Cancer Association of South Africa (CANSA)

Fact Sheet on Nutrition for Individuals Diagnosed with Breast Cancer

Introduction

Good nutrition is especially important for any person living with cancer. Eating a variety of foods and well-balanced meals can help one feel better and stay stronger. Eating well during treatment helps to maintain body weight, improve strength and energy, decrease the risk of infection and assist the body in healing and recovery from cancer treatments.

Picture Credit: Nutrition in Cancer

Most cancer treatments work better when one is well nourished. People with cancer who are well nourished and able to maintain a healthy body weight often have a better prognosis.

A healthy diet includes eating and drinking foods and liquids with nutrients that the body needs – proteins, carbohydrates, fats, vitamins, minerals, antioxidants, flavonoids, carotenoids and potable water. One's healthcare team, should include a registered dietitian who can assist one maintain nutrition throughout the period of one's treatment, after completion of treatment, and during times of experiencing any side effects. A dietitian is a key member of the healthcare team who is qualified to provide counselling about proper nutrition.

Nutrition and Breast Cancer

While there is no one single food or diet that can prevent or cause breast cancer, diet is an area in which individual choices can make a real difference. Breast Cancer is a complex disease with many contributing factors. Some of these factors, such as age, family history, genetics, and gender, cannot be controlled. There are, however, factors that individuals can control, which include not smoking, avoiding alcohol, exercising, being overweight, and diet.

Breast Cancer is the second highest form of cancer among black South African women. In a study by **Jacobs, et al.**, (2019), the researchers found that the "Incidence rates of breast cancer (BC) among South African black women are increasing. The aim of the current study was to investigate the association between dietary intake and BC risk in black South African women. The study population included 396 BC cases and 396 population-based controls matched on age and residence, participating in the South African Breast Cancer study. Diet was assessed using a validated quantified FFQ from which twelve energy-adjusted food groups were formed and

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analysed. OR were estimated using conditional logistic regressions, adjusted for confounding factors, comparing highest v. lowest median intake. Fresh fruit consumption showed an inverse association with BC risk (OR=0·3, 95 % CI 0·12, 0·80) in premenopausal women, whilst red and organ meat consumption showed an overall inverse association with BC risk (OR=0·6, 95 % CI 0·49, 0·94 and OR=0·6, 95 % CI 0·47, 0·91). Savoury food consumption (sauces, soups and snacks) were positively associated with BC risk in postmenopausal women (OR=2·1, 95 % CI 1·15, 4·07). Oestrogen receptor-positive stratification showed an inverse association with BC risk and consumption of nuts and seeds (OR=0·2, 95 % CI 0·58, 0·86). Based on these results, it is recommended that black South African women follow a diet with more fruit and vegetables together with a decreased consumption of less energy-dense, micronutrient-poor foods such as savoury foods. More research is necessary to investigate the association between BC risk and red and organ meat consumption. Affordable and practical methods regarding these recommendations should be implemented within health intervention strategies."

There are no food or dietary supplements that will act as "magic bullets" to reduce the risk of breast cancer or from breast cancer returning. The following broad dietary guidelines can, however, be used to decrease the risk of breast cancer. Apart from not smoking, and being as active as possible, the following nutritional guidelines can assist breast cancer survivors:

- Increase intake of fresh fruits (in season), vegetables and whole grains
- Limit fat intake to less than 30 percent of kilojoules – especially animal fats
- Reduce (minimise) intake of cured, pickled, smoked, and processed foods
- Achieve and maintain a healthy weight
- Avoid alcohol consumption

Sadeghi, M., Vahid, F., Rachmani, D., Akbari, M.E. & Davoodi, S.H. 2019.
BACKGROUND: Breast cancer (BrCa) is the most frequently diagnosed cancer among females and second cancer after lung cancer in many societies. Ignoring the phenotypes of the BrCa can affect the interpretation of the association between diet and BrCa. The aim of this study was to determine the association between dietary patterns and estrogen receptor (ER), and progesterone receptor (PR) status in women with BrCa.
METHODS: This study includes 150 cases of BrCa. Controls were 150 healthy adults, frequency matching based on age. The individual information, food frequency questionnaire, and physical activity were completed while interviews. Information about the pathologic factors obtained from patients' files. Factor analysis method used to determine the dietary patterns; logistic regression used to measure the odds ratios.
RESULTS: Getting upper median intake of unhealthy diet had a strong association with BrCa-positive ER and positive PR (OR: 4.98, 95% CI: 2.65-9.34 and OR: 4.99, 95% CI: 2.56-9.75, respectively) compared to under median intake of unhealthy diet. In addition, the protective effect of the healthy diet was stronger on BrCa-negative ER, negative PR (OR: 0.11, 95% CI: 0.04-0.34 and OR: 0.10, 95% CI: 0.03-0.25, respectively).
CONCLUSION: The protective effect of a healthy dietary pattern was stronger on BrCa negative ER and negative PR. The unhealthy dietary pattern had a strong association with BrCa positive ER and positive PR.

