

# Foods, nutrients and additives that may influence cancer risk

There is no single food that can protect against cancer, but there are steps you can take to lower your overall risk. Research tells us that people who eat lots of fruit and vegetables, are active and keep a healthy weight have less risk of getting cancer (Greenwald, 2001; WCRF, 1997; WHO, 2003).

We often hear news stories saying that a particular food, nutrient or additive causes cancer or can protect us from cancer. Sometimes these stories are confusing and it is difficult to know what to believe. This factsheet is based on the latest research and provides information about things we eat that may affect our risk of getting cancer. It covers particular foods, nutrients, supplements, and additives and preservatives commonly found in food.

## Additives and Preservatives

Additives are used to make food last longer on the shelf or in the fridge, or to enhance the look, flavour or texture of foods. Before an additive can be used in New Zealand it has to pass safety tests. The New Zealand Food Safety Authority does not allow the use of additives that are associated with increased risk of cancer at the doses that they are used in foods (Greenwald et al, 2001; Bezar et al, 2002; NZFSA, 2002).

Additives are usually present only in small amounts in food, and at these levels there is no evidence that they increase the risk of cancer (Bezar et al, 2002). No relationship has been found between the artificial sweeteners saccharin and cyclamate and cancer in humans (WCRF/AICR, 1997). There has been recent controversy about the sweetener Aspartame, but experts agree that aspartame is safe for humans and

there is no evidence that it causes cancer (EFSA, 2006).

For further information about food additives, see the New Zealand Food Safety Authority website: [www.nzfsa.org.nz](http://www.nzfsa.org.nz) and the Food Standards Australia New Zealand website: [www.foodstandards.gov.au](http://www.foodstandards.gov.au).

## Fish Oils and Omega-3

Recent European research shows that people who eat a lot of fish are at lower risk of colorectal (bowel) cancer than people who eat little or no fish (Norat et al, 2005). It has been suggested that fish has a protective effect against cancer because some types of fish such as salmon, tuna, and sardines are rich in omega-3 fatty acids.

Animal studies have found that omega-3 fatty acids may stop cancer from growing, but this has not been proven in humans (Byers et al, 2002). Recent systematic reviews of studies from around the world found no clear relationship between omega-3 consumption and cancer, and researchers concluded that omega-3 fatty acids are unlikely to prevent cancer (Hooper et al, 2006; MacLean et al, 2006).

It is not clear why fish-eaters have a lower incidence of bowel cancer than those who rarely eat fish. Possibly it is because they have a healthier diet in general and eat less red meat and processed meat. Diets high in red and processed meat are associated with higher cancer risk (Norat et al, 2005).

## Fluoridated Water

In most regions of New Zealand and in many other places around the world fluoride is added to the water supply to reduce dental caries. Fluoridation began in

New Zealand in the 1950s and it continues to be supported by the Ministry of Health as it has been shown to improve oral health without increasing other health risks (ESR, 2000). However fluoridation is controversial because some people are concerned about possible health risks associated with fluoride and believe that water fluoridation takes away the individual's right to choose to drink water without additives.

Reviews of research on this topic consistently find that there is no clear link between water fluoridation and cancer (ESR, 2000; NHS, 2000; WHO, 2002). The most comprehensive and systematic review to date concluded that overall the quality of research on water fluoridation was poor, and that there was no association between fluoridation and cancer.

## Garlic

Garlic is one of the allium family of vegetables commonly known as the onion family. Some studies have found that people who frequently eat garlic, onion and other allium vegetables are less likely to get certain cancers, including colorectal (bowel) cancer (WCFR/AICR, 1997; Buyers et al, 2002; Galeone et al, 2006). However it is possible that garlic-eaters have other healthy habits that influence their cancer risk, so we do not yet know for certain whether garlic and other allium vegetables prevent cancer.

Garlic has been thought of as a health-food for centuries but scientists are still investigating how garlic might work to help prevent cancer. Research shows that garlic contains a number of active ingredients, and it is possible that these interact to produce positive effects (Arnault, 2006). Garlic and other allium vegetables are selenium accumulators, which may help them fight cancer since selenium intake has been linked to reduced cancer risk (Arnault, 2006).

## Genetically Modified Foods (GMFs)

Genetically modified foods (GM foods) use gene technology to modify the genetic properties and potential of foods. No food produced using gene technology may be sold in New Zealand unless it has been assessed for safety by Food Standards Australia New Zealand (FSANZ) and then approved by a council of New Zealand and Australian ministers (MFE, 2007). The safety assessment process is designed to ensure that GM foods provide all of the benefits of conventionally produced foods and that no additional health risks will be caused as a result of the genetic modification (FSANZ, 2005).

