

THE RELATIONSHIP BETWEEN DIET AND BREAST CANCER RISK: A REVIEW OF THE LITERATURE

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Abstract

Breast cancer is a common cancer that causes a high mortality rate in women. There are risk factors for breast cancer that cannot be changed and those that can be changed. Diet plays an important role as a modifiable risk factor in preventing breast cancer. An unhealthy diet is one of the factors that trigger breast cancer. Conversely, a healthy diet can help reduce the risk of breast cancer. To determine the relationship between diet and breast cancer risk. Literature review with reference to articles through the online database, Pubmed, with the keywords diet AND dietary AND food AND nutrition AND breast cancer AND risk factor published in 2013-2023. Identified 11 articles showed an association between diet and breast cancer risk. Articles found that diets rich in fruits, vegetables, soy, cheese were associated with a reduced risk of breast cancer, whereas high consumption of dairy, sugar, fat, alcohol was associated with an increased risk of breast cancer. It was also found that diets rich in poultry, fish, eggs, fruit juice, milk (<450 g/day), yogurt, whole grains, nuts, had no association with cancer risk. Diet has an effect on breast cancer.

Keyword: diet, nutrition, breast cancer, risk factor

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1. Introduction

Breast cancer is one type of cancer that often occurs and results in a high number of deaths in women. Data from the Global Cancer Observatory 2020 shows that breast cancer is the most common cancer in women. New cases of breast cancer in 2020 reached 2.26 million people and the death rate reached 684,966 people worldwide [1]. Breast cancer is more common in high-income countries (571/100,000) than in low-income countries [2]. In Indonesia, breast cancer is the most common cancer in women with new cases reaching 65,858 people in 2020 and the death rate reaching 22,430 people [3].

In developed countries, lifestyle changes, delayed age of marriage, delayed first child, late-night work schedules, and hormonal replacement therapy are the main risk factors for the development of breast cancer. Whereas in developing countries, the main reasons for the high incidence and mortality of breast cancer are lack of awareness or knowledge about the disease, inappropriate screening programs, delayed diagnosis, and inadequate medical facilities [2].

There are unchangeable and changeable risk factors for breast cancer. Unchangeable factors include older age (>65 versus <65 years), genetic factors,

early menarche (<12 years), late menopause (>55 years), age of first pregnancy over 30 years, infertility no history of breastfeeding, and not having children [4]. Meanwhile, modifiable risk factors such as increased alcohol consumption, lack of physical activity, use of exogenous hormones, and certain female reproductive factors, such as pregnancy and age at first delivery [5].

The potential of diet on breast cancer risk has been investigated in a large number of epidemiologic studies, but the specific relationship between certain food groups and breast cancer risk is relatively inconsistent [5]. Thus, the aim of this literature review is to provide an overview of the relationship between diet and breast cancer risk.

2. Method

The research method used in this study uses a literature review research design. A literature review is a method used to collect data or sources related to a topic obtained from various sources, including articles, books, the internet, and other literature [6]. The data used in the literature review is secondary data obtained not from direct observation, but from previous research results [7].

Articles were searched through the online database, PubMed, with the keywords diet AND dietary AND food AND nutrition AND breast cancer AND risk factor published in 2013-2023. Inclusion criteria included articles in Indonesian or English, examining the relationship between diet and breast cancer risk. Exclusion criteria were not full text, discussing cancer types other than breast cancer. Data extracted included, author, year of publication, title, purpose, method, sample, and results.

