SUPPORTING INFORMATION

Post-diagnosis dietary factors, supplement use and breast cancer prognosis: Global Cancer Update Programme (CUP Global) systematic literature review and meta-analysis

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APPENDIX 1

Supplementary Table S1. PRISMA checklist

PRISMA Checklist 2009			
Section/topic	**#**	**Checklist item**	**Reported on page #**
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	4
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	5
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Supplementary Material
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	5
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	5
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	5
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	5-6, and Supplementary Material

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097 For more information, visit: www.prisma-statement.org.

Supplementary Table 1 PRISMA Checklist 2009

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	6 and supplementary material
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	6 and supplementary material
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	6 and Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	6-12, and Supplementary tables S4-S22
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	SLR published online
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	6-12, and Supplementary material
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	6-12, and Supplementary material
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	-
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	12
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	13-15, and Table 1
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	16-17
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	13-15
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	18-19

Supplementary Table S2A. Search terms used for PubMed

a. Searching for mortality, survival, recurrence, second cancer

1. Recurrence [MeSH Terms] OR “Neoplasm Recurrence, Local” [MeSH Terms] OR “Disease Progression”[MeSH Terms] OR “Disease-Free Survival”[MeSH Terms] OR Mortality[MeSH Terms] OR Mortality [Subheading] OR “Survival Analysis” [MeSH Terms] OR recurrence [tiab] OR recurrences [tiab] OR relapse [tiab] OR relapses [tiab] OR survivor [tiab] OR survivors [tiab] OR progression [tiab] OR survival [tiab] OR mortality [tiab] OR death [tiab] OR second cancer [tiab]

b. Searching for studies on breast cancer

(Search terms are those tested in the SLR for the WCRF Second Expert Report and the CUP)

2. Breast Neoplasms [MeSH Terms]

3. Breast AND (cancer* OR neoplasm* OR tumor* OR tumor* OR carcinoma* OR adenocarcinoma*)

4. mammary AND (cancer* OR neoplasm* OR tumor* OR tumor* OR carcinoma* OR adenocarcinoma*)

5. #2 OR #3 OR #4

c. Search for all studies relating to diet, body fatness and physical activity

6. diet therapy[MeSH Terms] OR nutrition[MeSH Terms]

7. diet[tiab] OR diets[tiab] OR dietetic[tiab] OR dietary[tiab] OR eating[tiab] OR

intake[tiab] OR nutrient*[tiab] OR nutrition[tiab] OR vegetarian*[tiab] OR vegan*[tiab]

OR "seventh day adventist"[tiab] OR macrobiotic[tiab]

8. “food and beverages” [MeSH Terms]

9. food*[tiab] OR cereal*[tiab] OR grain*[tiab] OR granary[tiab] OR

wholegrain[tiab] OR wholewheat[tiab] OR roots[tiab] OR plantain*[tiab] OR tuber[tiab]

OR tubers[tiab] OR vegetable*[tiab] OR fruit*[tiab] OR pulses[tiab] OR beans[tiab] OR

lentils[tiab] OR chickpeas[tiab] OR legume*[tiab] OR soy[tiab] OR soya[tiab] OR

nut[tiab] OR nuts[tiab] OR peanut*[tiab] OR groundnut*[tiab] OR (seeds[tiab] AND (diet*[tiab] OR food*[tiab])) OR meat[tiab] OR beef[tiab] OR pork[tiab] OR lamb[tiab] OR poultry[tiab] OR chicken[tiab] OR turkey[tiab] OR duck[tiab] OR (fish[tiab] AND (diet*[tiab] OR food*[tiab])) OR ((fat[tiab] OR fats[tiab] OR fatty[tiab]) AND (diet*[tiab] OR food*[tiab] OR adipose[tiab] OR blood[tiab] OR serum[tiab] OR plasma[tiab])) OR egg[tiab] OR eggs[tiab] OR bread[tiab] OR (oils[tiab] AND (diet*[tiab] OR food*[tiab] OR adipose[tiab] OR blood[tiab] OR serum[tiab] OR plasma[tiab])) OR shellfish[tiab] OR seafood[tiab] OR sugar[tiab] OR syrup[tiab] OR dairy[tiab] OR milk[tiab] OR herbs[tiab] OR spices[tiab] OR chilli[tiab] OR chillis[tiab] OR pepper*[tiab] OR condiments[tiab] OR tomato*[tiab]

10. fluid intake[tiab] OR water[tiab] OR drinks[tiab] OR drinking[tiab] OR tea[tiab] OR coffee[tiab] OR caffeine[tiab] OR juice[tiab] OR beer[tiab] OR spirits[tiab] OR

liquor[tiab] OR wine[tiab] OR alcohol[tiab] OR alcoholic[tiab] OR beverage*[tiab] OR

(ethanol[tiab] AND (drink*[tiab] OR intake[tiab] OR consumption[tiab])) OR yerba mate[tiab] OR ilex paraguariensis[tiab]

11. pesticides[MeSH Terms] OR fertilizers[MeSH Terms] OR "veterinary

drugs"[MeSH Terms]

12. pesticide*[tiab] OR herbicide*[tiab] OR DDT[tiab] OR fertiliser*[tiab] OR

fertilizer*[tiab] OR organic[tiab] OR contaminants[tiab] OR contaminate*[tiab] OR

veterinary drug*[tiab] OR polychlorinated dibenzofuran*[tiab] OR PCDF*[tiab] OR

polychlorinated dibenzodioxin*[tiab] OR PCDD*[tiab] OR polychlorinated

biphenyl*[tiab] OR PCB*[tiab] OR cadmium[tiab] OR arsenic[tiab] OR chlorinated

hydrocarbon*[tiab] OR microbial contamination*[tiab]

13. food preservation[MeSH Terms]

14. (mycotoxin*[tiab] OR aflatoxin*[tiab] OR pickled[tiab] OR bottled[tiab] OR bottling[tiab] OR canned[tiab] OR canning[tiab] OR vacuum pack*[tiab] OR refrigerate*[tiab] OR refrigeration[tiab] OR cured[tiab] OR smoked[tiab] OR preserved[tiab] OR preservatives[tiab] OR nitrosamine[tiab] OR hydrogenation[tiab] OR fortified[tiab] OR additive*[tiab] OR colouring*[tiab] OR coloring*[tiab] OR flavouring*[tiab] OR flavoring*[tiab] OR nitrates[tiab] OR nitrites[tiab] OR solvent[tiab] OR solvents[tiab] OR ferment*[tiab] OR processed[tiab] OR antioxidant*[tiab] OR genetic modif*[tiab] OR genetically modif*[tiab] OR vinyl chloride[tiab] OR packaging[tiab] OR labelling[tiab] OR phthalates[tiab]) AND (diet*[tiab] OR food*[tiab] OR adipose[tiab] OR blood[tiab] OR serum[tiab] OR plasma[tiab])

15. cookery[MeSH Terms]

16. cooking[tiab] OR cooked[tiab] OR grill[tiab] OR grilled[tiab] OR fried[tiab] OR

fry[tiab] OR roast[tiab] OR bake[tiab] OR baked[tiab] OR stewing[tiab] OR stewed[tiab] OR casserol*[tiab] OR broil[tiab] OR broiled[tiab] OR boiled[tiab] OR ((microwave[tiab] OR microwaved[tiab] OR re-heating[tiab] OR reheating[tiab] OR heating[tiab] OR re-heated[tiab] OR heated[tiab]) AND (diet*[tiab] OR food*[tiab])) OR poach[tiab] OR poached[tiab] OR steamed[tiab] OR barbecue*[tiab] OR chargrill*[tiab] OR heterocyclic amines[tiab] OR polycyclic aromatic hydrocarbons[tiab]

17. ((carbohydrates[MeSH Terms] OR proteins[MeSH Terms]) AND (diet*[tiab] OR food*[tiab])) OR sweetening agents[MeSH Terms]

18. (salt[tiab] OR salting[tiab] OR salted[tiab] OR fiber[tiab] OR fibre[tiab] OR polysaccharide*[tiab] OR starch[tiab] OR starchy[tiab] OR carbohydrate*[tiab] OR lipid*[tiab] OR linoleic acid*[tiab] OR sterols[tiab] OR stanols[tiab] OR sugar*[tiab] OR sweetener*[tiab] OR saccharin*[tiab] OR

aspartame[tiab] OR acesulfame[tiab] OR cyclamates[tiab] OR maltose[tiab] OR mannitol[tiab] OR sorbitol[tiab] OR sucrose[tiab] OR xylitol[tiab] OR cholesterol[tiab] OR protein[tiab] OR proteins[tiab] OR hydrogenated dietary oils[tiab] OR hydrogenated lard[tiab] OR hydrogenated oils[tiab]) AND (diet*[tiab] OR food*[tiab] OR adipose[tiab] OR blood[tiab] OR serum[tiab] OR plasma[tiab])

19. vitamins[MeSH Terms]

20. supplements[tiab] OR supplement[tiab] OR vitamin*[tiab] OR retinol[tiab] OR

carotenoid*[tiab] OR tocopherol[tiab] OR folate*[tiab] OR folic acid[tiab] OR methionine[tiab] OR riboflavin[tiab] OR thiamine[tiab] OR niacin[tiab] OR pyridoxine[tiab] OR cobalamin[tiab] OR mineral*[tiab] OR (sodium[tiab] AND (diet*[tiab] OR food*[tiab])) OR iron[tiab] OR ((calcium[tiab] AND (diet*[tiab] OR food*[tiab] OR supplement*[tiab])) OR selenium[tiab] OR (iodine[tiab] AND (diet*[tiab] OR food*[tiab] OR supplement*[tiab] OR deficiency)) OR magnesium[tiab] OR potassium[tiab] OR zinc[tiab] OR copper[tiab] OR phosphorus[tiab] OR manganese[tiab] OR chromium[tiab] OR phytochemical[tiab] OR allium[tiab] OR isothiocyanate*[tiab] OR glucosinolate*[tiab] OR indoles[tiab] OR polyphenol*[tiab] OR phytestrogen*[tiab] OR genistein[tiab] OR saponin*[tiab] OR coumarin*[tiab] OR lycopene[tiab]

21. physical fitness[MeSH Terms] OR physical exertion[MeSH Terms] OR physical endurance[MeSH Terms] OR walking[MeSH Terms] OR exercise[MeSH Terms] OR muscle stretching exercises[MeSH Terms] OR tai ji[MeSH Terms] OR yoga[MeSH Terms] OR sedentary lifestyle[MeSH Terms]

22. recreational activit*[tiab] OR household activit*[tiab] OR occupational

activit*[tiab] OR physical activit*[tiab] OR physical inactivit*[tiab] OR exercise[tiab]

OR exercising[tiab] OR energy intake[tiab] OR energy expenditure[tiab] OR energy

balance[tiab] OR energy density[tiab] OR sedentar*[tiab] OR standing[tiab] OR sitting[tiab] OR television[tiab] OR aerobic activities[tiab] OR aerobic activity[tiab] OR cardiovascular activities[tiab] OR cardiovascular activity[tiab] OR endurance activities[tiab] OR endurance activity[tiab] OR resistance training[tiab] OR strength training[tiab] OR physical conditioning[tiab] OR functional training[tiab] OR leisure-time physical activity[tiab] OR lifestyle activities[tiab] OR lifestyle activity[tiab] OR qi gong[tiab] OR tai chi[tiab] OR tai ji[tiab] OR yoga[tiab] OR free living activities[tiab] OR free living activity[tiab] OR walk[tiab] OR walking[tiab]

23. body weight[MeSH Terms] OR anthropometry[MeSH Terms] OR body composition[MeSH Terms] OR body constitution[MeSH Terms] OR body size[MeSH Terms] OR body size[tiab]

24. weight loss[tiab] OR weight gain[tiab] OR anthropometry[tiab] OR birth weight[tiab] OR birthweight[tiab] OR birth-weight[tiab] OR child development[tiab] OR

height[tiab] OR body composition[tiab] OR body mass index[tiab] OR BMI[tiab] OR

obesity[tiab] OR obese[tiab] OR overweight[tiab] OR over-weight[tiab] OR over

weight[tiab] OR skinfold measurement*[tiab] OR skinfold thickness[tiab] OR

DEXA[tiab] OR bio-impedence[tiab] OR waist circumference[tiab] OR hip circumference[tiab] OR waist hip ratio*[tiab]

25. #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR

#12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24

d. Limiting to human studies:

26. animal [MeSH Terms] NOT human [MeSH Terms]

27. #25 NOT #26

e. Combining the searches for each cancer

(a) AND (b) AND (c) AND (d)

i.e. #1 AND #5 AND #27

Supplementary Table S2B. Search terms used for Embase

a. Searching for mortality, survival, recurrence, second cancer.

1	*Recurrent disease/
2	*Disease exacerbation/
3	Disease free survival/
4	mortality/ or all-cause mortality/ or cancer mortality/ or cardiovascular mortality/ or mortality rate/ or premature mortality/
5	Survival analysis/
6	Relapse/
7	Survivor/
8	Second cancer/
9	(recur$ or local recurrence or progression or relap$ or prognos$ or surviv$ or mortality or death or (second$ adj5 primar$)).ab,ti.
10	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9

b. Searching for studies on breast cancer

11	breast tumor/
12	(breast and (cancer$ or neoplasm$ or tumour$ or tumor$ or carcinoma$ or adenocarcinoma$)).tw,kw.

13 (mammary and (cancer$ or neoplasm$ or tumour$ or tumor$ or carcinoma$ or adenocarcinoma$)).tw,kw.

14 11 or 12 or 13

c. Search for all studies relating to diet, body fatness and physical activity

15 Diet therapy/

16 Nutrition/

17 (diet or diets or dietetic$ or dietary or eating or intake or nutrient$ or nutrition or vegetarian$ or vegan$ or (seventh adj1 day adj1 adventist) or macrobiotic).ab,ti.

18 15 or 16 or 17

19 Food/

20 (food$ or cereal$ or grain$ or granary or wholegrain or wholewheat or roots or plantain$ or tuber or tubers or vegetable$ or fruit$ or pulses or beans or lentils or chickpeas or legume$ or soy or soya or nut or nuts or peanut$ or groundnut$ or (seeds and (diet$ or food$))).ab,ti.

21 (meat or beef or pork or lamb or poultry or chicken or turkey or duck or (fish and (diet$ or food$)) or ((fat or fats or fatty) and (diet$ or food$ or adipose or blood or serum or plasma)) or egg or eggs or bread or (oils and (diet$ or food$ or adipose or blood or serum or plasma)) or shellfish or seafood or sugar or syrup or dairy or milk or herbs or spices or chilli or chillis or pepper$ or condiments or tomato$).ab,ti.

22 19 or 20 or 21

23 Beverage/

24 (fluid intake or water or drinks or drinking or tea or coffee or caffeine or juice or beer or spirits or liquor or wine or alcohol or alcoholic or beverage$ or (ethanol and (drink$ or intake or consumption)) or yerba mate or ilex or paraguariensis).ab,ti.

25 23 or 24

26 *Pesticide/

27 *Fertilizer/

28 *Veterinary drug/

29 (pesticide$ or herbicide$ or DDT or fertiliser$ or fertilizer$ or organic or contaminents or contaminate$ or veterinary drug$ or polychlorinated dibenzofuran$ or PCDF$ or polychlorinated dibenzodioxin$ or PCDD$ or polychlorinated biphenyl$ or PCB$ or cadmium or arsenic or chlorinated hydrocarbon$ or microbial contamination$).ab,ti.

30 26 or 27 or 28 or 29

31 Food Preservation/

32 ((mycotoxin$ or aflatoxin$ or pickled or bottled or bottling or canned or canning or vacuum pack$ or refrigerate$ or refrigeration or cured or smoked or preserved or preservatives or nitrosamine or hydrogenation or fortified or additive$ or colouring$ or coloring$ or flavouring$ or flavoring$ or nitrates or nitrites or solvent or solvents or ferment$ or processed or antioxidant$ or genetic modif$ or genetically modif$ or vinyl chloride or packaging or labelling or phthalates) and (diet$ or food$ or adipose or blood or serum or plasma)).ab,ti.

33 31 or 32

34 Cooking/

35 (cooking or cooked or grill or grilled or fried or fry or roast or bake or baked or stewing or stewed or casserol$ or broil or broiled or boiled or (microwave or microwaved or re-heating or reheating or heating or re-heated or heated and (diet$ or food$)) or poach or poached or steamed or barbecue$ or chargrill$ or heterocyclic amines or polycyclic aromatic hydrocarbons).ab,ti.

36 34 or 35

37 Carbohydrate/ and ((diet$ or food$).ab,ti.)

38 Protein/ and ((diet$ or food$).ab,ti.)

39 Sweetening agent/

40 ((salt or salting or salted or fiber or fibre or polysaccharide$ or starch or starchy or carbohydrate$ or lipid$ or linoleic acid$ or sterols or stanols or sugar$ or sweetener$ or saccharin$ or aspartame or acesulfame or cyclamates or maltose or mannitol or sorbitol or sucrose or xylitol or cholesterol or hydrogenated dietary oils or hydrogenated lard or hydrogenated oils or protein$) and (diet$ or food$ or adipose or blood or serum or plasma)).ab,ti.

41 37 or 38 or 39 or 40

42 Vitamins/

43 Vitamin D/ or (supplements or supplement or vitamin$ or retinol or carotenoid$ or tocopherol or folate$ or folic acid or methionine or riboflavin or thiamine or niacin or pyridoxine or cobalamin or mineral$ or (sodium and (diet$ or food$)) or iron or (calcium and (diet$ or food$ or supplement$)) or selenium or (iodine and (diet$ or food$ or supplement$ or deficiency)) or magnesium or potassium or zinc or copper or phosphorus or manganese or chromium or phytochemical or allium or isothiocyanate$ or glucosinolate$ or indoles or polyphenol$ or phytoestrogen$ or genistein or saponin$ or coumarin$ or lycopene).ab,ti.

44 42 or 43

45 *Fitness/

46 Exercise/

47 *Endurance/

48 Walking/

49 Stretching exercise/

50 Tai Chi/

51 Qigong/

52 Yoga/

53 Sedentary lifestyle/

54 (physical fitness or physical exertion or physical endurance or muscle stretching exercise$ or recreational activit$ or household activit$ or occupational activit$ or physical activit$ or physical inactivit$ or exercise$ or exercising or energy intake or energy expenditure or energy balance or energy density or sedentar$ or standing or sitting or television viewing or aerobic activit$ or cardiovascular activit$ or endurance activit$ or resistance training or strength training or physical conditioning or functional training or leisure time physical activit$ or lifestyle activit$ or qigong or tai chi or tai ji or yoga or free living activit$ or walk or walking).ab,ti.

55 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54

56 Body weight/

57 Anthropometry/

58 Body Composition/

59 Body Constitution/

60 Body size/

61 (weight or weight loss or weight gain or anthropometry or birth weight or birthweight or birth weight or child development or height or body composition or fat distribution or body mass or BMI or obesity or obese or overweight or over weight or skinfold measurement$ or skinfold thickness or DEXA or bio-impedence or waist circumference or hip circumference or waist hip ratio$ or body size).ab,ti.

62 56 or 57 or 58 or 59 or 60 or 61

63 18 or 22 or 25 or 30 or 33 or 36 or 41 or 44 or 55 or 62

64 exp animal/

65 exp human/

66 64 not 65

67 63 not 66

Combined

68 10 and 14 and 67

Supplementary Table S3. Description of the potential influential sources of bias in cancer survival studies

Bias type	Description
Selection bias	Bias resulting from the inclusion in the analyses of participants who are different from the source population. Bias could arise from non-random allocation (in randomised clinical trials), self-selection, survival bias or differential loss to follow-up.
Information bias - Exposure measurement error	Errors in measuring or classifying the exposures and outcomes 1. The tool or method used to assess the exposure (or confounders) results in inaccurate measurement of exposures with regards to the actual value of the measure. The possibility of measurement error mainly arises from non-valid assessment methods. 2. Bias may also occur due to deviations from the assigned exposures measurements, for instance, when the exposures may change over time, but it is only measured using a single baseline measurement. It could be minimised by updating the exposure at multiple follow-up times. 3. Immortal time bias. It could arise when the non-exposed person-time is classified erroneously
- Outcome measurement error	1. Detection bias due to different assessment methods across exposed and non-exposed groups. Recurrence is more likely to be affected by this bias than mortality. 2. Systematic measurement error of the outcome related to the exposure. For example, differential attendance to clinical examinations for recurrence detection related to the lifestyle of the participants
Residual confounding	Bias arising when common risk factors between the exposure and outcome are missing as covariates in the analysis 1. Cancer stage and treatment affect the risk of mortality and/or recurrence and are associated with the exposures.

Supplementary Table S4. Grading criteria for evidence on diet, nutrition, physical activity and survival in women with breast cancer

Evidence grades		GRADING CRITERIA FOR EVIDENCE ON DIET, NUTRITION, PHYSICAL ACTIVITY AND SURVIVAL IN WOMEN WITH BREAST CANCER	Het	PB	Mec
Strong evidence	**Convincing**	Evidence of an effect from a meta-analysis of RCTs or at least two well-designed independent RCTs	No	No	Desirable
	Probable	Evidence of an effect from a meta-analysis of RCTs or two well-designed RCTs	Some	No	Desirable
		OR Evidence of an effect from one well-designed RCT and one well-designed cohort study	No	No	Required
		OR Evidence from at least one well-designed pooled analysis of follow-up studies	No	No	Required
		OR Evidence from at least two independent well-designed follow-up studies	No	No	Required
Limited evidence	**Limited suggestive**	Evidence from a meta-analysis of RCTs or at least two well-designed RCTs but the confidence interval may include the null	Some	No	Not required
		OR Evidence from one well-designed RCT but the confidence interval may include the null	No	No	Required
		OR Evidence of an effect from a pooled analysis of follow-up studies	Some	No	Not required
		OR Evidence from a pooled analysis of follow-up studies but the confidence interval may include the null	Some	No	Required
		OR Evidence of an effect from at least one follow-up study	No	No	Required
		OR Evidence of an effect from at least two follow-up studies	No	No	Not required
		OR Evidence from at least two follow-up studies but the confidence interval may include the null	Some	No	Required
	Limited – no conclusion	Any of the following reasons: - Too few studies available - Inconsistency of direction of effect - Poor quality of studies	-	-	-
Strong evidence	**Substantial effect on risk unlikely**	Evidence of the absence of an effect (a summary estimate close to 1.0) from any of the following: a) A meta-analysis of RCTs b) At least two well-designed independent RCTs c) A well-designed pooled analysis of follow-up studies d) At least two well-designed follow-up studies - Absence of a dose response relationship (in follow-up studies)	No	-	Absence

Het: Substantial unexplained heterogeneity or some unexplained heterogeneity

PB: Publication bias

Mec: Strong and plausible mechanistic evidence is required, desirable but not required, not required, or absent

Special upgrading factors:

- Presence of a plausible biological gradient ('dose response') in the association. Such a gradient need not be linear or even in the same direction across the different levels of exposure, so long as this can be explained plausibly.

- A particularly large summary effect size (a relative risk of 2.0 or more, or 0.5 or less, depending on the unit of exposure), after appropriate control for confounders.

- Evidence from appropriately controlled experiments demonstrating one or more plausible and specific mechanisms.

- All plausible known residual confounders or biases including reverse causation would reduce a demonstrated effect, or suggest a spurious effect when results show no effect. Special considerations important for evidence for breast cancer survivors including the following potential confounding variables – the type of tumour, type of treatment, amount of treatment received, and the dissemination of the disease.

Supplementary Table S5. Study characteristics of the included dietary intervention trials in breast cancer survivors

Author, Year, Study name, Country	Characteristics of study population	Intervention and timeframe	Follow-up time, Compliance	Outcome	Intervention vs control group	RR (95% CI)	Adjustments
Reddy[1] 2005, WINS, USA (superseded by Chlebowski[2], 2006	Early-stage breast cancer (n=2437) Age:48-79 years	Reducing fat intake to 15% of energy	Median 5 years	Secondary endpoint: Overall survival Primary endpoint: Relapse-free survival events Overall ER+ ER- Secondary endpoint: Disease-free survival	Reduced fat diet (n=975) vs comparison (minimal dietary counselling) (n=1,462)	Overall survival 0.89 (0.65-1.21) Relapse-free survival 0.76 (0.60-0.98) 0.85 (0.63-1.14) 0.58 (0.37-0.91) Disease-free survival 0.81 (0.65-0.99)	
Chlebowski[2], 2006 WINS, USA	Stage I-IIIA breast cancer (n=2,437) Age:48-79 years Peri- and postmenopausal women Recruited within 1 year of breast cancer diagnosis	Reducing fat intake to 15% of energy	Median 60 months Intervention: 45 lost and 170 withdrew Comparison: 66 lost and 106 withdrew Adherence: 80% of women provided dietary data for at least three time periods after baseline.	Secondary endpoint: Overall survival (34 deaths without breast cancer recurrence) Primary endpoint: Relapse-free survival events: 277 events	Reduced fat diet (n=975) vs comparison (minimal dietary counselling) (n=1,462) Overall ER positive ER negative PR positive PR negative	Overall survival: 0.89 (0.65-1.21) Relapse-free survival: 0.76 (0.60-0.98) 0.85 (0.63-1.14) 0.58 (0.37-0.91) (P for interaction – 0.15) 0.83 (0.59-1.15) 0.54 (0.35-0.83)	Nodal status, systemic adjuvant therapy, tumor size, and mastectomy

Author, Year, Study name, Country	Characteristics of study population	Intervention and timeframe	Follow-up time, Compliance	Outcome	Intervention vs control group	RR (95% CI)	Adjustments
					ER+/PR+ ER+/PR- ER-/PR+ ER-/PR-	0.83 (0.58-1.17) 0.73 (0.37-1.46) 0.57 (0.17-1.87) 0.44 (0.25-0.77)	
Pierce, 2007[3] (a) WHEL, USA	Stage I-IIIA breast cancer (n=3,080) Age:18-70 years Pre-and postmenopausal women Recruited within 4 years of breast cancer diagnosis	Diet rich in fruits, vegetables and fibre, and 15 to 20 % energy from fat	Mean 7.3 years Intervention: 16 lost and 22 withdrew Comparison: 8 lost and 19 withdrew	Overall survival: 315 deaths Disease-free survival events: 518 events	Healthy pattern (n=1,537) vs. comparison (minimal dietary counselling) (n=1,551) (5-a-day dietary advice) ER+/PR+ ER+/PR- ER-/PR+ ER-/PR- Overall ER+/PR+ ER+/PR- ER-/PR+ ER-/PR-	Overall survival: Overall: 0.91 (0.72-1.15) (P = 0.43) By cancer types: 0.92 (0.68-1.26) 1.03 (0.57-1.85) 1.08 (0.41-2.83) 1.13 (0.74-1.73) (P for interaction = 0.88) Disease-free survival: 0.96 (0.80-1.14) 0.95 (0.76-1.20) 0.97 (0.60-1.56) 0.89 (0.42-1.88) 1.14 (0.80-1.61) (P for interaction = 0.85)	Stratified by tumour stage, age, and clinical site; adjusted for antioestrogen use, oophorectomy status

Author, Year, Study name, Country	Characteristics of study population	Intervention and timeframe	Follow-up time, Compliance	Outcome	Intervention vs control group	RR (95% CI)	Adjustments
Gold, 2009[4] Secondary analysis of the WHEL study, USA	Stage I-IIIA breast cancer (n=2,967) Age: 18-79 years Within 4 years of diagnosis	Consume low-fat diet high in vegetables, fruit, and fiber	7.3 years	Additional breast cancer events (n=179) No hot flushes reported at baseline Additional breast cancer events (n = 313) hot flushes reported at baseline		0.69 (0.51-0.93) P= 0.02 0.77 (0.59-1.00) P=0.05	Menopausal status, tumor size and grade, number of positive lymph nodes, hormone receptor status, antiestrogen therapy, quality of life and clinical site
Pierce, 2009[5] WHEL, USA	Early stage breast cancer (n=869) < 4 years	Daily intake of 5 vegetable servings, 16 oz of vegetable juice or vegetable servings equivalents, 3 fruit servings, 30 g fiber, and 15–20% energy from fat)	7.3 years	Primary endpoint: Additional breast cancer events (n=179) Women without hot flushes	Vegetables-fruits Q4 vs Q1 Intervention (n=72) vs Comparison (n=107) Fibre Q4 vs Q1 Intervention (n=72) vs Comparison (n=107) Energy from fat Q4 vs Q1	0.41 (0.19-0.86) P=0.01 0.48 (0.26, 0.87) P=0.02 0.75 (0.4, 1.43) P=0.06	Stage and grade of original tumour and antiestrogen therapy

Author, Year, Study name, Country	Characteristics of study population	Intervention and timeframe	Follow-up time, Compliance	Outcome	Intervention vs control group	RR (95% CI)	Adjustments
					Intervention (n=72) vs Comparison (n=107) Fibre-to-fat ratio Intervention (n=72) vs Comparison (n=107)	0.38 (0.19-0.77) =0.01	
Rock[6], 2009 WHEL, USA (superseded by Pierce, 2007[3])	(n=3043) mean age:51.3 years	Low-fat diet high in vegetables, fruit, and fiber	Mean 7.12 years	Additional breast cancer events (n=508)	Reduced fat diet vs comparison	1.06 (0.89-1.27)	Stage, grade, tamoxifen use, plasma total carotenoids

Abbreviations: WHEL; Women's Healthy Eating and Living, WHI, Women's Health Initiative, WINS, Women's Intervention Nutrition

Supplementary Table S6. Main characteristics of dietary patterns of the included observational studies of dietary patterns, lifestyle scores and breast cancer prognosis

PATTERNS	Study, author, year
DATA-DRIVEN DIETARY PATTERNS	
Prudent pattern	
Higher prudent pattern scores indicate diet with higher amounts of fruit, vegetables, whole grains, protein and fibre and low-fat dairy products, lower amounts of trans-unsaturated and saturated fats, lower glycaemic load	NHS Kroenke[7], 2005(a)
Higher prudent pattern scores indicate a diet with higher intakes of fruits, vegetables, whole grains, and poultry	LACE Kwan[8], 2009
Higher scores indicate a diet with higher intakes of leafy vegetables, non-leafy vegetables, fruits, potatoes and legumes	HKNKBCSS Lei[9], 2021
Western pattern	
Higher western pattern scores indicate a diet with higher amounts of refined grains, red and processed meats, high-fat dairy, desserts, trans- and saturated fats, higher glycaemic load, and less protein and fibre	NHS Kroenke[7], 2005(a)
Higher western pattern scores indicate a diet with higher intakes of refined grains, red and processed meats	LACE Kwan[8], 2009
Higher western pattern scores indicate a diet with high intakes of refined grain, red meat, oil, fish and seafood, cakes and snacks, cessed meat and eggs	HKNKBCSS Lei[9], 2021
LIFESTYLE PATTERN INDICES (DIET AND OTHER LIFESTYLE FACTORS)	
World Cancer Research Fund (WCRF) Score	
Higher score indicates higher concordance with the 2007 WCRF guidelines for cancer prevention; include recommendations for BMI, physical activity level, intakes of sugary beverages, fruit and vegetables, fibre, red and processed meats, alcohol, and sodium	IWHS Inoue-Choi[10], 2013
Healthy lifestyle pattern	
Adherence to high level of fruit and vegetables intake and high level of physical activity	WHEL (control group) Pierce, 200[11]7(b)
DIETARY PATTERN INDICES	
Dietary inflammatory index (DII)	
Higher DII score indicate a more pro-inflammatory diet. Calculated using nutrients and bioactive compounds reported to be associated with biomarkers of inflammation: carbohydrate, protein, total fat, fibre, cholesterol, SFA, MUFA, PUFA, n-3 PUFA, n-6 PUFA, thiamine, riboflavin, niacin, vitamins B6, B12, A, C, D and E, carotene, folic acid, iron, magnesium, zinc, selenium, pepper, onion, garlic, ginger,	Jang[12], 2018; WHI Zheng[13], 2018 PLCO Wang[14], 2020

turmeric, alcohol, caffeine, and green tea and in the WHI also ginger, turmeric and pepper	
American Cancer Society (ACS) guidelines diet score	
Higher score indicates higher conformance with the ACS Nutrition and Physical Activity Guidelines for Cancer Prevention for intakes of fruits and vegetables, whole grains, and red and processed meats	CPS-II McCullough[15], 2016 The Pathways study Ergas[16], 2021
Healthy Eating Index (HEI)-2005	
Higher score indicates higher conformance with the Dietary Guidelines for Americans-2005; use an energy-adjusted density approach for intakes of total fruit; whole fruit; total vegetables; dark-green vegetables, orange vegetables, legumes; total grains; whole grains, milk; meats; beans; oils; saturated fat; sodium and calories from solid fat, alcohol, and added sugar	HEAL George[17], 2011 WHI George[18], 2014(a) NHANES III Karavasiloglou[19], 2019
Healthy Eating Index (HEI)-2010	
Higher score indicates higher conformance with the Dietary Guidelines for Americans 2010 using a density approach for intakes of total fruit; whole fruit; total vegetables; green vegetables beans; total protein foods; seafood, plant proteins, whole grains; dairy; fatty acids, refined grains, sodium and empty calories in the.	WHI Sun[20], 2018(a)
Healthy Eating Index (HEI)-2015	
Higher score indicates higher conformance with the Dietary Guidelines for Americans 2015. Component densities were derived for total fruits, whole fruits, total vegetables, greens and beans, dairy, total protein, seafood and plant protein, refined grains, added sugars, fatty acids, sodium, and saturated fats	SBCSS Wang[21], 2020 The Pathways study Ergas[16], 2021
Alternative Healthy Eating Index (AHEI)	
Adapted from the original HEI. Based on intakes of vegetables, fruits, nuts and soy, cereal fibre, ratio of white to red meat, trans fat, polyunsaturated: saturated fat ratio, alcohol, and duration of multivitamin use. A higher score indicates better diet quality	NHS Kim[22], 2011
Alternative Healthy Eating Index (AHEI)-2010	
Alternative to the HEI. Based on fruits and nutrients predictive of chronic disease risks: vegetables, fruits, whole grains, sugar-sweetened beverages, nuts and legumes, red and processed meats, trans Fats, long-chain (n-3) fats (EPA + DHA), and polyunsaturated fats, and alcohol	NHS Izano[23], 2013
Diet quality index-revised (DQI-R)	
Higher score indicated higher diet diversity and moderation based on intakes of grains, vegetables, fruits, total fat, saturated fat, cholesterol, iron, calcium, diet diversity, added fat and sugar	NHS Kim[22], 2011

Recommended food score (RFS)	
Higher score indicates conformance to recommended foods. Calculated from intakes of fruits, vegetables, whole grains, low saturated fat proteins, and low fat dairy products	NHS Kim[22], 2011
Dietary Approaches to Stop Hypertension (DASH)	
Higher score indicates more healthy eating pattern as recommended by the United States Department of Agriculture (more plant proteins, fruits and vegetables, moderate amounts of low-fat dairy products, and low amounts of sweets and sodium)	NHS Izano[23], 2013 SBCSS Wang[21], 2020 The Pathways study Ergas[16], 2021
Alternate Mediterranean Diet Score (aMED)	
Higher score is higher conformance to Mediterranean dietary pattern. Modified from the Mediterranean Score and calculated from intakes of vegetables, legumes, fruits, nuts, whole grains, fish, monounsaturated: saturated fat ratio, meat and dairy, and alcohol	NHS Kim[22], 2011 The Pathways study Ergas[16], 2021
Trichopoulou Mediterranean Diet Score (MedDiet)	
Higher score is higher conformance to Mediterranean dietary pattern calculated from intakes of legumes, vegetables, fruit and nuts, cereals, fish and seafood, meat and meat products, dairy products, the ratio of monounsaturated to saturated fats and alcohol	NHANES III Karavasiloglou[19], 2019
Chinese Food Pagoda (CHFP)-2007 and 2016	
Higher score is higher conformance to the Chinese food pagoda pattern. Calculated from salt, fats and oil, dairy products, beans, meat and poultry, fish, eggs, vegetables, fruits and grains	SBCSS Wang[21], 2020
Diabetes risk reduction diet (DRRD)	
Higher score is higher conformance to the diabetes risk reduction diet. Calculated from intakes of cereal fiber, coffee (caffeinated and decaffeinated), nuts, polyunsaturated:saturated fat ratio, whole fruits, glycemic index, trans-fat, SSBs/fruit juices, and red meat	NHSI and II Wang[24], 2021
Plant-based dietary index (PDI)	
Higher score is higher conformance to a plant-based dietary index. Calculated from intakes of whole grains, fruits, vegetables, nuts, legumes, vegetable oils, tea, and coffee, fruit juices, refined grains, potatoes, sugar-sweetened beverages, sweets and desserts, dairy, animal fat, egg, meat, fish or seafood, and miscellaneous animal-based foods. For PDI, positive scores are assigned to all plant foods. For healthy PDI, positive scores are assigned to healthful plant foods, and reverse scores are assigned to unhealthful plant foods. For unhealthy PDI, positive scores are assigned to unhealthful plant foods, and reverse scores are assigned to healthful plant foods	Pathways Study Anyene[25], 2021

Potential renal acid load (PRAL)	
Higher score indicates a more acid-forming potential. Calculated from protein, phosphorus, potassium, magnesium and calcium	WHEL Wu[26], 2020
Endogenous acid production (NEAP)	
Higher score indicates a more acid-forming potential. Calculated from protein and potassium	WHEL Wu[26], 2020

Abbreviations: CPS-II, Cancer Prevention Study II Nutrition Cohort; HEAL, Health, Eating, Activity, and Lifestyle Study; HKNKBCSS, Hong Kong NTEC-KWC Breast Cancer Survival Study; IWHS, Iowa Women's Health Study; LACE, Life After Cancer Epidemiology; NHANES, National Health and Nutrition Examination Survey; NHS, Nurses' Health Study; PLCO, Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial; SBCSS, Shangai Breast Cancer Study; WHEL; Women's Healthy Eating and Living, WHI, Women's Health Initiative

