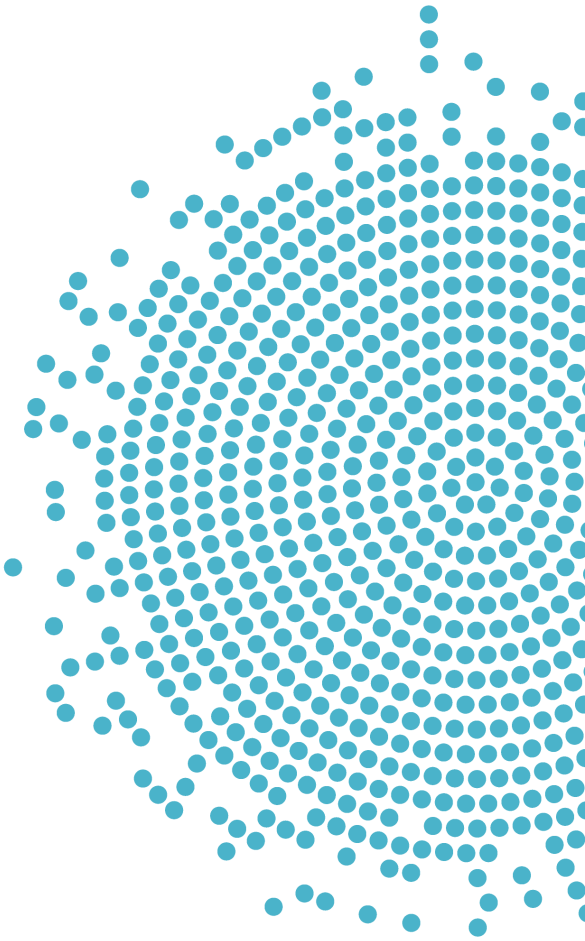
USDA
UNITED STATES DEPARTMENT OF AGRICULTURE

Dietary Patterns and Breast, Colorectal, Lung, and Prostate Cancer: A Systematic Review



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USDA and HHS implemented a process to identify topics and scientific questions to be examined by the 2020 Dietary Guidelines Advisory Committee. The Committee conducted its review of evidence in subcommittees for discussion by the full Committee during its public meetings. The role of the Committee members involved

[i] Under contract with the Food and Nutrition Service, United States Department of Agriculture.

establishing all aspects of the protocol, which presented the plan for how they would examine the scientific evidence, including the inclusion and exclusion criteria; reviewing all studies that met the criteria they set; deliberating on the body of evidence for each question; and writing and grading the conclusion statements to be included in the scientific report the 2020 Committee submitted to USDA and HHS. The NESR team with assistance from Federal Liaisons and Project Leadership, supported the Committee by facilitating, executing, and documenting the work necessary to ensure the reviews were completed in accordance with NESR methodology. More information about the 2020 Dietary Guidelines Advisory Committee, including the process used to identify topics and questions, can be found at www.DietaryGuidelines.gov. More information about NESR can be found at NESR.usda.gov.

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TABLE OF CONTENTS

Acknowledgements 3
Table of contents 5
Introduction 7
What is the relationship between dietary patterns consumed and risk of certain types of cancer? 10
Plain language summary 10
Technical abstract 13
Full review 17
Systematic review question 17
Conclusion statements and grades 17
Summary of the evidence 17
Dietary patterns: Breast cancer 20
Dietary patterns: Colorectal cancer 27
Dietary patterns: Lung cancer 35
Dietary patterns: Prostate cancer 39
Included articles 44
Methodology 213
Analytic framework 213
Literature search and screening plan 215
Inclusion and exclusion criteria 215
Electronic databases and search terms 217
Literature search and screening results 223
Excluded articles from updated literature search 225

Table 1. Description of studies that examined the relationship between dietary patterns and breast cancer 48
Table 2. Summary of the results from studies that examined the relationship between dietary patterns and breast cancer 80
Table 3. Risk of bias for randomized controlled trials examining dietary patterns and breast cancer 99
Table 4. Risk of bias for observational studies examining dietary patterns and breast cancer 99
Table 5. Description of studies that examined the relationship between dietary patterns and colorectal cancer 101
Table 6. Summary of the results from studies that examined the relationship between

dietary patterns and colorectal cancer 136
Table 7. Risk of bias for randomized controlled trials examining dietary patterns and colorectal cancer 157
Table 8. Risk of bias for observational studies examining dietary patterns and colorectal cancer 158
Table 9. Description of studies that examined the relationship between dietary patterns and lung cancer 159
Table 10. Summary of the results from studies that examined the relationship between dietary patterns and lung cancer 172
Table 11. Risk of bias for observational studies examining dietary patterns and lung cancer 185
Table 12. Description of studies that examined the relationship between dietary patterns and prostate cancer 186
Table 13. Summary of the results from studies that examined the relationship between dietary patterns and prostate cancer 202
Table 14. Risk of bias for observational studies examining dietary patterns and prostate cancer 212
Table 15. Inclusion and exclusion criteria 215
Table 16. Articles excluded after full-text screening with rationale for exclusion 225

Figure 1: Analytic framework 214
Figure 2: Flow chart of literature search and screening results 224

INTRODUCTION

This document describes a systematic review conducted to answer the following question: What is the relationship between dietary patterns consumed and risk of certain types of cancer? This systematic review was conducted by the 2020 Dietary Guidelines Advisory Committee, supported by USDA's Nutrition Evidence Systematic Review (NESR).

More information about the 2020 Dietary Guidelines Advisory Committee is available at the following website: www.DietaryGuidelines.gov.

NESR specializes in conducting food- and nutrition-related systematic reviews using a rigorous, protocol-driven methodology. More information about NESR is available at the following website: NESR.usda.gov.

NESR's systematic review methodology involves developing a protocol, searching for and selecting studies, extracting data from and assessing the risk of bias of each included study, synthesizing the evidence, developing conclusion statements, grading the evidence underlying the conclusion statements, and recommending future research. A detailed description of the systematic reviews conducted for the 2020 Dietary Guidelines Advisory Committee, including information about methodology, is available on the NESR website: https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews. In addition, starting on page 214, this document describes the final protocol as it was applied in the systematic review. A description of and rationale for modifications made to the protocol are described in the 2020 Dietary Guidelines Advisory Committee Report, Part D: Chapter 8. Dietary Patterns.

The systematic review described in this document updates existing systematic reviews that were conducted by the 2015 Dietary Guidelines Advisory Committee with support from USDA's Nutrition Evidence Systematic Review (NESR) team. Information about the 2015 Dietary Guidelines Advisory Committee's review of the evidence on dietary patterns and cancer can be found in their report, which is available at the following website: https://nesr.usda.gov/dietary-patterns-foods-and-nutrients-and-health-outcomes-subcommittee.

List of abbreviations

Abbreviation	Full name
AHEI-2010	Alternative Healthy Eating Index-2010
AICR	American Institute for Cancer Research
aMED	alternate Mediterranean diet score
aMEDr	alternate Mediterranean diet score without alcohol
BMI	Body mass index
CSDLH	Canadian Study of Diet, Lifestyle and Health
DASH	Dietary Approaches to Stop Hypertension
DRE	Digital rectal exam
EDIH	Empirical dietary index for hyperinsulinemia
EDIP	Empirical dietary inflammatory pattern
ERDP	Estrogen-related dietary pattern
f/u	Follow-up
FSAm-NPS	Nutrient Profiling System of the British Food Standards Agency (modified version)
FSAm-NPS DI	Nutrient Profiling System of the British Food Standards Agency dietary index (modified version)
h	Hour(s)
HDI	Human development index
HEI-2010	Healthy Eating Index-2010
HER2	Human epidermal growth factor receptor 2
HHS	United States Department of Health and Human Services
MEDI-LITE	Mediterranean diet score (French NutriNet-Sante study)
MET	Metabolic equivalent of task
mMED	Modified Mediterranean Diet
NBSS	National Breast Screening Study

Abbreviation	Full name
NESR	Nutrition Evidence Systematic Review
NIH	National Institutes of Health
PCA	Principal component analysis
PCS	Prospective cohort study
PNNS-GS	French National Nutrition Health Program-Guideline Score
PSA	Prostate-specific antigen
RCT	Randomized controlled trial
RRR	Reduced rank regression
SES	Socioeconomic status
USDA	United States Department of Agriculture
WCRF	World Cancer Research Fund
wk	Week(s)
y	Year(s)

WHAT IS THE RELATIONSHIP BETWEEN DIETARY PATTERNS CONSUMED AND RISK OF CERTAIN TYPES OF CANCER?

PLAIN LANGUAGE SUMMARY

What is the question?

- The question is: What is the relationship between dietary patterns consumed and risk of certain types of cancer?

What is the answer to the question?

Dietary patterns: Breast cancer

- Moderate evidence indicates that dietary patterns rich in vegetables, fruits, and whole grains, and lower in animal-source foods and refined carbohydrates, are associated with reduced risk of postmenopausal breast cancer. The data regarding these dietary patterns and premenopausal breast cancer risk point in the same direction, but the evidence is limited as fewer studies include premenopausal breast cancer.

Dietary patterns: Colorectal cancer

- Moderate evidence indicates that dietary patterns higher in vegetables, fruits, legumes, whole grains, lean meats and seafood, and low-fat dairy; and low in red and processed meats, saturated fat and sugar-sweetened beverages and sweets relative to other dietary patterns are associated with lower risk of colon and rectal cancer. Moderate evidence also indicates that dietary patterns that are higher in red and processed meats, French fries, potatoes, and sources of sugars (e.g., sugar-sweetened beverages, sweets and dessert foods) are associated with a greater colon and rectal cancer risk.

Dietary patterns: Lung cancer

- Limited evidence suggests that dietary patterns containing more frequent servings of vegetables, fruits, seafood, grains and cereals, legumes and lean vs. higher fat meats and lower fat or non-fat dairy products may be associated with lower risk of lung cancer, primarily among former smokers and current smokers.

Dietary patterns: Prostate cancer

- Limited evidence suggests no relationship between dietary patterns and risk of prostate cancer.

Why was this question asked?

- This important public health question was identified by the U.S. Departments of Agriculture (USDA) and Health and Human Services (HHS) to be examined by the 2020 Dietary Guidelines Advisory Committee.

How was this question answered?

- The 2020 Dietary Guidelines Advisory Committee, Dietary Patterns Subcommittee conducted a systematic review to answer this question with support from the

Nutrition Evidence Systematic Review (NESR) team. The systematic review updates existing systematic reviews conducted by the 2015 Dietary Guidelines Advisory Committee.
- Dietary patterns were defined as the quantities, proportions, variety, or combination of different foods, drinks, and nutrients (when available) in diets, and the frequency with which they are habitually consumed.

What is the population of interest?

- For the intervention/exposure, children through older adults, age 2 years and older
- For the outcome, children through older adults, age 2 years and older

What evidence was found?

Dietary patterns: Breast cancer

- This review identified 26 articles that met inclusion criteria.
- Most studies reported dietary patterns were related with lower risk of post-menopausal breast cancer.
    - Dietary patterns were higher in vegetables, fruits, and whole grains, and lower in animal products and refined carbohydrates.
    - Alcohol was not consistently included within the dietary patterns
    - Few studies reported results for premenopausal breast cancer risk.
    - Studies differed in dietary pattern methods, dietary intake assessment, and duration of follow-up.
    - Key limitations of the studies include not accounting for key confounders or possible changes in dietary intake over follow-up.
- The 2020 Committee updates and concurs with the conclusions drawn by the 2015 Committee.

Dietary patterns: Colorectal cancer

- This review identifies 24 articles that met inclusion criteria.
- Most studies reported dietary patterns were related to lower risk of colorectal cancer.
    - Dietary patterns were higher in vegetables, fruits, legumes, whole grains, lean meats and seafood, and low-fat dairy, and lower in red and processed meats, saturated fat, sodas, and sweets.
    - Alcohol was not consistently included within the dietary patterns.
    - Results were more consistent in men, and for total colorectal cancer risk.
    - Studies differed in dietary pattern methods, dietary intake assessment, and duration of follow-up.
    - Key limitations in the study design and conduct of included articles were identified. This includes a lack of accounting for key confounders or possible changes in dietary intake over follow-up.
- The 2020 Committee updates the conclusions drawn by the 2015 Committee.

Dietary patterns: Lung cancer

- This review identified 8 articles that met inclusion criteria.
- Most studies reported dietary patterns were associated to lower risk of lung cancer, but had several limitations.

    - Dietary patterns had more frequent servings of vegetables, fruits, seafood, grains and cereals, legumes and lean vs. higher fat meats and lower fat or non-fat dairy products.
    - Protective effects of the patterns were more consistent among participants who were former smokers and current smokers than among participants who were never smokers.
    - Alcohol was not consistently included within the dietary patterns.
    - Many limitations in the study design and conduct of included articles were identified. This includes a lack of accounting for key confounders or possible changes in dietary intake over follow-up.
- The 2020 Committee updates and concurs with the conclusions drawn by the 2015 Committee.

Dietary patterns: Prostate cancer

- This review identified 8 articles that met inclusion criteria.
- Most studies reported no significant associations between dietary patterns and risk of prostate cancer.
- Many limitations in the study design and conduct of included articles were identified. This includes a lack of accounting for key confounders or possible changes in dietary intake over follow-up.
- The 2020 Committee updates an existing review from the 2015 Committee, which did not draw a conclusion about this relationship.

How up-to-date is this systematic review?

- This review searched for studies from January, 2014 to January, 2020, and updated existing systematic reviews that included evidence from January, 2000 to January, 2014.

TECHNICAL ABSTRACT

Background

- This important public health question was identified by the U.S. Departments of Agriculture (USDA) and Health and Human Services (HHS) to be examined by the 2020 Dietary Guidelines Advisory Committee.
- The 2020 Dietary Guidelines Advisory Committee, Dietary Patterns Subcommittee conducted a systematic review to answer this question with support from the Nutrition Evidence Systematic Review (NESR) team.
- The goal of this systematic review was to examine the following question: What is the relationship between dietary patterns consumed and risk of certain types of cancer?

Conclusion statements and grades

Dietary patterns: Breast cancer

- Moderate evidence indicates that dietary patterns rich in vegetables, fruits, and whole grains, and lower in animal-source foods and refined carbohydrates, are associated with reduced risk of postmenopausal breast cancer. The data regarding these dietary patterns and premenopausal breast cancer risk point in the same direction, but the evidence is limited as fewer studies include premenopausal breast cancer. (Grade: Moderate - Postmenopausal breast cancer risk, Limited – Premenopausal breast cancer risk)

Dietary patterns: Colorectal cancer

- Moderate evidence indicates that dietary patterns higher in vegetables, fruits, legumes, whole grains, lean meats and seafood, and low-fat dairy; and low in red and processed meats, saturated fat and sugar-sweetened beverages and sweets relative to other dietary patterns are associated with lower risk of colon and rectal cancer. Moderate evidence also indicates that dietary patterns that are higher in red and processed meats, French fries, potatoes, and sources of sugars (e.g., sugar-sweetened beverages, sweets and dessert foods) are associated with a greater colon and rectal cancer risk. (Grade: Moderate)

Dietary patterns: Lung cancer

- Limited evidence suggests that dietary patterns containing more frequent servings of vegetables, fruits, seafood, grains and cereals, legumes and lean vs. higher fat meats and lower fat or non-fat dairy products may be associated with lower risk of lung cancer, primarily among former smokers and current smokers. (Grade: Limited)

Dietary patterns: Prostate cancer

- Limited evidence suggests no relationship between dietary patterns and risk of prostate cancer. (Grade: Limited)

Methods

- A literature search was conducted using 4 databases (PubMed, Embase, Cochrane, CINAHL) to identify articles that evaluated the intervention or exposure of dietary patterns consumed and risk of breast, colorectal, lung, and prostate cancer. A

manual search was conducted to identify articles that may not have been included in the electronic databases searched. Articles were screened by two NESR analysts independently for inclusion based on pre-determined criteria.
- Data extraction and risk of bias assessment were conducted for each included study, and both were checked for accuracy. The Committee qualitatively synthesized the body of evidence to inform development of a conclusion statement(s), and graded the strength of evidence using pre-established criteria for risk of bias, consistency, directness, precision, and generalizability.
- Dietary patterns were defined as the quantities, proportions, variety, or combination of different foods, drinks, and nutrients (when available) in diets, and the frequency with which they are habitually consumed.

Summary of the evidence

Dietary patterns: Breast cancer

- This systematic review update includes 26 studies that examined the relationship between dietary patterns and risk of breast cancer, met inclusion criteria, and were published between January 2014 and January 2020:
    - Three studies were randomized controlled trials,
    - Twenty-one were prospective cohort studies, and
    - Two studies were nested case-control studies.
- The studies were heterogeneous, in terms of which methods were used to identify or assess dietary patterns, how dietary intake was assessed, and duration of follow-up. However, despite this heterogeneity, the body of evidence was consistent in the types of foods and beverages examined in a number of the patterns, particularly in those studies that reported statistically significant associations with lower risk of breast cancer.
    - In a number of studies, dietary patterns that included vegetables, fruits, and whole grains, and that were lower in animal products and refined carbohydrates, were associated with reduced risk of postmenopausal breast cancer.
    - Alcohol was not consistently included within the patterns found to be inversely associated with breast cancer risk.
    - Few studies reported results for premenopausal breast cancer risk.
- The studies were direct and generalizable, in that the populations, interventions, comparators, and outcomes of interest in the included studies were directly related to the systematic review question, and were applicable to the U.S. population.
- The body of evidence had several risks of bias, particularly in the observational studies, including lack of adjustment for all key confounders, assessment of a dietary pattern only once at baseline or in the first few years of follow-up, and a lack of accounting for possible changes in dietary intake that may have occurred over follow-up.
- This systematic review updates and concurs with the conclusions drawn by the 2015 Committee.

Dietary patterns: Colorectal cancer

- This systematic review update includes 24 studies that examined the relationship

between dietary patterns and risk of colorectal cancer, met inclusion criteria, and were published between January 2014 and January 2020:
    - Two studies were randomized controlled trials,
    - Twenty-one studies were prospective cohort studies, and
    - One study was a nested case-control study.
- The studies were heterogeneous, in terms of which methods were used to identify or assess dietary patterns, how dietary intake was assessed, and duration of follow-up. However, despite this heterogeneity, the body of evidence was consistent in the types of foods and beverages examined in a number of the patterns, particularly in those studies that reported statistically significant associations with lower risk of colorectal cancer.
    - In a number of studies, dietary patterns that included vegetables, fruits, legumes, whole grains, lean meats and seafood, and low-fat dairy, and that were lower in red and processed meats, saturated fat, sodas, and sweets were associated with lower risk of colorectal cancer.
    - Alcohol was not consistently included within the patterns found to be inversely associated with colorectal cancer risk.
    - Results were more consistent in men, and for total colorectal cancer risk.
- The studies were direct and generalizable, in that that the populations, intervention, comparators, and outcomes of interest in the included studies were directly related to the systematic review question and were applicable to the U.S. population.
- The body of evidence had several risks of bias, particularly in the observational studies, including lack of adjustment for all key confounders, assessment of a dietary pattern only once at baseline or in the first few years of follow-up, and a lack of accounting for possible changes in dietary intake that may have occurred over follow-up.
- This systematic review updates the conclusions drawn by the 2015 Committee. The 2020 Committee determined that the body of evidence included in this update was consistent with that considered by the 2015 Committee, with the exception of alcohol. Because alcohol was not consistently part of the patterns found to be significantly associated with lower colorectal cancer risk, and in some cases, were part of cases associated with increased risk, “moderate alcohol” was removed from the conclusion statement.

Dietary patterns: Lung cancer

- This systematic review update includes 7 prospective cohort studies and one nested case-control study that examined the relationship between dietary patterns and risk of lung cancer, met inclusion criteria, and were published between January 2014 and January 2020.
- Though the body of evidence had some inconsistencies in direction and magnitude of effect, most studies reported significant associations between adherence to a dietary pattern and lower risk of lung cancer.
    - In several studies, dietary patterns containing more frequent servings of vegetables, fruits, seafood, grains and cereals, legumes and lean vs. higher fat meats and lower fat or non-fat dairy products were associated with lower risk of lung cancer

    - The protective effects of the patterns were more consistent among participants who were former smokers and current smokers than among participants who were never smokers.
    - Alcohol was not consistently included within the patterns found to be inversely associated with lung cancer risk.
- Most studies had large analytic sample sizes with a sufficient number of lung cancer cases occurring over follow-up to examine associations. However, the width of confidence intervals indicates some degree of imprecision within the body of evidence.
- The studies were direct and generalizable, in that the populations, intervention, comparators, and outcomes of interest in the included studies were directly related to the systematic review question, and were applicable to the U.S. population.
- The body of evidence had several risks of bias, including lack of adjustment for all key confounders, assessment of dietary pattern only once at baseline or in the first few years of follow-up, and a lack of accounting for possible changes in dietary intake that may have occurred over follow-up.
- This systematic review updates and concurs with the conclusions drawn by the 2015 Committee.

Dietary patterns: Prostate cancer

- This systematic review update includes 7 prospective cohort studies and one nested case-control study that examined the relationship between dietary patterns and risk of prostate cancer, met inclusion criteria, and were published between January 2014 and January 2020.
- Though the direction and magnitude of effect across the body of evidence was inconsistent, most studies reported no significant associations between adherence to a dietary pattern and risk of prostate cancer.
- Most studies had large analytic sample sizes with a sufficient number of prostate cancer cases occurring over follow-up to examine associations. However, the width of confidence intervals indicates some degree of imprecision within the body of evidence.
- The studies were direct and generalizable, in that the populations, exposures, comparators, and outcomes of interest in the included studies were directly related to the systematic review question, and were applicable to the U.S. population.
- The body of evidence had several risks of bias, including lack of adjustment for all key confounders, assessment of a dietary pattern only once at baseline or in the first few years of follow-up, and a lack of accounting for possible changes in dietary intake that may have occurred over follow-up.
- This systematic review updates the review done by the 2015 Committee, which did not draw a conclusion regarding the relationship between dietary patterns and the risk of prostate cancer due to limited evidence from a small number of studies with wide variation in study design, dietary assessment methodology and prostate cancer outcome ascertainment. The 2020 Committee determined that, based on the 8 additional studies in their update, limited evidence is now available to suggest no relationship between dietary patterns and risk of prostate cancer.

FULL REVIEW

Systematic review question

What is the relationship between dietary patterns consumed and risk of certain types of cancer?

Conclusion statements and grades

Dietary patterns: Breast cancer

Moderate evidence indicates that dietary patterns rich in vegetables, fruits, and whole grains, and lower in animal-source foods and refined carbohydrates, are associated with reduced risk of postmenopausal breast cancer. The data regarding these dietary patterns and premenopausal breast cancer risk point in the same direction, but the evidence is limited as fewer studies include premenopausal breast cancer. (Grade: Moderate - Postmenopausal breast cancer risk, Limited – Premenopausal breast cancer risk)

Dietary patterns: Colorectal cancer

Moderate evidence indicates that dietary patterns higher in vegetables, fruits, legumes, whole grains, lean meats and seafood, and low-fat dairy; and low in red and processed meats, saturated fat and sugar-sweetened beverages and sweets relative to other dietary patterns are associated with lower risk of colon and rectal cancer. Moderate evidence also indicates that dietary patterns that are higher in red and processed meats, French fries, potatoes, and sources of sugars (e.g., sugar-sweetened beverages, sweets and dessert foods) are associated with a greater colon and rectal cancer risk. (Grade: Moderate)

Dietary patterns: Lung cancer

Limited evidence suggests that dietary patterns containing more frequent servings of vegetables, fruits, seafood, grains and cereals, legumes and lean vs. higher fat meats and lower fat or non-fat dairy products may be associated with lower risk of lung cancer, primarily among former smokers and current smokers. (Grade: Limited)

Dietary patterns: Prostate cancer

Limited evidence suggests no relationship between dietary patterns and risk of prostate cancer. (Grade: Limited)

Summary of the evidence

Dietary patterns: Breast cancer

- This systematic review update includes 26 studies that examined the relationship between dietary patterns and risk of breast cancer, met inclusion criteria, and were published between January 2014 and January 2020:
    - Three studies were randomized controlled trials (RCTs),[1-3]
    - Twenty-one were prospective cohort studies (PCSs),[4-24] and

    - Two studies were nested case-control studies.[25,26]
- The studies were heterogeneous, in terms of which methods were used to identify or assess dietary patterns, how dietary intake was assessed, and duration of follow-up (f/u). However, despite this heterogeneity, the body of evidence was consistent in the types of foods and beverages examined in a number of the patterns, particularly in those studies that reported statistically significant associations with lower risk of breast cancer.
    - In a number of studies, dietary patterns that included vegetables, fruits, and whole grains, and that were lower in animal products and refined carbohydrates, were associated with reduced risk of postmenopausal breast cancer.
    - Alcohol was not consistently included within the patterns found to be inversely associated with breast cancer risk.
    - Few studies reported results for premenopausal breast cancer risk.
- The studies were direct and generalizable, in that the populations, interventions, comparators, and outcomes of interest in the included studies were directly related to the systematic review question, and were applicable to the U.S. population.
- The body of evidence had several risks of bias, particularly in the observational studies, including lack of adjustment for all key confounders, assessment of a dietary pattern only once at baseline or in the first few years of f/u, and a lack of accounting for possible changes in dietary intake that may have occurred over f/u.
- This systematic review updates and concurs with the conclusions drawn by the 2015 Committee.[ii]

Dietary patterns: Colorectal cancer

- This systematic review update includes 24 studies that examined the relationship between dietary patterns and risk of colorectal cancer, met inclusion criteria, and were published between January 2014 and January 2020:
    - Two studies were RCTs,[1,2]
    - Twenty-one studies were PCSs,[4,7,16,24,27-43] and,
    - One study was a nested case-control study.[44]
- The studies were heterogeneous, in terms of which methods were used to identify or assess dietary patterns, how dietary intake was assessed, and duration of f/u. However, despite this heterogeneity, the body of evidence was consistent in the types of foods and beverages examined in a number of the patterns, particularly in those studies that reported statistically significant associations with lower risk of colorectal cancer.
    - In a number of studies, dietary patterns that included vegetables, fruits,

[ii] Dietary Guidelines Advisory Committee. Scientific Report of the 2015 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture. US Department of Agriculture, Agricultural Research Service. https://health.gov/our-work/food-nutrition/2015-2020-dietary-guidelines/advisory-report. Published 2015. Accessed April 30, 2020.

legumes, whole grains, lean meats and seafood, and low-fat dairy, and that were lower in red and processed meats, saturated fat, sodas, and sweets were associated with lower risk of colorectal cancer.
    - Alcohol was not consistently included within the patterns found to be inversely associated with colorectal cancer risk.
    - Results were more consistent in men, and for total colorectal cancer risk.
- The studies were direct and generalizable, in that that the populations, intervention, comparators, and outcomes of interest in the included studies were directly related to the systematic review question and were applicable to the U.S. population.
- The body of evidence had several risks of bias, particularly in the observational studies, including lack of adjustment for all key confounders, assessment of a dietary pattern only once at baseline or in the first few years of f/u, and a lack of accounting for possible changes in dietary intake that may have occurred over f/u.
- This systematic review updates the conclusions drawn by the 2015 Committee. The 2020 Committee determined that the body of evidence included in this update was consistent with that considered by the 2015 Committee, with the exception of alcohol. Because alcohol was not consistently part of the patterns found to be significantly associated with lower colorectal cancer risk, and in some cases, were part of cases associated with increased risk, “moderate alcohol” was removed from the conclusion statement.

Dietary patterns: Lung cancer

- This systematic review update includes 7 PCSs [4,14,24,27,45-47] and one nested case-control study[48] that examined the relationship between dietary patterns and risk of lung cancer, met inclusion criteria, and were published between January 2014 and January 2020.
- Though the body of evidence had some inconsistencies in direction and magnitude of effect, most studies reported significant associations between adherence to a dietary pattern and lower risk of lung cancer.
    - In several studies, dietary patterns containing more frequent servings of vegetables, fruits, seafood, grains and cereals, legumes and lean vs. higher fat meats and lower fat or non-fat dairy products were associated with lower risk of lung cancer
    - The protective effects of the patterns were more consistent among participants who were former smokers and current smokers than among participants who were never smokers.
    - Alcohol was not consistently included within the patterns found to be inversely associated with lung cancer risk.
- Most studies had large analytic sample sizes with a sufficient number of lung cancer cases occurring over f/u to examine associations. However, the width of confidence intervals indicates some degree of imprecision within the body of evidence.
- The studies were direct and generalizable, in that the populations, intervention, comparators, and outcomes of interest in the included studies were directly

related to the systematic review question, and were applicable to the U.S. population.
- The body of evidence had several risks of bias, including lack of adjustment for all key confounders, assessment of dietary pattern only once at baseline or in the first few years of f/u, and a lack of accounting for possible changes in dietary intake that may have occurred over f/u.
- This systematic review updates and concurs with the conclusions drawn by the 2015 Committee.

Dietary patterns: Prostate cancer

- This systematic review update includes 7 PCSs[4,6,7,14,16,49,50] and one nested case-control study[51] that examined the relationship between dietary patterns and risk of prostate cancer, met inclusion criteria, and were published between January 2014 and January 2020.
- Though the direction and magnitude of effect across the body of evidence was inconsistent, most studies reported no significant associations between adherence to a dietary pattern and risk of prostate cancer.
- Most studies had large analytic sample sizes with a sufficient number of prostate cancer cases occurring over f/u to examine associations. However, the width of confidence intervals indicates some degree of imprecision within the body of evidence.
- The studies were direct and generalizable, in that the populations, exposures, comparators, and outcomes of interest in the included studies were directly related to the systematic review question, and were applicable to the U.S. population.
- The body of evidence had several risks of bias, including lack of adjustment for all key confounders, assessment of a dietary pattern only once at baseline or in the first few years of f/u, and a lack of accounting for possible changes in dietary intake that may have occurred over f/u.
- This systematic review updates the review done by the 2015 Committee, which did not draw a conclusion regarding the relationship between dietary patterns and the risk of prostate cancer due to limited evidence from a small number of studies with wide variation in study design, dietary assessment methodology and prostate cancer outcome ascertainment. The 2020 Committee determined that, based on the 8 additional studies in their update, limited evidence is now available to suggest no relationship between dietary patterns and risk of prostate cancer.

Dietary patterns: Breast cancer

Description of the evidence

This systematic review update includes 26 studies that examined the relationship between dietary patterns and risk of breast cancer, met inclusion criteria, and were published between January 2014 and January 2020. (**Table 1**). Three studies are randomized controlled trials (RCTs),[1-3] 21 are prospective cohort studies,[4-24] and 2 are

nested case-control studies.[25,26]

Population/participant characteristics

The studies included in this systematic review were conducted in Canada, [25] France [5-7,14,16] Japan,[15,22] Spain,[3] Sweden,[11,17] The Netherlands,[23,24] the United Kingdom,[26] the United States,[1,2,8-10,12,13,19-21], and Europe (Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, United Kingdom).[4,18]

Two studies reported results from the same RCT,[1,2] but reported results at different lengths of f/u. Four studies are from the same cohort in France, [5,7,14,16] 2 were from the same European cohort,[4,18] and 2 each were from 2 U.S. cohorts[9,21,12,13] but examined different dietary patterns in relation to breast cancer risk.

Sample sizes of the studies were large, ranging from 2,492 to 330,766 participants. Studies enrolled women, and mean age of participants at baseline ranged from approximately 38 years to 64 years. Mean BMI ranged from ~21 to 28 kg/m^2.

All studies excluded participants with prevalent or prior history of cancer, and some excluded participants who were diagnosed with cancer during the first 2 or 3y of f/u.[4,6,7] Studies included participants who were healthy and/or at risk of chronic disease, or diagnosed with a chronic disease other than cancer. One study excluded participants who had a history of stroke, cardiovascular disease, or diabetes at baseline.[15]

Intervention/exposure

Included studies examined dietary patterns using a variety of methods (**Table 1**). Two RCTs tested an intervention with increased vegetables, fruits, and grains, and decreased carbohydrates, and total, saturated, and unsaturated fat,[1,2] and another tested an intervention of a Mediterranean diet with extra-virgin olive oil, with nuts, or with decreased fat intakes.[3] Fourteen observational studies examined adherence to dietary patterns using different indices or scores.[4-7,10,12,14,16-19,21,23,24,26] Five studies identified dietary patterns using factor analysis [12,15,22,25,26] and 5 studies identified dietary patterns using reduced rank regression.[8,9,11,13,26] One study examined variations of vegetarian diets.[20]

Dietary intake was assessed using a variety of validated dietary assessment methods, including food frequency questionnaires, 24-hour dietary recalls, or dietary records. Most studies assessed diet once, at baseline, and 9 studies collected dietary data at baseline and at least one other time during f/u [1-3,5-7,14,16,19].

Outcome assessment

All included studies examined risk of developing breast cancer, with f/u ranging from 4y to 23y. Most studies reported risk of total breast cancer. Nine studies examined risk of premenopausal breast cancer,[5,7,12-15,17,22,25] 13 studies examined risk of postmenopausal breast cancer, [5,7,9-11,14,15,17,18,20,22,25,26] and 5 studies examined risk of invasive breast cancer.[1,2,8,9,21]

Evidence synthesis

Results from the included articles in this systematic review are provided in **Table 1** and **Table 2**. Prentice et al[1] and Thomson et al[2] reported results from the Women's Health

Initiative Dietary Modification Trial, conducted in the United States. Both reported no difference between intervention and comparison groups in risk of total or invasive breast cancer during f/u, through 19.6 y. However, Thomson et al[2] did report that women with higher baseline fat intake (quartiles) had significantly reduced risk of invasive breast cancer.

Toledo et al[3] reported results from the Prevención con Dieta Mediterránea (PREDIMED) trial in Spain. They found that breast cancer risk after 4.8y f/u was significantly reduced after consuming a Mediterranean diet supplemented with extra-virgin olive oil compared to a control low-fat diet.

Catsburg et al[25] reported results from 2 Canadian cohorts, the Canadian Study of Diet, Lifestyle and Health (CSDLH), and the National Breast Screening Study (NBSS). Higher adherence to the Meat and potatoes pattern was associated with increased risk of postmenopausal breast cancer in both the CSDLH and NBSS cohorts. However, the Meat and potatoes pattern was not associated with total risk of breast cancer or risk of premenopausal breast cancer in either cohort. Higher adherence to the Healthy pattern in the CSDLH cohort at 60y was associated with decreased risk of breast cancer after 13y f/u. However, results were not significant when pre- and postmenopausal women were analyzed separately. In addition, there was no significant association between adherence to the healthy pattern at 40-59y in the NBSS cohort and risk of breast cancer after 23y f/u. Adherence to the Ethnic pattern was not significantly associated with risk of breast cancer in either the CSDLH or NBSS cohort.

