

## Red meat and cancer

A large number of studies have looked at the association between environmental and lifestyle factors, including dietary factors, and risk of cancer. Cancer sites that have been investigated in relation to meat include oesophagus, stomach, lung, pancreas, endometrium and breast. The most studied cancer in relation to red and processed meat intake is bowel or colorectal cancer (CRC).

Early diagnosis via screening and improvements in treatment are generally felt to have made a significant improvement to survival from most cancers.

### Where does the evidence come from?

The evidence related to meat consumption and cancers largely relies on observation or epidemiology. Observational studies report the association between food intake and the occurrence of, or death from, a specific disease at some future point in time. Food intake may be assessed at intervals or at a single time point usually remote from the actual occurrence of the disease. Typically, food data is collated using a food frequency questionnaire, which can be unreliable and depends on how well the food category is defined, and how easily a serving can be identified.

### Key problems with the evidence

Although positive associations between red meat and processed meat and CRC have been reported in many observational cohort studies there are a number of key problems with this.

There have been considerable inconsistencies between studies, for example red and processed meat definitions are not uniform across studies and measures of intake and analytical comparisons are variable.

Patterns of associations for bowel cancer vary by gender and anatomic location of the tumour, with associations being approximately 10-30% stronger among men than women. Most associations are weak in magnitude and the large majority of associations are not statistically significant.

Observational studies measure many different dietary and lifestyle variables and can only control for confounders by statistical means. This makes it impossible to single out one food group, such as meat, as a cause of CRC.

Any association between red meat intake and cancer at other sites remains inconclusive.

## Comparison with Vegetarians

Many studies compare meat eaters with vegetarians. This gives a skewed picture of risk for the population as a whole. However, in the case of bowel cancer, the mortality rates are similar in Western vegetarians and comparable to non-vegetarians. Indeed in the Oxford arm of the European Prospective Investigation into Cancer and Nutrition (EPIC-Oxford), the incidence of bowel cancer was higher in vegetarians than in meat eaters.<sup>1</sup>

## The Scientific Advisory Committee on Nutrition (SACN)

This expert committee advises the UK government on diet and health. When reviewing the evidence on Iron and Health they also looked at the evidence around red meat intake and the risk of bowel cancer. They recognised the limitations of the evidence and concluded that whilst the available evidence suggested that red and processed meat intake was *probably* associated with increased bowel cancer risk, the increase in risk was not statistically significant in most studies (SACN 2010)<sup>2</sup>.

**Overall, there is no conclusive evidence of a causal relationship between red and processed meat and any of the cancers studied. Available evidence is not sufficient to support or refute a causal association (Alexander 2010)<sup>3</sup>.**

## Confounding Factors

It is very difficult to isolate the effects of any single dietary component, such as red meat consumption, on disease outcome. Other dietary and lifestyle factors, so called confounding factors, also impact on health. These include well established characteristics of a typical western diet and lifestyle: high intakes of refined sugars / high intakes of alcohol / low intakes of fruits, vegetables / low intakes of dietary fibre / low physical activity / cigarette smoking / high body mass index. Also, the majority of animal fat intake may be from non-meat sources, such as chocolate, cakes, crisps, fried foods, biscuits sauces.

The importance of these confounding factors is now well recognised as they collectively impact on health. This makes it very difficult to establish an independent positive association between a single dietary factor, such as red meat consumption, and cancer risk.

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<sup>1</sup> Key et al. Am J Clin Nutr 2009; 89:1620S-1626S

<sup>2</sup> SACN (Scientific Advisory Committee on Nutrition). (2009). "Draft SACN Report on Iron and Health." Retrieved 1st November 2010, from [http://www.sacn.gov.uk/pdfs/draft\\_iron\\_and\\_health\\_report\\_complete\\_june\\_2009\\_consultation.pdf](http://www.sacn.gov.uk/pdfs/draft_iron_and_health_report_complete_june_2009_consultation.pdf).

<sup>3</sup> Alexander D, Cushing CA. Obesity Review 2010. July 21 Epub ahead of print

## Recommendations for red meat intake

The Department of Health advises that lean red meat should be consumed as part of a balanced diet.

The latest report from World Cancer Research Fund (WCRF 2011) recommends consuming no more than 500g (cooked weight) of red meat per week, which is unchanged from the previous WCRF report (2007) and tallies with current average consumption levels in the UK.

The Scientific Advisory Committee on Nutrition (SACN) recently published a report on Iron and Health which confirmed that the vast majority of people do not need to change their meat-eating habits. The daily red meat intake recommended by SACN is already the average consumption in the UK.

SACN recommends that those consuming large amounts of red meat (more than 90g per day) should consider reducing their intake. However, average daily consumption of red meat in the UK is 76g. This means that most people are eating below this level. Four in ten men but only one in ten women eat over 90g of red meat per day.

## Consumption of Red meat in the UK

There has been a general decrease in the amount of red meat consumed in the UK during the last few decades. According to the National Diet and Nutrition Survey (NDNS 2003), average daily intake among adults in the UK is 96g for men and 57g for women. In general, 100g of red meat loses 20-30% of weight during cooking to give a cooked weight of 70-80g. Average daily consumption of red meat in the UK is 76g.

### What does a portion of cooked red meat weigh in practice?

3 slices of roast lamb	80g
1 grilled sirloin steak	160g
2 grilled rashers of back bacon	40g
1 grilled quarter pounder burger	80g
2 grilled premium sausages	110g
2 grilled lamb chops, excluding the bone	80g
1 portion of stewed mince	80g

## Contribution to the Diet

A recent review of published evidence, in the British Nutrition Foundation *Nutrition Bulletin*, about red meat and its links to health has shown that a moderate intake of lean red meat makes a significant positive contribution to both micronutrient and macronutrient intakes without risking any negative health effects. The review concluded that the relationship between red meat and health is a positive one<sup>4</sup>.

Lean red meat consumed in moderation can make a positive contribution to a healthy balanced diet. It is nutrient dense, that is, it is packed with a variety of nutrients, some of which are known to be in short supply in the diet (iron and zinc). It also contains some nutrients that are thought to be protective against cancer (selenium and folate).

Red meat contains protein, iron, zinc, selenium, vitamins A, B6, B12, D and E and heart health omega-3 polyunsaturated fatty acids. In addition, it is often overlooked that more than 50% of all the fats in red meat are of the monounsaturated variety similar to those in olive oil.

## In Conclusion

Establishing associations between dietary factors and cancer is difficult. Cancer develops over a long period of time, so it is not possible to assess immediate effects of certain foods on the risk of cancer. Thus any findings of association between foods and cancer always have to be considered with caution.

Please visit [www.meatandhealth.com](http://www.meatandhealth.com) for more information.

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<sup>4</sup> Wyness L, Weichselbaum E, O'Connor A, Williams EB, Benelam B, Riley H, Stanner S. Red Meat in the Diet: An Update. British Nutrition Foundation Nutrition Bulletin. March 2011.