

Information Sheet 15: Red Meat, Processed Meat

Key Points

- Limiting consumption of red meats and processed meats may reduce the risk of prostate cancer.
- High temperature cooking methods such as barbecuing and grilling can produce cancer-causing compounds. Other cooking methods such as steaming or oven-baking may be preferable alternatives.

Introduction

High consumption of red meats and processed meats may increase the risk of advanced prostate cancer [1]. In particular, the method of cooking and level of doneness of red meat appears to influence prostate cancer risk. Grilled and barbecued red meat, and well-done red meat have all been individually associated with an increased risk of prostate cancer [1, 2]. Hence, the method of cooking and level of doneness may be more important than total meat consumption.

Types of Red and Processed Meats

Types of red and processed meats which are associated with an increased risk of advanced prostate cancer include:

- Hamburgers
- Steak
- Bacon
- Sausage [2]
- Hot dogs [3]



Cooking Red Meat

For red meat, the cooking method and level of doneness appears to influence prostate cancer risk. In one study, higher consumption of grilled and barbecued red meat was associated with a 81% increased risk of advanced prostate cancer; and higher consumption of well-done and very well-done meat was associated with a 68% increased risk of advanced prostate cancer [2]. Other methods of cooking such as steaming or oven-baking may be suitable alternatives.

Carcinogens in Cooked and Processed Meat

The increased risk of prostate cancer associated with cooked and processed meats may be due to the production of carcinogens (compounds which cause cancer). There are at least three known carcinogens found in cooked and processed meats [2]. These are:

- Heterocyclic amines (HCAs), polycyclic aromatic hydrocarbons
 - o Produced by high temperature cooking methods (eg. grilling, barbequing)
- N-nitroso compounds
 - o Found in meats preserved with nitrates or nitrites

Summary of Research

In 2007, the World Cancer Research Fund-American Institute Cancer Research expert panel concluded that there was limited evidence that eating processed meat increased prostate cancer risk. No conclusion was provided for consumption of other meat types [4]. Since then, several studies have reported that high consumption of red meat and processed meat increases the risk of advanced prostate cancer [1, 2, 5].

In a study by Sinha et al. in 2009, high consumption of red meat and processed meat was associated with a 30% increase in advanced prostate cancer risk [1]. Conversely, a 2010 meta-analysis which included 15 studies about red meat and 11 studies about processed meat found no association between red or processed meat consumption and total or advanced prostate cancer risk [6]. It appears that cooking methods rather than total meat consumption play a role in the potential harmful effects of meat consumption.

In three recent studies, investigation of cooking methods found that barbequed and grilled meat was associated with a significant increase in advanced prostate cancer risk [1, 2, 5]. Two of these studies also found a significant association between consumption of well-done red meat and an increased risk of advanced prostate cancer [2, 5]. This suggests that red meat cooked at high temperatures may increase the risk of advanced prostate cancer.

Fewer studies have investigated the effects of post-diagnostic red meat intake and the risk of prostate cancer progression. In the CapSURE study, no association was found between red meat consumption and risk of prostate cancer progression [7]. Similarly, no significant association was found in a subsequent study investigating the effects post-diagnostic red meat consumption and prostate cancer death [8]. However, there is insufficient evidence available to draw a conclusion about the effects of meat consumption after diagnosis of prostate cancer.

References

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