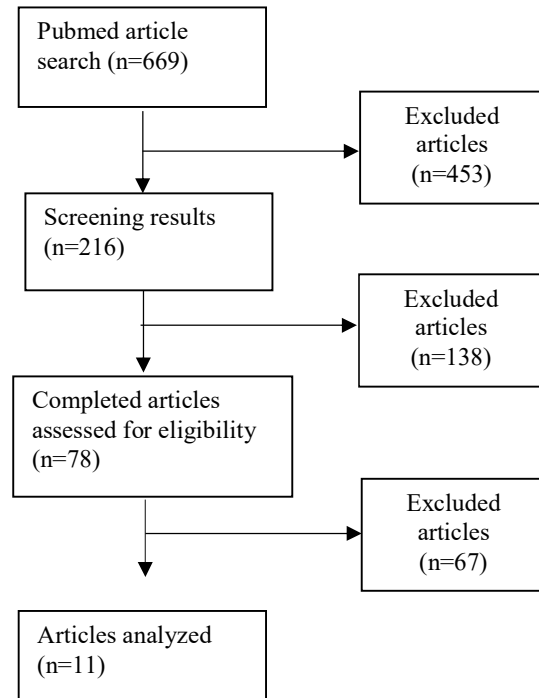


Figure 1. Article Search Diagram

The article selection process for this literature review was conducted through four main stages. In the first stage, a total of 669 articles were obtained from the PubMed database. After removing 453 duplicate articles, 216 articles were left for the next stage of selection. In the second stage, articles were assessed based on the title and abstract, resulting in 138 articles that were eliminated due to irrelevance to the research topic, for example, articles discussing other diseases or different interventions. Next, 78 articles proceeded to the third stage, where 67 articles were excluded because they did not meet the inclusion criteria or did not have sufficient data on diet. Finally, in the fourth stage, 11 articles that met all selection criteria were included in the literature review analysis.

3. Results and Discussion

Table 1. Journal search results

No.	Author(s), Year	Article Title	Objective	Methods, Samples	Research Results
1.	Asma Kazemi, Reza Barati-Boldaji, Sepideh Soltani, Nazanin Mohammadipoor, Zahra Esmacilinezhad, Cian C T Clark, Siavash Babajafari, and Marzieh Akbarzadeh (2020)	<i>Intake of Various Food Groups and Risk of Breast Cancer: A Systematic Review and Dose-Response Meta-Analysis of Prospective Studies</i>	To summarize the relationship between food types and breast cancer risk	<i>Systematic Review dan Meta-Analysis</i>	The findings showed that high intake of fruits, vegetables, soy, and cheese and low intake of red meat and processed meat were associated with a reduced risk of breast cancer. There was no association between poultry, fish, eggs, fruit juice, milk, dairy (<450 g/day), yogurt, grains, legumes, and nuts consumption and breast cancer risk, while milk consumption in amounts greater than 450 g/day was associated with an increased risk [5].
2.	Bahareh Sasanfar, Fatemeh Toorang, Elham Mohebbi2, Kazem Zendehdel2, and Leila Azadbakht (2021)	<i>Dietary carbohydrate quality and risk of breast cancer among women</i>	To study the association between carbohydrate quality index and overall breast cancer risk and menopausal status	<i>Case-control study</i> 461 case group women (diagnosed with breast cancer) 495 apparently healthy controls	Results showed stratification analysis based on menopausal status, premenopausal women in the highest glycemic index (GI) quartile had 1.85 times higher odds of developing breast cancer than women in the lowest quartile (95% CI: 1.12, 3.07, P=0.01). Research showed that women with the highest carbohydrate quality index (CQI) had lower odds of developing breast cancer, compared to women with the lowest CQI (0.63; 95% CI: 0.43-0.94, P=0.03) [8].
3.	Shang Cao, Shurong Lu, Jinyi Zhou, Zheng Zhu, Wei Li, Jian Su, Hao Yu, Wencong Du, Lan Cui, Yunqiu Dong, Yun Qian, Ming Wu, and Pingmin Wei (2021)	<i>Association between dietary patterns and risk of breast cancer in Chinese female population: a latent class analysis</i>	To determine whether certain dietary patterns are associated with breast cancer risk in Chinese women	<i>Case-control study</i> 695 case group women 804 control group women	Four dietary patterns were identified, namely Prudent, Chinese traditional, Western and Picky. The Picky diet was characterized by a higher extreme probability of not consuming certain foods, the highest probability of consuming pickled foods, and the lowest probability of consuming cereals, soy foods, and legumes. Compared to the Prudent class, the Picky class was associated with a higher risk (OR = 1-42, 95% CI 1-06, 1-90). The Western diet tends to consume high-protein, high-fat and high-sugar foods, and the traditional Chinese diet characterized by typical consumption of soy foods and white meat rather than red meat, both