Caution Expressed Around Consumption of Foods High in Phytoestrogens by Individuals Diagnosed with a Hormone-Sensitive Cancer
The Cancer Association of South Africa (CANSA) has noted:

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- A statement by Memorial Sloan Kettering Cancer Center saying that "… because compounds isolated from rooibos leaves demonstrated estrogenic activity, patients with hormone-sensitive cancers should use caution before taking rooibos." (Memorial Sloan Kettering Cancer Center).

- That phytoestrogens were successfully isolated from rooibos leaves by scientists from the School of Pharmaceutical Sciences, University of Shizuoka, Japan (Shimamura, *et al.*, 2006).

- That according to Deng, et al., (2010), "… there are important safety concerns associated with dietary supplements and foods rich in phytoestrogens, especially for breast cancer patients with hormone-sensitive disease. Based on current evidence, we propose recommendations for advising breast cancer patients, …"

- That, according to Nelles, Hu & Prins (2011), "Early work on the hormonal basis of prostate cancer focused on the role of androgens, but more recently estrogens have been implicated as potential agents in the development and progression of prostate cancer."

- That, according to Reger, *et al.*, (2016), "Experimental studies suggest that phytoestrogen intake alters cancer and cardiovascular risk. Some urinary phytoestrogens were associated with cardiovascular and all-cause mortality in a representative sample of 5 179 participants. This is one of the first studies that used urinary phytoestrogens as biomarkers of their dietary intake to evaluate the effect of these bioactive compounds on the risk of death from cancer and cardiovascular disease."

Position of the Cancer Association of South Africa (CANSA) Regarding Phytoestrogens and Individuals Diagnosed with a Hormone-Sensitive Cancer

CANSA, therefore, wishes to advise individuals diagnosed with the following hormone-sensitive cancers, namely: Breast Cancer, Ovarian Cancer, Endometrial Cancer, and Prostate Cancer, to:

- use caution before taking Rooibos tea and to discuss the issue around Rooibos tea consumption with their treating Oncologist prior to consuming Rooibos tea
- also use caution before taking the following high phytoestrogen-containing foods: all soy foods (including soybeans, tofu, miso, and tempeh); legumes (especially lentils, peanuts and chickpeas) and flaxseed-containing foods. Patients are advised to discuss consumption of the listed high phytoestrogen-containing foods with their treating Oncologist prior to consuming them.

Research on Foods High in Phytoestrogens and Breast Cancer
Chen, S.I., Tseng, H.T. & Hsieh< C.C. 2020.
"Accumulating evidence has shown that soy intake is associated with the promotion of health and prevention of cancers. However, the relationship between the intake of soy compounds and the risk of breast cancer is still debatable. In this study, we use mathematical models for assessing the impact of soy phytoestrogens and protein/peptide intervention on breast cancer development using the datasets acquired from a large number of published studies. We used data mining models, including the decision tree classification and association rule methods, to analyze 478 data collected from 201 research papers. The results indicated that the intervention of soy proteins and peptides, especially lunasin (LUN) and bowman-birk protease inhibitor (BBI), has a positive impact on different types of breast cancer, while the effects of soy phytoestrogens are inconsistent in breast cancer development. Among soy phytoestrogens, daidzein (DAI) exhibited the highest

negative impact on breast cancer, followed by coumestrol (COU), soysapogenol (SAP), genistein (GEN), and equol (EQ). With regard to the type of cancer, phytoestrogens should be carefully considered in estrogen receptor (ER)+ or progesterone receptor (PR)+ breast cancer. In the case of ER-, PR- or triple negative type, both soy categories can be used as auxiliary interventions. In summary, this is the first study to use data mining to explore the relationship between the intake of soy phytoestrogens or proteins/peptides and breast cancer development. Our findings indicate that soy intervention might reduce breast cancer development. However, the specific soy compound and cancer type should be considered before allocating a precise nutrient intervention."

