

Exploring the Cancer-Fibre Link

Dietary fibre has been widely recognized to play a role in the prevention of several chronic diseases, including cancer. A recent global review of scientific evidence carried out as part of the WCRF/AICR Continuous Update Project (CUP) strengthens existing evidence of the protective effect of dietary fibre for colorectal cancer. Here we look into its direct and indirect protective effects.

Foods rich in dietary fibre, including vegetables, fruits, legumes and wholegrains, are shown to be protective against colorectal cancer [1]. In the most recent review of the science in this area, the Expert Panel behind the CUP's judgements concluded that the evidence that foods containing dietary fibre reduce colorectal cancer risk has become stronger since the publication of the WCRF/AICR's 2007 Second Expert Report [2]. Seven more studies were added to the existing eight studies from the Report, and the evidence became more consistent. Here we review some of the ways in which dietary fibre may provide a direct and indirect protective effect for colorectal cancer.

Weight management and body fat distribution

According to the WCRF/AICR Second Expert Report, increased body fatness, as measured by body mass index (BMI), is associated with a higher colorectal cancer risk. Meta-analysis of cohort studies showed a 15 per cent increased risk per 5 units increase in BMI [2]. Dietary fibre plays a potential protective role in lowering cancer risk through the reduction of body fatness. A recent study showed that intake of fibre-rich wholegrain was inversely linked to abdominal subcutaneous adipose tissue (SAT) and visceral adipose tissue (VAT) [3]. VAT is associated with chronic inflammation and high insulin levels, which both induce carcinogenesis and inhibit apoptosis, and in turn, increase the cancer risk. However, the potential benefits of eating wholegrain would be offset by high intake of refined grains. The study also suggested an inverse relationship between wholegrain intake and waist circumference [3], which is also a risk factor of colorectal cancer [2].

Colon polyps

Colon polyps are precursors of colorectal cancer, and individuals with colon polyps are more likely to suffer from colorectal cancer. A recent study showed that regular consumption of foods rich in dietary fibre such as legumes, brown rice, cooked green vegetables and dried fruits could lower the risk of colon polyps [4]. A dose response effect was observed after following 2,818 individuals for 26 years. By eating brown rice at least once a week, the risk of colon polyps would be decreased by 40 per cent, while eating legumes and dried fruits three times or more a week would lowered the risk by 33% and 26% respectively.

In addition to the above potential protective effects, dietary fibre could also dilute potential carcinogens, speed up the transit of waste through the colon and minimise the exposure of carcinogens to the cell linings of the intestinal tract. It also slows glucose absorption, which helps in better glucose control and reduces hyperinsulinaemia, and in turn, lowers cancer risk [2-4].



By-products of dietary fibre

Dietary fibre is rich in fermentable carbohydrates. One of the metabolic by-products from the intestinal fermentation butyrate, a short-chain fatty acid, also offers indirect protection against colorectal cancer. Researchers from a WCRF/AICR funded study treated colorectal cancer cells with butyrate and the cancer cells generally stopped growing and led to apoptosis, while it served as an energy source that promoted normal cell growth [5]. Another WCRF/AICR funded literature review studied the potential protective role of dietary fibre against colorectal cancer [6]. The study found that butyrate stimulated the termination of colonic tumorigenesis by indirectly promoting cell cycle arrest, differentiation and apoptosis, which in turn inhibited cancer cell growth and development. Researchers suggested that the varied responsiveness to butyrate of different colorectal cancer subtypes was likely the reason why previous studies yielded inconsistent findings on the protective role of dietary fibre in lowering colorectal cancer risk. However, further study is needed to determine if butyrate exerts similar effects on colorectal cancer cells *in vivo*.

WCRF/AICR Recommendation for preventing colorectal cancer

The WCRF Global Network has been continuously reviewing the evidence on various factors in relation to cancer risk. Based on the latest CUP report on colorectal cancer, the Expert Panel has upgraded the protective effect of dietary fibre from "probable" to "convincing" [1]. In line with the evidence, WCRF HK recommends the public to eat a variety of fruits and vegetables, wholegrains, and pulses such as beans. Health professionals can encourage people to base their diet around plant foods, to aim for five portions of fruits and vegetables every day and to choose wholegrains whenever possible for cancer prevention [2].