					showed no difference in breast cancer risk compared to the Prudent class [9].
4.	Suhaina Sulaiman, Mohd Razif Shahril, Sharifah Wajihah Wafa, Soraya Hanie Shaharudin, Sharifah Noor Akmal Syed Hussin (2014)	<i>Dietary Carbohydrate, Fiber and Sugar and Risk of Breast Cancer According to Menopausal Status in Malaysia</i>	To determine the association of premenopausal and postmenopausal breast cancer risk with carbohydrate, fiber, and sugar intake.	<i>Case-control study</i> 382 case group women (diagnosed with breast cancer) 382 control group women	A significant doubling of breast cancer risk among premenopausal (OR Q4 to Q1=1.93) and postmenopausal (OR Q4 to Q1=1.87) was observed in the highest sugar quartile. Higher dietary fiber intake was associated with significantly lower breast cancer risk in premenopausal (OR Q4 to Q1 =0.31) and postmenopausal women (OR Q4 to Q1 =0.23). Sugar and dietary fiber intake were independently associated with breast cancer risk before and after menopause. However, no association was observed for dietary carbohydrate intake [10].
5.	Behjat Marzbani, Javad Nazari, Farid Najafi, Behnaz Marzbani, Sara Shahabadi, Mahin Amini, Mehdi Moradinazar, Yahya Pasdar, Ebrahim Shakiba, Saeed Amini (2019)	<i>Dietary patterns, nutrition, and risk of breast cancer: a case-control study in the west of Iran</i>	To assess the association between diet and breast cancer risk in women under 50 years old in western Iran.	<i>Case-control study</i> 620 women (212 cases and 408 controls)	Results showed fried foods 4.5 times increased the risk of breast cancer (OR=4.5). A dose-response model showed that increasing vegetable and fruit consumption to 90 servings per month decreased the likelihood of developing breast cancer, but consuming more than 90 servings per month increased the risk. Lack of vegetable consumption and consumption of soft drinks, industrially produced juices, fried foods, and sugary foods were identified as risk factors for breast cancer [11].
6.	Yunjun Xiao, Junjie Xia, Liping Li, Yuebin Ke, Jinquan Cheng, Yaojie Xie, Winnie Chu, Polly Cheung, Jean Hee Kim, Graham A. Colditz, Rulla M. Tamimi ⁸ , and Xuefen Su (2019)	<i>Associations between dietary patterns and the risk of breast cancer: a systematic review and meta-analysis of observational studies</i>	Examining the relationship between different dietary patterns and breast cancer risk	<i>Meta-analysis</i> 32 articles 14 cohort studies and 18 case-control studies	The pooled analysis found that a Western diet was associated with a 14% increased risk, while a prudent diet was associated with an 18% decreased risk of breast cancer [12].

