Information Sheet 5: Tomatoes (Lycopene)

Key Points

- Eating tomatoes and tomato products may lower the risk of prostate cancer reoccurrence, progression and death in men with prostate cancer
- Cooked and processed tomatoes are recommended over fresh tomatoes
    - Examples: tomato-based pasta and casserole sauces, tomato soup, tomato paste
- Try to eat two or more servings of cooked tomatoes per week
- There are no proven benefits for lycopene supplementation

Introduction

There is consistent evidence that consumption of tomatoes and tomato products may reduce the risk of developing prostate cancer, especially advanced and aggressive prostate cancer [1]. Even after diagnosis of prostate cancer, consumption of tomatoes and tomato products may reduce the risk of prostate cancer recurrence, progression and death [2]. The protective effects of tomatoes and tomato products are thought to be due to its high lycopene content. However, the relationship between lycopene supplementation and prostate cancer risk remain inconclusive [3].

Lycopene

Lycopene is a type of carotenoid found mainly in tomatoes and tomato products [3]. The potential benefits of lycopene in preventing and treating various cancers has been widely studied, mostly as part of tomato or tomato product intake.

Lycopene is a potent antioxidant [4]. Antioxidants are substances which prevent the body from being damaged by free radicals produced by normal body processes and exposure to sunlight, pollution and cigarette smoke. Damage from free radicals can contribute to the development of health problems such as heart disease and cancer [5]. Lycopene may provide protection against such damage.

Sources of Lycopene

In a typical Western diet, the main source of lycopene is from tomatoes. Minor sources include watermelon and pink grapefruit [6].

Tomatoes

Although tomatoes are high in lycopene, the method of cooking can affect the amount of lycopene which enters the bloodstream and becomes available to the body. Processed and cooked tomatoes are better sources of lycopene than fresh tomatoes [6].

Examples of tomato products rich in lycopene [6]:

- Tomato-based pasta and casserole sauces
- Ketchup (preferably without sugar)
- Tomato soup
- Tomato paste

Cooking tomatoes with olive oil also increases palatability and increases the amount of lycopene made available to the body [4].

Lycopene Supplements

Lycopene supplements can come in the form of capsules or tablets. However, the role of lycopene supplementation in prostate cancer is unclear. Although a review of intervention studies suggests that lycopene supplementation is unlikely to be harmful, there is insufficient evidence that it provides benefit to men with prostate cancer [3].

Rather than taking lycopene supplements, evidence suggests that eating tomato products has a greater protective effect against prostate cancer [6]. Other nutrients in tomatoes may provide benefits in addition to lycopene. Therefore, eating tomatoes and tomato products is recommended over lycopene supplementation.

Summary of Research – Tomatoes and Tomato Product Consumption

There is consistent evidence that foods containing lycopene, especially tomato products, have a protective effect against prostate cancer. The World Cancer Research Fund-American Institute for Cancer Research expert panel examined evidence up to 2005 and concluded that consumption of foods containing lycopene probably protected against prostate cancer [1]. Many studies also found a strong association between higher lycopene levels in the blood and a lower risk of prostate cancer [1, 6].

Lycopene appears to have a greater protective effect against advanced and aggressive prostate cancers than other types of prostate cancer. In the large Health Professionals Follow Up Study, an increase of 2-4 servings of tomatoes per week was associated with a 28% decreased risk of total prostate cancer and a 35% decreased risk of advanced prostate cancer [7]. In another large study, the Physicians' Health study, the group with the highest lycopene levels in the blood had a 44% lower risk of aggressive prostate cancer [8].

There is less evidence regarding the effects of post-diagnostic consumption of tomatoes and tomato products on prostate cancer progression. In a study conducted in men diagnosed with localised prostate cancer, an increase of two servings of tomato sauce was associated with a 20% lower risk of prostate cancer progression [2].

Summary of Research – Lycopene Intake/Supplementation

Two of the largest studies investigating the effects of lycopene intake on prostate cancer risk had conflicting results. While the Health Professionals Follow-Up Study found a significant association

between lycopene intake and reduced prostate cancer risk [7] , the Prostate Cancer Prevention Trial found no association [9].

The evidence surrounding lycopene supplementation in men with prostate cancer is sparse and inconclusive. A 2009 review identified eight intervention studies, but no conclusion was formed due to poor study design. In general, the studies had a small sample size, short duration, and only two were randomised controlled trials. Differences in dosage and form of lycopene supplementation also meant a meta-analysis was not possible [3].

It appears that consumption of tomatoes and tomato products is more strongly associated with a lower prostate cancer risk than lycopene intake alone. This suggests that other nutrients in tomatoes may contribute to its protective effects.

References

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