References:

1. WCRF/AICR. *Continuous Update Project on Colorectal Cancer*. Washington DC: AICR 2011. (<http://www.dietandcancerreport.org/cup/index.php>)
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4. Tantamango YM et al. Foods and Food Groups Associated With the Incidence of Colorectal Polyps: The Adventist Health Study. *Nutrition and Cancer* 2011; 63(4):565-72.
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Engaging in Low-Risk Lifestyle Behaviours to Prevent Premature Deaths

Eating well, being physically active, limiting alcohol intake and not smoking all help people to live longer, according to a recent study published in *American Journal of Public Health* [1].

Researchers of the study used data from almost 17,000 participants aged 17 years or older recruited from 1988 to 1994 by the National Health and Nutrition Examination Survey (NHANES) III Mortality Study and followed through 2006.

The study showed that all of the four “low-risk” behaviours mentioned were significantly associated with a reduction in all-cause mortality. The number of low-risk behaviours was inversely associated with the risk of all-cause mortality, mortality from major cardiovascular diseases and other causes, and never smoking provided the most protection from dying from all of the causes examined. It was also shown that people who engaged in all four mentioned healthy behaviours were 63% less likely to die from all causes, and 66%, 65% and 57% less likely to die from a malignant neoplasm, major cardiovascular diseases and other causes respectively, when compared with participants with none of the above behaviours.

As the WCRF/AICR Second Expert Report also concluded [2], researchers commented on the moderate use of alcohol as a low-risk lifestyle factor in the study because of its cardioprotective effect. However, it is suggested that moderate use of alcohol has to be carefully balanced against the harm caused by excess alcohol intake. Furthermore, it is well-documented that alcohol use increases the risk of many cancers, especially when combined with smoking [2]. Thus, the net impact from all alcohol use in many societies could lead to an increase in mortality and premature death.

For cancer prevention, WCRF HK recommends not to drink any alcohol, in addition to eating a healthy diet, being physically active and maintaining a healthy weight. However, after considering its protective effect on coronary heart disease when consumed in modest amounts, it is recommended to limit alcohol intake to no more than two drinks a day for men and one drink a day for women, *if consumed at all*. A drink contains about 10-15g of pure alcohol [2].

References:

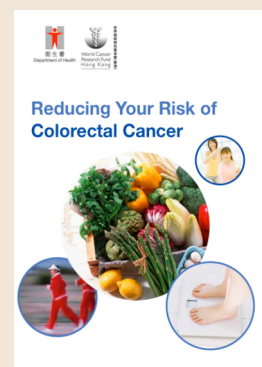
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2. WCRF/AICR. *Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective*. Washington DC: AICR, 2007. (<http://www.dietandcancerreport.org>)

WCRF HK's New Cancer Prevention Resource Reducing Your Risk of Colorectal Cancer

As one of the most preventable cancers and the second most common cancer in Hong Kong [1], colorectal cancer has the highest number of modifiable risk factors. According to the WCRF/AICR Policy Report, *Policy and Action for Cancer Prevention* [2], about 45% of colorectal cancer cases in the US could be prevented through eating a healthy diet, being physically active and maintaining a healthy weight.

The *Continuous Update Project (CUP) on Colorectal Cancer* provides you with the latest systematic review on the evidence for colorectal cancer, which was completed by the WCRF International CUP team. To read the latest findings on colorectal cancer, please visit <http://www.dietandcancerreport.org/cup/index.php> to view the summary and the full report online.

The *Reducing Your Risk of Colorectal Cancer* leaflet, jointly produced by WCRF HK and the Department of Health, has just been renewed. The leaflet provides up-to-date evidence-based information on how people can help reduce their risk of colorectal cancer. Please contact us on (852) 2529 5025 to request your free copy.



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1. Hospital Authority: Hong Kong Cancer Registry website. (http://www3.ha.org.hk/cancereg/e_stat.asp) Accessed in Nov 2011
2. WCRF/AICR. *Policy and Action for Cancer Prevention*. Washington DC: AICR, 2009. (<http://www.dietandcancerreport.org>)

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Please circulate this newsletter to other colleagues to help us spread the good news that cancer is largely preventable.

Informed is available free of charge to all health professionals.

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World Cancer Research Fund (WCRF HK)

Rm 601, On Hong Commercial Bldg, 145 Hennessy Road, Wanchai, Hong Kong.
Tel: (852) 2529 5025 Fax: (852) 2520 5202
Web: www.wcrf-hk.org Email: info-hk@wcrf.org
Registered Charity No: 596724
WCRF HK is a member of the WCRF global network.

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