

CANCER - PREVENTION IS BETTER THAN CURE

The information explosion in the science of nutrition very often creates the impression that available information is contradictory. Consequently, it is no longer easy to distinguish between fact, misinformation and fiction. The Division of Human Nutrition, Faculty of Medicine and Health Sciences, Stellenbosch University act as a reliable and independent source of nutrition information.

WE ARE WHAT WE EAT

Research is confirming that the small choices we make each day have an important impact on our cancer risk. What we eat, how we prepare our food, whether or not we exercise, manage our weight, drink alcohol or smoke - these simple decisions make an important difference.

South Africa faces the burden of infectious diseases (such as HIV/AIDS and tuberculosis) existing alongside diseases of lifestyle (non-communicable diseases) such as undernutrition, over nutrition, diabetes, hypertension and **cancer**. The rise of diet-related non-communicable diseases accounts for 28% of the burden of disease in South Africa, and is thought to be linked to the process of societal transition, urbanisation and westernisation from a traditional rural lifestyle – the South African a ‘nutritional transition’. The specific dietary and lifestyle changes observed is in patterns of consumption of food, alcohol and tobacco, reduction in physical activity, and a shift to a diet high in sugar, salt and saturated fat.

Evidence has shown that the risk for developing cardiovascular disease, cancer, diabetes, osteoarthritis and chronic kidney disease increase when a person’s weight-to-height ratio, also called a body mass index (BMI), exceeds 23. Apart from cardiovascular disease, cancer is currently the second leading cause of death in Western countries.

Breast cancer is the most common cancer in women worldwide

The World Cancer Research Fund analysis of global research shows that about a third of the most common cancers can be prevented through diet, maintaining a healthy weight and taking regular

physical activity. Certain dietary factors are protective against cancer, while others can contribute to the development thereof.

It is thus clear that a series of small adjustments in what we eat and what we do can make a big difference. This relationship is very complex and multi factorial. The overall evidence that body fatness is a cause of a number of cancers is convincing. Some of the mechanisms by which body fatness increases the risk of cancer are well understood. Obesity influences the levels of a number of hormones and growth factors. Insulin-like growth factor 1 (IGF-1), insulin, and leptin are all elevated in obese people, and can promote the growth of cancer cells. In the case of abdominal fatness, insulin resistance is increased and the pancreas compensates by increasing insulin production. This hyperinsulinaemia increases the risk of cancers of the colon and endometrium, and possibly of the pancreas and kidney. As we know, undernutrition also has its problems. Cancers caused by infectious agents, such as those of the liver and cervix are more common in low-income countries, where undernutrition may impair people's immune responses. Undernutrition, with deficiencies in specific micronutrients such as vitamin A, riboflavin, vitamin B12, folic acid, vitamin C, iron, selenium, and zinc, suppresses most immune functions and may fail to control chronic inflammation, resulting in an increased risk for these cancers.

HOW SHOULD WE ADJUST OUR DIET TO PREVENT CANCER IN GENERAL?

The initial approach for identifying dietary factors linked to cancer development focussed mainly on potentially dangerous aspects of the diet. Over the last three or so decades, however, there is increasing realisation that many factors in the diet actually also have cancer preventive effects.

Current Dietary Recommendations to prevent cancer include:

Be as lean as possible. Attain and maintain a healthy body weight.

Avoid Sugar containing beverages and processed meat

Limit energy dense foods

Limit alcohol

Limit salty food and red meat

Eat mostly food of plant origin, with a variety of non-starchy vegetables and of fruit every day and with unprocessed cereals and/or pulses within every meal".

This coincides with the basic Mediterranean diet characteristics.

The Mediterranean diet:

- Eating primarily plant-based foods, such as fruits and vegetables, whole grains, legumes and nuts
- Replacing butter with healthy fats, such as olive oil
- Using herbs and spices instead of salt to flavor foods
- Limiting red meat to no more than a few times a month
- Eating fish and poultry at least twice a week
- Drinking red wine in moderation (optional)

The diet also recognizes the importance of being physically active and enjoying meals with family and friends.

Red meat and bowel cancer

Processed meat increases the risk of bowel cancer. According to the most recent estimates by the Global Burden of Disease Project, an independent academic research organization, about 34 000 cancer deaths per year worldwide are attributable to diets high in processed meat. The strongest, but still limited, evidence for an association with eating red meat is for colorectal cancer. There is also evidence of links with pancreatic cancer and prostate cancer. There are several potential reasons to explain how red and processed meat may cause bowel cancer. Red meat contains a compound which gives it's red colour, haem, which promotes the formation of potentially carcinogenic *N*-nitroso compounds. When red meat is cooked at high temperatures, it results in the production of compounds (heterocyclic amines and polycyclic aromatic hydrocarbons) that can cause bowel cancer in people with a genetic predisposition. Processed red meat has nitrites, as well as nitrates added to it as preservatives and these are thought to cause cancer. Processing also changes the nature of the meat, which may play a role in its link to cancer.

