



Meat and you

Limit consumption of red meat and avoid processed meats in order to reduce the risk of cancer.

I WANT to repeat this very important message: the choices we make on what we eat, drink and how active we are each day will together provide us important protection against cancer at all times of life, from childhood to old age.

I have been writing on the prevention of cancer in this column recently, relying on the World Cancer Research Fund (WCRF) expert report on: *Food, Nutrition, Physical Activity and the Prevention of Cancer* to convey to you the important message of cancer prevention (www.dietandcancerreport.org/). I also find the Hong Kong WCRF publications most useful (www.wcrf-hk.org/).

I will continue with the focus on the role of foods and drinks in cancers and discuss the fifth WCRF recommendation: Limit intake of red meat and avoid processed meat.

Meat as part of a healthy, balanced diet

The WCRF expert panel recognised that an integrated approach to the evidence shows that many foods of animal origin are nourishing and healthy if consumed in modest amounts. The panel emphasises that the recommendation does not mean having a diet with no meat or no foods of animal origin.

The recommendation is for moderate consumption of meat. Meat can be a valuable source of nutrients, in particular protein, iron, zinc, and vitamin B12. It can therefore form part of a healthy, balanced diet.

In the Malaysian Dietary Guidelines (www.nutriweb.org.my), the nutritional value of these foods is also recognised. Fish, meat and poultry are placed at level three of the food pyramid and are recommended to be consumed moderately. Two to three servings are recommended to be consumed daily. The guidelines recommend choosing lean cuts of meat and trimming away the visible fat.

Consumption of red and processed meats and cancer – the evidence

The expert panel was of the opinion that red meat and processed meats are convincing or probable causes of some cancers. There is convincing evidence that red meat and processed meat is a cause of bowel cancer.

There is limited evidence suggesting that red meat is a cause of cancers of the oesophagus, lung, pancreas and endometrium (womb); that processed meat is a cause of cancers of the oesophagus, lung, stomach and prostate. There is also limited evidence that animal foods that are grilled (broiled), barbecued (charbroiled), or smoked, are a cause of stomach cancer.

In the WCRF report, meat refers to all animal flesh apart from fish and seafood. Meat can be further classed as either “red meat”, which generally refers to flesh from ani-



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mals that have more red than white muscle fibre, or poultry, which usually has more white than red muscle fibres.

Red meat in the report include beef, pork, lamb, and goat and foods like hamburgers, minced beef, pork chops and roast lamb. On the other hand, poultry include meat from birds such as chickens, guinea fowl, and turkeys.

The term “processed meat” refers to meats (usually red meats) preserved by smoking, curing or salting, or by the addition of chemical preservatives, e.g. nitrates or nitrites.

Meats preserved only by refrigeration, however they are cooked, are usually not classified as “processed meat”. Examples of processed meat are ham, bacon, pastrami and salami, as well as hot dogs and some sausages. Hamburgers and minced meat can be considered as processed meat if they have been preserved with salt or chemical additives.

What is the link to cancer?

The WCRF report has pointed out several possible reasons for the link between red meat and processed meat consumption and cancers.

Red meat contains substances that are linked to bowel cancer, e.g. haem, the compound that gives red meat its colour.

Haem contains iron, a very important mineral in vital metabolic processes in the body. However, free iron can also catalyse the generation of free radicals, which cause oxidative damage to specific cell components, including DNA, protein, and membrane lipids.

When meat is preserved by smoking, curing or salting, or by the addition of preservatives, e.g. nitrite, this can react with the degradation products of amino acids to form N-nitroso compounds (nitrosamines or nitrosamides). These may be formed in meat during the curing process or in the body (particularly

in the stomach) from dietary nitrite (or nitrate).

Haem, found in red meat, is also known to promote the formation of N-Nitroso compounds. Several of these N-nitroso compounds are known human or animal carcinogens (cancer-causing substances).

Nitrites can also be derived from nitrates present naturally in plants (e.g. vegetables); levels vary between species and with different soil conditions and the amount of fertiliser used. A considerable amount of this ingested nitrate can be converted to nitrite and then to N-nitroso compounds.

Another possible mechanism for the link between meat consumption and cancers is the formation of heterocyclic amines or polycyclic aromatic hydrocarbons (PAH) when meat (e.g. beef, pork, poultry and fish) is cooked over an open flame, at high temperatures (e.g. frying, grilling and barbecuing), and charred or “well done”. The ingestion of these compounds can increase the risk of cancers.