7.	Maedeh Mozafarinia, Bahareh Sasanfar, Fatemeh Toorang, Amin Salehi-Abargouei, and Kazem Zendehdel (2021)	<i>Association between dietary fat and fat subtypes with the risk of breast cancer in an Iranian population: a case-control study</i>	To examine the relationship between dietary fat intake and breast cancer progression	<i>Case-control study</i> 473 cases (309 pre and 158 postmenopausal women) 501 controls (326 pre and 165 postmenopausal women)	Individuals with the highest quartile of total fat intake and polyunsaturated fatty acid (PUFA) intake had a 1.50 times greater risk of developing breast cancer than others. Significant positive associations were observed between animal fat (OR=1.89), saturated fatty acid (SFA) (OR=1.70), monounsaturated fatty acid (MUFA) (OR=1.85,) and PUFA intake (OR=2.12) with breast cancer risk in postmenopausal women. However, no association occurred in premenopausal women [13].
8.	Fatemeh Pourhabibi-Zarandi, Masoud Amini Kahrizsangi, Sevdas Eskandarzadeh, Fatemeh Mansouri, Mohebat Vali, Saba Jalali, Zeinab Heidari, Zainab Shateri, Mehran Nouri, and Bahram Rashidkhani (2023)	<i>Dietary quality index and the risk of breast cancer: a case-control study</i>	Identify the association of dietary quality, assessed using the Diet Quality Index International (DQI-I) with breast cancer	<i>Case-control study</i> 134 case group women (newly diagnosed breast cancer) 267 control group women (without breast cancer)	Results showed a significant association between the last tertile of DQI-I and the odds of breast cancer in the fully adjusted model (OR = 0.30). Subgroup analysis by menopausal status also showed a significant decrease in the OR of breast cancer in pre-menopausal (OR = 0.27) and post-menopausal (OR = 0.35) women. This study suggests that higher DQI-I scores are associated with lower odds of breast cancer. According to this study, a healthy diet is essential for breast cancer prevention [14].
9.	Somaye Rigi, Seyed Mohammad Mousavi, Sanaz Benisi Kohansal, Leila Azadbakht, dan Ahmad Esmailzadeh (2021)	<i>The association between plant based dietary patterns and risk of breast cancer: a case-control study</i>	Examining the relationship between overall PDI (plant based diet index), healthy hypothesis (hPDI) and unhealthy hypothesis (uPDI) with breast cancer	<i>Case-control study</i> 350 case group women (newly diagnosed with breast cancer) 700 control group	The results showed that respondents in the highest PDI quartile had 67% lower odds of breast cancer than those in the lowest quartile. Respondents with the highest adherence to hPDI were 36% less likely to develop breast cancer than individuals with the lowest adherence. Within the uPDI, women in the upper quartile were 2.23 times more likely to develop breast cancer than women in the lower quartile (OR 2.23) [15].

			in women in Iran.	women (healthy)	
10.	Luan Miranda de Godoy, Marina Alves PinheiroI, Jordana Carolina Marques Godinho-MotaI, Larissa Vaz-GonçalvesII, Raquel Machado SchincagliaIII, Karine Anusca MartinsI, Luciana Bronzi de Souza (2022)	<i>Diet quality index and its components have not associated with the development of breast cancer risk assessed by the diet quality index: a case-control study</i>	Knowing the association of diet quality and its components with breast cancer risk	<i>Case-control study</i> 114 case group women (diagnosed with breast cancer) 218 control group women	Results showed BHEI-R (Brazilian Healthy Eating Index Revised) scores, showing no difference between groups in the lowest quartile of diet quality (p=0.853). The components of total cereals (p=0.038), saturated fat (p=0.039) and Gord_AA (fat, alcohol and added sugar) (p=0.023) had higher scores among the case group. Total fruits (p=0.010) and milk and dairy products (p=0.039) scores were higher in the control group. Dietary quality, as assessed by the BHEI-R and its components, was not associated with breast cancer [16].
11.	Heba Mohammed Arafat, Julia Omar, Noorazliyana Shafii, Ihab Ali Naser, Nahed Ali Al Laham, Rosediani Muhamad, Tengku Ahmad Damitri Al-Astani, Ashraf Jaber Shaqaliah, Ohood Mohammed Shamallakh, Kholoud Mohammed Shamallakh and Mai Abdel Haleem Abusalah (2023)	<i>The association between breast cancer and consumption of dairy products: a systematic review</i>	Identify the relationship between dairy food consumption and breast cancer development	<i>Systematic review</i> 18 observational studies	Results showed an inconsistent association between dairy food intake and breast cancer incidence. The findings of the systematic review showed that dairy consumption was negatively and significantly associated with the development of breast cancer reported in six studies. In contrast, only one study showed a positive association and five studies showed no association. Consumption of milk or other dairy products was not strongly associated with breast cancer progression [17].