Research Highlighting the Importance of Fruit and Vegetable Consumption by Breast Cancer Survivors

Women who eat a high amount of fruits and vegetables each day may have a lower risk of breast cancer, especially of aggressive tumours, than those who eat fewer fruits and vegetables, according to a new study led by researchers from Harvard T.H. Chan School of Public Health. In their findings, cruciferous vegetables such as broccoli, and yellow and orange vegetables, had a particularly significant association with lower breast cancer risk.

Research has found that women who ate more than 5.5 servings of fruits and vegetables each day had an 11% lower risk of breast cancer than those who ate 2.5 or fewer servings. (A serving is defined as one cup of raw leafy vegetables, half a cup of raw or cooked vegetables, or half a cup of chopped or cooked fruits.)

Buja, A., Pierbon, M., Lago, L., Grotto, F. & Baldo. V. 2020.
Introduction: Many studies have been published, but none have pooled the useful evidence available in the literature to produce guidelines and health policies promoting healthy eating styles to prevent breast cancer (BC). The present study aimed to summarize the evidence produced to date, taking a judicious, critical approach to the quality of the studies analyzed.
Methods: An umbrella review method was adopted, which is a systematic review of second-level studies, meta-analyses and literature reviews.
Results: In all, 48 studies were considered: 32 meta-analyses, 4 pooled analyses, 5 systematic reviews, and 7 qualitative reviews. A higher intake of total meat, or red or processed meats, or foods with a high glycemic index, or eggs would seem to be associated with a higher risk of BC. Some foods, such as vegetables, would seem instead to have an inverse association with BC risk. One meta-analysis revealed an inverse association between citrus fruit and mushroom consumption and BC. Some nutrients, such as calcium, folate, vitamin D, lignans and carotenoids, also seem to be inversely associated with BC risk. The evidence is still conflicting as concerns exposure to other dietary elements (e.g., polyunsaturated fatty acids, dairy foods).
Conclusion: Nutrition is one of the most modifiable aspects of people's lifestyles and dietary choices can affect health and the risk of cancer. Overall, adhering to a healthy eating style may be associated with a significant reduction in the risk of BC.

Research on The Role of Vitamins in Breast Cancer

Vitamin and mineral supplement use after a breast cancer diagnosis is common and controversial. Dosages used and the timing of initiation and/or discontinuation of supplements have not been clearly described. The role of vitamin supplements in preventing breast cancer still remains unclear. Although biologic mechanisms exist to support the anticancer effects of vitamins, there is no clear evidence for an effect in cancer prevention for vitamin supplements.

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Some research studies suggest a protective effect of B-vitamins on breast cancer risk. Research also suggests that women with low levels of vitamin D have a higher risk of breast cancer. Vitamin D may play a role in controlling normal breast cell growth and may be able to stop breast cancer cells from growing.

Morales-Suárez-Varela, M., Ruiz, S. A., Blanch, T.S., Pastor, C.I., Redondo, B.M., Peraita-Costa, I., Llopis-Morales, A. & Llopis-Gonzalez, A. 2020.
"Breast cancer is the most common tumor among women, representing the second cause of cancer deaths in women. Treatment with chemotherapy negatively interferes with nutritional status. The intake of vitamins before, during and after treatment in a pilot cohort of women with non-invasive breast cancer (type I, II) treated at the Valencian Institute of Oncology (IVO) is evaluated. A 3-day anthropometric and nutritional assessment was performed using the DIAL program. Nutritional intake is compared with the values of Estimated Average Requirements (EAR) and Dietary Reference Intake (DRI) provided by the United States Department of Agriculture (USDA) and the European Food Safety Authority (EFSA). There is an overall decrease in vitamin intake during treatment which worsens at the end of said treatment. The decrease is significant in the case of vitamins B_2 ($p = 0.006$), B_3 ($p = 0.042$), B_5 ($p = 0.001$), and B_8 ($p = 0.021$). The relative risk during and after treatment increases with respect to the reference timeframe, before treatment. Deficit risks are statistically significant in the case of vitamins B_5 ($p = 0.001$), B_8 ($p = 0.001$) and B_{12} ($p = 0.001$). Decreased vitamin intake during treatment suggests a negative change in the patients' dietary behaviors during this time. Nutritional intervention and support may be beneficial to optimize overall dietary intake and maintain compliance with EAR and DRI for patients during a time in which adequate nutrition is important."