Studies also show that people who eat a lot of red meat tend to eat less plant-based foods, so they benefit less from their cancer-protective properties of the latter types of foods.

Additionally, the expert panel also pointed out that red meats can be relatively high in animal fats. Diets with high levels of animal fats are often relatively high in energy, increasing the risk of weight gain.

We have already discussed the increased risk of overweight and obesity to cancers in a previous article.

It should also be noted that meats tend to have higher saturated fatty acids and cholesterol, which are recognised risk factors for heart disease.

WCRF recommendations

The recommendation of WCRF is therefore to limit intake of red meat and avoid processed meat.

The public health goals, which are for populations and are therefore principally for health professionals are:

- Population average consumption of red meat to be no more than 300g a week, very little if any of which to be processed.

The personal recommendations, meant for people, as communities, families, and individuals are:

- People who eat red meat to consume less than 500g a week, very little if any to be processed.

Practical tips

I would reiterate that the WCRF recommendations do not forbid the consumption of meat and red meat totally. Meat is recognised as a potential source of nutrients and can be part of a healthy, balanced diet. The expert panel recognised that there are many ways to enjoy meat and other animal foods as part of plant-based diets. The recommendation is for moderate consumption of meat and suggested that meat need not be eaten every day.

The WCRF recommendation is to consume not more than 500g of red meat a week. To help you visualise how much is 500g of red meat, here are some common red meats and their average serving sizes provided by WCRF Hong Kong.

Pork chop – 160g (cooked weight)
Beef burger – 90g (cooked weight)

Steak – 228g (cooked weight)

These are useful as a guide, but bear in mind that serving sizes vary considerably in different restaurants.

This amount recommended by WCRF is for cooked red meat. As a rough conversion, 500g of cooked red meat is about 700-750g of raw meat. This is a rough guide and may assist you when purchasing raw meat. The exact conversion will depend on the cut of the meat, the proportions of lean and fat, and the method and degree of cooking.

In place of red meat, the recommendation is to consume fish and low-fat poultry as alternatives. In addition, the use of legumes (various beans) and its products (e.g. soya bean products) can be encouraged as alternatives.

The WCRF also recommends to avoid processed meat. This would mean consuming processed meats (such as bacon, ham, Chinese style preserved meat and sausages) only during special occasions.

If you do eat red meat, always opt for the leanest meat available, trimming any visible fat before cooking.

The consumption of other animal foods and cancer

The WCRF Expert Panel did not provide any goals or recommendations for poultry, fish, and eggs in relation to cancer risk. The evidence for these foods was too limited in amount, consistency, or quality to draw any conclusions.

There is no basis for recommending avoidance of these foods to prevent cancer. Cantonese-style salted fish is a special case and will be further elaborated below.

The evidence on cow's milk, cheese, and foods high in calcium, and the risk of cancer, is hard to interpret because they point in different directions. After long discussions, the expert panel chose to make no recommendations here.

The evidence suggesting that animal fats are a cause of colorectal cancer is limited. Animal fats are high in energy and the expert panel integrated the limited evidence suggesting that animal fats are a cause of overweight and obesity into its findings on energy-dense foods.

The implication is that it is best to limit consumption of animal fats, as part of meat and also as contained in processed foods, in part because of the relation with cardiovascular disease.

In view that Cantonese-style salted fish are a traditional part of the diet here in Malaysia, as well as in southern China, Taiwan and Singapore, I should highlight that according to the WCRF expert panel, consumption of this type of salted fish probably increases risk to nasopharyngeal cancer.

Cantonese-style salted fish is characterised by using less salt and a higher degree of fermentation during the drying process. It is to be noted this finding does not apply to fish prepared (or salted) by other means.

■ *NutriScene is a fortnightly column by Dr Tee E Siong, who pens his thoughts as a nutritionist with over 30 years of experience in the research and public health arena. For further information, e-mail starhealth@thestar.com.my. The information provided is for educational and communication purposes only and it should not be construed as personal medical advice. Information published in this article is not intended to replace, supplant or augment a consultation with a health professional regarding the reader's own medical care. The Star does not give any warranty on accuracy, completeness, functionality, usefulness or other assurances as to the content appearing in this column. The Star disclaims all responsibility for any losses, damage to property or personal injury suffered directly or indirectly from reliance on such information.*