some research indicates an inverse relationship between prostate cancer and dietary fiber intake [35, 37] or fiber-rich foods, such as whole grains, legumes, nuts, and seeds [16, 19, 38].
- One study indicated that a high fiber, low-fat diet followed for only 10 days resulted in serum changes that reduced the growth of prostate cancer [35].
- Fiber may [34] or may not [39] lead to a reduction in PSA values.
- Prostate cancer mortality is inversely associated with consumption of cereals and nuts/seeds, according to a study in the Journal of the National Cancer Institute [40].

- A diet rich in natural fiber obtained from fruits, vegetables, legumes, and whole-grains (for example: whole-grain cereals and breads) may reduce cancer risk and reduce the risk of prostate cancer progression.
  - ❍ Choose breads with three or more grams of fiber per slice.
  - ❍ First ingredient on the label should be whole or sprouted grain flour, not white flour or unbleached white flour.
  - ❍ Whole grains include oats, barley, quinoa, amaranth, bulgur, millet, soba noodles, etc.
- Aim for 25-35 grams of fiber daily [41].
- Refer to high-fiber sources table for more information (see page 19).

LOW FAT DIET

- The increased cancer risk observed in developed countries may be, in part, due to the fact that a high fat diet stimulates increased testosterone levels, which is known to be associated with prostate cancer growth [42-43].
- A comprehensive review reported that 20 of 30 studies found positive, although not all statistically significant, associations between dietary fat intake and prostate cancer risk [44].
- While a positive association between prostate cancer and fat intake was not observed in all studies [45], some prospective studies did report significant findings [46-49].
- Most researchers agree to aim for 20% of your total calories from fat, with less than 10% of total calories from saturated fat [41].
- The type of fat is significant and may, in fact, be of greater importance than total fat.

Saturated Fats

- Several studies indicate a positive association between saturated fat intake from meat and dairy products (animal sources) and prostate cancer [21, 50-53]. Eating red meat [46, 49, 54-55] and dairy products [21, 46, 54-55] also appear to be related to an increased risk of metastatic prostate cancer.
  - ❍ Reduce or eliminate consumption of red meat, milk, and other dairy products.
  - ❍ Limit use of butter, mayonnaise, baked goods, and regular salad dressings due to high saturated fat and total fat content. Consider rice vinegar, balsamic vinegar, lemon juice, or salsa as alternative salad dressings.
  - ❍ Limit cheese consumption. Cheese is typically between 60-80% fat, much of which is saturated fat.

Trans Fatty Acids

- Trans fatty acids, or hydrogenated oils, are known to be atherogenic, increasing one's risk of heart disease [56-59].
- Preliminary research indicates these fats may also be associated with increased cancer risk [13, 60-61].
- A recent prostate cancer trial reported a 30% increased cancer risk in men who used margarine once or more daily [14].
- Limit use of hydrogenated fats, such as margarine, fried foods, and processed foods including breads, crackers, cereals, and cookies that are high in harmful trans fatty acids.
  - ❍ When you read that a product contains "hydrogenated" or "partially-hydrogenated" oils, consider putting it back on the shelf. (Be sure to bring your reading glasses when shopping.)
  - ❍ Trans fatty acid labeling should be in effect in the year 2006, when the amount of trans fatty acids in a product will be clearly identified.

Omega-6 Fatty Acids

- Omega-6 fatty acids (linoleic acid, which can be converted to arachidonic acid) may stimulate growth of prostate cancer cells [62-65]. Other studies, however, have observed no association [49, 66-68].
  - ❍ These fatty acids are in corn oil, safflower oil, sunflower oil, cottonseed oil, soybean oil, and other polyunsaturated oils.
  - ❍ Substitute olive oil or canola oil for your current cooking oil, but remember to use only in moderation. These oils are rich in monounsaturated fats, which don't appear to increase cancer risk [14, 45, 63, 69].
- Minimize consumption (no more than ¼ cup with meal/snack) of nuts due to high fat content. This includes peanuts, macadamia nuts, and pistachios.
  - ❍ Nuts are highly concentrated in monounsaturated fatty acids, which are neutral in terms of stimulating cancer growth and may be beneficial for heart disease. They are, however, high in fat.

Omega-3 Fatty Acids

- Omega-3 fatty acids may reduce risk for prostate cancer as well as reduce the risk of cancer progression [14, 63, 70-72].
  - ❍ Induce apoptosis (cell death)
  - ❍ Suppress cancer cell initiation
  - ❍ Compete with arachidonic acid, which limits harm from arachidonic acid

- In vitro and animal studies have consistently reported reduced cell proliferation and decreased rate of cancer progression with omega-3 fatty acids [73-74].
- Men who consumed fish 3 or more times per week also had a 44% lower risk of prostate cancer, especially for metastatic prostate cancer where the effect was even greater [71].
- Researchers in New Zealand reported that men with high levels of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), the omega-3 fats found in fish, had a 40% lower risk of prostate cancer than those with low blood levels [70].
- A 30-year follow-up study found that men who ate no fish had a 2 to 3 times higher frequency of prostate cancer than those who ate moderate or high amounts of fish [72].
- Dietary sources include cold-water fish (for example: salmon, trout, herring, sardines, mackerel), flaxseeds, walnuts, soybeans, and canola oil.
    - ❍ It may be wise to consume fish at least twice weekly to obtain an adequate amount of omega-3 fatty acids.
    - ❍ Alternatively, incorporating one of the following foods on a regular basis will help to achieve sufficient omega-3 fatty acids:
        - ❑ 1-2 Tbsp ground flaxseed
        - ❑ 1 oz walnuts
        - ❑ ½ - 1 cup cooked soybeans
- Fish and plant-based foods, however, contain different types of omega-3 fatty acids.
    - ❍ Fish contains EPA and DHA, two specific fatty acids that have shown promising results in protecting against cancer.
    - ❍ The plant-based omega-3 fatty acid sources, such as flaxseed and others listed above, contain alpha-linolenic acid (ALA). In an ideal environment, ALA is converted to EPA and DHA, however, this process is inefficient [75-76]. On the positive side, the conversion process is enhanced by following a diet that is low in saturated fats and low in omega-6 fatty acids [77].
    - ❍ Although not all studies agree [66, 78], some research indicates a positive association between ALA and prostate cancer [49, 55, 62, 68, 79]. It should be noted, however, that the primary source of ALA in these studies was red meat, milk, butter, mayonnaise, and margarine [49, 55, 79].

Fat – Bottom Line

- Less fat is better.
- Olive oil or canola oil is preferred.
- Avoid hydrogenated fats.
- Increase dietary omega-3 fatty acids.