Supplementary Table S7. Descriptive table of the included observational studies of post-diagnosis dietary patterns, lifestyle scores and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Dietary Inflammatory Index (DII)								
Jang[12] 2018, South Korea	Prospective cohort of cancer survivors (n=511), mean age: 51.9 years, race: mostly Asian	Diagnosis: 2000-2017, follow-up: median 63 months, until 2018	Stage 0-III	24h recall, interviewed by trained dietitian at 5.4 months post-diagnosis	All-cause mortality (n=44)	5.48 vs. -5.87	0.32 (1.11-0.93) P trend=0.041	Age, BMI, postmenopausal status, subtype, histological grade, tumour size, lymph node metastasis, AJCC stage, treatment, energy intake
					Recurrence (n=88)		0.43 (0.21-0.85) P trend=0.019	
					Pre-menopausal women, recurrence (n=50)		0.30 (0.12-0.80) P trend=0.014	
					Post-menopausal women, recurrence (n=38)		0.78 (0.25-2.44) P trend=0.669	
Energy-adjusted Dietary Inflammatory Index (E-DII)								
Zheng[13] 2018, WHI, USA	Population-based cohort study (n=2150), age range: 50-79 years, post-menopausal 100%, race: mostly White	Recruitment: 1993-1998, follow-up: median 13.3 years, until 2015	Invasive breast cancer	FFQ, self-administered at 1.5 years post-diagnosis, diet in the past 3 months	All-cause mortality (n=580)	3.79 vs. -6.81	0.82 (0.63-1.05) P trend=0.17	Age, ER status, race/ethnicity, PR status, smoking status, income, cancer stage, education, years from cancer diagnosis to FFQ, physical
					Breast cancer-specific mortality (n=212)		0.96 (0.62-1.49) P trend=0.96	
					Cardiovascular disease mortality (n=103)		0.44 (0.24-0.82) P trend=0.005	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								activity, total energy intake, BMI, hormone replacement therapy use
Wang 2020[14], PLCO, USA	Secondary analysis of clinical trials (n=1064), age range: 55-74 years, race: mostly White	Diagnosis: 1993-2001, follow-up: until 2011	Invasive breast cancer in situ 20.1%, stage I 50.3%, II 26.6%, III 2.8%, ER+ 84.6%, PR+ 75.2%	FFQ, self-administered	All-cause mortality (n=296)	-4.1 vs -7.8	0.75 (0.55-0.99)	Age, BMI, diabetes, energy intake, ER status, hormone therapy, income, marital status, physical activity, PR status, race, smoking, stage, study arm, years from cancer diagnosis to FFQ
					Cancer specific mortality (n=100) (Competing risk regression)		0.68 (0.41-1.12)	
					All-cause mortality (n=296)	Per 1 unit	0.94 (0.88-1.00)	
					Cancer specific mortality (n=100) (Competing risk regression)		0.91 (0.82-1.00)	
Healthy Eating Index (HEI) 2015								
Wang 2020[21], SBCS, China	Prospective cohort of cancer survivors (n=3450), age range: 25-70 years, pre- and	Diagnosis: 2002-2006, follow-up: until 2017	Stage I-IV	Semi-quantitative FFQ, 93 items, diet during the 12 months	Overall survival (n=374)	65.8 vs 38 points	0.79 (0.57-1.10) P trend=0.19	Age, BMI, chemotherapy, comorbidity, education, energy intake, er status, her2
					Breast cancer-specific mortality (n=252)		0.86 (0.58-1.27) P trend=0.31	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	post-menopausal, race: Chinese			preceding a 5-year post-diagnosis survey	Recurrence (n=228)		0.89 (0.59-1.33) P trend=0.23	status, immunotherapy, income, marital status, menopausal status, other factors, physical activity, pr status, radiotherapy, stage
					Overall survival (n=374)	Per 5 points	0.94 (0.85-1.03)	
					Breast cancer-specific mortality (n=252)		0.94 (0.83-1.06)	
					Recurrence (n=228)		0.92 (0.81-1.05)	
Ergas[16] 2021, Pathways Study, USA	Prospective cohort of cancer survivors (n=3660), age range: 24-94 years, race: White, Black and Other	Diagnosis: 2005-2013, follow-up: 40888 person-years, until 2018	Stage I 54.9%, II 34.3%, III 9.5%, IV 1.5%. ER+ 83.9%, ER- 16.0%. PR+ 64.1%, PR- 35.7%. HER2+ 12.9%, HER2- 83.2%	FFQ, diet at an average 2.3 months post-diagnosis	Overall survival (n=621)	80 vs 42.1 points	0.81 (0.62-1.06) P trend=0.12	Age, BMI, chemotherapy, education, er status, ethnicity, her2 status, hormonal therapy, menopausal status, physical activity, pr status, race, radiotherapy, smoking, stage, surgery, total energy intake
					Cancer specific mortality (n=312)		0.84 (0.56-1.27) P trend=0.44	Age, education, ER status,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Recurrence (n=449)		1.24 (0.88-1.75) P trend=0.30	ethnicity, HER2 status, Menopausal status, Physical activity, PR status, Race, Smoking, stage, total energy intake
					Other causes of death (n=322)		0.67 (0.48-0.94) P trend=0.006	
					Overall survival (n=621)	Per 1 point	0.99 P trend=0.12	Age, BMI, chemotherapy, education, er status, ethnicity, her2 status, hormonal therapy, menopausal status, physical activity, pr status, race, radiotherapy, smoking, stage, surgery, total energy intake
					Cancer specific mortality (n=312)		0.99 P trend=0.44	Age, education, ER status, ethnicity,
					Recurrence (n=449)		1.01 P trend=0.30	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Other causes of death (n=322)		0.98 P trend=0.06	HER2 status, Menopausal status, Physical activity, PR status, Race, Smoking, stage, total energy intake
					ER positive Overall survival (n=502)	80 vs 42.1 points	0.80 (0.60-1.06) P trend=0.03	Age, education, ER status, ethnicity, HER2 status, menopausal status, physical activity, PR status, race, smoking, stage, total energy intake
					ER negative Overall survival (n=132)		0.73 (0.38-1.40) P trend=0.99	
					ER positive Overall survival (n=502)	Per 1 point	0.99 P trend=0.03	
					ER negative Overall survival (n=132)		1.00 P trend=0.99	
Healthy Eating Index (HEI) 2010								
Sun[20] 2018(a), WHI, USA	Population-based cohort study (n=2295), post-menopausal 100%, race: mostly White	Recruitment: 1993-1998, follow-up: 12 years, until 2015	Invasive breast cancer	FFQ, 122 items, self-administered at an average 1.8 years post-diagnosis	All-cause mortality (n=763)	HEI 2010 score increase (≥15%) vs. no change or stable (+/-14.9%)	1.00 (0.81-1.23)	Age at diagnosis, pre-diagnosis HEI-2010 score, pre-diagnosis total energy intake, change in total energy
					Breast cancer-specific mortality (n=242)		0.98 (0.67-1.44)	
					Non-breast-cancer-related death (n=521)		0.96 (0.74-1.23)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								intake, race, ethnicity, education, income, cancer stage, oestrogen receptor status, progesterone receptor status, time from diagnosis to dietary intake assessment, pre-diagnosis smoking status, post-diagnosis smoking status, pre-diagnosis physical activity, pre-diagnosis alcohol intake, pre-diagnosis BMI, physical activity, use of postmenopausal hormone therapy,
					All-cause mortality (n=75)	HEI 2010 score decrease (≥15%) vs. no change or stable (+/-14.9%)	1.26 (0.99-1.62)	
					Breast cancer-specific mortality (n=27)		1.67 (1.10-2.54)	
					Non-breast-cancer related death (n=48)		1.19 (0.87-1.62)	
					All-cause mortality (n=763)	Q4 vs Q1	0.82 (0.66-1.02)	
					Breast cancer-specific mortality (n=242)		0.97 (0.66-1.43)	
					Non-breast cancer-related death (n=521)		0.72 (0.55-0.94)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								alcohol intake, BMI
Healthy Eating Index (HEI) 2005								
George[18] 2014(a), WHI, USA	Population-based cohort study (n=2317), age range: 50-79 years, post-menopausal 100%, race: mostly White	Recruitment 1993-1998, follow-up: median 9.6 years, 415 deaths, 188 from breast cancer, 227 from any other cause	Invasive breast cancer	FFQ, 122 items, self-administered, assessment at on average 1.5 years post-diagnosis	All-cause mortality (n=415)	91 vs 34 points	0.74 (0.55-0.99) P trend=0.043	Age at screening visit, WHI components, ethnicity, income, education, stage, oestrogen receptor status, progesterone receptor status, time
					Breast cancer-specific mortality (n=188)		0.91 (0.60-1.40) P trend=0.627	
					Non-breast-cancer-related death (n=227)		0.58 (0.38-0.87) P trend=0.011	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								since diagnosis, energy intake, physical activity, alcohol intake, use of postmenopausal hormone therapy
Karavasiloglo[19] 2019, NHANES III, USA	Retrospective cohort of cancer survivors (n=110), mean age: 53.7 years, race: mostly non-Hispanic White	Follow-up: median 16 years		24-Hour Recall	All-cause mortality (n=121)	5-9 vs 0-4 points	0.49 (0.25-0.97)	Age, BMI, Energy intake, Marital status, Menopausal hormone therapy use, other factors, Physical activity, Race, Smoking, Socioeconomic status, Time
						Per 1 point	0.97 (0.95-0.99)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								between cancer diagnosis and exposure assessment
George[17] 2011, HEAL, USA	Prospective cohort of cancer survivors (n=670), post-menopausal 61%, race: White, Black and Other	Diagnosis: 1995-1999, follow-up: average 6 years, 62 deaths, 24 from breast cancer	Invasive, localized 71.3%, regional 28.6%, ER+ 77.6% ER-, 22.3%. Surgery 23.8%, radiation 35.8%, chemotherapy1 2.2%, radiation and chemotherapy2 8%, tamoxifen 51.5%	FFQ, 122 items, self-administered at 30 months post-diagnosis	All-cause mortality (n=62) Breast cancer-specific mortality (n=24)	87 vs 35 points	0.40 (0.17-0.94) 0.12 (0.02-0.99)	Energy intake, Physical activity, ethnicity, tumour stage, tamoxifen use, BMI
Alternative Healthy Eating Index (AHEI) 2010								
Izano[23] 2013, NHS, USA	Population-based cohort study (n=4013),	Diagnosis: 1980-2003, follow-up:	Stage I–III	FFQ, 116 items, at least 12	Breast cancer-specific mortality (n=453)	Q5 vs Q1 score	1.07 (0.77-1.49) P trend=0.82	Time since diagnosis, age at diagnosis,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	mixed mean age: 60 years, race: mostly White	median 112 months, until 2010		months post-diagnosis and updated during follow-up, data beginning in 1984	Non-breast-cancer-related death (n=528)		0.57 (0.42-0.77) P trend<.0001	energy intake, BMI, BMI change, age at first birth, parity, oral contraceptive, menopausal status, HRT, smoking, stage of disease, radiation therapy, chemotherapy, hormonal therapy, physical activity
Kim[22] 2011, NHS, USA	Population-based cohort study (n=2377), post-menopausal 100%, race: mostly White	Diagnosis: 1978-1998, follow-up: until 2004, 572 deaths, 302 from breast cancer, 139 from CVD, 131 from other causes	Stage I-III	FFQ, 116 items, at least 12 months post-diagnosis	All-cause mortality (n=572)	Q5 vs Q1	0.85 (0.63 - 1.17) P trend=0.46	Time from diagnosis to exposure assessment, age, energy, BMI, oral contraceptive, smoking, physical activity, stage, categories of treatment, age at first birth, parity, menopausal status,
					Breast cancer-related death (n=302)		1.53 (0.98-2.39) P trend=0.08	
					Non-breast-cancer-related death (n=270)		0.52 (0.32-0.83) P trend=0.09	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								postmenopausal hormone use
					All-cause mortality (n=572)	Diet Quality Index Revised (DQIR) Q5 vs Q1	0.78 (0.58-1.07) P trend=0.18	Time from diagnosis to exposure assessment, age, energy, BMI, oral contraceptive, smoking, physical activity, stage, categories of treatment, age at first birth, parity, menopausal status, postmenopausal hormone use, multivitamins
					Breast cancer-related death (n=302)		0.81 (0.53-1.24) P trend=0.98	
					Non-breast-cancer-related death (n=270)		0.85 (0.54-1.34) P trend=0.24	
					All-cause mortality (n=572)	Recommended Food Score (RFS) Q5 vs Q1	1.03 (0.74-1.42) P trend=0.85	
					Breast cancer-related death (n=302)		1.54 (0.95-2.47) P trend=0.02	Time from diagnosis to exposure assessment, age, energy, BMI, oral contraceptive, smoking, physical activity, stage,
					Non-breast-cancer-related death (n=270)		0.86 (0.54-1.37) P trend=0.31	
					Distant breast cancer recurrence		1.45 (0.94-2.23) P trend=0.001	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								categories of treatment, age at first birth, parity, menopausal status, postmenopausal hormone use, multivitamins, alcohol intake
Dietary Approaches to Stop Hypertension (DASH) Diet								
Izano[23] 2013, NHS, USA	Population-based cohort study (n=7717), mixed mean age: 60 years, race: mostly White	Diagnosis: 1980-2003, follow-up: median 112 months, until 2010	Stage I–III	FFQ, 116 items, at least 12 months after diagnosis and updated during follow-up, diet data beginning in 1984	Breast cancer-specific mortality (n=453)	Q5 vs Q1	0.85 (0.61-1.19) P trend=0.93	Time since diagnosis, age at diagnosis, energy intake, BMI, BMI change, age at first birth, parity, oral contraceptive, menopausal status, HRT, smoking, stage of disease, radiation therapy, chemotherapy, hormonal therapy, physical activity
					Non-breast-cancer-related death (n=528)		0.72 (0.53-0.99) P trend=0.03	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Wang[21] 2020, SBCS, China	Prospective cohort of cancer survivors (n=3450), age range: 25-70 years, pre- and post-menopausal, race: Chinese	Diagnosis: 2002-2006, follow-up: until 2017	Stage I-IV	Semi-quantitative FFQ, 93 items, assessment of diet during the 12 months preceding a 5-year post-diagnosis survey	Overall survival (n=374)	49.3 vs 8.3 points	0.66 (0.49-0.91) P trend=0.01	Age, BMI, chemotherapy, comorbidity, education, energy intake, er status, HER2 status, immunotherapy, income, marital status, menopausal status, other factors, physical activity, PR status, radiotherapy, stage
					Breast cancer-specific mortality (n=252)		0.63 (0.44-0.92) P trend=0.01	
					Recurrence (n=228)		0.60 (0.40-0.90) P trend=0.01	
					Overall survival (n=374)	Per 5 points	0.93 (0.87-0.98)	
					Breast cancer-specific mortality (n=252)		0.91 (0.85-0.98)	
					Recurrence (n=228)		0.92 (0.85-0.99)	
					TNM I-II Overall survival (n=295)		0.91 (0.85-0.97)	
					TNM III-IV Overall survival (n=59		1.04 (0.87-1.24)	
					TNM I-II Breast cancer-specific mortality (n=194)		0.88 (0.81-0.96)	
					TNM III-IV Breast cancer-specific mortality (n=44)		1.08 (0.86-1.34)	
					TNM I-II Recurrence (n=185)		0.92 (0.82-1.02)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					TNM III-IV Recurrence (n=106)		0.92 (0.82-1.05)	
Ergas[16] 2021, Pathways Study, USA	Prospective cohort of cancer survivors (n=3660), age range: 24-94 years race: White, Black and Other	Diagnosis: 2005-2013, follow-up: 40888 person-years, until 2018	Stage I 54.9%, II 34.3%, III 9.5%, IV 1.5%. ER+ 83.9%, ER- 16.0%. PR+ 64.1%, PR- 35.7%. HER2+ 12.9%, HER2- 83.2%	FFQ, at 2.3 months post-diagnosis	Overall survival (n=621)	28 vs 10 points	0.80 (0.61-1.05) P trend=0.10	Age, BMI, chemotherapy, education, er status, ethnicity, her2 status, hormonal therapy, menopausal status, physical activity, pr status, race, radiotherapy, smoking, stage, surgery, total energy intake
					Cancer specific mortality (n=312)		0.93 (0.63-1.39) P trend=0.68	Age, education, ER status, ethnicity, HER2 status, Menopausal status, Physical activity, PR status, Race, Smoking, stage, total energy intake
					Recurrence (n=449)		1.02 (0.73-1.41) P trend=0.95	
					Other causes of death (n=322)		0.55 (0.38-0.79) P trend=0.002	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Overall survival (n=621)	Per 1 point	0.98 P trend=0.10	Age, BMI, chemotherapy, education, er status, ethnicity, her2 status, hormonal therapy, menopausal status, physical activity, pr status, race, radiotherapy, smoking, stage, surgery, total energy intake
					Cancer specific mortality (n=312)		0.99 P trend=0.68	Age, education, ER status, ethnicity, HER2 status, Menopausal status, Physical activity, PR status, Race, Smoking, stage, total energy intake
					Recurrence (n=449)		1.0 P trend=0.95	
					Other causes of death (n=322)		0.96 P trend=0.02	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					ER positive Overall survival (n=502)	28 vs 10 points	0.70 (0.52-0.95) P trend=0.02	Age, education, er status, ethnicity, her2 status, menopausal status, physical activity, pr status, race, smoking, stage, total energy intake
					ER negative Overall survival (n=132)		1.25 (0.64-2.43) P trend=0.55	
					ER positive Overall survival (n=502)	Per 1 point	0.98 P trend=0.02	
					ER negative Overall survival (n=132)		1.01 P trend=0.55	
High-Fat Diet								
Mohseny[27] 2019, Iran	Retrospective cohort of cancer survivors (n=1276)	Diagnosis: 2004-2015, follow-up: maximum 10 years, until 2015	Stage I-IV		Overall survival	Yes vs no	2.73 (1.06-7.03)	Age, education, ER status, other factors, PR status, stage, tumour size
Baghestani[28] 2015, Iran	Retrospective cohort of cancer survivors (n=366), age range: 17-84 years		Stage I 24.9%, II 47.0%, III 28.1%, HER2- 75.4%, HER2+ 24.6%		Breast cancer mortality	Yes vs no	2.83 P trend=0.033	
Diabetes Risk Reduction Diet								
Wang[24] 2021, NHS I and II, USA	Population-based cohort study (n=8482),	Diagnosis: 1980-2020, 1991-2015,	Stage I-III	Semi-quantitative FFQ, first	Overall survival (n=2600)	33 vs 19 points	0.66 (0.58-0.76) P trend=0.02	Age, age at menarche, alcohol intake,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	pre- and post-menopausal, race: mostly White	follow-up: median 14 years, until 2016, 2017		assessment at median 3 years post-diagnosis and every 4 years thereafter	Cancer specific mortality (n=1042)		0.80 (0.65-0.97) P trend=0.02	aspirin use, BMI, chemotherapy, er status, family history of breast cancer, hormonal therapy, menopausal hormone therapy use, menopausal status, oral contraceptive, personal history of benign breast disease, parity, physical activity, pre-diagnosis BMI, radiotherapy, smoking, stage, total energy intake, year of diagnosis
					Overall survival (n=2467)	High/high vs low/low	0.87 (0.79-0.96)	
					Cancer specific mortality (n=986)		0.94 (0.81-1.10)	
					Premenopausal Cancer specific mortality (n=301)	Q5 vs Q1	0.68 (0.47-0.99) P trend=0.10	
					Postmenopausal Cancer specific mortality (n=678)		0.81 (0.63-1.04) P trend=0.02	
					Stage I Cancer specific mortality (n=294)		0.85 (0.58-1.26) P trend=0.02	
					Stage II Cancer specific mortality (n=406)		0.76 (0.55-1.05) P trend=0.02	
					Stage III Cancer specific mortality (n=342)		0.77 (0.53-1.11) P trend=0.02	
Potential Renal Acid Load (PRAL)								

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Wu[29], 2020, WHEL, USA	Secondary analysis of clinical trials (n=3081)	Diagnosis: 1991-1996, follow-up: average 7.3 years, until 2006	Stage I-IIIA	24-h dietary recalls collected by telephone	Recurrence (n=517) (Competing risk regression)	Q4 vs Q1	0.86 (0.67-1.12) P trend=0.41	Age at diagnosis, race, education, intervention group, menopausal status at baseline, total calorie intake, alcohol intake, smoking status, pack-years, physical activity, BMI, tumor stage, tumor size, ER status, PR status,tamoxifen use, radiotherapy, chemotherapy
Wu[26], 2020, WHEL, USA	Secondary analysis of clinical trials (n=2950), post-menopausal	Diagnosis: 1991-1996, follow-up: average 7.3 years, until 2006	Stage I-IIIA	24-h dietary recalls collected by telephone	Total mortality (n=295)	Q4 vs Q1	0.77 (0.52-1.15) P trend=0.09	Age, alcohol intake, BMI, chemotherapy, education, ER and PR status, intervention

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	>79%, race: mostly White				Breast cancer-specific mortality (n=249) (Competing risk regression)		0.79 (0.52-1.20) P trend=0.09	group, menopausal status, number of comorbidities, pack years, physical activity, race/ethnicity, radiotherapy, tamoxifen use, total caloric intake, tumour size, tumour stage
					Recurrence (n=490) (Competing risk regression. Results superseded by Wu[29] 2020)		0.92 (0.70, 1.20) P trend=0.5	
Net Endogenous Acid Production (NEAP)								
Wu[29], 2020, WHEL, USA	Secondary analysis of clinical trials (n=3081)	Diagnosis: 1991-1996, follow-up: average 7.3 years, until 2006	Stage I-IIIA	24-h dietary recalls collected by telephone	Recurrence (n=517) (Competing risk regression)	Q4 vs Q1	0.84 (0.65-1.10) P trend=0.25	Age at diagnosis, race, education, intervention group, menopausal status at baseline, total calorie intake, alcohol intake, smoking status, pack-years, physical activity, BMI, tumor stage, tumor size, ER

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								status, PR status,tamoxifen use, radiotherapy, chemotherapy
Wu[26] 2020, WHEL, USA	Secondary analysis of clinical trials (n=1950), post-menopausal >79%, race: mostly White	Diagnosis: 1991-1996, follow-up: average 7.3 years, until 2006	Stage I-IIIA	Interview, self-reported questionnaire	Total mortality (n=295)	Q4 vs Q1	0.65 (0.44-0.96) P trend=0.03	Age, alcohol intake, BMI, chemotherapy, education, ER and PR status, intervention group, menopausal status, number of comorbidities, pack years, physical activity, race/ethnicity, radiotherapy, tamoxifen use, total caloric intake, tumour size, tumour stage
					Breast cancer-specific mortality (n=249) (Competing risk regression)		0.66 (0.43-0.99) P trend=0.04	
					Recurrence (n=490) (Competing risk regression. Results superseded by Wu[29] 2020)		0.87 (0.67-1.14) P trend=0.4	
Alternative Mediterranean Diet (aMED)								
Kim[22] 2011, NHS, USA	Population-based cohort study (n=2377),	Diagnosis: 1978-1998,	Stage I-III	FFQ, at least 12 months	All-cause mortality (n=572)	Q5 vs Q1	0.87 (0.64-1.17) P trend=0.34	Time from diagnosis to exposure

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	mean age 23.77 years, post-menopausal 100%, race: mostly White	follow-up: until 2004		after diagnosis	Breast cancer-related death (n=302)		1.15 (0.74-1.77) P trend=0.21	assessment, age, energy, BMI, oral contraceptive, smoking, physical activity, stage, categories of treatment, age at first birth, parity, menopausal status, postmenopausal hormone use, multivitamins
					Non-breast-cancer-related death (n=270)		0.80 (0.50-1.26) P trend=0.10	
Ergas[16] 2021, Pathways Study, USA	Prospective cohort of cancer survivors (n=3660), mean age: 59.7 years, race: White, Black and Other	Diagnosis: 2005-2013	Stage I 54.9%, II 34.3%, III 9.5%, IV 1.5%, ER+ 83.9%, ER- 16.0%. PR+ 64.1%, PR- 35.7%. HER2+ 12.9%, HER2- 83.2%	FFQ, 139 items	Overall survival (n=621)	6-9 vs 0 points	0.87 (0.66-1.14) P trend=0.27	Age, BMI, chemotherapy, education, ER status, ethnicity, HER2 status, hormonal therapy, menopausal status, physical activity, PR status, race, radiation delivery, smoking,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								stage, surgery, total energy intake
					Cancer specific mortality (n=312)		0.79 (0.57-1.16) P trend=0.25	Age, education, menopausal status, ER status, HER2 status, physical activity, PR status, race and ethnicity, smoking, total energy, tumor stage
					Recurrence (n=449)		1.08 (0.79-1.47) P trend=0.46	
					Other causes of death (n=322)		0.73 (0.50-1.05) P trend=0.08	
					Overall survival (n=621.0)	Per 1 point	0.97 P trend=0.27	Age, BMI, chemotherapy, education, ER status, ethnicity, HER2 status, hormonal therapy, menopausal status, physical activity, PR status, race, radiation delivery, smoking, stage, surgery,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								total energy intake
					Cancer specific mortality (n=312)		0.96 P trend=0.25	Age, education, menopausal status, ER status, HER2 status, physical activity, PR status, race and ethnicity, smoking, total energy, tumor stage
					Recurrence (n=449)		1.02 P trend=0.46	
					Other causes of death (n=322)		0.94 P trend=0.08	
					ER positive Overall survival (n=502.0)	6-9 vs 0 points	0.75 (0.55-1.01) P trend=0.08	Age, BMI, chemotherapy, education, ER status, ethnicity, HER2 status, hormonal therapy, menopausal status, physical activity, PR status, race, radiation delivery, smoking, stage, surgery,
					ER negative Overall survival (n=132.0)		0.92 (0.49-1.71) P trend=0.72	
					ER positive Overall survival (n=502.0)	Per 1 point	0.95 P trend=0.08	
					ER negative Overall survival (n=502.0)		1.02 P trend=0.63	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								total energy intake
Trichopoulou Mediterranean Diet (ModiMed)								
Karavasiloglou[19], 2019, NHANES III, USA	Retrospective cohort of cancer survivors (n=110), mean age: 53.7 years, race: mostly White	Recruitment: 1988-1995, follow-up: median 16 years, until 2011		24-Hour Diet Recall	All-cause mortality	5-9 vs 0-4 points	0.78 (0.47-1.32)	Age, BMI, energy intake, marital status, menopausal hormone therapy use, Other factors, physical activity, race, smoking, socioeconomic status, time between cancer diagnosis and exposure assessment
						Per 1 point	0.97 (0.82-1.16)	
Plant-Based Dietary Index (PDI)								
Anyene[25] 2021, Pathways Study, USA	Prospective cohort of cancer survivors (n=3646), mean age: 60 years, post-menopausal 71%, race: White, Black and Other	Diagnosis: 2005-2013, follow-up: median 9.2 years, until 2018	Stage I 55%, II 34%, III 9.5%, IV 1.5%, ER+ 84%, ER-16%, HER2+ 13%, HER2- 83%	FFQ, 139 items	All-cause mortality (n=653)	Per 10 units	0.96 (0.82-1.11)	Age at baseline, education, er status, menopausal status, physical activity, race, smoking, stage, total energy intake
					Cancer specific mortality (n=323)		1.17 (0.98-1.39)	
					Recurrence (n=461)		1.17 (0.98-1.39)	
					Other causes of death (n=330)		0.90 (0.73-1.11)	
Healthy Plant-Based Dietary Index (hPDI)								

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Anyene[25] 2021, Pathways Study, USA	Prospective cohort of cancer survivors (n=3646), mean age: 60 years, post-menopausal 71%, race: White, Black and Other	Diagnosis: 2005-2013, follow-up: median 9.2 years, until 2018	Stage I 55%, II 34%, III 9.5%, IV 1.5%, ER+ 84%, ER-16%, HER2+ 13%, HER2- 83%	FFQ, 139 items	All-cause mortality (n=653)	Per 10 units	0.93 (0.83-1.05)	Age at baseline, education, er status, menopausal status, physical activity, race, smoking, stage, total energy intake
					Cancer specific mortality (n=323)		1.07 (0.91-1.25)	
					Recurrence (n=461)		1.11 (0.97-1.26)	
					Other causes of death (n=330)		0.83 (0.71-0.96)	
Unhealthy Plant-Based Dietary Index (uPDI)								
Anyene[25] 2021, Pathways Study, USA	Prospective cohort of cancer survivors (n=3646), mean age: 60 years, post-menopausal 71%, race: White, Black and Other	Diagnosis: 2005-2013, follow-up: median 9.2 years, until 2018	Stage I 55%, II 34%, III 9.5%, IV 1.5%, ER+ 84%, ER-16%, HER2+ 13%, HER2- 83%	FFQ, 139 items	All-cause mortality (n=653)	Per 10 units	1.07 (0.96-1.20)	Age at baseline, education, er status, menopausal status, physical activity, race, smoking, stage, total energy intake
					Cancer specific mortality (n=323)		0.94 (0.80-1.10)	
					Recurrence (n=461)		0.90 (0.79-1.03)	
					Other causes of death (n=330)		1.2 (1.02-1.41)	
WCRF/AICR Recommendations								
Inoue-Choi[10] 2013, IWHS, USA	Population-based cohort study (n=938), age range: 72-99 years, post-menopausal	Diagnosis: 1986-2002, follow-up: until 2009	Invasive breast cancer	FFQ, 127 items, assessment at an average 8.6	All-cause mortality (n=203)	Adherence summary Q4 vs Q1	0.61 (0.39-0.96) P trend=0.01	Age, total number of comorbid conditions, perceived general health,
					Breast cancer-specific mortality (n=75)		0.88 (0.41-1.91) P trend=0.65	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	100%, race: mostly White			years post-diagnosis	Cardiovascular disease specific mortality (n=66)		0.67 (0.33-1.37) P trend=0.10	current smoking, cancer stage, cancer type, cancer treatment, subsequent cancer diagnosis before 2004, current cancer treatment, and person-years since cancer diagnosis
American Cancer Society (ACS) Guidelines Diet Score								
McCullough[1] [5] 2016, CPS-II, USA	Population-based cohort study (n=2152), age range: 40-93 years, race: mostly White	Diagnosis: 1992-2011, follow-up: mean 9.9 years, 640 deaths,192 from breast cancer, 129 from CVD	Local 77.3%, regional 22.7%, grade well differentiated 22.6%, moderately differentiated 39.0%, poorly or unknown 23.7%, ER+:79.5%; ER-:9.7%; PR+:57.2%; PR-:21.1%	FFQ, self-administered at a minimum of 1 year after diagnosis	Total mortality (n=640)	6-9 vs 0-2 points	0.93 (0.73-1.18) P trend=0.26	Age at diagnosis, diagnosis year, tumour stage, tumour grade, oestrogen and progesterone receptor status, initial delivered treatment, BMI, smoking status, physical activity, energy intake
						Per 2 points	0.96 (0.88-1.03)	
					Breast cancer-specific mortality (n=192)	6-9 vs. 0-2 points	1.44 (0.90-2.30) P trend=0.22	
						Per 2 points	1.09 (0.95-1.26)	
					Cardiovascular disease (n=129)	6-9 vs 0-2 points	0.81 (0.47-1.39) P trend=0.55	
						Per 2 points	0.95 (0.79-1.14)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Other causes (n=319)	6-9 vs 0-2 points	0.78 (0.56-1.07) P trend=0.03	
						Per 2 points	0.88 (0.79-0.99)	
					Total mortality (n=640)	Component score: % of total whole grain, Q4 vs Q1	1.09 (0.86-1.38) P trend=0.75	Age at diagnosis, diagnosis year, tumour stage, tumour grade, oestrogen and progesterone receptor status, initial delivered treatment, BMI, smoking status, physical activity, energy intake, fruit and vegetable consumption, red and processed meat intake
					Breast cancer-specific mortality (n=192)		1.24 (0.81-1.88) P trend=0.39	
					Cardiovascular disease mortality (n=129)		1.43 (0.82-2.50) P trend=0.44	
					Other causes (n=319)		0.91 (0.64-1.29) P trend=0.57	
					Total mortality (n=640)	Component score: Fruit and vegetable intake, 3 vs 0 points	1.03 (0.80-1.33) P trend=0.55	
					Breast cancer-specific mortality (n=192)		1.31 (0.83-2.06) P trend=0.19	
					Cardiovascular disease mortality (n=129)		0.80 (0.45-1.44) P trend=0.85	
					Other causes (n=319)		0.93 (0.65-1.34) P trend=0.73	
					Total mortality (n=640)	Component score: Red and processed	0.64 (0.49, 0.84) P trend=0.01	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer-specific mortality (n=192)	meat intake, Q1 vs Q4	0.88 (0.54, 1.43) P trend=0.60	
					Cardiovascular disease mortality (n=129)		0.52 (0.27, 0.98) P trend=0.11	
					Other causes (n=319)		0.57 (0.39, 0.82) P trend=0.02	
Ergas[16] 2021, Pathways Study, USA	Prospective cohort of cancer survivors (n=3660), mean age:59.7 years, race: White, Black and Other	Diagnosis: 2005-2013	Stage I 54.9%, II 34.3%, III 9.5%, IV 1.5%, ER+ 83.9%, ER- 16.0%. PR+ 64.1%, PR- 35.7%, HER2+ 12.9%, HER2- 83.2%	FFQ	Overall survival (n=621)	7-9 vs 0 points	0.77 (0.59-1.01) P trend=0.07	Age, BMI, chemotherapy, education, ER status, ethnicity, HER2 status, hormonal therapy, menopausal status, physical activity, PR status, race, radiation delivery, smoking, stage, surgery, total energy intake
					Cancer specific mortality (n=312)		0.75 (0.52-1.09) P trend=0.29	Age, education, ER status, ethnicity,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Recurrence (n=449)		1.19 (0.89-1.57) P trend=0.55	HER2 status, menopausal status, physical activity, PR status, race, smoking, stage, total energy intake
					Other causes of death (n=322)		0.69 (0.48-0.98) P trend=0.03	
					Overall survival (n=621)	Per 1 point	0.96 P trend=0.07	Age, BMI, chemotherapy, education, ER status, ethnicity, HER2 status, hormonal therapy, menopausal status, physical activity, PR status, race, radiation delivery, smoking, stage, surgery, total energy intake
					Cancer specific mortality (n=312)		0.97 P trend=0.29	Age, education, ER status, ethnicity, HER2 status,
					Recurrence (n=449)		1.01 P trend=0.55	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Other causes of death (n=322)		1.00 P trend=0.03	menopausal status, physical activity, PR status, race, smoking, stage, total energy intake
					ER positive Overall survival (n=502)	7-9 vs 0 points	0.68 (0.51-0.91) P trend=0.01	
					ER negative Overall survival (n=132)		1.05 (0.59-1.89) P trend=0.63	
					ER positive Overall survival (n=502)	Per 1 point	0.94 P trend=0.01	
					ER negative Overall survival (n=502)		1.02 P trend=0.63	
Chinese Food Pagoda (CHFP) 2007 Score								
Wang[21] 2020, SBCS, China	Prospective cohort of cancer survivors (n=3450), age range: 25-70 years, race: Chinese	Diagnosis: 2002-2006		Semi-quantitative FFQ	Overall survival (n=374)	39.2 vs 14.5 points	0.66 (0.48-0.89) P trend=0.01	Age, BMI, chemotherapy, comorbidity, education, energy intake, ER status, HER2 status, immunotherapy, income, marital status, menopausal status, other factors, physical activity, PR status,
					Breast cancer-specific mortality (n=252)		0.58 (0.40-0.84) P trend=0.01	
					Recurrence (n=228)		0.64 (0.44-0.93) P trend=0.01	
					Overall survival (n=252)	Per 5 points	0.87 (0.79-0.96)	
					Breast cancer-specific mortality (n=252)		0.86 (0.76-0.97)	
					Recurrence (n=228)		0.84 (0.74-0.95)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					TNM I-II Overall survival (n=295)		0.87 (0.78-0.98)	radiotherapy, stage
					TNM III-IV Overall survival (n=59)		0.89 (0.66-1.21)	
					TNM I-II Breast cancer-specific mortality (n=194)		0.84 (0.73-0.96)	
					TNM III-IV Breast cancer-specific mortality (n=44)		0.93 (0.63-0.96)	
					TNM I-II Recurrence (n=185)		0.81 (0.70-0.93)	
					TNM III-IV Recurrence (n=29)		1.23 (0.73-2.09)	
Chinese Food Pagoda (CHFP) 2016 Score								
Wang[21] 2020, SBCS, China	Prospective cohort of cancer survivors (n=3450), age range: 25-70 years, race: Chinese	Diagnosis: 2002-2006		Semi-quantitative FFQ	Overall survival (n=374.0)	35.7 vs 13.2 points	0.75 (0.55-1.01) P trend=0.01	Age, BMI, chemotherapy, comorbidity, education, energy intake, ER status, HER2 status, immunotherapy, income, marital status, menopausal status, other factors, physical
					Breast cancer-specific mortality (n=252.0)		0.70 (0.48-1.01) P trend=0.01	
					Recurrence (n=228.0)	35.7 vs 14 points	0.67 (0.45-0.99) P trend=0.01	
					Overall survival (n=374)	Per 5 points	0.87 (0.79-0.96)	
					Breast cancer-specific mortality (n=252)		0.85 (0.76-0.96)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Recurrence (n=228.0)		0.84 (0.74-0.95)	activity, PR status, radiotherapy, stage
Fasting								
Marinac[30] 2016, WHEL, USA	Secondary analysis of clinical trials (n= 2413), age range: 27-70 years, post-menopausal 82%, race: mostly White	Recruitment: 1995-2007, follow-up: mean 7.3 years	Stage I 37.8%, II 46.2%, III 16%, well differentiated 16.1%, moderately 40.5%, poorly 36.8%, unspecified 6.6%, no current or planned chemotherapy	24-hour recall. At baseline, year 1, and year 4, collected by telephone on random days during a 3-week period, stratified for weekend vs weekdays	All-cause mortality (n=420)	Eating episodes per day Per additional daily eating episode	0.99 (0.89-1.10) P trend=0.86	Age, race, education, comorbidity, tumour stage, grade, radiotherapy, tamoxifen use, calories, menopausal status, study site, intervention group
					Breast cancer-specific mortality (n=329)		1.00 (0.89-1.13) P trend=0.96	
					Breast cancer recurrence (n=390)		0.97 (0.87-1.08) P trend=0.60	
					All-cause mortality (n=420)	Eating after 8pm, yes vs no	0.97 (0.76-1.24) P trend=0.80	
					Breast cancer-specific mortality (n=329)		0.98 (0.74-1.28) P trend=0.86	
					Breast cancer recurrence (n=390)		0.97 (0.76-1.24) P trend=0.81	
					All-cause mortality (n=420)	Nightly fasting, <13 vs ≥13 hours/night	1.22 (0.95-1.56) P trend=0.12	
					Breast cancer-specific mortality (n=329)		1.21 (0.91-1.60) P trend=0.19	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer recurrence (n=390)		1.36 (1.05-1.76) P trend=0.02	
Prudent Dietary Pattern								
Kwan[8] 2009, LACE, USA	Prospective cohort of cancer survivors (n=1901), age range: 18-79 years, post-menopausal 65%, race: mostly White	Diagnosis: 1997-2000, follow-up: mean 4.2 years, 226 deaths, 128 from breast cancer, 29 from cardiovascular disease, 69 from other causes	Stage I 48%, IIA 32.7%, IIB 16.3%, IIIA 3%, ER+/PR+ 68.1%, ER+/PR- 14.6%, ER-/PR+ 1.9%, ER-/PR- 15.5%, treatment completed except for adjuvant hormonal therapy	Semi-quantitative FFQ, 122 items, self-administered, diet over the last 12 months assessed at 11- and 39-months post-diagnosis	All-cause mortality (n=213)	Q4 vs Q1	0.57 (0.36-0.90) P trend=0.02	Age at diagnosis, energy intake, race, BMI, physical activity, smoking, menopausal status, weight change, tumour stage, hormone receptor status, treatment
					Breast cancer-specific mortality (n=121)		0.79 (0.43-1.43) P trend=0.57	
					Additional breast cancer events (n=256)		0.95 (0.63-1.43) P trend=0.94	
					Non-breast-cancer-related death (n=92)		0.35 (0.17-0.73) P trend=0.03	
Kroenke[7] 2005(a), NHS	Population-based cohort study (n=2619), age range: 30-55 years, race: mostly White	Diagnosis: 1982-1998, follow-up: median 9 years, until 2002 414 deaths, 242 from breast cancer, 172 from other causes	Invasive breast cancer	FFQ, diet measured closest to and at least 12 months after breast cancer diagnosis	All-cause mortality (n=414)	Q5 vs Q1	0.78 (0.54-1.12) P trend=0.25	Age, BMI, energy intake, smoking, physical activity, age of menarche, oral contraceptive, menopausal status, hormonal therapy,
					Breast cancer-specific mortality (n=242)		1.07 (0.66-1.73) P trend=0.57	
					Non-breast-cancer-related death(n=172)		0.54 (0.31-0.95) P trend=0.03	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								tamoxifen use, chemotherapy, birth index, age at menopause, tumour stage
Lei[9] 2021, HKBCSS, China	Prospective cohort cancer survivors (n=1226), mean age: 52.3 years, post-menopausal 48.5%, race: Chinese	Diagnosis:2011-2014, follow-up: median 54.1 months, loss to follow-up: 10.4%	Stage I 31.6%, II 48.2%, III 19.7%, ER+ 73.6%, PR + 56.4%, HER2+ 27.2%	FFQ	Overall mortality (n=98.0)	Q3 vs Q1	1.45 (0.82-2.56) P trend=0.20	Age at follow-up interview, BMI, chemotherapy, comorbidity, ER status, HER2 status, histology, hormonal therapy, menopausal status, physical activity, PR status, radiotherapy, total energy intake, tumour stage
					Breast cancer-specific mortality (n=88.0)		1.37 (0.76-2.49) P trend=0.30	
					Recurrence (n=165.0)		1.01 (0.64-1.59) P trend=0.99	
					HR+ Overall mortality (n=70.0)		1.31 (0.68-2.54) P trend=0.42	
					HR- Overall mortality (n=26.0)		1.89 (0.54-6.64) P trend=0.32	
					HR+ Breast cancer-specific mortality (n=64.0)		1.36 (0.68-2.73) P trend=0.39	
					HR- Breast cancer-specific mortality (n=22.0)		1.79 (0.44-7.35) P trend=0.45	
					HR+ Recurrence (n=117.0)		1.17 (0.71-1.94) P trend=0.53	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					HR- Recurrence (n=45.0)		0.81 (0.32-2.05) P trend=0.51	
Western dietary pattern								
Kwan[8] 2009, LACE, USA	Prospective cohort of cancer survivors (n=1901), age range: 18-79 years, post-menopausal 65%, race: mostly White	Diagnosis: 1997-2000, follow-up: mean 4.2 years 226 deaths, 128 breast cancer mortality, 29 deaths from cardiovascular disease, 69 other causes of deaths	Stage I 48%, IIA 32.7%, IIB 16.3%, IIIA 3% 68.1%, ER+/PR+, 14.6%, ER+/PR-, 1.9%, ER-/PR+, 15.5%, ER-/PR-	Semi-quantitative FFQ, 122 items, self-administered, diet over the last 12 months assessed at 11 and 39 months post-diagnosis	Overall death (n=226)	Q4 vs Q1	1.53 (0.93-2.54) P trend=0.05	Age at diagnosis, energy intake, race, BMI, physical activity, smoking, menopausal status, weight change, tumour stage, hormone receptor status, treatment
					Breast cancer-specific mortality (n=128)		1.20 (0.62-2.32) P trend=0.60	
					Recurrence (n=268)		0.98 (0.62-1.54) P trend=0.94	
					Non-breast-cancer-related death (n=69)		2.15 (0.97-4.77) P trend=0.02	
Lei[9] 2021, HKBCSS, China	Prospective cohort of cancer survivors (n=1226), mean age: 52.3 years, post-menopausal 48.5%, race: Chinese	Diagnosis:2011-2014, follow-up: median 54.1 months, loss to follow-up: 10.4%	Stage I 31.6%, II 48.2%, III 19.7%, ER + 73.6%, PR+ 56.4%, HER2+ 27.2%	FFQ	Overall mortality (n=98.0)	Q3 vs Q1	0.79 (0.41-1.52) P trend=0.48	Age at follow-up interview, BMI, chemotherapy, comorbidity, ER status, HER2 status, histology, hormonal therapy, Menopausal status,
					Breast cancer-specific mortality (n=88.0)		0.90 (0.45-1.77) P trend=0.75	
					Recurrence (n=165.0)		1.03 (0.61-1.75) P trend=0.89	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					HR+ Overall mortality (n=70.0)		0.75 (0.35-1.60) P trend=0.46	physical activity, PR status, radiotherapy, total energy intake, tumour stage
					HR- Overall mortality (n=26.0)		0.65 (0.16-2.65) P trend=0.55	
					HR+ Breast cancer-specific mortality (n=64.0)		0.87 (0.39-1.95) P trend=0.77	
					HR- Breast cancer-specific mortality (n=22.0)		0.93 (0.20-4.26)	
					HR+ Recurrence (n=117.0)		1.21 (0.67-2.17) P trend=0.50	
					HR- Recurrence (n=45.0)		0.65 (0.22-1.93) P trend=0.43	
Kroenke[7] 2005(a), NHS, USA	Population-based cohort study (n=2619), age range: 30-55 years, race: mostly White	Diagnosis: 1982-1998, follow-up: median 9 years, until 2002, 414 deaths, 242 from breast cancer, 172 from other causes	Invasive breast cancer	FFQ, diet measured closest to and at least 12 months after breast cancer diagnosis	All-cause mortality (n=414)	Q5 vs Q1	1.53 (1.03-2.29) P trend=0.08	Age, BMI, energy intake, smoking, physical activity, age of menarche, oral contraceptive, menopausal status, hormonal therapy, tamoxifen use, chemotherapy,
					Breast cancer-specific mortality (n=242)		1.01 (0.60-1.70) P trend=0.99	
					Non-breast-cancer-related death (n=172)		2.31 (1.23-4.32) P trend=0.04	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								birth index, age at menopause, tumour stage
Healthy Pattern								
Pierce[11] 2007(b), WHEL, USA	Secondary analysis of clinical trials (n= 1490), mean age: 50 years, pre- and post-menopausal, race: mostly White	Diagnosis: 1991-2000, follow-up: average 6.7 years, until 2005, 135 deaths, 118 from breast cancer, 10 from other cancers, 7 from non-cancer causes	Stage I 40%, II 45%, III 15%, grade I 15.9%, II 39.8%, III 35.8%, unknown 8.3%, ER+/PR+ 63.1%, ER+/PR- 10.8%, ER-/PR+ 5.1%, ER-/PR- 20.8%	24-hour recall, at an average 20 months post-diagnosis	Overall morality (n=135)	Healthy pattern (fruit and vegetables, physical activity), high/high vs low/low	0.56 (0.31-0.98)	Age, alcohol intake, receptor status, time from diagnosis to randomization

Abbreviations: CPS-II, Cancer Prevention Study II Nutrition Cohort;HEAL, Health, Eating, Activity, and Lifestyle Study; IWHS, Iowa Women's Health Study; LACE, Life After Cancer Epidemiology; NHS, Nurses' Health Study; WHI, Women's Health Initiative; WHEL; Women's Healthy Eating and Living,

Supplementary Table S8. Descriptive table of the included observational studies of post-diagnosis fruit and vegetable intake and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Fruit and vegetables								
Farvid[31] MS, 2020, NHS and NHSII, USA	Population-based cohort (n=8927)	Diagnosed: 1980-2010 (NHS) and 1991-2011 (NHSII); follow Up: Median 11.5 years	Invasive breast cancer. Stage I-III	FFQ 1980-2010 to 2014 (NHS) and 1991-2011 to 2015 (NHSII)	All-cause mortality (n=2521.0)	7.4 vs 2.2 serving/ day	0.82 (0.71-0.94) P trend=0.004	Age at diagnosis, age at menopause, alcohol intake, aspirin use, BMI change, calendar year, chemotherapy, diagnosis year, er/pr status, hormonal therapy, menopausal status, oral contraceptive, physical activity, prediagnosis BMI, race, radiotherapy, smoking, stage, study, time between
					Cancer specific mortality (n=1070.0)		0.88 (0.71-1.09) P trend=0.55	
					All-cause mortality (n=2521)	Per 2 serving day	0.93 (0.88-0.98)	
					Cancer specific mortality (n=1070.0)		0.98 (0.90-1.06)	
					Cardiovascular disease mortality (n=301.0)	7.4 vs 2.2 serving/ day	0.96 (0.63-1.45) P trend=0.48	
					ER positive All-cause mortality (n=1847)	Per 2 serving day	0.92 (0.87-0.98)	
					ER negative All-cause mortality (n=445)		0.88 (0.77-1.00)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Stage I All-cause mortality (n=1279)		0.88 (0.82-0.95)	cancer diagnosis and exposure assessment
					Stage II All-cause mortality (n=794)		0.91 (0.83-1.00)	
					Stage III All-cause mortality (n=448)		1.02 (0.89-1.15)	
					ER positive Cancer specific mortality (n=769)		0.99 (0.90-1.08)	
					ER negative Cancer specific mortality (n=212)		0.95 (0.79-1.13)	
					Stage I Cancer specific mortality (n=339)		0.93 (0.80-1.07)	
					Stage II Cancer specific mortality (n=397)		0.91 (0.79-1.03)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Stage III Cancer specific mortality (n=334)		1.05 (0.91-1.21)	
McCullough[1][5] ML, 2016, CPS-II Nutrition Cohort, USA	Population-based cohort, (n= 2152) mean age:70.7 years	Recruitment between baseline (1992-1993) and June 2011 Follow up= 19 years	Locally and regionally staged breast cancer ER+ 79.5%; ER- 9.7%; PR+ 57.2%; PR- 21.1%, local: 77.3%, regional: 22.7% grade at diagnosis: well differentiated 22.6%, moderately differentiated: 39.0%; poorly or undifferentiated: 23.7%, surgery: 86.1%, chemotherapy: 22.9%, radiation: 56.0%, targeted therapy: 62.4%	68-item block FFQ with baseline survey in 1992 (12 months post-diagnosis to allow for completion of active treatment) and modified 152-item Harvard FFQ with follow-up surveys between 1999-2003 The mean SD time between 1992 baseline to diagnosis was 8.4 ± 4.8 years and from breast cancer diagnosis to post-diagnostic diet assessment was 3.3 ± 1.5 years.	All-cause mortality (n=640)	Combination of meeting ‘‘five a day’’ and consuming a variety of fruits and vegetables 3 vs. 0 score	1.03 (0.80-1.33) P trend=0.55	Age at diagnosis, diagnosis year, tumour stage, grade, oestrogen and progesterone receptor status, initial treatment, BMI, smoking status, physical activity, energy intake, total grain, red and processed meat intake
					Breast cancer-specific mortality (n=192)		1.31 (0.83-2.06) P trend=0.19	
					Mortality not including breast cancer or CVD (n=319)		0.93 (0.65-1.34) P trend=0.73	
					Cardiovascular disease mortality (n=129)		0.80 (0.45-1.44) P trend=0.85	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Pierce[11] JP, 2007(b), WHEL	Follow-up study of 1490 women age ≤70 years, average age, 50 years Randomly assigned to the control group in a dietary trial within 48 months of diagnosis (average, 24 months) between 1995 and 2000. Enrolment was an average of 2 years post-diagnosis all have completed primary treatments	Diagnosed: 1991-2000 Follow up= 6.7 years, until 2005. 135 total deaths, 118 breast cancer mortality, 10 deaths from other cancers, 7 non-cancer deaths, 236 breast cancer events Lost-to-follow up n=7	Early stage breast cancer 40% stage I (≥1cm), 45% stage II, 15% stage III, 15.9%. 63.1% ER+/PR+, 10.8% ER+/PR-, 5.1%ER-/PR+, 20.8% ER-/PR-. Grade I 39.8%, grade II 35.8%, grade III 8.3%, unknown 31.4%, none-chemotherapy, 25.7% nonanthracycline, 42.8% anthracycline; 42% adjuvant tamoxifen	At baseline four 24-hr dietary recalls on random days during a 3-week period telephone-based dietary assessment Use plasma carotenoid concentrations to validate reported fruit and vegetables intake	Mortality (n=135)	6.94-19.96 vs. 0.33-3.43 serving/day	0.63 P categorical =0.02	Univariate (age) stage, grade, BMI, physical activity, were not statistically significant in initial multivariate models
Fruits								
Farvid[31] MS, 2020, NHS and NHSII, USA	Population-based cohort (n=8927)	Diagnosed: 1980-2010 (NHS) and 1991-2011 (NHSII) follow Up: Median 11.5 years	Invasive breast cancer, Stage I-III	FFQ 1980-2010 to 2014 (NHS) and 1991-2011 to 2015 (NHSII)	All-cause mortality (n=2521.0) Cancer specific	2.8 vs 0.5 serving/ day	0.93 (0.81-1.07) P trend=0.18 1.03 (0.83-1.26)	Age at diagnosis, age at menopause, alcohol intake, aspirin use,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					mortality (n=1070.0)		P trend=0.93	BMI change, calendar year, chemotherapy, diagnosis year, er/pr status, hormonal therapy, menopausal status, oral contraceptive, physical activity, prediagnosis BMI, race, radiotherapy, smoking, stage, study, time between cancer diagnosis and exposure assessment
					All-cause mortality (n=2521)	Per 2 serving day	0.93 (0.83-1.03)	
					Cancer specific mortality (n=1070.0)		1.01 (0.85-1.19)	
					Cardiovascular disease mortality (n=311.0)	2.8 vs 0.5 serving/ day	1.27 (0.85-1.88) P trend=0.39	
					ER positive All-cause mortality (n=1847)	Per 2 serving day	0.94 (0.83-1.07)	
					ER negative All-cause mortality (n=445)		0.82 (0.62-1.08)	
					Stage I All-cause mortality (n=1279)		0.79 (0.68-0.93)	
					Stage II All-cause mortality (n=794)		1.00 (0.82-1.23)	
					ER positive Cancer specific		1.02 (0.84-1.24)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					mortality (n=769)			
					ER negative Cancer specific mortality (n=212)		0.93 (0.64-1.36)	
					Stage I Cancer specific mortality (n=339)		0.87 (0.61-1.16)	
					Stage II Cancer specific mortality (n=397)		0.94 (0.72-1.24)	
					Stage III Cancer specific mortality (n=334)		1.21 (0.89-1.65)	
Williams[32] PT, 2014, NRWHS, United States	Prospective cohort (n= 986) breast cancer survivors identified through the baseline questionnaires of the National Runners' and Walkers'	Follow up= 9.1 years (9.08 ± 0.83 years), 46 died from breast cancer	No specific information provided	Self-reported information on diet using a baseline questionnaire mean 7.9± 7.3 years after diagnosis questions on intake of meat, fruit, correlations	Breast cancer-specific mortality (n=46)	Per 1 piece/day	1.104 (0.866-1.346)	Age, race, exercise (runner vs. Walker)