Research on the Implications for Breast Cancer Survivors Who fail to Adhere to Nutritional Guidelines
Diet is thought to be partly responsible for about 30% to 40% of all cancers. No food or diet can prevent one from getting breast cancer. But some foods can make one's body the healthiest it can be, boost one's immune system, and help keep one's risk for breast cancer as low as possible. Research has shown that getting the nutrients one needs from a variety of foods, especially fruits, vegetables, legumes, and whole grains, can make one feel one's best and give one's body the energy it needs.

Eating food grown without pesticides may protect against unhealthy cell changes associated with pesticide use in animal studies. Breast cancer is less common in countries where the typical diet is plant-based and low in total fat (polyunsaturated fat and saturated fat).

Springfield, S., Odoms-Young, A., Tussing-Humphreys, L., Freels, S. & Stolley, M. 2019.
PURPOSE: The American Cancer Society (ACS) and the American Institute for Cancer Research (AICR) each created dietary and physical activity guidelines to improve cancer survivorship. Despite African American breast cancer survivors (AABCS) having the lowest survival rates of any racial or ethnic group, limited information exists on their adherence to cancer-specific lifestyle recommendations. The study's purpose was to measure adherence to ACS/AICR dietary recommendations in AABCS.
METHODS: Two hundred ten AABCS enrolled in the Moving Forward intervention trial, a randomized, community-based, 6-month weight loss study, were assessed for socio-demographics, dietary intake (via food frequency questionnaire), and related health factors at baseline. We operationalized the dietary recommendations put forth by ACS/AICR and created component and total adherence index scores. Descriptive statistics were used to calculate the proportion of women who met recommendations. Student's t test and χ2 tests were used to compare participant characteristics by median adherence scores.

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RESULTS: The mean total ACS/AICR score was 12.7 ± 2.5 out of 21 points (median, 13; range, 5 to 21). Over 90% were moderately or completely adherent to limiting alcohol and red & processed meat consumption, but the majority failed to meet the other recommendations to eat whole grains, legumes, fruits, vegetables, and avoid added sugars. Women with total scores below the median were younger, with higher BMI, had fewer years of education, and lower income levels.

IMPLICATIONS FOR CANCER SURVIVORS: The present study extends the literature on AABCS adherence to cancer survivor-specific dietary guidelines. Findings will inform future dietary lifestyle interventions in this population.

Research on Sugar Consumption and Breast Cancer

Scientific studies indicate that younger and older women (possibly pre- and post-menopausal women) differ with respect to correlation as far as sugar consumption is concerned. In older women a strong correlation was found between breast cancer mortality and sugar consumption (correlation coefficient = 0.9), and a weaker correlation, possibly of marginal interest, with fat consumption (correlation coefficient = 0.7). In younger women the correlation with diet seems weak. A possible connecting link between sugar consumption and breast cancer is insulin. This is an absolute requirement for the proliferation of normal mammary tissue and experimental mammary tumours may regress in its absence. Insulin secretion occurs in response to blood glucose level and could be excessive if the regulatory mechanism is overtaxed by large sugar intake. The same mechanism might account for the increased risk of mammary cancer in diabetics.

Debras, C., Chazelas, E., Srour, B., Kesse-Guyot, E., Julia, C., Zelek, L., Agaësse, C., Druesne-Pecollo, N., Galan, P., Hercberg, S., Latino-Martel, P., Deschasaux, M. & Touvier, M. 2020.

Background: Excessive sugar intake is now recognized as a key risk factor for obesity, type 2 diabetes, and cardiovascular diseases. In contrast, evidence on the sugar-cancer link is less consistent. Experimental data suggest that sugars could play a role in cancer etiology through obesity but also through inflammatory and oxidative mechanisms and insulin resistance, even in the absence of weight gain.

Objective: The objective was to study the associations between total and added sugar intake and cancer risk (overall, breast, and prostate), taking into account sugar types and sources.

Methods: In total, 101,279 participants aged >18 y (median age, 40.8 y) from the French NutriNet-Santé prospective cohort study (2009-2019) were included (median follow-up time, 5.9 y). Sugar intake was assessed using repeated and validated 24-h dietary records, designed to register participants' usual consumption for >3500 food and beverage items. Associations between sugar intake and cancer risk were assessed by Cox proportional hazard models adjusted for known risk factors (sociodemographic, anthropometric, lifestyle, medical history, and nutritional factors).