The World Cancer Research Fund Recommends the following: “Eat no more than 500g (cooked weight) a week of red meat, such as beef, pork and lamb. Eat little, if any, processed meat such as ham and bacon. This is because the evidence suggests eating 500g or less of red meat a week doesn't significantly increase bowel cancer risk. Red meat is also a good source of valuable nutrients, such as protein, iron, zinc and vitamin B12, so it can contribute to a healthy, balanced diet. Processed meat on the other hand has less valuable nutrients and can be high in fat and salt, so if you eat red meat it's best to choose fresh, unprocessed meat.”

'Red meat' refers to beef, pork, lamb, and goat from domesticated animals including that contained in processed foods. 'Processed meat' refers to meat preserved by smoking, curing or salting, or addition of chemical preservatives, including that contained in processed foods.

Cooking at high temperatures or with the food in direct contact with a flame or a hot surface, as in barbecuing or pan-frying, produces more of certain types of carcinogenic chemicals (such as polycyclic aromatic hydrocarbons and heterocyclic aromatic amines). However, there were not enough data to reach a conclusion about whether the way meat is cooked affects the risk of cancer.

Our South African Food Based Dietary Guidelines support this recommendation:

Diets should include:

- Two to 3 servings of fish per week and preferably oily fish such as sardines, pilchards tuna and mackerel (including tinned versions).
- Approximately four eggs per week.
- A serving of lean meat can be eaten daily, but should be limited to 90 g/day. Trim the visible fat from red meat and remove the skin and fat from chicken. Prepare the meat with little or no added fat and salt.

BREAST CANCER

Dietary factors associated with a higher incidence of breast cancer

Weight gain (obesity)	Adult weight gain is probably a cause of postmenopausal breast cancer. The evidence that body fatness is a cause of postmenopausal breast cancer is convincing, and abdominal body fatness is probably also a cause. On the other hand, body fatness probably protects against breast cancer diagnosed pre menopause. The role of fat intake in weight gain is an important aspect to consider, as well as changes in metabolic rate, physical activity and overall dietary intake.
Dietary fat intake	As a major contributor to total energy, dietary fat can also increase breast cancer risk. Saturated fat increase breast cancer risk.
Alcohol intake	Women who have 1 alcoholic drink per day have a small (11%) increased risk compared to those who have 2 drinks per day whom have 25% more risk compared to the risk of non-drinkers.
Dietary factors associated with a lower risk of breast cancer	
Mediterranean diet	Adherence to this diet is associated with lower breast cancer risk.

Dairy Products	Low fat milk and fermented dairy or yogurt consumption was associated with a lower breast cancer risk in post-menopausal women. Dairy consumption was inversely associated with the risk of breast cancer in a manner that appears to be dose-dependent, time-dependent, and dairy-type dependent.
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PROSTATE CANCER

Following a typical western diet high in animal (saturated) fat is associated with a higher risk of prostate cancer.

GASTROINTESTINAL CANCERS

Alcohol consumption increases the risk for a number of cancers of the gastrointestinal tract. The evidence that alcoholic drinks are a cause of cancers of the mouth, pharynx, and larynx, oesophagus and colorectum (men) is convincing. They are probably a cause of liver cancer, and of colorectal cancer in women. The available evidence does not show any 'safe limit' of alcohol intake, irrespective of the type of drink. A dose-response relationship is apparent and absolute moderation is advised. The risk is multiplied when drinkers of alcohol also smoke tobacco. Non-starchy vegetables, fruits, and also foods containing carotenoids probably protect against these cancers.

COLORECTAL CANCER

Colorectal cancer affects the colon and the rectum.

Cancer promoting dietary factors

Although many dietary factors have been associated with colon cancer, the evidence that red meat, processed meat, substantial consumption of alcoholic drinks (in men), body fatness and abdominal fatness, and the factors that lead to greater adult attained height, or its consequences, are causes of colorectal cancer is convincing.

Overweight in men, and low levels of physical activity in men and women are linked with a higher risk, which has been found to increase with age. Excessive alcohol consumption has also been linked to an increased risk (convincing evidence for men and probable evidence for women). It is thus wise to follow the recommendation of no more than 2 drinks per day for men and 1 for women.