Very little research has been done on the long term health effects of eating GM foods and so there is no evidence to suggest that GM foods will either increase or decrease cancer risk (Bezar et al, 2002). While some experts have concerns about the long-term safety of GM foods, a recent review concluded that although further research is needed, the evidence to date indicates that GM foods are safe (Bakshi, 2003).

For further information see the Food Standards Australia New Zealand booklet "Safety Assessment of Genetically Modified Foods" available at [www.foodstandards.gov.au](http://www.foodstandards.gov.au).

## Green Tea

Green tea is widely drunk in Asian societies and contains higher levels of catechins than black tea. Laboratory studies have shown that catechins are powerful antioxidants and could potentially block the growth of cancers (Cooper, 2005).

Studies have found that people who drink green tea may have reduced risk of many types of cancer (WCRF/AICR, 1997; Cooper, 2005) but further research is needed before we can be sure that green tea is effective in preventing cancer.

## Olive Oil

In countries where olive oil is the main source of fat in the diet (e.g. Spain, Greece and Italy), cancer rates tend to be lower than in other Western countries (Perez-Jimenez et al, 2005). Some studies have shown it has a protective effect for breast cancer, in particular (Greenwald et al, 2001).

It remains unclear which component of olive oil may be protective (Perez-Jimenez, 2006). If it is the monounsaturated nature of olive oil, the protective effect may apply to other monounsaturated fats such as canola.

However, olive oil is a fat source and general recommendations are to reduce total dietary fat. While fat intake overall should be lower, monounsaturated fatty acids sources, such as olive oil, should make up a greater proportion of the total fat intake.

## Organic Foods

There has been little scientific research comparing the cancer risk associated with organic versus non-organic food. There is no evidence that foods, grown without pesticides or genetic modification influence cancer risk more or less than foods produced using non-organic farming methods.

## Salt

The Cancer Society recommends a low salt diet. Too much salt can lead to high blood pressure, and may also increase the risk of certain cancers (WCRF/AICR, 1997).

In countries where salted foods are part of the staple diet, high salt intake has been linked to stomach cancer (ibid; Key et al, 2002). It is thought that foods preserved with salt may contain a variety of cancer-causing compounds (Riboli and Norat, 2001). This is less relevant in New Zealand, because refrigeration has reduced the need to salt foods in order to preserve them (Key et al, 2002), however processed foods may be high in salt so it pays to check the salt

(sodium) content. No evidence suggests that salt used in cooking or at the table affects cancer risk (Buyers et al, 2002)

## Selenium

Selenium is a mineral that we need in very small amounts in our diet to help keep our immune system and thyroid function healthy (NHMRC, 2006). In New Zealand, most of our selenium comes from meat, fish and seafood, eggs and cereals (ibid). Some plants such as garlic, onion and broccoli can accumulate the selenium from the soil (Arnault, 2006) so it may be helpful to include these foods in meals.

The level of selenium in plants depends on how much selenium there is in the soil<sup>1</sup>. New Zealand soils are naturally low in selenium (Cressey et al, 2000) and the amount of selenium in the blood of many New Zealanders is lower than in some other countries (Thomson, 1998). Although intakes of selenium in New Zealand are below levels recommended by other countries, this has not caused any known health problems for New Zealanders, although it is an area of ongoing research. An increase in blood selenium of people in this country has been noted in recent years, possibly because New Zealanders are now eating more imported foods and changing their dietary habits (Cressey et al, 2000).

The link between selenium and cancer is not clear. It has been known for many years that cancer rates tend to be lower in areas where the soil is rich in selenium (Rayman, 2005). A recent review of the evidence found that selenium seems to lower the risk of prostate cancer (Navarro Silvera, 2007) and some research also suggests that lung and colorectal (bowel) cancer risk may be lower in people with high levels of selenium in their blood (WHO, 2003; WCRF, 1997; DoH, 1998). Other research suggests that taking selenium supplements may reduce the risk of prostate, lung and bowel cancer but may increase the risk of skin cancers (NHMRC, 2006) and taking supplements may also increase the risk of prostate cancer in men who already have adequate selenium

intake in their diet (Moyad, 2002). Selenium may prevent cell damage that leads to cancer, although exactly how selenium works to prevent cancer is still being investigated (NHMRC 2006, Rayman, 2005).