A review of the literature shows that a high intake of fruits and vegetables is associated with a reduced risk of breast cancer [5]. Consuming up to 90 servings of fruits and vegetables per month may reduce the chance of developing breast cancer, but consuming more than 90 servings per month increases the risk [11]. Consuming fruits and vegetables may also reduce the risk of overweight and obesity, which are significant risk factors for breast cancer in women [18]. Fruits are generally high in polyphenols, which make them highly antioxidant and can help reduce cancer risk through various mechanisms, such as inhibiting tumor cell proliferation, migration, metastasis, and angiogenesis, inducing apoptosis and cell cycle arrest, and making tumor cells more sensitive to radiotherapy and chemotherapy. Some fruits, such as pomegranate, mangosteen, and citrus fruits, have shown inhibition against breast cancer cells [19].

Consumption of yellow/orange vegetables, cruciferous vegetables, green leafy vegetables and fruits and vegetables rich in vitamin C, α -carotene and β -carotene are associated with lower breast cancer incidence. Vegetable types including pumpkin, broccoli, cabbage and cauliflower with higher intakes were significantly associated with lower breast cancer incidence [20]. According to a meta-analysis, intake of cruciferous vegetables, such as broccoli, cauliflower, watercress, and brussels sprouts may reduce cancer risk. Experimental research shows cruciferous vegetables have anti-breast cancer effects, which may be due to their high glucosinolate content. When vegetables are cut or chewed, the enzyme myrosinase is released, and glucosinolates will degrade to form isothiocyanates. Isothiocyanates include various compounds such as benzyl isothiocyanate, phenethyl isothiocyanate, and sulforaphane, and have long been known to have chemopreventive activity for various neoplasms including breast cancer. In addition, indole-3-carbinol in cruciferous vegetables and its metabolite

3,30-diindolylmethane also exhibit anti-breast cancer effects [19].

The intake of red meat or processed meat is believed to increase the risk of breast cancer. This is due to the presence of carcinogenic compounds, such as Nnitroso compounds, heterocyclic amines, and polycyclic aromatic hydrocarbons in meat that can cause breast cancer. In addition, inflammation and oxidative stress may arise from animal fats and iron-enriched red meat [21]. In line with the reviewed article, low intake of red meat and processed meat is associated with a reduced risk of breast cancer [5]. A study also showed that red meat consumption may increase the risk of invasive breast cancer, whereas poultry consumption is associated with a reduced risk. Substituting poultry meat consumption for red meat may reduce the risk of breast cancer [22].

Intake of total dietary fat and fat sub-types is associated with breast cancer risk, particularly in menopausal women. A review of peer-reviewed articles showed the highest total fat intake had a 1.50 times greater risk of breast cancer than women with the lowest fat intake. Therefore, the amount of total fat and fatty acids in the diet needs to be carefully recommended to reduce the risk of breast cancer [13]. Several studies provide preclinical evidence suggesting that a high-fat diet induces deposition of breast adipose tissue and that obesity exerts a pro-inflammatory response that creates a favorable microenvironment for breast cancer carcinogenesis [23].

There have been many studies on the relationship between dairy consumption and breast cancer risk, but the results are inconsistent. The anticarcinogenic characteristics of calcium, vitamin D, and lactoferrin are said to support the basic theory that a dairy diet reduces breast cancer risk. These compounds are mostly found in dairy products, and research suggests that they may help reduce the risk of breast cancer. Conversely, dairy consumption is also associated with a higher chance of developing breast cancer. High

consumption of dairy products may indicate greater consumption of dietary fat, particularly saturated fat, which is associated with a higher risk of breast cancer [17]. A study showed that dairy foods, especially milk, are associated with an increased risk of breast cancer, and showed a reduced risk when replacing soy milk with an equivalent amount of milk [24].