LIMIT SIMPLE SUGARS

- High sugar foods are usually highly processed and refined, low in nutrient value, and low in dietary fiber.
- Furthermore, these foods appear to increase serum insulin and serum insulin-like growth factor (IGF-I) levels, which lead to both the development and promotion of cancer [80-88].
- Sugars to be consumed in limited amounts include products made with refined flours or refined grains, alcohol, and sweets, such as candy, cookies, cakes, and pies.

ADEQUATE FLUIDS

- The functions of water in the body include the following:
  - ❍ Carries nutrients and waste products.
  - ❍ Participates in chemical reactions.
  - ❍ Acts as a lubricant and cushion around joints.
  - ❍ Acts as a shock absorber in the eyes and spinal cord.
  - ❍ Aids in the body's temperature regulation.
  - ❍ Maintains blood volume.
- Increased fluid intake is needed for a high fiber diet.
- Drink plenty of water daily to help meet fluid needs.

MODEST CALORIC RESTRICTION

- Substantial evidence indicates that a high caloric intake increases one's risk of various cancers, including prostate cancer [17, 52, 78, 89-91].
- A case-control study reported a 115% increased risk in local prostate cancer and a 96% increased risk in regional/distant prostate cancer for those consuming higher calorie diets (2439 or more calories/day) compared with individuals consuming a lower calorie diet (less than 1322 calories/day) [90].
- In a separate study, researchers reported a nearly four-fold increase in prostate cancer risk in men who consumed the most calories (more than 2624 calories/day) compared with men who consumed the least calories (1064 calories/day) [91].
- An earlier study found that caloric intake was positively associated with preclinical prostate cancer risk; as caloric intake increased, cancer risk rose significantly [52]. The greatest risk was for men who consumed more than 3475 calories/day.
- The mechanism involved may be related to the decrease in IGF-I observed when caloric intake is restricted [52, 92].

BODY MASS/PHYSICAL ACTIVITY

- Higher body mass and physical inactivity may contribute to prostate cancer risk.
  - ❍ A large prospective study observed a significant positive association between body mass index (BMI) and prostate cancer risk [45].
  - ❍ A cohort study reported obese men to have a 20% increased risk of dying from prostate cancer and those men who were severely obese had a 34% elevated risk [93].
  - ❍ This research was further supported by recent evidence that obesity is a risk factor for aggressive prostate cancer [94-95].
- Recently, researchers conducted an 11-day study where men followed the Pritikin program [35]. The Pritikin program focuses on a diet that is high in vegetables, fruits, whole grains, and very low in fat in combination with 60 minutes of daily exercise.
  - ❍ Serum IGF-I decreased by 20% after following the program for 11 days. This reduction in IGF-I may be related to the lower serum insulin levels observed via a healthy low fat plant-based diet and regular exercise.
- These findings were further substantiated by researchers who placed blood serums of three groups of men (Pritikin followers of 14 years, regular exercisers of 14 years with no modified diet, and sedentary overweight men who consumed a high-fat, high-sugar diet) in culture dishes containing prostate cancer cells [81].
  - ❍ In a mere three days, researchers reported significant change in the cells. The blood serum of the Pritikin followers destroyed 50% of the prostate cancer cells compared to the exercise-only group where approximately 25% of the cells were destroyed and less than 3% of the cancer cells were destroyed in the overweight, sedentary men eating a more typical high-fat American diet.

Foods, Nutrients, & Food Components of Special Interest to Cancer Survivors

ANTIOXIDANTS – Found in abundance in fruits and vegetables, although vitamin E may need supplementation.

- Prevent oxidative damage in body cells.
  - ❍ Research indicates a link between oxidant damage and prostate carcinogenesis.
- Examples of antioxidant nutrients and nonnutrients include vitamins A, C, and E, selenium, lycopene, and beta-carotene.
- Note that patients may be advised to NOT consume antioxidant supplements during chemotherapy or radiation treatments.

Lycopene

- Antioxidant that scavenges free radicals to reduce tissue damage.
- Higher blood levels of lycopene are associated with reduced risk of prostate cancer [26, 96-98].

- Furthermore, lycopene inhibits the multiplication of prostate cancer cells [99-100].
- Men who consumed tomato sauce 2-4 times weekly had a 34% lower risk for prostate cancer in the largest prospective study to date [25].
- Thirty-two men with prostate cancer consumed 30 mg daily lycopene in the form of tomato sauce for 3 weeks; researchers reported a 28% reduction in oxidative DNA damage and a 17.5% decrease in PSA values [101-102].
- In a smaller study where men consumed 30 mg lycopene daily for three weeks, men had 18% lower PSA levels whereas the control group had a 14% increase in PSA levels [99].
- Dietary sources include tomato products, such as tomato juice, V-8 juice, spaghetti sauce, and ketchup as well as guava, grapefruit, papaya, and watermelon.
    - ❍ Cooked tomato products or juices contain higher amounts of lycopene.
- Additionally, lycopene-rich foods are best absorbed in the presence of fat (such as a small amount of olive oil) [103].
- As with most nutrients and non-nutrients, it is best to obtain lycopene from foods. Supplements appear to be capable of interfering with normal nutrition by promoting oxidative damage, which increases cancer risk [104].
- How much do I need? Research indicates positive changes with 30 mg lycopene daily, which would be approximately:
    - ❍ 4 ½ tbsp tomato paste
    - ❍ ¾ cup tomato sauce
    - ❍ 12 fl oz tomato juice
    - ❍ 8 medium raw tomatoes
    - ❍ 4 cups watermelon

Selenium

- Antioxidant, which scavenges free radicals and suppresses damage due to oxidation in the tissues.
- Selenium appears to inhibit cellular changes that may lead to prostate cancer. Selenium may also work to inhibit angiogenesis [105] and induce apoptosis or cell death [106].
    - ❍ Angiogenesis may be defined as the growth of new blood vessels. In cancer, new vessels allow tumor cells to escape into the circulation and lodge in other organs (tumor metastases) as well as enable a tumor to grow.
- Selenium has consistently been reported to reduce risk of prostate cancer [107-110].
- Low plasma selenium is associated with a 4 to 5-fold increased risk of prostate cancer [111].
    - ❍ Note that plasma selenium decreases with age, thus obtaining sufficient selenium may be particularly beneficial to older men.
- Additionally, selenium supplements have been shown to decrease the recurrence of prostate cancer by 63% [107].

- Some research indicates that the combination of selenium and vitamin E may work synergistically in reducing risk for prostate cancer [112]. This combination is currently being reviewed in the Selenium and Vitamin E Chemoprevention Trial (SELECT) [113].
- Dietary sources include Brazil nuts, seafood, enriched brewer's yeast, and grains. Selenium content depends somewhat on the amount in the soil in which the products are grown.
  - A mere two Brazil nuts will provide more than 200 mcg selenium.
- Most research studies have used a 200 mcg supplement daily [107, 114].
  - Selenomethionine is a type of selenium supplement that appears to have greater bioavailability than other forms [115-116].
  - Selenium supplements should be taken with food.