Patients with chronic ulcerative colitis have a high risk of developing colon cancer and frequently have low levels of folate. Folate supplements result in a 60% lower incidence of colon cancer in these patients.

Protective dietary factors

Foods containing dietary fiber, and also garlic, milk, and calcium, probably protect against this cancer.

Physical activity of all types protects against cancer of the colorectal cancer, the evidence is stronger for the colon than the rectum.

LUNG CANCER

Dietary factors:

- Fruits and food containing carotenoids have repeatedly been shown to have a protective effect against lung cancer. The evidence is convincing.
- Clinical trials done to test the hypothesis of the benefit of beta-carotene supplementation as a possible protective factor, particularly focussing on lung cancer, have shown that high pharmaceutical doses of beta-carotene (supplements) are not beneficial in reducing cancer risk, and increase lung cancer risk among high-risk individuals such as those who smoke or those who have a history of occupational exposure to known lung carcinogens.

DIETARY AND LIFESTYLE GUIDELINES FOR CANCER PREVENTION

- ◆ Maintain ideal body weight - avoid being underweight or overweight and limit weight gain during adulthood to less than 5 kg. Ensure that body weight through childhood and adolescence projects towards the lower end of the normal BMI range. Aim for ideal body weight at the age of 21. Avoid weight gain and an increase in waist circumference in the adult years.
- ◆ Limit energy dense foods such as sweets and fast foods and avoid sugary drinks such as carbonated drinks and fruit concentrates. Avoid fatty foods.
- ◆ Always use fat in moderation. Eat more canola margarine and –oil, olive oil, olives, nuts and avocado.
- ◆ Breastfeeding protects both mother and child against cancer. Mothers should aim to breastfeed infants exclusively for up to six months and to continue with complimentary foods thereafter.
- ◆ Eat less red meat (refers to beef, pork, lamb and goat- limit to no more than 500 g per week) and limit processed meat, and more white meat (chicken and fish). Eat more seeds, nuts, and legumes, eggs, cottage cheese, tinned fish. These are a great source of fibre and protein; nuts and seeds also provide healthy fats and antioxidants.

- ◆ Avoid highly salted, smoked, cured and mouldy foods. Limit salt intake to no more than 6g per day (2.4 g sodium). Do not eat mouldy cereals or pulses.
- ◆ Eat **at least** 5 portions of fruit (600g) and non-starchy vegetables per day (fresh rather than preserved) including a variety thereof such as green leafy vegetables, tomatoes and tomato products, cruciferous vegetables (e.g. cabbage, Brussel sprouts) and dark orange vegetables.
- ◆ Eat a variety of cereal foods, mainly in an unprocessed form such as whole wheat bread and breakfast cereals as well as whole grain pasta and rice.
- ◆ Enjoy two to three servings daily (a serving is 1 cup of milk or yogurt. Work in dairy from cultured milk (kefir, yogurt, fresh curd cheeses like ricotta); it's easier to digest and supplies beneficial bacteria that contribute to digestive health.
- ◆ Dietary supplements are not recommended for cancer prevention. Aim to meet nutritional needs through diet alone. Avoid high dose vitamin supplements (more than 150% of the RDA).
- ◆ Limit alcohol consumption. If alcoholic drinks are consumed, a maximum of 1 drink a day for women and 2 for men is recommended. One drink equals one beer (340 ml), 120 ml wine, 25 ml spirits (such as brandy and whiskey) or 60 ml sherry or martini.
- ◆ Do not smoke.
- ◆ Exercise regularly. Be moderately physically active for at least 30 minutes every day (equivalent to brisk walking). Limit sedentary habits such as watching television. Aim to improve fitness and to increase daily activity to 60 minutes or to more vigorous activity.

More tips on ways to include 5 portions of fruit and vegetables per day:

- ◆ Include 1 or 2 with each meal
- ◆ "Snack" on them when you are hungry between meals
- ◆ Choose a variety of fresh, frozen, dried and canned products
- ◆ One glass of fruit juice equals 2 portions of fruit
- ◆ Make your own fruit or vegetable juice or "smoothies" using fresh fruit/vegetables and low fat or skimmed milk
- ◆ Be adventurous - add them to pasta, rice, soup and stews
- ◆ Prepare stewed fruit for breakfast or pudding
- ◆ Experiment with stir-fries using a variety of vegetables
- ◆ Make a veggie-spread with finely chopped vegetables and Bulgarian yoghurt
- ◆ Make fruit crumbles with thin layers of crumble and lots of fruit underneath

For further, personalized and more detailed information, please contact a dietitian registered with the Health Professions Council of South Africa.

References from the scientific literature used to compile this document are available on request.

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