



FACT SHEET

Science and the Environment Diet and Prostate cancer

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Introduction

You will find a range of views among health professionals and others on whether diet has a significant effect on prostate cancer. However, the bottom line is this: dietary factors cause between 10 and 80% of cancers, depending on the type of cancer, and prostate cancer is at the upper end of this scale. Numerous epidemiological studies have demonstrated the strong association between diet and cancer rates.

There is generally a genetic component in individual susceptibility to cancer...and to most other diseases. For example, lack of a particular DNA repair gene; lack of a cancer suppressor gene such as p53; or an inherently less efficient immune system. Nevertheless, it is evident that an optimal cancer-preventive diet can minimise the impact of these negative genetic factors.

However, reports on foods and food components, not to mention new drugs and gene therapies, that can either inhibit or cause cancer, are so frequent as to be confusing for the public. What I will look at in this talk are the foods and supplements with the strongest accumulated evidence for risk reduction (prevention) of prostate cancer and/or ability to inhibit disease progression (control). First we will touch on some of the major types of cancer studies and levels of evidence.

Cancer studies

At the lower end of the scale of levels of evidence are:

- Laboratory (or *in vitro* studies), which include possible inhibitors applied to different cancer cell lines.
- Animal studies. These typically use rats or mice that have been bred to be susceptible to particular cancers, eg the TRAMP mouse model or old beagles for prostate cancer studies.

Then we progress to human studies:

- Epidemiological studies:
 - Whole country (ecological), eg comparison of breast cancer incidence, prevalence and mortality along with diet in Japan v Australia.
 - Cohort studies (prospective and retrospective), in which disease rates can be compared between those people exposed to a particular risk factor and those not exposed.
 - Case-control studies
 - Case series
- Clinical trials (intervention studies)
 - Randomised controlled trials (highest level of evidence).

Human trials can be large, long-running and expensive. People tend to drop out over time; if the study endpoint is diagnosis of the cancer itself, rather than specific early biomarkers, large numbers of participants are needed to achieve statistical significance; and large numbers also minimise inter-individual variation (as illustrated by the ubiquitous Normal distribution). But you don't want to wait until 2012 to be

told that the SELECT Trial has found that a combination of selenium and vitamin E can reduce prostate cancer risk. You want to adopt a dietary strategy NOW that is likely to assist in preventing or controlling prostate cancer.

Anti-prostate cancer foods and supplements

First, a note on overall diet. It is up to you as to what approach you take to diet. On one hand, you could just take the advice of many doctors and nutritionists: eat most things in moderation; a balanced, varied diet which should include the broad food categories of fruits, vegetables, legumes, whole grains, lean meat/fish...and do /take nothing else. This is reasonable advice, but you will be consuming sub-optimal levels of a number of key anti-prostate cancer nutrients/phytochemicals. At the other end of the scale you could try to adhere to a rigid regimen of up to 30 different supplements and religiously combine fixed proportions of food types at every meal. This would require great motivation and discipline (and expense!) and may be unsustainable.

I recommend something between the two. Eat a varied diet that includes a range of fruit (including apples and berries), vegetables (including broccoli, carrots, onions, beetroot, tomatoes, spinach, avocados), whole grain, legumes, fish and lean meat. Cook with olive oil, drink 1-2 glasses of wine (preferably red) per day, and don't overeat...limit your total caloric intake. And importantly: get plenty of exercise (30-45 minutes of vigorous activity that increases the heart rate appreciably, per day...including some aerobic work and light weights). Don't smoke. Limit your intake of dairy products and fatty meat. NB: in addition to the list below, I recommend supplementary magnesium (around 300 mg/day) and B-vitamins for most adults. An excellent source of these: Australian Naturalcare Products (who often advertise in the "Sunday Mail"...you can order from Sydney on 1300365020).

The A Team

The first list contains those dietary anti-prostate cancer agents that are backed by the strongest evidence:

Selenium	200-400 micrograms/day: sodium selenite, selenomethionine, Brazil nuts, high-selenium cereal products (Laucke Flour will launch their new range in September 2005). NB: 1000 micrograms = 1 milligram.
Vitamin E	alpha-tocopherol: take 250-500 milligrams/day (eg Cenovis, Herron, Blackmore capsules). NB: natural vit E better than synthetic.
gamma-tocopherol:	eat a dessertspoon of Tahini/day. Vit E is synergistic with selenium and vit C.
Lycopene	the red carotenoid in tomatoes. Eat a dessertspoon of tomato paste (eg Leggo's)/day. This processed form is more effective than that in raw tomatoes.
Green tea polyphenols:	notably epigallocatechin-3-gallate. If, like me, you don't like green tea and the prospect of drinking 1-2 litres per day is appalling, take capsules. Check the Internet: www.youngagain.com (2-3/day)
Soy polyphenols:	notably genistein. These are synergistic with green tea polyphenols. Try Blackmore's Phyto life Plus (2-3 tablets/day).
Omega-3 fatty acids:	notably DHA & EPA. Probably synergistic with Se. There are various brands around, with 1000 mg/capsule. Take 2/day.
Resveratrol:	from grape seed and red wine. There are grape seed extracts available.
Quercetin:	another flavonoid, found in apples, red wine. Available on the Internet, as for green tea.
Pomegranate juice:	has shown potent inhibition of prostate cancer in laboratory and animal trials.

- Beta-sitosterol: this is a natural plant hormone, and Saw Palmetto is a good source. Useful against BPH and prostate cancer. An even more concentrated form is in the capsules from www.youngagain.com (1-2/day).
- Vitamin C: take the ascorbate form (calcium or sodium), rather than ascorbic acid. Take 4-10 grams/day, depending on how unwell you are. Note that one heaped teaspoon = 5g. It is better to split the dose up if you can...it will cause diarrhoea if you take too much at once!
- Vitamin D3: from sunlight and supplements.

The B Team

These are probably not quite as important as the items on the “A-list”. Several are very promising, but not enough evidence exists for unequivocal efficacy.

- Curcumin (from turmeric)
- Phenethyl isothiocyanate (from watercress, broccoli)
- Dark chocolate (about the highest antioxidative-capacity food there is)
- Boron (boric acid, avocados, nuts)
- Epilobium (Willow herb)
- Aspirin (one-third tablet/day)
- Pau d’Arco (S American tree-bark herbal preparation)
- Beta-glucan (from the Shiitake mushroom)
- Phytate (in whole grains & legumes)
- Coenzyme Q10
- Alpha-lipoic acid
- Gamma-linolenic acid (from borage, blackcurrant seed, Evening Primrose oil)

Summary

Dietary factors play an important role in the development of most cancers, and in particular prostate cancer. A varied diet based on vegetables, fruit, wholegrains, legumes and fish, supplemented by appropriate levels of several key anti-cancer agents (eg selenium, vitamin E, lycopene, soy, green tea, pomegranate juice, omega-3 fatty acids), along with plenty of exercise, is likely to reduce prostate cancer risk, and also to slow its progression.

For more information on selenium, go to www.laucke.com.au

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