Nutrient	Recommended Dietary Allowance (RDA)	Prostate Cancer Research	Tolerable Upper Intake Level (UL)
Selenium	55 mcg	200 mcg	400 mcg

Vitamin A and Beta-Carotene

- Beta-carotene is one of the 600 carotenoids that can be partially converted into vitamin A in the body.
- Beta-carotene is an antioxidant that may play a role in helping prevent various diseases, including some cancers.
- Some research indicates that dietary beta-carotene may reduce prostate cancer if combined with a diet rich in fruits and vegetables, and low in fat [19, 26-28].
  - A study in Japan found beta-carotene in vegetables to be significantly protective, but the effect was not observed in fruits [28].
  - Other studies, including a case-control study in Canada and a 30-year follow-up study, observed no association between consumption of beta-carotene and prostate cancer [26, 117].
  - Beta-carotene supplements have not been shown to have any beneficial properties in regards to prostate cancer [118-120].
  - Furthermore, findings from the ATBC Trial revealed a 23% increased risk of prostate cancer incidence in men who consumed 20 mg beta-carotene supplements [121].
- Dietary sources include carrots, winter squash, sweet potatoes, cantaloupe, and mangoes.

Vitamin C

- May prevent the formation of free radicals that cause DNA damage and help repair damaged DNA.
- No consistent relationship between vitamin C and prostate cancer. Some studies report slight reductions in risk [17, 55, 122-123] while others have found no effect [117].

- Case-control studies in Spain [55] and Uruguay [17] that used food frequency questionnaires reported an inverse association of vitamin C and prostate cancer.
- An additional case-control study reported a 23% reduction in prostate cancer risk from daily vitamin C use [122].
- An in-vitro study observed a protective effect of vitamin C against prostate cancer [123].
  - Inhibits proliferation and survival of tumor cells.
- A large cohort study, however, found no protective effect for vitamin C against prostate cancer [118].
- Additionally, a 30-year follow up study observed no association between consumption of vitamin C and prostate cancer [117].

- Dietary sources include various fruits and vegetables:
  - Fruits: papaya, citrus fruits, kiwi, cantaloupe, mango, strawberries
  - Vegetables: yellow and red peppers, broccoli, tomatoes
- Supplements containing 250-500 mg taken once or twice daily appear safe.
- Some evidence suggests higher dosages (more than 1000 mg daily) may actually promote oxidative damage. There are, however, other studies that have not observed adverse effects with vitamin C supplementation.

Nutrient	Recommended Dietary Allowance (RDA)	Prostate Cancer Research	Tolerable Upper Intake Level (UL)
Vitamin C	90 mg (males)	NA	2000 mg

Vitamin E

- Studies show vitamin E may reduce risk of prostate cancer and inhibit prostate cancer cell growth [17, 121, 124-126].
  - Cancer incidence reduced by 33% and death from prostate cancer reduced 41% in a 6-year follow-up study where men consumed 50-100 IU vitamin E [121].
- Vitamin E may reduce the incidence of prostate cancer, and also lower the rate of conversion from latent to aggressive forms of prostate cancer.
- Results suggest that long-term vitamin E (alpha-tocopherol) supplementation decreases serum androgen concentrations, which is related to a reduced incidence of and mortality from prostate cancer [110].
- Researchers reported lower serum gamma-tocopherol (a form of vitamin E) values in men with prostate cancer in a recent cohort study [125]. Furthermore, large doses of alpha-tocopherol suppress levels of gamma-tocopherol [127-129].
- The most provocative study found that men with the highest plasma gamma-tocopherol concentrations had a significantly fivefold lower risk of prostate cancer compared with men in the lowest quintile [124]. This effect was not significant for plasma alpha-tocopherol concentrations.

- Other researchers have also found gamma-tocopherol to offer a protective effect against prostate cancer [125-127].
- Dietary sources of vitamin E include vegetable oils, wheat germ, nuts, seeds, soybeans, sweet potatoes, and avocado. Due to the high fat content of many dietary sources, a supplement may be beneficial.
- Many studies used a 400 IU vitamin E supplement daily, however, a multi-vitamin may easily provide 50-100 IU vitamin E.
- There has been considerable discussion regarding the different forms of vitamin E.
  - ❍ Natural forms of vitamin E (gamma-tocopherol, d-alpha-tocopherol) appear to be better absorbed by the body, but are more expensive [131-132]. A supplement containing mixed tocopherols (d-alpha, gamma, beta) and tocotrienols is preferred. The combination of gamma- and alpha-tocopherol may offer greater protection from DNA damage than alpha-tocopherol alone [133].
  - ❍ Many of the studies on vitamin E and prostate cancer have used synthetic forms of vitamin E (dl-alpha-tocopherol) [110, 121, 131, 134]. A recent study, however, reported that the natural form of vitamin E was more effective in the suppression of prostate cancer, and at a lower concentration [131].

Nutrient	Recommended Dietary Allowance (RDA)	Prostate Cancer Research	Tolerable Upper Intake Level (UL)
Vitamin E	15 mg 33 IU dl-alpha (synthetic) 22 IU d-alpha (natural)	50-400 IU *	1000 mg 2222 IU dl-alpha 1493 IU d-alpha

* Vitamin E form varies among studies

FLAXSEED

- Flax is a good source of omega-3 fatty acids and fiber, contains protein, calcium, potassium, B vitamins, iron, and boron.
- Flax may also work to block tumor growth, inhibit angiogenesis, and enhance immune system [135].
- Lignans, phytoestrogens found in flax, appear to bind with testosterone, which lower circulating levels of testosterone [136-137]. This may be one of the protective mechanisms of flax.
- Preliminary data suggest reduced tumor growth and spread with the use of flaxseed [136, 138-139].
- One study reported that prostate cancer patients following a 20% fat diet and consuming 30 gm flax daily (2 ½ Tbsp) resulted in reduced cancer growth rates the more days patients followed the above diet [131].
- Animal data indicates that flaxseed may lead to less aggressive tumors and a lower risk of metastasis [138].

- Dosage: 1-3 tablespoons ground flaxseed daily.
- Ground flax seeds have greater bioavailability than whole flax seeds. Flax seeds may easily be ground in a coffee grinder, blender, or food processor.
- Ground flax seeds can be sprinkled into many foods and beverages, including hot cereals, tomato sauce, fruit smoothies, brown rice or other grains, etc.
- Due to the instability of these fatty acids, it is best to store flax in the refrigerator or freezer.
- Note: Flax seed OIL is highly concentrated and lacks the protein, fiber, vitamins, minerals, and lignans that are found in ground flax seeds. Ground flax seed is highly preferred.

