

1. J Natl Cancer Inst. 1995 Dec 6;87(23):1767-76.

Intake of carotenoids and retinol in relation to risk of prostate cancer.

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BACKGROUND: Several human studies have observed a direct association between retinol (vitamin A) intake and risk of prostate cancer; other studies have found either an inverse association or no association of intake of beta-carotene (the major provitamin A) with risk of prostate cancer. Data regarding carotenoids other than beta-carotene in relation to prostate cancer risk are sparse. **PURPOSE:** We conducted a prospective cohort study to examine the relationship between the intake of various carotenoids, retinol, fruits, and vegetables and the risk of prostate cancer. **METHODS:** Using responses to a validated, semiquantitative food-frequency questionnaire mailed to participants in the Health Professionals Follow-up Study in 1986, we assessed dietary intake for a 1-year period for a cohort of 47,894 eligible subjects initially free of diagnosed cancer. Follow-up questionnaires were sent to the entire cohort in 1988, 1990, and 1992. We calculated the relative risk (RR) for each of the upper categories of intake of a specific food or nutrient by dividing the incidence rate of prostate cancer among men in each of these categories by the rate among men in the lowest intake level. All P values resulted from two-sided tests. **RESULTS:** Between 1986 and 1992, 812 new cases of prostate cancer, including 773 non-stage A1 cases, were documented. Intakes of the carotenoids beta-carotene, alpha-carotene, lutein, and beta-cryptoxanthin were not associated with risk of non-stage A1 prostate cancer; only lycopene intake was related to lower risk (age- and energy-adjusted RR = 0.79; 95% confidence interval [CI] = 0.64-0.99 for high versus low quintile of intake; P for trend = .04). Of 46 vegetables and fruits or related products, four were significantly associated with lower prostate cancer risk; of the four--tomato sauce (P for trend = .001), tomatoes (P for trend = .03), and pizza (P for trend = .05), but not strawberries--were primary sources of lycopene. Combined intake of tomatoes, tomato sauce, tomato juice, and pizza (which accounted for 82% of lycopene intake) was inversely associated with risk of prostate cancer (multivariate RR = 0.65; 95% CI = 0.44-0.95, for consumption frequency greater than 10 versus less than 1.5 servings per week; P for trend = .01) and advanced (stages C and D) prostate cancers (multivariate RR = 0.47; 95% CI = 0.22-1.00; P for trend = .03). No consistent association was observed for dietary retinol and risk of prostate cancer. **CONCLUSIONS:** These findings suggest that intake of lycopene or other compounds in tomatoes may reduce prostate cancer risk, but other measured carotenoids are unrelated to risk. **IMPLICATIONS:** Our findings support recommendations to increase vegetable and fruit consumption to reduce cancer incidence but suggest that tomato-based foods may be especially beneficial regarding prostate cancer risk.

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Cohort study of diet, lifestyle, and prostate cancer in Adventist men.

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Dietary and lifestyle characteristics were evaluated in relation to subsequent prostatic cancer risk in a cohort of approximately 14,000 Seventh-day Adventist men who completed a detailed lifestyle questionnaire in 1976 and who were monitored for cancer incidence until the end of 1982. During the 6-year follow-up period, 180 histologically confirmed prostatic cancers were detected among some 78,000 man-years of follow-up. Increasing educational attainment was associated with significantly decreased risk of prostate cancer in this study; age at first marriage was also inversely associated with risk, although this was not significant. There was no relationship between body mass index (as measured by Quetelet's Index) and risk. A history of prostate "trouble" was associated with a 60% increase in risk which was highly significant. Although there were suggestive relationships between increasing animal product consumption and increased risk, these results did not persist after accounting for the influence of fruit and vegetable consumption. Nor was exposure to the vegetarian lifestyle during the childhood years associated with alterations in subsequent risk. However, increasing consumption of beans, lentils and peas, tomatoes, raisin, dates, and other dried fruit were all associated with significantly decreased prostate cancer risk.

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