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	Health Surveys, survivors diagnosed 7.9 years before baseline			for these diets were obtained from a 4-day diet records from 100 men (r=0.46 for red meat and r=0.38 for fruit)				
Beasley[33] JM, 2011, CWLS, United States	Follow up of cases of population-based case-control studies (n= 4441) age range: 20-79 years, 73.3% postmenopausal	Diagnosed: 1987-1999, follow up= 5.5 years, until 2005, 525 deaths, 137 from breast cancer, 132 from cardiovascular disease	Primary invasive breast cancer, 72.8% local, 27.2% regional, surgery 97.9%, radiotherapy 49.8%, hormonal therapy 57.8%, chemotherapy 31.9%	Validated 126-item FFQ of post-diagnosis behaviour from 1998-2001	All-cause survival (n = 525)	2.5 vs. 0.1 serving/day	1.38 (0.80 - 1.30) P trend=0.67	Age, residence, menopausal status, smoking, tumour stage, alcohol intake, history of hormonal replacement therapy, interval between diagnosis and diet assessment, BMI, physical activity, breast cancer treatment,
					Breast cancer survival (n=137)		1.39 (0.64-2.99) P trend=0.16	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								energy intake
Holmes[34] MD, 1999, NHS, United States (superseded by Farvid[31], 2020)	Cancer survivors of population-based prospective cohort study (n= 1982) pre- and post-menopausal. Mean age: 54 years	Diagnosed: 1976-1990, mean follow up=157 months, until 1994, 378 deaths, 326 breast cancer mortality	Invasive breast carcinoma, grade 1-3	Validated FFQ's in 1980, 1984, 1986, and 1990 Intakes of total calories, alcohol and 83 nutrients were assessed, mean interval between diagnosis of breast carcinoma and diet assessment was 24 months (SD=18 months)	All-cause mortality (n=378)	Q4 vs. Q1	1.07 (0.77 - 1.49) P trend=0.40	Age, time between exposure assessment and cancer diagnosis, calendar year of diagnosis, oral contraceptive use, postmenopausal hormone therapy use, smoking, age at first birth and parity, number of metastatic lymph nodes, tumour size, BMI, menopausal status, energy intake

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Vegetables								
Farvid[31], 2020, NHS and NHSII, USA	Population-based cohort (n=8927)	Diagnosed:1980-2010 (NHS) and 1991-2011 (NHSII) follow Up: Median 11.5 years	Invasive breast cancer. Stage I-III	FFQ 1980-2010 to 2014 (NHS) and 1991-2011 to 2015 (NHSII)	All-cause mortality (n=2521.0)	5.1 vs 1.4 serving/ day	0.84 (0.72-0.97) P trend=0.001	Age at diagnosis, age at menopause, alcohol intake, aspirin use, BMI change, calendar year, chemotherapy, diagnosis year, ER/PR status, hormonal therapy, menopausal status, oral contraceptive, physical activity, prediagnosis BMI, race, radiotherapy, smoking, stage, study,
						Per 2 serving day	0.89 (0.82-0.95)	
					Cancer specific mortality (n=1070.0		0.94 (0.84-1.05)	
					Cardiovascular disease mortality (n=311.0)	5.1 vs 1.4 serving/ day	0.76 (0.49-1.16) P trend=0.08	
					ER positive All-cause mortality (n=1847)	Per 2 serving day	0.88 (0.81-0.96)	
					ER negative All-cause mortality (n=445)		0.84 (0.70-1.01)	
					Stage I All-cause mortality (n=1279)		0.89 (0.77-0.95)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Stage II All-cause mortality (n=794)		0.86 (0.75-0.98)	time between cancer diagnosis and exposure assessment
					Stage III All-cause mortality (n=448)		0.92 (0.77-1.09)	
					ER positive Cancer specific mortality (n=769)		0.95 (0.83-1.08)	
					ER negative Cancer specific mortality (n=212)		0.95 (0.74-1.22)	
					Stage I Cancer specific mortality (n=339)		0.96 (0.79-1.17)	
					Stage II Cancer specific mortality (n=397)		0.84 (0.70-1.01)	
					Stage III Cancer specific mortality (n=334)		0.96 (0.79-1.16)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Nechuta[35] S, 2013, ABCPP	Pooled analysis of 4 cohorts: LACE, WHEL, NHS, SBCSS (n= 11390), mean age: 56.9 years	Diagnosed between 1990-2006, mean follow up= 9 years, 1725 deaths 1421 recurrences	Invasive breast cancer	FFQ, mean of 22 months post-diagnosis, validated for major nutrients and/or food groups or based on a validated questionnaire SBCSS 29 items, WHEL Arizona Food Frequency Questionnaire 153-items, LACE >100 items	**Cruciferous vegetables**			Age at diagnosis, ER/PR status, TNM stage, chemotherapy, surgery, radiotherapy, hormonal therapy, smoking, BMI, exercise, menopausal status, race/ethnicity, education
					Total mortality (n=1725)	≥78 vs. <39 g/ day	1.03 (0.88-1.20) P trend=0.82	
					Total mortality ER-positive	Q4 vs Q1 Q4 vs Q1 ≥78 vs. <39 g/day	0.93 (0.79-1.09) P trend=0.35	
					Total mortality ER-negative		1.11 (0.84-1.45) P trend=0.13 P-interaction= 0.53	
					Total mortality Stage I-II		1.02 (0.87-1.20) P trend=0.60	
					Total mortality Sage III		0.94 (0.73-1.22) P trend=0.72 P interaction= 0.76	
					Total mortality Tamoxifen		0.91 (0.76-1.10) P trend=0.30	
					Total mortality		1.04 (0.74-1.47)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					No tamoxifen		P trend=0.87 P interaction= 0.28	
					Breast cancer mortality		1.09 (0.92–1.30) P trend=0.72	
					Breast cancer recurrence (n=1421)		1.05 (0.89-1.24) P trend=0.60	
					Breast cancer recurrence (n=1421)		1.05 (0.89-1.24) P trend=0.60	
					Breast cancer recurrence ER-positive		1.05 (0.88-1.25) P trend= 0.65	
					Breast cancer recurrence ER-negative		1.26 (0.92-1.72) P trend=0.27 P interaction= 0.77	
					Breast cancer recurrence Stage I-II		1.14 (0.95-1.36) P trend=0.28	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer recurrence Stage III		1.05 (0.79-1.39) P trend=0.82 P interaction= 0.44	
					Breast cancer recurrence Tamoxifen		1.02 (0.84-1.24) P trend=0.76	
					Breast cancer recurrence No tamoxifen		1.19 (0.80-1.75) P trend=0.78 P interaction= 0.53	
					Non-breast cancer related mortality		0.86 (0.69–1.08) P trend= 0.77	
Beasley[33] JM, 2011, CWLS, United States	Follow up of cases of population-based case-control study (n= 4441), age range: 20-79	Diagnosed: 1987-1999, 42% of women completed the FFQ Follow up= 5.5 years, until 2005, 525	Primary invasive breast cancer 72.8% local, 27.2% regional, surgery 97.9%, radiotherapy 49.8%, hormonal	Using a validated 126-item FFQ of post-diagnosis behaviour from 1998-2001	**Cruciferous vegetables**			Age, residence, menopausal status, smoking, tumour stage,
					All-cause survival	0.7 vs. 0.1 serving/ day	1.02 (0.8 - 1.3) P trend=0.35	
					Breast cancer-		0.95 (0.59-1.54)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	years, post-menopausal (73.3%)	deaths, 137 from breast cancer, 132 from cardiovascular disease	therapy 57.8%, chemotherapy 31.9%		specific mortality		P trend=0.86	alcohol intake, history of hormonal replacement therapy, interval between diagnosis and diet assessment, BMI, physical activity, breast cancer treatment, energy intake
					Vegetables			
					All-cause survival	2.5 vs. 0.4 serving/ day	1.44 (0.91-2.27) P trend=0.35	
					Breast cancer-specific mortality		0.96 (0.38-2.45) P trend=0.43	
Thomson[36] CA, 2011, WHEL	Patients in the control arms of a randomised controlled trial of the effect of plant-based dietary patterns (n= 3080), Peri-, pre-, and postmenopausal, mean age: 51.2 years, enrolled on average 23.5	Clinical trial conducted: 1995-2006, follow up = 7.3 years	Invasive breast cancer 74.2% ER+, 24.5% ER-, 1.3% not done/unknown. AJCC stages: 38.5% I, 33.2% IIA, 12.5% IIB, 12.1% IIIA, 3.7% IIIC. Chemotherapy 70%, radiotherapy 61.5%, current tamoxifen use: 59.5%	Pre-scheduled 24 hours recall, questionnaire collected via telephone from study-trained dietary assessors over a 3-week period including weekday and weekends	**Cruciferous vegetable**			Time from diagnosis to study entry, menopausal status, intervention status, cancer stage, oestrogen receptor status, chemotherapy, BMI,
					Breast cancer recurrence (n=487)	T3 vs. T1	0.85 (0.69-1.06)	
					Breast cancer recurrence Tamoxifen users (N=257)		0.65 (0.47-0.89)	
					Breast cancer recurrence		1.08 (0.79-1.47) P interaction=	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	months post-diagnosis, completed treatment for Stage I, II or III (AJCC VI classification)				Non-users of tamoxifen (n=230)		0.005	physical activity, clinical site, tamoxifen use
					Vegetables			
					Breast cancer recurrence (n=487)	T3 vs. T1	0.69 (0.55-0.87)	
					Breast cancer recurrence Tamoxifen users (N=257)		0.56 (0.41-0.77)	
					Breast cancer recurrence Non-users of tamoxifen (n=230)		0.77 (0.56-1.08) P interaction= 0.04	
Holmes[34] MD, 1999, NHS, United States	Cancer survivors of population-based prospective cohort study	Diagnosed: 1976-1990, follow up= 157 months, until 1994, 378 deaths, 326	Invasive breast carcinoma; grade 1-3	Validated Food frequency questionnaires in 1980, 1984, 1986, and 1990 Intakes of total	**Vegetables**			Age, time between exposure assessment and cancer diagnosis,
					All-cause mortality (n=378)	>4.20 vs. ≤2.12 servings/day	0.81 (0.59-1.11) P trend=0.07	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
(superseded by Farvid[31], 2020)	(n= 1982) pre- and post-menopausal, mean age: 54 years	breast cancer mortality		calories, alcohol and 83 nutrients were assessed, mean interval between diagnosis of breast carcinoma and diet assessment was 24 months (SD=18 months)	All-cause mortality With metastasis (N=250)	Q4 vs Q1	0.90 (0.60-1.33) P trend=0.53	calendar year of diagnosis, oral contraceptive use, postmenopausal hormone therapy use, smoking, age at first birth and parity, number of metastatic lymph nodes, tumour size, BMI, menopausal status, energy intake
					All-cause mortality Without metastasis (N=128)		0.62 (0.36-1.07) P trend=0.02	
Hebert[37] J, 1998, MSKCC, United States	Prospective cohort of breast cancer survivors (n=95) pre- and post-menopausal,	Diagnosed: 1982-1984, follow up= 10 years, until 1991, 109 had a recurrence of their diseases, 87 total death,	Early-stage breast cancer, 57.1% ER+. TNM, 39.7%, stage I, 40.6% stage II, 19.7% stage III	34-item semi-quantitative FFQ at cancer diagnosis and after two years when women were free from cancer	**Vegetable's change** Breast cancer-specific mortality Post-menopausal	1 piece increase/day	0.31 P=0.08	Tumour stage, age, vegetables, nbmis (proxy of total energy intake)

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	mean age: 52.2 years	73 breast cancer mortality			Breast cancer recurrence Post-menopausal		0.46 P=0.08	

Abbreviations: ABCPP, After Breast Cancer Pooling Project; BCFR; Breast Cancer Family Registry; CWLS, Collaborative Women's Longevity Study; LACE, Life After Cancer Epidemiology; NHS, Nurses' Health Study; SBCCS, Shanghai Breast Cancer Genetics Study; WHEL; Women's Healthy Eating and Living

Supplementary Table S9. Descriptive table of the included observational studies of post-diagnosis wholegrain intake and breast cancer prognosis

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
Dairy Foods								
Andersen[38] 2020, DCH	Population-based cohort study (n=977) Mean age: 66 years	Diagnosis year 1993 – 2013 Follow up = 7 years 175 total deaths, 121 breast cancer deaths, 152 recurrences	ER positive 78%, negative 16%, missing 6%	FFQ, at baseline, 5 years after diagnosis	All-cause mortality (n=175)	Continuous per 50g/day increase	0.99 (0.88-1.12)	Age at diagnosis, year at diagnosis, time of follow-up since diagnosis, alcohol, smoking, physical activity, BMI, education tumour size, nodal status, ER status
					Breast cancer mortality (n=121)		1.05 (0.93-1.21)	
					Recurrence (n=152)		0.98 (0.83-1.13)	
					All-cause mortality (n=175)	Pre- to post-diagnosis changes 50g/day	0.94 90.84-1.06)	Age at diagnosis, year at diagnosis, time of follow-up since diagnosis, alcohol, smoking, physical activity, BMI, education
					Breast cancer mortality (n=121)		0.96 (0.84-1.11)	
					Recurrence (n=152)		0.92 (0.79-1.07)	
McCullough [15] 2016, CPS-II, USA	Population-based cohort study (n=2152), age range: 40-93 years, race: mostly White	Diagnosis: 1992-2011, follow-up: mean 9.9 years, 640 deaths,192 from breast cancer, 129 from CVD	Local 77.3%, regional 22.7%, grade well differentiated 22.6%, moderately differentiated	FFQ, self-administered at a minimum of 1 year after diagnosis	All-cause mortality (n=640)	Q4 vs Q1	1.09 (0.86-1.38)	age at diagnosis, diagnosis year, tumor stage, tumor grade, ER status, PR status, treatment, BMI, smoking status,
					Breast cancer mortality (n=192)		1.24 (0.81-1.88)	

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
			39.0%, poorly or unknown 23.7%, ER+:79.5%; ER-:9.7%; PR+:57.2%; PR-:21.1%		Cardiovascular disease mortality (n=129)		1.43 (0.82-2.5)	physical activity, energy intake, fruit and vegetable intake, red and processed meat
					Other causes of death		0.91 (0.64-1.29)	
Beasley[33], 2011, CWLS, United States	Follow up of cases of (population-based) case-control study (n=4441) Age range: 20-79 years, 73% Post-menopausal 99% White	Diagnosis year: 1998-2001 Follow up= 5.5 years	Primary invasive breast cancer; Stages: 72.8% local, 27.2% regional, Surgery: 97.9%; Radiotherapy: 49.8%; Hormonal therapy: 57.8%; Chemotherapy:31.9%	Validated FFQ (126 items), 1-16 years after diagnosis (42% within 5 years)	All-cause mortality (n=525)	57 vs 7 g/ day	0.79 (0.59-1.08) P trend=0.20	Age, residence, menopausal status, smoking, stage, alcohol intake, hormonal therapy, interval between diagnosis and baseline interview, BMI, physical activity, breast cancer treatment, energy intake
					Breast cancer mortality (n=137)		0.83 (0.46-1.48) P trend=0.30	

Abbreviations: CPS-II, Cancer Prevention Study-II Nutrition Cohort; CWLS, Collaborative Women's Longevity Study; DCH, Diet Cancer and Health study.

Supplementary Table S10. Descriptive table of the included observational studies of post-diagnosis meat intake and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Holmes[39] MD, 2017, NHS	Prospective cohort (n= 6348) Mixed age range: 30-55 years. Patients were observed until death or June 1st, 2010, whichever occurred first	Follow up = 16 years	Radiation therapy 54.6%, tamoxifen use 69%, chemo 35.8% At baseline: ER +ve 81%	FFQ. Diet over the past year, assessed in baseline and follow-up questionnaires at least 12 months post-diagnosis	All-cause mortality	**Red meat** Q5 vs. Q1	1.13 (0.96 - 1.33) P trend =0.28	Age, time since diagnosis, energy intake, BMI, weight change, age at first birth, parity, oral contraceptive, menopausal status, hormone therapy, aspirin use, tumour stage, radiation therapy, treatment, calendar year
					Breast cancer mortality		1.08 (0.86 - 1.37) P trend=0.84	
					Distant recurrence		1.03 (0.83 - 1.29) P trend=0.93	
					All-cause mortality	**Processed meat** Q5 vs. Q1	0.99 (0.84 - 1.16) P trend=0.6	
					Breast cancer mortality		0.91 (0.73 - 1.14) P trend=0.83	
					Distant recurrence		0.97 (0.79 - 1.20) P trend=0.8	
					All-cause mortality	**Meat** Q5 vs. Q1	0.94 (0.79 - 1.11) P trend=0.31	
					Breast cancer mortality		0.90 (0.70 - 1.15) P trend=0.18	
					Distant recurrence		0.87 (0.69 - 1.09) P trend=0.1	
					All-cause mortality (n=1847)	**Poultry** Q5 vs. Q1 servings/ day	0.93 (0.79 - 1.08) P trend=0.48	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer mortality (n=919)		0.88 (0.70 - 1.10) P trend=0.76	
					Distant recurrence (n=1046)		0.85 (0.69 - 1.05) P trend=0.39	
					All-cause mortality (n=1847)	**Poultry (with skin)** Q5 vs. Q1 servings/ day	0.87 (0.74 - 1.01) P trend=0.06	
					Breast cancer mortality (n=919)		0.73 (0.59 - 0.91) P trend=0.02	
					All-cause mortality (n=1847)	**Poultry (without skin)** Q5 vs. Q1 servings/ day	1.06 (0.91 - 1.23) P trend=0.08	
					Breast cancer mortality (n=919)		1.16 (0.93 - 1.43) P trend=0.06	
Parada[40] H Jr, 2017, LIBCSP, USA	Population-based prospective study (n= 1508) Pre- and post-menopausal Mean age: 58.8 years. Until 2014	1996-1997 Follow up= 17.6 years 597 deaths of which 237 were breast cancer related	In situ: 235 Invasive: 1273 ≤2cm 75.5% >2cm 24.5% Radiation 60.9% Chemotherapy 41.4% Hormone therapy 61.1% ER- 26.7%, ER+ 73.3%	Interview and questionnaire. Consumption of grilled, barbecued and smoked meat; pre- and post-diagnosis changes in intake	All-cause mortality (n=428)	**Total grilled, barbecued, and smoked meat intake** High/high vs. low/low intake (pre/post-diagnosis)	1.31 (0.96 - 1.78)	Age at diagnosis, marital status, Income, alcohol intake, BMI, physical activity, tumour size, lymph node involvement, oestrogen
					Breast cancer mortality (n=126)		1.08 (0.63 – 1.83)	
					All-cause mortality (n=428)	**Grilled, barbecued beef, lamb and pork intake**	1.14 (0.87 - 1.51)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer mortality (n=126)	High/high vs. low/low intake (pre/post-diagnosis)	1.24 (0.76 - 2.03)	receptor status
					All-cause mortality (n=428)	**Smoked beef, lamb, and pork intake** High/high vs. low/low intake (pre/post-diagnosis)	1.20 (0.91 - 1.59)	
					Breast cancer mortality (n=126)		1.19 (0.71 - 1.99)	
					All-cause mortality (n=428)	**Grilled, barbecued poultry and fish intake** High/high vs. low/low intake	1.06 (0.79-1.43)	
					Breast cancer mortality (n=126)		1.11 (0.66-1.88)	
					All-cause mortality (n=428)	**Smoked poultry and fish** Any/any vs. none/none intake	0.88 (0.64-1.20)	
					Breast cancer mortality (n=126)		0.55 (0.31 – 0.97)	
McCullough[15] ML, 2016, CPS-II Nutrition Cohort, USA	(n= 2152) Mean age: 70.7 years	Follow up= 19 years. Among the 4,452 women included in the analytic cohort, 1,204	Local: 77.3%, regional: 22.7% Grade at diagnosis: well differentiated 22.6%, moderately	FFQ – Block On average 8.4 years before diagnosis Minimum of 1	All-cause mortality (n=640)	**Red and processed meat intake** <2.24 vs. ≥5.11 servings/week	0.64 (0.49 - 0.84) P trend=0.01	Age at diagnosis, diagnosis year, tumour stage, tumour grade, oestrogen
					Breast cancer mortality (n=192)		0.88 (0.54 - 1.43) P trend=0.6	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
		deaths occurred, 398 specifically due to breast cancer, and 233 due to CVD. In the analytic cohort of 2,152 women with post-diagnostic diet information, there were 640 deaths during follow-up, 192 breast cancer specific deaths, and 129 CVD	differentiated 39.0%; poorly or undifferentiated 23.7% Surgery: yes 86.1%; no 0.2% Chemotherapy: yes 22.9%; no 56.4% Radiation: yes 56.0%; no 28.5% Targeted therapy: yes 62.4%; no 3.7% ER+:79.5%; ER-:9.7%; PR+:57.2%; PR-:21.1%.	year after diagnosis	Cardiovascular disease (n=129) Mortality not including breast cancer or CVD (n=319)		0.52 (0.27 - 0.98) P trend=0.11 0.57 (0.39 - 0.82) P trend=0.02	and progesterone receptor status, initial delivered treatment, BMI, smoking status, physical activity, energy intake, fruit and vegetable consumption, total grain
Williams[32] PT, 2014, NRWHS	(n= 986)	Follow up= 9.1 years. 46 women died from breast cancer		Questionnaire average 7.9 years post diagnosis	Breast cancer mortality (n=46)	**Meat** Per 1 serving/day	0.53 (0.17 - 1.41)	Age, race, exercise
Beasley[33] JM, 2011, CWLS, United States	Follow up of cases of population-based case-control studies (n= 4441)	Follow up= 5.5 years 525 deaths, 137 breast cancer deaths, 132 deaths from	In situ: 0 Invasive: 4441 Stages: 72.8% local, 27.2% regional Surgery: 97.9% yes	FFQ within 5 years (range: 1–16 years) of diagnosis'	All-cause survival	**Meat** Q4 vs. Q1 serving/ day	1.12 (0.83 - 1.51) P trend=0.46	Age, residence, menopausal status, smoking, stage, alcohol intake,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	Mixed age range: 20-79 years 1998-2001 until 2005	cardiovascular disease	Radiotherapy: 49.8% yes Hormonal therapy: 57.8% yes Chemotherapy: 31.9% yes		Breast cancer mortality (n=137)		0.89 (0.50 - 1.60) P trend=0.94	hormonal therapy, interval between diagnosis and baseline interview, BMI, physical activity, breast cancer treatment, energy intake
Hebert[37] J, 1998, MSKCC, United States	Prospective cohort study of cancer survivors (n= 469) Pre- (47.3%) and postmenopausal Mean age:52.2 years White 86.8%	1982-1984 Follow up= 10 years max 87 deaths 73 breast cancer deaths 109 recurrences Vital status obtained for all but one woman	Early-stage invasive breast cancer TNM stage I 39.7% II 40.6%, IIIa 19.7% ER+ 57.1%	Measured at diagnosis and 2 years post-diagnosis	Breast cancer recurrence (n=109)	**Meat (all red meat including liver and bacon)**	1.12 (0.66 – 1.89) P trend=0.67	Stage, estrogen receptor, age, BMI, butter/ margarine/ lard, beer, menopausal status
							Premenopausal 1.93 (0.89 – 4.15) P trend=0.09	
					Breast cancer mortality (n = 73)		1.43 (0.74 – 2.79) P trend=0.29	
							Premenopausal 2.60 (0.96 – 7.03) P trend=0.06	

Abbreviations: CPS-II, Cancer Prevention Study II Nutrition Cohort; CWLS, Collaborative Women's Longevity Study; LIBCSP, Long Island Breast Cancer Study Project; NHS, Nurses' Health Study; NRWHS, National Runner's and Walker's Health study

Supplementary Table S11. Descriptive table of the included observational studies of post-diagnosis fish intake and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Holmes[39] MD, 2017, NHS, USA	Prospective cohort (n= 6348) Mixed age range: 30-55years. Patients were observed until death or June 1st 2010, whichever occurred first	Follow up= 16 years	At baseline: ER +ve 81% Radiation therapy 54.6%, tamoxifen use 69%, chemo 35.8%	FFQ, diet over the past year, assessed in baseline and follow-up questionnaires at least 12 months post-diagnosis	All-cause mortality (n=1847)	Fish Q5 vs. Q1 servings/ day	0.96 (0.82 - 1.13) P trend=0.82	Age, time since diagnosis, energy intake, BMI, weight change, age at first birth, parity, oral contraceptive, menopausal status, hormone therapy, aspirin use, tumour stage, radiation therapy, treatment, calendar year
					Breast cancer mortality (n=919)		0.99 (0.80 - 1.24) P trend=0.64	
					Distant recurrence (n=1046)		0.93 (0.76 - 1.15) P trend=0.87	
Parada[40] H Jr, 2017, LIBCSP, USA	Population-based prospective study (n= 1508) Pre and post-menopausal Mean age: 58.8 years. Until 2014	1996-1997 Follow up = 17.6 years 597 deaths of which 237 were breast cancer related	In situ: 235 Invasive: 1273 ≤2cm 75.5% >2cm 24.5% Radiation 60.9% Chemotherapy 41.4% Hormone therapy 61.1% ER- 26.7%, ER+ 73.3%	Interview and questionnaire. Consumption of grilled, barbecued and smoked meat; pre- and post-diagnosis changes in intake	All-cause mortality (n=428)	Grilled, barbecued poultry, and fish intake High/high vs. low-low (pre/post-diagnosis)	1.06 (0.79 - 1.43)	Age at diagnosis, marital status, income, alcohol intake, BMI, physical activity, tumour size, lymph node involvement, and oestrogen receptor status
					Breast cancer mortality (n=126)		1.11 (0.66 - 1.88)	
					All- cause mortality (n=428)	Smoked poultry and fish intake	0.88 (0.64 - 1.20)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer mortality (n=126)	Any/any vs. none/none (pre/post-diagnosis)	0.55 (0.31 - 0.97)	

Abbreviations: LIBCSP, Long Island Breast Cancer Study Project; NHS, Nurses' Health Study

Supplementary Table S12. Descriptive table of the included observational studies of post-diagnosis milk and dairy product intake and breast cancer prognosis

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
Dairy Foods								
Andersen[38] 2020, DCH	Population-based cohort study (n=977) Mean age: 66 years	Diagnosis year 1993 – 2013 Follow up = 7 years 175 total deaths, 121 breast cancer deaths, 152 recurrences	ER positive 78%, negative 16%, missing 6%	FFQ, at baseline, 5 years after diagnosis	All-cause mortality (n=175)	Continuous per 200g/day increase	0.99 (0.90-1.09)	Age at diagnosis, year at diagnosis, time of follow-up since diagnosis, alcohol, smoking, physical activity, BMI, education tumour size, nodal status, ER status
					Breast cancer mortality (n=121)		0.99 (0.87-1.12)	
					Recurrence (n=152)		0.93 (0.80-1.07)	
					All-cause mortality (n=175)	Pre- to post-diagnosis changes 200g/day	0.97 (0.87-1.07)	Age at diagnosis, year at diagnosis, time of follow-up since diagnosis, alcohol, smoking, physical activity, BMI, education
					Breast cancer mortality (n=121)		0.99 (0.88-1.13)	
					Recurrence (n=152)		0.95 (0.82-1.10)	
Holmes[39], 2017, NHS, United States Superseded by Holmes 1999 for the linear dose-	Prospective cohort (n= 6348) Age range: 30-55 Pre- and postmenopausal	Diagnosis year: 1976 - 2004 Follow up= 16 years 1847 total deaths, 919 breast cancer deaths, 1046 distant recurrences	Stage: I to III	Validated semiquantitative FFQ (61 to 116 items), at least 12 months post-diagnosis	All-cause mortality (n=1847)	Q5 vs. Q1	1.01 (0.86 - 1.19) P trend=0.46	Age at diagnosis, time since diagnosis, energy intake, BMI, weight change, age at first birth, parity, oral contraceptive use, menopausal status, hormone
					Breast cancer mortality (n=919)		1.01 (0.8 - 1.28) P trend=0.87	

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
response meta-analysis					Distant recurrence (n=1046)		0.91 (0.73 - 1.14) P trend=0.45	therapy use, aspirin use, alcohol, smoking, physical activity, tumour stage, radiation treatment, other treatment, calendar year
Kroenke[41], 2013, LACE, United States	Prospective cohort (n= 1893) Age range: 18-70 75% postmenopausal Mostly white	Diagnosis year: 2000-2002 Follow up = 11.8 years 349 recurrences, 372 total deaths, 189 breast cancer deaths	AJCC stage I-IIIa invasive breast cancer Completed breast cancer treatment, except adjuvant hormonal therapy	Validated semi-quantitative FFQ (120 items), baseline FFQ at 11-39 months and follow-up FFQ at 6 years post-diagnosis for diet in previous 12 months	All-cause mortality (n=372) Breast cancer mortality (n=189)	≥2.0 vs. <1 servings/day	1.39 (1.02 - 1.90) P trend=0.05 1.26 (0.81 - 1.95) P trend=0.32	Age at diagnosis, time from diagnosis to exposure assessment, age, race, education, tumour stage, tumour size, her-2/neu, nodal status, ER status, chemotherapy, radiotherapy, tamoxifen use, menopausal status, smoking, BMI, physical activity, energy intake, alcohol intake, fibre, fruit, comorbidity, red meat intake
					Breast cancer recurrence (n=349)		1.13 (0.83 - 1.54) P trend=0.38	
					Non-breast cancer mortality (n=183)		1.54 (0.99 - 2.39) P trend=0.07	

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
Beasley[33], 2011, CWLS, United States	Follow up of cases of (population-based) case-control study (n=4441) Age range: 20-79 years, 73% Post-menopausal 99% White	Diagnosis year: 1998-2001 Follow up= 5.5 years	Primary invasive breast cancer; Stages: 72.8% local, 27.2% regional, Surgery: 97.9%; Radiotherapy: 49.8%; Hormonal therapy: 57.8%; Chemotherapy:31.9%	Validated FFQ (126 items), 1-16 years after diagnosis (42% within 5 years)	All-cause mortality (n=525) Breast cancer mortality (n=137)	4 vs. 0.7 servings/ day	1.18 (0.9 - 1.54) P trend=0.27 0.94 (0.56 - 1.59) P trend=0.99	Age, residence, menopausal status, smoking, stage, alcohol intake, hormonal therapy, interval between diagnosis and baseline interview, BMI, physical activity, breast cancer treatment, energy intake
Holmes[34] MD, 1999, NHS, United States, Superseded by Holmes[39], 2017 for the high vs low forest plot	Population-based prospective cohort study (n= 1982) Pre- and postmenopausal Mean age: 54 years	Diagnosis year: 1976-1990 Follow up= 157 months	Invasive breast carcinoma 62% no lymph node metastases	FFQ (up to 2 years after diagnosis)	All- cause mortality (n=378)	≥2.15 vs. ≤0.92 servings/day	0.72 (0.52 – 1.00) P trend=0.04	Age, time between exposure assessment and cancer diagnosis, year of diagnosis, oral contraceptive, hormonal therapy, smoking, age at first birth, nodal status, tumour size, BMI, menopausal status, energy intake, dietary factors
High Fat Dairy								

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
Holmes[39], 2017, NHS, United States	Prospective cohort (n= 6348) Age range: 30-55 Pre- and postmenopausal	Diagnosis year: 1976 - 2004 Follow up= 16 years	Stage: I to III	Validated semiquantitative FFQ (61 to 116 items), at least 12 months post-diagnosis	All-cause mortality (n=1847)	2.49 vs. 0.33 servings/day	1.12 (0.96 - 1.31) P trend=0.32	Age at diagnosis, time since diagnosis, energy intake, BMI, weight change, age at first birth, parity, oral contraceptive use, menopausal status, hormone therapy use, aspirin use, alcohol, smoking, physical activity, tumour stage, radiation treatment, other treatment, calendar year
					Breast cancer mortality (n=919)		1.24 (0.98 - 1.56) P trend=0.05	
					Distant recurrence (n=1046)		1.09 (0.88 - 1.35) P trend=0.3	
Kroenke[41], 2013, LACE, United States	Prospective cohort (n= 1893) Age range: 18-70 75% postmenopausal Mostly white	Diagnosis year: 2000-2002 Follow up = 11.8 years	AJCC stage I-IIIa invasive breast cancer Completed breast cancer treatment, except adjuvant hormonal therapy	Validated semi-quantitative FFQ (120 items), baseline FFQ at 11-39 months and follow-up FFQ at 6 years post-	All-cause mortality (n=372)	≥1.0 vs. <0.5 servings/day	1.64 (1.24 - 2.17) P trend≤0.001	Age at diagnosis, time from diagnosis to exposure assessment, race, education, tumour stage, tumour size, her-2/neu, nodal status, ER status, chemotherapy, radiotherapy,
					Breast cancer mortality (n=189)		1.49 (1.00 - 2.24) P trend=0.05	

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
				diagnosis for diet in previous 12 months	Breast cancer recurrence (n=349)		1.22 (0.91 - 1.65) P trend=0.18	tamoxifen use, menopausal status, smoking, BMI, physical activity, energy intake, alcohol intake, fibre, fruit, comorbidity, red meat intake, low-fat dairy
					Non-breast cancer mortality (n=183)		1.67 (1.13 – 2.47) P trend= 0.007	
Low Fat Dairy								
Holmes[39], 2017, NHS, United States	Prospective cohort (n= 6348) Age range: 30-55 Pre- and postmenopausal	Diagnosis year: 1976 - 2004 Follow up= 16 years	Stage: I to III	Validated semiquantitative FFQ (61 to 116 items) at least 12 months post-diagnosis	All-cause mortality (n=1847)	2.15 vs. 0.14 servings/day	0.92 (0.79 - 1.07) P trend=0.1	Age at diagnosis, time since diagnosis, energy intake, BMI, weight change, age at first birth, parity, oral contraceptive use, menopausal status, hormone therapy use, aspirin use, alcohol, smoking, physical activity, tumour stage, radiation treatment, other treatment, calendar year
					Breast cancer mortality (n=919)		0.83 (0.67 - 1.04) P trend=0.03	
					Distant recurrence (n=1046)		0.84 (0.69 - 1.04) P trend=0.04	

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
Kroenke[41], 2013, LACE, United States	Prospective cohort (n= 1893) Age range: 18-70 75% postmenopausal Mostly white	Diagnosis year: 2000-2002 Follow up = 11.8 years	AJCC stage I-IIIa invasive breast cancer Completed breast cancer treatment, except adjuvant hormonal therapy	Validated semi-quantitative FFQ (120 items), baseline FFQ at 11-39 months and follow-up FFQ at 6 years post-diagnosis for diet in previous 12 months	All- cause mortality (n=372)	≥1.0 vs. <0.5 servings/day	1.05 (0.80 - 1.36) P trend=0.76	Age at diagnosis, time from diagnosis to exposure assessment, race, education, tumour stage, tumour size, Her-2/neu, nodal status, ER status, chemotherapy, radiotherapy, tamoxifen use, menopausal status, smoking, BMI, physical activity, energy intake, alcohol intake, fibre, fruit, comorbidity, red meat intake, high-fat dairy
					Breast cancer mortality (n=189)		1.03 (0.71 - 1.49) P trend=0.89	
					Breast cancer recurrence (n=349)		1.01 (0.78 - 1.32) P trend=0.85	
					Non-breast cancer mortality (n=183)		1.05 (0.71 – 1.55) P trend= 0.83	

Abbreviations: CWLS, Collaborative Women's Longevity Study; DCH, Diet, Cancer and Health cohort; LACE, Life After Cancer Epidemiology; NHS, Nurses' Health Study

Supplementary Table S13. Descriptive table of the included observational studies of post-diagnosis soy and isoflavone intake and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Isoflavones								
Zhang[42] FF, 2017(a), BCFR, USA	Follow-up study of cancer survivors cohort (n= 6235 of which n= 1466 reported the exposure post-diagnosis) pre- and postmenopausal mean age:51.8 years	Recruitment period: 1996-2011, follow up= 9.4 years 1224 deaths	First primary invasive breast cancer 52.3% ER+, 22.4% ER-, 1.9% unclassified, 23.4% unknown; 47.1% PR+, 26.9% PR-, 1.8% unclassified, 24.2% unknown ER+ 52.3%, ER- 22.4%, undetermined 1.9%, missing/unknown 23.4% PR+ 47.1%, PR- 26.9%, undetermined 1.8%, missing/unknown 24.2%; 86.3% surgery, 58.3% radiation therapy, 52.5% chemotherapy, 45.9% hormone therapy	Self-administered FFQ about usual dietary intake of 108 food items. Validity was assessed against repeated 24-hour recalls and women reporting untrue intakes were excluded, 1,466 women reported their dietary intake within 5 years after diagnosis	All-cause mortality (n=261) only women who reported post-diagnosis diet	≥ 1.494 vs. < 0.342 mg/day	0.65 (0.41 – 1.00) P trend=0.02	Age, study site, total caloric intake, race/ethnicity, education, total intake, healthy eating index, treatment type, recreational physical activity, BMI, alcohol use, smoking status, pack years
					All-cause mortality pre-menopausal (n=3056)		0.93 (0.68-1.27) P trend=0.46	
					All-cause mortality post-menopausal (n=3176)		0.78 (0.59-1.05) P trend=0.09	
					All-cause mortality normal weight (<25 kg/m^2) (n=2991)		0.74 (0.54-1.01) P trend=0.05	
					All-cause mortality overweight (25-29.9 kg/m^2) (n=1723)		0.97 (0.66-1.41) P trend=0.75	
					All-cause mortality obese (□ 30 kg/m^2) (n=1336)		0.76 (0.48-1.19) P trend=0.13	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					All-cause mortality ER+PR+, ER+PR-ER-PR+ (N=3348)		0.90 (0.69-1.19) P trend=0.41	
					All-cause mortality ER-PR- (n=1167)		0.49 (0.29-0.83) P trend=0.005	
					All-cause mortality received hormone therapy (n=2862)		0.90 (0.66-1.22) P trend=0.19	
					All-cause mortality did not received hormone therapy (n=3373)		0.68 (0.51-0.91) P trend=0.02	
Nechuta[43] SJ, 2012, ABCPP (LACE, WHEL, SBCSS), USA and China	Follow-up of prospective cohort studies in the pooling project (n= 9514) pre- and	Diagnosed: 1991 and 2006 Follow up= 7.4 years n= 1171 deaths (881 from breast cancer) n=	Invasive breast cancer	Soy food intake was assessed with a validated FFQ. Soy food intake assessed within a	All-cause mortality (n=1171)	≥ 10.0 vs. < 4.0 mg/day	0.87 (0.70 - 1.07)	Age at diagnosis, oestrogen receptor status, progesterone receptor status, TNM stage,
					All-cause mortality (n=419) premenopausal		1.11 (0.77-1.60) P trend=0.59	
					All-cause		0.84	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	postmenopausal	1348 recurrences		mean of 2 years after diagnosis Participants completed a baseline FFQ, multiple 24-h recalls twice per month consecutively for 12 months and a second FFQ at the end of the study	mortality (n=706) postmenopausal		(0.61 -1.14) P trend=0.26	chemotherapy, radiotherapy, hormonal therapy, smoking, BMI, exercise, cruciferous vegetables intake, parity, menopausal status, study, race/ethnicity, education
					All-cause mortality ER-positive		0.91 (0.69-1.20) P trend=0.54	
					All-cause mortality ER-negative		0.81 (0.54-1.23) P trend= <0.01	
					All-cause mortality among ER-positive tamoxifen use		0.74 (0.52-1.07)	
					All-cause mortality among ER-positive no tamoxifen use		0.98 (0.65-1.47)	
					Breast cancer-specific mortality (n=881)		0.83 (0.64-1.07)	
					Breast cancer-specific mortality (n=382) premenopausal		0.97 (0.66-1.43) P trend=0.59	
					Breast cancer-specific mortality (n=467) postmenopausal		0.78 (0.54-1.14) P trend=0.16	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer-specific mortality ER-positive		0.93 (0.67-1.28) P trend=0.69	
					Breast cancer-specific mortality ER-negative		0.67 (0.43-1.05) P trend=0.07	
					Breast cancer-specific mortality ER-positive tamoxifen use		0.84 (0.54-1.31)	
					Breast cancer-specific mortality ER-positive no tamoxifen use		1.16 (0.71-1.90)	
					Breast cancer recurrence (n=1348)		0.75 (0.61-0.92)	
					Breast cancer recurrence (n=589) premenopausal		0.93 (0.69-1.26) P trend=0.64	
					Breast cancer recurrence (n=695) postmenopausal		0.64 (0.48-0.87) P trend= <0.01	
					Breast cancer recurrence ER-positive		0.81 (0.63-1.04) P trend=0.11	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer recurrence ER-negative		0.64 (0.44-0.94) P trend=0.02	
					Breast cancer recurrence ER-positive tamoxifen use		0.63 (0.46-0.87)	
					Breast cancer recurrence ER-positive no tamoxifen use		0.79 (0.55-1.14)	
Zhang[44] Y, 2012, China	Prospective study of breast cancer patients (n=616) Pre-, post- or perimenopausal, mean age 45.7 ± 6.2 years	Recruitment period: 2004-2006, follow up= 52.1 months (range: 9-60 months), until 2011, 79 total deaths, 9 subjects were lost to follow up	61.4% ER+,38.6% ER-, 81.3% stage I-II, 18.7% stage III-IV chemotherapy: 86.7%; radiotherapy: 64.9%; hormone therapy:7.6%; tamoxifen use: 56.8%	Soy food intake was assessed by a quantitative FFQ (median 69 days post-diagnosis). Soy food intake was estimated based on the intake of six foods or food groups. Soy	**Soy Protein**			Age, education, smoking, alcohol intake, family history, tamoxifen use, TNM stage, chemotherapy, radiotherapy
					Total mortality	>13.03 vs. < 2.12 g/day	0.71 (0.52-0.98)	
					Total mortality ER-positive		0.66 (0.44-0.93)	
					Total mortality ER-negative		0.77 (0.53-1.00)	
					Isoflavone			
					Total mortality	>28.83 vs. <7.56 mg/day	0.62 (0.42 - 0.9)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
				isoflavones was defined as the sum of three individual isoflavones: daidzein, genistein and glycitein	Total mortality ER-positive		0.59 (0.40-0.93)	
					Total mortality ER-negative		0.78 (0.47-0.98)	
Caan[45] B, 2011, WHEL, United States (superseded by Nechuta[43], 2012)	Randomised controlled trial of dietary intervention trial, ancillary analysis (n=2736) age range:18-70 years Pre-, post- or perimenopausal	Diagnosed: 1991-2000; follow up= 7.3 years, until 2006, 271 deaths	Early stage breast cancer, 79.7% ER+ or PR+, 20.3% ER-/PR-, AJCC stages: 38.9% I, 45.8% II, 15.3% III Tamoxifen: 60.8% current, 32.7% never, 6.4% past user	FFQ, soy intake was measured at study entry post-diagnosis (median 2 years, range: 2 months to 4 years) using the Arizona Food Frequency Questionnaire (AFFQ) a 153-item semi quantitative	**Isoflavone**			Stage, grade, ER/PR status, menopausal status, chemotherapy treatment, radiation, age, education, race, soy supplement intervention group, presence of hot flash symptoms and their interaction,
					Overall (n=271)	16.33-86.9 vs. 0-0.07 mg/day	0.46 (0.2 - 1.05) P trend=0.02	
					Additional breast cancer events (n=448) (* includes an invasive breast cancer recurrence or a new invasive primary cancer)		0.78 (0.46-1.31) P trend=0.47	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
				questionnaire				tamoxifen use
Guha[46] N, 2009, LACE, United States, (superseded by Nechuta, 2012)	(n= 1954) age range: 18-79 years, pre- and postmenopausal women	Recruitment period: between January 2000 and April 2002, follow up= 6.31 years, until 2008, 282 breast cancer recurrences, mean time from enrolment to recurrence was 3.31 years	Primary breast cancer within 39 months of enrolment	A Fred Hutchinson Cancer Research Center (FHCRC) semi-quantitative FFQ with > 100 foods and beverages and a separate soy FFQ with 14 items, assessed post diagnosis	**Daidzein**			Age, race, soy supplement use, BMI 1 year before diagnosis, menopausal status, tobacco pack-years, tumour stage, ER status, Energy intake
					Breast cancer recurrence (n=266)	≥ 9,596.55 vs. 0 µg/day	0.96 (0.52-1.76)	
					Breast cancer recurrence (n=54) pre-menopausal		1.74 (0.63-4.76)	
					Breast cancer recurrence (n=171) post-menopausal		0.7 (0.27-1.77)	
					Genistein			
					Breast cancer recurrence (n=266)	≥ 13,025.88 vs. 0 µg/day	0.95 (0.52-1.75)	
					Breast cancer recurrence (n=54) pre-menopausal		1.75 (0.65-4.76)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
				(Assessed on average 23 months post diagnosis but intake referred to the 12 months prior diagnosis)	Breast cancer recurrence (n=171) post-menopausal		0.69 (0.27-1.75)	
					Glycetin			
					Breast cancer recurrence (n=266)	≥ 795.40 vs. 0 µg/day	0.8 (0.42-1.5)	
					Breast cancer recurrence (n=54) pre-menopausal		1.6 (0.54-4.72)	
					Breast cancer recurrence (n=54) post-menopausal		0.51 (0.18-1.38)	
Shu[47], 2009, SBCSS, China (superseded by Nechuta[43], 2012)	Prospective cohort of breast cancer survivors (n= 5042) pre- and postmenopausal age range: 20-75 years	Diagnosed: 2002-2006, follow up= 3.9 years, until 2008, 444 deaths and 534 recurrences or breast cancer–related deaths	Primary breast cancer, 63.2% ER+, 35.2% ER-; 57.5% PR+, 40.6% PR-, TNM stages: 85.8% 0-II, 9.8% III-IV, radical mastectomy: 92.6%; radiotherapy: 32.1%; chemotherapy: 91.2%; tamoxifen: 52.1%	6.5 months after diagnosis Habitual dietary intake was assessed using a validated FFQ over the preceding 6 months for the baseline	**Isoflavone**			Age at diagnosis, TNM stage, chemotherapy, radiotherapy, surgery type, BMI, menopausal status, receptor status, tamoxifen
					Total mortality (n=444) (Result superseded by Nechuta, 2012, SBR00559)	>62.68 vs. ≤20 mg/day	0.79 (0.61-1.03)	
					Total mortality (n=186) premenopausal		0.78 (0.52-1.16)	
					Total mortality (n=258) postmenopausal		0.81 (0.57-1.16)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
				survey, 12 months for the 18-month survey and the preceding 18 months for the 36-month survey	Total mortality (n=202) ER-positive (Result superseded by Nechuta, 2012, SBR00559)		0.78 (0.53-1.16)	use, education, income, cruciferous vegetables, meat intake, supplements use, tea consumption, physical activity
					Total mortality (n=224) ER-negative (Result superseded by Nechuta, 2012, SBR00559)		0.85 (0.58-1.24)	
					Total mortality (n=427) Stage 0-IV		0.81 (0.62-1.06)	
					Total mortality (n=56) Stage 0 and I		0.96 (0.44-2.10)	
					Total mortality (n=224) Stage II		1.02 (0.69-1.49)	
					Total mortality (n=147) Stage III and IV		0.54 (0.34-0.87)	
					Total mortality (n=125) Tamoxifen use		0.74 (0.42-1.29)	
					Total mortality (n=76)		0.74 (0.38-1.43)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					No tamoxifen use			
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=534) (Result superseded by Nechuta, 2012, SBR00559)		0.77 (0.60 - 0.98)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=242) premenopausal		0.77 (0.55-1.09)	
					Additional breast cancer events(recurrence/breast cancer mortality combined) (n=292) postmenopausal		0.78 (0.55-1.08)	
					Additional breast cancer events		0.77 (0.54-1.09)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					(recurrence/breast cancer mortality combined) (n=255) (Result superseded by Nechuta, 2012, SBR00559) ER-positive			
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=267) (Result superseded by Nechuta, 2012, SBR00559) ER-negative		0.88 (0.62-1.25)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=517) Stage 0-IV		0.78 (0.61-0.99)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=71) Stage 0 and I		0.84 (0.43-1.67)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=277) Stage II		0.77 (0.55-1.09)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=169) Stage III-IV		0.75 (0.49-1.15)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=158)		0.73 (0.44-1.19)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Tamoxifen use			
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=96) No tamoxifen use		0.71 (0.39-1.28)	
					Soy protein			
					Total mortality (n= 444)	> 15.31 vs. ≤5.31 g/day	0.71 (0.54-0.92)	
					Total mortality (n=186) premenopausal		0.69 (0.46-1.04)	
					Total mortality (n=258) postmenopausal		0.72 (0.51-1.03)	
					Total mortality (n=202) ER-positive		0.67 (0.45-1.00)	
					Total mortality (n=224) ER-negative		0.78 (0.54-1.14)	
					Total mortality (n=427) Stage 0-IV		0.73 (0.56-0.96)	
					Total mortality (n=56) Stage 0 and I		0.78 (0.37-1.65)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Total mortality (n=224) Stage II		0.97 (0.65-1.45)	
					Total mortality (n=147) Stage III and IV		0.48 (0.31-0.76)	
					Total mortality (n=125) Tamoxifen use		0.61 (0.34-1.08)	
					Total mortality (n=76) No tamoxifen use		0.65 (0.33-1.29)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n= 534)		0.68 (0.54-0.87)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=242) premenopausal		0.69 (0.49-0.98)	
					Additional breast cancer events (recurrence/brea		0.69 (0.49-0.96)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					st cancer mortality combined) (n=292) postmenopausal			
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=255) ER-positive		0.69 (0.50-0.98)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=267) ER-negative		0.77 (0.54-1.09)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=517) Stage 0-IV		0.71 (0.56-0.90)	
					Additional breast cancer events		0.79 (0.40-1.55)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					(recurrence/breast cancer mortality combined) (n=71) Stage 0 and I			
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=277) Stage II		0.73 (0.52-1.04)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=169) Stage III-IV		0.63 (0.41-0.95)	
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=158) Tamoxifen use		0.66 (0.40-1.09)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Additional breast cancer events (recurrence/breast cancer mortality combined) (n=96) No tamoxifen use		0.65 (0.36-1.17)	