GARLIC

- Many studies indicate that in populations that consume high amounts of garlic, scallions, onions, leeks, and shallots (all members of the same plant family) there is a reduced rate of overall cancer [14, 27, 140-141].
  - ❍ These allium vegetables are rich in flavonoids and organosulfur compounds that have anti-cancer properties.
- A Japanese study found that men who consumed 1/3 oz. or more of one of the allium-rich foods mentioned above had approximately 50% reduction in prostate cancer risk compared with men who consumed lesser amounts [140].
- One study reported a reduced risk of prostate cancer when subjects consumed natural garlic at least twice weekly [27].
- According to the prostate cancer literature, garlic supplements do not appear to have the same beneficial effects as real garlic, either raw or cooked [142].

GENOTOXINS: HETEROCYCLIC AMINES (HCA's) & POLYCYCLIC AROMATIC HYDROCARBONS (PAH's)

- Natural components in meat, such as amino acids, creatine, and polysaccharide precursors, are converted to HCA's during high-temperature cooking. HCA's are known to cause cancer in laboratory animals [143-146]. While human research is forthcoming [143, 147-150], only one study has observed no association between HCA's and prostate cancer [151].
- It may be that cancer risk is heightened in people who metabolize these compounds more rapidly. Some individuals appear to have genes that encode enzyme production, which readily metabolize HCA's [147, 152].
- The most important variables contributing to the formation of HCA's are [143, 153]:
  - ❍ Cooking temperature (greater than 300°F)
  - ❍ Cooking time (greater than 2 minutes)
  - ❍ Cooking method (frying, oven grilling/broiling, barbecuing)
- Charring of food (charcoal-broiled or smoked foods) contribute to PAH's [154].
- In the western diet, fried meat is the main source of exposure to HCA's.
  - ❍ Some research suggests that chicken is the largest source of HCA's.

- ❑ May be related to its frequent consumption.
- ❑ Preparing chicken using a lower-temperature cooking method produces much lower levels of HCA's.

- Meat can potentially be made "safer" to eat by being cooked in a way that does not lead to the formation of these compounds.
  - ❍ Choose lean, well-trimmed meats to grill. Lean cuts cause less fat to drip onto the coals (and hence, fewer flame-ups).
  - ❍ Using marinades significantly reduces the amount of HCA's.
  - ❍ Brief microwave preheating of raw meat, for example, substantially reduces the HCA content.
  - ❍ Small portions require less time on the grill.
- Alternatively, vegetables or meat substitutes do not lead to the formation of HCA's or PAH's.

GREEN TEA

- Tea contains phytochemicals known as polyphenols that provide antioxidant and anticancer properties [155].
- The most abundant polyphenols in green tea are flavonoids.
- Green tea polyphenols may act by blocking the formation of cancer-causing compounds, such as nitrosamines.
- Many studies indicate a lower risk of cancer with green tea consumption, but more research is needed for conclusive evidence [156-158].
- Green tea catechins, a phytochemical, suppress cell growth and induce cell death in human prostate cancer cells [157, 159-162].
- Animal studies have observed inhibition of prostate cancer development, lower serum testosterone concentrations, and increased survival with green tea [163].
- The combination of soy and green tea synergistically inhibited tumor weight and metastasis and significantly reduced serum concentrations of both testosterone and DHT [164].
- Nonetheless, a recent human study found green tea (6 gm daily) to have no significant effect on PSA levels [165]. The median length of the study, however, was only one month.
- A case-control study observed heightened protective effects of green tea with increasing frequency, duration, and quantity of green tea consumption [158].
- A cup of green tea daily would likely be a healthy addition to your diet, but evidence suggests that 3 or more cups are needed for the cancer protective effects [158].
- Green tea does naturally contain caffeine although a much lower amount than coffee or black tea. Although decaffeinated green tea is also available, reports suggest that the phytochemical content may be two-thirds less than regular green tea.

SOY

- Soy contains various nutrients, including protein, fiber, calcium, and B vitamins.

- Soy is rich in antioxidants known as isoflavones, namely genistein and daidzein.
- Associated with reduced rates of heart disease [166-168], protection against osteoporosis [169-170], and certain types of cancer, including prostate cancer [19, 40, 168, 17-176].
- Soy has been one dietary component thought to play a role in the lower rate of prostate cancer in Asian countries.
- Research shows that plant estrogens, such as soy, may also prevent prostate cancer by [172, 177]:
  - ❍ Decreasing blood androgen levels
  - ❍ Increasing SHBG (sex hormone-binding globulin) concentration
  - ❍ Binding to hormone receptors
  - ❍ Inhibiting 5-alpha reductase
  - ❍ Restricting other enzymes associated with cell growth
  - ❍ Causing direct tumor destruction that essentially starves the tumor
  - ❍ Decreasing IGF-I
- Recent studies found that soy flour (120 mg isoflavones daily) [178] and tofu [43] decreased serum testosterone levels in healthy men, further substantiating that soy may protect against prostate cancer.
- A low-fat diet combined with soy has been shown to decrease PSA values significantly in a 3-month period [179].
- A different study, however, found no significant decrease in PSA values in men who consumed 44 gm soy protein for one month [166].
- Soy products were found to be significantly protective in a study that included data from 42 countries [40].
- Vegan proteins, such as soy, can be expected to decrease circulating IGF-I activity, which may impede cancer induction [167].
- Dietary sources include soybeans, tofu, tempeh, edamame, miso, soy cheese, soy nuts, soymilk, textured vegetable protein (TVP), and more. Soy supplements or extracts are not recommended.
- Consume one or more servings of soy daily.

Source	Amount of Soy Protein (gm)	Amount of Soy Isoflavones (mg)
Tofu (4 oz)	13	38.8*
Soymilk (8 fl oz)	10	30*
Tempeh (1/2 cup)	19.5	36*
Soybeans, edamame (1/2 cup)	11	35*
Soy nuts (1/4 cup)	19	40-50*