Results: Total sugar intake was associated with higher overall cancer risk (n = 2503 cases; HR for quartile 4 compared with quartile 1: 1.17; 95% CI: 1.00, 1.37; Ptrend = 0.02). Breast cancer risks were increased (n = 783 cases; HRQ4vs.Q1 = 1.51; 95% CI: 1.14, 2.00; Ptrend = 0.0007). Results remained significant when weight gain during follow-up was adjusted for. In addition, significant associations with cancer risk were also observed for added sugars, free sugars, sucrose, sugars from milk-based desserts, dairy products, and sugary drinks (Ptrend ≤ 0.01).

Conclusions: These results suggest that sugars may represent a modifiable risk factor for cancer prevention (breast in particular), contributing to the current debate on the implementation of sugar taxation, marketing regulation, and other sugar-related policies. This trial was registered at clinicaltrials.gov as NCT03335644.

Research on Obesity and Breast Cancer Risk

One's risk of developing breast cancer increases if one is overweight or obese after the menopause. The menopause is when one stops having periods and are not able to get pregnant naturally. Putting on weight throughout adulthood also increases one's risk of developing breast cancer after the menopause. The more weight one gains over the course of adult life, the higher the risk. Being obese when diagnosed with breast cancer can increase the risk that the cancer will recur (come back after treatment). It can also reduce one's chances of surviving the disease.

Hillers-Ziemer, L.E. & Arendt, L.M. 2020.

"Obesity is a preventable risk factor for breast cancer following menopause. Regardless of menopausal status, obese women who develop breast cancer have a worsened prognosis. Breast tissue is comprised of mammary epithelial cells organized into ducts and lobules and surrounded by adipose-rich connective tissue. Studies utilizing multiple in vivo models of obesity as well as human breast tissue have contributed to our understanding of how obesity alters mammary tissue. Localized changes in mammary epithelial cell populations, elevated secretion of adipokines and angiogenic mediators, inflammation within mammary adipose tissue, and remodeling of the extracellular matrix may result in an environment conducive to breast cancer growth. Despite these significant alterations caused by obesity within breast tissue, studies have suggested that some, but not all, obesity-induced changes may be mitigated with weight loss. Here, we review our current understanding regarding the impact of obesity on the breast microenvironment, how obesity-induced changes may contribute to breast tumor progression, and the impact of weight loss on the breast microenvironment."

Research on Consumption of Milk and Breast Cancer Risk

Fraser, G.E., Jaceldo-Siegl, K., Orlich, M., Mashchak, A., Sirirat, R. & Knutsen, S. 2020.

Background: Associations between soy, dairy intakes and breast cancer risk are inconsistent. No studies exist with large numbers of dairy consumers and soy consumers to assess mutual confounding.

Methods: The study cohort contains 52 795 North American women, initially free of cancer, followed for 7.9 years (29.7% were Black). Dietary intakes were estimated from food frequency questionnaires and, for 1011 calibration study subjects, from six structured 24-h dietary recalls. Incident invasive breast cancers were detected mainly by matching with cancer registries. Analyses used multivariable proportional hazards regression.

Results: The participants (mean age of 57.1 years) experienced 1057 new breast cancer cases during follow-up. No clear associations were found between soy products and breast cancer, independently of dairy. However, higher intakes of dairy calories and dairy milk were associated with hazard ratios (HRs) of 1.22 [95% confidence interval (CI): 1.05-1.40] and 1.50 (95% CI 1.22-1.84), respectively, comparing 90th to 10th percentiles of intakes. Full fat and reduced fat milks produced similar results. No important associations were noted with cheese and yogurt. Substituting median intakes of dairy milk users by those of soy milk consumers was associated with HR of 0.68 (95% CI: 0.55-0.85). Similar-sized associations were found among pre- and post-menopausal cases, with CIs also excluding the null in estrogen receptor (ER+, ER-), and progesterone receptor (PR+) cancers. Less biased calibrated measurement-error adjusted regressions demonstrated yet stronger, but less precise, HRs and CIs that still excluded the null.

Conclusions: Higher intakes of dairy milk were associated with greater risk of breast cancer, when adjusted for soy intake. Current guidelines for dairy milk consumption could be viewed with some caution.

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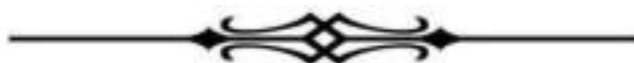
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