Deschasaux et al,[5] Deschasaux et al,[4] and Donnenfeld et al[6] examined the Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score and breast cancer risk in different cohorts, from France and several European countries. Deschausaux et al [4] found that consuming a diet that scores higher on the FSAm-NPS at 51y was associated with increased risk of breast cancer after 15.3y f/u. Deschausaux et al[5] found that higher FSAm-NPS score at 51y was significantly associated with increased risk of total and premenopausal breast cancer after 4y f/u. However, FSAm-NPS score was not significantly associated with risk of postmenopausal breast cancer. Finally, Donnenfeld et al[6] reported that FSAm-NPS score at 49y was not significantly associated with risk of breast cancer after 12.6y f/u.

Fiolet et al[7] examined an ultra-processed food score in a French cohort and found that higher ultra-processed food score at 49y was significantly associated with increased risk of postmenopausal breast cancer after 5.4y f/u. The higher score, when analyzed continuously, was also associated with higher risk of total breast cancer. However, ultra-processed food score at 49y was not significantly associated with risk of total breast cancer after 5.4y f/u, when analyzed categorically. It was also not associated with risk of premenopausal breast cancer (categorically or continuously).

Guinter et al[8] and Guinter et al[9] examined an estrogen-related dietary pattern (ERDP), derived using reduced rank regression, in 2 different cohorts from the United States. Guinter et al[8] found that higher ERDP score at 62y was significantly associated with increased risk of total and invasive breast cancer after 10.9y f/u. However, Guinter et al[9] reported that ERDP score at 58y was not significantly associated with risk of total

postmenopausal or invasive breast cancer after 6-12y f/u. Harris et al[11] examined a different estrogen dietary pattern, also derived using reduced rank regression, and reported that higher adherence to an estrogen dietary pattern at 62y was significantly associated with increased risk of breast cancer after 15y f/u.

Haridass et al[10] examined several different dietary pattern indices/scores in a U.S. cohort, and found that aMED, DASH, AHEI-2010, and Paleo scores at 40y were not significantly associated with risk of postmenopausal breast cancer risk after ~14y f/u.

Harris et al[12] and Harris et al[13] examined several different dietary patterns in the same cohort of women from the U.S. Harris et al[12] found that, in all women, higher adherence to the 'Prudent' pattern during adolescence was significantly associated with reduced risk of breast cancer after 22y f/u. However, there was no significant association with risk of premenopausal breast cancer risk. In addition, adherence to the 'Western', 'Fast food', and AHEI patterns during adolescence were not significantly associated with risk of total or premenopausal breast cancer risk after 22y f/u. Harris et al[13] found that higher adherence to an inflammatory dietary pattern during adolescence was significantly associated with increased risk of premenopausal breast cancer after 22y f/u. However, adherence to the inflammatory dietary pattern was not significantly associated with total or postmenopausal breast cancer risk. Results were similar when the early adulthood inflammatory pattern was analyzed, and when adolescent and early adult inflammatory patterns were averaged, except for the results for all cases of breast cancer. When the inflammatory dietary pattern was calculated based on an average of adolescence and young adulthood, higher adherence was significantly associated with increased risk of total breast cancer after 22y f/u.

Kane-Diallo et al[14] found that a pro plant-based dietary score at 49y, in a French cohort, was not significantly associated with risk of breast cancer, including pre- and postmenopausal breast cancer, after 4.3y f/u.

Kojima et al[15] examined dietary patterns in a Japanese cohort, and found that a higher animal food pattern adherence at 55y was significantly associated with increased premenopausal breast cancer risk after 16.9y f/u. However, animal food pattern adherence was not significantly associated with postmenopausal breast cancer risk. In addition, adherence to the vegetable pattern or the dairy product pattern at 55y were not significantly associated with postmenopausal breast cancer risk after 16.9y f/u.

Lavalette et al[16] found that, in a French cohort of women, scores representing AHEI-2010, Mediterranean diet score (MEDI-LITE), and French National Nutrition Health Program-Guideline Score (PNNS-GS) at 49y were not significantly associated with risk of breast cancer after 8.5y f/u.

Li et al[17] examined a cohort of Swedish women, and found the Healthy Nordic food index score at 39y was not significantly associated with risk of breast cancer (total, pre- and post-menopausal) after 20y f/u.

McKenzie et al[18] derived and examined a diet score in a large European cohort, reporting that a higher diet score at 53y was significantly associated with reduced risk of postmenopausal breast cancer after 10.9y f/u.

Nomura et al[19] examined women in a cohort from the U.S., and found that adherence

to the World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) diet score at 38y was not significantly associated with risk of breast cancer after 13.9y f/u when analyzed categorically or continuously. In addition, adherence to the WCRF/AICR diet score was also not significantly associated with breast cancer risk when analyzed categorically, time-varying. However, a higher WCRF/AICR score, diet only, time-varying, analyzed continuously, was associated with significantly decreased risk of breast cancer after 13.9y f/u.

In a cohort from the United States, Penniecook-Sawyers et al[20] examined four different vegetarian dietary patterns compared to a non-vegetarian dietary pattern. Results showed that adherence to the various vegetarian patterns at 64y were not significantly associated with risk of total or premenopausal breast cancer after 7.8y f/u.

Petimar et al[21] examined several different dietary patterns scores in a U.S. cohort, and found that a higher DASH score at 55y was significantly associated with reduced risk of total invasive breast cancer after 7.6y f/u. AHEI-2010 and aMED scores, with and without alcohol, at 55y, were not significantly associated with risk of total invasive breast cancer after 7.6y f/u.

Pot et al[26] examined several dietary patterns, dervied using different methodologies, in a case-control study using cases and controls from 4 cohorts within the United Kingdom. The Medieterranean diet score; a principal component analysis (PCA) identifying three dietary patterns; and a reduced rank regression (RRR) informed by response variables alcohol, total fat, and fiber were created. Using RRR, a high response score for alcohol was associated with a higher risk of total or postmenopausal breast cancer.

Shin et al[22] identified several dietary patterns using factor analysis in a Japanese cohort. Higher adherence to a Westernised dietary pattern at 57y was significantly associated with increased risk of breast cancer after 14.6y f/u. When pre- and post-menopausal breast cancer were analyzed separately, only post-menopausal breast cancer risk was significantly associated with Westernized dietary pattern adherence. Adherence to a prudent or traditional Japanese dietary pattern at 57y was not significantly associated with risk of breast cancer after 14.6y f/u. Results were similar when pre- and post-menopausal breast cancer were analyzed separately.

Van den Brandt et al[23] examined several dietary patterns scores in a cohort from the Netherlands. Alternative Mediterranean Diet (aMED) and mMED scores, with and without alcohol, were not significantly associated with risk of breast cancer after 20.3y f/u. Results were also not significant when stratified by years of f/u, age at baseline, smoking status, alcohol intake, BMI, physical activity, and family history of breast cancer. Also, aMED vs. WCRF, diet only, scores were not significantly associated with breast cancer risk.

Voortman et al[24] examined women from three sub-cohorts of the Rotterdam Study, and found the Dutch Dietary Guidelines 2015 score at 64y was not significantly associated with breast cancer after 11y f/u.

Assessment of the evidence[iii]

This systematic review update included 26 studies that met inclusion criteria, including 3 RCTs and 23 observational studies. The studies were heterogeneous, both in terms of the methods used to identify or assess dietary patterns, how dietary intake was assessed, and in duration of f/u. However, despite this heterogeneity there was consistency in the types of foods and beverages examined in a number of the patterns, particularly in those studies that reported statistically significant associations with lower risk of breast cancer. In a number of studies, dietary patterns that included vegetables, fruits, and whole grains, and were lower in animal products and refined carbohydrate, were associated with reduced risk of post-menopausal breast cancer. Fewer studies reported results for pre-menopausal breast cancer risk.

Publication bias is always a consideration, however it is not a serious concern for this body of evidence because a mix of significant and non-significant findings were reported.

As outlined and described below, the body of evidence examining dietary patterns and risk of breast cancer was assessed for the following elements used when grading the strength of evidence.

- **Risk of bias**: The included studies had a number of potential risks of bias, or limitations that may have influenced study results (**Table 1**; **Table 3**; **Table 4**). While observational studies accounted for a number of potential confounders, they did not adjust for all key confounders, such as race/ethnicity, hormonal contraceptive use, or socioeconomic status. All studies, regardless of study design, examined dietary patterns once at baseline or in the first few years of f/u, and did not account for possible changes in dietary intake that may have occurred over f/u. In addition, the studies enrolled older individuals, and did not account for dietary patterns consumed earlier in life. None of the studies fully accounted for and/or analyzed the impact of missing data, either due to loss to f/u or criteria used when selecting participants into the analyses. Finally, because preregistered statistical plans are uncommon for observational studies, the risk of potential selective outcome reporting is unclear.

- **Consistency:** Though there were some inconsistencies in the direction and magnitude of effect across the body of evidence, most studies reporting significant results found that dietary patterns including vegetables, fruits and whole grains, and were lower in animal products and refined carbohydrate, were associated with reduced risk of breast cancer. Results were primarily reported for risk of postmenopausal breast cancer risk, as fewer studies examined premenopausal breast cancer.

[iii]A detailed description of the methodology used for grading the strength of the evidence is available on the NESR website: https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews and in Part C of the following reference: Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.

- **Directness:** The populations, intervention or exposures, comparators, and outcomes of interest in the included studies are directly related to the systematic review question.

- **Precision:** Though the included studies did not report power analyses or sample size calculations, the majority had large analytic sample sizes with a sufficient number of breast cancer cases, particularly postmenopausal breast cancer cases, occurring over f/u to examine associations. However, there were fewer cases of premenopausal breast cancer. The width of confidence intervals indicates some degree of imprecision within the body of evidence.

- **Generalizability**: The study participants, interventions and/or exposures, comparators, and outcomes examined in the body of evidence are applicable to the U.S. population.

This systematic review updates and concurs with the conclusion drawn by the 2015 Dietary Guidelines Advisory Committee.[iv] The 2015 Committee concluded that, "Moderate evidence indicates that dietary patterns rich in vegetables, fruits and whole grains, and lower in animal products and refined carbohydrate, are associated with reduced risk of postmenopausal breast cancer. The data regarding this dietary pattern and premenopausal breast cancer risk point in the same direction, but the evidence is limited due to fewer studies." The 2015 conclusion was based on 26 articles, including 1 RCT, and 25 prospective cohort studies, that were published between January 2000 and January 2014. The 2020 Committee determined that the body of evidence included in this update was consistent with that considered by the 2015 Committee.

Research recommendations

The 2020 Committee concurs with the 2015 Committee that to better assess the relationship between dietary patterns and risk of developing breast cancer, additional research is needed to:

1. Improve and validate novel dietary assessment tools for the accurate assessment of dietary patterns over the life course, including the use of biomarkers
2. Adopt methodologic approaches for defining different dietary patterns such that patterns can be consistently identified, scored and compared across studies
    - Assess associations of vegetarian diet patterns, particularly vegan diets and risk of breast cancer
    - Examine the relationship of highly processed food patterns with breast cancer risk
3. Establish population studies starting earlier in life to better capture dietary

[iv] Dietary Guidelines Advisory Committee. *Scientific Report of the 2015 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture*. US Department of Agriculture, Agricultural Research Service. https://health.gov/our-work/food-nutrition/2015-2020-dietary-guidelines/advisory-report. Published 2015. Accessed April 30, 2020.

patterns contributing to risk of breast cancer risk later in life. Important considerations would be addressing phases of the life cycle relevant to breast cancer, including childhood and menarche, adolescence and periods of mammary gland development and growth, periods of reproduction and lactation and subsequent years prior to cancer development

4. Assess associations of dietary patterns by subtypes of breast cancer defined by histopathologic outcomes, tumor hormone receptor status, molecular genotypes, gene expression patterns and other biological characteristics that influence the tumor behavior, for example, by tumor hormone receptor status and other relevant phenotypic characteristics (e.g. HER2 status)
5. Examine how anthropometry, physical activity, sedentary behaviors, and sleep modify the relationship between dietary patterns and risk of breast cancer.
6. Examine the impact of SES and ethnic/racial groups regarding dietary patterns and breast cancer.

Dietary patterns: Colorectal cancer

Description of the evidence

This systematic review update includes 24 articles, including 2 articles from one randomized controlled trial,[1,2] and 21 prospective cohort studies,[4,7,16,24,27-43] and one nested case-control study[44] that examined the relationship between dietary patterns and risk of colorectal cancer, met inclusion criteria, and were published between January 2014 and January 2020 (**Table 5**).

Population/participant characteristics

The randomized controlled trial included in this systematic review[1,2] was conducted among 48,835 postmenopausal women, mean age ~62 y, from the United States. The studies reported risk of colorectal cancer at different f/u time points (13.5y and 19.6y).

The observational studies included in this systematic review were conducted in France, Japan, Sweden, The Netherlands, the United Kingdom, the United States, and a multi-country study from Europe (Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, United Kingdom). Two studies are from the same cohort in France ("NutriNet-Sante"),[7,16] but examined different dietary patterns in relation to colorectal cancer risk. Five studies were from the same cohorts in the United States (Nurses' Health Study, Health Professionals F/u Study),[31,32,35,38,39] four of which examined different dietary patterns.

Sample sizes of the studies were large, ranging from 8,050 to 471,495 participants. Most studies enrolled women and men, with the mean age of participants at baseline ranging from approximately 39 years to 64 y. Four studies enrolled women only.[29,36,41,43] Mean BMI of participants ranged from approximately 24 to 28 kg/m^2.

The health status of study participants enrolled in the studies was representative of the general population, including healthy individuals, as well as those at-risk for or diagnosed with a chronic disease. All studies excluded participants with prevalent or prior history of cancer, and some excluded participants who were diagnosed with

cancer during the first 1-2y of f/u.[4,7,29,41] In addition, several studies excluded individuals with a history of ulcerative colitis,[31,32,35,38] and one study excluded participants with end-stage renal disease, a history of colorectal polyps, or a first-degree relative with colon cancer.[40]

Intervention/exposure

Included studies examined dietary patterns using a variety of methods (**Table 5**). The randomized controlled trial compared a low-fat diet with fruits, vegetables, and grains to a control diet. Most studies examined adherence to dietary patterns using different indices or scores, [4,7,16,24,27-29,34-36,38-44]. Three studies identified dietary patterns using factor or cluster analysis[30,32,37] one study used reduced rank regression to derive dietary patterns,[31] and one study examined variations of vegetarian diets.[33]

Dietary intake was assessed using a variety of validated dietary assessment methods, including food frequency questionnaires, 24-hour dietary recalls, or dietary records. Most studies assessed diet once, at baseline, though several studies collected dietary data on 2 or more occasions.[7,16,27,31,32,35,38,39]

Outcome assessment

All included studies examined risk of developing colorectal cancer, with f/u ranging from 4y to 20y. All studies reported risk of overall colorectal cancer.

Additionally 4 studies also examined risk of rectal and colon cancer separately,[30,33,41,42] and 8 others further examined rectal colon, proximal colon, and distal colon separately.[29,32,34,35,37-39,44]

Evidence synthesis

Randomized controlled trials

Thomson et al[2] and Prentice et al[1] reported results from the Women's Health Initiative Dietary Modification Trial in the United States (**Table 5** and **Table 6**). The trial compared a low-fat diet, higher in fruits, vegetables, and whole and total grains, to a control diet, and reported no significant group differences in risk of colorectal cancer during the intervention, and after all f/u time points (8.5y, 13.5y, and 19.6y).

Observational studies

Mediterranean diet scores

A number of observational studies examined adherence to a Mediterranean diet, using various different indices and scores, and found that higher adherence was associated with decreased risk, especially among men (**Table 5** and **Table 6**). Fasanelli et al[28] reported that higher adherence to the Italian Mediterranean Index at 50y was significantly associated with decreased risk of colorectal cancer after 11y f/u, and the reported association was independent of waist-to-hip ratio. Jones et al[29] found that higher adherence to the Mediterranean diet score at 52y was significantly associated with lower risk of colorectal and rectal cancer after 17.4y f/u. However, the Mediterranean diet score at 52y was not significantly associated with colon, proximal colon, or distal colon cancer. Park et al[34] reported that higher adherence to a Mediterranean diet at 60y was significantly associated with lower risk of colorectal cancer after 16y f/u in men, but not women. And, when results were stratified by race,

greater adherence was significantly associated with lower risk of colorectal cancer in all groups, except African Americans. Results from Petimar et al[35] showed that higher adherence to a Mediterranean diet at 55y was significantly associated with lower risk of rectal cancer after 26y f/u. When women and men were analyzed separately, results were significant in men, but not in women. In addition, higher adherence in men was also associated with lower risk of total colorectal cancer. However, adherence in men and women was not significantly associated with different types of colorectal cancer (colorectal, colon, distal colon, proximal colon). Schulpen and van den Brandt[44] found the Mediterranean diet score, with and without alcohol, at 61y was not significantly associated with colorectal cancer risk after 20.3y f/u. Results were also not significant when stratified by smoking status in men, alcohol consumption, body mass index, education, or family history of colorectal cancer. However, in women former smokers, greater adherence to the aMEDr was significantly associated with lower risk of colorectal cancer. Torres Stone et al[40] also examined a Mediterranean diet score and found that higher scores were significantly associated with lower risk of colorectal cancer after 123 months f/u in men, but not in women.

Several studies examined adherence to a Mediterranean diet, and reported no significant associations with risk of colorectal cancer. Boden et al[27] and Lavalette et al[16] both found the Mediterranean diet score was not significantly associated with risk of colorectal cancer after 15y and 8.5y of f/u in men and women. And, both Cheng et al[43] and Vargas et al[41] examined data from cohort of women-only, and found that Mediterranean diet score was not significantly associated with risk of colorectal cancer after 18.1y and 12.4y of f/u, respectively.

DASH diet score

All studies that examined adherence to the DASH diet, reported statistically significant associations showing that higher adherence was associated with lower risk of colorectal cancer (**Table 5** and **Table 6**). Park et al[34] found that in both men and women, higher DASH adherence was associated with lower risk of colorectal cancer after 16y f/u. Higher adherence was also associated with significantly lower risk of left colon and rectum cancer, but not right colon cancer. And, when results were stratified by race, increased adherence was significantly associated with lower risk of colorectal cancer in all groups, except African Americans. Petimar et al[35] found that while DASH score at 55y was not significantly associated with colorectal cancer (colorectal, colon, distal colon, proximal colon, rectal cancer) after 26y f/u, in men, greater DASH adherence was significantly associated with lower total colorectal, total colon, and distal colon cancer risk. Results from Torres Stone et al[40] showed that in both men and women, higher DASH score was significantly associated with lower risk of colorectal cancer after 123 months f/u. Additionally, Vargas et al[41] reported that higher DASH scores at 63y were significantly associated with decreased risk of colorectal and colon cancer after 12.4y f/u, but not rectal cancer.

Dietary guidelines-related scores

Several studies examined adherence to the Dietary Guidelines for Americans, using either the Healthy Eating Index 2010 (HEI-2010) or the Alternative Healthy Eating Index 2010 (AHEI-2010) (**Table 5** and **Table 6**)). Results consistently showed that

higher HEI-2010 scores were associated with lower risk of colorectal cancer. However, results for the AHEI-2010 were less consistent, particularly among women. Park et al[34] examined both the Healthy Eating Index 2010 (HEI-2010) and the alternative HEI-2010. In men, increased adherence to the HEI-2010 and AHEI-2010 at 60y were significantly associated with lower risk of colorectal cancer after 16y f/u. In women, greater adherence to the HEI-2010, but not the AHEI-2010, was significantly associated with lower risk of colorectal cancer. HEI-2010 and AHEI-2010 scores were also associated with significantly lower risk of left colon and rectum cancer, but not right colon cancer. Furthermore, when results were stratified by race, increased adherence to both scores was significantly associated with lower risk of colorectal cancer in all groups, except African Americans. Vargas et al[41] also examined both the HEI-2010 and the AHEI-2010 in data from a cohort of women, and found that higher HEI-2010 score at 63y was significantly associated with decreased risk of colorectal and colon cancer after 12.4y f/u, but not rectal cancer. But, AHEI-2010 score was not significantly associated with risk of colorectal, colon, or rectal cancer. Torres Stone et al[40] examined the HEI-2010 and found that in both men and women, higher HEI-2010 scores were significantly associated with lower risk of colorectal cancer after 123 months f/u. Petimar et al[35] reported that AHEI-2010 score at 55y, in men and women pooled, was not significantly associated with colorectal cancer (colorectal, colon, distal colon, proximal colon, rectal cancer) after 26y f/u. However, in men only, higher AHEI-2010 adherence was significantly associated with lower total colorectal cancer risk. Finally, Lavalette et al[16] found that AHEI-2010 score at 49y was not significantly associated with risk of colorectal cancer.

Other indices and scores

A variety of additional indices and scores were also examined in this body of evidence (**Table 5** and **Table 6**), and those results are described below.

Some studies reported that higher adherence to various scores was associated with lower risk of colorectal cancer. Liu et al[31] found that higher empirical dietary inflammatory pattern score at 52y was associated with significantly greater risk of colorectal cancer, but this was only significant for quintile 2. Comparisons between the rest of the quintiles were not significant. Lavalette et al[16] found that higher French National Nutrition Health Program-Guideline Score (PNNS-GS) when analyzed continuously (but not categorically) at 49y was associated with significantly lower risk of colorectal cancer after 8.5y f/u. Voortman et al[24] found that higher Dutch Dietary Guidelines 2015 score at 64y was significantly associated with lower risk of colorectal cancer after 11y f/u. Additionally, Vulcan et al[42] reported that higher colorectal diet quality index score at 59y was significantly associated with lower risk of colorectal, colon, and rectal cancer after f/u.

Some studies reported no significant associations between various scores and risk of colorectal cancer. Cheng et al[43] found the evolutionary-concordance diet score at 61y was not associated with risk of colorectal cancer over a 18y period of f/u. Fiolet et al[7] reported the ultra-processed food score at 49y was not significantly associated with risk of colorectal cancer after 5.4y f/u. Results from Roswall et al[36] showed that the Healthy Nordic Food Index score at 39y was not significantly associated with risk of

colorectal cancer during f/u. Schulpen and van den Brandt[44] found that WCRF/AICR scores, with and without alcohol, at 61y was not significantly associated with colorectal cancer risk after 20.3y f/u. Results were also not significant when stratified by smoking status in men, alcohol consumption, body mass index, education, or family history of colorectal cancer.

Finally, some studies reported that higher adherence to various scores emphasizing less healthful foods was associated with increased risk of colorectal cancer. Deschasaux et al[4] reported that consuming a diet that scores higher on the Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) at 51y was associated with a higher risk of colorectal cancer after 15.3y of f/u. Tabung et al[38] found that higher adherence to EDIP scores for up to 26 y of f/u, which represented a proinflammatory diet, was significantly associated with risk of colorectal cancer, colon cancer, proximal colon cancer, distal colon cancer in men, women, and both combined, as well as risk of rectal cancer in men. Results were not significant for rectal cancer risk in women or men/women combined. In addition, when stratified by BMI < or >25 kg/m^2, results were significant for men in both groups, and only in women with BMI<25 kg/m^2. When stratified by alcohol intake (no drink, 0.1-1 drink/day, >1 drink/d), results were significant for men consuming no drinks or 0.1-1 drink/day, and in women consuming no drinks.Tabung et al[39] also found that the higher empirical dietary index for hyperinsulinemia (EDIH) scores at 55y were significantly associated with higher risk of colorectal cancer after 26y f/u. Results were similar for men only, women only, and men and women combined for colorectal, colon, and distal colon cancer. Results were also significant for women only and for men and women combined for proximal colon cancer, and in men only for rectal cancer. However, EDIH scores were not significantly associated with proximal colon cancer in men only, or in rectal cancer in women only or men and women combined. When stratified by BMI < or >25 kg/m^2, results were significant for men in both groups, and only in women with BMI>25 kg/m^2. When results were stratified by physical activity (MET-hour/wk below/above median), results were significant for men and women below the median.

Other dietary patterns

Three studies examined dietary patterns that were identified using factor or cluster analysis (**Table 5** and **Table 6**). Kumagai et al[30] found that higher adherence to a high-dairy, high-fruit-and-vegetable, low, alcohol dietary pattern at 60y was significantly associated with lower risk of colorectal and rectal cancer after 11y f/u. The Japanese dietary pattern and animal food dietary patterns were not significantly associated with risk of colorectal cancer. In addition, none of the patterns were significantly associated with risk of colon or rectal cancer, analyzed as separate outcomes. Mehta et al[32] found that higher adherence to a prudent dietary pattern at 52y was significantly associated with lower risk of colorectal cancer after 32y f/u. However, it was not significantly associated with proximal colon, distal colon, or rectal cancer. Results for the prudent dietary pattern were similar in women; however, in men, higher prudent diet score was significantly associated with decreased risk of distal colon and rectal cancer. Conversely, higher adherence to a western dietary pattern was shown to be significantly associated with increased risk of colorectal, distal colon, and rectal

cancer. However, it was not significantly associated with proximal colon cancer. And, results for the western dietary pattern were similar when men and women were analyzed separately. Results from Shin et al[37] also showed that higher adherence to a prudent dietary pattern was significantly associated with decreased risk of colorectal cancer and distal cancer in men and increased risk of rectal cancer in women. And, higher adherence to a westernized dietary pattern was significantly associated with increased risk of colon cancer and distal cancer in women.

Finally, one study, Orlich et al[33], examined various types of vegetarian diets (**Table 5** and **Table 6**). Results showed that consuming a vegetarian vs. nonvegetarian diet at 58y was associated with a significant reduction in risk of colorectal cancer after 7.3y f/u. When results were broken down by type of vegetarian diet, consuming a pescovegetarian diet vs a nonvegetarian diet at 58y was associated with lower risk, while there were no differences with vegan, lacto-ovo, or semi-vegetarian diets. When results were stratified by sex and race, they were no significant associations in men or Black participants. However, in women and non-black vegetarians, there was a borderline significant lower risk of colorectal cancer. And, vegetarian diet at 58y was not significantly associated with risk of rectal or colon cancer after 7.3y f/u, when they were analyzed separately.

Assessment of the evidence[v]

This systematic review update includes 24 articles, including 2 articles from one RCT and 21 prospective cohort studies. The studies were heterogeneous, both in terms of which methods were used to identify or assess dietary patterns, how dietary intake was assessed, and in duration of f/u. However, despite this heterogeneity, the body of evidence was consistent in the types of foods and beverages examined in a number of the patterns, particularly in those studies reporting statistically significant associations with lower risk of colorectal cancer. In a number of studies, dietary patterns that included vegetables, fruits, legumes, whole grains, lean meats and seafood, and low-fat dairy, and were lower in red and processed meats, saturated fat, sodas, and sweets were associated with lower risk of colorectal cancer. While alcohol was included in many of the dietary patterns, there was inconsistency in how it was treated within the patterns (e.g., a positive, neutral, or negative contributor for various indices and scores) and in analyses (e.g., analysis of scores with or without alcohol, stratification by alcohol intake).

Publication bias is always a consideration, however it is not a serious concern for this body of evidence because a mix of significant and non-significant findings were reported.

As outlined and described below, the body of evidence examining dietary patterns and

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[v]A detailed description of the methodology used for grading the strength of the evidence is available on the NESR website: https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews and in Part C of the following reference: Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.

risk of colorectal cancer was assessed for the following elements used when grading the strength of evidence.

- **Risk of bias**: The included studies had a number of potential risks of bias, or limitations that may have influenced study results (**Table 5**; **Table 7**; **Table 8**). While observational studies adjusted for a number of potential confounders, they did not account for all key confounders, such as race/ethnicity, inflammatory bowel disease, and colorectal polyps. All studies, regardless of study design, examined dietary patterns once at baseline or in the first few years of f/u and did not account for possible changes in dietary intake that may have occurred over f/u. In addition, the studies enrolled older individuals, and did not account for dietary patterns consumed earlier in life. None of the studies fully accounted for and/or analyzed the impact of missing data, either due to loss to f/u or criteria used when selecting participants into the analyses. Finally, because preregistered statistical plans are uncommon for observational studies, the risk of potential selective outcome reporting is unclear.

- **Consistency:** Though there were some inconsistencies in the direction and magnitude of effect across the body of evidence, most studies that reported significant associations found that dietary patterns that included vegetables, fruits, legumes, whole grains, lean meats and seafood, and low-fat dairy, and were lower in red and processed meats, saturated fat, sodas, and sweets were associated with lower risk of colorectal cancer. Alcohol was not consistently included within the patterns found to be inversely associated with colorectal cancer risk. Results were most consistent in men, and for total colorectal cancer risk.

- **Directness:** The populations, interventions and/or exposure, comparators, and outcomes of interest in the included studies are directly related to the systematic review question.

- **Precision:** Though the included studies did not report power analyses or sample size calculations, the majority had large analytic sample sizes with a sufficient number of colorectal cancer cases. However, there were fewer cases of colon, rectal, proximal colon, and distal colon cancer. The width of confidence intervals indicates some degree of imprecision within the body of evidence.

- **Generalizability**: The study participants, interventions and/or exposures, comparators, and outcomes examined in the body of evidence are applicable to the U.S. population.

This systematic review updates the conclusion drawn by the 2015 Dietary Guidelines Advisory Committee.[vi] The 2015 Advisory Committee concluded that, “Moderate

[vi] Dietary Guidelines Advisory Committee. *Scientific Report of the 2015 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture*. US Department of Agriculture, Agricultural Research Service. https://health.gov/our-work/food-nutrition/2015-2020-dietary-guidelines/advisory-report. Published 2015. Accessed April 30,

evidence indicates an inverse association between dietary patterns that are higher in vegetables, fruits, legumes, whole grains, lean meats and seafood, low-fat dairy and moderate alcohol; and low in red and processed meats, saturated fat and sodas and sweets relative to other dietary patterns and the risk of colon and rectal cancer. Conversely, diets that are higher in red and processed meats, French fries and potatoes, and sources of sugars (e.g., sugar-sweetened beverages, sweets and dessert foods) are associated with a greater colon and rectal cancer risk." The 2015 conclusion was based on 22 articles, including 1 RCT, and 21 prospective cohort studies, that were published between January, 2000 and January, 2014. The 2020 Dietary Guidelines Advisory Committee determined that the body of evidence included in this update was consistent with that considered by the 2015 Committee, with the exception of alcohol. Because alcohol was not consistently part of the patterns found to be significantly associated with lower colorectal cancer risk, and in some cases, were part of cases associated with increased risk, "moderate alcohol" was removed from the conclusion statement.

Research recommendations

The 2020 Committee concurs with the 2015 Committee that in order to better assess the relationship between dietary patterns and risk of developing colorectal cancer, additional research is needed to:

1. Improve and validate dietary assessment tools for the accurate assessment of dietary patterns over the life course, include the use of biomarkers
2. Adopt methodologic approaches for defining different dietary patterns such that patterns can be consistently identified, scored and compared across studies. However, recognize exploratory pattern definitions and analysis can assist with discovery especially as food supply changes
3. Establish cohort studies that start earlier in life in order to capture dietary patterns contributing to risk of colorectal cancer risk later in life
4. Examine the impact of gender, SES and ethnic/racial groups regarding dietary patterns and colorectal cancer
5. Examine dietary patterns in context of physical activity and sedentary behaviors
6. Continue to explore the role of energy balance and obesity (including patterns of weight change throughout the life cycle) and anthropometric measures in colorectal cancer risk
7. Assess associations of dietary patterns by sub-types of colorectal cancer defined by location within the colon, cancer genetics and other histopathologic characteristics
    - Assess associations of vegetarian dietary patterns and risk of colorectal cancer
    - Examine the relationship of highly processed food patterns with breast cancer risk
8. Continue to define the role of specific nutrients, phytochemicals and foods that may individually or in combination contribute to risk of colorectal cancer

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2020.

9. Examine the interactives roles of dietary intake and the gut microbiome and its influence on colorectal cancer risk.

Dietary patterns: Lung cancer

Description of the evidence

This systematic review update includes 7 prospective cohort studies [5,14,24,27,45-47] and one nested case-control study[48] that examined the relationship between dietary patterns and risk of lung cancer, met inclusion criteria, and were published between January 2014 and January 2020 (**Table** 9).

Population/participant characteristics

The studies included in this systematic review were conducted in Australia,[46] France,[14] Italy,[47] the Netherlands,[24,48] Sweden,[27] the United States,[45] and Europe (Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, United Kingdom).[4] Sample sizes of the studies were large, ranging from 4,336 to 460,700 participants. Studies enrolled older adults, mean age of participants at baseline ranged from approximately 51 years to 64 years. Mean BMI was ~24-27kg/m^2.

All studies excluded participants with prevalent or prior history of cancer, and some excluded participants who were diagnosed with cancer during the first 1y to 3y of f/u.[4,24,27] Studies included participants who were healthy and/or at risk of chronic disease, or diagnosed with a chronic disease other than cancer. One study excluded all participants who had a history of or existing diabetes, heart attack, or angina at baseline,[46] and another excluded participants with end-stage renal disease.[45]

Intervention/exposure

All 8 studies examined adherence to dietary patterns using indices or scores (**Table 9**; **Table 10**).[5,14,24,27,45-48] However, the studies differed in terms of the indices or scores assessed.

Dietary intake was assessed using a variety of validated dietary assessment methods, including food-frequency questionnaires, 24-hour dietary recalls, or dietary records. Most studies assessed diet once, at baseline, though 2 studies assessed diet at multiple time points during the first 1-2 years of f/u.[14,27]

Outcome assessment

All included studies examined risk of developing lung cancer, with f/u ranging from 4y to 20y. All studies reported risk of total lung cancer.

Evidence synthesis

Results reported in the studies included in this systematic review were mixed (**Table 9**; **Table 10**). In a large cohort from the United States, Anic et al[45] found that higher adherence to the HEI-2010, AHEI-2010, aMED, and DASH scores at 62y were all associated with significantly lower risk of lung cancer after 10.5y f/u. When they analyzed by smoking status, AHEI-2010, aMED, and DASH score results remained significant for former smokers, but were no longer significant for never or current

smokers. For HEI-2010, results remained significant for former and current smokers, but were no longer significant for never smokers.

Maissoneuve et al[47] also examined adherence to the aMED, in an Italian cohort, and reported that a higher aMED score at >50y was associated with significantly lower risk of lung cancer after 8.5y f/u. Hodge et al[46] examined a different Mediterranean diet score in an Australian cohort, reporting that a higher score at 40-69y was associated with significantly lower risk of lung cancer after 18y f/u. When they analyzed by smoking status, results remained significant in current smokers, but were no longer significant in never and former smokers. However, Boden et al[27] examined a Mediterranean diet score in a Swedish cohort at 46 y and found no significant association with risk of lung cancer after 15y f/u.