* Isoflavone content varies by brand

VITAMIN D and CALCIUM

- Vitamin D is known to inhibit prostate cancer in animals [180-184] and although human research remains unclear, vitamin D appears to be of benefit [108, 185-187]. Vitamin D is believed to be important in the protection of human prostate cells [187-190].
- Epidemiological studies indicate that sunlight exposure is inversely proportional to prostate cancer mortality and that prostate cancer risk is greater in men with lower levels of vitamin D [185-186, 188, 191-192].
- A case-control study observed elevated cancer risk in men with both low (less than 19 nmol/l) and high (more than 80 nmol/l) serum 25(OH)-vitamin D levels [186]. Men with the lowest risk had normal serum 25(OH)-vitamin D levels ranging between 40-60 nmol/l.
- A recent study on advanced prostate cancer reported that the combination of vitamin D and the chemotherapy agent taxotere was twice as effective as taxotere alone based on PSA responses [193].
- Excessive doses of vitamin D (more than 2000 IU daily), however, can be toxic and cause high levels of calcium in the blood.
- Epidemiological studies (12 of 14) have reported increased prostate cancer incidence with high calcium intakes [108].
    - ❍ One theory is that high amounts of calcium (more than 2000 mg daily) suppress circulating vitamin D blood levels [108, 194].
- The relationship between dairy foods and increased prostate cancer risk may be due to the high calcium content in dairy and/or to the animal fats in dairy [45, 194].
    - ❍ Some studies using skim or low-fat milk have found an increased association with prostate cancer, supporting the calcium connection [45, 194].
    - ❍ Men who drank more than 6 glasses of milk a week had lower levels of vitamin D than men who drank fewer than 2 glasses of milk a week.
- One analysis identified a four- to fivefold risk elevation with very high (more than 2000 mg daily) or very low calcium intakes (less than 500 mg daily) [108].
- A recent study found that higher calcium intakes resulted in a modest 7% increase risk of localized prostate cancer, but more than 200% increased risk for advanced prostate cancer compared to men with the lowest calcium intake [90].
- Additionally, a positive association between IGF-I and intake of milk, dairy products, and calcium has been reported [195].
- Thus, it is recommended to consume adequate amounts of vitamin D and calcium, but to avoid high calcium intakes (more than 2000 mg daily).
- Non-dairy sources of vitamin D include cold-water fish (for example: salmon, trout, herring, sardines, mackerel), fortified products (for example: soy milk, cereals), and sunlight.
- Ten to fifteen minutes of sunlight 3-4 times per week should provide you with adequate vitamin D [196]. Individuals with darker pigmented skin may need 20-25 minutes of sunlight.
- Vitamin D absorption declines with age, and vitamin D deficiency is not uncommon among older adults [197-201].

- Patients, especially those on hormone therapy, may benefit from a serum vitamin D blood test (25-OH) and a dual energy x-ray absorptiometry (DEXA) bone density scan.

Nutrient	Adequate Intake (AI)	Prostate Cancer Research	Tolerable Upper Intake Level (UL)
Vitamin D	Under 50 yrs: 5 mcg or 200 IU 50-70 yrs: 10 mcg or 400 IU Over 70 yrs: 15 mcg or 600 IU	AI	50 mcg or 2000 IU
Calcium	19-50 yrs: 1000 mg Over 50 yrs: 1200 mg	AI	2500 mg

Food Safety

- Especially important for those with weakened or impaired immune systems.
- The following recommendations have been adapted from guidelines provided by the American Cancer Society.
  - ❍ Wash foods thoroughly before eating.
  - ❍ Keep all aspects of food preparation meticulously clean.
  - ❍ Use special care in handling raw meats, poultry, and eggs.
    - ❑ Thoroughly clean all utensils, countertops, cutting boards, and sponges that touched raw meat.
    - ❑ Thaw meats and fish in the refrigerator.
  - ❍ Do not eat perishable foods that have been left out of the refrigerator for more than two hours.
  - ❍ Store foods at low temperatures (less than 40°F) to minimize bacterial growth.
  - ❍ When eating in restaurants, avoid foods that may have bacterial contamination, including sushi, salad bars, buffets, unpasteurized beverages or food products, and raw or undercooked meat, poultry, fish, and eggs.

Herbs

MILK THISTLE

- There is no conclusive evidence regarding milk thistle and prostate cancer.
- There have been a few studies (in vitro and in vivo studies only) that suggest the components in milk thistle, silymarin and silibinin, inhibit growth and apoptosis of prostate cancer cells [203-206].
  - ❍ The mechanism of action is still to be determined, but may be related to the inhibition of the IGF-I pathway [203, 206].

PC-SPES

- Combination of seven Chinese herbs and one North American herb, saw palmetto.
- This herbal combination exhibits estrogenic activity and can reduce blood testosterone levels, hence its association with reduced prostate cancer risk [207-208].
- FDA recalled PC-SPES supplements in February 2002 because it was found to contain undeclared prescription drug ingredients.
- This product could cause serious health effects. If you are using PC-SPES, please discuss with your physician.

SAW PALMETTO

- A partially dried, ripe fruit of a low scrubby palm associated with prostate benefits.
- This botanical, composed of flavonoids, water-soluble polysaccharides, and free fatty acids, is believed to function as an anti-androgen and anti-inflammatory agent [209].
- Saw palmetto may reduce the growth of normal or malignant prostate cells by slowing the conversion of testosterone to DHT [210].
- Research also indicates beneficial effects on urinary flow rates in men with enlarged prostates, or benign prostatic hyperplasia (BPH) [209].
  - ❍ 320 mg daily seems to be effective.
- There is currently no conclusive scientific evidence regarding saw palmetto and prostate cancer.
- It has been theorized by some physicians that saw palmetto may, like the drug Proscar, lower PSA values. It is not clear, however, if there is any effect on the tumor. In other words, saw palmetto may mask the cancer.
- The use of saw palmetto may exclude an individual from participating in certain clinical trials.

TURMERIC (CURCUMIN)

- Curcumin, the yellow pigment and active component of turmeric, is a potent antioxidant, which exhibits chemopreventive and growth inhibitory activity in several tumor cell lines [211-214].
- Evidence suggests that curcumin may suppress tumor initiation, promotion, and metastasis [211, 214-215].
- Results indicate that curcumin is a novel and potent inducer of apoptosis in both androgen-dependent and androgen-independent prostate cancer cells [211-212, 214].
- Additionally, curcumin promotes detoxification in the liver and possesses anti-inflammatory activity, possibly by inhibiting COX-2 activity [216].

Summary – Healthy Diet for Prostate Cancer

- 8-10 fruit and vegetable servings daily
  - ❍ 2-3 pieces of fruit
  - ❍ 1 cup or more of vegetables with lunch and dinner
  - ❍ 12 fl oz tomato-based juice
- 25-35 grams of fiber daily
  - ❍ You will likely meet your fiber goal if you eat 8-10 servings of fruits and vegetables plus 1 serving beans/legumes or at least 2 servings of whole grains.
- Limit meats and dairy
- Include some sources of healthy fats daily:
  - ❍ Examples include cold-water fish (i.e. salmon, trout, herring, sardines), flaxseed, walnuts, soybeans, avocadoes, and olive oil.
- Selenium (200 mcg)
  - ❍ 2 Brazil nuts or supplement
- Lycopene (30 mg)
  - ❍ ¾ C tomato sauce, 12 fl oz tomato juice, 4 ½ tbsp tomato paste
- Vitamin E (50-200 IU)
  - ❍ Natural vitamin E supplement that contains gamma-tocopherol
- Adequate vitamin D (200-600 IU depending on age)
- Drink green tea daily

PRACTICE PRECAUTION

- Always discuss changes in diet and supplement use with your physician.

WORDS OF WISDOM

"Let food be your medicine and medicine be your food."