Many studies have shown that intake of foods with a high glycemic index also plays an important role in the etiology of several cancers including breast cancer. Diets with a higher glycemic index can increase blood glucose and insulin concentrations which are both associated with cancer development [8]. Previously reviewed articles showed that no significant association was found between carbohydrate intake and breast cancer risk. However, higher sugar intake has the potential to significantly increase breast cancer risk [10].

A higher intake of soy foods will help lower the risk of breast cancer. Soy is an important source of vegetable protein. Its positive effect on breast cancer risk and breast cancer survival is due to its content of isoflavones, phytoestrogens and selective estrogen receptor modulators [21]. Isoflavones work similar to how estrogen acts on organs by binding and activating estrogen receptors resulting in decreased estrogen production. Soy isoflavones have been shown to reduce breast cancer cell growth through inhibition of these estrogen receptors [25].

4. Conclusion

In this literature review, 11 articles were analyzed. The results of the analysis show that there are several diets that increase the risk of breast cancer and there are also diets that reduce the risk factors for breast cancer. Types of foods that can increase the risk of breast cancer based on literature review include red meat, fat, sugar. While the types of foods that can reduce the risk of breast cancer include vegetables and fruits, milk, soy.

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6. References

- [1] who. Cancer Fact Sheets [Internet]. Cancer Fact Sheets. 2020. Tersedia pada: <https://gco.iarc.fr/today/data/factsheets/cancers/20-Breast-fact-sheet.pdf>
- [2] Kashyap D, Pal D, Sharma R, Garg VK, Goel N, Koundal D, dkk. Global Increase in Breast Cancer Incidence: Risk Factors and Preventive Measures. Teekaraman Y, editor. BioMed Research International. 2022;2022:1–16.
- [3] WHO. Cancer today (Estimated Number of New Cases in 2020, Indonesia) [Internet]. 2020 [dikutip 7 Desember 2022]. Tersedia pada: <http://gco.iarc.fr/today/home>
- [4] De Cicco P, Catani MV, Gasperi V, Sibilano M, Quaglietta M, Savini I. Nutrition and Breast Cancer: A Literature Review on Prevention, Treatment and Recurrence. *Nutrients*. 2019;11(7):1514.
- [5] Kazemi A, Barati-Boldaji R, Soltani S, Mohammadipoor N, Esmailinezhad Z, Clark CCT, dkk. Intake of Various Food Groups and Risk of Breast Cancer: A Systematic Review and Dose-Response Meta-Analysis of Prospective Studies. *Advances in Nutrition*. 2021;12(3):809–49.
- [6] Syabariyah S, Anesti R. Efektivitas Pemberian Vitamin D Terhadap Peningkatan Daya Tubuh: Tinjauan Literatur. *BIKK*. 2023;2(03):117–28.
- [7] Nursalam. *Metodologi Penelitian Ilmu Keperawatan Pendekatan Praktis*. Selemba Medika; 2016.
- [8] Sasanfar B, Toorang F, Mohebbi E, Zendehdel K, Azadbakht L. Dietary carbohydrate quality and risk of breast cancer among women. *Nutr J*. 2021;20(1):93.