Schulpen and van den Brandt[48] implemented a nested case-cohort approach in the Netherlands, and examined several different dietary patterns scores, including 2 variations on Mediterranean diet scores, including the aMED, in relation to risk of lung cancer. Schulpen and van den Brandt[48] analyzed all diet scores with and without alcohol. Results showed that aMED and mMED, and WCRF/AICR scores, with and without alcohol, at 61y were not significantly associated with lung cancer after 20.3y f/u. Though, in men, WCRF/AICR score with alcohol was significantly associated with lower risk of lung cancer.

Deschasaux et al[4] reported that in a group of European men, score on the Nutrient Profiling System of the British Food Standards Agency dietary index (modified version) (FSAm-NPS DI) at 51y was not significantly associated with risk of lung cancer after 15.3y f/u in men and women combined, or in women-only. However, in men only, higher FSAm-NPS score was significantly associated with increased risk of lung cancer.

Kane-Diallo et al[14] found that a higher pro plant-based dietary score, among a group of French participants who were 57y at baseline, was associated with a significantly reduced risk of lung cancer after 4.3y f/u.

Voortman et al[24] applied the Dutch Dietary Guidelines 2015 score to inform disease incidence among men and women at 64y. With regard to lung cancer, after 11y f/u in a group of participants from the Netherlands, adherence to the guidelines was not significantly associated with lung cancer.

Assessment of the evidence[vii]

This systematic review update included 8 studies that met inclusion criteria, and all were observational studies. The studies varied in terms of which dietary patterns were examined, how dietary intake was assessed, and in duration of f/u. However, despite

[vii]A detailed description of the methodology used for grading the strength of the evidence is available on the NESR website: https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews and in Part C of the following reference: Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.

this heterogeneity, most studies reported significant associations between higher adherence to a dietary pattern higher in fruits, vegetables, whole grains, fish, and legumes, and lower in red and processed meat and dairy products and lower risk of lung cancer, particularly among participants who were current or former smokers, and therefore at higher risk of lung cancer. Many studies adjusted for smoking status, including factors such as current or former smoking status, duration of smoking, or cigarettes per day. Other stratified analyses by smoking status, reported different results in former or current smokers compared to never smokers. However, while it is apparent that smoking status may modify the effect of dietary patterns on risk of lung cancer, it unclear whether there may be residual confounding or reverse causality that may be impacting the results.

Publication bias is always a consideration, however it is not a serious concern for this body of evidence because a mix of significant and non-significant findings were reported.

As outlined and described below, the body of evidence examining dietary patterns and risk of lung cancer was assessed for the following elements used when grading the strength of evidence.

- **Risk of bias**: The included studies had a number of potential risks of bias, or limitations that may have impacted study results (**Table 9** and **Table 11**). While studies adjusted for a number of potential confounders, including smoking, they did not adjust for all key confounders, such as race/ethnicity, history of lung disease, or environmental exposure to lung carcinogens. All studies examined dietary patterns once at baseline or in the first few years of f/u, and did not account for possible changes in dietary intake that may have occurred over f/u. In addition, the studies enrolled older individuals, and did not account for dietary patterns consumed earlier in life. None of the studies fully accounted for and/or analyzed the impact of missing data, either due to lost to f/u or criteria used when selecting participants into the analyses. Finally, because preregistered statistical plans were not available for some of the included articles, the risk of potential selective outcome reporting is unclear.

- **Consistency:** Though there were some inconsistencies in the direction and magnitude of effect across the body of evidence, most studies reported significant associations between higher adherence to a dietary pattern higher in fruits, vegetables, whole grains, fish, and legumes, and lower in red and processed meat and dairy products and lower risk of lung cancer. Most studies had large analytic sample sizes with a sufficient number of prostate cancer cases occurring over f/u to examine associations. However, the width of confidence intervals indicates some degree of imprecision within the body of evidence.

- **Directness:** The populations, interventions and/or exposures, comparators, and outcomes of interest in the included studies are directly related to the systematic review question.

- **Precision:** Though the included studies did not report power analyses or sample size calculations, the majority had large analytic sample sizes with a sufficient number of lung cancer cases occurring over f/u to examine associations. However, the width of confidence intervals indicates some degree of imprecision within the body of evidence.

- **Generalizability**: The study participants, interventions and/or exposures, comparators, and outcomes examined in the body of evidence are applicable to the U.S. population.

This systematic review updates and concurs with the conclusion drawn by the 2015 Dietary Guidelines Advisory Committee.[viii] The 2015 Advisory Committee concluded that, "Limited evidence from a small number of studies suggests a lower risk of lung cancer associated with dietary patterns containing more frequent servings of vegetables, fruits, seafood, grains and cereals, legumes and lean vs. higher fat meats and lower fat or non-fat dairy products. Despite reported modest significant reductions in risk, definitive conclusions cannot be established at this time because of the small number of articles, as well as wide variation in study design, dietary assessment and case ascertainment." The 2015 conclusion was based on three prospective cohort studies published between January 2000 and January 2014. The 2020 Dietary Guidelines Advisory Committee determined that the 8 additional studies in this update are consistent with the 2015 conclusion.

Research recommendations

The 2020 Committee concurs with the 2015 Committee that in order to better assess the relationship between dietary patterns and risk of developing lung cancer, additional research is needed to:

1. Examine dietary patterns and associations with lung cancer risk among diverse ethnic/racial minority groups in the United States
2. Investigate how dietary patterns consumed across the life cycle, including children and in younger aged smokers impact the risk of lung cancer
3. Examine dietary patterns in association with smoking status (including smokers, ex-smokers, never smokers and passive smoking exposure) and by duration and amount of smoking with risk of lung cancer including possible biological mechanisms
4. Examine alternatives to tobacco smoking and/or vaping, and their associated with dietary intakes, body weight, and with risk of lung cancer
5. Consider histopathologic and molecular subtypes of lung cancer and whether dietary pattern and lung cancer association vary by subtype
6. Continue to define the role of specific nutrients, phytochemicals and foods that

[viii] Dietary Guidelines Advisory Committee. *Scientific Report of the 2015 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture*. US Department of Agriculture, Agricultural Research Service. https://health.gov/our-work/food-nutrition/2015-2020-dietary-guidelines/advisory-report. Published 2015. Accessed April 30, 2020.

may individually or in combination during various stages of the life cycle impact the risk of lung cancer.

Dietary patterns: Prostate cancer

Description of the evidence

This systematic review update includes 7 prospective cohort studies[5-7,14,16,49,50] and one nested case-control study[51] that examined the relationship between dietary patterns and risk of prostate cancer, met inclusion criteria, and were published between January 2014 and January 2020 (**Table 12**).

Population/participant characteristics

The studies included in this systematic review were conducted in France,[6,7,14,16] Japan,[49] the Netherlands,[51] the United States,[50] and Europe (Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, United Kingdom).[4] Three studies are from the same cohort in France,[7,14,16] but examined different dietary patterns in relation to prostate cancer risk. Sample sizes of the studies were large, ranging from 2,753 to 140,729 participants. Studies enrolled older men and mean age of participants at baseline ranged from approximately 43 y to 61 y. Mean BMI was ~24-25 kg/m^2.

All studies excluded participants with prevalent or prior history of cancer, and some excluded participants who were diagnosed with cancer during the first 2 or 3y of f/u.[4,6,7] Studies included participants who were healthy and/or at risk of chronic disease or diagnosed with a chronic disease other than cancer.

Intervention/exposure

Included studies examined dietary patterns using a variety of methods (**Table 12**). Six studies examined adherence to dietary patterns using different indices or scores.[4,6,7,14,16,51] One study identified dietary patterns using factor analysis[49] and one study examined variations of vegetarian diets.[50]

Dietary intake was assessed using a variety of validated dietary assessment methods, including food-frequency questionnaires and dietary records. Most studies assessed diet once, at baseline, though the 3 studies from one cohort in France collected dietary data using at least 3 dietary records collected at different specified times during the first 1-2 years of f/u.[7,14,16]

Outcome assessment

All included studies examined risk of developing prostate cancer, with f/u ranging from 4y to 20y. All studies reported risk of overall prostate cancer. Additionally, three studies also examined risk of advanced prostate cancer,[49-51] one examined nonadvanced prostate cancer,[51] and one examined localized prostate cancer.[49]

Evidence synthesis

Results reported in the studies included in this systematic review were mixed, though many reported no significant associations between dietary patterns and risk of lung cancer (**Table 12**; **Table 13**). Deschasaux et al[4] reported that European men who consumed a diet that scored higher on the Nutrient Profiling System of the British Food Standards Agency dietary index (modified version) (FSAm-NPS DI) at 51y, had borderline significantly higher risk of prostate cancer after 15.3y f/u. However, Donnenfeld et al[6] found that FSAm-NPS DI score, in a cohort of French men, ~49y at baseline, was not significantly associated with risk of prostate cancer after 12.6y f/u.

All three studies from the same cohort in France, reported no significant relationships between various dietary patterns and risk of prostate cancer. Fiolet et al[7] found that an ultra-processed food score at 49y was not significantly associated with risk of prostate cancer after 5.4y f/u. Kane-Diallo et al[14] found that a pro plant-based dietary score at 57y was not significantly associated with risk of prostate cancer after 4.3y f/u. And, Lavalette et al[16] found that AHEI-2010, MEDI-LITE, and PNNS-GS scores at 55y were not significantly associated with risk of prostate cancer after 8.5y f/u.

Schulpen and van den Brandt[51] conducted a nested case-control study in the Netherlands, and examined several different dietary patterns scores, with and without alcohol, in relation to risk of total, nonadvanced, and advanced prostate cancer. Higher alternative Mediterranean Diet Score (aMED) score (continuous and categorical) with and without alcohol was associated with significantly increased risk of nonadvanced prostate cancer after 20.3y f/u. In addition, the aMED score (continuous; categorical was borderline significant) with alcohol was significantly associated with all cases after 20.3y f/u. However, aMED scores, with and without alcohol, were not significantly associated with total risk of advanced prostate cancer after 20.3y f/u. Modified Mediterranean Diet (mMED) score, with and without alcohol, was not significantly associated with risk of prostate cancer, including nonadvanced and advanced prostate cancer, after 20.3y f/u. Finally, WCRF/AICR diet only score, with and without alcohol, was not significantly associated with risk of prostate cancer, including nonadvanced and advanced prostate cancer, after 20.3y f/u.

Shin et al[49] identified 3 dietary patterns using exploratory factor analysis in a cohort of men form Japan. Results showed that higher adherence to a “westernized pattern” at 56y was associated with significantly increased risk of total and localized prostate cancer after 13.8y f/u, but was not significantly associated with risk of advanced prostate cancer. Additionally, adherence to the “prudent pattern” and the “traditional pattern” at 56y were not significantly associated with risk of advanced prostate cancer after 13.8y f/u.

Finally, Tantamango-Bartley et al[50] examined various iterations of a vegetarian diet in relation to risk of prostate cancer. Results showed that consuming a vegan diet vs. a nonvegetarian diet was associated with a significantly lower risk of prostate cancer after 7.8y f/u. However, when stratified by race, results were only significant in white participants and not in black participants. In addition, consuming vegan, vegetarian, and nonvegetarian diets were not significantly associated with risk of advanced prostate cancer.

Assessment of the evidence[ix]

This systematic review update included 8 studies that met inclusion criteria, and all were observational studies. The studies were heterogeneous, both in terms of which dietary patterns were examined, how dietary intake was assessed, in duration of f/u, and in direct and magnitude of effect of reported results. Based on this assessment, a conclusion was drawn indicating that limited evidence suggests no relationship between dietary patterns and risk of prostate cancer.

Publication bias is always a consideration, however it is not a serious concern for this body of evidence because a mix of significant and non-significant findings were reported.

As outlined and described below, the body of evidence examining dietary patterns and risk of prostate cancer was assessed for the following elements used when grading the strength of evidence.

- **Risk of bias**: The included studies had a number of potential risks of bias, or limitations that may have impacted study results (**Table 12**; **Table 14**). While studies adjusted for a number of potential confounders, they did not adjust for all key confounders, such as race/ethnicity. All studies examined dietary patterns once at baseline or in the first few years of f/u, and did not account for possible changes in dietary intake that may have occurred over f/u. In addition, the studies enrolled older individuals, and did not account for dietary patterns consumed earlier in life. None of the studies fully accounted for and/or analyzed the impact of missing data, either due to lost to f/u or criteria used when selecting participants into the analyses. Finally, because preregistered statistical plans were not available for many of the included articles, the risk of potential selective outcome reporting is unclear.

- **Consistency:** The direction and magnitude of effect across the body of evidence was inconsistent. Most studies reported no significant associations between adherence to a dietary pattern and risk of prostate cancer. Though some studies reported significant associations depending on prostate cancer type (advanced, nonadvanced), whether dietary pattern score was examined categorically or continuously, if alcohol was included or excluded from the dietary pattern score, or subject characteristics (e.g., race), the reported associations were not consistent across the body of evidence.

- **Directness:** The populations, intervention, comparators, and outcomes of interest in the included studies are directly related to the systematic review question.

[ix]A detailed description of the methodology used for grading the strength of the evidence is available on the NESR website: https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews and in Part C of the following reference: Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.

- **Precision:** Though the included studies did not report power analyses or sample size calculations, the majority had large analytic sample sizes with a sufficient number of prostate cancer cases occurring over f/u to examine associations. However, the width of confidence intervals indicates some degree of imprecision within the body of evidence.

- **Generalizability**: The study participants, interventions and/or exposures, comparators, and outcomes examined in the body of evidence are applicable to the U.S. population.

This systematic review updates the conclusion drawn by the 2015 Committee.[x] The 2015 Committee concluded that, "No conclusion can be drawn regarding the relationship between dietary patterns and the risk of prostate cancer. This is due to limited evidence from a small number of studies with wide variation in study design, dietary assessment methodology and prostate cancer outcome ascertainment. (Grade: Grade Not Assignable)." This conclusion was based on seven prospective cohort studies published between January, 2000 and January, 2014. The 2015 Committee noted that most of the studies included in that review did not detect clear or consistent relationships between dietary patterns and risk of prostate cancer. The 2020 Dietary Guidelines Advisory Committee determined that, based on the 8 additional studies in this update, there is now limited evidence to suggest no relationship between dietary patterns and risk of prostate cancer.

Research recommendations

The 2020 Committee concurs with the 2015 Committee that in order to better assess the relationship between dietary patterns and risk of developing prostate cancer, additional research is needed to:

1. Investigate how dietary patterns consumed across the life cycle impact the risk of prostate cancer later in life, including childhood and adolescence, mid-life and later years.
2. Examine the impact of other potential confounders on the relationship between dietary patterns and prostate cancer risk, including PSA and DRE screening history, family history and genetics and the use of pharmaceutical agents impacting hormonal status.
3. Examine dietary patterns and associations with prostate cancer risk among diverse ethnic/racial minority groups in the United States.
4. Continue to explore the role of energy balance and obesity (including patterns of weight change throughout the life cycle), anthropometrics and physical activity in

[x] Dietary Guidelines Advisory Committee. *Scientific Report of the 2015 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture*. US Department of Agriculture, Agricultural Research Service. https://health.gov/our-work/food-nutrition/2015-2020-dietary-guidelines/advisory-report. Published 2015. Accessed April 30, 2020.

prostate cancer risk.

5. Continue to define the role of specific nutrients, phytochemicals and foods that may individually or in combination during various stages of the life cycle impact the risk of prostate cancer.
6. When designing studies and conducting data analyses consider the possibility that men consuming a protective dietary pattern may also be living longer with less comorbidity, less competing mortality and may be more likely to be screened over a longer time interval (higher chance of detecting prostate cancers).
7. Recognize that prostate cancer is a heterogeneous collection of diseases and that future evaluation of dietary patterns, as well as specific nutrients and dietary components, may be more informative when considering specific subtypes defined by aggressiveness or molecular phenotyping.

Included articles

1. Prentice RL, Aragaki AK, Howard BV, et al. Low-fat dietary pattern among postmenopausal women influences long-term cancer, cardiovascular disease, and diabetes outcomes. *J Nutr*. 2019;149(9):1565-1574. doi:10.1093/jn/nxz107.
2. Thomson CA, Van Horn L, Caan BJ, et al. Cancer incidence and mortality during the intervention and postintervention periods of the Women's Health Initiative dietary modification trial. *Cancer Epidemiol Biomarkers Prev*. 2014;23(12):2924-2935. doi:10.1158/1055-9965.Epi-14-0922.
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Table 1. Description of studies that examined the relationship between dietary patterns and breast cancer[xi]

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Randomized Controlled Trials			
Prentice, 2019[1] RCT (Women's Health Initiative Dietary Modification (DM) trial) United States Analytic N: 48835 (Intervention: 19541, Comparison: 29294) (Attrition: 0%) Participants were 100% female, ~62y (50-79y), 28.2 kg/m2, 51% never smokers	**Dietary patterns:** • Intervention group: Reduction in fat from ~35%E to 20%E, 5 servings/d fruits and vegetables, 6 serving/d grains; achieved reductions 8–10%E of total, saturated, and unsaturated fat, reductions in 8–10% of carbohydrate, and increased vegetables, fruit, and grains vs. comparison. • Comparison group: Received written health-related materials only; lower intakes of fruits, vegetables, whole grains, and total grains **Dietary assessment methods:** Adherence was monitored using FFQs at baseline, 1y, and every 3y thereafter	**Significant:** N/A **Non-Significant:** There were no significantly differences in postmenopausal invasive breast cancer risk during the intervention or after 19.6y f/u between the intervention vs. comparison groups.	**Key confounders accounted for:** N/A for RCTs **Other:** Baseline hazard stratified on age at random assignment, ethnicity, hysterectomy status, prior disease (if applicable), randomization status in the hormone therapy trials, and study phase **Limitations:** • The intensity of the intervention may have differed between groups, as the intervention group received more intensive education than the comparison **Funding Sources**: NIH *Summary: There were no difference between intervention and comparison groups in risk of*

[xi] **Abbreviations:** AHEI-2010, Alternative Healthy Eating Index-2010; aMED, Alternative Mediterranean Diet Score ; BMI, body mass index; CSDLH, Canadian Study of Diet, Lifestyle and Health; CVD, Cardiovascular disease; d, day; DASH, Dietary Approaches to Stop Hypertension; DM, dietary modification; DP, Dietary pattern; %E, % of energy; EPIC, European Prospective Investigation into Cancer and Nutrition; ERDP, Estrogen-related dietary pattern, EVOO, extra-virgin olive oil; FFQ, food frequency questionnaire; FSAm-NPS, Nutrient Profiling System of the British Food Standards Agency (modified version); f/u, follow-up; HNFI, Healthy Nordic food index ; HR, hazard ratio; IMI, Italian Mediterranean Index; MEDI-LITE, Mediterranean diet score; MD, Mediterranean diet; MDS, Mediterranean Diet Score; mMED, modified Mediterranean diet score; mo, month(s); N/A, Not applicable; NBSS, National Breast Screening Study; NIH, National Institutes of Health; NOVA, Ultra-processed food score; NS, Not significant; NR, Not reported; PCS, prospective cohort study; pt, point; RCT, randomized controlled trial; SEER, Surveillance, Epidemiology, and End Results Program; WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; wk, week(s); y, year(s)

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	Outcome assessment methods: US National Cancer Institute's SEER system		*postmenopausal breast cancer during the 8.5y intervention or over 19.6y f/u.*
Thomson, 2014[2] RCT (Women's Health Initiative Dietary Modification (DM) trial) United States Analytic N: 48835 (Intervention: 19541, Comparison: 29294) (Attrition: 0%) Participants were 100% female, ~62y (50-79y), 28.2 kg/m2, 51% never smokers	**Dietary patterns:** • Intervention group: Reduction in fat from ~35%E to 20%E, 5 servings/d fruits and vegetables, 6 serving/d grains; achieved reductions 8–10%E of total, saturated, and unsaturated fat, reductions in 8–10% of carbohydrate, and increased vegetables, fruit, and grains vs. comparison. • Comparison group: Received written health-related materials only; lower intakes of fruits, vegetables, whole grains, and total grains **Dietary assessment methods:** Adherence was monitored using FFQs at baseline, 1y, and every 3y thereafter **Outcome assessment methods:** US National Cancer Institute's SEER system (Note: This paper also examined various molecular subtypes of breast cancer; results for molecular subtypes were not extracted in this table)	**Significant:** Women with higher baseline fat intake (quartiles) had significantly reduced risk of postmenopausal breast cancer (p=0.03): • During the intervention: HR: 0.76, 95% CI: 0.62, 0.92 • During post-intervention f/u: HR: 1.11, 95% CI: 0.84, 1.4 **Non-Significant:** There were no significant differences in invasive postmenopausal breast cancer risk after 5.2y, 8.5y, or 13.5y f/u between the intervention vs. comparison groups.	**Key confounders accounted for:** N/A for RCTs **Other:** N/A **Limitations:** • The intensity of the intervention may have differed between groups, as the intervention group received more intensive education than the comparison **Funding Sources:** NIH *Summary: There were no difference between intervention and comparison groups in risk of invasive postmenopausal breast cancer during the 8.5y intervention or over 19.6y f/u.* *However, women with higher baseline fat intake (quartiles) had significantly reduced risk of invasive postmenopausal breast cancer.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Toledo, 2015[3] RCT (PREDIMED Trial) Spain Analytic N: 4152 Participants were 100% female, 60-80y Excluded women with previous breast cancer (~3% of original sample)	**Dietary patterns:** • Mediterranean diet (MD) with extra-virgin olive oil (EVOO): MD supplemented with EVOO (provided 1L per week); MD diet included live oil for cooking and dressing; fruit, vegetables, legumes and fish; reduced total meat consumption, white meat instead of red or processed meat; homemade sauce with tomato, garlic, onion and spices with olive oil to dress vegetables, pasta, rice and other dishes; avoidance of butter, cream, fast food, sweets, pastries and sugar-sweetened beverages; and moderate red wine • MD with mixed nuts: MD supplemented with mixed nuts (MD-nuts), with 30g per day of mixed nuts (15g walnuts, 7.5g hazelnuts and 7.5g almonds) • Control diet: Consumed similar food groups, but were counseled to also decrease fat intake in accordance with American Heart Association guidelines **Dietary assessment methods:** Screening questionnaires were used to asses adherence to assigned diet **Outcome assessment methods:** Medical records, death certificate review (Note: This paper also examined various molecular subtypes of breast cancer; results for molecular subtypes were not extracted in this table)	**Significant:** Postmenopausal Breast cancer after 4.8y f/u: • Control, n=18/12 523: HR: 1.00 • MD+EVOO, n=17/5829: HR: 0.31, 95% CI: 0.13, 0.77 • MD+Nuts, n=8/7031: HR: 0.53, 95% CI: 0.23, 1.26 • MD diets combined, n=10/5492: HR: 0.41, 95% CI: 0.19, 0.86 Results were similar when excluding diagnosed within first year. In the stratified analyses by age (< or >67y), smoking (never, ever), alcohol intake (< or >25g/d), diabetes mellitus (yes, no), BMI (< or >30kg/m2), use of hormone therapy (yes, no), family history of cancer (no, yes), baseline MD adherence (low, high), all but 2 point estimates (for MD+nuts vs. control, among participants with BMI>30 and for those with high baseline adherence to MD) showed an inverse association between the MD+EVOO intervention and the incidence of breast cancer. **Non-Significant:** N/A	**Key confounders accounted for:** N/A for RCTs **Other:** Adjusted for Age, BMI, hormone therapy use, physical activity, total energy intake, alcohol consumption, age at menopause, baseline MD adherence, recruitment center, education to account for intra-cluster correlations in participants who were not individually randomized, considering as clusters the households and each of the clinics of Site D that were allocated in clusters **Limitations:** • Some concerns about bias due to randomization **Funding Sources:** Spanish government (Instituto de Salud Carlos III); supplemental foods were donated by Patrimonio Comunal Olivarero and Hojiblanca (EVOO), California Walnut Commission (walnuts), Borges SA (almonds) and La Morella Nuts (hazelnuts) *Summary: Consuming a MD diet with EVOO or nuts was significantly decreased risk of postmenopausal breast cancer after 4.8 y/fu, comapred to a control low-fat diet.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Observational Studies			
Catsburg, 2015[25] Nested Case-Control Study and PCS (Canadian Study of Diet, Lifestyle and Health (CSDLH), National Breast Screening Study (NBSS)) Canada Analytic N: CSDLH: 4417, NBSS: 49410 Subjects were 100%, female, ~60yo (49-77y): CSDLH and 40-59y: NBSS, ~23.5kg/m^2: CSDLH and NR: NBSS, ~54% never smokers: CSDLH and NR: NBSS, ~3.4g/d alchohol: CSDLH and NR: NBSS Exclusion criteria: NR	**Dietary patterns:** Adherence to 3 dietary patterns identified using principal components factor analysis using CSDLH data, and replicated using confirmatory factor analysis using NBSS data: • "Healthy" pattern: Higher loadings for vegetable and legume food groups • "Ethnic" pattern: Higher loading for rice, spinach, fish, tofu, liver, eggs, and salted and dried meat • "Meat and potatoes" pattern: Higher loadings for red meat groups and potatoes **Dietary assessment methods:** 166-item, validated FFQ at baseline (CSDLH); 86-item, validated FFQ at baseline (NBSS) **Outcome assessment methods:** Canadian Cancer Registry, National Mortality Database	**Significant:** "Healthy" pattern at ~60y (CSLDH) and total breast cancer after 13y f/u: • Q1, n=125: HR: 1.00 • Q2, n=258: HR: 0.93, 95% CI: 0.74, 1.18 • Q3, n=270: HR: 0.78, 95% CI: 0.61, 0.99 • Q4, n=391: HR: 0.80, 95% CI: 0.64, 1.01 • Q5, n=452: HR: 0.73, 95% CI: 0.58, 0.91 • p-trend=0.0001 Results for the "Healthy" pattern were no longer significant when pre- and postmenopausal breast cancer were analyzed separately. "Meat and potatoes" pattern at ~60y (CSLDH) and postmenopausal breast cancer after 13y f/u: • Q1, n=57: HR: 1.00 • Q2, n=66: HR: 0.80, 95% CI: 0.55, 1.18 • Q3, n=148: HR: 1.49, 95% CI: 1.07, 2.07 • Q4, n=149: HR: 1.21, 95% CI: 0.87, 1.69	**Key confounders accounted for:** Sex, age, physical activity, BMI, family history of the cancer outcome, aenopausal status **Other:** Energy intake, other dietary patterns **Limitations:** • Did not account for race/ethnicity, socioeconomic status, alcohol intake (in adults), smoking, hormonal contraceptive • Criteria used to select subjects into the analysis not reported • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Breast Cancer Research Foundation *Summary: Higher adherence to the "Healthy" pattern in the CSLDH cohort at 60y was associated with decreased risk of breast cancer after 13y f/u. However, results were not significant when pre- and postmenopausal women were analyzed separately. In addition, there was no significant associated between adherence to the "healthy" pattern at 40-59y*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		• Q5, n=205: HR: 1.26, 95% CI: 0.92, 1.73 • p-trend=0.043 "Meat and potatoes pattern" at 40-59y (NBSS) and postmenopausal breast cancer after ~23y f/u: • Q1, n=358: HR: 1.00 • Q2, n=361: HR: 1.03, 95% CI: 0.85, 1.24 • Q3, n=399: HR: 1.22, 95% CI: 0.98, 1.52 • Q4, n=365: HR: 1.17, 95% CI: 0.91, 1.50 • Q5, n=338: HR: 1.31, 95% CI: 0.98, 1.76 • p-trend=0.043 **Non-Significant:** "Healthy pattern" at 40-59y (NBSS) was not significantly associated with breast cancer after ~23y f/u, in all women combined and when pre- and postmenopausal women were analyzed separately. "Meat and potatoes" pattern at 40-59y (NBSS) was not significantly associated with breast cancer after ~23y f/u, in all women combined or in premenopausal women.	*in the NBSS cohort and risk of breast cancer after 23y f/u.* *Adherence to the "Ethnic" pattern was not significantly associated with risk of breast cancer in either the CSLDH or NBSS cohort.* *Higher adherence to the "Meat and potatoes" pattern was associated with increased risk of postmenopausal breast cancer in both the CSLDH and NBSS cohorts. However, the "Meat and potatoes" pattern was not associated with total risk of breast cancer or risk of premenopausal breast cancer in either cohort.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		"Meat and potatoes" pattern at ~60y (CSLDH) was not significantly associated with breast cancer after 13y f/u, in all women combined or in premenopausal women. "Ethnic" pattern at 40-59y (NBSS) was not significantly associated with breast cancer after ~23y f/u, in all women combined and when pre- and postmenopausal women were analyzed separately. "Ethnic" pattern at ~60y (CSLDH) was not significantly associated with breast cancer after 13y f/u (p=0.073), in all women combined and when pre- and postmenopausal women were analyzed separately.	
Deschasaux, 2018[4] PCS (European Prospective Investigation into Cancer and Nutrition (EPIC)) Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, UK Analytic N: 330766	**Dietary patterns:** Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score, categorical (quintiles) and continuous (per 2 pt increment) • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fibers, proteins, and fruits/vegetables/legumes/nuts. • Higher FSAm-NPS score had higher intakes of alcohol, energy and red and processed meat, lower intakes of dietary fibers, vegetables, fruit, fish, and lean meat	**Significant:** FSAm-NPS score at 51y and postmenopausal breast cancer after 15.3y f/u: • Q1, n=2093: HR: 1.00 • Q2, n=2303: HR: 1.04, 95% CI: 0.98, 1.1 • Q3, n=2403: HR: 1.03, 95% CI: 0.97, 1.10 • Q4, n=2682: HR: 1.07, 95% CI: 1.01, 1.14 • Q5, n=2636: HR: 1.06, 95% CI: 0.99, 1.14	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, height, family history of the cancer, hormonal contraceptive, menopausal status **Other:** Center, hormone replacement therapy, age at menarche, age at first full-term pregnancy, age at menopause, energy intake **Limitations:** • Did not account for race/ethnicity

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Subjects were 100% female, ~51yo, ~25.4 kg/m^2, 43% never-smokers, ~5.3 g/d alcohol Excluded those with prevalent cancer; cancer diagnosis in first 2y of f/u; missing data; implausible energy intake (~10% of original sample)	**Dietary assessment methods:** FFQs or 7-day diet records, validated, at baseline, age ~51y **Outcome assessment methods:** Record linkage with population-based cancer registries, health insurance records, pathology registries, and f/u with study subjects	• p-trend=0.05 Continuous, per 2pt increment, n=12063: HR: 1.02, 95% CI: 1.00, 1.04; p-trend=0.05 **Non-Significant:** N/A	• Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** French National Cancer Institute, European Commission, the International Agency for Research on Cancer *Summary: Consuming a diet that scores higher on the Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) at 51y was associated with increased risk of postmenopausal breast cancer after 15.3y f/u.*
Deschasaux, 2017[5] PCS (NutriNet-Santé) France Analytic N: 46864 Subjects were 100% female, ~51yo, ~24.1 kg/m^2, 48% never-smokers, ~6.5 g/d alcohol Excluded those with prevalent cancer; <35yo at baseline; at	**Dietary patterns:** Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score, categorical (quintiles) and continuous (per 2 pt increment) • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fibers, proteins, and fruits/vegetables/legumes/nuts. • Higher FSAm-NPS score had higher intakes of protein, fiber, fruit, vegetables, legumes, poultry, fish, and dairy, and lower intakes of energy, alcohol, fat, carbohydrate, red meat, processed meat,	**Significant:** FSAm-NPS score at 51y and total breast cancer after 4y f/u: • Q1, n=82: HR: 1.00 • Q2, n= 122: HR: 1.43, 95% CI: 1.08, 1.90 • Q3, n=117: HR: 1.43, 95% CI: 1.07, 1.91 • Q4, n=138: HR: 1.79, 95% CI: 1.35, 2.38 • Q5, n=96: HR: 1.52v 1.11, 2.08 • p-trend=0.002 FSAm-NPS score, continuous, and total breast cancer, n=555: HR:1.06, 95% CI: 1.02, 1.11 p-trend=0.005	**Key confounders accounted for:** Sex, Age, race/ethnicity, education, alcohol intake, physical activity, smoking, BMI, height, family history of cancer, hormonal contraceptive, menopausal status **Other:** Number of dietary records, energy intake, number of biological children, hormonal treatment for menopause **Limitations:** • Did not account for race/ethnicity • Only assessed dietary intake during first 2y of f/u; did not account for possible changes in dietary intake over f/u

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
least 3 valid 24-hr dietary records during first 2y f/u (~40% of original sample)	**Dietary assessment methods:** 3, 24-hour dietary recalls, assessed every 6mo during the first 2y of f/u, at age ~49y **Outcome assessment methods:** Participant report, medical record review, pathological reports	FSAm-NPS score at 51y and premenopausal breast cancer after 4y f/u: • Q1, n=12: HR: 1.00 • Q2, n=28: HR: 1.92, 95% CI: 0.97, 3.79 • Q3, n=31: HR: 1.89, 95% CI: 0.96, 3.71 • Q4, n=52: HR: 2.76, 95% CI: 1.45, 5.26 • Q5, n=48: HR: 2.46, 95% CI: 1.27, 4.75 • p-trend=0.004 FSAm-NPS score, continuous, and premenopausal breast cancer, n=171: HR: 1.09, 95% CI: 1.01, 1.18 p-trend=0.03 **Non-Significant:** FSAm-NPS score at 51y (categorical and continuous) was not significantly associated (p=0.09, p=0.06) with postmenopausal breast cancer after 4y f/u:	• No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Région Ile-de-France, Cancéropôle Ile-de-France and CORDDIM), Ministère de la Santé, Institut de Veille Sanitaire (InVS), Institut National de la Prévention etde l'Education pour la Santé (INPES), Région Ile-de-France (CORDDIM), Institut Nationalde la Santé et de la Recherche Médicale (INSERM), Institut National de la Recherche Agronomique (INRA), onservatoire National des Arts et Métiers (CNAM) and Université Paris 13 *Summary: Higher FSAm-NPS score at 51y was significantly associated with increased risk of total and premenopausal breast cancer after 4y f/u. However, FSAm-NPS score was not significantly associated with risk of postmenopausal breast cancer.*
Donnenfeld, 2015[6] PCS (SUpplémentation en VItamines et Minéraux AntioXydants cohort)	**Dietary patterns:** Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score, categorical (quintiles) and continuous (per 2 pt increment) • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium,	**Significant:** N/A **Non-Significant:** FSAm-NPS score at 49y (categorical and continuous) was not significantly associated with breast cancer after 12.6y f/u.	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, height, family history of the cancer, menopausal status **Other:** Intervention group of the initial SU.VI.MAX trial, number of dietary records, hormone replacement therapy, number of live births