- Hippocrates

For additional information or resources, please visit the Ida and Joseph Friend Cancer Resource Center at 1600 Divisadero Street on the first floor, or call (415) 885-3693. The information in this publication is designed for educational purposes only and is not intended to replace the advice of your physician or health care provider, as each patient's circumstances are individual. We encourage you to discuss with your physician any questions and concerns that you may have.

High-Fiber Sources

FRUITS:

Food	Serving Size	Fiber Grams/ Serving
Apple	1 medium	3.7
Banana	1 medium	2.8
Blackberries	½ cup	3.8
Blueberries	½ cup	1.9
Cantaloupe	1 cup	1.3
Figs (dried)	¼ cup	6.0
Grapefruit	1 medium	3.4
Grapes	1 cup	1.6
Guava	1 medium	4.9
Kiwi	1 medium	2.6
Orange	1 medium	3.1
Pear	1 medium	4.0
Persimmon	1 medium	6.0
Prunes	¼ cup	3.1

GRAINS & OTHER PRODUCTS:

Food	Serving Size	Fiber Grams/ Serving
Amaranth	¼ cup dry	7.4
Barley	½ cup cooked	3.0
Beans, black	½ cup cooked	8.3
Beans, red kidney	½ cup cooked	8.2
Beans, garbanzo	½ cup cooked	5.0
Bran cereals	¾ cup	Check labels (5.0-22.0)
Brown rice	½ cup cooked	1.4
Bulgur	½ cup cooked	4.0
Cream of wheat	½ cup cooked	0.5
Oatmeal	½ cup cooked	2.0
Peanuts	¼ cup	2.9
Quinoa	¼ cup dry	2.5
White rice	½ cup cooked	0.3

VEGETABLES:

Food	Serving Size	Fiber Grams/ Serving
Artichokes	1 medium	6.9
Beets	½ cup cooked	1.7
Broccoli	½ cup cooked	2.3
Brussels sprouts	½ cup cooked	2.0
Carrots	½ cup cooked	2.6
Kale	½ cup cooked	1.3
Lima beans	½ cup cooked	4.5
Peas, green	½ cup cooked	4.4
Spinach	½ cup cooked	2.2
Squash, winter-type	½ cup cooked	3.4
Sweet potatoes (yams)	½ cup cooked	2.7

Baked Tofu

Ingredients:

- 1 pound tofu, firm, drained
- 3-4 tbsp marinade or sauce (personal favorite: Veri Veri Teriyaki by Soy Vay)

Chop drained firm tofu into 1" cubes. Place tofu cubes in glass dish for baking. Pour marinade or sauce over tofu, stir well. Place tofu in oven at 350 F for 1 hour. Stir every 15-20 minutes.

Makes four 4-ounce servings.

Nutrition Information (per 4 oz serving):

Calories: 96	Dietary fiber: <1 gm
Protein: 8 gm	Sodium: 318 mg
Fat: 5 gm	Calcium: 155 mg (16% Daily Value)
Saturated fat: <1 gm	Iron: 1.4 mg (8% Daily Value)

Recipe developed by Natalie Ledesma, MS, RD

Washington Insider Salad

Ingredients:

- 1 can (15 oz) kidney beans, drained
- 1 can (15 oz) black eyed peas, drained
- 1 ½ cups cooked barley
- 6 tbsp cilantro, chopped finely
- 1 can (11 oz) corn
- 1 ½ cups tomatoes, diced
- 3 tbsp balsamic vinegar
- 2 tbsp olive oil

Prepare vegetables. Mix all ingredients together, and serve on a bed of dark green leafy lettuce. Add salt and pepper to taste.

Makes 8 servings (1 cup each).

Nutrition Information (per serving):
Calories: 215
Protein: 10 gm
Fat: 4 gm
Dietary fiber: 9 gm

Recipe developed by Sous Chef Chris at the Occidental Grill, Washington D.C.

Thick 'N Chunky Tortilla Soup

Ingredients:

- 1 tbsp olive oil
- 1 cup chopped onions
- 2 garlic cloves, minced
- 3 medium sweet potatoes, cut into ½ " cubes (4 cups)
- 3 cups chicken (or vegetable broth)

- ½ tsp cumin
- ½ tsp dried oregano leaves
- ½ tsp chili powder
- ¼ tsp ground red pepper (cayenne)
- 3 corn tortillas, cut into ½ " strips
- 1 14.5-ounce can diced tomatoes, drained
- 1 cup corn (fresh, frozen, or canned)
- 1 4.5-ounce can chopped green chiles, undrained
- 2 tbsp fresh cilantro

Heat oven to 375 F. Heat oil in Dutch oven or 4-quart saucepan over medium heat until hot. Add onions and garlic; cook and stir 5-7 minutes or until onions are tender. Stir in sweet potatoes, broth, cumin, oregano, chili powder, and cayenne. Bring to a boil. Reduce heat to low; cover and simmer 10-15 minutes or until sweet potatoes are tender. Meanwhile, arrange tortilla strips in single layer on ungreased cookie sheet. Lightly spray strips with nonstick cooking spray. Bake at 375 F for 8-12 minutes or until golden brown and crisp. Cool and set aside. Transfer 2 ½ cups hot sweet potato mixture to food processor or blender; process until smooth. Return mixture to saucepan. Stir in tomatoes, corn, chiles, and cilantro. Cook over medium heat for 5 minutes or until thoroughly heated, stirring occasionally. To serve, spoon soup into individual soup bowls. Top each with crisp tortilla strips.

Makes 5 servings (1 ½ cups each).

Nutrition Information (per serving):
Calories: 280
Protein: 8 gm
Carbohydrate: 50 gm
Dietary fiber: 7 gm
Fat: 6 gm

Adapted from The Best of Italian, Mexican, & Chinese Cooking. Pillsbury Classic Cookbooks; January 1999.

Barbecued Tempeh with Bell Peppers

Ingredients:

- 8 ounce package tempeh
- 1 cup sliced onion
- 2 medium red or green bell peppers; sliced in strips
- 1 tsp minced garlic
- ¾ cup water
- ¼ cup tomato paste
- 1-2 tbsp molasses
- 1-2 tbsp brown sugar
- 2 tsp yellow mustard
- 2 tsp apple cider vinegar
- 1 tsp chili powder

Marinade

- ½ cup tamari or soy sauce, low-sodium if desired
- 2 tbsp rice wine vinegar
- 4 tsp lemon juice
- 2 tsp honey

In a small bowl, combine marinade ingredients and mix well. Place tempeh in a shallow bowl and pour marinade over it. Cover and refrigerate several hours, turning occasionally. Drain tempeh and reserve marinade. Cut tempeh into ½" cubes. Coat bottom of large nonstick skillet with cooking spray and heat over medium heat until

hot. Add onion and bell peppers and cook, stirring often, until just tender, about 5 minutes. Add marinade and all remaining ingredients. Bring mixture to a boil. Reduce heat and simmer, uncovered, until mixture thickens.