Abbreviations: ABCPP, After Breast Cancer Pooling Project; BCFR; Breast Cancer Family Registry; LACE, Life After Cancer Epidemiology; SBCCS, Shanghai Breast Cancer Genetics Study; WHEL; Women's Healthy Eating and Living

Supplementary Table S14. Descriptive table of the included observational studies of post-diagnosis carbohydrate intake and breast cancer prognosis

Publication	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
Farvid[48], 2021, NHS I and NHSII, USA,	Population based cohort (n=8932), Age range: 30-55 years	Diagnosed:1980 to 2010 NHS and 1991 to 2011 NHSII	Stage I-III	FFQ 1980-2010 to 2014 in NHS and 1991-2011 to 2015 in NHSII	All-cause mortality (n=2523.0)	252.8 vs 171.2 g/day	1.20 (1.04-1.38) P trend=0.009	Age at diagnosis, age at menopause, alcohol intake, aspirin use, BMI change, calendar year, chemotherapy, energy intake, er/pr status, hormonal therapy, menopausal status, physical activity, prediagnosis BMI, race, radiotherapy, smoking, stage, study, time between cancer diagnosis and exposure assessment
					Cancer specific mortality (n=1071.0)		1.24 (1.01-1.52) P trend=0.06	
					All-cause mortality (n=2523.0)	55.5 vs 14.2 g/day	0.97(0.85-1.11) P trend=0.42	Age at diagnosis, age at menopause, alcohol intake, aspirin use,

Publication	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
						23.3 vs 0.9 g/day	1.15 (1.01-1.30) P trend=0.008	BMI change, calendar year, chemotherapy, er/pr status, hormonal therapy, menopausal status, oral contraceptive, physical activity, pre-diagnosis BMI, race, radiotherapy, smoking, stage, study, time between exposure assessment and cancer diagnosis, total energy intake
						23.9 vs 8 g/day	0.86 (0.75-0.97) P trend=0.01	
						38.3 vs 5.7 g/day	0.92 (0.80-1.05) P trend=0.13	
						10.5 vs 2.1 g/day	0.99 (0.88-1.13) P trend=0.47	
						24 vs 4 g/day	1.13 (0.99-1.28) P trend=0.14	
						55.5 vs 14.2 g/day	1.02 (0.83-1.25) P trend=0.99	
						23.3 vs 0.9 g/day	1.24 (1.02-1.50)	

Publication	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
							P trend=0.008	
						23.9 vs 8 g/day	0.84 (0.69-1.02) P trend=0.14	
					Cancer specific mortality (n=1071.0)	38.3 vs 5.7 g/day	1.12 (0.91-1.37) P trend=0.36	
						64.7 vs 25.7 g/day	0.96 (0.79-1.18) P trend=0.50	
						10.5 vs 2.1 g/day	1.12 (0.92-1.36) P trend=0.44	
						24 vs 4 g/day	1.25 (1.02-1.52) P trend=0.11	
Farvid[49] 2021, NHS I	Population based cohort (n=8932), Age range: 30-55 years	Diagnosed:1980 to 2010 NHS and 1991 to 2011 NHSII	Stage I-III	FFQ 1980-2010 to 2014 in NHS and 1991-2011 to 2015 in NHSII	All-cause mortality (n=2523)	Carbohydrates from fruits 55.5 vs 14.2 g/day	0.97 (0.85-1.11) P trend=0.42	Study, age at diagnosis, calendar year, time between

Publication	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
and NHSII, USA,						Carbohydrates from juices 23.3 vs 0.9 g/day	1.15 (1.01-1.30) P trend=0.008	cancer diagnosis and exposure assessment, pre-diagnosis BMI, BMI changes, smoking, physical activity, oral contraceptive, alcohol intake, total energy intake, menopausal status, age at menopause, aspirin use, race, stage, ER/PR status, radiotherapy, chemotherapy, hormonal therapy
						Carbohydrates from vegetables 23.9 vs 8.0 g/day	0.86 (0.75-0.97) P trend=0.01	
						Carbohydrates from whole grains 38.3 vs 5.7 g/day	0.92 (0.80-1.05) P trend=0.13	
						Carbohydrates from refined grains 64.7 vs 25.7 g/day	1.16 (1.02-1.32) P trend=0.06	
						Carbohydrates from legumes 10.5 vs 2.1 g/day	0.99 (0.88-1.13) P trend=0.47	
						Carbohydrates from potatoes 24 vs 4 g/day	1.13 (0.99-1.28) P trend=0.14	

Publication	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
					Breast cancer-specific mortality (n=1071)	Carbohydrates from fruits 55.5 vs 14.2 g/day	1.02 (0.83-1.25) P trend=0.99	
						Carbohydrates from juices 23.3 vs 0.9 g/day	1.24 (1.02-1.50) P trend=0.008	
						Carbohydrates from vegetables 23.9 vs 8.0 g/day	0.84 (0.69-1.02) P trend=0.14	
						Carbohydrates from whole grains 38.3 vs 5.7 g/day	1.12 (0.91-1.37) P trend=0.36	
						Carbohydrates from refined grains 64.7 vs 25.7 g/day	0.96 (0.79-1.18) P trend=0.50	
						Carbohydrates from legumes 10.5 vs 2.1 g/day	1.12 (0.92-1.36) P trend=0.44	

Publication	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
						Carbohydrates from potatoes 24 vs 4 g/day	1.25 (1.02-1.52) P trend=0.11	
Emond[50] JA, 2014, WHEL, United States	Follow up of a nested case-control study (n=265) Mean age: 57 Postmenopausal, 84% non-Hispanic White	Follow up:7.3 years	Stage of primary cancer: I: 24.9%, II: 66.0%, III A: 9.1% Chemotherapy:70.1% Radiation therapy: 63.4% Ever tamoxifen use: 75.1%	24-hour diet recall, change in carbohydrate intake baseline (mean of 1.9 years after diagnosis) to 1 year	Breast cancer recurrence	Stable/increased vs. decreased	2.0 (1.3 – 5)	Carbohydrate and energy intake at baseline as well as change in post-diagnosis energy and fiber intake
Beasley[33] JM, 2011, CWLS, United States	Follow up of cases of population-based case-control study (n=4441), age range: 20-79 years, 73% Post-menopausal 99% White	Diagnosis year: 1998-2001, Follow up: 5.5 years	Primary invasive breast cancer; Stages: 72.8% local, 27.2% regional, Surgery: 97.9%; Radiotherapy: 49.8%; Hormonal therapy: 57.8%; Chemotherapy:31.9%	Validated FFQ (126 items), 1-16 years after diagnosis (42% within 5 years)	All- cause mortality (n=525)	63 vs. 42 % kcal/ day	0.97 (0.72 - 1.3) P trend=0.80	Age, residence, menopausal status, smoking, stage, alcohol intake, hormonal therapy, interval between diagnosis and diet assessment, BMI, physical activity, breast cancer treatment, energy intake
					Breast cancer mortality (n=137)		0.93 (0.54-1.62) P trend=0.87	

Publication	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
Belle[51] F, 2011, HEAL, United States	Prospective cohort (n= 688), mean age: 55.3 60.9% postmenopausal, 57.7% non-Hispanic white, 28.5% African American, 11.9% Hispanic, 1.9% other	Diagnosis year:1995-1999, follow up: 6.7 years	In situ to IIIA breast cancer	FFQ (122 items) on average 31.5 months post-diagnosis	All-cause mortality (n=106)	>175.7 vs. 137.5 g/day	0.7 (0.38 - 1.29) P trend=0.35	Energy intake, folate intake, tumour stage, tamoxifen use, treatment, fibre
					Breast cancer mortality (n=83)		0.59 (0.3 - 1.17) P trend=0.21	
					Nonfatal or new recurrence (n=82)		0.62 (0.31 - 1.23) P trend=0.26	
Borugian M, 2004, VCC-CCA, Canada	Prospective cohort of breast cancer survivors (n=603) mean age:54.5, 39% premenopausal, 61% postmenopausal	Follow Up: 10 years average	Tumor grades: 7.6% well differentiated, 46.4% moderately differentiated, 46% poorly differentiated Systemic treatment: Tamoxifen only: 21.9%; Chemotherapy only: 14.7%; Chemotherapy and tamoxifen: 21.4%; Other hormone 1.9%; None 40.1%. Local treatment: lumpectomy alone: 4.6%; Lumpectomy + RT: 14.6%; Complete	Semi-quantitative FFQ Questionnaire of during diagnosis Recruitment 1991-1992	Post-menopausal Breast cancer-specific mortality (n=112)	≥ 224 vs ≤ 146g/day	1.50 (0.70-3.40) P trend=0.69	Age, energy intake, tumor stage
					Breast cancer-specific mortality (n=112)	Per 1 % Energy	1.00 (0.99-1.03)	

Publication	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
			mastectomy alone: 59.6%; Complete		Pre-menopausal Breast cancer-specific mortality	≥ 224 vs ≤ 146g/day	1.30 (0.30-5.10) P trend=0.73	
						Per 1 % Energy	1.00 (0.97-1.04)	
					Post-menopausal Breast cancer-specific mortality	≥ 224 vs ≤ 146g/day	2.00 (0.70-5.70) P trend=0.47	
						Per 1 % Energy	1.02 (0.99-1.05)	
Holmes[34] MD, 1999, NHS, United States (superseded by Farvid[48], 2021)	Population-based prospective cohort study (n= 1982), mean age: 54 Pre- and post-menopausal	Diagnosis 1976-1990, follow up: 157 months	Invasive breast carcinoma 62% no lymph node metastases	FFQ (up to 2 years after diagnosis) on average 24 months post-diagnosis.	All-cause mortality (n=378)	Q5 vs. Q1	0.91 (0.65 - 1.26) P trend=0.79	Age, diet interval, year of diagnosis, oral contraceptive, hormonal therapy, smoking, age at first birth and parity, nodal status, tumour size, BMI, menopausal status, energy intake
Rohan[52] T 1993, SACCR follow-up, Australia	Follow-up of cases of population-based case-control (n=412), mean	Follow up: 5.5 years median	Invasive primary breast cancer, any stage	Self-administered FFQ (179 dietary items) on average 4.8	Breast cancer-specific mortality (n=112)	≥256 vs <144g/day	0.61 (0.31-1.22) P = 0.13	Energy intake, age of menarche, quetelet index

Publication	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
	age: 55.1, pre- and post-menopausal			months post-diagnosis.				

Abbreviations: CWLS, Collaborative Women's Longevity Study; HEAL, Health, Eating, Activity, and Lifestyle Study; NHS, Nurses' Health Study; SACCR, South Australian Central Cancer Registry; WHEL; Women's Healthy Eating and Living

Supplementary Table S15. Descriptive table of the included observational studies of post-diagnosis protein intake and breast cancer prognosis

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
Total Protein								
Farvid[48] MS, 2021, NHS and NHSII, USA	Population based cohort (n=8932), Age range: 30-55 years	Diagnosed: 1980 to 2010 NHS and 1991 to 2011 NHSII	Stage I-III	FFQ 1980-2010 to 2014 in NHS and 1991-2011 to 2015 in NHSII	All-cause mortality (n=2523.0)	89 vs 57.4 g/day	0.80 (0.70-0.91) P trend=0.0009	Age at diagnosis, age at menopause, alcohol intake, aspirin use, BMI change, calendar year, chemotherapy, energy intake, er/pr status, hormonal therapy, menopausal status, physical activity, prediagnosis BMI, race, radiotherapy, smoking, stage, study, time between cancer diagnosis and exposure assessment
					Cancer specific mortality (n=1071.0)		0.68 (0.56-0.83) P trend=0.0002	
Holmes[39] MD, 2017, NHS, United States	Prospective cohort of cancer survivors (n= 6348), Age range: 30-55, Pre- and postmenopausal	Diagnosis year:1976 – 2004, Follow up:16 years	Stage I to III	Validated semiquantitative FFQ (61 to 116 items), at least 12 months post-diagnosis	All- cause mortality (n=1847)	88.3 vs. 61.5 g/day	0.98 (0.85 - 1.14) P trend=0.5 (superseded by Farvid[48], 2021)	Age, time since diagnosis, energy intake, BMI, weight change, age at first birth, parity, oral contraceptive, menopausal status, hormone therapy, aspirin use, alcohol, smoking, physical activity, tumour stage, radiation
					Breast cancer mortality (n=919)		0.95 (0.77 - 1.17) P trend=0.17	

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
							(superseded by Farvid[48], 2021)	therapy, treatment, calendar year
					Distant recurrence (n=1046)		0.84 (0.69 - 1.03) P trend=0.02	
Beasley[33] JM, 2011, CWLS, United States	Follow up of cases of population-based case-control study (n=4441), Age range: 20-79 years, 73% Post-menopausal, 99% White	Diagnosis year: 1998-2001, Follow up: 5.5 years	Primary invasive breast cancer; Stages: 72.8% local, 27.2% regional, Surgery: 97.9%; Radiotherapy: 49.8%; Hormonal therapy: 57.8%; Chemotherapy: 31.9%	Validated FFQ (126 items), 1-16 years after diagnosis (42% within 5 years)	All- cause mortality (n=525)	21 vs. 13 % kcal/ day	0.98 (0.73 - 1.31) P trend=0.72	Age, residence, menopausal status, smoking, stage, alcohol intake, hormonal therapy, interval between diagnosis and baseline interview, BMI, physical activity, breast cancer treatment, energy intake
					Breast cancer mortality (n=137)		1.19 (0.66 - 2.14) P trend=0.49	
Borugian, 2004, VCC-BCCA, Canada	Prospective cohort of 603 breast cancer survivors, mean age:54.5, 39% premenopausal, 61% postmenopausal	Follow Up: Average 10 years	Tumor grades: 7.6% well differentiated, 46.4% moderately differentiated, 46% poorly differentiated Systemic treatment: Tamoxifen only: 21.9%; Chemotherapy only: 14.7%; Chemotherapy and tamoxifen: 21.4%; Other hormone 1.9%; None 40.1%. Local treatment:	Semi-quantitative FFQ Questionnaire of during diagnosis Recruitment 1991-1992	cancer-specific mortality (n=112)	≥83 vs ≤52 g/day	0.4 (0.20-0.80) P trend=0.07	Age, energy intake, tumor stage
					Breast cancer-specific mortality (n=112)	Per 1 % Energy	0.87 (0.82-0.93) P trend ≤0.0001	
					Pre-menopausal Breast cancer-	≥83 vs ≤52 g/day	0.20 (0.10-0.90) P trend=0.14	

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
			lumpectomy alone: 4.6%; Lumpectomy + RT: 14.6%; Complete mastectomy alone: 59.6%; Complete		specific mortality	Per 1 % Energy	0.81 (0.73-0.90) P trend ≤0.0001	
					Post-menopausal Breast cancer-specific mortality	≥83 vs ≤52 g/day	0.60 (0.20-1.60) P trend=0.12	
						Per 1 % Energy	0.91 (0.84-0.99) P trend=0.03	
Holmes[34], 1999, NHS					All-cause mortality (n=378)	≥81.6 vs ≤60.9g/day	0.65 (0.47-0.88) P trend<0.001 (superseded by Farvid[48], 2021)	Age, time between exposure assessment and diagnosis, year of diagnosis, oral contraceptive, hrmonal therapy, smoking, age at first birth, nodal status, tumor size, BMI, menopausal status, energy intake
					Nonmetastatic All-cause mortality (n=128)		0.49 (0.28-0.84) P trend=0.006	
					Metastatic All-cause mortality		0.71 (0.48-1.05) P trend=0.02	

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
					(n=250)			
Rohan[52] T 1993, SACCR follow-up, Australia	Follow-up of cases of population-based case-control study of 412 pre- and postmenopausal Mean age: 55.1	Follow up: 5.5 years median	Invasive primary breast cancer, any stage	Self-administered FFQ (179 dietary items) on average 4.8 months post-diagnosis	Breast cancer-specific mortality (n=112)	≥103 vs ≤59g/day	0.74 (0.34-1.66) P = 0.573	Energy intake, age of menarche, quetelet index
Animal Protein								
Farvid MS, 2021[48], NHS and NHSII, USA	Population based cohort (n=8932), Age range: 30-55 years	Diagnosed:1980 to 2010 NHS and 1991 to 2011 NHSII	Stage I-III	FFQ at least 12 months post-diagnosis	All-cause mortality (n=2523.0)	65.9 vs 33.7 g/day	0.92 (0.8-1.04) P trend=0.12	Age at diagnosis, age at menopause, alcohol intake, aspirin use, BMI change, calendar year, chemotherapy, energy intake, ER/PR status, hormonal therapy, menopausal status, physical activity, prediagnosis BMI, race, radiotherapy, smoking, stage, study, time between cancer diagnosis and exposure assessment
					Cancer specific mortality (n=1071.0)		0.73 (0.60-0.89) P trend=0.001	

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
Holmes[39] MD, 2017, NHS, USA (superseded by Farvid[48], 2021)	Prospective cohort of cancer survivors (n= 6348), Age range: 30-55, Pre- and postmenopausal	Diagnosis year: 1976 – 2004, Follow up: 16 years	Stage I to III	Validated semiquantitative FFQ (61 to 116 items), at least 12 months post-diagnosis	All- cause mortality (n=1847)	68.5 vs. 41.5 g/day	0.99 (0.85 - 1.15) P trend=0.6	Age, time since diagnosis, energy intake, BMI, weight change, age at first birth, parity, oral contraceptive, menopausal status, hormone therapy, aspirin use, alcohol, smoking, physical activity, tumour stage, radiation therapy, treatment, calendar year, vegetable protein
					Breast cancer mortality (n=919)		0.85 (0.68 - 1.05) P trend=0.044	
					Distant recurrence (n=1046)		0.78 (0.63 - 0.95) P trend=0.003	
Vegetable Protein								
Farvid[48], 2021, NHS and NHSII, USA	Population based cohort (n=8932), Age range: 30-55 years	Diagnosed:1980 to 2010 NHS and 1991 to 2011 NHSII	Stage I-III	FFQ 1980-2010 to 2014 in NHS and 1991-2011 to 2015 in NHSII	All-cause mortality (n=2523.0)	29.8 vs 175 g/day	0.86 (0.75-0.98) P trend=0.03	Age at diagnosis, age at menopause, alcohol intake, aspirin use, BMI change, calendar year, chemotherapy, energy intake, er/pr status, hormonal therapy, menopausal status, physical activity, prediagnosis BMI, race, radiotherapy, smoking, stage, study, time between cancer diagnosis
					Cancer specific mortality (n=1071.0)		0.96 (0.78-1.17) P trend=0.87	

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
								and exposure assessment
Holmes[39] MD, 2017, NHS, USA (superseded by Farvid[48], 2021)	Prospective cohort of cancer survivors (n= 6348), age range: 30-55 Pre- and postmenopausal	Diagnosis year: 1976 - 2004 Follow up= 16 years	Stage: I to III	Validated semiquantitative FFQ (61 to 116 items), at least 12 months post-diagnosis	All- cause mortality (n=1847) Breast cancer mortality (n=919) Distant recurrence (n=1046)	25 vs. 14.3 g/day	0.97 (0.83 - 1.14) P trend=0.59 1.09 (0.87 - 1.37) P trend=0.44 1.20 (0.97 - 1.49) P trend=0.08	Age, time since diagnosis, energy intake, BMI, weight change, age at first birth, parity, oral contraceptive, menopausal status, hormone therapy, aspirin use, alcohol, smoking, physical activity, tumour stage, radiation therapy, treatment, calendar year, animal protein

Abbreviations: CWLS, Collaborative Women's Longevity Study; NHS, Nurses' Health Study; SACCR, South Australian Central Cancer Registry; VCC-BCCA, Vancouver Cancer Centre of the British Columbia Cancer Agency

Supplementary Table S16. Descriptive table of the included observational studies of post-diagnosis fat intake and breast cancer prognosis

Publication, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Comparison	RR (95% CI)	Covariates
Total Fats								
Beasley[33] 2011, CWLS, United States	Follow up of cases of case-control study (n=4441), age range: 20-79 years, post-menopausal 73%, race: mostly White	Diagnosis: 1998-2001, follow-up: 5.5 years, 525 deaths, 137 from breast cancer, 132 from cardiovascular disease	Primary invasive breast cancer, local 72.8%, regional 27.2%, surgery 97.9%, chemotherapy 31.9%, radiotherapy 49.8%, hormonal therapy 57.8%	Validated FFQ, 126 items, at 1-16 years after diagnosis (42% within 5 years)	All-cause mortality (n=525)	39% vs 23% kcal/day	1.05 (0.79 - 1.39) P trend=0.98	Age, residence, menopausal status, smoking, stage, alcohol intake, hormonal therapy, interval between diagnosis and baseline interview, BMI, physical activity, breast cancer treatment, energy intake
					Breast cancer mortality (n=137)		0.92 (0.53 - 1.6) P trend=0.39	
Borugian[53] 2004, VCCBCCA, Canada	Prospective cohort study (n=603), mean age: 54.5 years, post-menopausal 61%	Recruitment: 1991-1992, follow-up: 10 years	Tumour grade well differentiated 7.6%, moderately differentiated 46.4%, poorly differentiated 46%,	Semi-quantitative FFQ, self-administered, at 2 months after surgery	Breast cancer mortality (n=112)	≥76 vs <43 g/day	1.80 (0.90 – 4.80) P trend=0.35	Age, total caloric intake, stage at diagnosis

			complete mastectomy alone 59.6%, lumpectomy alone 4.6%, lumpectomy + RT 14.6%, chemotherapy only 14.7%, tamoxifen only 21.9%, chemotherapy and tamoxifen 21.4%, other hormone 1.9%, none 40.1%	but before the start of adjuvant treatment	Breast cancer mortality, pre-menopausal		4.80 (1.3-18.10) P trend 0.08	
					Breast cancer mortality, post-menopausal		0.7 (0.2-2.20) P trend= 0.49	
Holmes[34] 1999, NHS, USA	Population-based cohort study (n= 1982), mean age: 54 years, postmenopausal 64.9%, race: mostly White	Diagnosis: 1976-1990, follow-up: 157 months, until 1994, 378 deaths, 326 from breast cancer	Invasive breast carcinoma, grade 1-3	FFQ, 85 items, at up to 2 years after diagnosis	All- cause mortality (n=378) (superseded by Farvid[48], 2021)	69.7 vs 53 g/day	1.21 (0.78 - 1.90) P trend=0.72	Age, diet interval, year of diagnosis, oral contraceptive, postmenopausal hormone use, smoking, age at first birth, number of metastatic lymph nodes, tumour size, BMI, menopausal status, energy intake, caloric intake
					Breast cancer mortality (n=326) (superseded by Farvid[48], 2021)		1.44 (1.01 - 2.04) P trend=0.25	

Ewertz[54] 1991, DBCCG, Denmark	Prospective cohort study (n=2445), age maximum: 70 years, pre- and post-menopausal	Diagnosis: 1983-1984, follow-up: 7 years, 805 deaths	Primary invasive breast cancer	Semi-quantitative FFQ	All- cause mortality (n=805)	Q4 vs Q1	0.96 (0.75 - 1.22)	Age, tumour size, nodal status, tumour grade, skin invasion, area of residence
Farvid[48] 2021, NHS I and II, USA	Population-based cohort study (n=8932), age range: 30-55 years	Diagnosis: 1980-2021, 1991-2011	Stage I-III	FFQ at least 12 months post-diagnosis	All-cause mortality (n=2523)	70.5 vs 41 g/day	0.85 (0.74-0.97) P trend=0.02	Age at diagnosis, age at menopause, alcohol intake, aspirin use, BMI change, calendar year, chemotherapy, energy intake, er/pr status, hormonal therapy, menopausal status, physical activity, prediagnosis BMI, race, radiotherapy, smoking, stage, study, time between cancer diagnosis and exposure assessment
					Cancer-specific mortality (n=1071)	70.5 vs 41 g/day	0.94 (0.76-1.15) P trend=0.69	
Nomura[55] 1991, HCJFS, USA	Prospective cohort study (n=343), age range: 45-74 years, race: White and Asian	Diagnosis: 1975 and 1980, follow-up: 12.5 years	In situ 5%, localized 56%, regional 36%, distant 3%	Structured interview, 43 items, at on average 2.2 months after diagnosis	All-cause mortality (n=34)	High vs low	*Caucasian subgroup* 3.17 (1.17-8.55)	Stage of disease, menopausal status, obesity index, estrogen use
					All-cause mortality (n=25)		*Japanese subgroup*	

							0.66 (0.25-1.76)	
Pierce 2007[11], WHEL, USA	Randomised controlled trial (n= 1490), mean age: 50 years, pre- and post-menopausal, race: mostly White	Diagnosis: 1991-2000, follow-up: 6.7 years, until 2005	Stage I 40%, II 45%, III 15%, grade I 15.9%, II 39.8%, III 35.8%, unknown 8.3%, ER+/PR+ 63.1%, ER+/PR- 10.8%, ER-/PR+ 5.1%, ER-/PR- 20.8%, no chemotherapy 31.4%, non-anthracycline 25.7%, anthracycline 42.8%, adjuvant tamoxifen 42%, no adjuvant tamoxifen 58%	24-hr food recall and questionnaire, at on average 20 months post-diagnosis	All-cause mortality (n=135)	33-59% vs 9-24% energy from fat	1.39 P trend=0.10	
Rohan[52] 1993, SACCR follow-up, Australia	Follow-up of population-based case-control study (n= 412), mean age: 55.1 years, pre- and post-menopausal	Diagnosis: 1982-1984, follow-up: 5.5 years, until 1989	Stage I-IV	FFQ	Breast cancer-specific mortality (n=112)	≥108 vs <56 g/day	1.40 (0.66-2.96) P trend=0.52	Energy intake, Age of menarche, Quetelet Index
Newman[56] 1986, Canada	Prospective cohort of cancer survivors (n=298), age range: 35-74 years, pre- and postmenopausal	Diagnosis: 1973-1975, follow-up: maximum 7 years	Nonmetastatic disease	Measured 3-5 months after surgery	Breast cancer-specific mortality (n=72)	≥77.7 vs ≤77.7 g/day	0.91 P trend=0.69	Body weight
Saturated Fats								

Beasley[33] 2011, CWLS, USA	Follow up of case-control study (n=4441), age range: 20-79 years, post-menopausal 73%, race: White	Diagnosis: 1998-2001, follow-up: 5.5 years, until 2015, 525 deaths, 137 from breast cancer, 132 from cardiovascular disease	Primary invasive breast cancer, local 72.8%, regional 27.2%, surgery 97.9%, chemotherapy 31.9%, radiotherapy 49.8%, hormonal therapy 57.8%	Validated FFQ, 126 items, at 1-16 years after diagnosis (42% within 5 years)	All- cause mortality (n=525)	13 vs. 7 % kcal/ day	1.41 (1.06-1.87) P trend=0.03	Age, residence, menopausal status, smoking, stage, alcohol intake, hormonal therapy, interval between diagnosis and baseline interview, BMI, physical activity, breast cancer treatment, energy intake
					Breast cancer mortality (n=137)		1.55 (0.88-2.75) P trend=0.50	
Borugian[53] 2004, VCCBCCA, Canada	Prospective cohort study (n=603), mean age: 54.5 years, post-menopausal 61%	Recruitment: 1991-1992, follow-up: 10 years	Tumour grade well differentiated 7.6%, moderately differentiated 46.4%, poorly differentiated 46%, complete mastectomy alone 59.6%, lumpectomy alone 4.6%, lumpectomy + RT 14.6%, chemotherapy only 14.7%, tamoxifen only 21.9%, chemotherapy and tamoxifen 21.4%, other hormone 1.9%, none 40.1%	Semi-quantitative FFQ, self-administered, at 2 months after surgery but before the start of adjuvant treatment	Breast cancer mortality (n=112)	Q4 vs Q1	2.50 (1.20 - 5.30) P trend=0.07	Age, total caloric intake, stage at diagnosis
					Breast cancer mortality, pre-menopausal		4.90 (1.40-17.00) P trend=0.06	
					Breast cancer mortality, post-menopausal		1.50 (0.50-4.00) P trend=0.54	

Rohan[52] 1993, Diet and Breast Cancer in Australia Follow-up Study, Australia	Follow-up of case-control study (n= 412), mean age: 55.1 years, pre- and post-menopausal	Diagnosis: 1982-1984, follow-up: 5.5 years, until 1989	Primary breast cancer, stage I-IVE	FFQ	Breast cancer-specific mortality(n=112)	≥45 vs <20 g/day	1.65 (0.73-3.75) P trend=0.62	Energy intake, Age of menarche, Quetelet Index
Holmes[34] 1999, NHS, United States	Population-based cohort study (n= 1982), mean age: 54 years, pre- and postmenopausal	Diagnosis: 1976-1990, follow-up: 157 months, 378 deaths, 326 from breast cancer	Invasive breast carcinoma	FFQ, 85 items, up to 2 years after diagnosis	All- cause mortality (n=378)	Q5 vs Q1	1.23 (0.89-1.69) P trend=0.29	Age, diet interval, year of diagnosis, oral contraceptive, postmenopausal hormone use, smoking, age at first birth, number of metastatic lymph nodes, tumour size, BMI, menopausal status, energy intake, caloric intake
Monounsaturated Fats								
Beasley[33] 2011, CWLS, USA	Follow up of case-control study (n=4441), age range: 20-79 years, post-menopausal 73%, race: White	Diagnosis: 1998-2001, follow-up: 5.5 years, 525 deaths, 137 from breast cancer, 132 from	Primary invasive breast cancer, local 72.8%, regional 27.2%, surgery 97.9%, chemotherapy 31.9%, radiotherapy	FFQ,126 items, at 1-16 years after diagnosis (42% within 5 years)	All- cause mortality (n=525)	15% vs 8% kcal/day	1.14 (0.86-1.52) P trend=0.93	Age, residence, menopausal status, smoking, stage, alcohol intake, hormonal therapy, interval between diagnosis and

		cardiovascular disease	49.8%, hormonal therapy 57.8%		Breast cancer mortality (n=137)		0.89 (0.49-1.6) P trend=0.25	baseline interview, BMI, physical activity, breast cancer treatment, energy intake
Holmes[34] 1999, NHS, United States	Population-based cohort study (n= 1982), mean age: 54 years, pre- and postmenopausal	Diagnosis: 1976-1990, follow-up: 157 months, 378 deaths, 326 from breast cancer	Invasive breast carcinoma	FFQ, 85 items, up to 2 years after diagnosis	All-cause mortality (n=378)	Q5 vs Q1	1.34 (0.96-1.86) P trend=0.60	Age, diet interval, year of diagnosis, oral contraceptive, postmenopausal hormone use, smoking, age at first birth, number of metastatic lymph nodes, tumour size, BMI, menopausal status, energy intake, caloric intake
Rohan[52] 1993, Diet and Breast Cancer in Australia Follow-up Study, Australia	Follow-up of case-control study (n= 412), mean age: 55.1 years, pre- and postmenopausal	Diagnosis: 1982-1984, follow-up: 5.5 years, until 1989	Primary breast cancer, any stages	FFQ	Breast cancer-specific mortality (n=112)	≥37 vs ≤17 g/day	1.33 (0.56-3.13) P trend=0.64	Energy intake, Age of menarche, Quetelet Index
Polyunsaturated Fat								

Beasley[33], 2011, CWLS, USA	Follow up of case-control study (n=4441), age range: 20-79 years, post-menopausal 73%, race: White	Diagnosis: 1998-2001, follow-up: 5.5 years, 525 deaths, 137 from breast cancer, 132 from cardiovascular disease	Primary invasive breast cancer, local 72.8%, regional 27.2%, surgery 97.9%, chemotherapy 31.9%, radiotherapy 49.8%, hormonal therapy 57.8%	FFQ, 126 items, at 1-16 years after diagnosis (42% within 5 years)	All-cause mortality (n=525)	8% vs 4% kcal/day	0.91 (0.70-1.19) P trend=0.41	Age, residence, menopausal status, smoking, stage, alcohol intake, hormonal therapy, interval between diagnosis and baseline interview, BMI, physical activity, breast cancer treatment, energy intake
					Breast cancer mortality (n=137)		0.90 (0.52 - 1.55) P trend=0.33	
Holmes[34] 1999, NHS, USA	Population-based cohort study (n= 1982), mean age: 54 years, pre- and postmenopausal	Diagnosis: 1976-1990, follow-up: 157 months, 378 deaths, 326 from breast cancer	Invasive breast carcinoma	FFQ, 85 items, at up to 2 years after diagnosis	All-cause mortality (n=378)	Q5 vs Q1	1.05 (0.77-1.43) P trend=0.57	Age, diet interval, year of diagnosis, oral contraceptive, postmenopausal hormone use, smoking, age at first birth, number of metastatic lymph nodes, tumour size, BMI, menopausal status, energy intake, caloric intake

Nomura[55] 1991, HCJFS, USA	Prospective cohort of cancer survivors (n=182), age range: 45-74 years, race: White	Diagnosis: 1975 and 1980, follow-up: 12.5 years	In situ 5%, localized 56%, regional 36%, distant 3%	Structured interview, 43 items, at on average 2.2 months after diagnosis	All-cause mortality	High vs low	1.72 (0.74-4.00)	Stage of disease, menopausal status, obesity index, estrogen use
Rohan[52] 1993, SACCR follow-up, Australia	Follow-up of case-control study (n= 412), mean age: 55.1 years, pre- and postmenopausal	Diagnosis: 1982-1984, follow-up: 5.5 years, until 1989	Primary breast cancer, stage I-IV	FFQ	Breast cancer-specific mortality (n=112)	≥20 vs <7 g/day	1.57 (0.78-3.14) P trend=0.31	Energy intake, Age of menarche, Quetelet Index
Trans fatty acids								
Beasley[33] 2011, CWLS, USA	Follow up of case-control study (n=4441), age range: 20-79 years, post-menopausal 73%, race: White	Diagnosis: 1998-2001, follow-up: 5.5 years, 525 deaths, 137 from breast cancer, 132 from cardiovascular disease	Primary invasive breast cancer, local 72.8%, regional 27.2%, surgery 97.9%, chemotherapy 31.9%, radiotherapy 49.8%, hormonal therapy 57.8%	FFQ, 126 items, at 1-16 years after diagnosis (42% within 5 years)	All-cause mortality (n=525)	1.6% vs 0.7% kcal/ day	1.78 (1.35-2.32) P trend=0.01	Age, residence, menopausal status, smoking, stage, alcohol intake, hormonal therapy, interval between diagnosis and baseline interview, BMI, physical activity, breast cancer
					Breast cancer mortality (n=137)		1.42 (0.80-2.52) P trend=0.34	

								treatment, energy intake
Holmes[34] 1999, NHS, United States	Population-based cohort study (n= 1982, mean age: 54 years, pre- and postmenopausal	Diagnosis: 1976-1990, follow-up: 157 months, 378 deaths, 326 from breast cancer	Invasive breast carcinoma	FFQ, 85 items, at up to 2 years after diagnosis	All-cause mortality (n=378)	Q5 vs Q1	1.16 (0.84-1.57) P trend=0.49	Age, diet interval, year of diagnosis, oral contraceptive, postmenopausal hormone use, smoking, age at first birth, number of metastatic lymph nodes, tumour size, BMI, menopausal status, energy intake, caloric intake
EPA DHA								
Patterson[57] 2011, WHEL, USA	Secondary analysis of clinical trials (n=3081), mean age: 52.7 years, race: mostly White	Diagnosis: 1995-2000, follow-up: 7.3 years, 314 deaths, 261 from breast cancer, 27 from other cancers, 7 from heart disease, 19	Stage I 38.6%, IIA 5%, ER+ 74.2%, tamoxifen use 59.6%	24-hour recall	All-cause mortality (n=314)	≥153 vs ≤ 36.7 mg/day	0.60 (0.44-0.83) P trend=0.007	Tumour stage, time from diagnosis to randomization, supplements use, tumour grade

		from other causes			Recurrence		0.72 (0.57-0.90) P trend=0.06	
EPA								
Holmes[34] 1999, NHS, USA	Population-based cohort study (n= 1982), mean age: 54 years, pre- and postmenopausal	Diagnosis: 1976-1990, follow-up: 157 months, 378 deaths, 326 from breast cancer	Invasive breast carcinoma	FFQ, 85 items, at up to 2 years after diagnosis	All-cause mortality (n=378)	Q5 vs Q1	0.71 (0.49-1.00) P trend=0.08	Age, diet interval, year of diagnosis, oral contraceptive, postmenopausal hormone use, smoking, age at first birth, number of metastatic lymph nodes, tumour size, BMI, menopausal status, energy intake, caloric intake
DHA								
Holmes[34] 1999, NHS, USA	Population-based cohort study (n= 1982), mean age: 54 years, pre- and postmenopausal	Diagnosis: 1976-1990, follow-up: 157 months, 378 deaths, 326 from breast cancer	Invasive breast carcinoma	FFQ, 85 items, at up to 2 years after diagnosis	All-cause mortality (n=378)	Q5 vs Q1	0.7 (0.5-0.97) P trend=0.02	Age, diet interval, year of diagnosis, oral contraceptive, postmenopausal hormone use, smoking, age at first birth, number of metastatic lymph nodes, tumour size, BMI,

								menopausal status, energy intake, caloric intake
Other polyunsaturated fatty acids								
Holmes[34] 1999, NHS, USA	Population-based cohort study (n= 1982), mean age: 54 years, pre- and postmenopausal	Diagnosis: 1976-1990, follow-up: 157 months, 378 deaths, 326 from breast cancer	Invasive breast carcinoma	FFQ, 85 items, at up to 2 years after diagnosis	All- cause mortality (n=378)	Q5 vs. Q1	20:1 fatty acid (eicosanoic) 0.78 (0.57 - 1.07) P trend=0.007 22:5 fatty acid (DPA) 0.7 (0.50-0.97) P trend= 0.02	Age, diet interval, year of diagnosis, oral contraceptive, postmenopausal hormone use, smoking, age at first birth, number of metastatic lymph nodes, tumour size, BMI, menopausal status, energy intake, caloric intake

Abbreviations: CWLS, Collaborative Women's Longevity Study; DBCCG, Danish Breast Cancer Cooperative Group; HCJFS; Hawaiian Caucasian, Japanese Follow-up Study; NHS, Nurses' Health Study; SACCR, South Australian Central Cancer Registry; SACCR, South Australian Central Cancer Registry; WHEL; Women's Healthy Eating and Living

Supplementary Table S17. Descriptive table of the included observational studies of post-diagnosis fibre intake and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Pierce[11] 2007, WHEL, USA	Randomised controlled trial (n= 1490), mean age 50 years, pre- and post-menopausal	Diagnosis: 1991-2000, follow-up: 6.7 years, until 2005	Stage I 40%, II 45%, III 15%, grade I 15.9%, II 39.8%, III 35.8%, unknown 8.3%, ER+/PR+ 63.1%, ER+/PR- 10.8%, ER-/PR+ 5.1%, ER-/PR- 20.8%, none-chemotherapy 31.4%, non-anthracycline 25.7%, anthracycline 42.8%, adjuvant tamoxifen 42%, no adjuvant tamoxifen 58%	24-hr food recall, questionnaire, at on average 20 months post-diagnosis	All-cause mortality (n=135)	23.5-59.7 vs 5.1-15.6 g/d	0.61 P trend=0.12	Unadjusted
Beasley[33] 2011, CWLS, USA	Follow up of cases of case-control study (n=4441), age range: 20-79 years, post-menopausal 73%, race: mostly White	Diagnosis: 1998-2001, follow-up: 5.5 years	Primary invasive breast cancer, local 72.8%, regional 27.2%, surgery 97.9%, chemotherapy 31.9%, radiotherapy 49.8%, hormonal therapy 57.8%	Validated FFQ, 126 items, at 1-16 years after diagnosis (42% within 5 years)	All-cause mortality (n=525)	30 vs 11 g/d	0.75 (0.52-1.09) P trend=0.17	Age, residence, menopausal status, smoking, stage, alcohol intake, hormonal therapy, interval between diagnosis and baseline interview, BMI, physical activity, breast cancer treatment, energy intake
					Breast cancer-specific mortality (n=137)		0.75 (0.38-1.49) P trend=0.24	
Belle[51] 2011, HEAL, USA	Prospective cohort of cancer survivors	Diagnosis: 1995-1998, follow-up: 6.7 years, until 2004	Invasive, stage 0-IIIA	FFQ,122 items	All-cause mortality (n=106)	>16.3 vs <10.3 g/d	0.75 (0.43-1.31) P trend=0.94	Energy intake, folate intake, physical activity, tumour stage,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	(n=688), mean age: 55.3 years				Breast cancer-specific mortality (n=83)		0.85 (0.46-1.59) P trend=0.55	treatment, tamoxifen use
					Recurrence (n=82)		0.84 (0.45-1.57 P trend=0.53	
Holmes[58] 2009 NHS, USA	Population-based cohort study (n=3846), age range: 30-55 years, pre- and post-menopausal	Diagnosis: 1976-2001, follow-up: 321 months, until 2006	Stage I-III	FFQ, at 2 years post-diagnosis	All-cause mortality, cereal fibre	Q5 vs Q1	0.71 (0.53-0.96) P trend=0.03	Age, time between exposure assessment and cancer diagnosis, year of diagnosis oral contraceptive hormonal therapy, smoking, age at first birth, nodal status, tumor size, BMI, menopausal status, energy intake, dietary factors, BMI change, age at first birth and parity, stage of disease, radiation treatment, chemotherapy and hormonal treatment, date of diagnosis, physical activity
					Breast cancer mortality, cereal fibre (n=446)		1.00 (0.71-1.40) P trend=0.59	
					Breast cancer mortality, ER+		1.04 (0.70-1.55) P trend=0.98	
					Breast cancer mortality, ER-		0.59 (0.17-2.05) P trend=0.35	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Borugian[53] 2004, VCCBCCA, Canada	Prospective cohort of breast cancer survivors (n= 603), mean age: 54.5 years	Recruitment: 1991-1992, follow-up: 10 years, 146 deaths, 112 from breast cancer	Well differentiated 7.6%, moderately differentiated 46.4%, poorly differentiated 46%, ER+ 76.4%, chemotherapy only 14.7%, tamoxifen only 21.9%, chemotherapy and tamoxifen 21.4%, other hormone 1.9%, none 40.1%	Questionnaire, self-administered, after surgery and before treatment	Breast cancer-specific mortality (n=112)	Q4 vs Q1	0.7 (0.4-1.3) P trend=0.34	Age, total caloric intake, and stage at diagnosis
					Breast cancer-specific mortality, pre-menopausal (n=235)		0.7 (0.2-1.6) P trend=0.26	
					Breast cancer-specific mortality, post-menopausal (n=368)		0.8 (0.3-1.8) P trend=0.74	
Farvid[48] 2021, NHS I and II, USA	Population-based cohort study (n=8932), age range: 30-55 years	Diagnosis: 1980-2010, 1991-2011	Stage I-III	FFQ	All-cause mortality (n=2523)	27.3 vs 13.7 g/day	0.85 (0.75-0.97) P trend=0.004	Age at diagnosis, age at menopause, alcohol intake, aspirin use, BMI change, calendar year, chemotherapy, energy intake, er/pr status, hormonal therapy, menopausal status, physical activity, prediagnosis BMI, race, radiotherapy, smoking, stage, study, time between cancer diagnosis and exposure assessment
					Cancer specific mortality (n=1071)		0.95 (0.78-1.16) P trend=0.52	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Holmes[34] 1999, NHS, USA	Population-based cohort study (n=1982), mean age 54 years, pre- and postmenopausal	Diagnosis: 1976-1990, follow-up: 157 months, until 1994	Invasive, grade 1-3	Validated FFQ in 1980, 1984, 1986, and 1990	All-cause mortality (n=238) (Result superseded by Farvid[48], 2021)	>20 vs ≤12.5 g/d	0.77 (0.47-1.25) P trend=0.37	Age, time between exposure assessment and cancer diagnosis, year of diagnosis, oral contraceptive, hormonal therapy, family history, smoking, age at first birth and parity, age at menarche, nodal status, tumour size, tumour grade, number of metastatic lymph nodes, BMI, menopausal status, energy intake, dietary factors, nulliparous, oestrogen receptor (positive vs negative) Progesterone receptor (positive vs negative)
					Nonmetastatic All-cause mortality (n=128)		0.59 90.33-1.08) P trend=0.04	
					Metastatic All-cause mortality (n=250)		0.69 (0.45-1.05) P trend=0.13	
Rohan[52] 1993, SACCR follow-up, Australia	Follow-up of case-control study (n=412), mean age 55.1 years, pre- and postmenopausal	Follow up=5.5 years median	Invasive primary breast cancer, any stage	Interview by trained interviewer at home. Average interval between diagnosis and	Breast cancer-specific mortality (n=112)	≥27 vs. ≤13 g/d	0.87 (0.45-1.68) P trend=0.812	Energy intake, age of menarche, quetelet index

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
				interview was 4.8 months. Usual dietary intake was collected with a self-administered quantitative validated FFQ that assessed 179 specified dietary items				