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
France Analytic N: 6435 Subjects were 100% female, ~49yo, 34% BMI >25kg/m^2, 48% never-smokers, ~18.8g/d alcohol Excluded those with prevalent cancer; cancer diagnosis in first 3y of f/u; <6 24-hr recalls within the first 2y of f/u; implausible energy intake (~51% of original sample)	fibers, proteins, and fruits/vegetables/legumes/nuts. **Dietary assessment methods:** 3, 24-hour dietary recalls, assessed every 6mo for the first 2y of f/u, age ~49y **Outcome assessment methods:** Participant report, medical record review, pathological reports		**Limitations:** • Did not account for race/ethnicity, hormonal contraceptive use • Only assessed dietary intake during first 2y of f/u; did not account for possible changes in dietary intake over f/u • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** French Ministry of Health (DGS), National Institute for Prevention and Health Education (INPES) *Summary: Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score at 49y was not significantly associated with risk of breast cancer after 12.6y f/u.*
Fiolet, 2018[7] PCS (NutriNet-Santé) France Analytic N: 104,980 Subjects were 100% female, ~42.8yo, 23.8kg/m2 BMI, 83% never or former smokers, ~7.8g/d achohol	**Dietary patterns:** • Ultra-processed food score (NOVA), categorical (quartiles) ○ Main food groups contributing to NOVA score were sugary drinks, drinks, starchy foods and breakfast cereals, ultra-processed fruits and vegetables, dairy products, meats, fish, and eggs, processed meats, fats, and salty snacks **Dietary assessment methods:** 3, 24-hour dietary recalls, assessed every 6mo for the first 2y of f/u, age ~49y	**Significant:** Ultra-processed food score, continuous, and total breast cancer (n=739): HR: 1.11, 95% CI: 1.01, 1.21; p-trend=0.03 Ultra-processed food score at 49y and postmenopausal breast cancer after 5.4y f/u: Q1, n=90: HR: 1.00 Q2, n=70: HR: 1.23, 95% CI: 0.95, 1.59 Q3, n=55: HR: 1.27, 95% CI: 0.97, 1.65 Q4, n=49: HR: 1.38, 95% CI: 1.05, 1.81	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, height, family history of the cancer, hormonal contraceptive, menopausal status **Other:** Energy intake without alcohol, number of 24 hour dietary records, hormone replacement therapy, number of children, intakes of lipids, sodium, and carbohydrates, western dietary pattern **Limitations:** • Did not account for race/ethnicity

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Excluded those with prevalent cancer; <35yo at baseline; at least 2 valid 24-hr dietary records during first 2y f/u; diagnosis in first 2y of f/u (~40% of original sample)	**Outcome assessment methods:** Participant report, medical record review, pathological reports	p-trend=0.02 Ultra-processed food score, continuous, and postmenopausal breast cancer (n=264): HR: 1.13, 95% CI: 1.00, 1.27; p-trend=0.05 **Non-Significant:** Ultra-processed food score at 49y (categorical) was not significantly associated with total breast cancer after 5.4y f/u. Ultra-processed food score at 49y (categorical and continuous) was not significantly associatef with premenopausal breast cancer after 5.4y f/u.	• Only assessed dietary intake during first 2y of f/u; did not account for possible changes in dietary intake over f/u • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Région Ile-de-France, Cancéropôle Ile-de-France and CORDDIM), Ministère de la Santé, Institut de Veille Sanitaire (InVS), Institut National de la Prévention etde l'Education pour la Santé (INPES), Région Ile-de-France (CORDDIM), Institut Nationalde la Santé et de la Recherche Médicale (INSERM), Institut National de la Recherche Agronomique (INRA), onservatoire National des Arts et Métiers (CNAM) and Université Paris 13 *Summary: Higher ultra-processed food score at 49y was significantly associated with increased risk of postmenopausal breast cancer after 5.4y f/u. It was also associated with higher risk of total breast cancer, when analyzed continuously.* *However, ultra-processed food score at 49y was not significantly associated with risk of total breast cancer after 5.4y f/u, when analyzed categorically. It was also not associated with risk of premenopausal breast cancer (categorically or continuously).*
Guinter, 2018a (IJC)[8] PCS (Prostate, Lung, Colorectal and	**Dietary patterns:** Adherence to a dietary pattern identified using data from a subset of subjects (n=653) via	**Significant:**	**Key confounders accounted for:** Sex, age, race/ethnicity, education, alcohol intake, physical activity,BMI, BMI at age 20y,

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Ovarian Screening Trial) United States Analytic N: 27488 Subjects were 100% female, ~62yo, ~27kg/m2, ~58% never smokers, ~60% had 0-7 drinks/wk Excluded men, subjects without complete data, prevalent cancer (~30% of original sample)	reduced rank regression (response variables: unconjugated estradiol, ratio of 2- and 16-hydroxylated estrogen metabolites), categorical (quartiles) and continuous: • "Estrogen-related dietary pattern (ERDP)": Higher loadings for non-whole/refined grains, tomatoes, cruciferous vegetables, cheese, high omega-3 fish/shellfish, franks/luncheon meats, and lower in nuts/seeds, other vegetables, low omega-3 fish/shellfish, yogurt, coffee **Dietary assessment methods:** 137-item, validated, FFQ t baseline, age ~62y **Outcome assessment methods:** Participant f/u, National Death Index, physician reports, state cancer registries, next of kin reports (Note: This paper also examined various molecular subtypes of breast cancer; results for molecular subtypes were not extracted in this table)	"ERDP" score at 62y and total postmenopausal breast cancer after 10.9y f/u: ○ Q1, n=366: HR: 1.00 ○ Q2, n=393: HR: 1.08, 95% CI: 0.94, 1.25 ○ Q3, n=403: HR: 1.10, 95% CI: 0.95, 1.27 ○ Q4, n=431: HR: 1.14, 95% CI: 0.98, 1.32 ○ Continuous: HR: 1.09, 95% CI: 1.01, 1.18, p-trend=0.04 "ERDP" score at 62y and invasive postmenopausal breast cancer after 10.9y f/u: • Q1, n=280: HR: 1.00 • Q2, n=309: HR: 1.12, 95% CI: 0.95, 1.31 • Q3, n=331: HR: 1.18, 95% CI: 1.01, 1.39 • Q4, n=348: HR: 1.20, 95% CI: 1.02, 1.42 • Continuous: HR: 1.13, 95% CI: 1.04, 1.24, p-trend=0.005 **Non-Significant:** N/A	family history of the cancer outcome, menopausal status **Other:** Hormone therapy, total energy intake, bilateral oophorectomy, parity, recruitment center **Limitations:** • Did not account for smoking, hormonal contraceptive use • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** NIH *Summary: Higher "ERDP" score at 62y was significantly associated with increased risk of total and invasive breast cancer after 10.9y f/u.*
Guinter, 2018b (CEBP)[9]	**Dietary patterns:**	**Significant:** N/A	**Key confounders accounted for:**

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
PCS (Sister Study) United States Analytic N: 37925 Subjects were 100% female, ~58yo (35-74y), ~28kg/m2, ~55% never smokers, ~11% > 1drink/d Excluded subjects with prevalent cancer, premenopausal, extreme BMI, implausible energy intake, missing covariate data (~25% of original sample)	Adherence to a dietary pattern identified using reduced rank regression (response variables: unconjugated estradiol, ratio of 2- and 16-hydroxylated estrogen metabolites), categorical by quartile: • "Estrogen-related dietary pattern" (ERDP): Higher loading for non-whole/refined grains, tomatoes, cruciferous vegetables, cheese, high omega-3 fish/shellfish, franks/luncheon meats, and lower in nuts/seeds, other vegetables, low omega-3 fish/shellfish, yogurt, coffee **Dietary assessment methods:** 110-item, validated FFQ at baseline, ~58y **Outcome assessment methods:** Self-report, confirmed by medical records (Note: This paper also examined various molecular subtypes of breast cancer; results for molecular subtypes were not extracted in this table)	**Non-Significant:** "ERDP" score at 58y was not significantly associated with total postmenopausal breast cancer after 6-12y f/u. "ERDP" score at 58y was not significantly associated with invasive breast cancer after 6-12y f/u.	Sex, Age, Race/ethnicity, Alcohol intake, BMI, BMI at 30y, Family history of the cancer outcome, Menopausal status **Other:** Total energy intake, hormone therapy, age at menarche, parity, hysterectomy **Limitations:** • Did not account for socioeconomic status, physical activity, smoking, hormonal contraceptive use • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** NIH, Susan G. Komen *Summary: "ERDP" score at 58y was not significantly associated with risk of total postmenopausal or invasive breast cancer after 6-12y f/u.*
Haridass, 2018 [10] PCS (California Teachers Study)	**Dietary patterns:** • Alternative Mediterranean Diet Score (aMED)[xii], with and without alcohol, categorical (quintiles)	**Significant:** N/A **Non-Significant:**	**Key confounders accounted for:** Sex, age, race/ethnicity, socioeconomic status, alcohol intake, physical activity, smoking, BMI, family history of the cancer

[xii] Fung TT, Hu FB, McCullough ML, Newby PK, Willett WC, Holmes MD. Diet quality is associated with the risk of estrogen receptor-negative breast cancer in postmenopausal women. J Nutr 2006;136:466–72.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
United States Analytic N: 96959 Subjects were 100% female, ~40yo (22-104y), ~24.4kg/m2, ~24% ever smoked, ~7g/d alcohol Excluded subjects with self-reported history of diabetes, heart attack, stroke, or cancer; excessive missing data; implausible energy intake (~73% of the original sample)	○ Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat • DASH Index[xiii], categorical (quintiles) ○ Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy ○ Negative components: Red and processed meat, sweetened beverages, sodium • AHEI-2010[xiv], with and without alcohol, categorical (quintiles) ○ Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA ○ Neutral components: Alcohol ○ Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium • Paleo Index[xv], categorical (quintiles)	aMED score, with or without alcohol, at 40y was not significantly associated with postmenopausal breast cancer after ~14y f/u: DASH score at 40y was not significantly associated with postmenopausal breast cancer after ~14y f/u. AHEI-2010 score, with and without alcohol, at 40y was not significantly associated with postmenopausal breast cancer after ~14y f/u. Paleo score at 40y was not significantly associated with postmenopausal breast cancer after ~14y f/u.	outcome, hormonal contraceptive, menopausal status **Other:** Age at menarche, parity, total energy intake **Limitations:** • Excluded subjects with chronic diseases at baseline • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** NIH, California Breast Cancer Research Fund *Summary: aMED, DASH, AHEI-2010, and Paleo scores at 40y were not significantly associated with risk of postmenopausal breast cancer risk after ~14y f/u.*

[xiii] Fung TT, Hu FB, Hankinson SE, Willett WC, Holmes MD. Low carbohydrate diets, dietary approaches to stop hypertension-style diets, and the risk of postmenopausal breast cancer. Am J Epidemiol 2011;174:652–60.
[xiv] Chiuve SE, Fung TT, Rimm EB, Hu FB, McCullough ML, Wang M, Stampfer MJ, Willett WC. Alternative dietary indices both strongly predict risk of chronic disease. J Nutr 2012;142:1009–18.
[xv] Whalen KA, McCullough ML, Flanders WD, Hartman TJ, Judd S, Bostick RM. Paleolithic and Mediterranean diet pattern scores are inversely associated with biomarkers of inflammation and oxidative balance in adults. J Nutr 2016;146:1217–26.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	○ Positive components: Vegetables, fruit and vegetable diversity, fruit, nuts, fish, lean meat, calcium (from **Non-**dairy foods) ○ Negative components: Grains and starches, baked goods, red and processed meat, dairy foods, sugar-sweetened beverages, alcohol, sodium **Dietary assessment methods:** 103-item, validated FFQ at baseline, ~40y **Outcome assessment methods:** California Cancer Registry		
Harris, 2015 [11] PCS (Swedish Mammography Cohort) Sweden Analytic N: 37004 Subjects were 100% female, ~61.8yo, ~25kg/m2, ~22% current smokers, ~5g/d alcohol	**Dietary patterns:** Adherence to a dietary pattern identified via reduced rank regression (response variables: estradiol, estrone sulfate), categorical (quartiles) and continuous: • "Estrogen" dietary pattern: Higher loadings or red meat, legumes and pizza, and lower in coffee, whole grains **Dietary assessment methods:** 96-item, validated FFQ at baseline, ~62y **Outcome assessment methods:** Swedish Cancer registers (Note: This paper also examined various molecular subtypes of breast	**Significant:** "Estrogen" dietary pattern at 62y and postmenopausal breast cancer after 15y f/u: • Q1, n=363: HR: 1.00 • Q2, n=401: HR: 1.10, 95% CI: 0.92, 1.31 • Q3, n=414: HR: 1.13, 95% CI: 0.95, 1.35 • Q4, n=425: HR: 1.29, 95% CI: 1.08, 1.55 • p-trend=0.006 Continuous: HR: 1.03, 95% CI: 1.00, 1.05	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, height, family history of the cancer outcome, hormonal contraceptive, menopausal status **Other:** Energy intake, hormone replacement therapy, age at menarche, history of benign breast disease **Limitations:** • Did not account for race/ethnicity • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Excluded subjects with prevalent cancer, implausible energy intake, or who had completed the 1997 questionnaire with covariate data (~44% of original sample)	cancer; results for molecular subtypes were not extracted in this table)	**Non-Significant:** N/A	• Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Swedish Cancer Foundation, Swedish Research Council/Committee for Infrastructure, Swedish Foundation for International Cooperation in Research and Higher Education and the Regional Research Fund Uppsala-€Orebro Region *Summary: Higher adherence to an "estrogen" dietary pattern at 62y was significantly associated with increased risk of breast cancer after 15y f/u.*
Harris, 2016[12] PCS (Nurses' Health Study II) United States Analytic N: 45204 Subjects were 100% female, ~41yo in 1997, ~21kg/m2 at 18y Excluded subjects who did not complete the high school FFQ, implausible energy intake, missing data,	**Dietary patterns:** Adherence to 3 dietary patterns identified using principal components analysis, categorical (quintiles): • "Prudent" pattern: Higher loadings for vegetables, fruits, legumes, fish and poultry • "Western" pattern: Higher loadings for refined grains, red and processed meats, sweets and potatoes • "Fast-food" pattern: Higher loadings for pizza, fries, sweets and soda	**Significant:** "Prudent" pattern and total breast cancer after 22y f/u: • Q1, n=315: HR: 1.00 • Q2, n=317: HR: 1.00, 95% CI: 0.85, 1.17 • Q3, n=278: HR: 0.83, 95% CI: 0.70, 0.98 • Q4, n=290: HR: 0.88, 95% CI: 0.74, 1.03 • Q5, n=277: HR: 0.86, 95% CI: 0.73, 1.02 • p-trend=0.04 **Non-Significant:**	**Key confounders accounted for:** Sex, age, alcohol intake (in adults), physical activity, height at 18y, BMI at 18y, weight change since 18y, family history of the cancer outcome, hormonal contraceptive, menopausal status **Other:** Energy intake in high school, age at menarche, age at first birth/parity, history of benign breast disease, hormone use **Limitations:** • Did not account for race/ethnicity, socioeconomic status, smoking • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
prevalent cancer before 1989 (~61% of the original sample)	Alternative Healthy Eating Index[xvi], categorical (quintiles) • Positive components: Vegetables (not potatoes, French fries), fruit, nuts and soy protein, cereal fiber, PUFA/SFA, multivitamin use • Neutral components: Alcohol • Negative components: Trans fatty acids **Dietary assessment methods:** 124-item, validated FFQ that captured dietary intake during high school, (aged 13-18y) measured in 1997 when subjects were ~41y **Outcome assessment methods:** F/u with study subjects, National Death Index, medical records and pathology reports (Note: This paper also examined various molecular subtypes of breast cancer; results for molecular subtypes were not extracted in this table)	"Prudent" pattern was not significantly associated with premenopausal breast cancer after 22y f/u. "Western" pattern was not significantly associated with total or premenopausal breast cancer after 22y f/u: "Fast food" pattern was not significantly associated with total or premenopausal breast cancer after 22y f/u: AHEI score was not significantly associated with total or premenopausal breast cancer after 22y f/u.	• Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** NIH *Summary: In all women, higher adherence to the "prudent" pattern during adolescence was significantly associated with reduced risk of breast cancer after 22y f/u. However, there was no significant associated with risk of premenopausal breast cancer risk.* *Adherence to the "western", "fast food", and AHEI patterns during adolescence was not significantly associated with risk of total or premenopausal breast cancer risk after 22y f/u.*
Harris, 2017[13] PCS (Nurses' Health Study II)	**Dietary patterns:** Adherence to a dietary pattern identified via reduced rank regression (response variables: C-reactive protein, IL6, and TNFa receptor 2), categorical (quintiles):	**Significant:** Adolescent "inflammatory" pattern and premenopausal breast cancer after 22y f/u: • Q1, n=162: HR: 1.00 • Q2, n=154: HR: 0.96, 95% CI: 0.77, 1.20	**Key confounders accounted for:** Sex, age, alcohol intake (in adults), physical activity, height at 18y, BMI at 18y, weight change since 18y, family history of the cancer

[xvi] McCullough, M.L. et al. (2002) Diet quality and major chronic disease risk in men and women: moving toward improved dietary guidance. Am. J. Clin. Nutr., 76, 1261–1271.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
United States Analytic N: 45204 Subjects were 100% female, ~41yo in 1997, ~21kg/m2 at 18y, Excluded subjects who did not complete the high school FFQ, implausible energy intake, missing data, prevalent cancer before 1989 (~61% of the original sample)	• "Inflammatory" dietary pattern: Higher loadings for sugar-sweetened and diet soft drinks, refined grains, red and processed meat, margarine, corn, other vegetables, and fish, and lower in green leafy vegetables, yellow vegetables, cruciferous vegetables, and coffee **Dietary assessment methods:** Adolescence: 124-item, validated FFQ that captured dietary intake during high school, (aged 13-18y) measured in 1997 when subjects were ~41y Early adulthood: 130-item, validated FFQ, measured in 1991 when subjects were 27-44y **Outcome assessment methods:** F/u with study subjects, National Death Index, medical records and pathology reports (Note: This paper also examined various molecular subtypes of breast cancer; results for molecular subtypes were not extracted in this table)	• Q3, n=180: HR: 0.96, 95% CI: 0.77, 1.20 • Q4, n=189: HR: 1.30, 95% CI: 1.04, 1.62 • Q5, n=185: HR: 1.35, 95% CI: 1.06, 1.73 • p-trend=0.002 Average of adolescent and early adult "inflammatory" pattern and total breast cancer after 22y f/u: • Q1, n=263: HR: 1.00 • Q2, n=295: HR: 1.15, 95% CI: 0.97, 1.36 • Q3, n=301: HR: 1.22, 95% CI: 1.03, 1.44 • Q4, n=270: HR: 1.13, 95% CI: 0.94, 1.35 • Q5, n=270: HR: 1.25, 95% CI: 1.03, 1.52 • p-trend=0.04 **Non-Significant:** Adolescent "inflammatory" pattern was not significantly associated with total or postmenopausal breast cancer after 22y f/u. Results were similar when the early adulthood "inflammatory" pattern was analyzed, and when adolescent and early adult "inflammatory" patterns were	outcome, hormonal contraceptive, menopausal status **Other:** Total energy intake, age at menarche, age at first birth, parity, history of benign breast disease, hormone replacement therapy **Limitations:** • Did not account for race/ethnicity, socioeconomic status, smoking • Only assessed dietary intake twice during f/u; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** NIH *Summary: Higher adherence to an "inflammatory" dietary pattern during adolescence wass signiciantly associated with increased risk of premenopausal breast cancer after 22y f/u. However, adherence to the "inflammatory" dietary pattern was not significantly associated with total or postmenopausal breast cancer risk.* *Results were similar when the early adulthood "inflammatory" pattern was analyzed, and when adolescent and early adult "inflammatory" patterns were averaged, except for the results for all cases of breast cancer.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		averaged, except for the results for all cases of breast cancer.	*When "inflammatory" dietary pattern was calculated based on an average of adolescence and young adulthood, higher adherence was significantly associated with increases risk of total breast cancer after 22y f/u.*
Kane-Diallo, 2018[14] PCS (NutriNet-Sante study) France Analytic N: 42544 Subjects were 100% female, ~49y (all >45y), ~25kg/m2, ~44% never-smokers, 9.7g/d alcohol Excluded those with prevalent cancer; <3 24-hr recalls within the first year of f/u; missing f/u data; implausible energy intake; <45y (79% of original sample)	**Dietary patterns:** "Pro plant-based" dietary score, categorical (tertiles) • Higher in plant foods: vegetables, legumes, fruits, cereal products, potatoes, nuts, vegetables oils • Lower in animal foods: red and processed meat, eggs, animal fat, dairy products, seafood **Dietary assessment methods:** 3, 24-hour dietary recalls, assessed every 6mo during the first 2y of f/u, at age ~49y **Outcome assessment methods:** Participant report, medical record review, pathological reports	**Significant:** N/A **Non-Significant:** "Pro plant-based" dietary score at 49y was not significantly associated with risk of total, premenopausal, or postmenopausal breast cancer after 4.3y f/u.	**Key confounders accounted for:** Sex, age, education, alcohol intake (in adults), physical activity, smoking, height, BMI, family history of the cancer outcome, hormonal contraceptive, menopausal status **Other:** Energy intake without alcohol, number of 24-hr dietary records, Lipids intake, Hormone replacement therapy, Number of children **Limitations:** • Did not account for race/ethnicity • Only assessed dietary intake only during first 2y of f/u; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Ministere de la Sante, Institut de Veille Sanitaire, Institut National de la Prevention et de l'Education pour la Sante, Region Ile-de-France, Institut National de la Sant_e et de la Recherche Medicale, Institut National de la Recherche Agronomique, Conservatoire National des Arts et Metiers, The French National Cancer Institute

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
			Summary: "Pro plant-based" dietary score at 49y was not significantly associated with risk of breast cancer, including pre- and postmenopausal breast cancer, after 4.3y f/u.
Kojima, 2017[15] PCS (Japan Collaborative Cohort Study) Japan Analytic N: 23172 Subjects were 100% female, ~55yo, ~70% normal weight, ~88% never smokers, ~74% currently drink alcohol Excluded men, those with prevalant cancer, stroke, CVD, or diabetes, missing dietary data, missing outcome data, implausible energy intake, or died within first 5y of f/u (~79% of the original sample)	**Dietary patterns:** Adherence to 3 dietary patterns identified using factor analysis, categorical (tertiles): • "Vegetable pattern": Higher loadings for vegetables, potatoes, seaweed, tofu, fruits, fresh fish, eggs, and miso soup • "Animal food pattern": Higher loadings for meat, deep-fried foods, fried vegetables, fish paste and salt-preserved fish • "Dairy product pattern": Higher loadings for milk, dairy products, fruits, coffee and tea **Dietary assessment methods:** 39-item, validated FFQ, at baseline, **Outcome assessment methods:** Population-based cancer registries, death record review	**Significant:** "Animal food pattern" at 55y and premenopausal breast cancer after 16.9y f/u: • T1, n=20: HR: 1.00 • T2, n=13: HR: 0.47, 95% CI: 0.22, 1.00 • T3, n=15: HR: 0.42, 95% CI: 0.18, 0.93 • p-trend=0.04 **Non-Significant:** "Animal food pattern" at 55y was not significantly associated with postmenopausal breast cancer after 16.9y f/u. "Vegetable pattern" at 55y was not significantly associated with premenopausal or postmenopausal breast cancer after 16.9y f/u. "Dairy pattern" at 55y was not significantly associated with premenopausal or	**Key confounders accounted for**: Sex, age, education, alcohol intake (in adults), physical activity, smoking, BMI, family history of the cancer outcome, menopausal status **Other:** Area, age at Menarche, age at first birth, parity, energy intake, hormone therapy **Limitations:** • Did not account for race/ethnicity, hormonal contraceptive • Excluded those with chronic diseases at baseline • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** NR *Summary: Higher "animal food pattern" adherence at 55y was significantly associated with increased premenopausal breast cancer risk after 16.9y f/u. "Animal food pattern"*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		postmenopausal breast cancer after 16.9y f/u.	*adherence was not significantly associated with postmenopausal breast cancer risk.* *"Vegetable pattern" and "dairy product pattern" adherence at 55y were not significantly associated with postmenopausal breast cancer risk after 16.9y f/u.*
Lavalette, 2018[16] PCS (NutriNet-Sante study) France Analytic N: 41543 Subjects were 100% female, ~54yo (all >40y), ~24.5kg/m2, ~44% never-smokers, ~9.4g/d alcohol Excluded those with prevalent cancer; <3 24-hr recalls within the first year of f/u; missing f/u data; implausible energy	Dietary patterns: • Alternate Healthy Eating Index 2010 (AHEI-2010)[xvii], categorical (quintiles) and continuous (per 2 pt increment) o Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA o Neutral components: Alcohol o Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium • Mediterranean diet score (MEDI-LITE)[xviii], categorical (quintiles) and continuous (per 2 pt increment) o Positive components: Vegetables, legumes, fruit and nuts, cereals, fish, olive oil o Neutral components: Alcohol	**Significant:** N/A **Non-Significant:** AHEI-2010 score at ~49y (categorical or continuous) was not associated with risk of breast cancer after 8.5y f/u: MEDI-LITE score at ~49y (categorical or continuous) was not associated with risk of breast cancer after 8.5y f/u: PNNS-GS score at ~49y (categorical or continuous) was not associated with risk of breast cancer after 8.5y f/u.	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, height, BMI, family history of the cancer, hormonal contraceptive, menopausal status **Other:** Number of 24-hours dietary records, energy intake without alcohol, number of biological children, hormone replacement therapy **Limitations:** • Did not account for race/ethnicity • Only assessed dietary intake during first 2y of f/u; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Ministere de la Sante, Institut de Veille Sanitaire, Institut National de la Prevention et de l'Education pour la Sante,

[xvii] Chiuve SE, Fung TT, Rimm EB, Hu FB, McCullough ML, Wang M, et al. Alternative dietary indices both strongly predict risk of chronic disease. J Nutr 2012;142:1009–18.
[xviii] Sofi F, Macchi C, Abbate R, Gensini GF, Casini A. Mediterranean diet and health status: an updated meta-analysis and a proposal for a literature-based adherence score. Public Health Nutr 2014;17: 2769–82.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
intake; <40y (>50% of original sample)	○ Negative components: Meat, dairy products • French National Nutrition Health Program-Guideline Score (PNNS-GS)[xix], categorical (quintiles) and continuous (per 2 pt increment) ○ Positive components: Vegetables and Fruit, Seafood, Vegetable Fat ○ Neutral components: Breads, cereals, potatoes, legumes, meat and poultry, seafood, and eggs, milk and dairy products, alcohol ○ Negative components: Sweetened foods, soda, added fat, salt **Dietary assessment methods:** 3, 24-hour dietary recalls, assessed during the first year of f/u, at age ~49y **Outcome assessment methods:** Participant report, medical record review, pathological reports		Region Ile-de-France, Institut National de la Sant_e et de la Recherche Medicale, Institut National de la Recherche Agronomique, Conservatoire National des Arts et Metiers, The French National Cancer Institute *Summary: AHEI-2010, MEDI-LITE, and PNNS-GS scores at 49y were not significantly associated with risk of breast cancer after 8.5y f/u.*
Li, 2015[17] PCS (Swedish Women's Lifestyle and Health cohort)	**Dietary patterns:** • Healthy Nordic food index (HNFI)[xx], categorical and continuous ○ Positive components: Cabbage, root vegetables, apples and pears, rye	**Significant:** N/A **Non-Significant:** All women, HNFI at 39y was not significantly associated with total,	**Key confounders accounted for:** Sex, age, education, alcohol intake, smoking, BMI, height, family history of the cancer outcome, hormonal contraceptive, menopausal status

[xix] Estaquio C, Kesse-Guyot E, Deschamps V, Bertrais S, Dauchet L, Galan P, et al. Adherence to the French Programme National Nutrition Sante Guideline Score is associated with better nutrient intake and nutritional status. J Am Diet Assoc 2009;109:1031–41.
[xx] Olsen A, Egeberg R, Halkjær J, Christensen J, Overvad K, Tjønneland A (2011) Healthy aspects of the Nordic diet are related to lower total mortality. J Nutr 141:639–644

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Sweden Analytic N: 44296 Subjects were 100% female, ~39yo (29-49y), ~23kg/m2, ~40% never smokers, ~2.9g/d alcohol Exclude those with previous breast cancer, extreme energy intakes, missing data on any variable (~10% of original sample)	bread, oatmeal, fish **Dietary assessment methods:** 8-item, validated FFQ, at baseline, ~39y **Outcome assessment methods:** Swedish Cancer Registry and Cause of Death Registry (Note: This paper also examined various molecular subtypes of breast cancer; results for molecular subtypes were not extracted in this table)	premenopausal, or postmenopausal breast cancer after 20y f/u.	**Other:** Age at menarche, history of benign breast disease, age at first child, parity, breastfeeding, saturated fat intake, energy intake **Limitations:** • Did not account for race/ethnicity, physical activity • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Swedish Cancer Society, Swedish Research Council *Summary: HFNI score at 39y was not significantly associated with risk of breast cancer (total, pre- and post-menopausal) after 20y f/u.*
McKenzie, 2015[18] PCS (European Prospective Investigation into Cancer and Nutrition Cohort Study) Denmark, France, Germany, Greece,	**Dietary patterns:** • Diet score, categorical (quintiles) ○ Positive components: Cereal fiber, folate, PUFA/SFA, fatty fish, fruits and vegetables ○ Negative components: margarine, glycemic load **Dietary assessment methods:** FFQ, diet	**Significant:** Diet score at 53y and postmenopausal breast cancer (n=7756) after 10.9y f/u: ○ Q1, n=88: HR: 1.00 ○ Q2, n=93: HR: 0.93, 95% CI: 0.87, 0.99 ○ Q3, n=87: HR: 0.98, 95% CI: 0.91, 1.06	**Key confounders accounted for:** Sex, age, education, alcohol intake (in adults), physical activity, smoking, height, BMI, hormonal contraceptive, menopausal status **Other:** Study center, age at menarche, age at first pregnancy, hormone replacement therapy, breastfeeding, energy intake without alcohol

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Italy, the Netherlands, Norway, Spain, Sweden and the United Kingdom Analytic N: 242918 Subjects were 100% female, ~53yo, ~25kg/m2, ~49% ever smokers, ~4.2g/d alcohol Exclude subjects with prevalent cancer, premenopausal, missing f/u data, top or bottom 1% of energy intake to energy requirement, missing covariate data (~44% of original sample)	history questionnaires, validated, at baseline, 53y **Outcome assessment methods:** Cancer registries, health insurance records, cancer/pathology registrations and through participants and next-of-kin	○ Q4, n=98: HR: 0.89, 95% CI: 0.83, 0.95 ○ Q5, n=122: HR: 0.90, 95% CI: 0.84, 0.97 ○ p-trend=0.005 **Non-Significant:** N/A	**Limitations:** • Did not account for race/ethnicity, family history of the cancer outcome • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Genesis Oncology Trust; European Commission the International Agency for Research on Cancer; Danish Cancer Society; Ligue Contre le Cancer, Institut Gustave Roussy, Mutuelle Generale de l'Education Nationale, Institut National de la Sante et de la Recherche Medicale; Deutsche Krebshilfe, Deutsches Krebsforschungszentrum and Federal Ministry of Education and Research; Hellenic Health Foundation; Italian Association for Research on Cancer and National Research Council; Dutch Ministry of Public Health, Welfare and Sports, Netherlands Cancer Registry, LK Research Funds, Dutch Prevention Funds, Dutch ZON, World Cancer Research Fund, Statistics Netherlands; Nordforsk, Nordic Centre of Excellence programme on Food, Nutrition and Health (Norway); Health Research Fund of the Spanish Ministry of Health, the Catalan Institute of Oncology, and the participating regional governments and institutions of Spain; Swedish Cancer Society, Swedish Scientific Council and Regional

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
			Government of Skane and Vasterbotten; Cancer Research United Kingdom, Medical Research Council, Stroke Association, British Heart Foundation, Department of Health, Food Standards Agency, and Welcome Trust *Summary: Higher diet score at 53y was significantly associated with decreased risk of postmenopausal breast cancer after 10.9y f/u.*
Nomura, 2016[19] PCS (Black Women's Health Study) United States Analytic N: 49103 Subjects were 100% female, ~38yo (21-69y), ~50% overweight/obese, ~68% never smokers, ~77% <1 drink/wk Excluded those not 21-69y at baseline, incomplete questionnaires, with prevalent cancer, pregnant at baseline, implausible energy	**Dietary patterns:** • WCRF/AICR Score, diet only, categorical (tertiles) and continuous (per 0.5 unit increase) ○ Positive components: Vegetables and fruit, dietary fiber ○ Negative components: Red and processed meat, sugary drinks, alcohol, sodium, energy-dense foods **Dietary assessment methods:** 68- and 85-item FFQ at baseline (1995) and f/u (2001) **Outcome assessment methods:** Self-report, linkage with cancer registries	**Significant:** WCRF/AICR score, diet only, time-varying, continuous (per 0.5 unit increase), n=1766: HR:0.91, 95% CI: 0.83, 0.99; p-trend=0.04 When results were analyzed by menopausal status, results were borderline significant in premenopausal breast cancer (p=0.06), and non-significant for postmenopausal breast cancer. **Non-Significant:** WCRF/AICR score, diet only, at baseline (categorical, continuous, and time-varying-categorical), 38yo, was not significantly associated with breast cancer after 13.9y f/u. Results were similar when pre- and post-menopausal breast cancer were analyzed separately.	**Key confounders accounted for:** Sex, age, race/ethnicity, education, alcohol intake, smoking, BMI, family history of the cancer outcome, hormonal contraceptive, menopausal status **Other:** Geographic region of residence, energy intake, parity, hormone replacement therapy **Limitations:** • Did not account for physical activity • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** NIH *Summary: Adherence to the WCRF/AICR diet score at 38y was not significantly associated*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
intake (~17% of original sample)			*with risk of breast cancer after 13.9y f/u when analyzed categorically or continuously. In addition, adherence to the WCRF/AICR diet score was also not significantly associated with breast cancer risk when analyzed categorically, time-varying.* *However, higher WCRF/AICR score, diet only, time-varying, analyzed continuously, was associated with significantly decreased risk of breast cancer after 13.9y f/u.*
Penniecook-Sawyers, 2016[20] PCS (Adventist Health Study-2) United States Analytic N: 50404 Subjects were 100% female, ~64y (35-110y), ~27.5kg/m2, ~15% ever smokers, ~11% drank alcohol within 2y of enrollment Excluded Canadian participants, those with prevalent cancer, age <35 years,	**Dietary patterns:** • "Vegans"[xxi]: Red meat, poultry, fish; eggs; and dairy <1 time/mo • "Lacto-ovo-vegetarian": Red meat, poultry, and fish <1 time/mo, eggs or dairy >1 time/mo • "Pesco-vegetarian": Red meat or poultry <1 time/mo, fish >1 time/mo, and eggs/dairy in any amount • "Semi-vegetarian": Red meat or poultry >1 time/mo, and all meats combined (including fish) <1 time/wk and eggs/dairy in any amount • **"Non-**vegetarians": Red meat and poultry >1 time/mo and all meats combined (including fish) >1 time/wk, and eggs/dairy in any amount "Vegetarians" vs. "nonvegetarians" consumed higher amounts of fruits, vegetables, avocados, non-fried potatoes, whole grains, legumes, soya	**Significant:** N/A **Non-Significant:** "Vegetarian" pattern at 64y was not significantly associated with total or postmenopausal breast cancer after 7.8y f.u. Results were similar when analyzed by non-black or black race.	**Key confounders accounted for:** Sex, age, race/ethnicity, education, alcohol intake, physical activity, smoking, height, BMI, family history of the cancer outcome, hormonal contraceptive, menopausal status **Other:** Mammography in last 2y after 42y, age at menarche, hormone replacement therapy, age at first child, number of children, Breastfeeding **Limitations:** • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting

[xxi] Orlich MJ, Jaceldo-Siegl K, Sabate J, et al. Patterns of food consumption among vegetarians and non-vegetarians. Br J Nutr. 2014; 112:1644–1653. [PubMed: 25247790]

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
incomplete FFQ, implausible energy intakes, never had menstrual period (~20% of original sample)	foods, nuts and seeds, and observed among vegetarians, was lower amounts of meats, dairy products, eggs, refined grains, added fats, sweets, snack foods and non-water beverages **Dietary assessment methods:** >220-item, validated FFQ, at baseline, >30y **Outcome assessment methods:** State cancer registries, patient f/u with medical record verification		**+Funding Sources:** NIH, World Cancer Research Fund *Summary: Consuming various "vegetarian" patterns at 64y was not significantly associated with risk of total or premenopausal breast cancer after 7.8y f/u.* *Consuming a "semi-vegetarian" pattern vs. a "non-vegetarian" pattern at 64y was associated with significantly increased risk of postmenopausal breast cancer after 7.8y f/u.*
Petimar, 2019[21] PCS (Sister Study) United States Analytic N: 45626 Subjects were 100% female, ~55yo, ~27kg/m2, ~45% ever smokers, ~5.5g/d alcohol Excluded those with prevalent cancer,	**Dietary patterns:** • Alternative Mediterranean Diet Score (aMED)[xxii], categorical (quintiles) ○ Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat • DASH Index[xxiii], categorical (quintiles) ○ Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy ○ Negative components: Red and processed meat, sweetened	**Significant:** DASH score at 55y and total invasive breast cancer after 7.6y f/u: • Q1, n=388: HR: 1.00 • Q2, n=486: HR: 0.880.77, 1.01 • Q3, n=409: HR: 0.89, 95% CI: 0.77, 1.03 • Q4, n=417: HR: 0.78, 95% CI: 0.67, 0.90 • p-trend=0.001 **Non-Significant:**	**Key confounders accounted for:** Sex, age, race/ethnicity, income, education, alcohol intake, physical activity, smoking, BMI, family history of the cancer outcome, hormonal contraceptive, menopausal status **Other:** Total energy intake, age at first live birth, parity, hormone replacement therapy, age at menarche, breastfeeding, time of last mammogram **Limitations:** • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u

[xxii] Fung TT, Hu FB, McCullough ML, Newby PK, Willett WC, Holmes MD. Diet quality is associated with the risk of estrogen receptor-negative breast cancer in postmenopausal women. J Nutr 2006;136:466–72.
[xxiii] Fung TT, Hu FB, Hankinson SE, Willett WC, Holmes MD. Lowcarbohydrate diets, dietary approaches to stop hypertension-style diets, and the risk of postmenopausal breast cancer. Am J Epidemiol 2011;174:652–60.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
pregnant, breastfeeding, missing dietary intake data, extreme calorie intake, cases diagnosed in first year of f/u, missing covariate data (~10% of original sample)	beverages, sodium • AHEI-2010[xxiv], categorical (quartiles) ○ Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA ○ Neutral components: Alcohol ○ Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium **Dietary assessment methods:** 110-item, validated, FFQ at baseline, ~55y **Outcome assessment methods:** Self-report, medical record review (Note: This paper also examined various molecular subtypes of breast cancer; results for molecular subtypes were not extracted in this table)	AHEI-2010 score, with and without alcohol, at 55y was not significantly associated with total invasive breast cancer after 7.6y f/u. aMED score, with and without alcohol, at 55y, was not significantly associated with total invasive breast cancer after 7.6y f/u.	• Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** NIH, Breast Cancer Research Foundation *Summary: Higher DASH score at 55y was significantly associated with reduced risk of total invasive breast cancer after 7.6y f/u.* *AHEI-2010 and aMED scores, with and without alcohol, at 55y, were not significantly associated with risk of total invasive breast cancer after 7.6y f/u.*
Pot, 2014[26] Nested Case-Control Study (UK Dietary Cohort Consortium) United Kingdom	**Dietary patterns:** • Mediterranean Diet Score (MDS)[xxv], with and without alcohol, categorical (tertiles) ○ Positive components: Vegetables, legumes, fruit and nuts, cereals, fish, MUFA/SFA ○ Neutral components: Alcohol	**Significant:** "High alcohol" pattern and breast cancer (n=387 cases): • T1: HR: 1.00 • T2: HR: 1.04, 95% CI: 0.77, 1.39 • T3: HR: 1.28, 95% CI: 0.95, 1.71	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, weight, height, family history of the cancer outcome, menopausal status **Other:**

[xxiv] Chiuve SE, Fung TT, Rimm EB, Hu FB, McCullough ML, Wang M, Stampfer MJ, Willett WC. Alternative dietary indices both strongly predict risk of chronic disease. J Nutr 2012;142:1009–18.

[xxv] Trichopoulou A, Bamia C, Lagiou P, Trichopoulos D. Conformity to traditional Mediterranean diet and breast cancer risk in the Greek EPIC (European Prospective Investigation into Cancer and nutrition) cohort. Am J Clin Nutr. 2010; 92:620–5. [PubMed: 20631204]

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Analytic N: 601 cases, 1891 controls Subjects were 100% female, ~57yo, ~25.7kg/m2, 60% never smokers, ~9.5g/d alcohol Cases were free from cancer at baseline, and were matched to 4 controls who were free of cancer at baseline and f/u (matched on cohort, age at enrollment, and date of diet collection)	○ Negative components: Red and processed meat, dairy products • Three dietary patterns identified using principal components analyses: The first pattern had higher loadings for cheese, crisps and savory snacks, fresh fruit, legumes, low fat milk, nuts and seeds, other fruit, rice/pasta/other grains, sauces, vegetable mixed dishes, and lower in potatoes, poultry, and red meat. The other two patterns added little variation and were not included. • Only two of the three dietary patterns identified using reduced rank regression were examined (response variables: alcohol, total fat, fiber): ○ "High alcohol": Higher loadings for wines, spirits, and beers and ciders ○ "High fiber": Higher loadings for fiber, fresh fruit, raw and boiled vegetables, high fiber bread, high fiber breakfast cereals, lower in alcohol and total fat **Dietary assessment methods:** 4-7 day dietary records, at baseline, ~57y **Outcome assessment methods:** NR	• p-trend=0.08 "High alcohol" pattern and postmenopausal breast cancer (n=409 cases): • T1: HR: 1.00 • T2: HR: 1.14, 95% CI: 0.84, 1.55 • T3: HR: 1.46, 95% CI: 0.08, 1.98 • p-trend=0.01 **Non-Significant:** MDS score, with and without alcohol, was not significantly associated with total or postmenopausal breast cancer. PCA dietary pattern score was not significantly associated with total or postmenopausal breast cancer. "High fiber" pattern score was not significantly associated with total or postmenopausal breast cancer.	Parity, hormone replacement therapy, breastfeeding **Limitations**: • Did not account for race/ethnicity, smoking, or hormonal contraceptive • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** NR *Summary: MDS score, a factor analysis dietary pattern score, and a "high fiber" dietary pattern derived using RRR were not associated with risk of total or postmenopausal breast cancer.* *Higher adherence to a "high alcohol" dietary pattern was associated with increased risk of total and postmenopausal breast cancer.*
Shin, 2016[22] PCS (Japan Public Health Center-based	**Dietary patterns:** Adherence to 3 dietary patterns derived using principal component analysis, categorical (quintiles):	**Significant:** "Westernized" pattern score at 57y and breast cancer after 14.6y f/u: • Q1, n=125: HR: 1.00	**Key confounders accounted for:** Sex, age, race/ethnicity, alcohol intake, physical activity, smoking, BMI, menopausal status, use of exogenous hormones

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Prospective Study (JPHC Study)) Japan Analytic N: 49552 Subjects were 100% female, ~57yo, 23.5kgm/2, ~94% never smokers Exclude those with prevalent cancer, implausible energy intakes, Non-Japanese ethnicity, late report of migration occurring before the start of the study or incorrect birth data), deceased or moved out of study area (~31% of original sample)	• "Prudent" pattern: Higher loadings for vegetables, fruits, soya products, potatoes, seaweed, mushroom, and fish • "Westernized" pattern: Higher loadings for bread, meat, processed meats, dairy products, soup, coffee, soft drinks, black tea, sauces, mayonnaise and dressing • "Traditional Japanese" pattern: Higher loadings for salmon, seafood other than fish, oily fish, lean fish, salty fish, chicken and pickles **Dietary assessment methods:** 147-item, validated FFQ at baseline, ~57y **Outcome assessment methods:** F/u with subjects, population-based cancer registries (Note: This paper also examined various molecular subtypes of breast cancer; results for molecular subtypes were not extracted in this table)	• Q2, n=138: HR: 1.07, 95% CI: 0.84, 1.37 • Q3, n=147: HR: 1.14, 95% CI: 0.89, 1.46 • Q4, n=142: HR: 1.10, 95% CI: 0.86, 1.42 • Q5, n=166: HR: 1.32, 95% CI: 1.03, 1.70 • p-trend=0.04 Results were similar when analyzed by quintiles among the highest quintile group. When pre- and postmenopausal breast cancer were analyzed separately, only post-menopausal breast cancer risk was significantly associated with "westernized" dietary pattern adherence. **Non-Significant:** "Prudent" pattern score at 57y was not significantly associated with total, premenopausal, or postmenopausal breast cancer after 14.6y f/u. "Traditional" pattern score at 57y was not significantly associated with total, premenopausal, or postmenopausal breast cancer after 14.6y f/u.	**Other:** Public healthcare centre area, energy intake, age at menarche, parity, age at first birth **Limitations:** • Did not account for socioeconomic status, family history of the cancer outcome • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** National Cancer Center Research and Development Fund, Ministry of Health, Labour and Welfare of Japan *Summary: Higher adherence to a "westernised" dietary pattern at 57y was significantly associated with increased risk of breast cancer after 14.6y f/u. When pre- and postmenopausal breast cancer were analyzed separately, only postmenopausal breast cancer risk was significantly associated with "westernized" dietary pattern adherence.* *Adherence to a "prudent" or "traditional" Japanese dietary pattern at 57y was not significantly associated with risk of breast cancer after 14.6y f/u. Results were similar when pre- and postmenopausal breast cancer were analyzed separately.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Van den Brandt, 2017[23] Nested Case-Control Study (Netherlands Cohort Study) The Netherlands Analytic N: 2321 cases, 1665 controls Subjects were 100% female, ~61yo (55-69y), ~25kg/m2, ~20% current smokers, ~26% 5-25g/d alcohol Excluded Cases and subcohort with history of cancer (except skin cancer), incomplete or inconsistent dietary data (~33% of original sample)	**Dietary patterns:** • aMED[xxvi], with and without alcohol, categorical and continuous • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat • mMED[xxvii], without alcohol, categorical and continuous • Positive components: Vegetables, legumes, fruit, cereals, fish, MUFA+PUFA/SFA • Neutral components: Alcohol • Negative components: Meat, dairy products • WCRF[xxviii], diet only, with and without alcohol, continuous • Positive components: Vegetables and fruit, dietary fiber • Negative components: Red and processed meat, sugary drinks, alcohol, sodium, energy-dense foods **Dietary assessment methods:** 150-item, validated FFQ at baseline, ~61y	**Significant:** N/A **Non-Significant:** aMED and mMED scores, with and without alcohol, at 61y was not significantly associated with postmenopausal breast cancer after 20.3y f/u. Results were similar when stratified by years of f/u, age at baseline, smoking status, alcohol intake, BMI, physical activity, and family history of breast cancer. aMED vs. WCRF, diet only, with and without alcohol at 61y was not significantly associated with postmenopausal breast cancer after 20.3y f/u.	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, height, BMI, family history of the cancer outcome, hormonal contraceptive, menopausal status **Other:** History of benign breast disease, age at menarche, parity, age at first birth, hormone replacement therapy **Limitations:** • Did not account for race/ethnicity • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** World Cancer Research Fund International *Summary: aMED and mMED scores, with and without alcohol, was not significantly associated with risk of breast cancer afgter 20.3y f/u. Results were also NS when stratified by years of f/u, age at baseline, smoking status, alcohol intake, BMI, physical*

[xxvi] Fung TT, McCullough ML, Newby PK, et al.Diet-quality scores and plasma concentrations of markers of inflammation and endothelial dysfunction. Am J Clin Nutr 2005;82:163–73.
[xxvii] Trichopoulou A, Orfanos P, Norat T, et al. Modified Mediterranean diet and survival: EPIC-elderly prospective cohort study. BMJ 2005;330:991.
[xxviii] World Cancer Research Fund/American Institute for Cancer Research. Food, nutrition, physical activity, and the prevention of cancer: a global perspective. Washington, DC: AICR, 2007.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	Outcome assessment methods: Netherlands Cancer Registry and the nationwide Dutch Pathology Registry (Note: This paper also examined various molecular subtypes of breast cancer; results for molecular subtypes were not extracted in this table)		*activity, and family history of breast cancer. Also, aMED vs. WCRF, diet only, scores were not significantly associated with breast cancer risk.*
Voortman, 2017[24] PCS (Rotterdam Study) The Netherlands Analytic N: 9627 Subjects were 100% female, 64.1yo, 26.3kg/m2, 32% never smokers, 61% <10g/d alcohol Excluded those without reliable dietary data, prevalent cancer cases, missing outcome data (~19% of original sample)	**Dietary patterns:** • Dutch Dietary Guidelines 2015 score, continuous ○ Positive components: Vegetables, legumes, fruit, nuts, whole grains, fish, dairy products, unsaturated fats and oils, tea ○ Negative components: Replace refined grains with whole-grain products, red meat, processed meat, alcohol, sodium **Dietary assessment methods:** 170 to 389-item, validated FFQ at baseline, ~64y **Outcome assessment methods:** nationwide registry of histopathology and cytopathology, f/u with general practitioners	**Significant:** N/A **Non-Significant:** Dutch Dietary Guidelines 2015 score was not significantly associated with breast cancer (n=273) after 10.9y f/u.	**Key confounders accounted for:** Sex, age, race/ethnicity, education, employment status, alcohol intake, physical activity, smoking, BMI **Other**: Cohort, total energy intake **Limitations**: • Did not account for race/ethnicity, family history of the cancer outcome, hormonal contraceptive, menopausal status • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Erasmus University Medical Center; Erasmus University Rotterdam; Netherlands Organization for Health Research and Development; Research Institute for Diseases in the Elderly; Netherlands Genomics Initiative; Ministry of Education, Culture and Science; Ministry of Health, Welfare and Sports; the European Commission; Municipality of Rotterdam

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
			Summary: Dutch Dietary Guidelines 2015 score at 64y was not significantly associated with breast cancer after 11y f/u.

Table 2. Summary of the results from studies that examined the relationship between dietary patterns and breast cancer[xxix]

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Randomized Controlled Trials			
Prentice, 2019[1] RCT (Women's Health Initiative Dietary Modification (DM) trial) United States Analytic N: 48835 (Intervention: 19541, Comparison: 29294)	• Intervention group: Reduction in fat from ~35%E to 20%E of energy, 5 servings/d fruits and vegetables, 6 serving/d grains; achieved reductions 8–10%E of total, saturated, and unsaturated fat, reductions in 8–10% of carbohydrate, and increased vegetables, fruit, and grains vs. comparison. • Comparison group: Received written health-related materials only; lower intakes of fruits, vegetables, whole grains, and total grains		There were no significantly differences in invasive postmenopausal breast cancer risk during the intervention or after 19.6y f/u between the intervention vs. comparison groups.

[xxix] **Abbreviations:** AHEI-2010, Alternative Healthy Eating Index-2010; aMED, Alternative Mediterranean Diet Score ; BMI, body mass index; CSDLH, Canadian Study of Diet, Lifestyle and Health; CVD, Cardiovascular disease; d, day; DASH, Dietary Approaches to Stop Hypertension; DM, dietary modification; DP, Dietary pattern; %E, % of energy; EPIC, European Prospective Investigation into Cancer and Nutrition; ERDP, Estrogen-related dietary pattern, EVOO, extra-virgin olive oil; FFQ, food frequency questionnaire; FSAm-NPS, Nutrient Profiling System of the British Food Standards Agency; f/u, follow-up; HNFI, Healthy Nordic food index ; HR, hazard ratio; IMI, Italian Mediterranean Index; MEDI-LITE, Mediterranean diet score; MD, Mediterranean diet; MDS, Mediterranean Diet Score; mMED, modified Mediterranean diet score; mo, month(s); MUFA, monounsaturated fat/fatty acids; N/A, Not applicable; NBSS, National Breast Screening Study; NIH, National Institutes of Health; NOVA, Ultra-processed food score; NS, Not significant; NR, Not reported; PCS, prospective cohort study; pt, point; RCT, randomized controlled trial; SEER, Surveillance, Epidemiology, and End Results Program; SFA, saturated fat/fatty acids; WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; wk, weeks; y, years

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Thomson, 2014[2] RCT (Women's Health Initiative Dietary Modification (DM) trial) United States Analytic N: 48835 (Intervention: 19541, Comparison: 29294)	• Intervention group: Reduction in fat from ~35%E to 20%E, 5 servings/d fruits and vegetables, 6 serving/d grains; achieved reductions 8–10%E of total, saturated, and unsaturated fat, reductions in 8–10% of carbohydrate, and increased vegetables, fruit, and grains vs. comparison. • Comparison group: Received written health-related materials only; lower intakes of fruits, vegetables, whole grains, and total grains	Women with higher baseline fat intake (quartiles) had significantly reduced risk of postmenopausal breast cancer (p=0.03): • During the intervention: HR: 0.76, 95% CI: 0.62, 0.92 During post-intervention f/u: HR: 1.11, 95% CI: 0.84, 1.4	There were no significantly differences in invasive postmenopausal breast cancer risk after 5.2y, 8.5y, or 13.5y f/u between the intervention vs. comparison groups.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Toledo, 2015[3] RCT (PREDIMED Trial) Spain Analytic N: 4152	• Mediterranean diet (MD) with extra-virgin olive oil (EVOO): MD supplemented with EVOO (provided 1L per week); MD diet included live oil for cooking and dressing; fruit, vegetables, legumes and fish; reduced total meat consumption, white meat instead of red or processed meat; homemade sauce with tomato, garlic, onion and spices with olive oil to dress vegetables, pasta, rice and other dishes; avoidance of butter, cream, fast food, sweets, pastries and sugar-sweetened beverages; and moderate red wine • MD with mixed nuts: MD supplemented with mixed nuts (MD-nuts), with 30g per day of mixed nuts (15g walnuts, 7.5g hazelnuts and 7.5g almonds) • Control diet: Consumed similar food groups, but were counseled to also decrease fat intake in accordance with American Heart Association guidelines	Postmenopausal Breast cancer after 4.8y f/u: • Control, n=18/12 523: HR: 1.00 • MD+EVOO, n=17/5829: HR: 0.31, 95% CI: 0.13, 0.77 • MD+Nuts, n=8/7031: HR: 0.53, 95% CI: 0.23, 1.26 • MD diets combined, n=10/5492: HR: 0.41, 95% CI: 0.19, 0.86 Results were similar when excluding diagnosed within first year. In the stratified analyses by age (< or >67y), smoking (never, ever), alcohol intake (< or >25g/d), diabetes mellitus (yes, no), BMI (< or >30kg/m2), use of hormone therapy (yes, no), family history of cancer (no, yes), baseline MD adherence (low, high), all but 2 point estimates (for MD+nuts vs. control, among participants with BMI>30 and for those with high baseline adherence to MD) showed an inverse association between the MD+EVOO intervention and the incidence of breast cancer.	
Obervational Studies			

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Catsburg, 2015[25] Nested Case-Control Study and PCS (Canadian Study of Diet, Lifestyle and Health (CSDLH), National Breast Screening Study (NBSS)) Canada Analytic N: CSDLH: 4417, NBSS: 49410	"Healthy" pattern (PCA): Higher loadings for vegetable and legume food groups	"Healthy" pattern at ~60y (CSLDH) and total breast cancer after 13y f/u: • Q1, n=125: HR: 1.00 • Q2, n=258: HR: 0.93, 95% CI: 0.74, 1.18 • Q3, n=270: HR: 0.78, 95% CI: 0.61, 0.99 • Q4, n=391: HR: 0.80, 95% CI: 0.64, 1.01 • Q5, n=452: HR: 0.73, 95% CI: 0.58, 0.91 • p-trend=0.0001 Results for the "Healthy" pattern were no longer significant when pre- and postmenopausal breast cancer were analyzed separately.	"Healthy" pattern at 40-59y (NBSS) was not significantly associated with breast cancer after ~23y f/u, in all women combined and when pre- and postmenopausal women were analyzed separately.
	"Ethnic" pattern (PCA): Higher loadings for rice, spinach, fish, tofu, liver, eggs, and salted and dried meat		"Ethnic" pattern at 40-59y (NBSS) was not significantly associated with breast cancer after ~23y f/u, in all women combined and when pre- and postmenopausal women were analyzed separately. "Ethnic" pattern at ~60y (CSLDH) was not significantly associated with breast cancer after 13y f/u (p=0.073), in all women combined and when pre- and postmenopausal women were analyzed separately.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	"Meat and potatoes" pattern: Higher loadings for red meat groups and potatoes	"Meat and potatoes" pattern at ~60y (CSLDH) and postmenopausal breast cancer after 13y f/u: • Q1, n=57: HR: 1.00 • Q2, n=66: HR: 0.80, 95% CI: 0.55, 1.18 • Q3, n=148: HR: 1.49, 95% CI: 1.07, 2.07 • Q4, n=149: HR: 1.21, 95% CI: 0.87, 1.69 • Q5, n=205: HR: 1.26, 95% CI: 0.92, 1.73 • p-trend=0.043 "Meat and potatoes" pattern at 40-59y (NBSS) and postmenopausal breast cancer after ~23y f/u: • Q1, n=358: HR: 1.00 • Q2, n=361: HR: 1.03, 95% CI: 0.85, 1.24 • Q3, n=399: HR: 1.22, 95% CI: 0.98, 1.52 • Q4, n=365: HR: 1.17, 95% CI: 0.91, 1.50 • Q5, n=338: HR: 1.31, 95% CI: 0.98, 1.76 • p-trend=0.043	"Meat and potatoes" pattern at 40-59y (NBSS) was not significantly associated with breast cancer after ~23y f/u, in all women combined or in premenopausal women. "Meat and potatoes" pattern at ~60y (CSLDH) was not significantly associated with breast cancer after 13y f/u, in all women combined or in premenopausal women.
Deschasaux, 2018[4] PCS (EPIC) Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, UK Analytic N: 471495	Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fibers, proteins, and fruits/vegetables/legumes/nuts. • Higher FSAm-NPS score had higher intakes of alcohol, energy and red and processed meat, lower intakes of dietary fibers, vegetables, fruit, fish, and lean meat	FSAm-NPS score at 51y and postmenopausal breast cancer after 15.3y f/u: • Q1, n=2093: HR: 1.00 • Q2, n=2303: HR: 1.04, 95% CI: 0.98, 1.1 • Q3, n=2403: HR: 1.03, 95% CI: 0.97, 1.10 • Q4, n=2682: HR: 1.07, 95% CI: 1.01, 1.14 • Q5, n=2636: HR: 1.06, 95% CI: 0.99, 1.14 • p-trend=0.05 Continuous, per 2pt increment, n=12063: HR: 1.02, 95% CI: 1.00, 1.04; p-trend=0.05	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Deschasaux, 2017[5] PCS (NutriNet-Santé) France Analytic N: 46864	Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fibers, proteins, and fruits/vegetables/legumes/nuts. • Higher FSAm-NPS score had higher intakes of protein, fiber, fruit, vegetables, legumes, poultry, fish, and dairy, and lower intakes of energy, alcohol, fat, carbohydrate, red meat, processed meat, lower intakes of dietary fibers, vegetables, fruit, fish, and lean meat	FSAm-NPS score at 51y and total breast cancer after 4y f/u: • Q1, n=82: HR: 1.00 • Q2, n= 122: HR: 1.43, 95% CI: 1.08, 1.90 • Q3, n=117: HR: 1.43, 95% CI: 1.07, 1.91 • Q4, n=138: HR: 1.79, 95% CI: 1.35, 2.38 • Q5, n=96: HR: 1.52v 1.11, 2.08 • p-trend=0.002 FSAm-NPS score, continuous, and total breast cancer, n=555: HR:1.06, 95% CI: 1.02, 1.11 p-trend=0.005 FSAm-NPS score at 51y and premenopausal breast cancer after 4y f/u: • Q1, n=12: HR: 1.00 • Q2, n=28: HR: 1.92, 95% CI: 0.97, 3.79 • Q3, n=31: HR: 1.89, 95% CI: 0.96, 3.71 • Q4, n=52: HR: 2.76, 95% CI: 1.45, 5.26 • Q5, n=48: HR: 2.46, 95% CI: 1.27, 4.75 • p-trend=0.004 FSAm-NPS score, continuous, and premenopausal breast cancer, n=171: HR: 1.09, 95% CI: 1.01, 1.18 p-trend=0.03	FSAm-NPS score at 51y (categorical and continuous) was not significantly associated (p=0.09, p=0.06) with postmenopausal breast cancer after 4y f/u:

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Donnenfeld, 2015[6] PCS (SUpplémentation en VItamines et Minéraux AntioXydants cohort) France Analytic N: 6435	Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fibers, proteins, and fruits/vegetables/legumes/nuts.		FSAm-NPS score at 49y (categorical and continuous) was not significantly associated with breast cancer after 12.6y f/u.
Fiolet, 2018[7] PCS (NutriNet-Santé) France Analytic N: 104,980	Ultra-processed food score (NOVA) ○ Main food groups contributing to NOVA score were sugary drinks, drinks, starchy foods and breakfast cereals, ultra-processed fruits and vegetables, dairy products, meats, fish, and eggs, processed meats, fats, and salty snacks	Ultra-processed food score, continuous, and total breast cancer (n=739): HR: 1.11, 95% CI: 1.01, 1.21; p-trend=0.03 Ultra-processed food score at 49y and postmenopausal breast cancer after 5.4y f/u: Q1, n=90: HR: 1.00 Q2, n=70: HR: 1.23, 95% CI: 0.95, 1.59 Q3, n=55: HR: 1.27, 95% CI: 0.97, 1.65 Q4, n=49: HR: 1.38, 95% CI: 1.05, 1.81 p-trend=0.02 Ultra-processed food score, continuous, and postmenopausal breast cancer (n=264): HR: 1.13, 95% CI: 1.00, 1.27; p-trend=0.05	Ultra-processed food score at 49y (categorical) was not significantly associated with total breast cancer after 5.4y f/u. Ultra-processed food score at 49y (categorical and continuous) was not significantly associatef with premenopausal breast cancer after 5.4y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Guinter, 2018a (IJC)[8] PCS (Prostate, Lung, Colorectal and Ovarian Screening Trial) United States Analytic N: 27488	Estrogen-related dietary pattern (ERDP; RRR, response variables: unconjugated estradiol, ratio of 2- and 16-hydroxylated estrogen metabolites): • Higher loading for non-whole/refined grains, tomatoes, cruciferous vegetables, cheese, high omega-3 fish/shellfish, franks/luncheon meats • Lower loadings for nuts/seeds, other vegetables, low omega-3 fish/shellfish, yogurt, coffee	ERDP score at 62y and total postmenopausal breast cancer after 10.9y f/u: ○ Q1, n=366: HR: 1.00 ○ Q2, n=393: HR: 1.08, 95% CI: 0.94, 1.25 ○ Q3, n=403: HR: 1.10, 95% CI: 0.95, 1.27 ○ Q4, n=431: HR: 1.14, 95% CI: 0.98, 1.32 ○ Continuous: HR: 1.09, 95% CI: 1.01, 1.18, p-trend=0.04 ERDP score at 62y and invasive postmenopausal breast cancer after 10.9y f/u: • Q1, n=280: HR: 1.00 • Q2, n=309: HR: 1.12, 95% CI: 0.95, 1.31 • Q3, n=331: HR: 1.18, 95% CI: 1.01, 1.39 • Q4, n=348: HR: 1.20, 95% CI: 1.02, 1.42 • Continuous: HR: 1.13, 95% CI: 1.04, 1.24, p-trend=0.005	
Guinter, 2018b (CEBP)[9] PCS (Sister Study) United States Analytic N: 37925	Estrogen-related dietary pattern (ERDP; RRR, response variables: unconjugated estradiol, ratio of 2- and 16-hydroxylated estrogen metabolites): • Higher loading for non-whole/refined grains, tomatoes, cruciferous vegetables, cheese, high omega-3 fish/shellfish, franks/luncheon meats • Lower loadings for nuts/seeds, other vegetables, low omega-3 fish/shellfish, yogurt, coffee		ERDP score at 58y was not significantly associated with total postmenopausal breast cancer after 6-12y f/u. ERDP score at 58y was not significantly associated with invasive postmenopausal breast cancer after 6-12y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Haridass, 2018[10] PCS (California Teachers Study) United States Analytic N: 96959	alternate Mediterranean diet score (aMED) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat		aMED score, with or without alcohol, at 40y was not significantly associated with postmenopausal breast cancer after ~14y f/u:
	DASH Score • Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy • Negative components: Red and processed meat, sweetened beverages, sodium		DASH score at 40y was not significantly associated with postmenopausal breast cancer after ~14y f/u.
	Alternative Healthy Eating Index (AHEI)-2010 • Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA • Neutral components: Alcohol • Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium		AHEI-2010 score, with and without alcohol, at 40y was not significantly associated with postmenopausal breast cancer after ~14y f/u.
	Paleo Index • Positive components: Vegetables, fruit and vegetable diversity, fruit, nuts, fish, lean meat, calcium (from non-dairy foods) • Negative components: Grains and starches, baked goods, red and processed meat, dairy foods, sugar-sweetened beverages, alcohol, sodium		Paleo score at 40y was not significantly associated with postmenopausal breast cancer after ~14y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Harris, 2015[11] PCS (Swedish Mammography Cohort) Sweden Analytic N: 37004	Estrogen dietary pattern (RRR, response variables: estradiol, estrone sulfate) • Higher loadings or red meat, legumes and pizza, and lower in coffee, whole grains	Estrogen dietary pattern at 62y and postmenopausal breast cancer after 15y f/u: • Q1, n=363: HR: 1.00 • Q2, n=401: HR: 1.10, 95% CI: 0.92, 1.31 • Q3, n=414: HR: 1.13, 95% CI: 0.95, 1.35 • Q4, n=425: HR: 1.29, 95% CI: 1.08, 1.55 • p-trend=0.006 Continuous: HR: 1.03, 95% CI: 1.00, 1.05	
Harris, 2016[12] PCS (Nurses' Health Study II) United States Analytic N: 45204	"Prudent" pattern(PCA): Higher loadings for vegetables, fruits, legumes, fish and poultry	"Prudent" pattern and total breast cancer after 22y f/u: • Q1, n=315: HR: 1.00 • Q2, n=317: HR: 1.00, 95% CI: 0.85, 1.17 • Q3, n=278: HR: 0.83, 95% CI: 0.70, 0.98 • Q4, n=290: HR: 0.88, 95% CI: 0.74, 1.03 • Q5, n=277: HR: 0.86, 95% CI: 0.73, 1.02 • p-trend=0.04	"Prudent" pattern was not significantly associated with premenopausal breast cancer after 22y f/u.
	"Western" pattern (PCA): Higher loadings for refined grains, red and processed meats, sweets and potatoes		"Western" pattern was not significantly associated with total or premenopausal breast cancer after 22y f/u.
	"Fast-food" pattern (PCA): Higher loadings for pizza, fries, sweets and soda		"Fast food" pattern was not significantly associated with total or premenopausal breast cancer after 22y f/u.
	Alternative Healthy Eating Index • Positive components: Vegetables (not potatoes, French fries), fruit, nuts and soy protein, cereal fiber, PUFA/SFA, multivitamin use • Neutral components: Alcohol • Negative components: Trans fatty acids		AHEI score was not significantly associated with total or premenopausal breast cancer after 22y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Harris, 2017[13] PCS (Nurses' Health Study II) United States Analytic N: 45204	Adherence to a dietary pattern identified via reduced rank regression (response variables: C-reactive protein, IL6, and TNFa receptor 2), categorical (quintiles): • "Inflammatory" dietary pattern: Higher loadings for sugar-sweetened and diet soft drinks, refined grains, red and processed meat, margarine, corn, other vegetables, and fish, and lower in green leafy vegetables, yellow vegetables, cruciferous vegetables, and coffee	Adolescent "inflammatory" pattern and premenopausal breast cancer after 22y f/u: • Q1, n=162: HR: 1.00 • Q2, n=154: HR: 0.96, 95% CI: 0.77, 1.20 • Q3, n=180: HR: 0.96, 95% CI: 0.77, 1.20 • Q4, n=189: HR: 1.30, 95% CI: 1.04, 1.62 • Q5, n=185: HR: 1.35, 95% CI: 1.06, 1.73 • p-trend=0.002 Average of adolescent and early adult "inflammatory" pattern and total breast cancer after 22y f/u: • Q1, n=263: HR: 1.00 • Q2, n=295: HR: 1.15, 95% CI: 0.97, 1.36 • Q3, n=301: HR: 1.22, 95% CI: 1.03, 1.44 • Q4, n=270: HR: 1.13, 95% CI: 0.94, 1.35 • Q5, n=270: HR: 1.25, 95% CI: 1.03, 1.52 • p-trend=0.04	Adolescent "inflammatory" pattern was not significantly associated with total or postmenopausal breast cancer after 22y f/u. Results were similar when the early adulthood "inflammatory" pattern was analyzed, and when adolescent and early adult "inflammatory" patterns were averaged, except for the results for all cases of breast cancer.
Kane-Diallo, 2018[14] PCS (NutriNet-Sante study) France Analytic N: 42544	"Pro plant-based" dietary score • Higher in plant foods: vegetables, legumes, fruits, cereal products, potatoes, nuts, vegetables oils • Lower in animal foods: red and processed meat, eggs, animal fat, dairy products, seafood		"Pro plant-based" dietary score at 49y was not significantly associated with risk of total, premenopausal, or postmenopausal breast cancer after 4.3y f/u.
Kojima, 2017[15]	"Vegetable" pattern (factor analysis): Higher loadings for vegetables, potatoes, seaweed, tofu, fruits, fresh fish, eggs, and miso soup		"Vegetable pattern" at 55y was not significantly associated with premenopausal or postmenopausal breast cancer after 16.9y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
PCS (Japan Collaborative Cohort Study) Japan Analytic N: 23172	"Animal food" pattern (factor analysis): Higher loadings for meat, deep-fried foods, fried vegetables, fish paste and salt-preserved fish	"Animal food" pattern at 55y and premenopausal breast cancer after 16.9y f/u: • T1, n=20: HR: 1.00 • T2, n=13: HR: 0.47, 95% CI: 0.22, 1.00 • T3, n=15: HR: 0.42, 95% CI: 0.18, 0.93 • p-trend=0.04	"Animal food" pattern at 55y was not significantly associated with postmenopausal breast cancer after 16.9y f/u.
	"Dairy product" pattern (factor analysis): Higher loadings for milk, dairy products, fruits, coffee and tea		"Dairy product" pattern at 55y was not significantly associated with premenopausal or postmenopausal breast cancer after 16.9y f/u.
Lavalette, 2018[16] PCS (NutriNet-Sante study) France Analytic N: 41543	Alternative Healthy Eating Index (AHEI)-2010 • Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA • Neutral components: Alcohol • Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium		AHEI-2010 score at ~49y (categorical or continuous) was not associated with risk of breast cancer after 8.5y f/u.
	Mediterranean diet score (MEDI-LITE) • Positive components: Vegetables, legumes, fruit and nuts, cereals, fish, olive oil • Neutral components: Alcohol • Negative components: Meat, dairy products		MEDI-LITE score at ~49y (categorical or continuous) was not associated with risk of breast cancer after 8.5y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	French National Nutrition Health Program-Guideline Score (PNNS-GS) • Positive components: Vegetables and Fruit, Seafood, Vegetable Fat • Neutral components: Breads, cereals, potatoes, legumes, meat and poultry, seafood, and eggs, milk and dairy products, alcohol • Negative components: Sweetened foods, soda, added fat, salt		PNNS-GS score at ~49y (categorical or continuous) was not associated with risk of breast cancer after 8.5y f/u.
Li, 2015[17] PCS (Swedish Women's Lifestyle and Health cohort) Sweden Analytic N: 44296	Healthy Nordic food index (HNFI) • Positive components: Cabbage, root vegetables, apples and pears, rye bread, oatmeal, fish		All women, HNFI at 39y was not significantly associated with total, premenopausal, or postmenopausal breast cancer after 20y f/u.
McKenzie, 2015[18] PCS (EPIC) Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden and the United Kingdom Analytic N: 242918	Diet score • Positive components: Cereal fiber, folate, PUFA/SFA, fatty fish, fruits and vegetables • Negative components: margarine, glycemic load	Diet score at 53y and postmenopausal breast cancer (n=7756) after 10.9y f/u: ○ Q1, n=88: HR: 1.00 ○ Q2, n=93: HR: 0.93, 95% CI: 0.87, 0.99 ○ Q3, n=87: HR: 0.98, 95% CI: 0.91, 1.06 ○ Q4, n=98: HR: 0.89, 95% CI: 0.83, 0.95 ○ Q5, n=122: HR: 0.90, 95% CI: 0.84, 0.97 ○ p-trend=0.005	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Nomura, 2016[19] PCS (Black Women's Health Study) United States Analytic N: 49103	WCRF/AICR score, diet only • Positive components: Vegetables and fruit, dietary fiber • Negative components: Red and processed meat, sugary drinks, alcohol, sodium, energy-dense foods	WCRF/AICR score, diet only, time-varying, continuous (per 0.5 unit increase), n=1766: HR:0.91, 95% CI: 0.83, 0.99; p-trend=0.04 When results were analyzed by menopausal status, results were borderline significant in premenopausal breast cancer (p=0.06), and non-significant for postmenopausal breast cancer.	WCRF/AICR score, diet only, at baseline (categorical, continuous, and time-varying-categorical), 38yo, was not significantly associated with breast cancer after 13.9y f/u. Results were similar when pre- and post-menopausal breast cancer were analyzed separately.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Penniecook-Sawyers, 2016[20] PCS (Adventist Health Study-2) United States Analytic N: 50404	"Vegetarian" patterns: • "Vegans"[xxx]: Red meat, poultry, fish; eggs; and dairy <1 time/mo • "Lacto-ovo-vegetarian": Red meat, poultry, and fish <1 time/mo, eggs or dairy >1 time/mo • "Pesco-vegetarian": Red meat or poultry <1 time/mo, fish >1 time/mo, and eggs/dairy in any amount • "Semi-vegetarian": Red meat or poultry >1 time/mo, and all meats combined (including fish) <1 time/wk and eggs/dairy in any amount • "Non-vegetarians": Red meat and poultry >1 time/mo and all meats combined (including fish) >1 time/wk, and eggs/dairy in any amount "Vegetarians" vs. "nonvegetarians" consumed higher amounts of fruits, vegetables, avocados, non-fried potatoes, whole grains, legumes, soya foods, nuts and seeds, and was observed among vegetarians; and lower amounts of meats, dairy products, eggs, refined grains, added fats, sweets, snack foods and non-water beverages		"Vegetarian" pattern at 64y was not significantly associated with total or postmenopausal breast cancer after 7.8y f.u. Results were similar when analyzed by non-black or black race.