- [9] Cao S, Lu S, Zhou J, Zhu Z, Li W, Su J, dkk. Association between dietary patterns and risk of breast cancer in Chinese female population: a latent class analysis. *Public Health Nutr.* 2021;24(15):4918–28.
- [10] Sulaiman S, Shahril MR, Wafa SW, Shaharudin SH, Hussin SNAS. Dietary Carbohydrate, Fiber and Sugar and Risk of Breast Cancer According to Menopausal Status in Malaysia. *Asian Pacific Journal of Cancer Prevention.* 2014;15(14):5959–64.
- [11] Marzbani B, Nazari J, Najafi F, Marzbani B, Shahabadi S, Amini M, dkk. Dietary patterns, nutrition, and risk of breast cancer: a case-control study in the west of Iran. *Epidemiol Health.* 2019;41:e2019003.
- [12] Xiao Y, Xia J, Li L, Ke Y, Cheng J, Xie Y, dkk. Associations between dietary patterns and the risk of breast cancer: a systematic review and meta-analysis of observational studies. *Breast Cancer Res.* 2019;21(1):16.
- [13] Mozafarinia M, Sasanfar B, Toorang F, Salehi-Abargouei A, Zendehdel K. Association between dietary fat and fat subtypes with the risk of breast cancer in an Iranian population: a case-control study. *Lipids Health Dis.* 2021;20(1):138.
- [14] Pourhabibi-Zarandi F, Kahrizsangi MA, Eskandarzadeh S, Mansouri F, Vali M, Jalali S, dkk. Dietary quality index and the risk of breast cancer: a case-control study. *BMC Women's Health.* 1 September 2023;23(1):469.
- [15] Rigi S, Mousavi SM, Benisi-Kohansal S, Azadbakht L, Esmailzadeh A. The association between plant-based dietary patterns and risk of breast cancer: a case-control study. *Sci Rep [Internet].* 9 Februari 2021 [dikutip 11 Desember 2024];11(1):3391. Tersedia pada: <https://www.nature.com/articles/s41598-021-82659-6>
- [16] Godoy LM de, Pinheiro MA, Godinho-Mota JCM, Vaz-Gonçalves L, Schincaglia RM, Martins KA, dkk. Diet quality index and its components have not associated with the development of breast cancer risk assessed by the diet quality index: a case-control study. *Rev bras epidemiol.* 2022;25:e220027.
- [17] Arafat HM, Omar J, Shafii N, Naser IA, Al Laham NA, Muhamad R, dkk. The association between breast cancer and consumption of dairy products: a systematic review. *Annals of Medicine [Internet].* 12 Desember 2023 [dikutip 11 Desember 2024];55(1):2198256. Tersedia pada: <https://www.tandfonline.com/doi/full/10.1080/07853890.2023.2198256>
- [18] Socha M, Sobiech KA. Eating Habits, Risk of Breast Cancer, and Diet-Dependent Quality of Life in Postmenopausal Women after Mastectomy. *JCM.* 2022;11(15):4287.
- [19] Li Y, Li S, Meng X, Gan RY, Zhang JJ, Li HB. Dietary Natural Products for Prevention and Treatment of Breast Cancer. *Nutrients [Internet].* 8 Juli 2017;9(7):728. Tersedia pada: <https://www.mdpi.com/2072-6643/9/7/728>
- [20] Farvid MS, Chen WY, Rosner BA, Tamimi RM, Willett WC, Eliassen AH. Fruit and vegetable consumption and breast cancer incidence: Repeated measures over 30 years of follow-up. *Intl Journal of Cancer.* 2019;144(7):1496–510.
- [21] Dong H, Kong X, Wang X, Liu Q, Fang Y, Wang J. The Causal Effect of Dietary Composition on the Risk of Breast Cancer: A Mendelian Randomization Study. *Nutrients.* 2023;15(11):2586.

- [22] Lo JJ, Park YM, Sinha R, Sandler DP. Association between meat consumption and risk of breast cancer: Findings from the Sister Study. *Intl Journal of Cancer*. 2020;146(8):2156–65.
- [23] Uhomoibhi TO, Okobi TJ, Okobi OE, Koko JO, Uhomoibhi O, Igbinosun OE, dkk. High-Fat Diet as a Risk Factor for Breast Cancer: A Meta-Analysis. *Cureus*. 8 Desember 2022;
- [24] Fraser GE, Jaceldo-Siegl K, Orlich M, Mashchak A, Sirirat R, Knutsen S. Dairy, soy, and risk of breast cancer: those confounded milks. *International Journal of Epidemiology*. 2020;49(5):1526–37.
- [25] Boutas I, Kontogeorgi A, Dimitrakakis C, Kalantaridou SN. Soy Isoflavones and Breast Cancer Risk: A Meta-analysis. *In Vivo*. 2022;36(2):556–62.