Abbreviations: CWLS, Collaborative Women's Longevity Study; HEAL, Health, Eating, Activity, and Lifestyle Study; NHS, Nurses' Health Study; SACCR, South Australian Central Cancer Registry; WHEL; Women's Healthy Eating and Living

Supplementary Table S18. Descriptive table of the included observational studies of post-diagnosis alcohol intake and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Schmidt[59] G, 2020, Germany,	Female (n=197), premenopausal 29.4%, postmenopausal 70.6%	Follow Up: Median 41.43 months	Triple-negative breast cancer. Grade G1 1%, G2 29.5%, G3 66.5%. Neoadjuvant chemotherapy 42.7%, pcr after neoadjuvant chemotherapy 40.5%, adjuvant chemotherapy 44.1%, no chemotherapy 13.2%	Registry database of during diagnosis	Overall survival	Consumption vs No consumption	Log rank test P value =0.65	NULL
					Disease free survival	Consumption vs No consumption	Log rank test p-value = 0.75	NULL
Furrer[60] D, 2018, CMSDF, Canada,	Female Historical cohort (n=236)	Follow Up: Median 7.4 years, Six patients died from causes other than breast cancer 66 (28.0%) of 236 patients experienced disease recurrence.	GRADE: grade I/II= 86; grade III=149; unknown=1 STAGE: stage I=60; stage II=106; stage III=70 Radiotherapy no=35; yes=201	Self-administered Questionnaire before diagnosis, at and during trastuzumab treatment of during diagnosis July 2005 to August 2016	During trastuzumab treatment Disease-free (n=34)	>2 vs 0-2 drinks/week >2 vs 0-2 drinks/week of wine >2 vs 0-2 drinks/week of beer	0.68 (0.30-1.56) 0.55 (0.23-1.23)	Adjuvant endocrine therapy, age at diagnosis, BMI, radiotherapy, stage

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
				(end of study period)			1.98 (0.53-7.33)	
Knight[61], 2017, WECARE, USA	Population-based case-control study Female (n=3431) mean age:46, Cancer Diagnosis: 1985-2008, Mostly White	Diagnosed:1985-2008	Invasive breast cancer stage I-III	Interview	Contralateral breast cancer (n=1521)	Any drinking - Yes vs Any drinking - No	1.15 (0.98-1.34)	Age at diagnosis, age at menarche, BMI at diagnosis, chemotherapy, er status, family history, histology, hormonal therapy, number of full-term pregnancies, radiotherapy, smoking, tumor stage
Veal[62], 2017 WISC USA	Cohort of women with an incident primary DCIS diagnosis reported to the Wisconsin Cancer Reporting System (n= 1925)	Reported diagnosis 1997-2006 Follow up= 6.7 years, until 2012 Death (n=196) including 87 cancer deaths, 34 CVD deaths, and 75 deaths due to other causes	DCIS	Interview, Baseline questionnaire collected median 1.3 years after DCIS diagnosis	All-cause mortality (n=196)	≥7 vs. 0 drinks/ week	1.03 (0.47 - 2.27)	Age at diagnosis, family history of breast cancer, education, surgical treatment type, year of diagnosis, post-treatment endocrine therapy use, comorbidity, post-menopausal hormone use, remaining exposures as time-varying covariates, pre-diagnosis exposure level as static covariates
Nakamura[63], 2017 Biobank Japan	Follow-up study of cancer survivor's cohort (n= 1860)	2003-2008 Follow up= 7.8 years Total death (n=218)	- In situ:226 –Invasive:1414 75.8%	Questionnaire, 90 days after the diagnosis	All-cause mortality(n=215)	Ever (current/former) vs. never	1.06 (0.75 - 1.52)	Age at study entry, entry year

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	Mean age:55.3 Calendar year: 2003-2008 until 2014		-ER+, 24.2% ER-, 62.1%; PR+, 37.9% PR- -10.9% stage 0, 47.9% stage I, 31.3% stage IIA, 5.8% stage IIB, 1.4% stage IIIA, 1.1% stage IIIB, 0.3% stage IIIC, 0.8% stage IV, 0.5% unclassified					
Wu[64], 2017 UTS (UTMDACC) USA	Cohort (n=15 314) Postmenopausal, premenopausal, perimenopausal Mean age:54.5	1997-2012 Follow up= 7.95 years Recurrence (n=684) Death (n=1095)	Diagnosed with stage I to III Histology according to (AJCC) -Ductal (n=7799) -Lobular (n=916) -Mixed Ductal/Lobular (n=676) -Other (n=496)	Within a year of diagnosis	All-cause mortality (n=711)	Yes vs. no	0.75 (0.65 - 0.87)	
					Recurrence (n=730)		0.71 (0.62 - 0.83)	
Lowry[65], 2016 WHI USA	Cohort of postmenopausal women (n= 7835)	Follow up= 7.9 years		Questionnaire	Breast cancer mortality(n=270) ER- breast cancer ER+ breast cancer	≥7 vs. 0 drinks/ week	0.93 (0.40 - 2.14) 0.49 (0.25–0.98) 0.86 (0.48–1.54)	Age, Income, Race, study, family history of breast cancer, smoking status, Menopausal Hormone therapy use, BMI

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	Calendar year: Recruitment 1991				All-cause mortality(n=606) ER- breast cancer ER+ breast cancer		0.54(0.32-0.91) 0.54(0.32-0.89) 0.89(0.65-1.22)	
Nechuta[66], 2016 ABCPP USA and China (Reputed results with ER+/- status)	Pooled analysis (prospective cohort) (n= 6596) Mixed age range:20-83 calendar year: 1976 and 2004 Year of diagnosis, range: 1990–2004	Follow up= 10 years 49% of deaths=due to breast cancer, 17%=other cancers, 13%=CVD and 21%=other causes Total deaths=1,427; Total recurrence=1,309 Disease-free survival: 92.7% at 5 years, 84.9% at 10 years. Overall survival: 96.7% at 5 years and 86.6% at 10 years.	Women diagnosed with invasive breast cancer Chemotherapy, n (%) = 3,046 (46.2); Radiotherapy, n (%) =4,063 (61.6); Mastectomy, n (%) =3,203 (48.6); Hormonal therapy, n (%) =5,689 (86.3)	FFQ	late recurrence (≥5 years) (n=593) ER positive	≥12 (>1 drinks/day) vs. non-drinker (0 to 0.36) g/ day	1.28 (1.01-1.62) P trend=0.06	Age at diagnosis, TNM stage, PR status, chemotherapy, radiotherapy, Surgery, Hormonal therapy, race/ethnicity, menopausal status, Comorbidity, time between exposure measurement and 5-year post-diagnosis date, stratified by study, pre-diagnosis BMI, Exercise, Weight change, smoking
					Early recurrence (n=396)		0.87 (0.62-1.23) P trend=0.73	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					late all-cause mortality (≥5 years) (n=593) ER positive (n=1 163)		0.93 (0.75-1.17)	
Larsen[67], 2015 DCHS Denmark	(n= 1229) Postmenopausal Age range:50-64 years	December 1993-May 1997 Follow up= 9.6 years	- Stage: 1: 496 (40%); Stage 2: 612 (50%); Stage 3: 19 (2%); Missing: 102 (8%) -Tumour Size (mm): ≤ 20: 740 (60%); 21-50: 361 (29%); ≥51: 104 (8%) -Oestrogen receptor status: +ve: 928 (76%); -ve: 196 (16%); Missing: 105 (9%) -Malignancy grade: 1: 333 (27%); 2: 358 (29%); 3: 178 (14%); Non-classified/non-ductal: 236 (19%); Missing: 124 (10%)	FFQ	All-cause mortality (number of death is not reported)	> 14 vs. 1-14 drinks/week	1.03(0.71-1.50)	Age, Charlson Comorbidity Index
Simonsson[68], 2014 Swedish Cohort	Prospective cohort (n= 1 045)	Follow up=3 years 76 deaths, 65	-In situ:0 -Invasive:255	Questionnaire, 1045 patients were	Recurrence (n=100)	> 10 vs. 0 drinks/week	0.70 (0.21 - 2.32)	Age at diagnosis, Tumour size, lymph node involvement,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Sweden	Mean age:60.9 Calendar year: October 2002-December 2011,	distant metastases, 100 breast cancer events	- ER+ 813, PgR+ 656, ER + PgR+ 650, ER + PgR- 163, ER-PgR- 113, ER-PgR+ 6 -Tumour size 1 (n=679), 2 (n=238), 3 (n=15), 4 (n=2), invasive (n=255) -No preoperative treatment (n=934)	included in the study at the time of diagnosis, and were followed until December 31st 2012				Tumour grade, ER status, BMI, current smoking, Treatment,
Williams[32], 2014, NRWHS, USA	Cohort of breast cancer survivors FROM the National Runners' and Walkers' Health Surveys (n= 986)	Follow up= 9.1 years Death from breast cancer (n=46)		Questionnaire	Breast cancer mortality (n=46)	Per g/day	0.98(0.94-1.01)	Age, race, exercise
Ali[69], 2014 SEARCH Multi-country	Pooled analysis of prospective case-cohort studies (n= 29 239), of which only SEARCH cohort included Postmenopausal, premenopausal, perimenopausal	Follow up= 6 years, 55,684 person-years.		self-administered questionnaire	Breast cancer mortality (n=765) ER- breast cancer	1 unit/week >14 vs. 0 unit/week	0.93(0.85-1.01) 0.86(0.63-1.18) 0.81(0.69-0.96) 0.98(0.89-1.09)	Stage, grade, ER status, BMI, smoking status, SES and menopausal status

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					ER+ breast cancer			
					All-cause mortality (n=945) ER- ER+	>14 vs. 0 unit/week	0.77 (0.58-1.03) 0.77 (0.66-0.90) 0.95 (0.87-1.04)	
Kwan[70], 2013, ABCPP, Multi-country	Pooling study of 3 prospective cohort studies in US (n= 9329) Mean age:58.8	1990-2006 Follow up=10.3 years	-AJCC stage: I: 51.3%, II: 37.1%; III: 11.6% -Hormone receptor status: ER+/PR+: 65.2%; ER-/PR+: 3.1%; ER+/PR-: 14.8%; ER-/PR-: 16.9% -Chemotherapy: No: 47.9%; Yes: 52.1% -Radiation therapy: No: 38.9%; Yes: 61.1% -Hormonal therapy: No: 26.2%; Yes: 73.8% -Surgery type: none: 0.2%; lumpectomy:	FFQ	All-cause mortality (n=1542) Breast cancer mortality (n=911) Recurrence (n=1487)	≥24 vs <0.36 g/day	0.79 (0.63-1.00) P trend=0.06 0.80 (0.59 - 1.09) P trend=0.29 1.04(0.84-1.31)	Age at diagnosis, AJCC stage, race/ethnicity, education, menopausal status at diagnosis, Hormone receptor status, Surgery, Treatment, smoking, Physical activity, pre-diagnosis BMI, Comorbidity Included in high vs. low analysis only

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
			50.6%; mastectomy: 49.2%					
Newcomb[71], 2013 Collaborative Women's Longevity Study (CWLS) USA	A survivorship cohort of The Collaborative Breast Cancer Study (CBCS), population-based case-control study of risk factors	Follow up=11.3 years 3484 breast cancer death		Questionnaire	Breast cancer mortality (n=276)	≥10 vs 0 drinks/week of total alcohol	0.83(0.45-1.54)	Age at diagnosis, stage of disease at diagnosis, state of residence at diagnosis, study phase, family history of breast cancer, age at first birth, menopausal status, hormone therapy use, BMI, weight change, smoking status, education mammography
						≥7 vs 0 drinks/week of wine	1.45 (0.77-2.73)	
						≥7 vs 0 drinks/week of beer	0.94 (0.37-2.39)	
						≥7 vs 0 drinks/week of spirit	0.83 (0.43-1.62)	
Beasley[33], 2011 CWLS, USA (Included in the analysis) (Results superseded by Newcomb[71], 2013,)	Follow up of cases of population-based case-control studies (n= 4441) Mixed age range:20-79 years Calendar year:1998-2001 until 2005	Follow up= 5.5 years	In situ:0 - Invasive:4441 Primary invasive breast cancer; Stages: 72.8% local, 27.2% Regional Surgery: 97.9% yes; Radiotherapy: 49.8% yes; Hormonal therapy: 57.8% yes;	FFQ	All-cause mortality (n=525) Breast cancer mortality(n=137)	15 vs. 0% E from alcohol	0.78(0.60-1.01) 1.27 (0.76–2.14)	Age, residence, menopausal status, smoking, stage, alcohol intake, Hormonal therapy, interval between diagnosis and baseline interview, BMI, Physical activity, breast cancer treatment, Energy intake
					Breast cancer mortality(n=112)	≥10 vs. 0 g	0.86 (0.51 - 1.47) P trend=0.458	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
			Chemotherapy: 31.9% yes					
Allin[72], 2011, Denmark	(n= 2910) Age range:26-99	2002-2009		self-administered questionnaire	All-cause mortality(n=383)	>168 vs. ≤ 168 g of alcohol per week	0.79 (0.53-1.19)	
Kwan[73] M, 2010 LACE (Superseded by Kwan[70] 2013)	Prospective cohort of breast cancer survivors (n=1897) Mixed age range: 1870 calendar year:2000-2002	1997-2000 Follow up= 7.4 years 293 breast cancer recurrences 273 total death, 154 breast cancer deaths 24 to other cancers, 32 to cardiovascular causes 63 to other causes,	Among those with data:15.6% ER-ve/PR-ve, 1.86% ER-ve/PR+ve, 14.7% ER+ve/PR-ve, 67.7% ER+ve/PR+ve Invasive breast cancer; among those with data: 47.7% stage I, 32.6% stage IIA, 16.6% stage IIB, 3.06% stage IIIA Surgery: 50.1% conserving, 49.8% mastectomy; None treatment: 17.4%; Chemotherapy only: 19.5%; Radiation only: 25.9%; Both radian and chemotherapy: 37.1%;	FFQ	All-cause mortality (n=273)	≥6 vs. none g/ day	1.19 (0.87-1.62) P trend=0.23	Age at diagnosis, BMI, Folate intake, Tumour stage, Receptor status, Tamoxifen use, Treatment, Nodal status

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
			Tamoxifen use: 77.8%					
					Recurrence (n=268)		1.35 (1.00-1.83) P trend=0.04	
					Breast cancer mortality (n=144)		1.51 (1.00-2.29) P trend=0.05	
Flatt[74], 2010, WHEL USA (Superseded by Kwan 2013)	Prospective cohort of breast cancer survivors (n= 3088) Pre- and postmenopausal mean age:52 calendar year:1995-2000 until 2006	1991-2000 Follow up= 7.3 years	Invasive: 3088 24.8% ER-ve, 75.1% ER+ve 38.5% stage I (=1 cm), 45.5% stage II, 15.9% stage III; 15.7% grade 1, 40.1% grade2, 35.9% grade 3, 8.2% unspecified	24h Recall + FFQ	Mortality Additional breast cancer events (n=518)	moderate/heavy vs. minimal g/ month	0.69 (0.49-0.97) 0.91 (0.71-1.18)	Tumour stage, Tumour grade, weight, years btw diagnosis and study entry, parity, Physical activity, ethnicity, smoking, education
Li[75], 2009, Seattle-Puget Sound Region Nested Case-Control Study, United States	Female Population-based nested case-control study (n=1091) Pre- and postmenopausal age range: 40-79 years, Cancer	Diagnosed:1990-2005 follow Up: Average 17 years, 365 contralateral breast cancers	AJCC stages: 67.4% I, 32.6% II or III; Tumor size (cm): 33.4% <=1.0, 41.7% 1.1-2.0, 21.9% >2, 3% missing Chemotherapy: 26.1% yes,	Interview	Contralateral breast cancer (n=263) Never smokers (n=212)	>=7 vs none drinks/ week	1.90 (1.10-3.20) 0.90 (0.50-1.80)	Age, BMI, chemotherapy, county, hormonal therapy, race, survival time, tumor stage, year of diagnosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	Diagnosis: 1990-2005		73.9% no; Radiotherapy: 65.4% yes, 34.6% no, 0.1% missing; Adjuvant hormone therapy: 66.8% yes, 33.2% no		Current smokers (n=51)		3.70 (1.40-9.80)	
Knight[76], 2009, WECARE, USA	Nested case-control study Female (n=2107) mean age:51, Cancer	Diagnosed:1985-2000	Invasive breast cancer stage I-III	Interview	Contralateral breast cancer (n=1521)	Ever drank - Yes vs No	1.2 (0.90-1.50)	Age
Barnett[77], 2008 SEARCH UK (superseded by Ali[69] 2014)	Cancer survivors of a population-based prospective cohort study (n= 4560) Pre- and postmenopausal Mean age:51.5 Calendar year:1996 until 2005	1991-2005 Follow up= 6.82 years	In situ:0 - Invasive:4560 18.7% ER-ve, 81.2% ER+ve Invasive breast cancer; 73% incident and 27% prevalent 49.7% stage I, 45.8% stage II, 3.3% stage III, 1.1% stage IV; 24.1% grade 1, 47.2% grade 2, 28.6% grade 3	self-administered questionnaire Recruited at various time post-diagnosis	All-cause mortality(n=564)	>7 vs. ≤ 7 units/ week	0.78 (0.64-0.95)	NULL

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Brewster[78], 2007 UTS (UTMDACC) USA (superseded by Wu[64] 2017, could be included in the high vs low only)	Cohort (n= 2327) Mean age:55 Calendar year:1985-2000	Follow up= 5 years	Early stage breast cancer -Tumour size: ≤2 (n=1603)/ >2 (n=57) -Node negative: n=1558 -Node Positive: n=765 Missing: n=4	Medical records	Recurrence (n=332)	Heavy vs. Never/rare	0.98 (0.54 - 1.80) P trend=0.98	Treatment, stage
Trentham-Dietz[79], 2007, Wisconsin Follow-up Study of Women with Invasive Breast Cancer, United States	Female Follow-up of cases of case-control studies (n=10953) Pre- and postmenopausal mean age:59.4, Cancer Diagnosis: 1987-2000	Diagnosed:1987-2000 follow Up: Average 7.1 years, 1188 second cancers: 488 second breast cancers, 132 colorectal cancers, 113 endometrial cancers, 36 ovarian cancers	Stages: 63% local, 28.9% regional, 2.3% distant, 5.8% unknown	Interview interviewed regarding their pre-diagnosis risk factors conducted approximately 1 year after diagnosis. 1987-2002 until 2002	Breast cancer (n=885) Colorectal cancer (n=237) Endometrial cancer (n=199) Ovarian cancer (n=60)	>7 vs none drinks/ week	1.09 (0.78-1.53) P trend=0.91 1.92 (1.07-3.43) P trend=0.01 0.84 (0.42-1.69) P trend=0.47 0.55 (0.18-1.72)	Age, alcohol intake, BMI, family history, hrt, menopausal status, parity, smoking, tumor stage, year of diagnosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
							P trend=0.87	
Borugian M[53], 2004, Vancouver Cancer Centre of the British Columbia Cancer Agency, Canada, (Not comparable with other studies (% of energy from alcohol reported)	Prospective cohort of breast cancer survivors (n= 603) mean age:54.5 calendar year: Recruitment 1991-1992	Follow up= 10 years 146 deaths, 112 breast cancer mortality	76.4% ER+ Tumour grades: 7.6% well differentiated, 46.4% moderately differentiated, 46% poorly differentiated Systemic treatment: Tamoxifen only: 21.9%; Chemotherapy only: 14.7%; Chemotherapy and tamoxifen: 21.4%; Other hormone 1.9%; None 40.1%. Local treatment: lumpectomy alone: 4.6%; Lumpectomy + RT: 14.6%; Complete mastectomy alone: 59.6%; Complete	semi-quantitative FFQ, Questionnaire	Breast cancer mortality(n=112)	Per 1 % / increase of energy from alcohol	0.99 (0.94 - 1.04)	Age, Tumour stage, Energy intake
					Breast cancer mortality: (N of		0.96 (0.90 - 1.04)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					cases is not reported. N of total pre-menopausal women= 235)			
					Breast cancer mortality: (N of cases is not reported. N of total post-menopausal women=368)		1.00 (0.93 - 1.07)	
Holmes[34], 1999 NHS United States	Cancer survivors of population-based prospective cohort study (n= 1982) Pre- and postmenopausal mean age:54 calendar year: Until 1994	1976-1990 Follow up= 157 months 378 deaths, 326 breast cancer mortality	In situ:0 Invasive:1982 Invasive breast carcinoma; Grade 1-3	FFQ	Breast cancer mortality: (N of cases is not reported. N of total pre-menopausal women= 235)	> 15 vs 0 g/ day	0.96 (0.90 - 1.04)	Age, Time between exposure assessment and cancer diagnosis, year of diagnosis, oral contraceptive, Hormonal therapy, smoking, Age at first birth, Nodal status, Tumour size, BMI, menopausal status
					All-cause mortality		0.92(0.66-1.27)	
Tominaga[80], 1998 Tochigi Cancer Center Hospital, Japan	Follow-up of patients of a hospital-based study (n= 398) Calendar year:1986 until 1995	Breast surgery: 1986-1995 Follow up= 48 breast cancer mortality	-TNM stages: 29.1% I, 52.3% II, 15.3% III, 3.2% IV -Mastectomy: 13% partial, 1% simple, 57% modified radical, 29% radical;	Medical records	All-cause mortality (n=98)	Yes vs. no	0.10 (0.01 - 0.72) P trend=0.023	Age at diagnosis, TNM stage, Curability

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
			-Chemotherapy: 65% yes, 35% no; -Hormone therapy: 44% yes, 56% no -Radiation therapy: 13% yes, 87% no					
Ewertz[81], 1993, DBCCG, Denmark (Superseded by Ewertz 1991)	Female Follow up of cases of a population based case-control study (n=2445) Pre- and postmenopausal, Cancer Diagnosis: 1983-1984	Diagnosed:1983-1984 follow Up: Maximum 7 years, Loss to Follow-up: 3 patients emigrated, 805 total death	Primary invasive breast cancer; 44.8% grade I, 42.3% grade II, 12.8% grade III Adjuvant therapy	Semi-quantitative Ffq Data collected a year after diagnosis to avoid the period when adjuvant chemotherapy was administered Until 1990	Total mortality (n=805)	High vs low	1.30 (0.10-1.75)	NULL
Rohan, 1993, Diet and Breast Cancer in Australia Follow-up Study, Australia, SBR00120	Follow-up of cases of population-based case-control study (n= 412) Pre- and postmenopausal Mean age:55.1 Calendar year: Until 1989	1982-1984 Follow up= 5.5 years	Primary breast cancer, any stages	FFQ	Breast cancer mortality(n=412)	≥10 vs. 0 g/day	0.86 (0.51 – 1.47)	Energy intake, Age of menarche, Quetelet Index

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Ewertz[54], 1991 DBCCG, Denmark	Cohort study (n= 2445) Pre- and postmenopausal Calendar year: 1983-1984 until 1990 Death (n=805)	Follow up= 7 years	In situ:0 Invasive:2445 Primary Invasive breast cancer; 44.8%Grade I, 42.3% Grade II, 12.8% Grade III breast cancer	semi-quantitative FFQ	All-cause mortality (n=485)	>121 vs. 0 g/week	1.26(0.90-1.74)	Age, Tumour size, Nodal status, Tumour grade, Skin invasion, Area of residence

Abbreviations: ABCPP, After Breast Cancer Pooling Project; CWLS, Collaborative Women's Longevity Study; DBCCG, Danish Breast Cancer Cooperative Group; DCHS, Danish Diet, Cancer and Health Cohort; LACE, Life After Cancer Epidemiology; LIBCSP, Long Island Breast Cancer Study Project; NHS, Nurses' Health Study; NRWHS, National Runner's and Walker's Health study; SEARCH, Studies of Epidemiology and Risk Factors in Cancer Heredity Breast Cancer Study; VCCBCC, Vancouver Cancer Centre of the British Columbia Cancer Agency; WHI, Women's Health Initiative; WHEL; Women's Healthy Eating and Living; WISC, Wisconsin In Situ Cohort Study

Supplementary Table S19. Descriptive table of the included observational studies of post-diagnosis multivitamin use and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Nechuta[82] 2011, SBCSS, China	Population-based cohort study (n=4877), pre- and post-menopausal, age range: 20-75 years, race: Chinese	Diagnosis: 2002-2006, follow-up: mean 4.1 years, 444 total deaths, 389 from breast cancer, 55 from other causes	Stage I 34.5%, II 50.9%, III-IV 10.1%, missing 4.6%, ER+/PR+ 50.05%, ER+/PR- 13%, ER-/PR+ 7.4%, ER-/PR- 27.7%, unknown 1.9%, chemotherapy 92.2%, radiotherapy 32.8%, tamoxifen use 51.7%	Interview, by trained professional, at on average 6.5 months post-diagnosis	All-cause mortality (n=333)	Multivitamin supplement use, yes vs never	0.82 (0.57-1.17)	Receptor status, TNM stage, chemotherapy, radiotherapy, tamoxifen use, education, income, BMI, tea consumption, exercise, cruciferous vegetables, soy protein, vitamin E, antioxidants
					Breast cancer-specific mortality (n=290)		0.77 (0.52-1.15)	
					Recurrence (n=398)		0.74 (0.53-1.03)	
					All-cause mortality (n=333)	Multivitamin supplement use, duration of use ≤3 months vs never	1.01 (0.63-1.64)	
					Breast cancer-specific mortality (n=290)		0.88 (0.51-1.52)	
					Recurrence (n=398)		0.70 (0.42-1.17)	
					All-cause mortality (n=333)	Multivitamin supplement use,	0.69 (0.42-1.11)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer-specific mortality (n=290)	duration of use >3 months vs never	0.69 (0.41-1.18)	
					Recurrence (n=398)		0.77 (0.51-1.16)	
Ambrosone[83] 2020, DELCaP, USA	Secondary analysis of clinical trials (n=1134), age range: 23-80 years, pre-menopausal 47%, post-menopausal 52%, race: mostly White	Diagnosis: 2003-2010, follow-up: median 8.1 years	Stage II-III, ER+ or PR+ 65%, ER- or PR- 35%, HER2+ 21%, radical mastectomy or local excision of all tumours plus axillary node dissection or sentinel node resection	Questionnaire, self-administered, at 6 months post-diagnosis	Overall survival (n=181)	Multivitamin supplement use, during treatment vs no use	0.91 (0.54-1.55)	Age, alcohol intake, BMI, er status, her2 status, lymph node status, physical activity, pr status, smoking, toxicity, treatment arm, tumor size
						Multivitamin supplement use, before treatment vs no use	1.35 (0.87-2.09)	
						Multivitamin supplement use, before and during treatment vs no use	1.31 (0.92-1.88)	
					Disease-free survival (n=432)	Multivitamin supplement use, during treatment vs no use	1.02 (0.67-1.56)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
						Multivitamin supplement use, before treatment vs no use	1.27 (0.88-1.84)	
						Multivitamin supplement use, before and during treatment vs no use	1.21 (0.90-1.64)	
Jung[84] 2019, MARIE, Germany	Prospective cohort of cancer survivors (n=2223), age range: 58-66 years, post-menopausal	Diagnosis: 2002-2005, follow-up: median 6 years, until 2015	Stage I-IV, grade low 19.6%, moderate 49.3%, high 21.9%, ER+/PR+ 60.7%, ER+ or PR+ 16.8%, ER-/PR- 13.5%, HER2+ 15.4%, HER2- 68.0%, mastectomy 26.1%, breast-conserving therapy 73.7%,	Interview, at median 5.8 years post-diagnosis	Overall survival (n=328)	Multivitamin supplement use, yes vs no	1.13 (0.86-1.50)	Age, alcohol intake, BMI, cardiovascular disease, chemotherapy, detection type, diabetes, education, hormone receptor status, menopausal hormone therapy use, nodal status, other factors, physical activity, radiotherapy,
					Cancer specific mortality (n=180)		0.97 (0.68-1.37)	
					Recurrence (n=515)		1.10 (0.88-1.38)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
			chemotherapy 45.8%, radiation therapy 70.9%, hormone therapy 80.7%					smoking, tumor grade, tumor size
Kwan[85] 2011, LACE, USA	Prospective cohort of cancer survivors (n=2236), age range: 18-79 years, pre- and post-menopausal, race: mostly White	Diagnosis: 1997-2000, follow-up: average 8.33 years, until 2011	Stage I-IIIA, treatment completed except for adjuvant chemotherapy	FFQ, self-administered, at on average 1.91 years post-diagnosis	All-cause mortality (n=311)	Multivitamin supplement use with or without minerals, yes vs no	0.92 (0.71-1.19) P trend=0.51	Age at diagnosis, education, fruit and vegetable consumption, hormone receptor status, non-sedentary physical activity, other antioxidant use, positive lymph nodes, pre-diagnosis BMI, race/ethnicity, smoking, stage, treatment
					Breast cancer-specific mortality (n=167)		0.87 (0.60-1.24) P trend=0.43	
					Recurrence (n=312)		0.92 (0.71-1.20) P trend=0.56	
					All-cause mortality (n=266)	Multivitamin supplement use	0.93 (0.71-1.22)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
						with minerals, yes vs no	P trend=0.60	
					Breast cancer-specific mortality (n=141)		0.87 (0.6-1.27) P trend=0.48	
					Recurrence (n=265)		0.89 (0.67-1.17) P trend=0.39	
					All-cause mortality (n=266)	Multivitamin supplement use without minerals, yes vs no	0.87 (0.5-1.51) P trend=0.61	
					Breast cancer-specific mortality (n=141)		0.82 (0.39-1.73) P trend=0.60	
					Recurrence (n=265)		0.83 (0.49-1.42)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
							P trend=0.50	
					All-cause mortality (n=306)	Multivitamin supplement use with or without minerals, 6-7 days/week vs never	0.92 (0.70-1.20) P trend=0.55	
					Breast cancer-specific mortality (n=164)		0.88 (0.61-1.28) P trend=0.56	
					Recurrence (n=307)		0.90 (0.69-1.19) P trend=0.44	
					All-cause mortality (n=261)	Multivitamin supplement use with or without minerals before and after	0.79 (0.56-1.12) P trend=0.18	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer-specific mortality (n=145)	diagnosis 3-5 days/week vs never	0.70 (0.44-1.11) P trend=0.12	
					Recurrence (n=261)		0.76 (0.54-1.06) P trend=0.11	

Abbreviations: SBCCS, Shanghai Breast Cancer Genetics Study

Supplementary Table S20. Descriptive table of the included observational studies of post-diagnosis antioxidants use and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Poole[86] 2013, ABCPP, China and USA	Consortium of four prospective cohort studies (n=12,019), age range: 20-83 years, pre- and post-menopausal, race: mostly Asian and White	Diagnosis: 1976-2006, follow-up: mean 8.4 years	Stage I-III	In-person interview or mailed questionnaire, self-reported, at least 1 year post-diagnosis	Total mortality (n=1298)	Antioxidant supplement use, yes vs no	0.84 (0.72-0.99)	Age at diagnosis, exercise, stage, treatment, BMI, menopausal status, smoking status, Vitamin A, B, C, D, E
					Breast cancer mortality (n=849)		0.88 (0.74-1.03)	
					Recurrence (n=1325)		0.94 (0.83-1.07)	
					ER-positive, recurrence (n=703)		0.95 (0.82-1.10)	
					ER-negative, recurrence (n=198)		0.87 (0.67-1.12)	
					Total mortality (n=1298)	Number of antioxidant supplement use, 3 vs 0	0.79 (0.66-0.95)	
					Breast cancer mortality (n=849)		0.85 (0.67-1.07)	
					Recurrence (n=1325)		0.88 (0.74-1.05)	
					ER-positive, recurrence (n=181)		0.93 (0.77-1.13)	

					ER-negative, recurrence (n=45)		0.73 (0.51-1.07)	
Nechuta[82] 2011, SBCSS, China	Population-based cohort study (n=4877), pre- and post-menopausal, age range: 20-75 years, race: Chinese	Diagnosis: 2002-2006, follow-up: mean 4.1 years, 444 total deaths, 389 from breast cancer, 55 from other causes	Stage I 34.5%, II 50.9%, III-IV 10.1%, missing 4.6%, ER+/PR+ 50.05%, ER+/PR- 13%, ER-/PR+ 7.4%, ER-/PR- 27.7%, unknown 1.9%, chemotherapy 92.2%, radiotherapy 32.8%, tamoxifen use 51.7%	Interview, by trained professional, at on average 6.5 months post-diagnosis	Total mortality (n=404) (Result superseded by Poole 2013)	Antioxidant supplement use, yes vs never	0.82 (0.65-1.02)	Receptor status, TNM stage, chemotherapy, radiotherapy, tamoxifen use, education, Income, BMI, Tea consumption, exercise, cruciferous vegetables, soy protein, multivitamins, vitamin E, vitamin C
					Breast cancer-specific mortality (n=352) (Result superseded by Poole 2013)		0.79 (0.62-1.01)	
					Breast cancer recurrence (n=486) (Result superseded by Poole 2013)		0.78 (0.63-0.95)	
					Total mortality (n=404)	Duration of antioxidant supplement use, ≤3 months vs never	1.13 (0.85–1.50)	
					Breast cancer mortality (n=352)		1.05 (0.77-1.43)	
					Recurrence (n=486)		0.92 (0.70–1.21)	
					Total mortality (n=404)	Duration of antioxidant supplement use, >3 months vs never	0.60 (0.44-0.82)	
					Breast cancer mortality (n=352)		0.60 (0.43-0.85)	

					Recurrence (n=486)		0.67 (0.51-0.88)	
Fleischauer[87] 2003, FASTCAB, USA	(n= 385), mean age: 62.1 years, post-menopausal	Diagnosis: 1986-1988, follow-up: 14 years, until 1999	Invasive primary breast cancer	FFQ and questionnaire, self-administered, 124 items	Disease-free survival (n=58)	Antioxidant supplement use, yes vs no	0.54 (0.27-1.04)	Age at diagnosis, age at menopause, tumour stage, tamoxifen use, radiotherapy, hormonal therapy, smoking, physical activity, dietary factors
Jung[84] 2019, MARIE, Germany	Prospective cohort of cancer survivors (n=2223), age range: 58-66 years, post-menopausal	Diagnosis: 2002-2005, follow-up: median 6 years, until 2015	Stage I-IV, grade low 19.6%, moderate 49.3%, high 21.9%, ER+/PR+ 60.7%, ER+ or PR+ 16.8%, ER-/PR- 13.5%, HER2+ 15.4%, HER2- 68.0%, mastectomy 26.1%, breast-conserving therapy 73.7%, chemotherapy 45.8%, radiation therapy 70.9%, hormone therapy 80.7%	Interview, at median 5.8 years post-diagnosis	All-cause mortality (n=278)	Antioxidant supplement use, yes vs no	1.02 (0.75-1.39) P trend=0.91	Age, alcohol intake, BMI, cardiovascular disease, chemotherapy, detection type, diabetes, education, hormone receptor status, menopausal hormone therapy use, nodal status, other factors, physical activity, radiotherapy, smoking, tumor grade, tumor size
					Cancer specific mortality (n=161)		1.34 (0.91-1.97) P trend=0.14	
					Recurrence (n=440)		1.14 (0.89-1.45) P trend=0.31	
					Chemotherapy and/or radiation,	Antioxidant supplement	1.64 (1.01-2.66)	

					All-cause mortality (n=217)	use during adjuvant treatment, yes vs no	P trend=0.04	
					Chemotherapy, All-cause mortality (n=150)		1.80 (0.96-3.40) P trend=0.07	
					Radiation, All-cause mortality (n=195)		1.18 (0.74-1.87) P trend=0.49	
					Chemotherapy and/or radiation, cancer specific mortality (n=128)		1.80 (0.97-3.35) P trend=0.06	
					Chemotherapy, Cancer specific mortality (n=134)		1.99 (0.94-4.20) P trend=0.07	
					Radiation, Cancer specific mortality (n=114)		1.73 (0.87-3.44) P trend=0.12	
					Chemotherapy and/or radiation, Recurrence (n=330)		1.84 (1.26-2.68) P trend=0.002	
					Chemotherapy, Recurrence (n=373)		2.24 (1.39-3.63) P trend=0.001	
					Radiation, Recurrence (n=294)		1.63 (1.07-2.48)	

							P trend=0.02	
Ambrosone[83] 2020, DELCaP, USA	Secondary analysis of clinical trials (n=1134), age range: 23-80 years, pre-menopausal 47%, post-menopausal 52%, race: mostly White	Diagnosis: 2003-2010, follow-up: median 8.1 years	Stage II-III, ER+/PR+ 65%, ER-/PR- 35%, HER2+ 21%, radical mastectomy or local excision of all tumours plus axillary node dissection or sentinel node resection	Questionnaire, self-administered, at 6 months post-diagnosis	All-cause mortality (n=181)	Antioxidant supplement use, during treatment vs no use	1.03 (0.53-1.98)	Age, alcohol intake, BMI, er status, her2 status, lymph node status, multivitamins, physical activity, pr status, smoking, toxicity, treatment arm, tumor size
						Antioxidant supplement use, before treatment vs no use	1.19 (0.81-1.76)	
						Antioxidant supplement use, before and during treatment vs no use	1.40 (0.90-2.18)	
					Disease-free survival (n=432)	Antioxidant supplement use, during treatment vs no use	0.92 (0.52-1.64)	
						Antioxidant supplement use, before treatment vs no use	1.04 (0.74-1.47)	
						Antioxidant supplement use, before and during treatment vs no use	1.41 (0.98-2.04)	

Abbreviations: ABCPP, After Breast Cancer Pooling Project; LACE, Life After Cancer Epidemiology; NHS, Nurses' Health Study; SBCCS, Shanghai Breast Cancer Genetics Study; WHEL; Women's Healthy Eating and Living

Supplementary Table S21. Descriptive table of the included observational studies of post-diagnosis any vitamin or mineral use and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Saquib[88] 2012, WHEL, USA	Secondary analysis of clinical trials (n= 177), age range: 18-70 years	Diagnosis: 1991-1996, follow-up: average 7.3 years, until 2006	Stage I-IIIA	24h recall, at baseline	Breast cancer recurrence (n=34), women did not receive systemic treatment (n=177)	Number of supplement use, ≥3 vs ≤2	1.10 (0.56-2.26)	
					Breast cancer recurrence, women who received systemic treatment (n=2909)		1.03 (0.86-1.23)	
Nechuta[82] 2011, SBCSS, China	Population-based cohort study (n=4877), pre- and post-menopausal, age range: 20-	Diagnosis: 2002-2006, follow-up: 4.1 years,	Stage I 34.5%, II 50.9%, III-IV 10.1%, missing 4.6%, ER+/PR+ 50.05%, ER+/PR- 13%,	Interview, by trained professional, at on average 6.5	Total mortality (n=444)	Vitamin supplement use, yes vs never	0.88 (0.72-1.08)	
					Total mortality (n=53) ER/PR-positive		0.98 (0.69-1.38)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	75 years, race: Chinese	444 total deaths, 389 from breast cancer, 55 from other causes	ER-/PR+ 7.4%, ER-/PR- 27.7%, unknown 1.9%, chemotherapy 92.2%, radiotherapy 32.8%, tamoxifen use 51.7%	months post-diagnosis	Total mortality (n=62) ER/PR-negative		0.84 (0.61-1.16)	
					Total mortality (n=95) Stage I or II		0.86 (0.67-1.10)	
					Total mortality (n=48) Stage III or IV		0.87 (0.60-1.27)	
					Total mortality (n=79) radiotherapy		1.03 (0.77-1.38)	
					Total mortality (n=169) no radiotherapy		0.75 (0.56-1.00)	
					Total mortality (n=135) chemotherapy		0.89 (0.72-1.09)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Total mortality (n=23) no chemotherapy		0.79 (0.52-1.22)	
					Total mortality (n=68) used tamoxifen		0.90 (0.66-1.25)	
					Total mortality (n=79) did not use tamoxifen		0.89 (0.68-1.18)	
					Breast cancer-specific mortality (n=389)		0.88 (0.71-1.09)	
					Recurrence (n=532)		0.84 (0.7-1.01)	
					Recurrence (n=66) ER/PR-positive		0.95 (0.70-1.29)	
					Recurrence (n=71) ER/PR-negative		0.78 (0.58-1.05)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Recurrence (n=116) Stage I or II		0.82 (0.65-1.03)	
					Recurrence (n=56) Stage III or IV		0.80 (0.57-1.14)	
					Recurrence (n=96) radiotherapy		1.02 (0.78-1.33)	
					Recurrence (n=79) no radiotherapy		0.72 (0.55-0.94)	
					Recurrence (n=170) chemotherapy		0.87 (0.72-1.06)	
					Breast cancer recurrence (n=24) no chemotherapy		0.66 (0.43-1.00)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Recurrence (n=79) used tamoxifen		0.77 (0.58-1.02)	
					Recurrence (n=96) did not use tamoxifen		0.89 (0.69-1.15)	
					Total mortality (n=444)	Duration of any vitamin supplement use, ≤3 months vs never	1.09 (0.81-1.45)	
					Breast cancer-specific mortality (n=389)		1.04 (0.76-1.43)	
					Recurrence (n=532)		0.90 (0.69-1.19)	
					Total mortality (n=444)	Duration of any vitamin supplement use, >3	0.79 (0.62-1.00)	
					Breast cancer-specific mortality (n=389)		0.80 (0.62-1.03)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Recurrence (n=532)	months vs never	0.81 (0.65-1.00)	

Abbreviations: SBCCS, Shanghai Breast Cancer Genetics Study; WHEL; Women's Healthy Eating and Living