[xxx] Orlich MJ, Jaceldo-Siegl K, Sabate J, et al. Patterns of food consumption among vegetarians and non-vegetarians. Br J Nutr. 2014; 112:1644–1653. [PubMed: 25247790]

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Petimar, 2019[21] PCS (Sister Study) United States Analytic N: 45626	alternate Mediterranean diet score (aMED) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat		aMED score, with and without alcohol, at 55y, was not significantly associated with total invasive breast cancer after 7.6y f/u.
	DASH Score • Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy • Negative components: Red and processed meat, sweetened beverages, sodium	DASH score at 55y and total invasive breast cancer after 7.6y f/u: • Q1, n=388: HR: 1.00 • Q2, n=486: HR: 0.880.77, 1.01 • Q3, n=409: HR: 0.89, 95% CI: 0.77, 1.03 • Q4, n=417: HR: 0.78, 95% CI: 0.67, 0.90 • p-trend=0.001	
	Alternative Healthy Eating Index (AHEI)-2010 • Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA • Neutral components: Alcohol • Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium		AHEI-2010 score, with and without alcohol, at 55y was not significantly associated with total invasive breast cancer after 7.6y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Pot, 2014[26] Nested Case-Control Study (UK Dietary Cohort Consortium) United Kingdom Analytic N: 601 cases, 1891 controls	Mediterranean Diet Score (MDS), with and without alcohol • Positive components: Vegetables, legumes, fruit and nuts, cereals, fish, MUFA/SFA • Neutral components: Alcohol • Negative components: Red and processed meat, dairy products		MDS score, with and without alcohol, was not significantly associated with total or postmenopausal breast cancer.
	PCA pattern Higher loadings for cheese, crisps and savory snacks, fresh fruit, legumes, low fat milk, nuts and seeds, other fruit, rice/pasta/other grains, sauces, vegetable mixed dishes, and lower in potatoes, poultry, and red meat		PCA dietary pattern score was not significantly associated with total or postmenopausal breast cancer.
	"High alcohol" (RRR, response variables: alcohol, total fat, fiber): Higher loadings for wines, spirits, and beers and ciders	"High alcohol" pattern and breast cancer (n=387 cases): • T1: HR: 1.00 • T2: HR: 1.04, 95% CI: 0.77, 1.39 • T3: HR: 1.28, 95% CI: 0.95, 1.71 • p-trend=0.08 "High alcohol" pattern and postmenopausal breast cancer (n=409 cases): • T1: HR: 1.00 • T2: HR: 1.14, 95% CI: 0.84, 1.55 • T3: HR: 1.46, 95% CI: 0.08, 1.98 • p-trend=0.01	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	"High fiber" (RRR, response variables: alcohol, total fat, fiber): Higher loadings for fiber, fresh fruit, raw and boiled vegetables, high fiber bread, high fiber breakfast cereals, lower in alcohol and total fat		"High fiber" pattern score was not significantly associated with total or postmenopausal breast cancer.
Shin, 2016[22] PCS (Japan Public Health Center-based Prospective Study (JPHC Study)) Japan Analytic N: 49552	Prudent pattern (PCA): Higher loadings for vegetables, fruits, soya products, potatoes, seaweed, mushroom, and fish		Prudent pattern score at 57y was not significantly associated with total, premenopausal, or postmenopausal breast cancer after 14.6y f/u.
	Westernized pattern (PCA): Higher loadings for bread, meat, processed meats, dairy products, soup, coffee, soft drinks, black tea, sauces, mayonnaise and dressing	Westernized pattern score at 57y and breast cancer after 14.6y f/u: • Q1, n=125: HR: 1.00 • Q2, n=138: HR: 1.07, 95% CI: 0.84, 1.37 • Q3, n=147: HR: 1.14, 95% CI: 0.89, 1.46 • Q4, n=142: HR: 1.10, 95% CI: 0.86, 1.42 • Q5, n=166: HR: 1.32, 95% CI: 1.03, 1.70 • p-trend=0.04 Results were similar when analyzed by quintiles among the highest quintile group. When pre- and post-menopausal breast cancer were analyzed separately, only post-menopausal breast cancer risk was significantly associated with westernized dietary pattern adherence.	
	Traditional Japanese pattern (PCA): Higher loadings for salmon, seafood other than fish, oily fish, lean fish, salty fish, chicken and pickles		Traditional pattern score at 57y was not significantly associated with total, premenopausal, or postmenopausal breast cancer after 14.6y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Van den Brandt, 2017[23] Nested Case-Control Study (Netherlands Cohort Study) The Netherlands Analytic N: 2321 cases, 1665 controls	alternate Mediterranean diet score (aMED) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat		aMED score, with and without alcohol, at 61y was not significantly associated with postmenopausal breast cancer after 20.3y f/u. Results were similar when stratified by years of f/u, age at baseline, smoking status, alcohol intake, BMI, physical activity, and family history of breast cancer.
	modified Mediterranean diet score (mMED) • Positive components: Vegetables, legumes, fruit, cereals, fish, MUFA+PUFA/SFA • Neutral components: Alcohol • Negative components: Meat, dairy products		mMED score, with and without alcohol, at 61y was not significantly associated with postmenopausal breast cancer after 20.3y f/u.
	WCRF/AICR score, diet only • Positive components: Vegetables and fruit, dietary fiber • Negative components: Red and processed meat, sugary drinks, alcohol, sodium, energy-dense foods		aMED vs. WCRF, diet only, with and without alcohol at 61y was not significantly associated with postmenopausal breast cancer after 20.3y f/u.
Voortman, 2017[24] PCS (Rotterdam Study) The Netherlands Analytic N: 9627	Dutch Dietary Guidelines 2015 score • Positive components: Vegetables, legumes, fruit, nuts, whole grains, fish, dairy products, unsaturated fats and oils, tea • Negative components: Replace refined grains with whole-grain products, red meat, processed meat, alcohol, sodium		Dutch Dietary Guidelines 2015 score was not significantly associated with breast cancer (n=273) after 10.9y f/u.

Table 3. Risk of bias for randomized controlled trials examining dietary patterns and breast cancer[xxxi, xxxii]

	Randomization	Deviations from intended interventions – effect of assignment	Deviations from intended interventions – per-protocol	Missing outcome data	Outcome measurement	Selection of the reported result
Prentice, 2019[1]	Low	Low	Some	Low	Low	Low
Thomson, 2014[2]	Low	Low	Some	Low	Low	Low
Toledo, 2015[3]	Some	Low	Low	Low	Low	Low

Table 4. Risk of bias for observational studies examining dietary patterns and breast cancer[xxxiii]

	Confounding	Selection of participants	Classification of exposures	Deviations from intended exposures	Missing data	Outcome measurement	Selection of the reported result
Catsburg, 2015[25]	Serious	Serious	Low	Serious	Serious	Low	Serious
Deschasaux, 2018[4]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Deschasaux, 2017[5]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Donnenfeld, 2015[6]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Fiolet, 2018[7]	Serious	Moderate	Moderate	Serious	Moderate	Low	Moderate
Guinter, 2018a (IJC)[8]	Serious	Serious	Moderate	Serious	Serious	Low	Serious
Guinter, 2018b (CEBP)[9]	Serious	Serious	Moderate	Serious	Serious	Low	Moderate

[xxxi] A detailed description of the methodology used for assessing risk of bias is available on the NESR website: https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews and in Part C of the following reference: Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.

[xxxii] Possible ratings of low, some concerns, or high determined using the "Cochrane Risk-of-bias 2.0" (RoB 2.0) (August 2016 version)" (Higgins JPT, Sterne JAC, Savović J, Page MJ, Hróbjartsson A, Boutron I, Reeves B, Eldridge S. A revised tool for assessing risk of bias in randomized trials In: Chandler J, McKenzie J, Boutron I, Welch V (editors). Cochrane Methods. *Cochrane Database of Systematic Reviews* 2016, Issue 10 (Suppl 1). dx.doi.org/10.1002/14651858.CD201601.)

[xxxiii] Possible ratings of low, moderate, serious, critical, or no information determined using the "Risk of Bias for Nutrition Observational Studies" tool (RoB-NObs) (Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.)

Haridass, 2018[10]	Moderate	Serious	Low	Serious	Serious	Low	Moderate
Harris, 2015[11]	Serious	Serious	Moderate	Serious	Moderate	Low	Moderate
Harris, 2016[12]	Serious	Serious	Serious	Serious	Serious	Low	Serious
Harris, 2017[13]	Serious	Serious	Serious	Serious	Serious	Low	Serious
Kane-Diallo, 2018[14]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Kojima, 2017[15]	Serious	Serious	Serious	Serious	Serious	Low	Moderate
Lavalette, 2018[16]	Serious	Moderate	Low	Serious	Serious	Low	Moderate
Li, 2015[17]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
McKenzie, 2015[18]	Serious	Moderate	Moderate	Serious	Serious	Low	Moderate
Nomura, 2016[19]	Serious	Moderate	Low	Moderate	Moderate	Low	Moderate
Penniecook-Sawyers, 2016[20]	Moderate	Serious	Low	Serious	Moderate	Low	Moderate
Petimar, 2019[21]	Moderate	Moderate	Low	Serious	Serious	Low	Serious
Pot, 2014[26]	Serious	Moderate	Moderate	Serious	Moderate	No information	Moderate
Shin, 2016[22]	Serious	Moderate	Moderate	Serious	Moderate	Low	Moderate
Van den Brandt, 2017[23]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Voortman, 2017[24]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate

Table 5. Description of studies that examined the relationship between dietary patterns and colorectal cancer[xxxiv]

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Randomized Controlled Trials			
Prentice, 2019[1] RCT (Women's Health Initiative Dietary Modification (DM) trial) United States **Analytic N: 48835 (Intervention: 19541, Comparison: 29294) (Attrition: 0%)** **Participants were 100% female, ~62y (50-79y), 28.2 kg/m2, 51% never smokers**	**Dietary patterns:** • Intervention group: Reduction in fat from ~35%E to 20%E of energy, 5 servings/d fruits and vegetables, 6 serving/d grains; achieved reductions 8–10%E of total, saturated, and unsaturated fat, reductions in 8–10% of carbohydrate; had higher intakes of fruits, vegetables, whole grains, and total grains • Comparison group: Received written health-related materials only; lower intakes of fruits, vegetables, whole grains, and total grains **Dietary assessment methods:** Adherence was monitored using FFQs at baseline, 1y, and every 3y thereafter	**Significant**: N/A **Non-Significant**: There were no significantly differences between intervention and comparison groups and colorectal cancer during the intervention, after 8.5y f/u, and after 19.6y f/u.	**Key confounders accounted for:** N/A for RCTs **Other:** Baseline hazard stratified on age at random assignment, ethnicity, hysterectomy status, prior disease (if applicable), randomization status in the hormone therapy trials, and study phase **Limitations:** • The intensity of the intervention may have differed between groups, as the intervention group received more intensive education than the comparison **Funding Sources:** NIH *Summary: There were no difference between intervention and comparison groups in risk of colorectal cancer during the 8.5y intervention or over 19.6y f/u.*

[xxxiv]Abbreviations : AHEI-2010, Alternative Healthy Eating Index-2010; aMED, Alternative Mediterranean Diet Score ; BMI, body mass index; CDQI, Colorectal Diet Quality Index; d, day; DASH, Dietary Approaches to Stop Hypertension; DFA, "High-dairy", "high-fruit-and-vegetable", "low, alcohol" dietary pattern; DM, dietary modification; DP, Dietary pattern; %E, % of energy; EDIH, Empirical dietary index for hyperinsulinemia; EDIP, Empirical dietary inflammatory pattern; EPIC, European Prospective Investigation into Cancer and Nutrition; FFQ, food frequency questionnaire; FSAm-NPS, Nutrient Profiling System of the British Food Standards Agency (modified version); f/u, follow-up; HNFI, Healthy Nordic food index ; HR, hazard ratio; IMI, Italian Mediterranean Index; MEDI-LITE, Mediterranean diet score; MD, Mediterranean diet; MDS, Mediterranean Diet Score; mo, month(s); N/A, Not applicable; NIH, National Institutes of Health; NOVA, Ultra-processed food score; NS, Not significant; NR, Not reported; PCS, prospective cohort study; pt, point; RCT, randomized controlled trial; SEER, Surveillance, Epidemiology, and End Results Program; WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; wk, week(s); y, year(s)

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	Outcome assessment methods: US National Cancer Institute's SEER system		
Thomson, 2014[2] RCT (Women's Health Initiative Dietary Modification (DM) trial) United States **Analytic N: 48835 (Intervention: 19541, Comparison: 29294) (Attrition: 0%)** **Participants were 100% female, ~62y (50-79y), 28.2 kg/m2, 51% never smokers**	**Dietary patterns:** • Intervention group: Reduction in fat from ~35%E to 20%E of energy, 5 servings/d fruits and vegetables, 6 serving/d grains; achieved reductions 8–10%E of total, saturated, and unsaturated fat, reductions in 8–10% of carbohydrate; had higher intakes of fruits, vegetables, whole grains, and total grains • Comparison group: Received written health-related materials only; lower intakes of fruits, vegetables, whole grains, and total grains **Dietary assessment methods:** Adherence was monitored using FFQs at baseline, 1y, and every 3y thereafter **Outcome assessment methods:** US National Cancer Institute's SEER system	**Significant**: N/A **Non-Significant**: There were no significantly differences between intervention and comparison groups and colorectal cancer during the intervention, after 8.5y f/u, and after 13.5y f/u.	**Key confounders accounted for:** N/A for RCTs **Other:** N/A **Limitations:** • The intensity of the intervention may have differed between groups, as the intervention group received more intensive education than the comparison **Funding Sources:** NIH *Summary: There were no difference between intervention and comparison groups in risk of colorectal cancer during the 8.5y intervention or over 13.5y f/u.*
Observational Studies			
Boden, 2019[27] **PCS (Vasterbotten Intervention Programme)**	**Dietary patterns:** • Mediterranean diet score (MDS)[xxxv], per tertile increase o Positive components: Vegetables and potatoes, fruit and fresh juices,	**Significant**: N/A **Non-Significant**:	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI **Other:**

[xxxv] Tognon G, Nilsson LM, Lissner L, Johansson I, Hallmans G, Lindahl B, et al. The Mediterranean diet score and mortality are inversely associated in adults living in the subarctic region. J Nutr. 2012; 142 (8):1547–53.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Sweden Analytic N: 35393 Participants were 52% female, ~46yo, ~15% obese, ~17% current smoker Excluded participants with prevalent cancer, insufficient dietary data, implausible food or energy intakes, implausible anthropometric data, cancer diagnosed within 1y year of last measurement, single dietary measure (~65% of original sample)	wholegrain cereals, fish and fish products, MUFA+PUFA/SFA, o Moderation components: Alcohol o Negative components: Meat and meat products, dairy products **Dietary assessment methods:** 84-item and 64-66-item, validated, FFQs, at least 2 measures less than 2y apart at baseline, age ~46y **Outcome assessment methods:** Swedish Cancer Registry	Mediterranean diet score at 46y was not significantly associated with colorectal cancer (n=1036) after 15y f/u in all participants, or when men and women were analyzed separately.	Energy intake **Limitations:** • Did not account for race/ethnicity, family history of the cancer outcome, inflammatory bowel disease, colorectal polyps • Only assessed dietary intake during the first year of f/u; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** The Cancer Research Fund in Northern Sweden, Arctic Research Center at Umeå University, Ostersunds Hospital, Swedish Cancer Society, Region Vasterbotten, Swedish Research Council for Health, Working Life and Welfare, Swedish Research Council *Summary: Mediterranean diet score at 46y was not significantly associated with risk of colorectal cancer after 15y f/u.*
Cheng, 2018[43] **PCS (Iowa Women's Health Study)**	**Dietary patterns:** • Evolutionary-concordance score[xxxvi], categorical and continuous o Positive components: Vegetables,	**Significant**: N/A **Non-Significant**:	**Key confounders accounted for:** Sex, age, race/ethnicity, education, physical activity, smoking, BMI, family history of the cancer outcome

[xxxvi] Whalen KA, McCullough ML, Flanders WD, Hartman TJ, Judd S, Bostick RM. Paleolithic and Mediterranean Diet Pattern Scores Are Inversely Associated with Biomarkers of Inflammation and Oxidative Balance in Adults. J Nutr 2016;146(6):1217–26.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
United States Analytic N: 35221 Participants were 100% female, ~61yo (55-69y), ~27kg/m2 BMI, ~33% ever smokers, ~3.5g/d alcohol, ~14% high physical activity Excluded those with history of cancer, missing dietary record data, implausible energy intake (~16% of original sample)	fruits, lean meats, fish, nuts, fruit and vegetable diversity, calcium ○ Negative components: Red and processed meats, sodium, dairy foods, grains and starches, baked goods, sugar-sweetened beverages, alcohol • Mediterranean diet score[xxxvii], categorical ○ Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat **Dietary assessment methods:** 127-item, validated FFQ at baseline, ~61y **Outcome assessment methods:** State Health Registry of Iowa, National Death Index	Evolutionary-concordance score at 61y (categorical and continuous) was not significantly associated with colorectal cancer (n=1731) after 18y f/u. Mediterranean diet score at 61y (categorical and continuous) was not significantly associated with colorectal cancer (n=1731) after 18y f/u.	**Other:** Total energy intake, hormone replacement therapy, arthritis **Limitations:** • Did not account for inflammatory bowel disease, colorectal polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** NIH *Summary: Evolutionary-concordance and Mediterranean diet scores at 61y were not associated with risk of colorectal over a 18y period of f/u.*
Deschasaux, 2018[4] **PCS (European Prospective Investigation into Cancer and Nutrition (EPIC))** **Denmark, France, Germany, Greece,**	**Dietary patterns:** Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score, categorical (quintiles) and continuous (per 2 pt increment) • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fibers, proteins, and fruits/vegetables/legumes/nuts.	**Significant**: FSAm-NPS score at 51y and risk of colorectal cancer after 15.3y f/u: • Q1, n=1144: HR: 1.00 • Q2, n=1150: HR: 1.07, 95% CI: 0.99, 1.17 • Q3, n=1152: HR: 1.07, 95% CI: 0.98, 1.17	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, height, family history of the cancer **Other:**

[xxxvii] Fung TT, Hu FB, Wu K, Chiuve SE, Fuchs CS, Giovannucci E. The Mediterranean and Dietary Approaches to Stop Hypertension (DASH) diets and colorectal cancer. Am J Clin Nutr 2010;92(6):1429–35.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Italy, the Netherlands, Norway, Spain, Sweden, UK Analytic N: 471495 Participants were 70% female, ~51yo, ~25.4 kg/m^2, 43% never-smokers, ~5.3 g/d alcohol Excluded those with prevalent cancer; cancer diagnosis in first 2y of f/u; missing data; implausible energy intake (~10% of original sample)	• Higher FSAm-NPS score had higher intakes of alcohol, energy and red and processed meat, lower intakes of dietary fibers, vegetables, fruit, fish, and lean meat **Dietary assessment methods:** FFQs or 7-day diet records, validated, at baseline, age ~51y **Outcome assessment methods:** Record linkage with population-based cancer registries, health insurance records, pathology registries, and f/u with study participants	• Q4, n=1195: HR: 1.12, 95% CI: 1.02, 1.22 • Q5, n=1165: HR: 1.11, 95% CI: 1.01, 1.22 • p-trend= 0.02 Continuous, per 2pt increment, n=5086 cases: HR: 1.03, 95% CI: 1.00, 1.06, p-trend=0.03 **Non-Significant**: N/A	Center, hormone replacement therapy, age at menarche, age at first full-term pregnancy, age at menopause, energy intake **Limitations:** • Did not account for race/ethnicity, inflammatory bowel disease, colorectal polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** French National Cancer Institute, European Commission, the International Agency for Research on Cancer *Summary: Consuming a diet that scores higher on the Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) at 51y was associated with increased risk of colorectal cancer after 15.3y f/u.*
Fasanelli, 2017[28] **PCS (European Prospective Investigation into Cancer and Nutrition)**	**Dietary patterns:** • Italian Mediterranean Index (IMI)[xxxviii], categorical, via mediation analysis with waist-to-hip ratio ○ Positive components: Pasta, Mediterranean vegetables (raw	**Significant**: Total causal effect of IMI score at 50y and colorectal cancer (n=414) after 11y f/u: • 0-1: HR: 1.00 • 2-3: HR: 0.51, 95% CI: 0.95, 0.35, 0.84	**Key confounders accounted for:** NR (the mediation analysis required several assumptions, including no unmeasured exposure-mediator, mediator-outcome and exposure-outcome confounding; and no effect of any exposure that may confound the mediator-outcome relationship)

[xxxviii] Agnoli C, Krogh V, Grioni S, et al. A prioridefined dietary patterns are associated with reduced risk of stroke in a large Italian cohort. J Nutr 2011;141:1552–8.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Italy Analytic N: 42984 Participants were 70% female, ~50yo, 55% overweight or obese, ~47% never smokers, ~68% inactive Excluded those with prevalent cancers, missing information on diet, anthropometrics, or lifestyle, implausible energy intake (~10% of original sample)	tomatoes, cooked leafy vegetables, raw leafy vegetables, onion or garlic, mixed salad or mixed vegetables), fruits, legumes, olive oil, fish ○ Neutral components: Alcohol ○ Negative components: Soft drinks, butter, red meat, potatoes **Dietary assessment methods:** Validated, FFQ at baseline, at 50y **Outcome assessment methods:** NR	• 4-5: HR: 0.62, 95% CI: 0.95, 0.41, 0.95 • 6-1: HR: 0.51, 95% CI: 0.95, 0.31, 0.85 Results of the pure direct effect analysis were similar. However, results were not significantly when analyzed through waist-to-hip ratio, via the natural indirect effect analysis. **Non-Significant**: N/A	**Other:** N/A **Limitations:** • Unclear whether the following key confounders were accounted for: sex, age, race/ethnicity, socioeconomic status, alcohol intake (in adults), physical activity, smoking, anthropometry, family history of the cancer outcome, inflammatory bowel disease, colorectal polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** Italian Ministry of Health, the Italian Association for Cancer Research, the Compagnia di San Paolo *Summary: Higher adherence to the Italian Mediterranean Index at 50y was significantly associated with decreased risk of colorectal cancer after 11y f/u. This was independent of waist-to-hip ratio.*
Fiolet, 2018[7] **PCS (NutriNet-Santé) France** Analytic N: 104,980	**Dietary patterns:** • Ultra-processed food score (NOVA), categorical (quartiles) ○ Main food groups contributing to NOVA score were sugary drinks, drinks, starchy foods and breakfast cereals, ultra-processed fruits and vegetables,	**Significant**: N/A **Non-Significant**: Ultra-processed food score at 49y and colorectal cancer after 5.4y f/u: • Q1, n=48: HR: 1.00	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, height, family history of the cancer **Other:** Energy intake without alcohol, number of 24 hour dietary records, intakes of lipids, sodium,

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Participants were 78% female, ~42.8yo, 23.8kg/m2 BMI, 83% never or former smokers, ~7.8g/d achohol Excluded those with prevalent cancer; <35yo at baseline; at least 2 valid 24-hr dietary records during first 2y f/u; diagnosis in first 2y of f/u (~40% of original sample)	dairy products, meats, fish, and eggs, processed meats, fats, and salty snacks **Dietary assessment methods:** 3, 24-hour recalls, assessed during the first year of f/u, at age ~49y **Outcome assessment methods:** Participant report, medical record review, pathological reports	• Q2, n=43: HR: 1.12, 95% CI: 0.74, 1.70 • Q3, n=36: HR: 1.22, 95% CI: 0.79, 1.89 • Q4, n=26: HR: 1.23, 95% CI: 1.08, 1.40 • p-trend=0.07 Ultra-processed food score, continuous, and colorectal cancer (n=153): HR: 1.16, 95% CI: 0.95, 1.42; p-trend=0.10	and carbohydrates and Western dietary pattern **Limitations:** • Did not account for inflammatory bowel disease or colorectal polyps • Only assessed dietary intake during the first year of f/u; did not account for possible changes in dietary intake over f/u • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** Région Ile-de-France, Cancéropôle Ile-de-France, Ministère de la Santé, Institut de Veille Sanitaire, Institut National de la Prévention etde l'Education pour la Santé, Institut Nationalde la Santé et de la Recherche Médicale, Institut National de la Recherche Agronomique, onservatoire National des Arts et Métiers, Université Paris 13 *Summary: Ultra-processed food score at 49y was not significantly associated with risk of colorectal cancer after 5.4y f/u.*
Jones, 2017[29] **PCS (UK Women's Cohort Study)**	**Dietary patterns:** • Mediterranean diet score[xxxix], categorical and continuous (per 2pt increment)	**Significant**: Mediterranean diet score at 52y and colorectal cancer after 17.4y f/u: • Q1, n=74, HR: 1.00	**Key confounders accounted for:** Sex, age, alcohol intake, physical activity, smoking, BMI, family history of the cancer outcome

[xxxix] Trichopoulou A, Orfanos P, Norat T, Bueno-de-Mesquita B, Ocké MC, Peeters PH, van der Schouw YT, Boeing H, Hoffmann K, Boffetta P, Nagel G. Modified Mediterranean diet and survival: PIC-elderly prospective cohort study. Bmj. 2005 Apr 28;330(7498):991.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
United Kingdom Analytic N: 35372 Participants were 100% female, ~52yo, 24kg/m2 BMI, ~11% current smokers, ~5g/d alcohol, ~0.2hr physical activity/d Excluded those with prevalent or history of cancer, diagnosed with colorectal cancer within 1y of baseline, missing dietary records and covariate data, implausible energy intake (~9% of original sample)	○ Positive components: Vegetables, legumes, fruit, cereals, fish, MUFA+PUFA/SFA ○ Neutral components: Alcohol ○ Negative components: Meat, dairy products **Dietary assessment methods:** 217-item, validated FFQ at baseline, ~52y **Outcome assessment methods:** Record linkage with the National Health Service	• Q2, n=75, HR: 0.91, 95% CI: 0.64, 1.30 • Q3, n=88, HR: 0.82, 95% CI: 0.58, 1.15 • Q4, n=136, HR: 0.63, 95% CI: 0.45, 0.87 • Q5, n=92, HR: 0.82, 95% CI: 0.57, 1.17 • Per 2 unit increment: HR: 0.88, 95% CI: 0.78, 0.99 • p-trend=0.030 Mediterranean diet score at 52y and rectal cancer after 17.4y f/u: • Q1, n=30, HR: 1.00 • Q2, n=26, HR: 0.77, 95% CI: 0.44, 1.35 • Q3, n=26, HR: 0.58, 95% CI: 0.32, 1.02 • Q4, n=44, HR: 0.50, 95% CI: 0.29, 0.83 • Q5, n=28, HR: 0.38, 95% CI: 0.20, 0.74 • Per 2 unit increment: HR: 0.69, 95% CI: 0.56, 0.86 • p-trend=0.001 **Non-Significant**: Mediterranean diet score at 52y was not significantly associated with colon, proximal colon, or distal colon cancer after 17.4y f/u.	**Other:** Energy intake **Limitations:** • Did not account for race/ethnicity, socioeconomic status, inflammatory bowel disease, colorectal polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plans; serious potential for selective outcome reporting **Funding Sources:** World Cancer Research Fund *Summary: Higher adherence to the mediterranean diet score at 52y was significantly associated with lower risk of colorectal and rectal cancer after 17.4y f/u. Mediterranean diet score at 52y was not significantly associated with colon, proximal colon, or distal colon cancer after 17.4y f/u.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Kumagai, 2014[30] **PCS (Ohsaki National Health Insurance (NHI) Cohort Study)** **Japan** Analytic N: 44079 Participants were ~46% female, ~60y (40-79y), ~23.6kg/m2 BMI, ~32% current smokers, ~48% current drinkers Excluded those without history of cancer at baseline, missing dietary or outcome data, implausible energy intakes (~20% of original sample)	**Dietary patterns:** Adherence to 3 dietary patterns identified using factor analysis (principal component analysis), categorical: • "Japanese" dietary pattern: Higher loadings for soybean products, fish, seaweeds, vegetables, fruits, and green tea • "Animal food" dietary pattern: Higher loadings for beef pork, ham, sausage, chicken, liver, butter, coffee, and alcoholic beverages • "High-dairy", "high-fruit-and-vegetable", "low, alcohol" (DFA) dietary pattern: Higher loadings for dairy products (milk and yoghurt), margarine, fruits, and vegetables (carrot, pumpkin and tomato), and lower for rice, miso soup, and alcoholic beverages **Dietary assessment methods:** 40-item, validated FFQ at baseline, ~60y **Outcome assessment methods:** Miyagi Prefectural Cancer Registry	**Significant**: DFA pattern score at 60y and colorectal cancer after 11y f/u: • Q1, n=288: HR: 1.00 • Q2, n=223: HR: 0.88, 95% CI: 0.72, 1.06 • Q3, n=185: HR: 0.82, 95% CI: 0.66, 1.03 • Q4, n=158: HR: 0.76, 95% CI: 0.60, 0.97 • p-trend=0.02 DFA pattern score at 60y and rectal cancer after 11y f/u: • Q1, n=127: HR: 1.00 • Q2, n=82: HR: 0.79, 95% CI: 0.58, 1.07 • Q3, n=68: HR: 0.76, 95% CI: 0.53, 1.08 • Q4, n=46: HR: 0.56, 95% CI: 0.37, 0.84 • p-trend=0.0003 **Non-Significant**: "Japanese" dietary pattern and "animal food" dietary pattern scores at 60y were not significantly associated with risk of colorectal cancer after 11y f/u. "Japanese" dietary pattern, "animal food", and DFA dietary pattern scores at 60y	**Key confounders accounted for:** Sex, age, education, alcohol intake (in adults), physical activity, smoking, BMI, family history of the cancer outcome **Other:** Total energy intake **Limitations:** • Did not account for race/ethnicity, inflammatory bowel disease, colorectal polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** Ministry of Health, Labour and Welfare, Japan *Summary: Higher adherence to the DFA dietary pattern at 60y was significantly associated with lower risk of colorectal and rectal cancer after 11y f/u.* *"Japanese" dietary pattern and "animal food" dietary pattern scores at 60y were not significantly associated with risk of colorectal cancer after 11y f/u.* *"Japanese" dietary pattern, "animal food", and DFA dietary pattern scores at 60y were not*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		were not significantly associated with risk of colon cancer (n=554) after 11y f/u. "Japanese" dietary pattern and "animal food" dietary pattern scores at 60y were not significantly associated with risk of rectal cancer (n=323) after 11y f/u.	*significantly associated with risk of colon cancer (n=554) after 11y f/u.* *"Japanese" dietary pattern and "animal food" dietary pattern scores at 60y were not significantly associated with risk of rectal cancer (n=323) after 11y f/u*.
Lavalette, 2018[16] **PCS (NutriNet-Sante study)** **France** Analytic N: 41543 Participants were % female, ~54yo (all >40y), ~24.5kg/m2, ~44% never-smokers, ~9.4g/d alcohol Excluded those with prevalent cancer; <3 24-hr recalls within the first year of f/u; missing f/u data; implausible energy intake; <40y (>50% of original sample)	**Dietary patterns:** • Alternate Healthy Eating Index 2010 (AHEI-2010)[xl], categorical (quintiles) and continuous (per 2 pt increment) o Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA o Neutral components: Alcohol o Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium • Mediterranean diet score (MEDI-LITE)[xli], categorical (quintiles) and continuous (per 2 pt increment) o Positive components: Vegetables, legumes, fruit and nuts, cereals, fish, olive oil o Neutral components: Alcohol	**Significant**: Higher PNNS-GS score at ~49y (continuous) and colorectal cancer after 8.5y f/u: HR: 0.89, 95% CI: 0.80, 1.00, p=0.04 **Non-Significant**: AHEI-2010 score at ~49y (categorical and continuous) was not significantly associated with colorectal cancer after 8.5y f/u. MEDI-LITE score at ~49y (categorical and continuous) was not significantly associated with colorectal cancer after 8.5y f/u. PNNS-GS score at ~49y (categorical) was not associated with risk of colorectal cancer after 8.5y f/u.	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, height, BMI, family history of the cancer **Other:** Number of 24-hours dietary records, energy intake without alcohol, number of biological children, hormone replacement therapy **Limitations:** • Did not account for race/ethnicity, inflammatory bowel disease, colorectal polyps • Only assessed dietary intake during the first year of f/u; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** Ministere de la Sante, Institut de Veille Sanitaire, Institut National de