Selenium is toxic in high doses (NHMRC, 2006). The exact amount of selenium that is safe and effective for reducing cancer risk has not been determined. Taking selenium supplements is not advised by the Cancer Society because the margin between adequate and toxic intake of selenium is narrow. It is better to eat a diet that contains natural sources of selenium. More research is required before recommendations can be made regarding appropriate selenium levels (Combs, 2005).

## Soy and Phytoestrogens

The link between soy and cancer has not been proven but it is thought that soy products (e.g. tofu, tempeh, miso and soy milk) may influence cancer risk because they contain a group of naturally occurring chemicals called phytoestrogens. In our bodies, these act like mild versions of the hormone oestrogen. Some cancers such as breast cancer are known to be influenced by this hormone, so it is possible that soy products could reduce the risk of these cancers.

Major cancer prevention reports say that there is not enough evidence to be sure that phytoestrogens reduce the risk of cancer (WHO, 2003; WCRF, 1997), however more recent reviews suggests that there may be a link. Two studies both found that a high intake of soy is associated with a slightly lower risk of breast cancer (Trock, 2006; Qin, 2006). There have also been two recent reviews of the link between soy and prostate cancer, with conflicting findings. One found that that high-soy diets are linked to lower rates of prostate cancer (Yan, 2005), and the other concluded that the evidence for the protective effect of soy was weak and inconsistent (Gantry, 2005). Research has not found any link between soy intake and other cancers (CCNSW, 2006).

While some research has suggested that soy may play a role in preventing cancer, there is also some evidence that the phytoestrogens in soy may *increase* risk for women with *existing* breast cancer. Phytoestrogens could potentially stimulate the growth of existing estrogen-sensitive tumors, and reduce the effectiveness of the anti-cancer drug tamoxifen (de Lemos, 2001; Duffy, 2003). So high-soy diets and supplements such as soy protein isolates or isoflavone capsules may not be safe for women with existing or past breast cancer, and caution is recommended (CCNSW, 2006). Further research is needed before we can be sure.

## Vitamin and Mineral Supplements

Experts agree that the best way to get a full range of vitamins and minerals is to eat a healthy, balanced diet, with a variety of fruit and vegetables (Greenwald, 2001; WHO, 2003; WCRF, 1997). Supplements do not substitute for a healthy diet, although some people may be advised to take them at certain times in their lives. For example, doctors may advise women who are planning to have a baby to take a supplement of folic acid to reduce the risk of neural tube defects (NHMRC, 2006).

Typical diets in certain parts of the world have been shown to reduce cancer risk, for example the Mediterranean diet which is high in vegetables and olive oil (Perez-Jimenez et al, 2005). Evidence suggests that a range of vitamins and minerals interact with other nutrients and chemicals in the diet to produce positive effects. Increasing your intake of a particular vitamin or mineral in the form of supplements is less beneficial than having a healthy diet overall, and could even be harmful in some cases (DoH, 1998; Byers, 2002; Moyad, 2002).

While research has shown that higher dietary intakes of beta-carotene, and vitamins A,C,E, and folate are associated with a decreased risk of several cancers (Greenwald et al, 2001; WCRF/AICR, 1997; Riboli and Norat, 2001; DoH, 1998), taking supplements of these vitamins does not generally reduce cancer risk (DoH, 1998). Supplementation only seems to reduce

cancer risk in groups with poor diets that lack vital nutrients (Hercberg, 2004, Moyad, 2002). In most studies of dietary supplements, high doses of single nutrients have shown no benefit in the prevention of cancer. In two studies the risk of cancer was actually increased and the studies stopped (Byers et al, 2002).

Two recent reviews of the effectiveness of multi-vitamin and mineral supplements for the prevention of cancer both concluded that there is not enough evidence to say whether taking multi-vitamins and minerals reduces the risk of cancer or not (Huang, 2006; Prentice, 2007).

Overall, the evidence weighs against the use of dietary supplements to reduce cancer risk. It is much more effective to get vitamins and minerals by eating a range of healthy foods particularly fruit and vegetables, as supplements taken in high doses for prolonged periods may be unsafe (DoH, 1998).

## Very high temperature foods and drinks

Consumption of very hot foods and drinks may increase the risk of developing cancer by damaging the lining of the gastrointestinal tract (WCRF/AICR, 1997; Gescher et al, 2001). It is possible that this may initiate the cancer process (WCRF/AICR, 1997). It is advisable to avoid consuming foods and drinks when they are very hot.

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