Supplementary Table S22. Descriptive table of the included observational studies of post-diagnosis single vitamin supplementation and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Madden[89] 2018, Ireland	Retrospective cohort of cancer survivors (n= 5417), age range: 50-80 years, race: White	Diagnosis: 2001-2011, follow-up: until 2012	Stage I-III, ER+ 148.4%, ER- 31.6%, unspecified 19.9%, PR- 49.9%, PR+ 104.6%, unspecified 46.8%, HER2+ 23.8%, HER2- 123.7%, unspecified 52.4%	Pharmacy claims database, new vitamin D prescriptions dispensed post-diagnosis	All-cause mortality (n=1394)	Vitamin D supplementation, yes vs no	0.86 (0.72-1.01) P trend<0.05	Age at diagnosis, smoking status, comorbidity, tumour stage, tumour grade, ER status, PR status, HER2 status, bisphosphonate, chemotherapy, anti-oestrogen use, statins, NSAID use, anti-diabetic medication use
						Vitamin D supplementation initiation, <180 days post-diagnosis vs no	0.58 (0.44-0.76)	
						Vitamin D supplementation initiation, ≥180 days post-diagnosis vs no	0.95 (0.78-1.16)	
						Vitamin D supplementation duration, 1-12 months vs no	0.80 (0.68-0.93) P trend<0.05	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
						Vitamin D supplementation duration, >12 months vs no	0.36 (0.30-0.42) P trend<0.05	
						Vitamin D supplementation, >400 IU/day vs 1-400 IU/ day	0.82 (0.69-0.99) P trend<0.05	
					Cancer specific mortality (n=806)	Vitamin D supplementation, yes vs no	0.80 (0.64-0.99) P trend<0.05	
						Vitamin D supplementation initiation, <180 days post-diagnosis vs no	0.51 (0.34-0.74)	
						Vitamin D supplementation initiation, ≥180	0.91 (0.70-1.18)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
						days post-diagnosis vs no		
						Vitamin D supplementation duration, 1-12 months vs. no	0.73 (0.60-0.91) P trend<0.05	
						Vitamin D supplementation duration, >12 months vs no	0.33 (0.26-0.41) P trend<0.05	
						Vitamin D supplementation, >400 IU/day vs 1-400 IU/ day	0.79 (0.62-1.01)	
Inoue-Choi[90] 2014, Iowa Women's Health Study, USA	Prospective cohort of cancer survivors (n= 969), age	Diagnosis: 1986-2002, follow-up: 6.1 years	No information specific to breast cancer	FFQ, self-report, more than 1 year	All-cause mortality	Vitamin D supplementation, yes vs never	0.75 (0.47-1.19)	Age, energy intake, BMI, physical activity, smoking, comorbidity index, perceived general health, history of diabetes, history of
						Vitamin C supplementation, yes vs never	0.79 (0.58-1.08)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	range: 55-69 years					Vitamin E supplementation, yes vs never	0.80 (0.60-1.08)	high blood pressure, cancer stage, surgery, chemotherapy, number of cancers, current cancer treatment, years since cancer diagnosis, protein intake, total vegetable and fruit intake, whole grain intake
						Vitamin A supplementation, yes vs never	0.82 (0.43-1.57)	
						B complex vitamin supplementation, yes vs never	0.70 (0.41-1.18)	
						Vitamin B6 supplementation, yes vs never	0.94 (0.58-1.51)	
						Beta carotene supplementation, yes vs never	1.05 (0.46-2.41)	
						Folic acid supplementation, yes vs never	1.01 (0.60-1.70)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
						Calcium supplementation, yes vs never	0.83 (0.64-1.09)	
						Iron supplementation, yes vs never	1.60 (1.11-2.31)	
						Magnesium supplementation, yes vs never	1.01 (0.57-1.8)	
						Selenium supplementation, yes vs never	0.74 (0.34-1.58)	
						Zinc supplementation, yes vs never	0.85 (0.50-1.44)	
						Copper supplementation, yes vs never	2.50 (0.59-10.65)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Harris[91] 2013, Swedish Mammography Cohort, Sweden	Population-based cohort study (n= 3405), mean age: 65 years, pre- and post-menopausal	Diagnosis: 1987-2010, follow-up: 7.8 years, 1055 deaths, 416 from breast cancer	Invasive breast cancer, stage I-IV	67-item FFQ at baseline and a 96-item FFQ in 1997 dietary assessment occurred a mean of 4.6 years after breast cancer diagnosis range (1 year to 10 year)	Total mortality (n=228)	Vitamin C supplementation, yes vs no	0.81 (0.53-1.26)	Age, energy intake, education, marital status, menopausal status, BMI, alcohol intake, year of diagnosis, tumour stage, tumour grade, radiotherapy, treatment
					Breast cancer-specific mortality (n=66)	Vitamin C supplementation, yes vs no	1.06 (0.52-2.17)	
Poole[86] 2013, ABCPP, China and USA	Consortium of four prospective cohort studies (n=12,019), age range: 20-83 years, pre- and post-menopausal, race: mostly	Diagnosis: 1976-2006, follow-up: mean 8.4 years	Stage I-III	In-person interview or mailed questionnaire, self-reported, at least 1 year post-diagnosis	Total mortality (n=1298)	Vitamin A supplementation, yes vs no	1.06 (0.82-1.36)	Age at diagnosis, exercise, stage, treatment, BMI, menopausal status, smoking status
						Vitamin B supplementation, yes vs no	0.96 (0.81-1.15)	
						Vitamin C supplementation, yes vs no	0.87 (0.76-1.01)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	Asian and White					Vitamin D supplementation, yes vs no	0.95 (0.72-1.24)	
						Vitamin E supplementation, yes vs no	0.92 (0.79-1.07)	
					Breast cancer specific mortality (n=849)	Vitamin A supplementation, yes vs no	0.95 (0.68-1.34)	
						Vitamin B supplementation, yes vs no	0.98 (0.80-1.21)	
						Vitamin C supplementation, yes vs no	0.94 (0.79-1.12)	
						Vitamin D supplementation, yes vs no	0.97 (0.68-1.38)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
						Vitamin E supplementation, yes vs no	0.89 (0.72-1.10)	
					Recurrence (n=1325)	Vitamin A supplementation, yes vs no	1.16 (0.80-1.70)	
					Recurrence, ER-positive (n=79)		1.12 (0.88-1.43)	
					Recurrence, ER-negative (n=18)		1.36 (0.82-2.24)	
					Recurrence (n=1325)	Vitamin B supplementation, yes vs no	0.94 (0.79-1.11)	
					Recurrence, ER-positive (n=135)		0.81 (0.68-0.98)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Recurrence, ER-negative (n=50)		1.03 (0.76-1.40)	
					Recurrence (n=1325)	Vitamin C supplementation, yes vs no	0.98 (0.85-1.12)	
					Recurrence, ER-positive (n=331)		0.92 (0.80-1.05)	
					Recurrence, ER-negative (n=99)		0.87 (0.68-1.11)	
					Recurrence (n=1325)	Vitamin D supplementation, yes vs no	0.92 (0.62-1.35)	
					Recurrence, ER-positive (n=44)		0.64 (0.47-0.87)	
					Recurrence, ER-negative (n=22)		1.25 (0.78-1.98)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Recurrence (n=1325)	Vitamin E supplementation, yes vs no	0.90 (0.78-1.03)	
					Recurrence, ER-positive (n=367)		0.89 (0.78-1.02)	
					Recurrence, ER-negative (n=101)		0.90 (0.70-1.15)	
Greenlee H[92], 2012, LACE, United States	Prospective cohort of cancer survivors (n= 2264), mean age: 58.3 years, pre- and post-menopausal	1997-2000 Follow up= 10 years, until 2010 393 deaths, 214 breast cancer mortality, 375 breast cancer recurrence	Early-stage primary breast cancer among those with data: 84.4% ER+ and/or PR+, 15.6% ER- and/PR-AJCC; 80.3% stage I or IIA 57.2% chemotherapy,	Questionnaire, self-administered, at on average 1.9 years post-diagnosis	Total mortality (n=314)	Carotenoid supplementation, frequent vs no	1.63 (1.06-2.5) P trend=0.04	Age at diagnosis, ethnicity, stage of disease, number of positive lymph nodes, hormone receptor status, chemotherapy, radiotherapy, hormonal therapy, BMI, smoking, alcohol intake, physical activity,
					Total mortality, chemotherapy (n=51)		2.09 (1.21-3.61)	
					Total mortality, radiotherapy (n=14)		2.14 (1.20-3.82)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
			63% radiation therapy, 80.4% hormone therapy		Total mortality, hormonal therapy (n=18)		1.66 (1.00-2.73)	fruit, vegetables, comorbidity
					Breast mortality (n=166)		1.93 (1.14-3.28) P trend=0.03	
					Breast cancer mortality, chemotherapy (n=13)		2.54 (1.37-4.70)	
					Breast cancer mortality, radiotherapy (n=10)		2.54 (1.28-5.05)	
					Breast cancer mortality, hormonal therapy (n=12)		2.14 (1.16-3.97)	
					Recurrence (n=311)		1.23 (0.76-1.96)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
							P trend=0.52	
					Recurrence, chemotherapy (n=15)		1.66 (0.96-2.88)	
					Recurrence, radiotherapy (n=11)		1.37 (0.73-2.57)	
					Recurrence, hormonal therapy (n=14)		1.31 (0.75-2.27)	
					Total mortality (n=315)	Beta carotene supplementation, frequent vs no	1.18 (0.71-1.97) P trend=0.41	
					Breast cancer mortality (n=169)		1.33 (0.69-2.55) P trend=0.34	
					Recurrence (n=314)		0.89 (0.50-1.60) P trend=0.90	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Total mortality (n=314) (Result superseded by Poole, 2013, ABCPP, SBR00601)	Vitamin E supplementation, frequent vs no	0.75 (0.59-0.96) P trend=0.02	
					Breast cancer mortality (n=168) (Result superseded by Poole, 2013, ABCPP, SBR00601)		0.85 (0.64-1.18) P trend=0.34	
					Recurrence (n=312) (Result superseded by Poole, 2013,		0.70 (0.54-0.90) P trend<0.01	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					ABCPP, SBR00601)			
					Recurrence, chemotherapy (n=65)		0.79 (0.56-1.12)	
					Recurrence, radiotherapy (n=63)		0.70 (0.49-0.98)	
					Recurrence, hormonal therapy (n=81)		0.70 (0.51-0.96)	
					Total mortality (n=316)	Lycopene supplementation, frequent vs no	1.38 (0.41-4.61) P trend=0.46	
					Breast cancer mortality (n=169)		2.09 (0.59-7.43) P trend=0.15	
					Recurrence (n=313)		1.17 (0.35-3.89)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
							P trend=0.67	
					Total mortality (n=318)	Selenium supplementation, frequent vs no	0.80 (0.45-1.41) P trend=0.65	
					Breast cancer mortality (n=169)		0.90 (0.45-1.79) P trend=0.87	
					Recurrence (n=314)		0.89 (0.53-1.49) P trend=0.75	
					Total mortality (n=317)	Zinc supplementation, frequent vs no	0.75 (0.46-1.21) P trend=0.29	
					Breast cancer mortality (n=168)		0.82 (0.44-1.53) P trend=0.29	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Recurrence (n=312)		0.79 (0.49-1.28) P trend=0.26	
Jacobs[93] 2011, WHEL, USA	Nested case-control study within a prospective cohort (n=3085), mean age: 51.6 years	Follow-up: mean 7.3 years	Invasive breast cancer, stage I 21.1%, II 48.1%, III 30.9% III, chemotherapy 80.3%, radiotherapy 62.7%, anti-oestrogen use 54.9%, Chemotherapy: 80.7% yes; Radiotherapy: 63.1% yes; Anti-oestrogen use: 64.5% yes, among controls	FFQ, at approximately 2 years post-diagnosis	Breast cancer recurrence (Result superseded by Poole, 2013, ABCPP, SBR00601)	Vitamin D supplementation, no vs 538.7 IU/d	1.08 (0.87-1.34) P trend=0.47	Age, ethnicity, BMI, intervention group, energy intake, stage of baseline cancer, and years between diagnosis and study entry.
					Breast cancer recurrence Pre-menopausal women		0.96 (0.61-1.52) P trend=0.84	
					Breast cancer recurrence Post-menopausal women		1.11 (0.86-1.41) P trend=0.44	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer recurrence (Result superseded by Poole, 2013, ABCPP, SBR00601)	Vitamin D supplementation, no vs yes	1.07 (0.88-1.29) P trend=0.49	
					Breast cancer recurrence Pre-menopausal women		0.94 (0.65-1.37) P trend=0.76	
					Breast cancer recurrence Post-menopausal women		1.10 (0.88-1.38) P trend=0.38	
Nechuta S[82], 2011, SBCSS	Prospective cohort (population-based) of	Diagnosed: 2002-2006 Follow up= 4.1 years, 444	Invasive breast cancer 50.05% ER+/PR+, 13% ER+/PR-, 7.4%	Interviews conducted by trained interviewer	Total mortality (n=358) (Results superseded by	Vitamin C supplementation, yes vs never	0.81 (0.61-1.07) P trend=0.13	Receptor status, TNM stage, chemotherapy, radiotherapy,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	breast cancer survivors (n= 4877) Pre- and postmenopausal age range: 20-75 years	total deaths, 389 breast cancer mortality, 55 death from other causes	ER-/PR+, 27.7% ER-/PR-, 1.9% unknown TNM; 34.5% stage I, 50.9% stage IIA/IIB, 10.1% stage III–IV, 4.6% missing chemotherapy 92.2%, radiotherapy 32.8%, tamoxifen use 51.7%	within 6 months post-diagnosis, (on average 6.5 months after diagnosis)	Poole, 2013, ABCPP, SBR00601)			tamoxifen use, education, income, BMI, tea consumption, exercise, cruciferous vegetables, soy protein, vitamin E, antioxidants
					Breast cancer-specific mortality (n=316) (Results superseded by Poole, 2013, ABCPP, SBR00601)		0.82 (0.61-1.10)	
					Breast cancer recurrence (n=435) (Results superseded by Poole, 2013, ABCPP, SBR00601)		0.81 (0.63-1.03) P trend=0.09	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Total mortality	Duration of vitamin C supplementation, ≤3 months vs never	1.08 (0.77-1.52)	
					Breast cancer mortality		1.11 (0.78-1.58)	
					Breast cancer recurrence		1.00 (0.74-1.37)	
					Total mortality (n=435)	Duration of vitamin C supplementation, >3 months vs never	0.56 (0.37-0.87) P trend=0.009	
					Breast cancer mortality		0.56 (0.35-0.88)	
					Breast cancer recurrence		0.62 (0.43-0.90) P trend=0.01	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Total mortality (n=319) (Results superseded by Poole, 2013, ABCPP, SBR00601)	Vitamin E supplementation, yes vs never	0.71 (0.46-1.11) P trend=0.13	
					Breast cancer-specific mortality (n=278) (Results superseded by Poole, 2013, ABCPP, SBR00601)		0.63 (0.38-1.04)	
					Breast cancer recurrence (n=382) (Results superseded by Poole, 2013, ABCPP, SBR00601)		0.65 (0.43-0.97) P trend=0.04	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Total mortality	Duration of vitamin E supplementation, ≤3 months vs never	0.97 (0.55-1.70) P trend=0.90	
					Breast cancer mortality		0.76 (0.39-1.49)	
					Breast cancer recurrence		0.74 (0.42-1.29) P trend=0.29	
					Total mortality	Duration of vitamin E supplementation, >3 months vs never	0.52 (0.27-1.01) P trend=0.05	
					Breast cancer mortality		0.53 (0.26-1.07)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Breast cancer recurrence		0.57 (0.32-1.01) P trend=0.05	
Bruemme[94], 2003, Fred Hutchinson Cancer Research Center Nutritional Supplement Follow-up study, USA	Prospective cohort of cancer survivors (n=99)	Recruited: 1994-1997 Follow up= 2 years, until 2 years after transplant		Questionnaire was conducted approximately two weeks before initiation of the radiation and/or chemotherapy regimen	Non-relapse mortality	Vitamin C supplementation, ≥500mg/day vs no	0.80 (0.27-2.41) P trend=0.58	Age, tumour stage
					Relapse-free recurrence		0.11 (0.02-0.89) P trend=0.03	
					Mortality or recurrence		0.41 (0.17-1.02) P trend=0.04	
Fleischauer AT[87], 2003, FASTCAB, United States	(n= 385) Post-menopausal, mean age: 62.1 years	Diagnosed: 1986-1988 Follow up= 14 years, until 1999	Invasive breast cancer	Questionnaire, self-administered	Disease-free survival (n=220)	Vitamin C supplementation, yes vs no	0.64 (0.32-1.27)	Age at diagnosis, age at menopause, tumour stage, tamoxifen use, radiotherapy, hormonal therapy, smoking, physical
						Vitamin C supplementation	0.90 (0.35-2.23)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
						post-diagnosis, yes vs no		activity, dietary factors
						Duration of vitamin C supplementation, >4 years vs no	0.34 (0.11-0.97)	
						Vitamin E supplementation, yes vs no	0.55 (0.28-1.08)	
						Vitamin E supplementation post-diagnosis, yes vs no	0.75 (0.34-1.76)	
						Duration of vitamin E supplementation, >3 years vs no	0.33 (0.10-1.07)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Zeichner[95] 2015, USA	Retrospective cohort of cancer survivors (n=134), mean age: 54 years, race: Hispanic and Non-Hispanic White	Diagnosis: 2006-2012, follow-up: median 29.5 months	Nonmetastatic, grade low/intermediate 39.7%, high 60.3%, HER2+ 100%, ER+ 63.6%, PR+ 53.0%, neoadjuvant chemotherapy 100%, mastectomy 60.6%, lumpectomy 34.9%, no surgery 4.6%, radiation 88%, hormone therapy 58.1%	Medical records	Overall survival (n=21)	Vitamin D supplementation during chemotherapy, yes vs no	0.30 (0.07-1.37) P trend=0.12	Age at diagnosis, BMI, er status, histological grade, lymph node metastasis, tumor size
					Disease-free survival (n=89)		0.36 (0.15-0.88) P trend=0.26	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Jung[84] 2019, MARIE, Germany	Prospective cohort of cancer survivors (n=2223), age range: 58-66 years, post-menopausal	Diagnosis: 2002-2005, follow-up: median 6 years, until 2015	Stage I-IV, grade low 19.6%, moderate 49.3%, high 21.9%, ER+/PR¬+ 60.7%, ER+ or PR+ 16.8%, ER-/PR- 13.5%, HER2+ 15.4%, HER2- 68.0%, mastectomy 26.1%, breast-conserving therapy 73.7%, chemotherapy 45.8%, radiation therapy 70.9%, hormone therapy 80.7%	Interview, at median 5.8 years post-diagnosis	All-cause mortality (n=278)	Magnesium supplementation, yes vs no	1.02 (0.73-1.42)	Age, alcohol intake, BMI, cardiovascular disease, chemotherapy, detection type, diabetes, education, hormone receptor status, menopausal hormone therapy use, nodal status, other factors, physical activity, radiotherapy, smoking, tumor grade, tumor size
					Cancer specific mortality (n=154)		0.97 (0.60-1.55)	
					Recurrence (n=428)		0.99 (0.74-1.33)	
					All-cause mortality (n=270)	Calcium supplementation, yes vs no	0.79 (0.54-1.14)	
					Cancer specific mortality (n=150)		0.74 (0.44-1.24)	
					Recurrence (n=423)		0.87 (0.65-1.16)	
					All-cause mortality (n=296)	Magnesium or calcium	0.92 (0.69-1.24)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Cancer specific mortality (n=163)	supplementation, yes vs no	0.86 (0.57-1.29)	
					Recurrence (n=460)		0.92 (0.73-1.17)	
Ambrosone [83] 2020, DELCaP, USA	Secondary analysis of clinical trials (n=1134), age range: 23-80 years, pre-menopausal 47%, post-menopausal 52%, race: mostly White	Diagnosis: 2003-2010, follow-up: median 8.1 years	Stage II-III, ER+ or PR+ 65%, ER- or PR- 35%, HER2+ 21%, radical mastectomy or local excision of all tumours plus axillary node dissection or sentinel node resection	Questionnaire, self-administered, at 6 months post-diagnosis	All-cause mortality	Vitamin C supplementation, during treatment vs no	1.15 (0.58-2.31)	Age, alcohol intake, BMI, er status, her2 status, lymph node status, multivitamins, physical activity, PR status, smoking, toxicity, treatment arm, tumor size
					Disease-free survival		1.14 (0.64-2.03)	
					All-cause mortality	Vitamin C supplementation, before treatment vs no	1.27 (0.83-1.93)	
					Disease-free survival		1.04 (0.72-1.52)	
					All-cause mortality	Vitamin C supplementation, before and during treatment vs no	1.37 (0.80-2.34)	
					Disease-free survival		1.31 (0.83-2.08)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					All-cause mortality	Vitamin A supplementation, during treatment vs no	1.25 (0.45-3.49)	
					Disease-free survival		1.51 (0.70-3.29)	
					All-cause mortality	Vitamin A supplementation, before treatment vs no	0.66 (0.24-1.83)	
					Disease-free survival		0.71 (0.31-1.63)	
					All-cause mortality	Vitamin A supplementation, before and during treatment vs no	3.20 (0.93-10.99)	
					Disease-free survival		4.06 (1.26-13.16)	
					All-cause mortality	Vitamin E supplementation, during treatment vs no	1.19 (0.55-2.58)	
					Disease-free survival		1.13 (0.59-2.16)	
					All-cause mortality	Vitamin E supplementation,	1.04 (0.66-1.62)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Disease-free survival	before treatment vs no	0.98 (0.67-1.44)	
					All-cause mortality	Vitamin E supplementation, before and during treatment vs no	1.39 (0.68-2.82)	
					Disease-free survival		1.38 (0.75-2.54)	
					All-cause mortality	Coenzyme Q10 supplementation, during treatment vs no	1.34 (0.49-3.67)	
					Disease-free survival		1.35 (0.59-3.06)	
					All-cause mortality	Coenzyme Q10 supplementation, before treatment vs no	1.08 (0.47-2.48)	
					Disease-free survival		1.28 (0.65-2.51)	
					All-cause mortality	Coenzyme Q10 supplementation, during and before treatment vs no	1.88 (0.75-4.76)	
					Disease-free survival		1.68 (0.73-3.89)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					All-cause mortality	Carotenoid supplementation, during treatment vs no	3.21 (0.97-10.61)	
					Disease-free survival		3.20 (1.16-8.87)	
					All-cause mortality	Carotenoid supplementation, before treatment vs no	0.74 (0.18-3.04)	
					Disease-free survival		0.99 (0.36-2.70)	
					All-cause mortality	Carotenoid supplementation, before and during treatment vs no	1.50 (0.35-6.55)	
					Disease-free survival		2.24 (0.68-7.37)	
					All-cause mortality	Vitamin D supplementation, during treatment vs no	1.05 (0.66-1.65)	
					Disease-free survival		1.19 (0.81-1.74)	
					All-cause mortality	Vitamin D supplementation,	1.07 (0.65-1.77)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Disease-free survival	before treatment vs no	0.96 (0.62-1.48)	
					All-cause mortality	Vitamin D supplementation, before and during treatment vs no	1.11 (0.67-1.82)	
					Disease-free survival		1.22 (0.81-1.84)	
					All-cause mortality	Vitamin B6 supplementation, during treatment vs no	0.97 (0.64-1.47)	
					Disease-free survival		0.89 (0.63-1.27)	
					All-cause mortality	Vitamin B6 supplementation, before treatment vs no	0.79 (0.39-1.60)	
					Disease-free survival		0.65 (0.35-1.22)	
					All-cause mortality	Vitamin B6 supplementation, before and during treatment vs no	1.13 (0.56-2.29)	
					Disease-free survival		1.07 (0.58-1.96)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					All-cause mortality	Vitamin B12 supplementation, during treatment vs no	0.85 (0.44-1.64)	
					Disease-free survival		1.08 (0.66-1.77)	
					All-cause mortality	Vitamin B12 supplementation, before treatment vs no	0.70 (0.36-1.36)	
					Disease-free survival		0.80 (0.47-1.36)	
					All-cause mortality	Vitamin B12 supplementation, before and during treatment vs no	1.91 (1.13-3.22)	
					Disease-free survival		1.77 (1.10-2.84)	
					All-cause mortality	Iron supplementation, during treatment vs no	1.67 (1.02-2.72)	
					Disease-free survival		1.79 (1.18-2.70)	
					All-cause mortality	Iron supplementation,	0.50 (0.20-1.26)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Disease-free survival	before treatment vs no	0.58 (0.28-1.19)	
					All-cause mortality	Iron supplementation, before and during treatment vs no	1.80 (0.85-3.84)	
					Disease-free survival		1.88 (0.96-3.67)	
					All-cause mortality	Folic acid supplementation, during treatment vs no	1.11 (0.58-2.16)	
					Disease-free survival		1.21 (0.72-2.04)	
					All-cause mortality	Folic acid supplementation, before treatment vs no	0.63 (0.32-1.22)	
					Disease-free survival		0.72 (0.42-1.21)	
					All-cause mortality	Folic acid supplementation, before and during treatment vs no	1.70 (0.84-3.43)	
					Disease-free survival		1.32 (0.68-2.54)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					All-cause mortality	Calcium supplementation, during treatment vs no	0.96 (0.55-1.66)	
					Disease-free survival		1.17 (0.76-1.80)	
					All-cause mortality	Calcium supplementation, before treatment vs no	1.49 (0.99-2.24)	
					Disease-free survival		1.24 (0.87-1.78)	
					All-cause mortality	Calcium supplementation, before and during treatment vs no	1.19 (0.77-1.84)	
					Disease-free survival		1.20 (0.84-1.74)	

Abbreviations: ABCPP, After Breast Cancer Pooling Project; LACE, Life After Cancer Epidemiology; NHS, Nurses' Health Study; SBCCS, Shanghai Breast Cancer Genetics Study; WHEL; Women's Healthy Eating and Living

Supplementary Table S23. Descriptive table of the included observational studies of post-diagnosis vitamin D from diet and/or supplements and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome Events	Contrast	RR (95% CI)	Covariates
Zeichner[95] 2015, USA	Retrospective cohort of cancer survivors (n=134), mean age: 54 years, race: Hispanic and Non-Hispanic White	Diagnosis: 2006-2012, follow-up: median 29.5 months	Nonmetastatic, grade low/intermediate 39.7%, high 60.3%, HER2+ 100%, ER+ 63.6%, PR+ 53.0%, neoadjuvant chemotherapy 100%, mastectomy 60.6%, lumpectomy 34.9%, no surgery 4.6%, radiation 88%, hormone therapy 58.1%	Medical records	All-cause mortality (n=21)	From supplements Use vs non-use	0.30 (0.07-1.37) P trend=0.12	Age at diagnosis, Tumour size, Lymph node metastasis, Histological grade, ER status, BMI
					Disease-free survival (n=89)		0.36 (0.15-0.88) P trend=0.26	
Beasley[33] 2011, CWLS, USA	Follow up of 4441 pre- and post-menopausal women diagnosed with	Diagnosed between 1987 and 1999	Primary invasive breast cancer; Stages: 72.8% local, 27.2% regional Surgery: 97.9%; Radiotherapy: 49.8%; Hormonal therapy:	Validated FFQ	All-cause mortality (n=525)	Q5 vs. Q1 mg/day (from diet and supplements-total)	0.86 (0.64-1.16) P trend=0.35	Age, state of residence, menopausal status, smoking, breast cancer stage, alcohol, history of hormone

	invasive breast cancer Age range: 20-79	Mean follow up=5.5 years	57.8%; Chemotherapy: 31.9%		Breast cancer-mortality (n=137)	Q5 vs. Q1 mg/day (from diet and supplements-total)	1.02 (0.58-1.79) P trend=0.90	replacement therapy), interval between diagnosis and diet assessment, energy intake, breast cancer treatment, body mass index, and physical activity
Saquib[96] 2011, WHEL, USA	Prospective cohort of 3081 pre- and post-menopausal women diagnosed with invasive breast cancer Age: 18–70 years	Median follow up=9 years	Primary invasive breast cancer, stages I(>=1cm), II (56.4%), or IIIA Chemotherapy: 70%	24 Hour Diet Recall	All-cause mortality (n=388)	above UL vs. adequate intake mcg (from diet and supplements-total)	0.9 (0.13-7.11)	Age at randomization, tumor stage, tumor grade, time since diagnosis, BMI, smoking, randomisation group, Hot flashes, Group by hot flashes interaction and physical health
Jacobs[93] 2011, WHEL, USA	Matched case-control study (of 512 matched pairs) Mean (SD) age: 51.6 +/- 9.5 years	Mean follow up=7.3 years	Invasive:512 69.5% ER+, 29.3% ER- among cases; 73.4% ER+, 25.4% ER- among controls Stages: 21.1% I, 48.1% II, 30.9% III among cases and controls; Tumour	FFQ	Breast cancer recurrence All participants Premenopausal	Lowest vs. highest tertile (from diet and supplements-total)	1.07 (0.85-1.34) P trend=0.57 1.17 (0.73-1.89)	Age, ethnicity, BMI, intervention group, energy intake, stage of baseline cancer, and years between diagnosis and study entry

			grades: 8.4% I, 37.9% II, 45.1% III among cases, 11.1% Chemotherapy: 80.3% yes; Radiotherapy 62.7% yes; Anti-oestrogen use 54.9% yes, among cases; Chemotherapy: 80.7% yes; Radiotherapy: 63.1% yes; Anti-oestrogen use: 64.5% yes, among controls				P trend=0.49	
					Postmenopausal		1.01(0.78-1.32) P trend=0.92	
					Breast cancer recurrence All participants	Lowest vs. highest tertile (from diet only)	1.17 (0.93-1.49) P trend=0.18	
					Premenopausal		1.72 (1.08-2.74) P trend=0.02	
					Postmenopausal		1.04 (0.79-1.37) P trend=0.77	
Holmes[34], 1999, NHS, USA	Population-based prospective cohort of 1982	Mean follow up=13 years	Invasive breast carcinoma; Grade 1-3	Validated FFQ	All-cause mortality (n=378)	Q5 vs. Q1	0.86 (0.62-1.17) P trend=0.21	Age, Time between exposure assessment and cancer diagnosis,

	pre- and post-menopausal women diagnosed with invasive breast cancer	(157 months)				(from diet and supplements)		Year of diagnosis, Oral contraceptive, Hormonal therapy, Smoking, Age at first birth, Nodal status, Tumor size, BMI, Menopausal status, Energy intake
					All-cause mortality (n=326)	Q5 vs. Q1 (from diet only)	0.73 (0.53-1.02) P trend=0.05	

Abbreviations: CWLS, Collaborative Women's Longevity Study; NHS, Nurses' Health Study; WHEL; Women's Healthy Eating and Living

Supplementary Table S24. Descriptive table of the included observational studies of post-diagnosis serum 25(OH)D and breast cancer prognosis

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Tokunaga[97] 2022, Japan	Retrospective cohort of cancer survivors (n=250), mean age: 59 years, post-menopausal 46%, race: Asian	Diagnosis: 2009-2019	Stage I 2.4%, II 64.8%, III 32.8%, ER+ 69.9%, PR+ 48.0%, HER2+ 39.2%, neoadjuvant chemotherapy and definitive surgery 100%	Measured from serum by enzyme-linked immunosorbent assay, before neoadjuvant therapy	Recurrence	≥19 vs <29 ng/ml	2.28 (1.12-5.03) P trend=0.023	Pathological complete response, tumor stage
Kanstrup[98] 2020, Denmark	Prospective cohort of cancer survivors (n=2981), mean age: 62 years, post-menopausal 74.9%	Diagnosis: 2008-2013, follow-up: median 4.69 years	Invasive cancer, grade I 21%, II 46.7%, III 26.1%, HER2-86%, HER2+ 13.7%	Measured from serum by isotope dilution liquid chromatograph-tandem mass spectrometry, before adjuvant therapy	Overall survival (n=427)	<52 vs <76-99 nmol/l	1.31 (0.98-1.74) P trend=0.01	Age, BMI, er status, her2 status, other factors, tumor grade, tumor size, tumor type
						≥99 vs <52 nmol/L	0.88 (0.67-1.15)	
					Event free survival (n=447)	<52 vs 76-99 nmol/l	1.63 (1.21-2.19) P trend=<0.01	
						≥99 vs <52 nmol/L	0.84 (0.63-1.12)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Lim[99] 2020, South Korea	Retrospective cohort of cancer survivors (n=455), mean age: 52 years, race: Asian	Diagnosis: 2004-2012, follow-up: median 103 months, until 2019	Stage I-III, HR+ 100%, adjuvant endocrine therapy	Measured from serum, after adjuvant therapy	Recurrence-free survival (n=48)	<=19.99 vs 20 ng/ml	2.28 (1.16-4.52) P trend=0.018	Age, histological grade, human epidermal growth factor receptor 2, ki-67 expression, lymphatic invasion, number of axillary invaded nodes, p53 mutation, surgery, tumor size, vascular invasion
						≥49.9 vs <49.9 nmol/L	0.44 (0.22-0.87)	
Huang[100] 2019, China	Prospective cohort of cancer survivors (n=206), mean age: 46 years, race: Asian	Diagnosis: 2009-2012, follow-up: maximum 5 years, until 2017		Measured from fasting serum by enzyme-linked immunosorbent assay, before surgery	All-cause mortality	<21.3 vs ≥21.3 ng/ml	1.65 (1.05-2.70) P trend=0.034	Lymph node metastasis, molecular phenotype, other factors, radiotherapy
						≥52.5 vs 52.5 nmol/L	0.61 (0.37-0.96)	
Robsahm[101] 2019, the Janus cohort, Norway	Population based-cohort study (n=270), mean age: 55 years	Diagnosis 1970s-2012		Measured from serum by competitive radioimmunoassay (DiaSorin, Stillwater, MN)	All-cause mortality (n=68)	51-67 vs ≤50 nmol/L	0.40 (0.19-0.81)	Age, season, serum storage time
						51-67 vs ≤50 nmol/L	0.44 (0.22-0.87)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
(Superseded by Tretli[102])						68-86 vs ≤50 nmol/L	0.32 (0.15-0.67)	
Thanasitthichai[103] 2019, Thailand	Retrospective cohort of cancer survivors (n=303), mean age: 50.8 years, race: Asian	Diagnosis: 2011-2012	Stage I-II 69.5%, III-IV 30.5%, ER+ 64.9%, ER- 35.1%, HER2+ 19.2%, HER2- 60.4%, equivocal 20.4%	Measured from serum by high-performance liquid chromatography, before and after adjuvant therapy	Overall survival, stratified by age	≥16 vs <16 ngl/ml	2.47 (1.08-5.64) P trend=0.031	Er status, her2 status, lymph node involvement
					Overall survival, stratified by BMI		2.70 (1.16-6.27) P trend=0.021	Age, er status, lymph node involvement
					Overall survival, stratified by stage		2.43 (1.15-5.14) P trend=0.02	
					Overall survival, stratified by HER2 status		2.50 (1.10-5.70) P trend=0.03	
					Overall survival, stratified by lymph node involvement		2.49 (1.09-5.70) P trend=0.03	Age, er status, her2 status
					Overall survival, stratified by PR status		2.56 (1.11-5.88) P trend=0.027	Age, er status, her2 status, lymph node involvement

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Overall survival, stratified by P53 status		2.52 (1.10-5.77) P trend=0.029	
					Overall survival, stratified by ER status		2.97 (1.40-6.29) P trend=0.005	Age, her2 status, lymph node involvement
					Overall survival, stratified by Ki-67 status		2.46 (1.05-5.77) P trend=0.038	Lymph node involvement, p53
Bouvard[104] 2018, France	Prospective cohort of cancer survivors (n=450), mean age: 60.7 years, post-menopausal	Diagnosis: 2004-2006, follow-up: median 5.2 years	Stage I 23.1%, II 50.2%, III 22.0%, unknown 4.7%, PR+ 81.8%, PR- 16.9%, unknown 1.3%, chemotherapy 55.8%, radiotherapy 93.1%	Measured from fasting serum by chemiluminescence protein-binding assay, before adjuvant therapy	All-cause mortality (n=67)	≥25 vs <25 nmol/l	1.85 (1.01-3.38) P trend=0.34	Age, bisphosphonate, nodal involvement, pr status, tumor size, vitamin d
					Cancer specific mortality (n=41)		2.01 (0.90-4.51) P trend=0.34	
					Recurrence (n=65)		1.37 (0.69-2.73) P trend=0.34	
Mizrak[105] 2018, Turkey	Prospective cohort of cancer survivors	Diagnosis: 2007-2013, follow-up:	T stage T1 33.5%, T2 57.8%, T3 8.7%,	Measured from serum, after	All-cause mortality (n=30)	Deficiency (<10ng/ml)	P log rank test=0.32	HER2 status, hormone receptor status,

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	(n=186), age range: 22-89 years, pre- and post-menopausal	median 64 months	N stage N0 45%, N1 31.3%, N2 13.4%, N3 10.3%, HER2+ 22%, surgery 100%	surgery and before adjuvant therapy	Recurrence (n= 35)	Insufficiency (10 to 25 ng/ml) Sufficiency (>25ng/ml)	P log rank test=0.38	nodal status, tumor grade, tumor stage
Kim 2018[106], South Korea	Retrospective cohort of cancer survivors (n=374), mean age: 48.7 years, pre- and post-menopausal, race: Asian	Diagnosis: 2010-2013, follow-up: mean 53.2 months	Stage I-IV, surgery 100%	Measured from serum by radioimmunoassay, before and after neoadjuvant therapy	All-cause mortality	Both deficient at baseline and after neo-adjuvant therapy, <20ng/ml Either sufficient at baseline or after neo-adjuvant therapy, ≥20ng/ml	P log rank test=0.95	
					Disease-free survival		P log rank test=0.58	
Viala[107] 2018, France and USA	Retrospective cohort of cancer survivors	Diagnosis: 2005-2015, follow-up:	Stage I-II 63%, III 27%, HER-/HER2+ 14.7%, HR+/HER2+	Measured from serum by electrogenerated chemiluminescence	Overall survival	≥20 vs <20 ng/ml	1.03 (0.60-1.80) P trend=0.9	Age, other factors, sbr grade of the

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
	(n=327), mean age: 50 years	median 5.3 years	13.8%, HER+/HER2- 43.9%, TNBC 27.6%, neoadjuvant chemotherapy 100%	immunoassay and multiplex flow immunoassay, before adjuvant therapy	Progression-free survival		1.00 (0.60-1.50) P trend=0.8	tumor, stage, tumor subtype
Yao[108] 2017, the Pathways study, USA	Case-cohort study (n=1666), pre- and post-menopausal, race: White, Black, Asian, Hispanic	Diagnosis: 2006-2013, follow-up: median 7 years, until 2014	Stage I 49.5%, II 36.4%, III 12.1%, IV 2.0%, ER+ 73.6%, HER2-enriched 6.8%, triple-negative 19.4%	Measured from serum by immunochemiluminometric assay, median 69 days post-diagnosis	All-cause mortality (n=250)	≥62.7 vs <41.8 nmol/l	0.72 (0.54-0.98) P trend=0.03	Age at diagnosis, race/ethnicity, BMI, season blood drawn, tumour stage, tumour grade, tumour subtype, treatment
					All-cause mortality, pre-menopausal (n=59)		0.45 (0.21-0.96) P trend=0.04	
					All-cause mortality, post-menopausal (n=191)		0.79 (0.56-1.2) P trend=0.19	
					Breast cancer-specific mortality (n=133)		0.85 (0.55-1.33) P trend=0.53	
					Breast cancer, pre-menopausal (n=42)		0.37 (0.15-0.93) P trend=0.03	
					Breast cancer specific mortality, post-menopausal (n=91)		1.27 (0.74-2.17) P trend=0.39	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Recurrence-free (n=200)		1.13 (0.82-1.58) P trend=0.47	
					Recurrence free survival, post-menopausal (n=130)		1.48 (0.97-2.27) P trend=0.05	
					Invasive disease-free survival (n=372)		0.85 (0.6-1.2) P trend=0.36	
					Invasive disease-free survival, pre-menopausal (n=100)		0.58 (0.34-1.01) P trend=0.04	
					Invasive disease-free survival, post-menopausal (n=271)		0.98 (0.73-1.3) P trend=0.89	
					Second primary cancers (n=96)		0.84 (0.51-1.39) P trend=0.49	
					Second primary cancers, pre-menopausal (n=18)		1.53 (0.46-5.05) P trend=0.82	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Second primary cancers, post-menopausal (n=78)		0.81 (0.46-1.41) P trend=0.40	
Wu[109] 2017, USA	Nested case-cohort study (n=243), age range: 28-80 years, pre- and post-menopausal, race: Black and Hispanic		Stage I-II 60.1%, III-IV 25.9%, ER+/PR+ 48.6%, ER-/PR- 40.7%, HER2+ 18.9%, HER2- 70.3%	Measured from serum by liquid chromatography/tandem mass spectrometry, before any treatment	All-cause mortality	<12 vs ≥24 ng/ml	1.9 (0.7–3.8) P trend=0.26	Age at time of diagnosis, ethnicity, tumour size, node stage, oestrogen receptor, progesterone receptor and HER2 receptor status, BMI and season of blood draw
					Disease-free survival		4.4 (0.9-22.7) P trend=0.28	
Lim[110] 2015, South Korea	Retrospective cohort of cancer survivors (n=469), mean age: 49.6 years, race: Asian	Diagnosis: 2000-2008, follow-up: median 85.8 months	Stage I 32.4%, II 50.3%, III 17.3%, PR+ 52%, PR- 48%. HER2+ 12.6%, HER2- 86.8%, chemotherapy 64.2%, radiotherapy 58.2%, hormone therapy 75.3%	Measured from serum by chemiluminescent microparticle immunoassay, after surgery	Overall survival	≥20 vs <20 ng/ml	0.46 (0.19-1.12)	Age, BMI, chemotherapy, er status, her2 status, lymphatic invasion, pr status, stage
					Cancer specific mortality		0.46 (0.17-1.30)	
					Disease-free survival		0.45 (0.25-0.82)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Lohmann[111] 2015, Canada	Correlative study nested in a randomized controlled trial (n=934), mean age: 47.8 years, pre- and post-menopausal	Diagnosis: 2000-2005, follow-up: 9.2 years (OS) and 8.0 years (RFS), until 2013 (OS) and 2012 (RFS)	T stage T1 36%, T2-4 64%, ER- 39%, ER+ 61%, partial mastectomy 48%, total mastectomy 52%	Measured from fasting serum by radioimmunoassay, post-surgery and before chemotherapy	All-cause mortality	≥125 vs <40 nmol/l	0.5 (0.14-1.77)	Treatment, number of positive lymph nodes, type of surgery, oestrogen receptor status, age, race, tumour size, nodal status, menopausal status, HER2 status, ECOG performance
					Breast cancer mortality		0.65 (0.18-2.37)	
					Relapse-free survival		0.65 (0.21-2.00)	
Vrieling[112] 2014, MARIE, Germany	Prospective cohort of cancer survivors (n=2177), age range: 50-74 years, post-menopausal	Follow-up: 5.3 years	Stage I-IIA 86.9%, IIIB-IV 7.9%, ER+ 78.3%, ER- 19.6%, PR+ 66.1%, PR- 31.8%, ER+/PR+ 60.6%, ER-/PR- 15.0%, HER2+ 18.5%, HER2- 70.0%, chemotherapy 45%, radiotherapy 79.9%, tamoxifen/arom	Measured from serum by enzyme immunoassay, majority before therapy, median 116 days post diagnosis	All-cause mortality (n=274)	<35 vs ≥55 nmol/l	0.8 (0.57-1.14)	Age at diagnosis, study centre, season, tumour size, nodal status, metastasis, tumour grade, ER/PR status, diabetes, cardiovascular disease, mode of detection, smoking, hormone replacement therapy (HRT)
						≥55 vs 35 nmol/l	0.73 (0.53-1.00)	
					All-cause mortality (n=274)	Per 10 nmol/l decrement	1.07 (1.00-1.13)	
						Per 10 nmol/l increment	0.93 (0.88-1.00)	
					Breast cancer-specific mortality (n=197)	<35 vs ≥55 nmol/l	0.75 (0.5-1.15)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
			atase inhibitor 80.6%			≥55 vs 35 nmol/l	0.79 (0.54-1.16)	use at diagnosis
					Breast cancer-related death (n=197)	Per 10 nmol/l decrement	1.04 (0.97-1.12)	
						Per 10 nmol/l increment	0.96 (0.89-1.03)	
					Recurrence (n=201)	<35 vs ≥55 nmol/l	1.35 (0.92-1.97)	
						≥55 vs 35 nmol/l	0.70 (0.48-1.03)	
					Recurrence (n=201)	Per 10 nmol/l decrement	1.07 (0.99-1.14)	
					Distant disease free (n=235)	<35 vs ≥55 nmol/l	1.17 (0.81-1.68)	
						≥55 vs 35 nmol/l	0.59 (0.40-0.81)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Distant disease free (n=235)	Per 10 nmol/l decrement	1.12 (1.04-1.19)	
					Non-breast cancer related death (n=77)	<34.9 vs ≥55 nmol/L	0.9 (0.46-1.74)	
					Non-breast cancer related death (n=77)	Per 10 nmol/l decrement	1.15 (1.02-1.28)	
Villaseñor[113] 2013, HEAL, USA	Prospective cohort of cancer survivors (n=585), mean age: 55.8 years, pre- and post-menopausal	Median follow-up: median 9.2 years	ER+ and/or PR+ 71.5%, ER-/PR- 19.3%, unknown 9.2%, surgery only 23.4%, surgery and radiation 36.9%, surgery and chemotherapy 12.5%, surgery, chemotherapy, and radiation 27.2%, tamoxifen 52.1%	Measured from fasting serum by radioimmunosorbent assay, after treatment, 36 months post diagnosis	All-cause mortality (n=110)	>30 vs <20 ng/ml	0.9 (0.5-1.61)	Age at diagnosis, tumour stage, BMI, race/ethnicity, study site, tamoxifen use, season blood drawn, treatment
						Per 10 ng/ml	0.85 (0.68-1.09)	
					Breast cancer-specific mortality (n=48)	>30 vs <20 ng/ml	1.21 (0.52-2.8)	Age at diagnosis, tumour stage, BMI, race/ethnicity, study site, tamoxifen use, season blood drawn,
						Per 10 ng/ml	1.08 (0.75-1.54)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
								treatment, physical activity, smoking status
Tretli[102] 2012, the Janus cohort, Norway	Population based-cohort study (n=251), age range: 36-75 years, race: White	Diagnosis: 1984-2004, follow-up: until 2008	Local 26.7%, regional 29.5%, distant 9.6%, unknown 34.3%	Measured from serum by competitive radioimmunoassay, within 90 days of cancer diagnosis	All-cause mortality (n=98)	≥81 vs <46 nmol/l	0.37 (0.21-0.67) P trend<0.01	Sex, age at diagnosis, season blood drawn
					Breast cancer-specific mortality (n=82)	≥81 vs <46 nmol/l	0.42 (0.21-0.82) P trend=0.01	
Hatse[114] 2012, Belgium	Prospective cohort of cancer survivors (n=1800), mean age 57.7 years	Diagnosis: 2003-2010, follow-up: median 4.7 years	Non-metastatic, invasive	Measured from serum by radioimmunoassay (DiaSorin), before treatment	All-cause mortality (n=134)	Per 10 ng/ml	0.79 (0.65–0.95) P trend=0.0104	Age, BMI, lymph nodes, tumour size, ER, grade
						≥30 vs <30 ng/ml	0.53 (0.33–0.86) P trend=0.01	
					Breast cancer specific mortality (n=64)	Per 10 ng/ml	0.79 (0.62-1.00) P trend=0.05	Age, BMI, tumour size, pN, grade, and ER
						≥30 vs <30 ng/ml	0.49 (0.27–0.89) P trend=0.02	
					Post-menopausal	≥30 vs <30 ng/ml	0.15 (0.03–0.63) P trend=0.01	
					Pre-menopausal	≥30 vs <30 ng/ml	0.93 (0.43–2.02) P trend=0.85	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
Kim[115] 2011, South Korea	Retrospective cohort of cancer survivors (n=310), mean age: 48.7 years, race: Asian	Diagnosis: 2006, follow-up: median 23 months	T stage T0-T3	Measured from serum by radioimmunoassay, before surgery	Disease-free survival	<20 vs 30-150 ng/ml	3.97 (1.77-8.91) P trend=0.001	Age, er status, lymph node status, tumor size
						74.9-374.4 vs <49.9 nmol/L	0.25 (0.11-0.56)	
Pritchard[116] 2011, Canada and USA	Randomized control trial (n=667), mean age: 60.1 years, post-menopausal, race: mostly White	Follow-up: median 7.9 years	T stage T1 58%, T2 38%, T3A 2%, T4 1%, mastectomy 100%, adjuvant chemotherapy 34%	Measured from serum, before therapy	Event free survival (n=220)	Continuous baseline 25-OH vitamin D	P = 0.43	
Vrieling[117] 2011, Germany	Prospective cohort of cancer survivors (n=1295), mean age 63.4 years, postmenopausal	Diagnosis: 2002-2005, follow-up: 5.8 years, until 2009	Stage I-IV, invasive, in situ, ER+ 76.6%, ER- 23.4%	Measured from serum by OCTEIA enzyme immunoassay, 83 days after diagnosis	All-cause mortality (n=174) (superseded by Vrieling 2014)	<34.9 vs ≥55 nmol/l	1.55 (1.00-2.39)	Age at diagnosis, season blood drawn, tumour size, nodal status, metastasis, tumour grade, hormone receptor status, diabetes, mode of detection
					All-cause mortality (n=174) (superseded by Vrieling 2014)	Per 10 mmol/l	1.08 (1.00-1.17)	