[xl] Chiuve SE, Fung TT, Rimm EB, Hu FB, McCullough ML, Wang M, et al. Alternative dietary indices both strongly predict risk of chronic disease. J Nutr 2012;142:1009–18.
[xli] Sofi F, Macchi C, Abbate R, Gensini GF, Casini A. Mediterranean diet and health status: an updated meta-analysis and a proposal for a literature-based adherence score. Public Health Nutr 2014;17: 2769–82.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	○ Negative components: Meat, dairy products • French National Nutrition Health Program-Guideline Score (PNNS-GS)[xlii], categorical (quintiles) and continuous (per 2 pt increment) ○ Positive components: Vegetables and Fruit, Seafood, Vegetable Fat ○ Neutral components: Breads, cereals, potatoes, legumes, meat and poultry, seafood, and eggs, milk and dairy products, alcohol ○ Negative components: Sweetened foods, soda, added fat, salt **Dietary assessment methods:** 3, 24-hour recalls, assessed during the first year of f/u, at age ~49y **Outcome assessment methods:** Participant report, medical record review, pathological reports		la Prevention et de l'Education pour la Sante, Region Ile-de-France, Institut National de la Sant_e et de la Recherche Medicale, Institut National de la Recherche Agronomique, Conservatoire National des Arts et Metiers, The French National Cancer Institute *Summary: Higher PNNS-GS score (continuous only) at 49y were associated with significantly lower risk of colorectal cancer after 8.5y f/u. AHEI-2010 and MEDI-LITE scores at 49y were not significantly associated with risk of colorectal cancer after 8.5y f/u.*
Liu, 2017[31] **PCS (Nurses' Health Study, Health Professional Follow-up Study)**	**Dietary patterns:** Adherence to a dietary pattern derived using lower rank regression (response variables: IL6, CRP (C-reactive protein) and TNFRSF1B (TNFα-receptor 2)): • Empirical dietary inflammatory pattern (EDIP) score: Higher in red and processed	**Significant**: EDIP score at 52y and colorectal cancer after 2,998,258 person-y f/u: • Q1: HR: 1.00 • Q2: HR: 0.86, 95% CI: 0.75, 0.98 • Q3: HR: 0.93, 95% CI: 0.82, 1.06	**Key confounders accounted for:** Sex, age, alcohol intake, physical activity, smoking, family history of the cancer outcome, inflammatory bowel disease **Other:**

[xlii] Estaquio C, Kesse-Guyot E, Deschamps V, Bertrais S, Dauchet L, Galan P, et al. Adherence to the French Programme National Nutrition Sante Guideline Score is associated with better nutrient intake and nutritional status. J Am Diet Assoc 2009;109:1031–41.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
United States Analytic N: 124,433 Participants were male and female, ~52yo, ~25 kg/m2 BMI, ~12 pack-years smoking, ~9g/d alcohol, ~23 METS-hrs/wk Exclude those with ulcerative colitis, without birth dates, prevalent cancer before 1984, died before 1984, missing diet data (~28% of original sample)	meats, refined grains, carbonated beverages, and some vegetables; lower in beer, wine, coffee, tea, yellow and leafy vegetables, and fruit juice **Dietary assessment methods:** Validated, FFQ at baseline and every 4y after, baseline at 52y **Outcome assessment methods:** F/u with participantes, medical record review, National Death Index, next of kin (Note: This paper also examined various molecular subtypes of colorectal cancer; results for molecular subtypes were not extracted in this table)	• Q4: HR: 0.99, 95% CI: 0.87, 1.13 • Q5: HR: 1.14, 95% CI: 0.99, 1.30 • p-trend=0.02 **Non-Significant**: N/A	Endoscopy status, Total energy intake, multivitamin use, aspirin use **Limitations:** • Did not account for race/ethnicity, socioeconomic status, anthropometry, colorectal polyps • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** NIH, Dana-Farber Harvard Cancer Center; The Paula and Russell Agrusa Fund for Colorectal Cancer Research, The Friends of the Dana-Farber Cancer Institute, Bennett Family Fund, and the Entertainment Industry Foundation through National Colorectal Cancer Research Alliance. *Summary: Higher empirical dietary inflammatory pattern score at 52y was associated with significantly increased risk of colorectal cancer.*
Mehta, 2017[32] **PCS (Nurses' Health Study, Health Professional F/u Study)** **United States** Analytic N: 137217	**Dietary patterns:** Adherence to 2 dietary patterns identified via principal component analysis: • "Western" dietary pattern: Higher loadings for red and processed meats, high-fat dairy products (such as whole milk and cream), refined grains, and desserts • "Prudent" dietary pattern: Higher loadings for vegetables, fruits, whole grains, and fish	**Significant**: "Western" dietary patterns at 52y and colorectal cancer after 32y f/u: • Q1, n=835: HR: 1.00 • Q2, n=822: HR: 1.09, 95% CI: 0.99, 1.20 • Q3, n=784: HR: 1.11, 95% CI: 1.00, 1.24 • Q4, n=819: HR: 1.31, 95% CI: 1.15, 1.48	**Key confounders accounted for:** Sex, age, physical activity, smoking, BMI, family history of the cancer outcome **Other:** Calendar year, History of endoscopy, regular aspirin or NSAID use, total energy intake **Limitations:** • Did not account for race/ethnicity,

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Participants were 65% female, ~60yo, ~26kg/m2 BMI, ~8% women and ~~16% men were current smokers, ~8g/d alcohol Exclude those with ulcerative colitis, without birth dates, prevalent cancer before 1984, died before 1984, missing diet data (~5% of original sample)	**Dietary assessment methods:** Validated, FFQ at baseline and every 4y after, baseline at 52y **Outcome assessment methods:** F/u with participantes, medical record review, National Death Index, next of kin (Note: This paper and another by the same author also examined various molecular subtypes of colorectal cancer; results for molecular subtypes were not extracted in this table) [xliii]	• p-trend=<0.0001 "Western" dietary patterns at 52y and distal colon cancer after 32y f/u: • Q1, n=216: HR: 1.00 • Q2, n=208: HR: 1.10, 95% CI: 0.90, 1.34 • Q3, n=208: HR: 1.19, 95% CI: 0.97, 1.47 • Q4, n=234: HR: 1.55, 95% CI: 1.22, 1.96 • p-trend=0.0004 "Western" dietary patterns at 52y and rectal cancer after 32y f/u: • Q1, n=172: HR: 1.00 • Q2, n=151: HR: 0.98, 95% CI: 0.78, 1.22 • Q3, n=176: HR: 1.24, 95% CI: 0.99, 1.56 • Q4, n=171: HR: 1.35, 95% CI: 1.03, 1.77 • p-trend=0.01 "Prudent" dietary patterns at 52y and colorectal cancer after 32y f/u: • Q1, n=843: HR: 1.00	socioeconomic status, alcohol intake, inflammatory bowel disease, colorectal polyps • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** NIH, Dana-Farber Harvard Cancer Center, The Project P Fund for Colorectal Cancer Research, The Friends of the Dana-Farber Cancer Institute, Bennett Family Fund, and the Entertainment Industry Foundation through National Colorectal Cancer Research Alliance *Summary: Higher adherence to a "western" dietary pattern at 52y was significantly associated with increased risk of colorectal, distal colon, and rectal cancer after 32y f/u. However, it was not significantly associated with proximal colon cancer. Results for the "western" dietary pattern were similar when men and women were analyzed separately.* *Higher adherence to a "prudent" dietary pattern at 52y was significantly associated with lower risk of colorectal cancer after 32y f/u. However, it was not significantly associated with proximal colon, distal colon, or rectal cancer. Results for the "prudent"*

[xliii] Mehta, R. S.,Nishihara, R.,Cao, Y.,Song, M.,Mima, K.,Qian, Z. R.,Nowak, J. A.,Kosumi, K.,Hamada, T.,Masugi, Y.,Bullman, S.,Drew, D. A.,Kostic, A. D.,Fung, T. T.,Garrett, W. S.,Huttenhower, C.,Wu, K.,Meyerhardt, J. A.,Zhang, X.,Willett, W. C.,Giovannucci, E. L.,Fuchs, C. S.,Chan, A. T.,Ogino, S.. Association of Dietary Patterns With Risk of Colorectal Cancer Subtypes Classified by Fusobacterium nucleatum in Tumor Tissue. *JAMA Oncol.* 2017. 3:921-927

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		• Q2, n=761: HR: 0.88, 95% CI: 0.80, 0.97 • Q3, n=830: HR: 0.90, 95% CI: 0.82, 1.00 • Q4, n=826: HR: 0.86, 95% CI: 0.77, 0.95 • p-trend=0.01 **Non-Significant**: "Western" dietary patterns at 52y was not significantly associated with proximal colon cancer after 32y f/u. "Prudent" dietary patterns at 52y was not significantly associated with proximal colon, distal colon, or rectal cancer after 32y f/u. Results for the "western" dietary pattern were similar when men and women were analyzed separately. Results for the "prudent" dietary pattern were similar in women; however, in men, higher "prudent" diet score was significantly associated with decreased risk of distal colon and rectal cancer.	*dietary pattern were similar in women; however, in men, higher "prudent" diet score was significantly associated with decreased risk of distal colon and rectal cancer.*
Orlich, 2015[33] **PCS (Adventist**	**Dietary patterns:**	**Significant**: "Vegetarian" diet at 58y and colorectal cancer after 7.3y f/u:	**Key confounders accounted for:** Sex, age, race/ethnicity, education, alcohol intake, physical activity, smoking, BMI, family

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Health Study-2 (AHS-2) **United States** Analytic N: 77659 Participants were 64% female, ~58yo (≥25yo), 66% ~26kg/m2 BMI, ~15% ever smokers, ~7% currently use alcohol, ~15% family history of prostate cancer, ~19% no vigorous exercise Excluded participants from ME and WI (no cancer registry), with prevalent cancers, no medical record verification, no date of cancer diagnosis, missing or invalid dietary data, age <25y, missing data on age/sex, implausible energy intake (~19% of original sample)	• "Vegans"[xliv]: Red meat, poultry, fish; eggs; and dairy <1 time/mo • "Lacto-ovo-vegetarian": Red meat, poultry, and fish <1 time/mo, eggs or dairy >1 time/mo • "Pesco-vegetarian": Red meat or poultry <1 time/mo, fish >1 time/mo, and eggs/dairy in any amount • "Semi-vegetarian": Red meat or poultry >1 time/mo, and all meats combined (including fish) <1 time/wk and eggs/dairy in any amount • "Nonvegetarians": Red meat and poultry >1 time/mo and all meats combined (including fish) >1 time/wk, and eggs/dairy in any amount "Vegetarians" vs. "nonvegetarians" consumed higher amounts of fruits, vegetables, avocados, non-fried potatoes, whole grains, legumes, soy foods, nuts and seeds, and was observed among vegetarians; and lower amounts of meats, dairy products, eggs, refined grains, added fats, sweets, snack foods and non-water beverages **Dietary assessment methods:** >220-item, validated FFQ, at baseline, at ~58y	• "Vegan", n=40: HR: 0.86, 95% CI: 0.59, 1.24, p=0.42 • "Lacto-ovo", n=147: HR: 0.83, 95% CI: 0.66, 1.05, p=0.11 • "Pesco", n=35: HR: 0.58, 95% CI: 0.40, 0.84, p=0.004 • "Semi", n=30: HR: 0.93, 95% CI: 0.62, 1.38, p=0.71 • "Nonvegetarian", n=238: HR: 1.00 Vegetarian diet at 58y and colorectal cancer after 7.3y f/u: • "Vegetarian", n=252: HR: 0.79, 95% CI: 0.64, 0.97 • "Nonvegetarian", n=238: HR: 1.00 • p=0.03 When results were stratified by sex and race, they were no significant associations in men or black participants. However, in women and non-black vegetarians, there was a borderline significant lower risk of colorectal cancer (p=0.08). "Vegetarian" diet at 58y and rectal cancer after 7.3y f/u: • "Vegetarian", n=55: HR: 0.66, 95% CI: 0.43, 1.02 • "Nonvegetarian", n=55: HR: 1.00	history of the cancer outcome, inflammatory bowel disease **Other:** History of peptic ulcer, treatment for diabetes mellitus in past year, aspirin use, statin use, prior colonoscopy or flexible sigmoidoscopy, supplemental calcium use, energy intake, hormone therapy use, fiber intake **Limitations:** • Did not account for history of colorectal polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** NIH, World Cancer Research Fund *Summary: Consuming a "vegetarian" vs. "nonvegetarian" diet at 58y was associated with a significant reduction in risk of colorectal cancer after 7.3y f/u. When results were broken down by type of "vegetarian" diet, consuming a "pescovegetarian" diet vs a "nonvegetarian" diet at 58y was associated with lower risk, while there were no*

[xliv] Orlich MJ, Jaceldo-Siegl K, Sabate J, et al. Patterns of food consumption among vegetarians and non-vegetarians. Br J Nutr. 2014; 112:1644–1653. [PubMed: 25247790]

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	Outcome assessment methods: State cancer registries, patient f/u with medical record verification	• p=0.06 **Non-Significant**: "Vegetarian" vs. "nonvegetarian" diet at 58y was not significantly associated with colon cancer after 7.3y f/u.	*differences with "vegan", "lacto-ovo", or "semi-vegetarian" diets.* *When results were stratified by sex and race, they were no significant associations in men or black participants. However, in women and non-black vegetarians, there was a borderline significant lower risk of colorectal cancer.* *Finally, "vegetarian" diet at 58y was not significantly associated with risk of rectal or colon cancer after 7.3y f/u-, when they were analyzed separately.*
Park, 2017[34] **PCS (Multiethnic Cohort study)** **United States** Analytic N: 190949 Participants were % female, ~60yo (45-75y), ~26kg/m2 BMI, ~70% men and ~45% women were ever smokers, ~15g/d men and ~5g/d women alcohol	**Dietary patterns:** • Healthy Eating Index 2010 (HEI-2010)[xlv] ○ Positive components: Total vegetables, geens and beans, total fruit, whole fruit, whole grains, seafood and plant proteins, total protein foods, dairy, fatty acids ○ Negative components: Refined grained, added sugars, solid fats, sodium • Alternative Healthy Eating Index 2010 (AHEI-2010)[xlvi] ○ Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA ○ Neutral components: Alcohol ○ Negative components: Red and Processed Meat, Sugar Sweetened	**Significant**: Men, HEI-2010 score at 60y and colorectal cancer after 16y f/u: • Q1, n=702, HR: 1.00 • Q2, n=496, HR: 0.81, 95% CI: 0.72, 0.91 • Q3, n=434, HR: 0.80, 95% CI: 0.70, 0.91 • Q4, n=339, HR: 0.72, 95% CI: 0.62, 0.82 • Q5, n=267, HR: 0.69, 95% CI: 0.59, 0.80 • p-trend<0.001 Women, HEI-2010 score at 60y and colorectal cancer after 16y f/u:	**Key confounders accounted for:** Sex, age, race/ethnicity, alcohol intake, physical activity, smoking, BMI, family history of the cancer outcome, colorectal polyps **Other:** Multivitamin use, NSAID use, menopausal status, hormone replacement therapy, total energy intake **Limitations:** • Did not account for socioeconomic status, inflammatory bowel disease • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome

[xlv] Guenther PM, Casavale KO, Reedy J, et al. Update of the Healthy Eating Index: HEI-2010. J Acad Nutr Diet. 2013; 113:569–580.
[xlvi] Chiuve SE, Fung TT, Rimm EB, et al. Alternative dietary indices both strongly predict risk of chronic disease. J Nutr. 2012; 142:1009–1018.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Excluded those who were not African American, Native Hawaiian, Japanese American, Latino and white, prevalent colorectal cancer, implausible dietary intake (~12% of original sample)	Beverages and Fruit Juice, Trans FA, Sodium • alternate Mediterranean diet score (aMED)[xlvii] ○ Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat • Dietary Approaches to Stop Hypertension (DASH) score[xlviii] ○ Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy ○ Negative components: Red and processed meat, sweetened beverages, sodium **Dietary assessment methods:** >180-item, validated FFQ at baseline, at ~60y **Outcome assessment methods:** Surveillance, Epidemiology and End Results Program tumor registries in Hawaii and California, National Death Index	• Q1, n=279, HR: 1.00 • Q2, n=312, HR: 0.87, 95% CI: 0.74, 1.03 • Q3, n=389, HR: 0.86, 95% CI: 0.73, 1.01 • Q4, n=421, HR: 0.78, 95% CI: 0.66, 0.91 • Q5, n=536, HR: 0.82 , 95% CI: 0.70, 0.96 • p-trend=0.008 Men, AHEI-2010 score at 60y and colorectal cancer after 16y f/u: • Q1, n=571, HR: 1.00 • Q2, n=429, HR: 0.84, 95% CI: 0.73, 0.95 • Q3, n=410, HR: 0.82, 95% CI: 0.72, 0.93 • Q4, n=465, HR: 0.92, 95% CI: 0.81, 1.04 • Q5, n=412, HR: 0.75, 95% CI: 0.65, 0.85 • p-trend<0 .001	reporting **Funding Sources:** NIH *Summary: In men, increased adherence to the HEI-2010, AHEI-2010, aMED, and DASH scores at 60y was significantly associated with lower risk of colorectal cancer after 16y f/u.* *In women, increased adherence to the HEI-2010 and DASH scores, but not the AHEI-2010 or aMED, were significantly associated with lower risk of colorectal cancer after 16y f/u.* *Increased adherence to the HEI-2010, AHEI-2010, and DASH scores were associated with significantly lower risk of left colon and rectum cancer, but not right colon cancer.* *When results were stratified by race, increased adherence to dietary pattern scores was significantly associated with lower risk of colorectal cancer in all groups, except African-Americans.*

[xlvii] Fung TT, McCullough ML, Newby PK, et al. Diet-quality scores and plasma concentrations of markers of inflammation and endothelial dysfunction. *Am J Clin Nutr*. 2005; 82:163–173.
[xlviii] Fung TT, Chiuve SE, McCullough ML, et al. Adherence to a DASH-style diet and risk of coronary heart disease and stroke in women. *Arch Intern Med*. 2008; 168:713–720.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		Men, aMED score at 60y and colorectal cancer after 16y f/u: • Q1, n=432: HR: 1.00 • Q2, n=405: HR: 0.98, 95% CI: 0.85, 1.12 • Q3, n=468: HR: 0.99, 95% CI: 0.87, 1.14 • Q4, n=380: HR: 0.84, 95% CI: 0.72, 0.97 • Q5, n=553: HR: 0.84, 95% CI: 0.73, 0.97 • p-trend=0.004 Men, DASH score at 60y and colorectal cancer after 16y f/u: • Q1, n=556: HR: 1.00 • Q2, n=328: HR: 0.85 (0.74–0.97) • Q3, n=535: HR: 0.81 (0.72–0.92) • Q4, n=340: HR: 0.82 (0.71–0.95) • Q5, n=479: HR: 0.75 (0.66–0.86) • p-trend<0 .001 Women, DASH score at 60y and colorectal cancer after 16y f/u: • Q1, n=435: HR: 1.00 • Q2, n=298: HR: 0.98 (0.85–1.14) • Q3, n=469: HR: 0.86 (0.75–0.99) • Q4, n=304: HR: 0.90 (0.77–1.05)	

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		• Q5, n=431: HR: 0.86 (0.75–1.00) • p-trend=0.04 Higher adherence to the HEI-2010, AHEI-2010, and DASH scores were associated with significantly lower risk of left colon and rectum cancer, but not right colon cancer. When results were stratified by race, higher adherence to the following dietary pattern scores was significantly associated with lower risk of colorectal cancer among the following race/ethnicity groups: • African American: None • Native Hawaiian: None (trend for HEI-2010, DASH) • Japanese American: HEI-2010, DASH (trend for AHEI-2010) • Latino: HEI-2010, AHEI-2010, aMED, DASH • White: HEI-2010, AHEI-2010, DASH **Non-Significant**: Women, AHEI-2010 score at 60y was not significantly associated with colorectal cancer after 16y f/u.	

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		Women, aMED score at 60y was not significantly associated with colorectal cancer after 16y f/u.	
Petimar, 2018[35] **PCS (Nurses' Health Study, Health Professional Follow-up Study)** **United States** Analytic N: 78012 (NHS), 46695 (HPFS) Participants were 63% female, ~55yo, ~25kg/m2 BMI, ~20% women and ~10% men were current smokers, ~5% women and ~15% men >2 drinks/d Exclude those with history of cancer or ulcerative colitis, without birth dates, missing diet data, implausible energy	**Dietary patterns:** • Alternative Healthy Eating Index 2010 (AHEI-2010)[xlix] ○ Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA ○ Neutral components: Alcohol ○ Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium • alternate Mediterranean diet score (aMED)[l] ○ Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat • Dietary Approaches to Stop Hypertension (DASH) score[li] ○ Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy ○ Negative components: Red and	**Significant**: aMED score at 55y, in men and women pooled, was significantly associated with rectal cancer after 26y f/u: NS • Q1, n=120: HR: 1.00 • Q2, n=121: HR: 0.94 (0.68, 1.30) • Q3, n=118: HR: 0.84 (0.64, 1.09 • Q4, n=103: HR: 0.72 (0.54, 0.95 • Q5, n=103: HR: 0.76 (0.54, 1.07 • p-trend=0.02 When women and men were analyzed separately, results were similar in men, and no longer significant in women. **Non-Significant**: DASH score at 55y, in men and women pooled, was not significantly associated with colorectal cancer (colorectal, colon, distal colon, proximal colon, rectal cancer) after 26y f/u • In women only, results were similar • In men only, increased DASH	**Key confounders accounted for:** Sex, age, alcohol intake, physical activity, smoking, BMI, family history of the cancer outcome, inflammatory bowel disease, colorectal polyps **Other:** Total energy intake, NSAID use, previous colorectal cancer screening, multivitamin use, supplemental calcium use, menopausal status, postmenopausal hormone use **Limitations:** • Did not account for race/ethnicity, socioeconomic status • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** NIH *Summary: Higher aMED adherence at 55y was significantly associated with lower risk of rectal cancer after 26y f/u. When women and men were analyzed separately, results were similar in men, and no longer significant in women. aMED score was not significantly*

[xlix] Chiuve SE, Fung TT, Rimm EB, et al. Alternative dietary indices both strongly predict risk of chronic disease. J Nutr. 2012; 142:1009–1018.
[l] Fung TT, McCullough ML, Newby PK, et al. Diet-quality scores and plasma concentrations of markers of inflammation and endothelial dysfunction. Am J Clin Nutr. 2005; 82:163–173.
[li] Fung TT, Chiuve SE, McCullough ML, et al. Adherence to a DASH-style diet and risk of coronary heart disease and stroke in women. Arch Intern Med. 2008; 168:713–720.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
intake (~30% of original sample)	processed meat, sweetened beverages, sodium **Dietary assessment methods:** Validated, FFQ at baseline and every 4y after, baseline at 55y **Outcome assessment methods:** Follow-up with participantes, medical record review, National Death Index, next of kin	adherence was significantly associated with lower total colorectal, total colon, and distal colon cancer risk aMED score at 55y, in men and women pooled, was not significantly associated with colorectal cancer (colorectal, colon, distal colon, proximal colon) after 26y f/u • In women only, results were similar • In men only, increased aMED adherence was significantly associated with lower total colorectal cancer risk AHEI-2010 score at 55y, in men and women pooled, was not significantly associated with colorectal cancer (colorectal, colon, distal colon, proximal colon, rectal cancer) after 26y f/u • In women only, results were similar • In men only, increased AHEI-2010 adherence was significantly associated with lower total colorectal colon cancer risk	*associated with colorectal cancer (colorectal, colon, distal colon, proximal colon), which the exception of in men, increased aMED adherence was significantly associated with lower total colorectal cancer risk.* *DASH score at 55y was not significantly associated with colorectal cancer (colorectal, colon, distal colon, proximal colon, rectal cancer) after 26y f/u, which the exception that in men, increased DASH adherence was significantly associated with lower total colorectal, total colon, and distal colon cancer risk.* *AHEI-2010 score at 55y, in men and women pooled, was not significantly associated with colorectal cancer (colorectal, colon, distal colon, proximal colon, rectal cancer) after 26y f/u, with the exception that in men, increased AHEI-2010 adherence was significantly associated with lower total colorectal colon cancer risk*
Roswall, 2015[36] **PCS (Women's Lifestyle and Health cohort)**	**Dietary patterns:** Healthy Nordic food index (HNFI) • Positive components: Cabbage, root vegetables, apples and pears, rye bread, oatmeal, fish	**Significant**: N/A **Non-Significant**: HNFI score at 39y (categorical and continuous) was not significantly associated with colorectal cancer.	**Key confounders accounted for:** Sex, education, alcohol intake, smoking, BMI, **Other:** Oral contraceptives, energy intake, red and processed meat **Limitations:**

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Sweden Analytic N: 45222 Participants were 100% female, 39y, 23kg/m2 BMI, 41% never smokers, 2.9 g/d alcohol Exclude those who emigrated before f/u, extreme energy intakes, missing covariate data, prevalent colorectal cancer (~8% of original sample)	**Dietary assessment methods:** 80-item, validated FFQ at baseline, 39y **Outcome assessment methods:** Swedish Cancer Registry		• Did not account for age, race/ethnicity, physical activity, family history of the cancer outcome, inflammatory bowel disease, colorectal polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** Swedish Research Council *Summary: Healthy Nordic Food Index score at 39y was not significantly associated with risk of colorectak cancer during f/u.*
Schulpen, 2020[44] **Nested Case-Control Study (Netherlands Cohort Study (NLCS))** **The Netherlands** Analytic N: 8050	**Dietary patterns:** • alternate Mediterranean diet scores (aMED)[lii], and without alcohol (aMEDr) ○ Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat	**Significant**: In women, smoking status significantly modified the relationship between aMEDr (per 2-pt increment) and colorectal cancer: • Never smokers, n=256: HR: 1.00, 95% CI: 0.88, 1.13 • Former smokers, n=350: HR: 0.78, 95% CI: 0.63, 0.98 • Current smokers, n=309: HR: 1.21, 95% CI: 0.96, 1.51	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, family history of the cancer, lung disease **Other:** Daily energy intake **Limitations:** • Did not account for race/ethnicity, inflammatory bowel disease, colorectal

[lii] Fung TT, McCullough ML, Newby PK, Manson JE, Meigs JB, Rifai N, et al. Diet-quality scores and plasma concentrations of markers of inflammation and endothelial dysfunction. Am J Clin Nutr 2005;82: 163–73.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Participants were 52% female, ~61yo (55-69y), ~25kg/m^2 BMI, ~55% former-smokers; ~10g/d alcohol Excluded those with prevalent cancer (except skin); missing data on diet and alcohol (~10% of the original sample)	• WCRF/AICR score[liii], diet only, and without alcohol ○ Positive components: Vegetables and fruit, dietary fiber ○ Negative components: Red and processed meat, sugary drinks, alcohol, sodium, energy-dense foods **Dietary assessment methods:** 150-item, validated FFQ at baseline, age ~61y **Outcome assessment methods:** Netherlands Cancer Registry and the nationwide Dutch Pathology Registry, and review of pathology records	• p-interaction=0.015 **Non-Significant**: Adherence to the aMED, with and without alcohol, and the WCRF/AICR, diet only score, with and without alcohol, at 61y was not significantly associated with risk of colorectal, colon, proximal, distal, or rectal cancer in men or women after 20.3y f/u. Results were also not significant when stratified by smoking status in men, alcohol consumption, body mass index, education, or family history of colorectal cancer.	polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plans; serious potential for selective outcome reporting **Funding Sources:** Wereld Kanker Onderzoek Fonds Nederland, World Cancer Research Fund International *Summary: aMED and WCRF/AICR scores, with and without alcohol, at 61y were not significantly associated with risk colorectal cancer after 20.3y f/u.* *Results were also not significant when stratified by smoking status in men, alcohol consumption, body mass index, education, or family history of colorectal cancer. However, in female former smokers, greater adherence to the aMEDr was significantly associated with lower risk of colorectal cancer.*
Shin, 2018[37] PCS (Japan Public Health Center-based Prospective Study (JPHC))	**Dietary patterns:** Adherence to 3 dietary patterns (categorical – quintiles) identified via principal component analysis:	**Significant**: In men, “prudent” dietary pattern score at 57y and colorectal cancer • Q1, n=318: HR: 1.00 • Q2, n=299: HR: 0.95, 95% CI:	**Key confounders accounted for:** Sex, age, race/ethnicity, physical activity, smoking **Other:**

[liii] World Cancer Research Fund/American Institute for Cancer Research. Food, nutrition, physical activity, and the prevention of cancer: a global perspective. Washington DC: American Institute for Cancer Research; 2007.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Japan Analytic N: 93,062 Participants were 53% female, ~57 yo, ~23 kg/m2 BMI, ~36% past or current smokers, and ~46% ever drinkers Excluded those with history of cancer, from one study center missing outcome data, missing diet data, unsuitable energy intake, non-Japanese ethnicity, inaccurate birth date, moved out of area, who died, lost to f/u (30% of original sample)	• "Prudent" dietary pattern: higher loadings for high intakes of vegetables, fruit, noodle, potatoes, soy products, mushroom, seaweed • "Westernized" dietary pattern: higher loadings for meat and processed meat, eel, dairy foods, fruit juice, coffee, tea, soft beverages, sauces, alcohol • "Traditional" dietary pattern: higher loadings for pickles, seafood, fish (oily-, salty-, lean-fish, and salmon), chicken, sake **Dietary assessment methods:** 138-item validated FFQ at baseline, 57y **Outcome assessment methods:** Cancer registry system and local medical records	0.81, 1.11 • Q3, n=274: HR: 0.82, 95% CI: 0.70, 0.96 • Q4, n=308: HR: 0.90, 95% CI: 0.77, 1.05 • Q5, n=315: HR: 0.85, 95% CI: 0.72, 1.00 • p-trend=0.0346 Results were similar for distal colon cancer. In women, "prudent" dietary pattern score at 57y and colorectal cancer • Q1, n=50: HR: 1.00 • Q2, n=45: HR: 0.93, 95% CI: 0.62, 1.39 • Q3, n=45: HR: 0.94, 95% CI: 0.62, 1.41 • Q4, n=46: HR: 0.96, 95% CI: 0.63, 1.44 • Q5, n=73: HR: 1.53, 95% CI: 1.04, 2.23 • p-trend=0.0463 In women, "westernized" dietary pattern score at 57y and colon cancer: • Q1, n=147: HR: 1.00 • Q2, n=149: HR: 1.15, 95% CI:	Total energy intake **Limitations:** • Did not account for socioeconomic status, alcohol intake**,** anthropometry, family history of the cancer outcome, inflammatory bowel disease, colorectal polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** National Cancer Center Research and Development Fund (Japan), Ministry of Health, Labour and Welfare of Japan *Summary: Higher adherence to the "prudent" dietary pattern was significantly associated with decreased risk of colorectal cancer and distal cancer in men and increased risk of rectal cancer in women. Higher adherence to the "westernized" dietary pattern was significantly associated with increased risk of colon cancer and distal cancer in women.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		0.91, 1.45 • Q3, n=165: HR: 1.40, 95% CI: 1.12, 1.76 • Q4, n=131: HR: 1.24, 95% CI: 0.97, 1.59 • Q5, n=117: HR: 1.28, 95% CI: 0.98, 1.68 • p-trend=0.0337 Results were similar for distal colon cancer. **Non-Significant**: "Prudent" dietary pattern score at 57y was not significantly associated with colon, proximal colon, or rectal cancer in men, or colorectal, colon cancer, proximal colon, or distal colon cancer in women. "Westernized" dietary pattern score at 57y was not significantly associated with colorectal, colon, proximal colon, distal colon, or rectal cancer in men, or colorectal, proximal colon, or rectal cancer in women. "Traditional" dietary pattern score at 57y was not significantly associated with colorectal, colon, proximal colon, distal colon, or rectal cancer in both men and women.	