Makes 4 servings.

Nutrition Information (per serving):
Calories: 222
Protein: 18 gm
Fat: 5 gm
Saturated fat: 1 gm
Carbohydrate: 30 gm
Dietary Fiber: 7 gm

Recipe from Vegetarian Times, September 1998.

Spinach Spread

Ingredients:

- 1 package (10.5 ounces) silken tofu
- 1 tbsp lemon juice
- ¼ tsp garlic powder
- ¾ tsp onion powder
- ½ tsp dried tarragon
- ¼ tsp salt
- 1 box (10 ounce) frozen chopped spinach, thawed
- 1 cup coarsely shredded carrots
- ¼ cup chopped green onion

Puree the tofu and lemon juice in blender until smooth. Whirl in the garlic and onion powders, tarragon, and salt just to blend. Scrape into a mixing bowl. Squeeze the spinach as dry as possible. Stir it into the tofu, along with the carrots and green onion. Mix well. Serve with crackers, pita triangles, or vegetables.

Makes 8 servings (1/4 cup each).

Nutrition information (per serving):

Calories: 39	Sodium: 82 mg
Fat: 1 gm	Calcium: 51 mg
Saturated fat: 0 gm	Carbohydrate: 5 gm
Protein: 4 gm	Dietary Fiber: 2 gm

Recipe from the U.S. Soyfoods Directory, 1998.

Tofuntastico – Tofu Sauce

Ingredients:

- 1 package (12.3 ounce) silken tofu
- ½ cup water
- ¾ cup fresh basil, chopped
- 4 tbsp nutritional yeast
- 3 tbsp Bragg's liquid aminos (or tamari or soy sauce)
- 1 tbsp lemon juice
- 1 tsp garlic, minced
- ¾ tsp black pepper
- Alternative: Use lime/cilantro rather than lemon/basil

Blend all ingredients together in a blender or food processor. Serve over pasta, vegetables, baked potato, or other.

Makes 6 servings (½ cup each).

Nutrition Information (per serving):

Calories: 47	Carbohydrate: 4 gm
Protein: 7 gm	Dietary fiber: 2 gm
Fat: <1 gm	

Recipe developed by Natalie Ledesma, MS, RD

Alaska Salmon Bake with Walnut Crunch Coating

Ingredients:

- 1 pound salmon fillets, thawed if necessary
- 2 tbsp Dijon-style mustard
- 1-2 tbsp olive oil
- 4 tsp honey
- ¼ cup bread crumbs
- ¼ cup walnuts, finely chopped
- 2 tsp parsley, chopped
- Salt and pepper to taste
- Lemon wedges

Mix together mustard, olive oil, and honey in a small bowl; set aside. Mix together bread crumbs, walnuts, and parsley in a small bowl; set aside. Season each salmon fillet with salt and pepper. Place on a lightly greased baking sheet or broiling pan. Brush each fillet with mustard-honey mixture. Pat top of each fillet with bread crumb mixture. Bake at 450 F for 10 minutes per inch of thickness or until salmon just flakes when tested with a fork. Serve with lemon wedges.

Makes 4 servings (4 oz each).

Nutrition Information (per serving):
Calories: 228
Protein: 20 gm
Fat: 12 gm
Omega-3 fatty acids: 1.7 gm

Adapted from Alaska Seafood Marketing Institute.

Vegan French Toast

Ingredients:

- 2 cups sliced bananas
- ¾ cup vanilla soymilk
- 1 tsp cinnamon, or ¾ tsp cinnamon plus ¼ tsp cardamom
- 8 sliced day-old whole grain bread
- 1 tsp canola oil
- 1 mango, peeled and cut

Place bananas, soymilk, cinnamon, and cardamom (if using) in a blender or food processor; blend until smooth. Pour mixture into a pie plate. Dip bread into mixture, turning to coat both sides. Scrape off excess batter. Brush a nonstick skillet or griddle lightly with oil or spray. When hot, add coated bread slices. Brown on one side, 2-3 minutes. Turn; brown other side. Transfer to plates; serve immediately with mango puree.

Makes 4 servings (2 slices each with 2 tbsp puree).

Nutrition Information (per serving)**:**

Calories: 116	Carbohydrate: 23 gm
Protein: 4 gm	Dietary fiber: 3 gm
Fat: 2gm	Sodium: 137 mg

Recipe from Vegetarian Times, December 1995.

Banana Bread

Ingredients:

- ¾ cup ground flax seed
- 1 cup mashed banana
- ¼ cup apple juice concentrate
- ½ cup brown sugar
- ¼ cup applesauce
- Egg replacer for 2 eggs or 2 eggs (Ener-G Egg Replacer is made from potato starch & tapioca flour; works wonderfully in baked goods.)
- 1 ½ cup whole wheat pastry flour
- 1 tsp baking soda
- ½ tsp salt

**Additional optional ingredients may include ½ cup walnuts, raisins, or chocolate chips.

Mix all ingredients together. Pour in a coated 8”x4” pan. Bake at 350 F for about 40-45 minutes.
Makes 10 servings.

Nutrition Information (per serving):

Calories: 168	Carbohydrate: 29 gm
Protein: 5 gm	Dietary fiber: 5 gm
Fat: 4 gm	Omega-3 fatty acids: 1.4 gm

Recipe developed by Natalie Ledesma, MS, RD

Dilled Salmon Salad with Peas

Ingredients:

- 1 can (15 oz) salmon, drained
- 1 package (16 oz) frozen peas, thawed
- ¼ cup lemon juice
- ¼ cup fresh dill (or 1-2 tbsp dried dill)
- 2 tbsp Dijon-style mustard
- 2 shallots, sliced thinly (about ½ cup)
- 1 bunch radishes (about 11 medium), thinly sliced
- 6 cups red leaf lettuce
- Salt and pepper to taste

Drain salmon, place in a mixing bowl, and break into pieces. Prepare the lemon juice, shallots, radishes, and lettuce. Add to the salmon the peas, lemon juice, dill, mustard, shallots, and radishes. Mix together gently. Add salt and pepper to taste. Serve salmon mixture over lettuce.
Makes 6 servings (2 cups each).

Nutrition Information (per serving):
Calories: 160
Protein: 17 gm
Fat: 4 gm
Dietary fiber: 5 gm

Adapted from the Women's Healthy Eating & Living Study (WHEL) at the University of California, San Diego. Developed by Vicky Newman, MS, RD, WHEL nutrition coordinator.