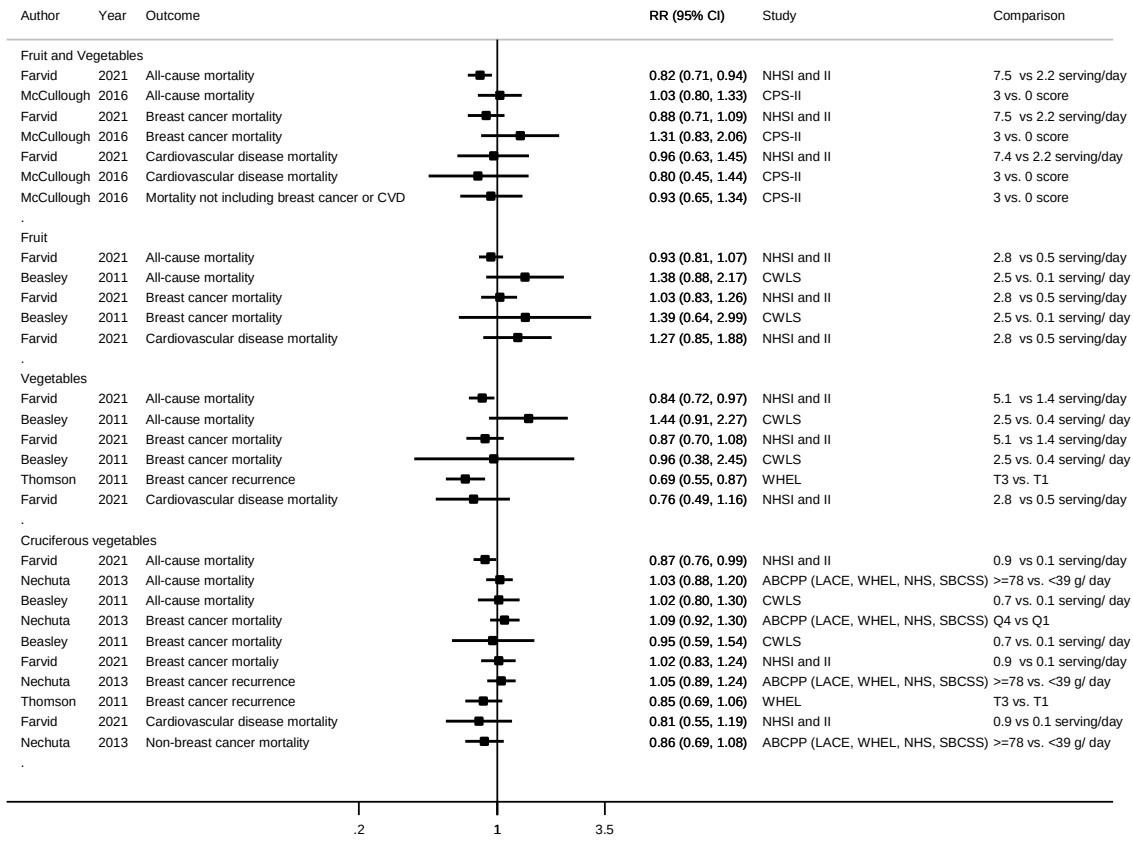
Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Distant disease free (n=135)	<35 vs ≥55 nmol/l	2.09 (1.29-3.41)	
						≥55 vs 35 nmol/l	0.48 (0.29-0.78)	
					Distant disease free (n=135)	Per 10 mmol/l	1.14 (1.05-1.24)	
Jacobs[93] 2011, WHEL, USA	Matched case-control study (n=1024), mean age: 51.6 years, pre- and post-menopausal, race: mostly White	Diagnosis: 1991-2000, follow-up: mean 7.3 years	Stage I 21.1%, II 48.0%, IIIA 41.7%, ER+ 71.5%, ER- 27.3%, chemotherapy 80.5%, radiation 62.9%, hormone therapy 59.7%	Measured from serum by chemiluminescent immunoassay, 2 years after diagnosis	All-cause mortality (n=250)	<20 vs ≥20 ng/ml	1.13 (0.72-1.79) P value=0.59	BMI, ethnicity, intervention group, calcium intake, tumour grade
						≥49.9 vs <49.9 nmol/l	0.88 (0.56-1.39)	
					Local recurrence (n=62)	<20 vs ≥20 ng/ml	1.48 (0.47-4.65) P value=0.50	
						≥49.9 vs <49.9 nmol/l	0.68 (0.22-2.13)	
					Regional recurrence (n=19)	<20 vs ≥20 ng/ml	1.13 (0.20-6.44) P value=0.89	
						≥49.9 vs <49.9 nmol/l	1.13 (0.20-6.44)	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
					Distant recurrence (n=346)	<20 vs ≥20 ng/ml	1.00 (0.68-1.48) P value=0.99	
						≥49.9 vs <49.9 nmol/l	1.00 (0.68-1.47)	
					Recurrence, all cases and controls, pre-menopausal (n=512)	<10 vs ≥30 ng/ml	1.14 (0.57-2.31) P trend=0.85	
					Recurrence-free, pre-menopausal (n=59)		0.17 (0.01-3.07) P trend=0.61	
					Recurrence-free, post-menopausal (n=346)		1.45 (0.62-3.37) P trend=0.49	
Goodwin[118] 2009, Canada	Prospective cohort of cancer survivors (n=512), mean age: 50.4 years, pre- and post-menopausal	Diagnosis: 1989-1996, follow-up: mean 11.6 years	Stage I 56.2%, II 32.0%, III 4.7%, unknown 7.0%, ER+ 77.7%, ER- 22.3%, mastectomy 22.7%, lumpectomy 77.3%, adjuvant chemotherapy	Measured from fasting serum by radioimmunoassay, before adjuvant therapy	All-cause mortality (n=106)	<50 vs ≥72 nmol/l	1.6 (0.96-2.64) P trend=0.05	Age, tumour stage, nodal status, oestrogen receptor level, tumour grade
						≥72 vs <50 nmol/l	0.63 (0.38-1.04)	
					Distant disease free (n=116)	<50 vs ≥72 nmol/l	1.71 (1.02-2.86) P trend=0.09	

Author, year, study name, country, WCRF Code	Study description	Time of diagnosis and follow-up	Disease characteristics treatment	Exposure assessment	Outcome (Events)	Contrast	RR (95% CI)	Covariates
			38.9% adjuvant tamoxifen therapy 39.1%			≥72 vs <50 nmol/l	0.58 (0.35-0.98)	

HEAL, Health, Eating, Activity, and Lifestyle Study; MARIE, Mammary carcinoma risk factor Investigation; NCIC CTG, National Cancer Institute of Canada Clinical Trials Group; WHEL; Women's Healthy Eating and Living

Supplementary Figure S1. Forest plot of prognostic outcomes for the highest compared with the lowest level of fruit and vegetable intake after breast cancer diagnosis



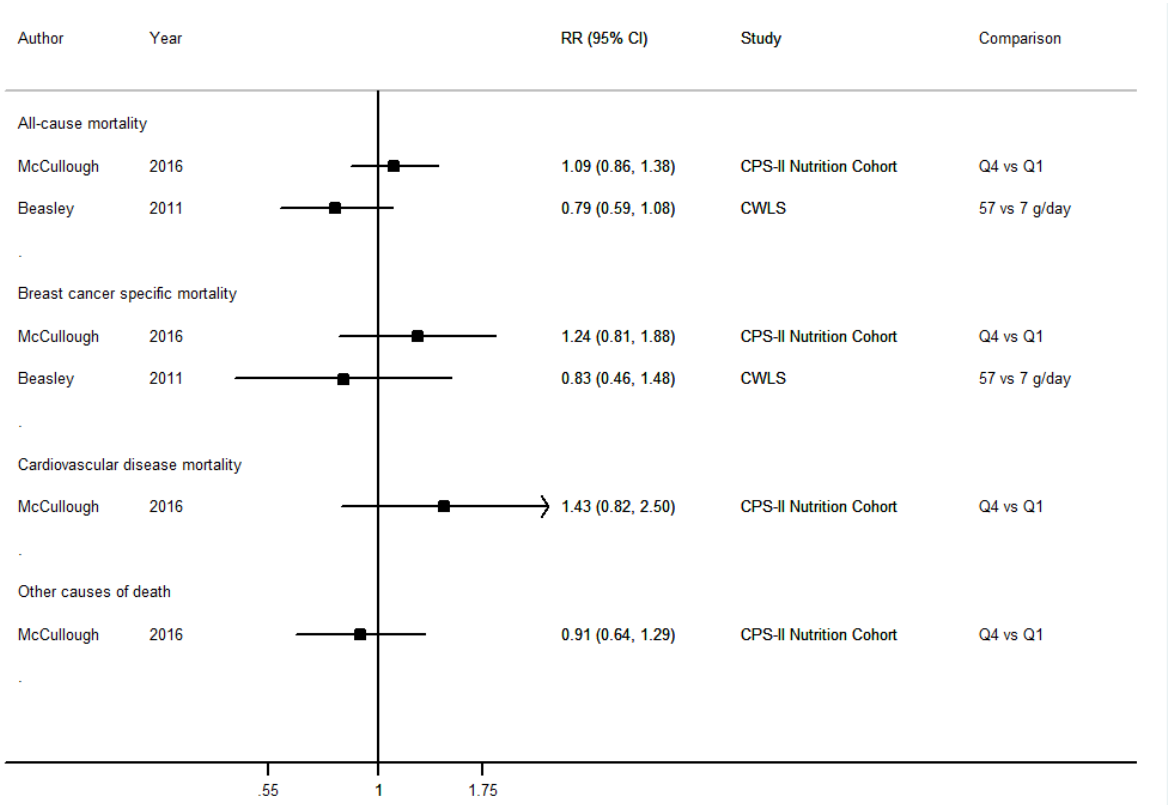
Note: Three additional studies were not included. The National Runners' and Walkers' Health Surveys reported result on breast cancer mortality in relation to each increase of a piece of fruit (HR 1.10, 95% CI 0.86-1.35, P value=0.40) (Wiliams, 2014). The MSKCC study only reported the risk estimates (HR 0.31 for breast cancer specific mortality and 0.46 for breast cancer recurrence on post-menopausal women) without 95%CI confidence interval (Hebert 1998). The WHEL study comparison group did not report the results from the multivariate analysis for all-cause mortality and fruit and vegetable intake (HR 6.94-19.96 vs. 0.33-3.43 servings/day = 0.63; P trend = 0.08 for univariate analysis) (Pierce, 2007(b)).

For cruciferous vegetables, there is some overlapping between Farvid 2021(a) and Nechuta 2013 regarding NHSI. However, Farvid 2021 also includes NHS II that is not used in the ABCPP.

The figure should not be interpreted as a quantitative summary.

Abbreviations: ABPCC, After Breast Cancer Pooling Project; CPS-II, Cancer Prevention Study II Nutrition Cohort; CVD, Cardiovascular Disease; CWLS, Collaborative Women's Longevity Study; NHS, Nurses' Health Study; Q, quantile; RR, Relative Risk

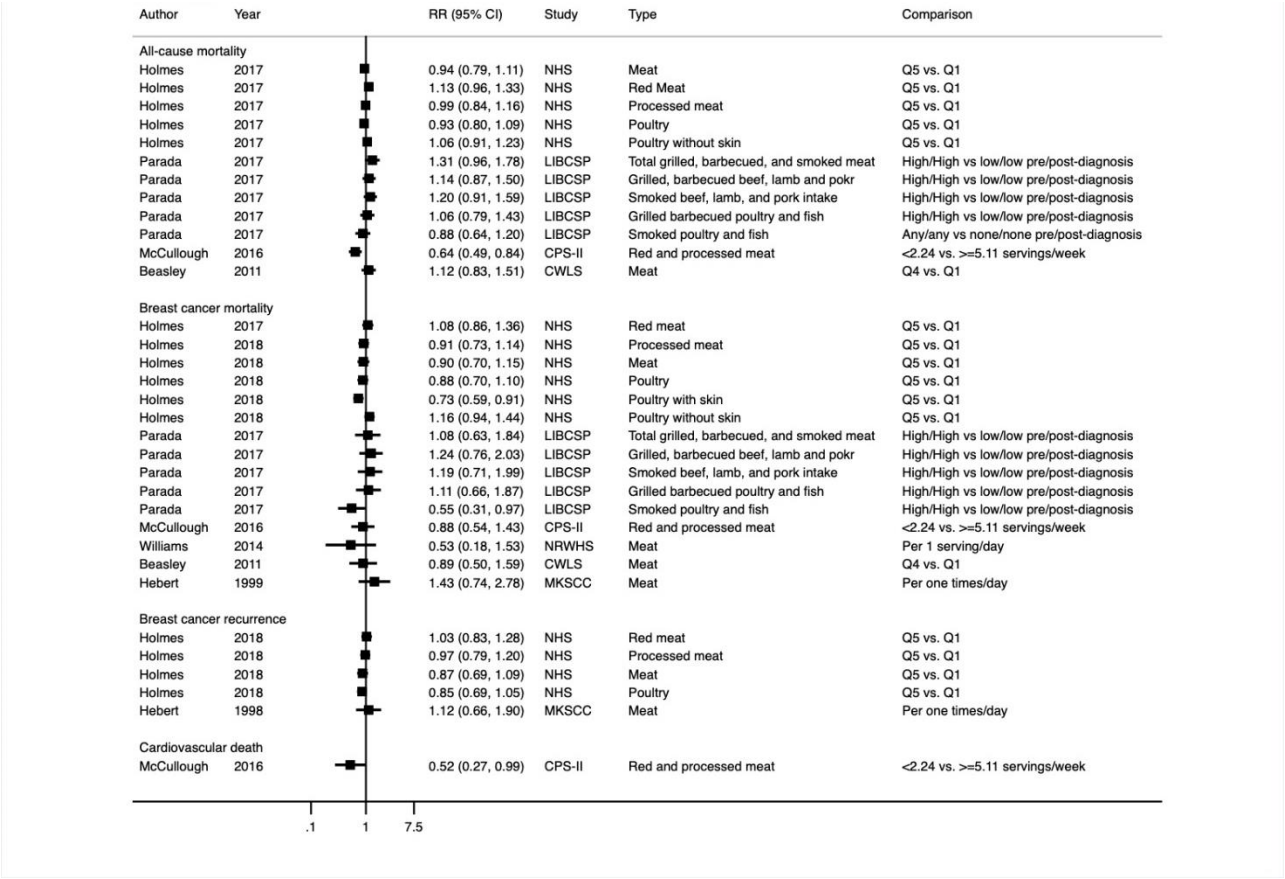
Supplementary Figure S2. Forest plot of prognostic outcomes for the highest compared with the lowest level of wholegrains intake after breast cancer diagnosis



Note: One additional study was not included. The Diet Cancer and Health study reported result on all-cause mortality (HR 0.99, 95% CI 0.88-1.12), breast cancer mortality (HR 1.05, 95% CI 0.92-1.21) and recurrence (HR 0.98, 95% CI 0.83-1.13) in relation to each increase 50g/day of wholegrains (Andersen, 2020). The figure should not be interpreted as a quantitative summary.

CPS-II, Cancer Prevention Study II Nutrition Cohort; CWLS, Collaborative Women's Longevity Study.

Supplementary Figure S3. Forest plot of prognostic outcomes for the highest compared with the lowest level of meat intake after breast cancer diagnosis

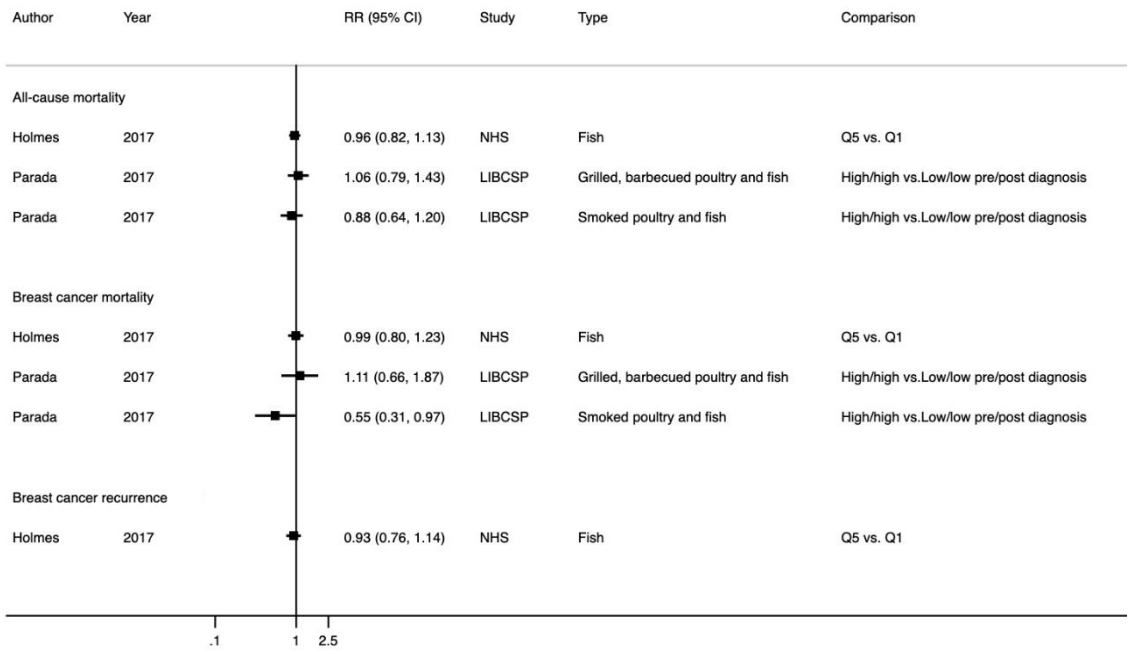


Author	Year	RR (95% CI)	Study	Type	Comparison
All-cause mortality					
Holmes	2017	0.94 (0.79, 1.11)	NHS	Meat	Q5 vs. Q1
Holmes	2017	1.13 (0.96, 1.33)	NHS	Red Meat	Q5 vs. Q1
Holmes	2017	0.99 (0.84, 1.16)	NHS	Processed meat	Q5 vs. Q1
Holmes	2017	0.93 (0.80, 1.09)	NHS	Poultry	Q5 vs. Q1
Holmes	2017	1.06 (0.91, 1.23)	NHS	Poultry without skin	Q5 vs. Q1
Parada	2017	1.31 (0.96, 1.78)	LIBCSP	Total grilled, barbecued, and smoked meat	High/High vs low/low pre/post-diagnosis
Parada	2017	1.14 (0.87, 1.50)	LIBCSP	Grilled, barbecued beef, lamb and pokr	High/High vs low/low pre/post-diagnosis
Parada	2017	1.20 (0.91, 1.59)	LIBCSP	Smoked beef, lamb, and pork intake	High/High vs low/low pre/post-diagnosis
Parada	2017	1.06 (0.79, 1.43)	LIBCSP	Grilled barbecued poultry and fish	High/High vs low/low pre/post-diagnosis
Parada	2017	0.88 (0.64, 1.20)	LIBCSP	Smoked poultry and fish	Any/any vs none/none pre/post-diagnosis
McCullough	2016	0.64 (0.49, 0.84)	CPS-II	Red and processed meat	<2.24 vs. >=5.11 servings/week
Beasley	2011	1.12 (0.83, 1.51)	CWLS	Meat	Q4 vs. Q1
Breast cancer mortality					
Holmes	2017	1.08 (0.86, 1.36)	NHS	Red meat	Q5 vs. Q1
Holmes	2018	0.91 (0.73, 1.14)	NHS	Processed meat	Q5 vs. Q1
Holmes	2018	0.90 (0.70, 1.15)	NHS	Meat	Q5 vs. Q1
Holmes	2018	0.88 (0.70, 1.10)	NHS	Poultry	Q5 vs. Q1
Holmes	2018	0.73 (0.59, 0.91)	NHS	Poultry with skin	Q5 vs. Q1
Holmes	2018	1.16 (0.94, 1.44)	NHS	Poultry without skin	Q5 vs. Q1
Parada	2017	1.08 (0.63, 1.84)	LIBCSP	Total grilled, barbecued, and smoked meat	High/High vs low/low pre/post-diagnosis
Parada	2017	1.24 (0.76, 2.03)	LIBCSP	Grilled, barbecued beef, lamb and pokr	High/High vs low/low pre/post-diagnosis
Parada	2017	1.19 (0.71, 1.99)	LIBCSP	Smoked beef, lamb, and pork intake	High/High vs low/low pre/post-diagnosis
Parada	2017	1.11 (0.66, 1.87)	LIBCSP	Grilled barbecued poultry and fish	High/High vs low/low pre/post-diagnosis
Parada	2017	0.55 (0.31, 0.97)	LIBCSP	Smoked poultry and fish	High/High vs low/low pre/post-diagnosis
McCullough	2016	0.88 (0.54, 1.43)	CPS-II	Red and processed meat	<2.24 vs. >=5.11 servings/week
Williams	2014	0.53 (0.18, 1.53)	NRWHS	Meat	Per 1 serving/day
Beasley	2011	0.89 (0.50, 1.59)	CWLS	Meat	Q4 vs. Q1
Hebert	1999	1.43 (0.74, 2.78)	MKSCC	Meat	Per one times/day
Breast cancer recurrence					
Holmes	2018	1.03 (0.83, 1.28)	NHS	Red meat	Q5 vs. Q1
Holmes	2018	0.97 (0.79, 1.20)	NHS	Processed meat	Q5 vs. Q1
Holmes	2018	0.87 (0.69, 1.09)	NHS	Meat	Q5 vs. Q1
Holmes	2018	0.85 (0.69, 1.05)	NHS	Poultry	Q5 vs. Q1
Hebert	1998	1.12 (0.66, 1.90)	MKSCC	Meat	Per one times/day
Cardiovascular death					
McCullough	2016	0.52 (0.27, 0.99)	CPS-II	Red and processed meat	<2.24 vs. >=5.11 servings/week

Note: The same study may be represented more than once if different types of meat were investigated. The figure should not be interpreted as a quantitative summary.

CPS-II, Cancer Prevention Study II Nutrition Cohort; CWLS, Collaborative Women's Longevity Study; LIBCSP, Long Island Breast Cancer Study Project; MKSCC, Memorial Sloan-Kettering Cancer Centre; NHS, Nurses' Health Study

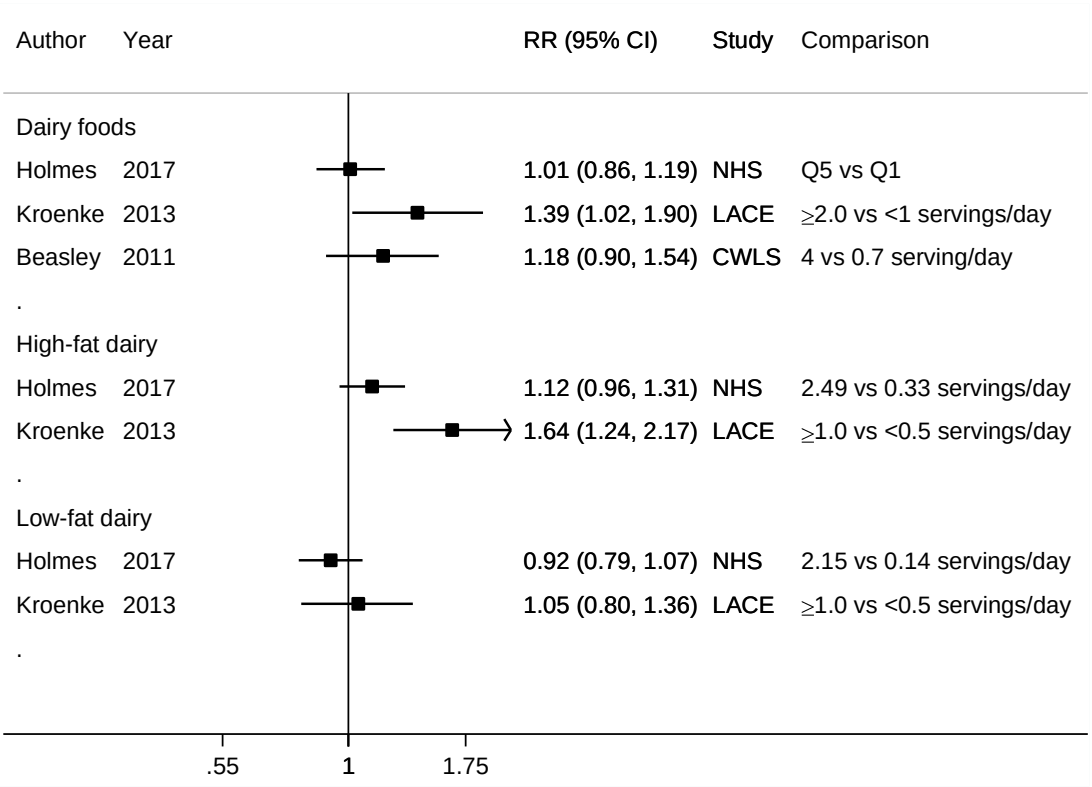
Supplementary Figure S4. Forest plot of prognostic outcomes for the highest compared with the lowest level of fish intake after breast cancer diagnosis



Note: The same study may be represented more than once if different types of fish were investigated. The figure should not be interpreted as a quantitative summary.

LIBCSP, Long Island Breast Cancer Study Project; MKSCC, Memorial Sloan-Kettering Cancer Centre; NHS, Nurses' Health Study

Supplementary Figure S5. Forest plot of all-cause mortality for the highest compared with the lowest level of dairy intake after breast cancer diagnosis

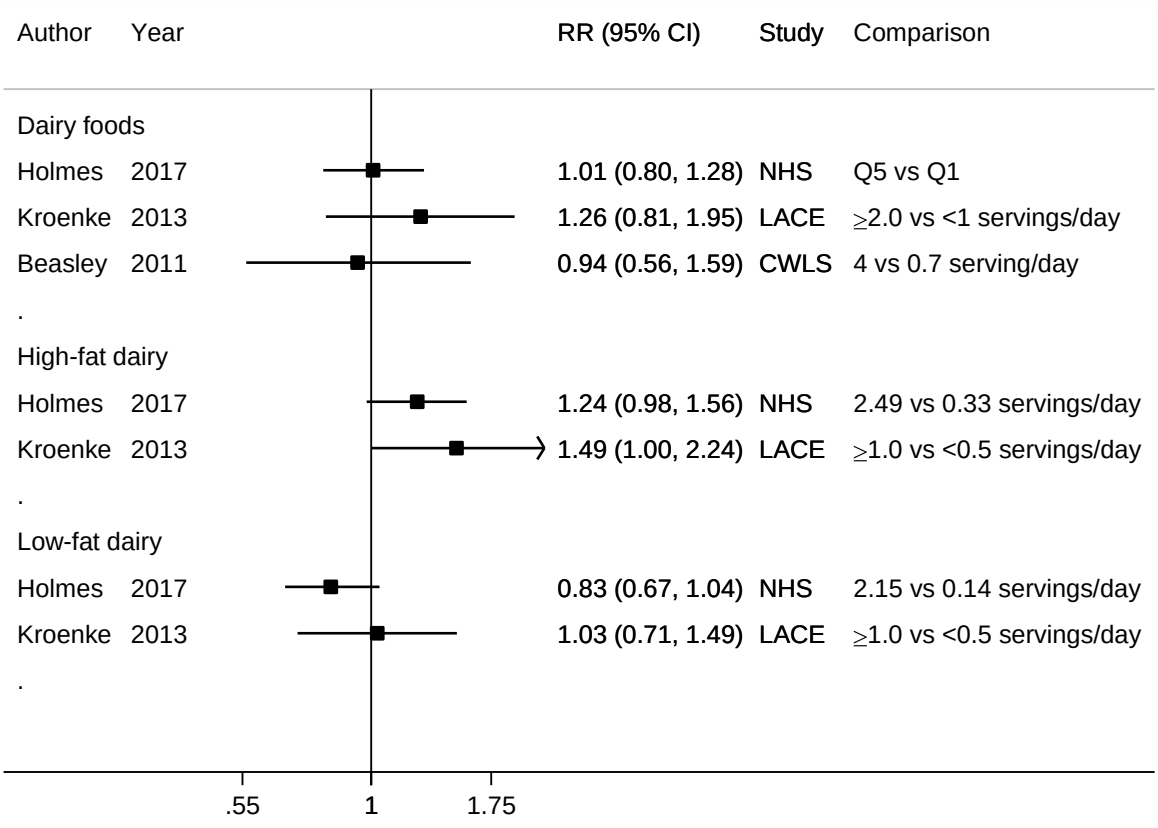


Note: The figure should not be interpreted as a quantitative summary.

One publication (Andersen, 2020) was not included in the forest plot because the point estimate was reported in continuous per each 200g/day increase (HR 1.03, 95% CI 0.96-1.08).

CWLS, Collaborative Women's Longevity Study; LACE, Life After Cancer Epidemiology Study; NHS, Nurses' Health Study; Q, quantile; RR, Relative Risk

Supplementary Figure S6. Forest plot of breast cancer mortality for the highest compared with the lowest level of dairy intake after breast cancer diagnosis

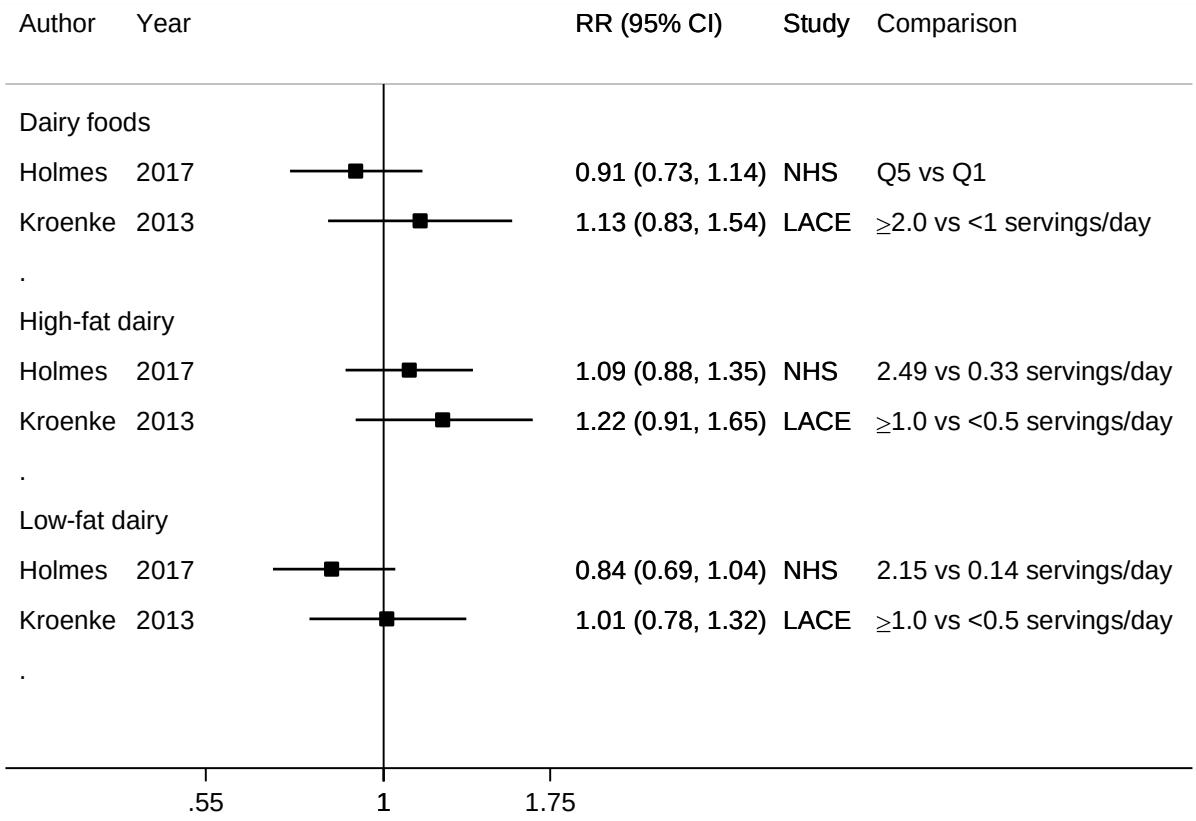


Note: The figure should not be interpreted as a quantitative summary.

One publication (Andersen, 2020) was not included in the forest plot because the point estimate was reported in continuous per each 200g/day increase (HR 0.98, 95% CI 0.91-1.06).

CWLS, Collaborative Women's Longevity Study; LACE, Life After Cancer Epidemiology Study; NHS, Nurses' Health Study; Q, quantile; RR, Relative Risk

Supplementary Figure S7. Forest plot of breast cancer recurrence for the highest compared with the lowest level of dairy intake after breast cancer diagnosis

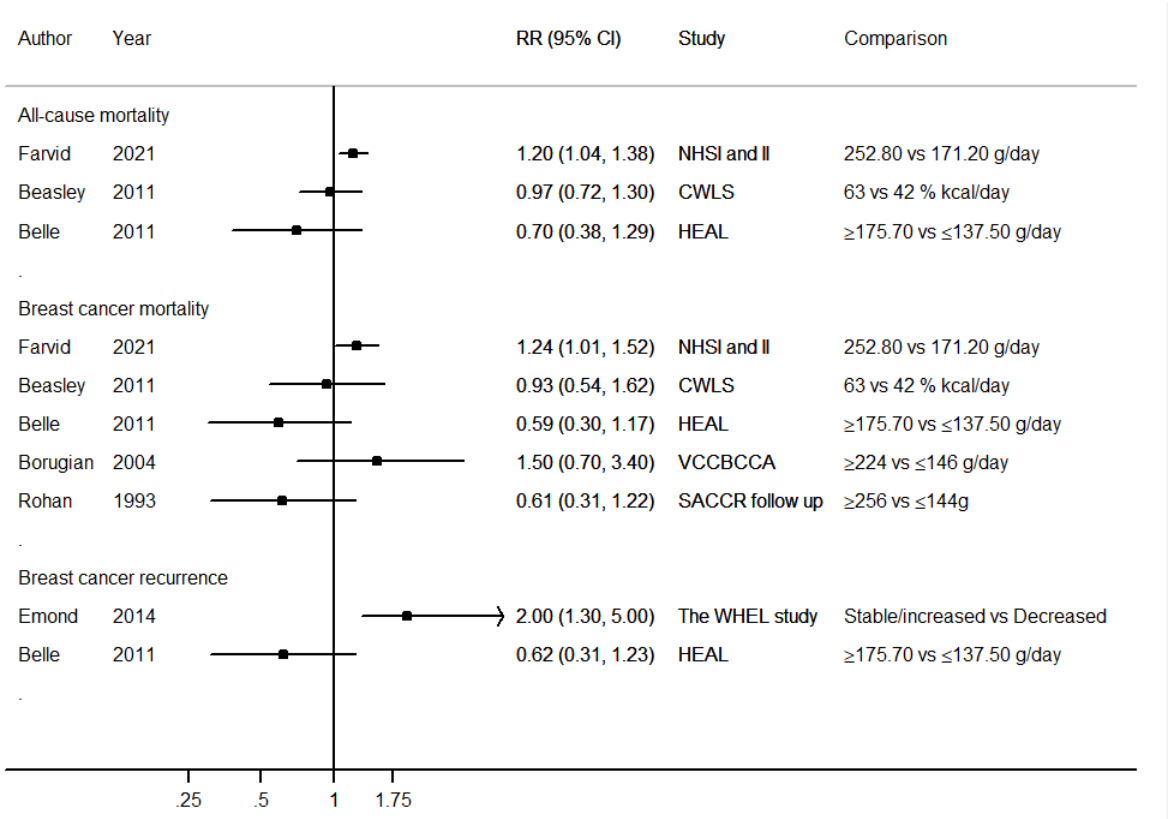


Note: The figure should not be interpreted as a quantitative summary.
*Holmes 2017 exclusively included distant breast cancer recurrences.

One publication (Andersen, 2020) was not included in the forest plot because the point estimate was reported in continuous per each 200g/day increase (HR 0.98, 95% CI 0.91-1.06).

LACE, Life After Cancer Epidemiology Study; NHS, Nurses' Health Study; Q, quantile; RR, Relative Risk

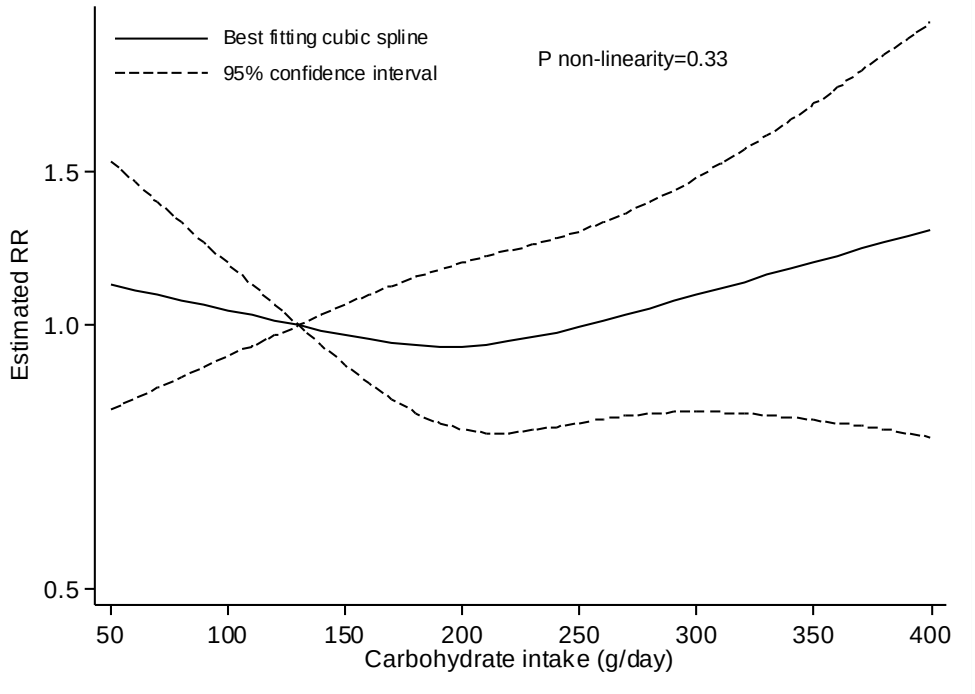
Supplementary Figure S8. Forest plot of breast cancer prognosis for the highest compared with the lowest level of carbohydrate intake after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.

CWLS, Collaborative Women's Longevity Study; HEAL, Health, Eating, Activity, and Lifestyle Study; NHS, Nurses' Health Study; Q, quantile; RR, Relative Risk; SACCR, South Australian Central Cancer Registry; WHEL, Women's Healthy Eating and Living Study

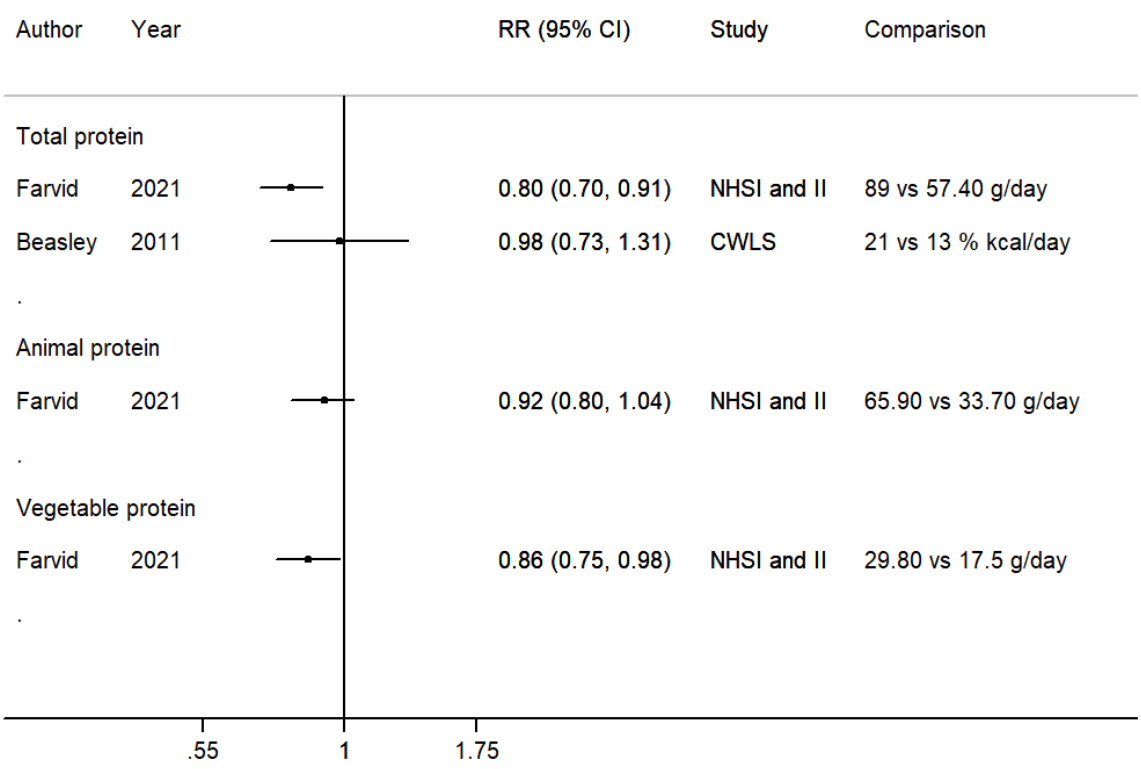
Supplementary Figure S9. Nonlinear dose-response meta-analysis of post-diagnosis carbohydrate intake and breast cancer-specific mortality



Carbohydrates (g/day)	RR estimates (95% CI)
50	1.11 (0.80, 1.54)
100	1.04 (0.92, 1.18)
130	1 (Reference)
150	0.97 (0.90, 1.06)
200	0.95 (0.76, 1.18)
250	0.99 (0.77, 1.28)
300	1.08 (0.78, 1.79)
350	1.18 (0.78, 1.79)

Non-linear curve was estimated using restricted cubic spline regression with three knots at 10th, 50th and 90th percentiles of distribution of the exposure and pooled in random-effects meta-analysis. Carbohydrate intake at 130 g/day was chosen as reference. The table shows selected carbohydrate intake values and their corresponding RR (95% CI) estimated in the non-linear dose-response meta-analysis

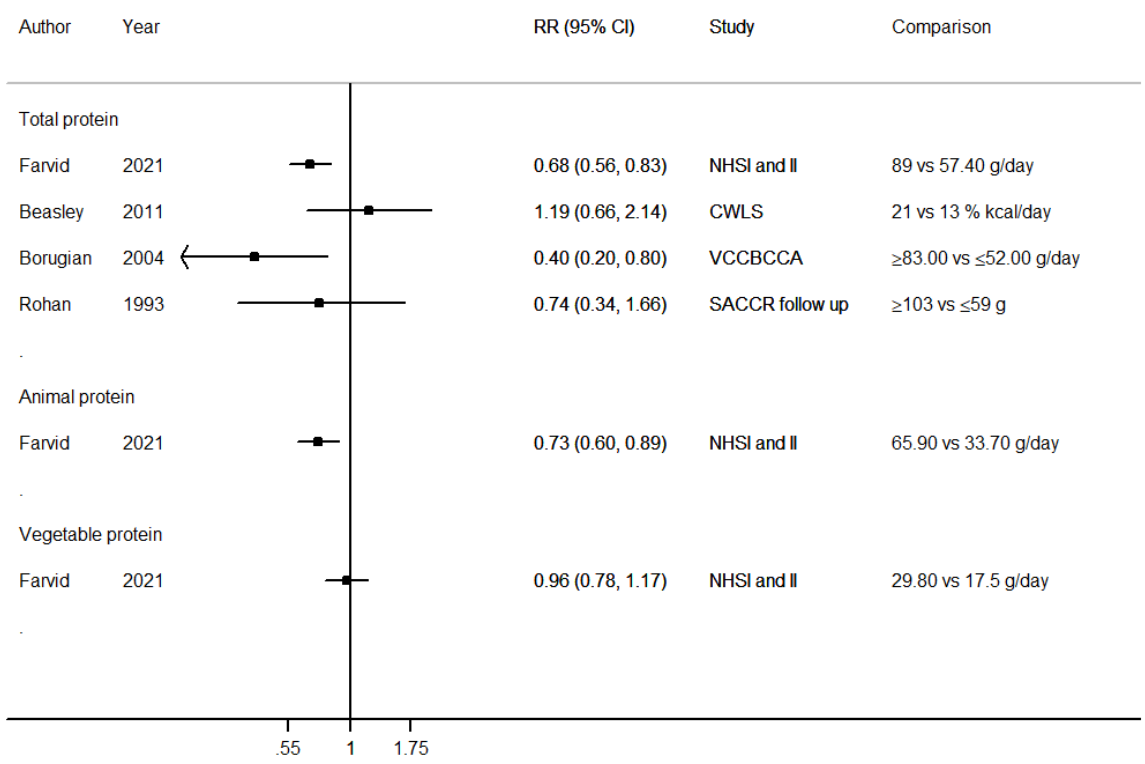
Supplementary Figure S10. Forest plot of all-cause mortality for the highest compared with the lowest level of protein intake after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.

CWLS, Collaborative Women's Longevity Study; NHS, Nurses' Health Study, RR, Relative Risk

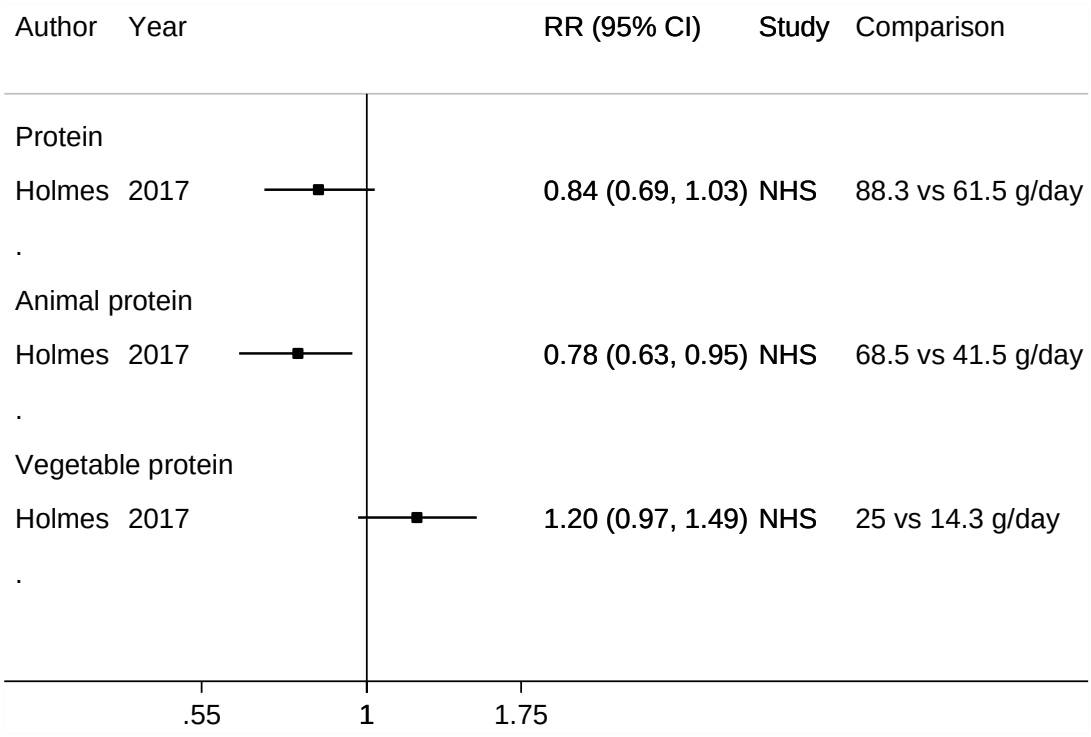
Supplementary Figure S11. Forest plot of breast cancer mortality for the highest compared with the lowest level of protein intake after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.

CWLS, Collaborative Women's Longevity Study; HEAL, Health, Eating, Activity, and Lifestyle Study; NHS, Nurses' Health Study; Q, quantile; SACCR, South Australian Central Cancer Registry; RR, Relative risk

Supplementary Figure S12. Forest plot of distant breast cancer recurrence for the highest compared with the lowest level of protein intake after breast cancer diagnosis

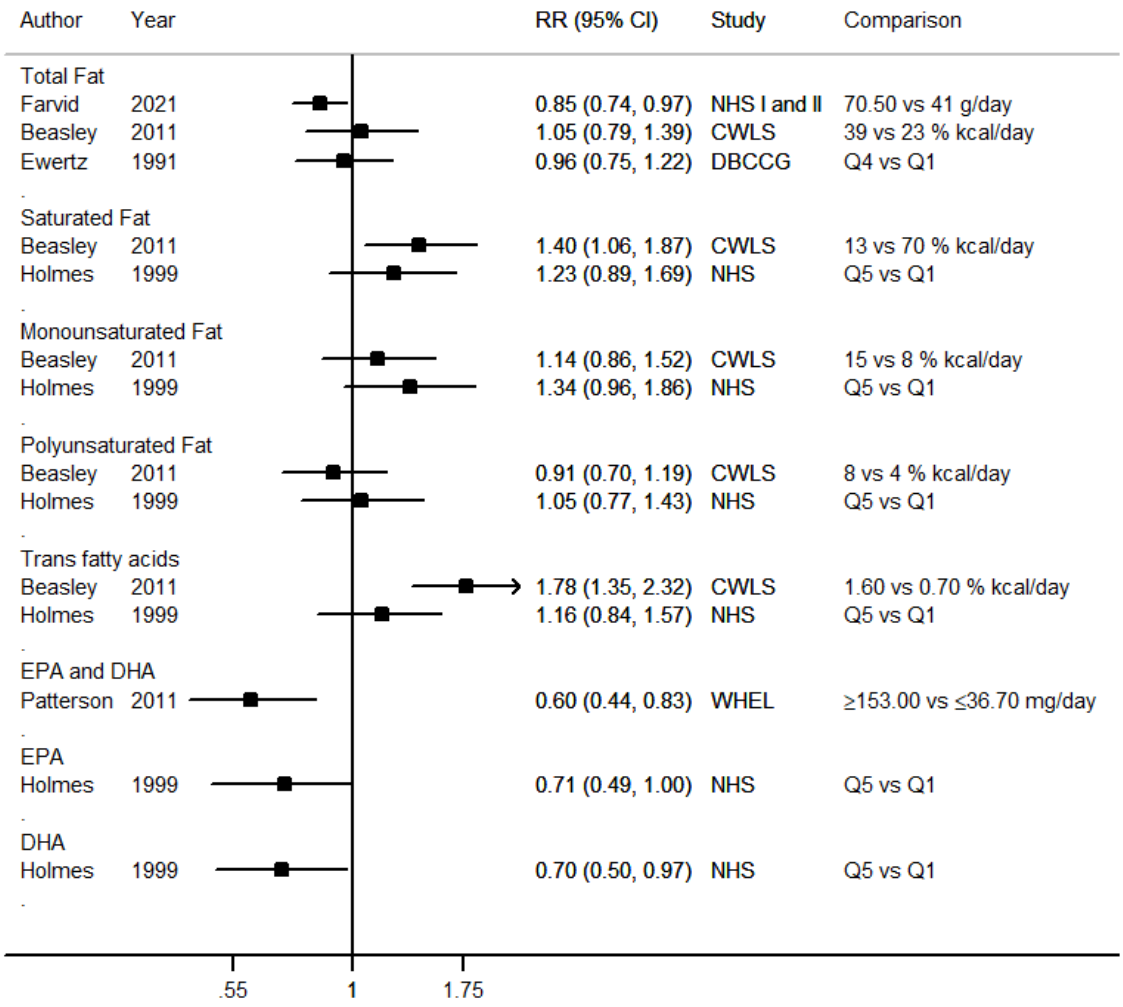


Note:

The figure should not be interpreted as a quantitative summary.

NHS, Nurses' Health Study; RR, Relative risk

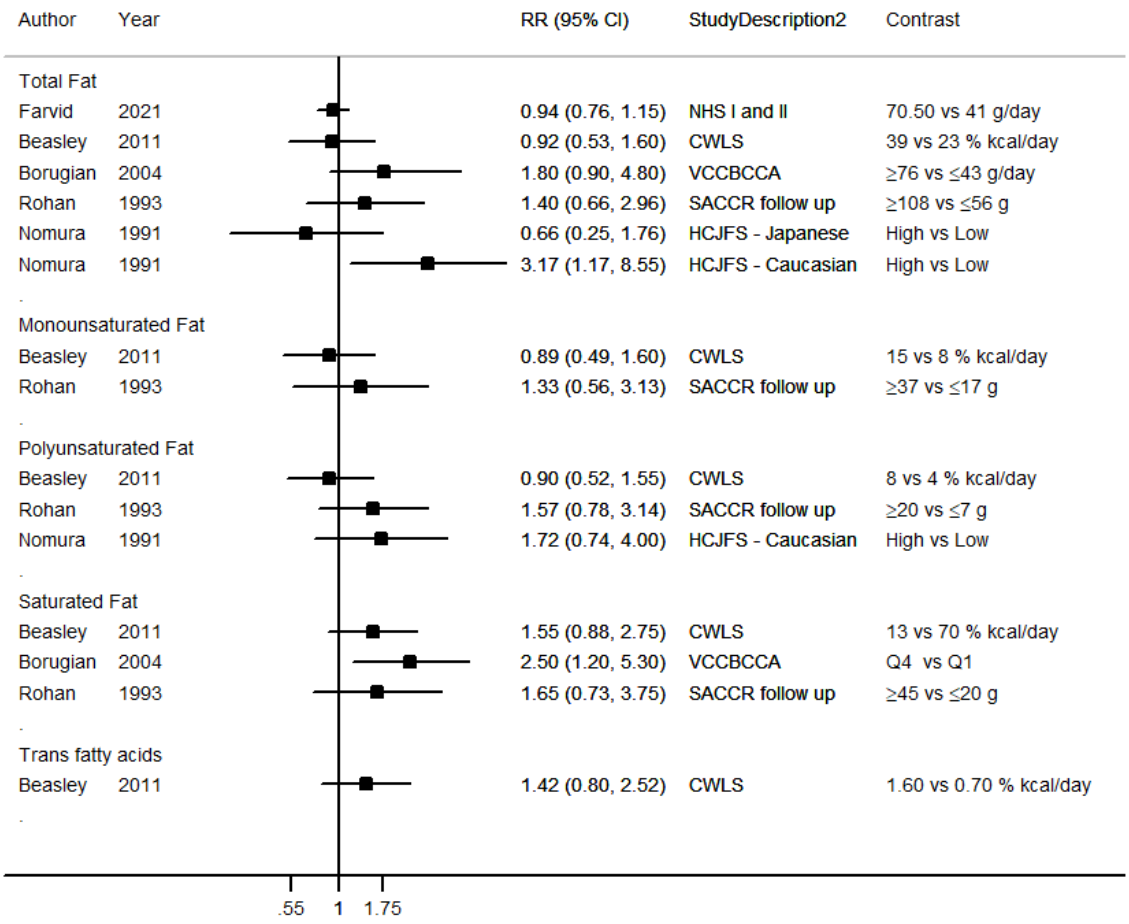
Supplementary Figure S13. Forest plot of all-cause mortality for the highest compared with the lowest level of fat intake after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.

CWLS, Collaborative Women's Longevity Study; DBCCG, Danish Breast Cancer Cooperative Group; NHS, Nurses' Health Study; RR, Relative Risk; WHEL, Women's Healthy Eating and Living Study

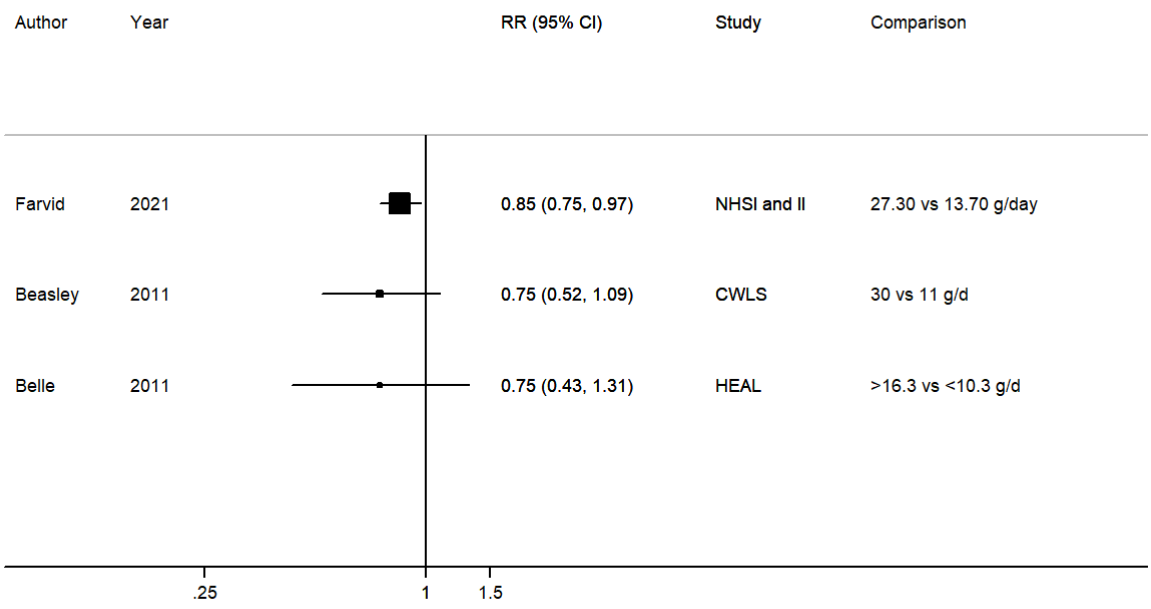
Supplementary Figure S14. Forest plot of breast cancer mortality for the highest compared with the lowest level of fat intake after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.

CWLS, Collaborative Women's Longevity Study; NHS, Nurses' Health Study; Q, quantile; SACCR, South Australian Central Cancer Registry; VCBBCCA, Vancouver Cancer Centre of the British Columbia Cancer Agency; RR, Relative Risk

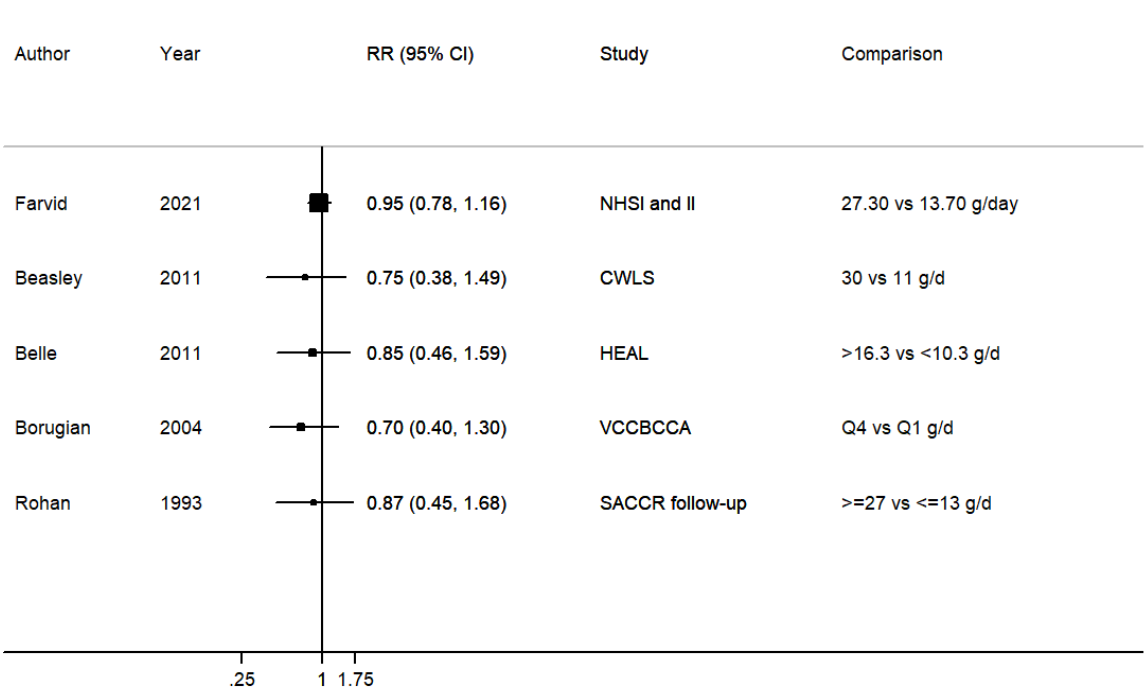
Supplementary Figure S15. Forest plot of all-cause mortality for the highest compared with the lowest level of fibre intake after breast cancer diagnosis.



Note: The figure should not be interpreted as a quantitative summary.

CWLS, Collaborative Women's Longevity Study; HEAL, Health, Eating, Activity, and Lifestyle Study; NHS, Nurses' Health Study; RR, Relative Risk

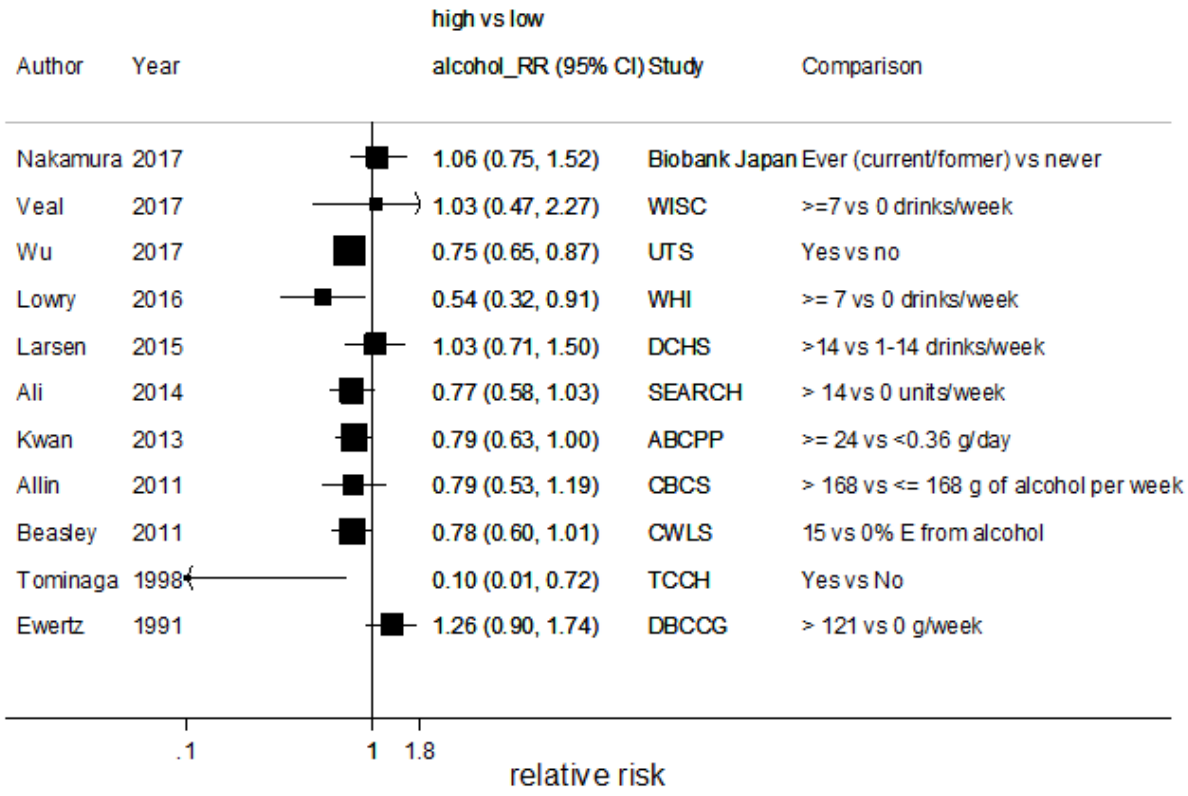
Supplementary Figure S16. Forest plot of breast cancer mortality for the highest compared with the lowest level of fibre intake after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.

CWLS, Collaborative Women's Longevity Study; HEAL, Health, Eating, Activity, and Lifestyle Study; SACCR, South Australian Central Cancer Registry; VCBBCCA, Vancouver Cancer Centre of the British Columbia Cancer Agency; RR, Relative Risk

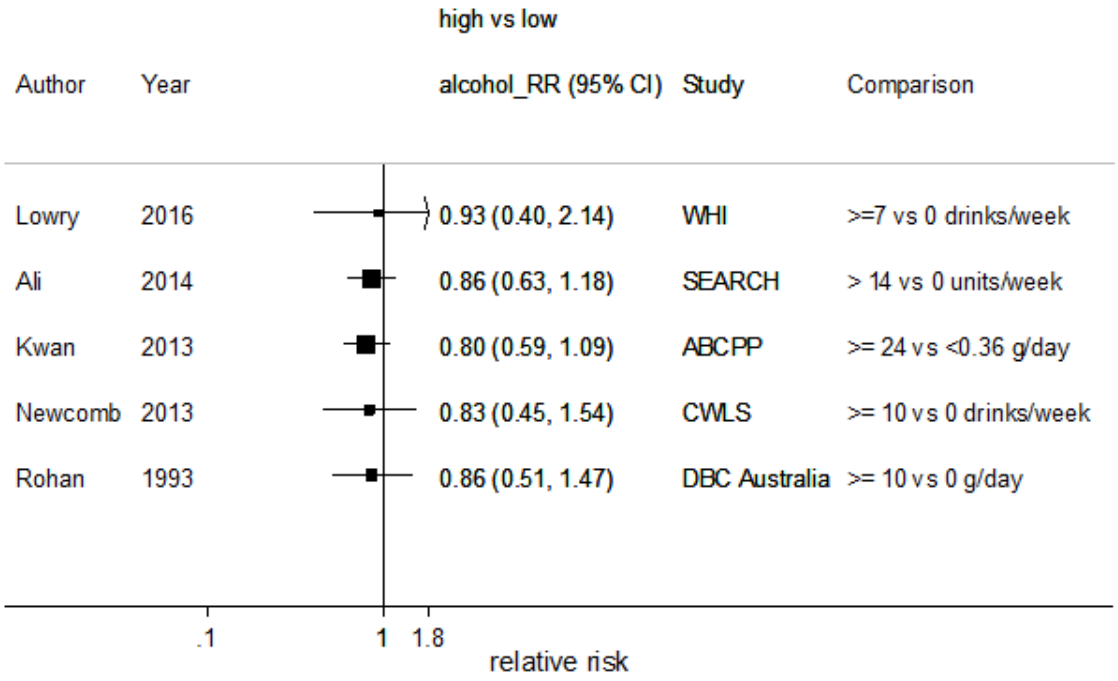
Supplementary Figure S17. Forest plot of all-cause mortality for the highest compared to the lowest level of alcohol intake after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.

ABCPP, After Breast Cancer Pooling Project; DCHS, Danish Diet, Cancer and Health Cohort; CBCS, California Breast cancer Survivorship consortium; CWLS, Collaborative Women's Longevity Study; DBCCG, Danish Breast Cancer Cooperative Group; SEARCH, Studies of Epidemiology and Risk factors in Cancer Heredity Breast Cancer Study; WHI, Women's Health Initiate; WISC, Wisconsin In Situ Cohort Study;

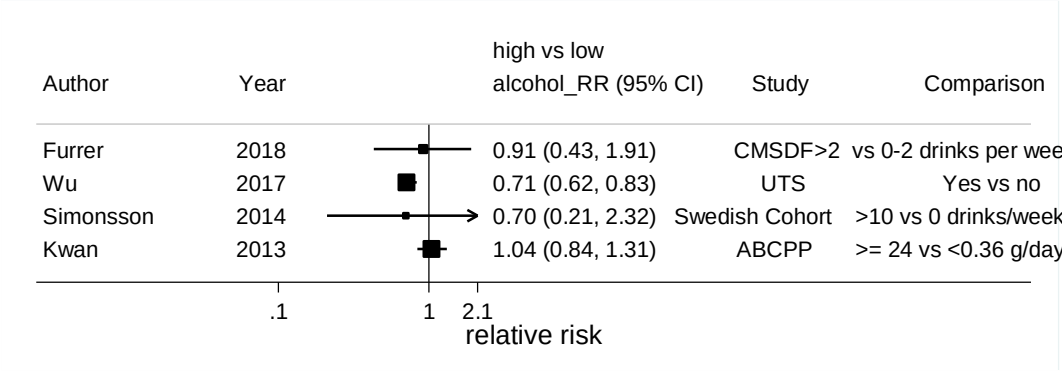
Supplementary Figure S18. Forest plot of breast cancer mortality for the highest compared to the lowest level of alcohol intake after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.

ABCPP, After Breast Cancer Pooling Project; CWLS, Collaborative Women's Longevity Study; RR, Relative Risk; SEARCH, Studies of Epidemiology and Risk factors in Cancer Heredity Breast Cancer Study; WHI, Women's Health Initiate;

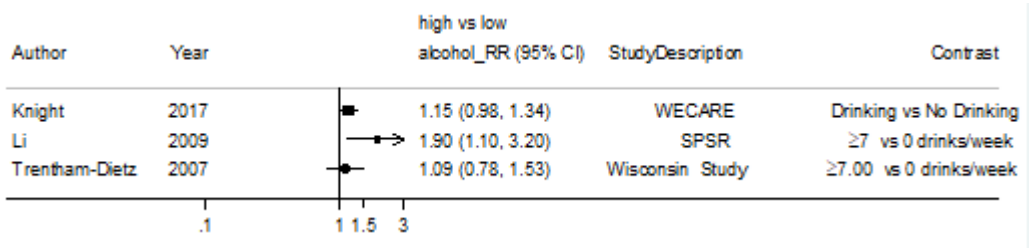
Supplementary Figure S19. Forest plot of breast cancer recurrence for the highest compared to the lowest level of alcohol intake after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.

ABCPP, After Breast Cancer Pooling Project; CMSDF, Centre des Maladies du Sein Deschênes-Fabia; CWLS, Collaborative Women's Longevity Study; RR, Relative Risk.

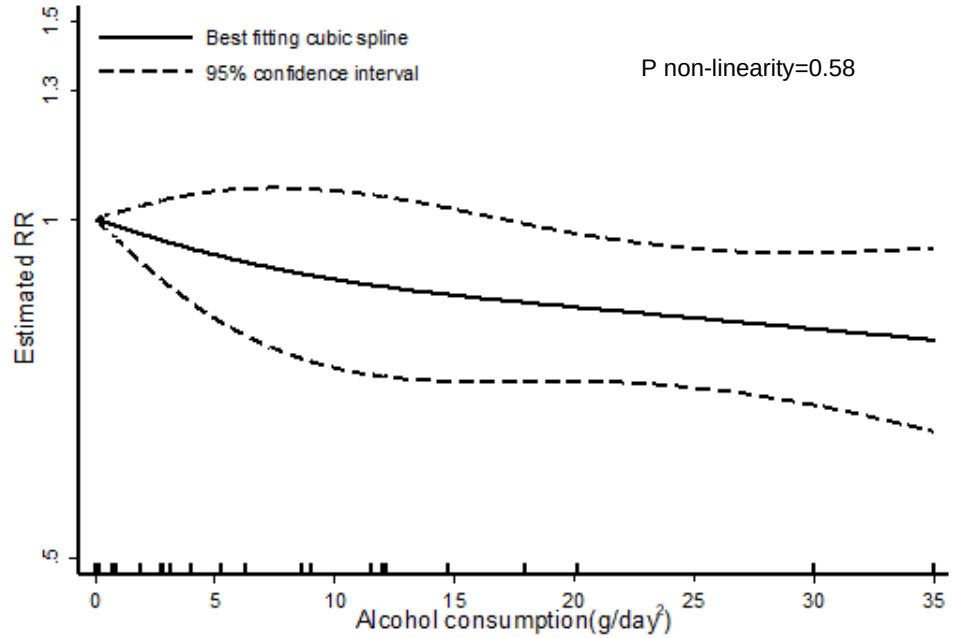
Supplementary Figure S20. Forest plot of second cancer for the highest compared to the lowest level of alcohol intake after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.

RR, Relative Risk; SPSR, Seattle-Puget Sound region; WECARE, Women's Environmental Cancer and Radiation Epidemiology.

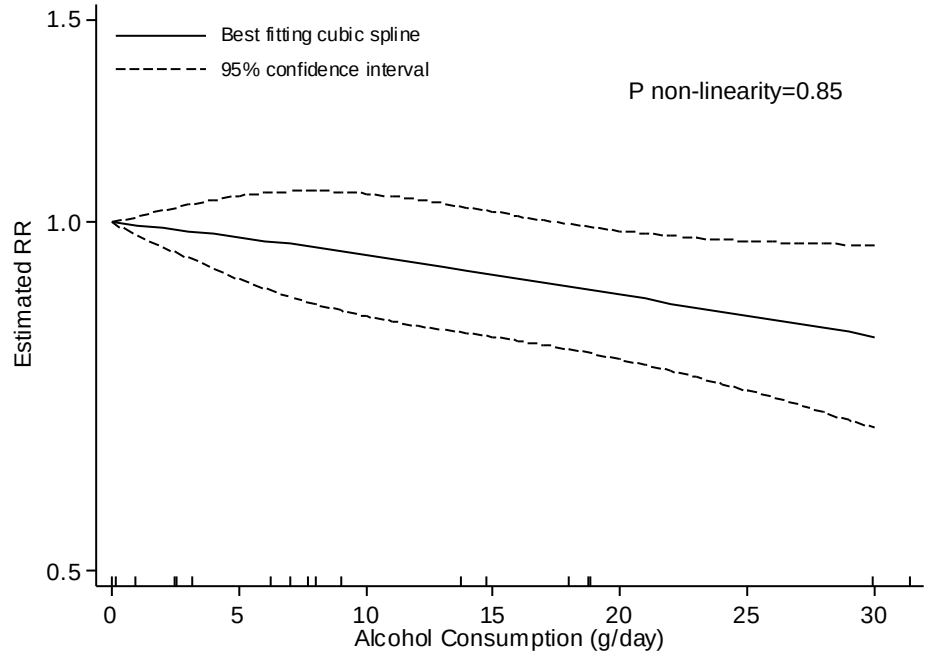
Supplementary Figure S21. Nonlinear dose-response meta-analyses of post-diagnosis alcohol intake and all-cause mortality



Alcohol (g/day)	RR estimates (95% CI)
0	1 (Reference)
5	0.94 (0.83-1.07)
10	0.90 (0.75-1.08)
15	0.87 (0.75 -1.03)
20	0.85 (0.72-1.00)
25	0.83 (0.72-0.95)
30	0.81 (0.71-0.92)

Non-linear curve was estimated using restricted cubic spline regression with three knots at 10th, 50th and 90th percentiles of distribution of the exposure and pooled in random-effects meta-analysis. Alcohol at 0 g/day was chosen as reference. The table shows selected alcohol intake values and their corresponding RR (95% CI) estimated in the non-linear dose-response meta-analysis

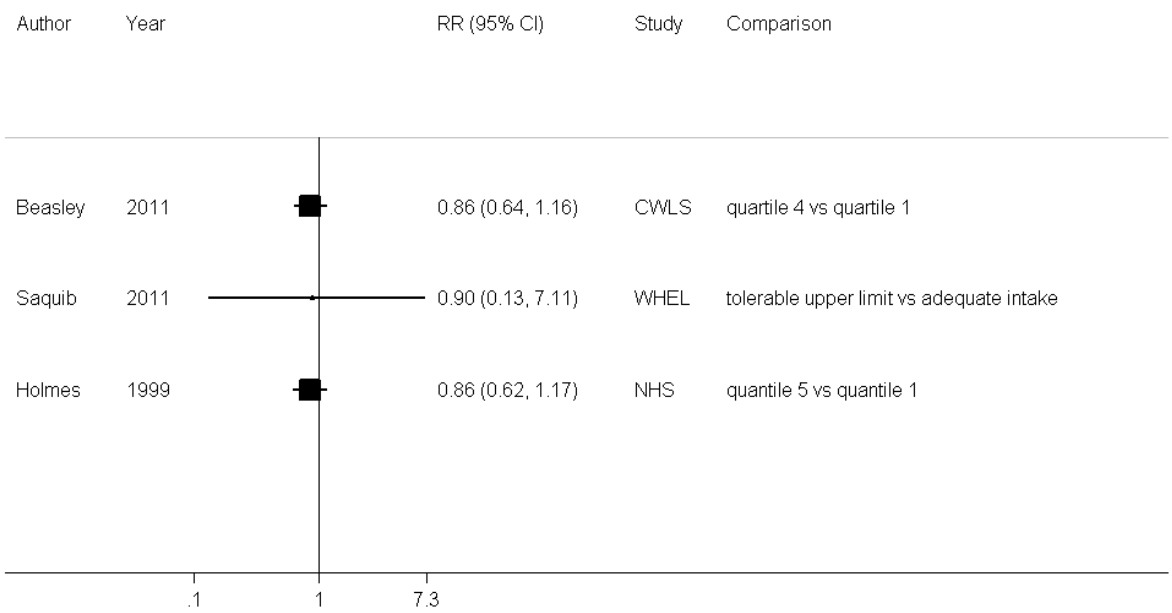
Supplementary Figure S22. Nonlinear dose-response meta-analyses of post-diagnosis alcohol intake and breast cancer mortality



Alcohol (g/day)	RR estimates (95% CI)
0	1 (Reference)
5	0.97 (0.89-1.05)
10	0.94 (0.83-1.06)
15	0.90 (0.80-1.02)
20	0.87 (0.76-0-98)
25	0.83 (0.72-0.96)
30	0.80 (0.66-0.96)

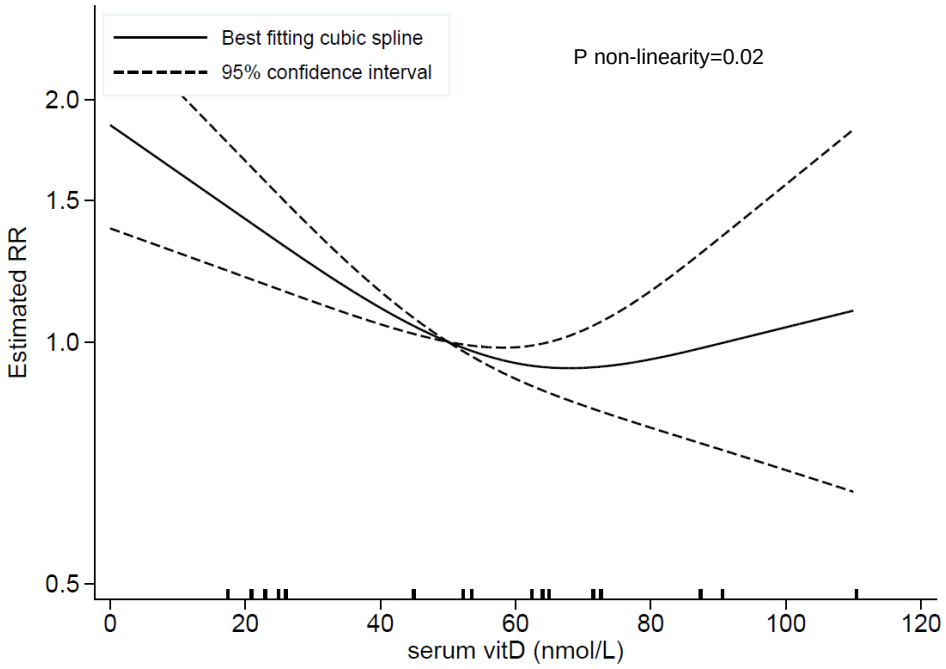
Non-linear curve was estimated using restricted cubic spline regression with three knots at 10th, 50th and 90th percentiles of distribution of the exposure and pooled in random-effects meta-analysis. Alcohol at 0 g/day was chosen as reference. The table shows selected alcohol intake values and their corresponding RR (95% CI) estimated in the non-linear dose-response meta-analysis

Supplementary Figure S23. Forest plot of all-cause for the highest compared to the lowest level of vitamin D intake from diet and/or supplements after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary.
CWLS, Collaborative Women's Longevity Study; NHS, Nurses' Health Study; RR, Relative Risk; WHEL, Women's Healthy Eating and Living Study

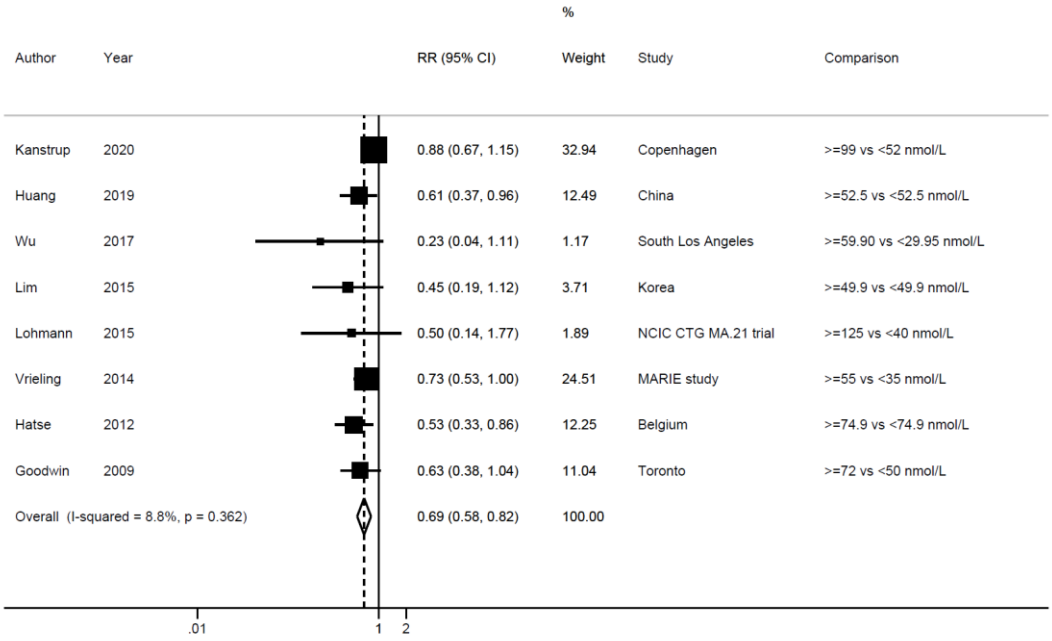
Supplementary Figure S24. Non-linear dose-response meta-analysis of post-diagnosis serum 25-hydroxyvitamin D and all-cause mortality



25-hydroxyvitamin D	RR estimates (95% CI)
50	1 (Reference)
60	0.94 (0.90-0.98)
70	0.93 (0.83-1.03)
80	0.95 (0.78-1.16)
90	0.99 (0.74-1.34)
100	1.04 (0.69-1.57)

Non-linear curve was estimated using restricted cubic spline regression with three knots at 10th, 50th and 90th percentiles of distribution of the exposure and pooled in random-effects meta-analysis. Serum 25-hydroxyvitamin D at 50 nmol/L (20ng/ml) was chosen as reference. The table shows selected serum 25-hydroxyvitamin D values and their corresponding RR (95% CI) estimated in the non-linear dose-response meta-analysis

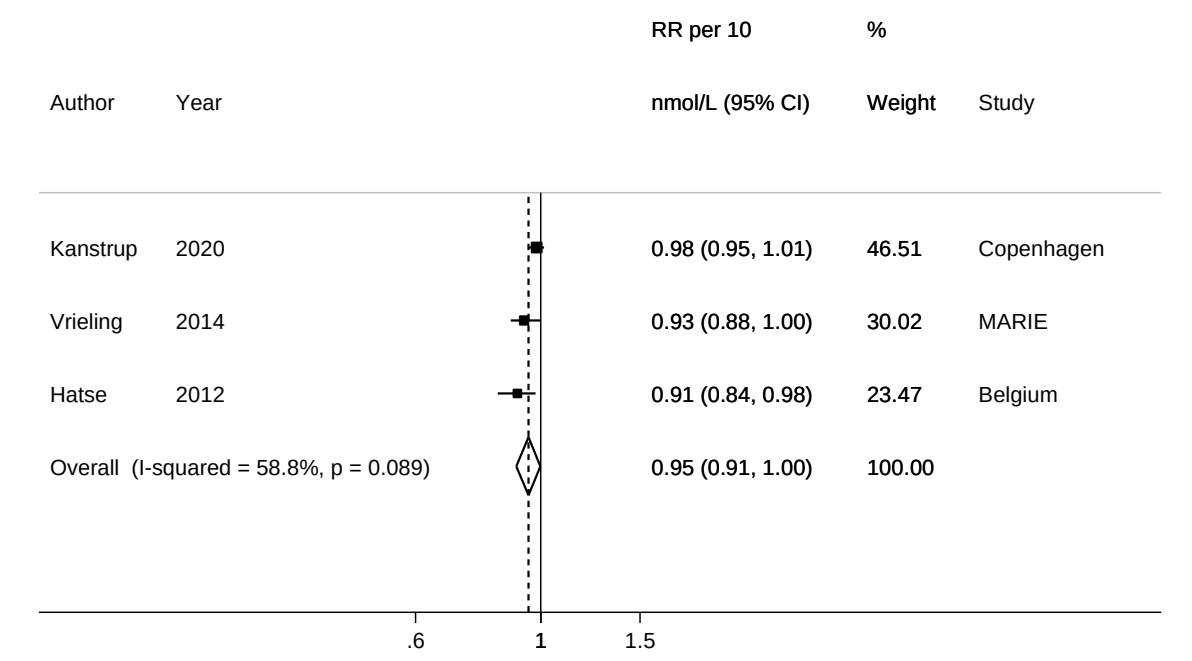
Supplementary Figure S25. Meta-analysis for highest compared with the lowest level of post-diagnosis serum 25(OH)D collected before initiation treatment and all-cause mortality



Data are expressed as relative risk and 95% confidence interval by using inverse-variance weighted DerSimonian-Laird random-effects model. Diamonds represents the pooled risk estimates.

NCIC CTG, National Cancer Institute of Canada Clinical Trials Group; MARIE, Mammary carcinoma risk factor Investigation;

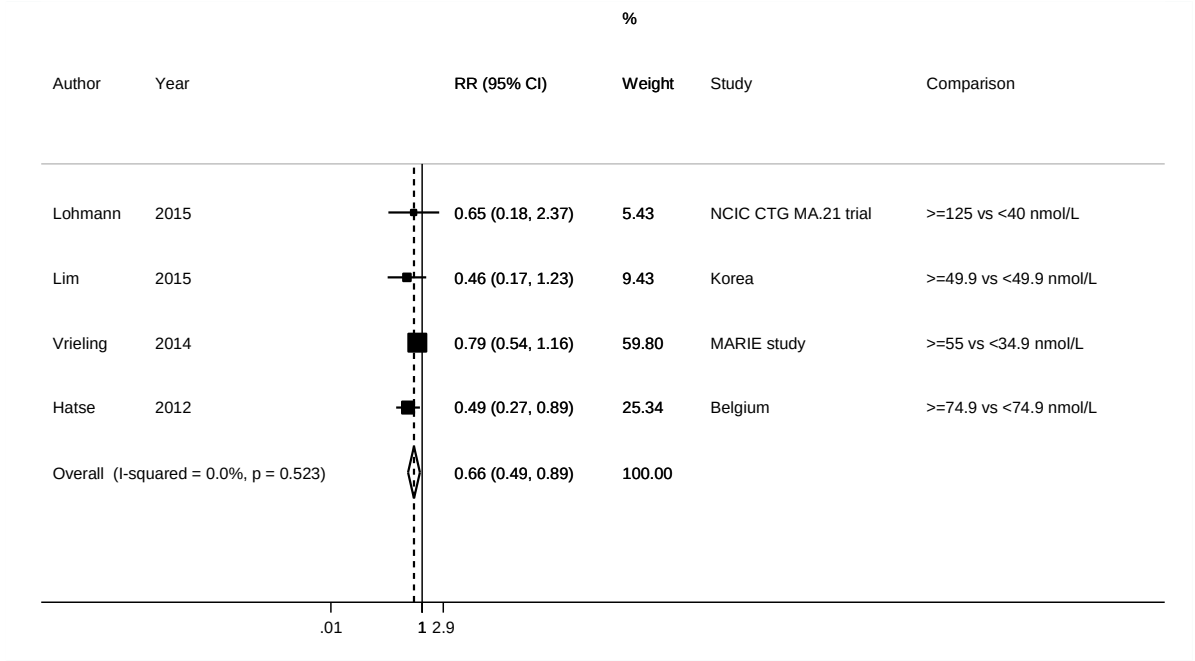
Supplementary Figure S26. Linear dose-response meta-analysis per 10 nmol/L increase of post-diagnosis serum 25(OH)D collected before initiation treatment and all-cause mortality



Data are expressed as relative risk and 95% confidence interval by using inverse-variance weighted DerSimonian-Laird random-effects model. Diamonds represents the pooled risk estimates.

Abbreviations: MARIE, Mammary carcinoma risk factor Investigation; RR, relative risk.

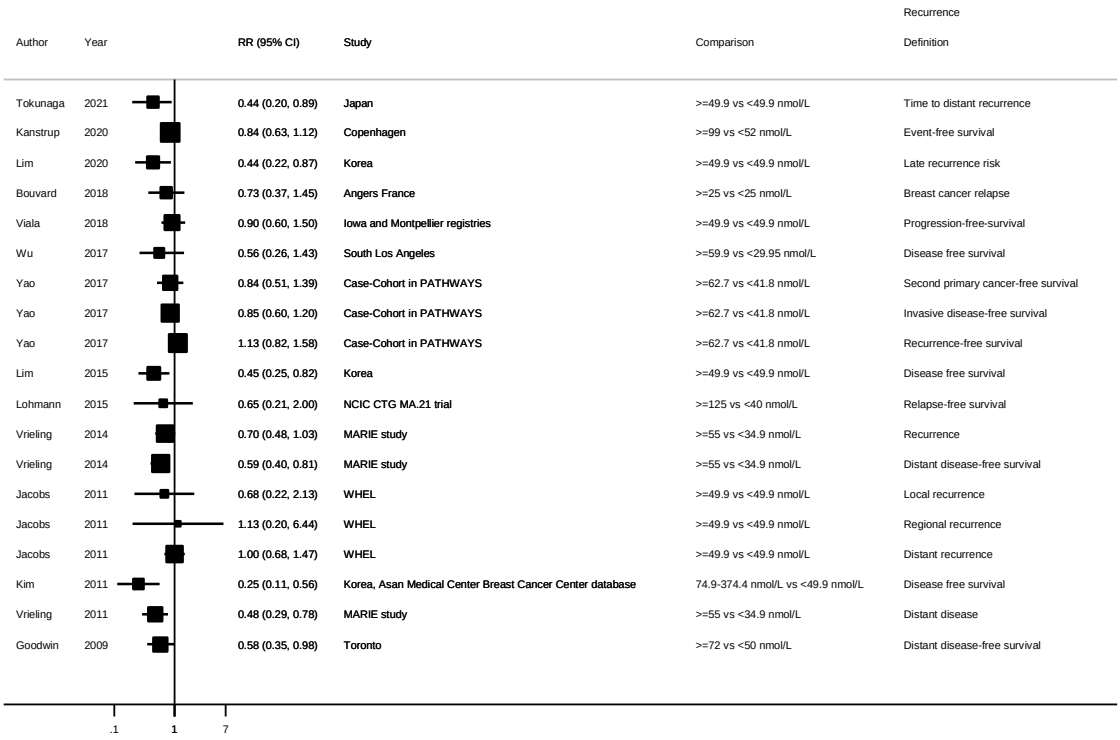
Supplementary Figure S27. Meta-analysis for highest compared with the lowest level of post-diagnosis serum 25(OH)D collected before initiation treatment and breast cancer mortality



Data are expressed as relative risk and 95% confidence interval by using inverse-variance weighted DerSimonian-Laird random-effects model. Diamonds represents the pooled risk estimates.

NCIC CTG, National Cancer Institute of Canada Clinical Trials Group; MARIE, Mammary carcinoma risk factor Investigation;

Supplementary Figure S28. Forest plot of breast cancer recurrence for the highest compared to the lowest level of serum 25(OH)D after breast cancer diagnosis



Note: The figure should not be interpreted as a quantitative summary. The same study may be represented more than once if different breast cancer recurrence definitions were investigated. The figure should not be interpreted as a quantitative summary.
MARIE, Mammary carcinoma risk factor Investigation; NCIC CTG, National Cancer Institute of Canada Clinical Trials Group; RR, Relative Risk; WHEL, Women's Healthy Eating and Living Study

APPENDIX 2

Material and methods

Data extraction

Relevant data were extracted in the CUP Global database at Imperial College London including author's last name, publication year, study name and study type, participants characteristics. Disease characteristics and treatment information. Inclusion, exclusion criteria of the participants in the study, dietary assessment method and if validated or not. Time between exposure assessment and diagnosis, follow-up time and time frame. Exposures and outcome of interest, effect size, 95% confidence intervals (CIs), and p-values and type of variables if they were quantiles, categories or continuous and adjustments. Authors of the reviewed studies were not contacted if there were missing, unclear data.

Outcome definition

Breast cancer recurrence was defined differently in the studies. In some studies, the term "recurrence/relapse-free survival" or "breast cancer recurrence" was used; while in others, the terms "disease-free survival", "event-free survival", "progression-free survival", or "additional breast cancer events" were used. In some studies, the events included in the definition of recurrence were local, regional and/or distant recurrence (metastasis). Other studies included second primary breast cancer or any primary cancer, breast cancer-related death, any cause of death, or any combination of these as events under recurrence. All such studies were reviewed under "recurrence", and when more than one "recurrence" outcomes were reported in a study, the outcome with the highest number of events, most often including any death (disease-free survival) was selected.

Risk of bias assessment

The quality of individual studies was not graded using a specific tool. Instead, relevant study characteristics that could be used to explore potential sources of bias were included into the CUP Global database. For all the included studies, information on potential for selection bias, information bias of exposure and outcome assessment, and residual confounding by cancer stage and treatment was retrieved after identifying the most likely influential sources of bias in cancer survival studies[119, 120]. Details on how the study authors addressed the potential biases were also included. In the Expert Panel meeting, whether the studies had serious quality issues were discussed when judging the evidence for each exposure-outcome association. When possible, the potential influence of measurement error, length of follow-up and

loss to follow-up, and adjustment for confounding factors on results was tested in subgroup meta-analyses and meta-regression analyses.

Statistical analysis

Meta-analysis was conducted when at least three new studies per exposure and outcome (compared to the WCRF/AICR Third Expert Report with evidence up to 30 June 2012) were identified. The linear dose-response meta-analysis[121, 122] was the preferred option to summarize the strength of the associations. The relative risk (RR) and 95% CIs were summarized, using an inverse-variance weighted DerSimonian-Laird random-effects model[123]. We directly used the dose-response estimate provided in the original studies when available. The generalized least-square for trend estimation method described by Grenland and Longnecker[121, 124] was used to compute estimates per exposure increment unit in those studies reporting categorical risk estimates. To perform this method, information about risk estimates with their corresponding 95%CI, doses, and the total number of participants or person-years and cases for at least three categories of exposures were required. If directly reported, the mean or median within each exposure category was assigned to the RR. If studies reported ranges, we used the midpoint of each category. For open-ended extreme categories, the midpoint was estimated assuming its width to be the same as the adjacent category. If person-years or total number of participants per category were not available, we assumed equal size categories and divided the total number of persons or person-years by the number of quantiles. For studies not reporting the serving size, we used 80g as the unit of conversion for fruits. For total dairy products, 177g was used, which is a serving size reported in the US Department of Agriculture Food and Nutrient Database for Dietary Studies as most studies were from the USA. One study[33] on alcohol intake reported exposure as a percentage of energy intake from alcohol. It was converted to grams per day using the energy intake (kcal/day) of each quintile reported in the paper.

Subgroup meta-analysis based on exposure timing respective to cancer treatment (before, during, and/or after neoadjuvant/adjuvant treatment) was performed when sufficient studies were available.

Leave-one-out analysis was conducted to inspect influence from individual studies on the summary estimate[125].

Potential non-linear dose-response associations were explored using restricted cubic splines with three knots at 10%, 50%, and 90% percentiles of the distribution, which were combines using multivariate meta-analysis[126, 127]. Non-linearity was tested using

the likelihood ratio test and comparing the linear- with the non-linear dose-response meta-analysis.

When linear and non-linear dose-response meta-analyses were not possible, we performed a descriptive synthesis, where the findings of the individual studies were systematically gathered, tabulated, and descriptively summarised by type of dietary exposure and outcome analysed. A forest plot for the RR comparing extreme exposure categories was presented to aid results interpretation.

Stata 13.1 (StataCorp, College Station, TX, USA) was used.

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