Neat Loaf

Ingredients:

- 2 cups cooked brown rice
- 1 cup walnuts, finely chopped
- 1 onion, finely chopped
- ½ medium bell pepper, finely chopped
- 2 medium carrots, shredded or finely chopped
- 1 cup wheat germ
- 1 cup quick-cooking rolled oats
- ½ tsp each: thyme, marjoram, sage
- 2 tbsp soy sauce
- 2 tbsp stone ground or Dijon mustard
- Barbecue sauce or ketchup

Preheat the oven to 350 F. Combine all the ingredients except the barbecue sauce or ketchup. Mix for 2 minutes with a large spoon. This will help bind it together. Pat into an oil-sprayed 5x9" loaf pan and top with barbecue sauce or ketchup. Bake for 60 minutes. Let stand 10 minutes before serving.

Makes 8-10 servings.

Nutrition Information (per serving):
Calories: 204
Protein: 9 gm
Fat: 9 gm
Carbohydrate: 19 gm
Sodium: 248 mg
Cholesterol: 0 mg

Recipe from The Peaceful Palate written by Jennifer Raymond, 1996.

Three Day Menu Plan: 3 Meals + Snack

This menu is based on 2100 calories, calories can be adjusted by altering portion sizes. The menu has been designed to serve as a guide in making healthy food choices. Experiment with substitutions as desired.

Day 1	Day 2	Day 3
Oatmeal (1 cup) Soy milk (1 cup) Flaxseed, ground (2 tbsp) Dried cranberries (1/4 cup) Brazil nuts (2 each)	Bagel, whole grain (1 each) Cream cheese, light (2 tbsp) Tomato (6 slices) Lemon pepper Cantaloupe (1 cup)	Tofu scramble Tofu (4 oz) Onions (1/4 cup) Peppers (1/2 cup) Mushrooms (1/2 cup) Toast, whole grain (2 slices) Jam (2 tbsp)
Turkey sandwich Whole grain bread (2 slices) Turkey (2 ½ oz) Lettuce (1 cup) Tomato (4 slices) Red peppers (1/4 cup) Onions (1/4 cup) Mustard (1 tsp) Peach (1 med)	Chunky Tortilla Soup (2 cups) Corn tortillas (2 each) Black beans (1/2 cup) Green salad (2 cups) Oil/vinegar dressing (2 tbsp)	Salad Spinach (2 cups) Broccoli (1/3 cup) Carrots (1/3 cup) Tomato (1/3 cup) Garbanzo beans (1/2 cup) Barley (1/2 cup) Walnuts (2 tbsp) Avocado (4 slices) Oil/vinegar dressing (2 tbsp) Whole-grain roll Orange (1 med)
Vegetable juice (12 oz) Granola bar (1 each)	Fruit smoothie Banana (1 each) Berries (1 cup) Flaxseed, ground (2 tbsp) Soy milk (1 cup) Brazil nuts (2 each)	Vegetable juice (12 oz) Popcorn (3 cups) Raw vegetables (1 cup) Hummus (1/4 cup)
Pasta, whole grain (2 cups) Tomato sauce (1 cup) Mushrooms (3/4 cup) Broccoli (1 cup) Green salad (2 cups) Light dressing (2 tbsp) Mixed fruit (1 cup)	Chicken & vegetable stir-fry Chicken breast (4 oz) Mixed vegetables (2 cups) Walnuts (2 tbsp) Brown rice (2 cups)	Salmon (4 oz) Quinoa (1 cup) with Brazil nuts (2 Tbsp) Asparagus (1 cup) Fruit salad (1 cup)

Nutrition Resources

Books

The ABC's of Nutrition & Supplements and Prostate Cancer – written by Mark Moyad

Eating Your Way to Better Health: The Prostate Forum Nutrition Guide – written by Charles E. Myers Jr., M.D., Sara Sgarlat Steck, R.T. and Rose Sgarlat Myers, PT., Ph.D.

Food for Life: How the New Four Food Groups Can Save Your Life – written by Neal Barnard, M.D.

How to Prevent & Treat Cancer with Natural Medicine – written by Michael Murray, N.D.

The Color Code – written by James Joseph, Ph.D., Daniel Nadeau, M.D., & Anne Underwood

The Prostate Cancer Protection Plan – written by Robert Arnot, M.D.

Cookbooks

Cancer Lifeline Cookbook: Good Nutrition, Recipes, and Resources to Optimize the Lives of People Living with Cancer – written by Kimberly Mathai & Ginny Smith

Fat-Free and Easy: Great Meals in Minutes – written by Jennifer Raymond (vegetarian cookbook)

Lickety-Split Meals – written by Zonya Foco, R.D.

One Bite at a Time: Nourishing Recipes for People with Cancer, Survivors, & Their Caregivers – written by Rebecca Katz, Marsha Tomassi, & Mat Edelson

The Peaceful Palate – written by Jennifer Raymond (vegetarian cookbook)

Newsletters/Magazines

Cooking Light www.cookinglight.com

Environmental Nutrition http://www.environmentalnutrition.com (800) 829-5384

Nutrition Action Health Letter http://www.cspinet.org/nah/ Fax: (202) 265-4954

Websites

American Cancer Society http://www.cancer.org (415) 394-7100

American Institute for Cancer Research http://www.aicr.org (800) 843-8114

Cancer Nutrition Info (Provides up-to-date & comprehensive information on the connection between nutrition & cancer) www.cancernutritioninfo.com

CaP CURE - Good source of current research and articles. www.capcure.org

Center for Informed Food Choices - Offer cooking classes in the Bay Area that emphasize plant-based foods. www.informedeating.org

Consumer Lab - Evaluates quality of over-the-counter supplements http://www.consumerlab.com

Doctor's Guide to Prostate Cancer www.pslgroup.com/prostcancer.htm

EarthSave International - Promotes food choices that are healthy for people & the planet.
www.earthsave.org

Ida & Joseph Friend Cancer Resource Center – UCSF Mt.Zion http://cc.ucsf.edu/crc (415) 885-3693

National Cancer Institute http://www.nci.nih.gov/ (800) 4-CANCER (800-422-6237)
Oncolink – Provides information regarding clinical trials, newsgroups, psychosocial support, & more.
http://oncolink.upenn.edu

Physicians Committee for Responsible Medicine – Nonprofit organization that promotes preventive medicine, conducts clinical research, and encourages higher standards for ethics & effectiveness in research.
http://www.pcrm.org/index.html

Prostate Pointers - Comprehensive prostate cancer web site with a full range of subjects pertinent to prostate cancer. www.prostatepointers.com

San Francisco Vegetarian Society – Monthly restaurant outings & pot-luck dinners; call 415-273-5481.
http://www.sfvs.org

US TOO International, Inc. - Nonprofit organization offers descriptions of treatments, online newsletter, glossary of medical terms & information on local support groups. www.ustoo.com

The Vegetarian Resource Group - Provides vegetarian nutrition information & vegetarian recipes
www.vrg.org

WebMD http://my.webmd.com

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