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Tabung, 2018a[38] **PCS (Nurses' Health Study, Health Professional Follow-up Study)** **United States** Analytic N: 121,050 Participants were 61% female, had a mean age of ~62 y, ~25 kg/m2 BMI, ~60% drinkers, ~5 drinks/wk, and ~8% current smokers. Excluded those with history of cancer, incomplete dietary data, implausible energy intake (30% of original sample)	**Dietary patterns:** • Empirical Dietary Inflammatory Pattern (EDIP) Score (categorical – quintiles) ○ Higher in processed meat, red meat, organ meat, fish (other than dark-meat fish), other vegetables, refined grains, high-energy beverages, low-energy beverages, tomatoes ○ Lower in beer, wine, tea, coffee, dark yellow vegetables, green leafy vegetables, snacks, fruit juice, pizza **Dietary assessment methods:** Validated, FFQ at baseline and every 4y after, baseline at 55y **Outcome assessment methods:** Follow-up with participantes, medical record review, National Death Index, next of kin	**Significant**: In men and women combined, EDIP scores at 55y and colorectal cancer after 26y f/u: • Q1, n=113: HR: 1.00 • Q2, n=121: HR: 1.02, 95% CI: 0.90, 1.16 • Q3, n=140: HR: 1.13, 95% CI: 1.00, 1.28 • Q4, n=130: HR: 1.17, 95% CI: 1.03, 1.32 • Q5, n=151: HR: 1.32, 95% CI: 1.12, 1.55 • p-trend<0.001 Results were similar men, women, and in combined analyses for colon, distal colon, and proximal colon. Results were also significant, for men only, with rectal cancer. When stratified by BMI < or >25kg/m^2, results were significant for men in both groups, and only in women with BMI<25kg/m^2. When results were stratified by alcohol intake (no drink, 0.1-1 drink/d, >1 drink/d), results were significant for men consuming no drinks or 0.1-1 drink/d, and in women consuming no drinks.	**Key confounders accounted for:** Sex, age, race/ethnicity, alcohol intake, physical activity, anthropometry, smoking, family history of the cancer outcome **Other:** Total energy intake, multivitamin use, history of endoscopy **Limitations:** • Did not account for socioeconomic status, inflammatory bowel disease, colorectal polyps • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** NCI, NIH, Dana-Farber Harvard Cancer Center, and Stand Up to Cancer grant *Summary: Higher adherence to EDIP scores over up to 26 y f/u (most proinflammatory diet) was significantly associated with risk of colorectal cancer, colon cancer, proximal colon cancer, distal colon cancer in men, women, and both combined, as well as riak of rectal cancer in men. Results were not significant for rectal cancer risk in women or men/women combined.* *When stratified by BMI < or >25kg/m^2, results were significant for men in both groups, and only in women with BMI<25kg/m^2. When stratified by alcohol intake (no drink, 0.1-1*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		Non-Significant: EDIP scores at 55y was not significantly associated with rectal cancer after 26y f/u, in women or pooled analyses.	*drink/d, >1 drink/d), results were significant for men consuming no drinks or 0.1-1 drink/d, and in women consuming no drinks.*
Tabung, 2018b [39] **PCS (Nurses' Health Study, Health Professional Follow-up Study)** **United States** Analytic N: 120,401 Participants were 62% female with a mean age ~64 y, ~25 kg/m2 BMI, ~60% drinkers, and ~8% current smokers. Excluded those with history of cancer or ulcerative colitic, incomplete dietary data, implausible energy intake (30% of original sample)	**Dietary patterns:** • Empirical dietary index for hyperinsulinemia (EDIH) ○ Higher in red meat, processed meat, low energy beverages, cream soups, margarine, poultry, high energy beverages, butter, French fries, other fish, low fat dairy, eggs, tomatoes, cruciferous vegetables ○ Lower in wine, coffee, high fat dairy, green leafy vegetables, whole fruits, dark yellow vegetables, snacks **Dietary assessment methods:** Validated, FFQ at baseline and every 4y after, baseline at 55y **Outcome assessment methods:** Follow-up with participantes, medical record review, National Death Index, next of kin	**Significant**: In men and women combined, EDIH score at 55y and colorectal cancer after 26y f/u: • Q1, n=552: HR: 1.00 • Q2, n=525: HR: 0.97, 95% CI: 0.86, 1.10 • Q3, n=566: HR: 1.10, 95% CI: 0.97, 1.24 • Q4, n=529: HR: 1.10, 95% CI: 0.97, 1.25 • Q5, n=511: HR: 1.26, 95% CI: 1.12, 1.42 • p-trend<0.0001 Results were similar for men, women, and men and women combined for colorectal, colon, and distal colon cancer. Results were also significantly for women and men and women combined for proximal colon cancer, and in men for rectal cancer. When stratified by BMI < or >25kg/m^2, results were significant for men in both groups, and only in women with BMI>25kg/m^2.	**Key confounders accounted for:** Sex, age, race/ethnicity, alcohol intake, physical activity, anthropometry, smoking, family history of the cancer outcome **Other:** Total energy intake, multivitamin use, history of endoscopy **Limitations:** • Did not account for socioeconomic status, inflammatory bowel disease • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** NCI, NIH, Dana-Farber Harvard Cancer Center, and Stand Up to Cancer grant *Summary: Higher EDIH scores at 55y was significantly associated with higher risk of colorectal cancer after 26y f/u. Results were similar for men, women, and men and women combined for colorectal, colon, and distal colon cancer. Results were also significantly for women and men and women combined for proximal colon cancer, and in men for rectal cancer.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		When results were stratified by physical activity (MET-h/wk below/above median), results were significant for men and women below the median. **Non-Significant**: Higher EDIH scores over up to 26 y f/u were not significantly associated with proximal colon cancer in men, or in rectal cancer in women or men and women combined.	*Higher EDIH scores over up to 26 y f/u were not significantly associated with proximal colon cancer in men, or in rectal cancer in women or men and women combined.* *When stratified by BMI < or >25kg/m^2, results were significant for men in both groups, and only in women with BMI>25kg/m^2. When results were stratified by physical activity (MET-h/wk below/above median), results were significant for men and women below the median.*
Torres Stone, 2017[40] **PCS (NIH)-AARP) Diet and Health Study)** **United States** Analytic N: 398458 Participants were 41% female, majority >60y (50-71y), ~65% overweight or obese, 37% never smokers	**Dietary patterns:** • Healthy Eating Index 2010 (HEI-2010)[liv] ○ Positive components: Total vegetables, geens and beans, total fruit, whole fruit, whole grains, seafood and plant proteins, total protein foods, dairy, fatty acids ○ Negative components: Refined grained, added sugars, solid fats, sodium • Mediterranean diet score[lv] ○ Positive components: Vegetables, legumes, fruit, cereals, fish, MUFA+PUFA/SFA ○ Neutral components: Alcohol ○ Negative components: Meat, dairy products	**Significant**: In normal weight men, mediterranean diet score at 60y and colorectal cancer (n=4483 cases) after 123mo f/u: • Q1: HR: 1.00 • Q2: HR: 0.79, 95% CI: 0.66, 0.96 • Q3: HR: 0.66, 95% CI: 0.54, 0.82 • Q4: HR: 0.67, 95% CI: 0.54, 0.84 • Q5: HR: 0.65, 95% CI: 0.51, 0.83 • p-trend=0.0004 Results were also significant in overweight (p=0.0013) and obese (p=0.0508) men	**Key confounders accounted for:** Sex, age, race/ethnicity, education, physical activity, smoking, BMI, family history of the cancer outcome, colorectal polyps **Other:** Energy intake **Limitations:** • Did not account for alcohol intake, inflammatory bowel disease • Excluded subjects with history of colorectal polyps, first-degree relatives with colon cancer, and underweight • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u

[liv] Guenther PM, Casavale KO, Reedy J, et al. Update of the Healthy Eating Index: HEI-2010. J Acad Nutr Diet. 2013; 113:569–580.
[lv] Trichopoulou A, Orfanos P, Norat T, Bueno-de-Mesquita B, Ocké MC, Peeters PH, van der Schouw YT, Boeing H, Hoffmann K, Boffetta P, Nagel G. Modified Mediterranean diet and survival: PIC-elderly prospective cohort study. Bmj. 2005 Apr 28;330(7498):991.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Excluded those with history of cancer or end-stage renal disease, history of colorectal polyps, first-degree relatives with colon cancer, underweight, missing height or weight, implausible energy intake, questionnaires completed by proxy (~30% original sample)	• Dietary Approaches to Stop Hypertension (DASH) score[lvi] ○ Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy ○ Negative components: Red and processed meat, sweetened beverages, sodium **Dietary assessment methods:** 124-item validated FFQ at baseline, 60y **Outcome assessment methods:** State cancer registries	In normal weight men, HEI-2010 score at 60y and colorectal cancer (n=4483 cases) after 123mo f/u: • Q1: HR: 1.00 • Q2: HR: 0.94, 95% CI: 0.77, 1.14 • Q3: HR: 0.83, 95% CI: 0.67, 1.03 • Q4: HR: 0.73, 95% CI: 0.58, 0.91 • Q5: HR: 0.67, 95% CI: 0.54, 0.84 • p-trend=0.0001 Results were also significant in overweight (p<0.0001) and obese (p=0.0394) men In normal weight men, DASH score at 60y and colorectal cancer (n=4483 cases) after 123mo f/u: • Q1: HR: 1.00 • Q2: HR: 0.91, 95% CI: 0.08, 1.11 • Q3: HR: 0.79, 95% CI: 0.64, 0.99 • Q4: HR: 0.83, 95% CI: 0.66, 1.04 • Q5: HR: 0.67, 95% CI: 0.54, 0.84 • p-trend=0.0005 Results were also significant in overweight men (p<0.0001), but not in obese men (p=0.0801)	• Did not account for missing data • No preregistered statistical plans; serious potential for selective outcome reporting **Funding Sources:** NIH *Summary: In men, higher Mediterranean, HEI-2010, and DASH scores were significantly associated with lower risk of colorectal cancer after 123mo f/u.* *In women, higher HEI-2010 score was significantly associated with lower risk of colorectal cancer in overweight women. Higher DASH score was significantly associated with lower risk of colorectal cancer in normal weight and obese women. Mediterranean diet score was not significantly associated with risk of colorectal cancer in women.*

[lvi] Fung TT, Chiuve SE, McCullough ML, et al. Adherence to a DASH-style diet and risk of coronary heart disease and stroke in women. Arch Intern Med. 2008; 168:713–720.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		When probablities were examined, in normal weight, overweight, and obese men, higher scores on all 3 dietary patterns was associated with decreased risk of colorectal cancer. In overweight women, HEI-2010 score at 60y and colorectal cancer (n=2032 cases) after 123mo f/u: • Q1: HR: 1.00 • Q2: HR: 0.87, 95% CI: 0.65, 1.16 • Q3: HR: 0.94, 95% CI: 0.71, 1.25 • Q4: HR: 0.73, 95% CI: 0.55, 0.98 • Q5: HR: 0.64, 95% CI: 0.47, 0.86 • p-trend=0.0001 Results were not significant in normal weight (p=0.1557) and obese (p=0.0573) women In normal weight women, DASH score at 60y and colorectal cancer (n=2032 cases) after 123mo f/u: • Q1: HR: 1.00 • Q2: HR: 0.86, 95% CI: 0.68, 1.09 • Q3: HR: 0.70, 95% CI: 0.53, 0.93 • Q4: HR: 0.86, 95% CI: 0.66, 1.13 • Q5: HR: 0.73, 95% CI: 0.56, 0.95	

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		• p-trend=0.0005 Results were also significant in obese women (p=0.0128), but not in overweight women (p=0.1256) When probablities were examined, in normal weight women, higher DASH score was associated with decreased risk of colorectal cancer. In overweight and obese women, increased HEI-2010 and DASH scores were associated with decreased risk of colorectal cancer. **Non-Significant**: In normal weight, overweight, and obese women, mediterranean diet score at 60y was not significantly associated with colorectal cancer (n=2032 cases) after 123mo f/u.	
Vargas, 2016[41] **PCS (Women's Health Initiative Observational Study)** **United States** Analytic N: 78273	**Dietary patterns:** • Healthy Eating Index 2010 (HEI-2010)[lvii] ○ Positive components: Total vegetables, geens and beans, total fruit, whole fruit, whole grains, seafood and plant proteins, total protein foods, dairy, fatty acids ○ Negative components: Refined grained, added sugars, solid fats, sodium	**Significant**: HEI-2010 score at 63y and colorectal cancer after 12.4 y f/u: • Q1, n=209: HR: 1.00 • Q2, n=189: HR: 0.88, 95% CI: 0.72, 1.08 • Q3, n=175: HR: 0.81, 95% CI: 0.66, 0.99	**Key confounders accounted for:** Sex, age, race/ethnicity, education, alcohol intake, physical activity, smoking **Other:** Hormone replacement therapy **Limitations:** • Did not account for anthropometry, family history of the cancer outcome, inflammatory bowel disease, colorectal

[lvii] Guenther PM, Casavale KO, Reedy J, et al. Update of the Healthy Eating Index: HEI-2010. J Acad Nutr Diet. 2013; 113:569–580.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Participants were 100% female, ~63yo, ~27kg/m2, ~19% never smokers, ~2.5 alcohol servings/wk Excluded those with history of cancer, colorectal diagnosis during first year of f/u, missing f/u or dietary data, implausible energy intakes (~16% of original sample)	• Alternative Healthy Eating Index 2010 (AHEI-2010)[lviii] ○ Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA ○ Neutral components: Alcohol ○ Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium • alternate Mediterranean diet score (aMED)[lix] ○ Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat • Dietary Approaches to Stop Hypertension (DASH) score[lx] ○ Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy ○ Negative components: Red and processed meat, sweetened beverages, sodium	• Q4, n=172: HR: 0.77, 95% CI: 0.63, 0.95 • Q5, n=166: HR: 0.73, 95% CI: 0.59, 0.90 • p-trend=0.032 Higher HEI-2010 score was significantly associated with decreased riusk of colon cancer, but not rectal cancer. DASH score at 63y and colorectal cancer after 12.4 y f/u: • Q1, n=195: HR: 1.00 • Q2, n=177: HR: 0.84, 95% CI: 0.68, 1.03 • Q3, n=193: HR: 0.72, 95% CI: 0.59, 0.89 • Q4, n=183: HR: 0.74, 95% CI: 0.60, 0.91 • Q5, n=163: HR: 0.78, 95% CI: 0.62, 0.97 • p-trend=0.021 Higher DASH score was significantly associated with decreased riusk of colon cancer, but not rectal cancer.	polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting **Funding Sources:** NIH *Summary: Higher HEI-2010 and DASH scores at 63y were significantly associated with decreased risk of colorectal and colon cancer after 12.4y f/u, but not rectal cancer.* *AHEI and aMED scores were not significantly associated with risk of colorectal, colon, or rectal cancer after 12.4y f/u.*

[lviii] Chiuve SE, Fung TT, Rimm EB, et al. Alternative dietary indices both strongly predict risk of chronic disease. J Nutr. 2012; 142:1009–1018.
[lix] Fung TT, McCullough ML, Newby PK, et al. Diet-quality scores and plasma concentrations of markers of inflammation and endothelial dysfunction. Am J Clin Nutr. 2005; 82:163–173.
[lx] Fung TT, Chiuve SE, McCullough ML, et al. Adherence to a DASH-style diet and risk of coronary heart disease and stroke in women. Arch Intern Med. 2008; 168:713–720.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	Dietary assessment methods: 122-item validated FFQ, at baseline, ~63y **Outcome assessment methods:** Participant f/u, medical records, pathology reports	**Non-Significant**: AHEI score at 63y was not significantly associated with risk of colorectal, colon, and rectal cancer after 12.4 y f/u (p=0.427). aMED score at 63y was not significantly associated with risk of colorectal, colon, and rectal cancer after 12.4 y f/u (p=0.217).	
Voortman, 2017[24] **PCS (Rotterdam Study)** **The Netherlands** Analytic N: 9627 Participants were 58% female, 64.1yo, 26.3kg/m2, 32% never smokers, 61% <10g/d alcohol Excluded those without reliable dietary data, prevalent cancer cases, missing outcome data (~19% of original sample)	**Dietary patterns:** • Dutch Dietary Guidelines 2015 score, continuous ○ Positive components: Vegetables, legumes, fruit, nuts, whole grains, fish, dairy products, unsaturated fats and oils, tea ○ Negative components: Replace refined grains with whole-grain products, red meat, processed meat, alcohol, sodium **Dietary assessment methods:** 170 to 389-item, validated FFQ at baseline, ~64y **Outcome assessment methods:** Nationwide registry of histopathology and cytopathology, f/u with general practitioners	**Significant**: Dutch Dietary Guidelines 2015 score and colorectal cancer (n=324) after 11y f/u: HR: 0.90, 95% CI: 0.84, 0.96), p<0.05 **Non-Significant**: N/A	**Key confounders accounted for:** Sex, age, race/ethnicity, education, employment status, alcohol intake, physical activity, smoking, BMI **Other:** Cohort, total energy intake **Limitations:** • Did not account for race/ethnicity, family history of the cancer outcome, inflammatory bowel disease, colorectal polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not fully account for missing data • No preregistered statistical plans; potential for selective outcome reporting

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
			Funding Sources: Erasmus University Medical Center and Erasmus University Rotterdam; the Netherlands Organization for Health Research and Development; the Research Institute for Diseases in the Elderly; the Netherlands Genomics Initiative; the Ministry of Education, Culture and Science; the Ministry of Health, Welfare and Sports; the European Commission (DG XII); and the Municipality of Rotterdam *Summary: Higher Dutch Dietary Guidelines 2015 score at 64y was significantly associated with lower risk of colorectal cancer after 11y f/u.*
Vulcan, 2019[42] **PCS (Malmö Diet and Cancer Study)** **Sweden** Analytic N: 27931 Participants were ~60% female, ~59yo, 26.5kg/m2 BMI, 37% never smokers, ~72% drnak 0-20g/d alcohol Excluded those with a history of cancer (~1%)	**Dietary patterns:** • Colorectal Diet Quality Index (CDQI) ○ Positive components: Fiber, dairy products ○ Negative components: Processed meat **Dietary assessment methods:** 168-item FFQ, and a 7-day menu diet history book at baseline, ~59y **Outcome assessment methods:** Swedish Cancer Registry	**Significant**: CDQI score at 59y and colorectal cancer (n=923) after 502136 person years f/u: • 0-3, n=135: HR: 1.00 • 4-6, n=222: HR: 0.77, 95% CI: 0.65, 0.91 • 7-9, n=187: HR: 0.74, 95% CI: 0.61, 0.89 • 10-12, n=46: HR: 0.57, 95% CI: 0.43, 0.75 • p-trend<0.001 Results were similar for colon and rectal cancer, and when women and men were analyzed separately.	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI **Other:** Diet assessment method, season, total energy **Limitations:** • Did not account for race/ethnicity, anthropometry, family history of the cancer outcome, inflammatory bowel disease, colorectal polyps • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • No preregistered statistical plans; potential for selective outcome reporting

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		Non-Significant: N/A	**Funding Sources:** Malmö Hospital Foundation for Cancer Prevention, South Region of healthcare *Summary: Higher colorectal diet quality index score at 59y was significantly associated with lower risk of colorectal, colon, and rectal cancer after f/u.*

Table 6. Summary of the results from studies that examined the relationship between dietary patterns and colorectal cancer[lxi]

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Randomized Controlled Trials			
Prentice, 2019[1] RCT (Women's Health Initiative Dietary Modification (DM) trial) United States	• Intervention group: Reduction in fat from ~35%E to 20%E of energy, 5 servings/d fruits and vegetables, 6 serving/d grains; achieved reductions 8–10%E of total, saturated, and unsaturated fat, reductions in 8–10% of carbohydrate; had higher intakes of fruits, vegetables, whole grains, and total grains Comparison group: Received written health-related materials only; lower intakes of fruits, vegetables, whole grains, and total grains		There were no significantly differences between intervention and comparison groups and colorectal cancer during the intervention, after 8.5y f/u, and after 19.6y f/u.
Thomson, 2014[2] RCT (Women's Health Initiative Dietary Modification (DM) trial)	• Intervention group: Reduction in fat from ~35%E to 20%E of energy, 5 servings/d fruits and vegetables, 6 serving/d grains; achieved reductions 8–10%E of total, saturated, and unsaturated fat, reductions in 8–10% of carbohydrate; had higher intakes of fruits, vegetables, whole grains, and total grains		There were no significantly differences between intervention and comparison groups and colorectal cancer during the intervention, after 8.5y f/u, and after 13.5y f/u.

[lxi] Abbreviations: AHEI-2010, Alternative Healthy Eating Index-2010; aMED, Alternative Mediterranean Diet Score ; BMI, body mass index; CDQI, Colorectal Diet Quality Index; d, day; DASH, Dietary Approaches to Stop Hypertension; DFA, "High-dairy", "high-fruit-and-vegetable", "low, alcohol" dietary pattern; DM, dietary modification; DP, Dietary pattern; %E, % of energy; EDIH, Empirical dietary index for hyperinsulinemia; EDIP, Empirical dietary inflammatory pattern; EPIC, European Prospective Investigation into Cancer and Nutrition; FFQ, food frequency questionnaire; FSAm-NPS, Nutrient Profiling System of the British Food Standards Agency (modified version); f/u, follow-up; HNFI, Healthy Nordic food index ; HR, hazard ratio; IMI, Italian Mediterranean Index; MEDI-LITE, Mediterranean diet score; MD, Mediterranean diet; MDS, Mediterranean Diet Score; mo, month or months; N/A, Not applicable; NIH, National Institutes of Health; NOVA, Ultra-processed food score; NS, Not significant; NR, Not reported; PCS, prospective cohort study; pt, point; RCT, randomized controlled trial; SEER, Surveillance, Epidemiology, and End Results Program; WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; wk, week(s); y, year(s)

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
United States	• Comparison group: Received written health-related materials only; lower intakes of fruits, vegetables, whole grains, and total grains		
Obervational Studies			
Boden, 2019[27] PCS (Vasterbotten Intervention Programme) Sweden	Mediterranean diet score (MDS) • Positive components: Vegetables and potatoes, fruit and fresh juices, wholegrain cereals, fish and fish products, MUFA+PUFA/SFA, • Moderation components: Alcohol • Negative components: Meat and meat products, dairy products		Mediterranean diet score at 46y was not significantly associated with colorectal cancer (n=1036) after 15y f/u in all participants, or when men and women were analyzed separately.
Cheng, 2018[43] PCS (Iowa Women's Health Study) United States	Evolutionary-concordance score • Positive components: Vegetables, fruits, lean meats, fish, nuts, fruit and vegetable diversity, calcium • Negative components: Red and processed meats, sodium, dairy foods, grains and starches, baked goods, sugar-sweetened beverages, alcohol		Evolutionary-concordance score at 61y (categorical and continuous) was not significantly associated with colorectal cancer (n=1731 after 18y f/u).
	Mediterranean diet score • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat		Mediterranean diet score at 61y (categorical and continuous) was not significantly associated with colorectal cancer (n=1731) after 18y f/u.
Deschasaux, 2018[4] PCS (European	Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score	FSAm-NPS score at 51y and risk of colorectal cancer after 15.3y f/u: • Q1, n=1144: HR: 1.00	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Prospective Investigation into Cancer and Nutrition (EPIC)) Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, UK	• Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fibers, proteins, and fruits/vegetables/legumes/nuts. • Higher FSAm-NPS score had higher intakes of alcohol, energy and red and processed meat, lower intakes of dietary fibers, vegetables, fruit, fish, and lean meat	• Q2, n=1150: HR: 1.07, 95% CI: 0.99, 1.17 • Q3, n=1152: HR: 1.07, 95% CI: 0.98, 1.17 • Q4, n=1195: HR: 1.12, 95% CI: 1.02, 1.22 • Q5, n=1165: HR: 1.11, 95% CI: 1.01, 1.22 • p-trend= 0.02 Continuous, per 2pt increment, n=5086 cases: HR: 1.03, 95% CI: 1.00, 1.06, p-trend=0.03	
Fasanelli, 2017[28] PCS (European Prospective Investigation into Cancer and Nutrition) Italy	Italian Mediterranean Index (IMI) (mediation with waist-to-hip ratio) • Positive components: Pasta, Mediterranean vegetables (raw tomatoes, cooked leafy vegetables, raw leafy vegetables, onion or garlic, mixed salad or mixed vegetables), fruits, legumes, olive oil, fish • Neutral components: Alcohol • Negative components: Soft drinks, butter, red meat, potatoes	Total causal effect of IMI score at 50y and colorectal cancer (n=414) after 11y f/u: • 0-1: HR: 1.00 • 2-3: HR: 0.51, 95% CI: 0.95, 0.35, 0.84 • 4-5: HR: 0.62, 95% CI: 0.95, 0.41, 0.95 • 6-1: HR: 0.51, 95% CI: 0.95, 0.31, 0.85 Results of the pure direct effect analysis were similar. However, results were not significantly when analyzed through waist-to-hip ratio, via the natural indirect effect analysis.	
Fiolet, 2018[7] PCS (NutriNet-Santé) France	Ultra-processed food score (NOVA), categorical (quartiles) • Main food groups contributing to NOVA score were sugary drinks, drinks, starchy foods and breakfast cereals, ultra-processed fruits and vegetables, dairy products, meats, fish, and eggs, processed meats, fats, and salty snacks		Ultra-processed food score at 49y and colorectal cancer after 5.4y f/u: • Q1, n=48: HR: 1.00 • Q2, n=43: HR: 1.12, 95% CI: 0.74, 1.70 • Q3, n=36: HR: 1.22, 95% CI: 0.79, 1.89 • Q4, n=26: HR: 1.23, 95% CI: 1.08, 1.40 • p-trend=0.07

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
			Ultra-processed food score, continuous, and colorectal cancer (n=153): HR: 1.16, 95% CI: 0.95, 1.42; p-trend=0.10
Jones, 2017[29] PCS (UK Women's Cohort Study) United Kingdom	Mediterranean diet score • Positive components: Vegetables, legumes, fruit, cereals, fish, MUFA+PUFA/SFA • Neutral components: Alcohol • Negative components: Meat, dairy products	Mediterranean diet score at 52y and colorectal cancer after 17.4y f/u: • Q1, n=74, HR: 1.00 • Q2, n=75, HR: 0.91, 95% CI: 0.64, 1.30 • Q3, n=88, HR: 0.82, 95% CI: 0.58, 1.15 • Q4, n=136, HR: 0.63, 95% CI: 0.45, 0.87 • Q5, n=92, HR: 0.82, 95% CI: 0.57, 1.17 • Per 2 unit increment: HR: 0.88, 95% CI: 0.78, 0.99 • p-trend=0.030 Mediterranean diet score at 52y and rectal cancer after 17.4y f/u: • Q1, n=30, HR: 1.00 • Q2, n=26, HR: 0.77, 95% CI: 0.44, 1.35 • Q3, n=26, HR: 0.58, 95% CI: 0.32, 1.02 • Q4, n=44, HR: 0.50, 95% CI: 0.29, 0.83 • Q5, n=28, HR: 0.38, 95% CI: 0.20, 0.74 • Per 2 unit increment: HR: 0.69, 95% CI: 0.56, 0.86 • p-trend=0.001	Mediterranean diet score at 52y was not significantly associated with colon, proximal colon, or distal colon cancer after 17.4y f/u.
Kumagai, 2014[30] PCS (Ohsaki National Health Insurance (NHI) Cohort Study) Japan	Japanese dietary pattern: Higher loadings for soybean products, fish, seaweeds, vegetables, fruits, and green tea		Japanese dietary pattern score at 60y was not significantly associated with risk of colorectal, colon, or rectal cancer after 11y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	Animal food dietary pattern: Higher loadings for beef pork, ham, sausage, chicken, liver, butter, coffee, and alcoholic beverages		Animal food dietary pattern score at 60y was not significantly associated with risk of colorectal, colon, or rectal cancer after 11y f/u.
	High-dairy, high-fruit-and-vegetable, low, alcohol (DFA) dietary pattern: Higher loadings for dairy products (milk and yoghurt), margarine, fruits, and vegetables (carrot, pumpkin and tomato), and lower for rice, miso soup, and alcoholic beverages	DFA pattern score at 60y and colorectal cancer after 11y f/u: • Q1, n=288: HR: 1.00 • Q2, n=223: HR: 0.88, 95% CI: 0.72, 1.06 • Q3, n=185: HR: 0.82, 95% CI: 0.66, 1.03 • Q4, n=158: HR: 0.76, 95% CI: 0.60, 0.97 • p-trend=0.02 DFA pattern score at 60y and rectal cancer after 11y f/u: • Q1, n=127: HR: 1.00 • Q2, n=82: HR: 0.79, 95% CI: 0.58, 1.07 • Q3, n=68: HR: 0.76, 95% CI: 0.53, 1.08 • Q4, n=46: HR: 0.56, 95% CI: 0.37, 0.84 • p-trend=0.0003	DFA dietary pattern score at 60y was not significantly associated with risk of colon cancer after 11y f/u.
Lavalette, 2018[16] PCS (NutriNet-Sante study) France	Alternate Healthy Eating Index 2010 (AHEI-2010) • Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA • Neutral components: Alcohol • Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium		AHEI-2010 score at ~49y (categorical and continuous) was not significantly associated with colorectal cancer after 8.5y f/u.
	Mediterranean diet score (MEDI-LITE) • Positive components: Vegetables, legumes, fruit and nuts, cereals, fish, olive		MEDI-LITE score at ~49y (categorical and continuous) was not significantly associated with colorectal cancer after 8.5y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	oil • Neutral components: Alcohol • Negative components: Meat, dairy products		
	French National Nutrition Health Program-Guideline Score (PNNS-GS) • Positive components: Vegetables and Fruit, Seafood, Vegetable Fat • Neutral components: Breads, cereals, potatoes, legumes, meat and poultry, seafood, and eggs, milk and dairy products, alcohol • Negative components: Sweetened foods, soda, added fat, salt	Higher PNNS-GS score at ~49y (continuous) and colorectal cancer after 8.5y f/u: HR: 0.89, 95% CI: 0.80, 1.00, p=0.04	PNNS-GS score at ~49y (categorical) was not associated with risk of colorectal cancer after 8.5y f/u.
Liu, 2017[31] PCS (Nurses' Health Study, Health Professional Follow-up Study) United States	Empirical dietary inflammatory pattern (EDIP) score (response variables: IL6, CRP (C-reactive protein): Higher in red and processed meats, refined grains, carbonated beverages, and some vegetables; lower in beer, wine, coffee, tea, yellow and leafy vegetables, and fruit juice	EDIP score at 52y and colorectal cancer after 2,998,258 person-y f/u: • Q1: HR: 1.00 • Q2: HR: 0.86, 95% CI: 0.75, 0.98 • Q3: HR: 0.93, 95% CI: 0.82, 1.06 • Q4: HR: 0.99, 95% CI: 0.87, 1.13 • Q5: HR: 1.14, 95% CI: 0.99, 1.30 • p-trend=0.02	
Mehta, 2017[32] PCS (Nurses' Health Study, Health Professional Follow-up Study)	Western dietary pattern: Higher loadings for red and processed meats, high-fat dairy products (such as whole milk and cream), refined grains, and desserts	Western dietary patterns at 52y and colorectal cancer after 32y f/u: • Q1, n=835: HR: 1.00 • Q2, n=822: HR: 1.09, 95% CI: 0.99, 1.20 • Q3, n=784: HR: 1.11, 95% CI: 1.00, 1.24 • Q4, n=819: HR: 1.31, 95% CI: 1.15, 1.48 • p-trend=<0.0001	Western dietary patterns at 52y was not significantly associated with proximal colon cancer after 32y f/u. Results for the western dietary pattern were similar when men and women were analyzed separately.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
United States		Western dietary patterns at 52y and distal colon cancer after 32y f/u: • Q1, n=216: HR: 1.00 • Q2, n=208: HR: 1.10, 95% CI: 0.90, 1.34 • Q3, n=208: HR: 1.19, 95% CI: 0.97, 1.47 • Q4, n=234: HR: 1.55, 95% CI: 1.22, 1.96 • p-trend=0.0004 Western dietary patterns at 52y and rectal cancer after 32y f/u: • Q1, n=172: HR: 1.00 • Q2, n=151: HR: 0.98, 95% CI: 0.78, 1.22 • Q3, n=176: HR: 1.24, 95% CI: 0.99, 1.56 • Q4, n=171: HR: 1.35, 95% CI: 1.03, 1.77 • p-trend=0.01	
	Prudent dietary pattern: Higher loadings for vegetables, fruits, whole grains, and fish	Prudent dietary patterns at 52y and colorectal cancer after 32y f/u: • Q1, n=843: HR: 1.00 • Q2, n=761: HR: 0.88, 95% CI: 0.80, 0.97 • Q3, n=830: HR: 0.90, 95% CI: 0.82, 1.00 • Q4, n=826: HR: 0.86, 95% CI: 0.77, 0.95 • p-trend=0.01	Prudent dietary patterns at 52y was not significantly associated with proximal colon, distal colon, or rectal cancer after 32y f/u. Results for the prudent dietary pattern were similar in women; however, in men, higher prudent diet score was significantly associated with decreased risk of distal colon and rectal cancer.
Orlich, 2015[33] PCS (Adventist Health Study-2 (AHS-2))	• Vegans: Red meat, poultry, fish; eggs; and dairy <1 time/mo • Lacto-ovo-vegetarian: Red meat, poultry, and fish <1 time/mo, eggs or dairy >1 time/mo	Vegetarian diet at 58y and colorectal cancer after 7.3y f/u: • Vegan, n=40: HR: 0.86, 95% CI: 0.59, 1.24, p=0.42 • Lacto-ovo, n=147: HR: 0.83, 95% CI: 0.66, 1.05, p=0.11 • Pesco, n=35: HR: 0.58, 95% CI: 0.40, 0.84, p=0.004 • Semi, n=30: HR: 0.93, 95% CI: 0.62, 1.38, p=0.71	Vegetarian vs. nonvegetarian diet at 58y was not significantly associated with colon cancer after 7.3y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
United States	• Pesco-vegetarian: Red meat or poultry <1 time/mo, fish >1 time/mo, and eggs/dairy in any amount • Semi-vegetarian: Red meat or poultry >1 time/mo, and all meats combined (including fish) <1 time/wk and eggs/dairy in any amount • Nonvegetarians: Red meat and poultry >1 time/mo and all meats combined (including fish) >1 time/wk, and eggs/dairy in any amount Vegetarians vs. nonvegetarians consumed higher amounts of fruits, vegetables, avocados, non-fried potatoes, whole grains, legumes, soy foods, nuts and seeds, and was observed among vegetarians; and lower amounts of meats, dairy products, eggs, refined grains, added fats, sweets, snack foods and non-water beverages	• Nonvegetarian, n=238: HR: 1.00 Vegetarian diet at 58y and colorectal cancer after 7.3y f/u: • Vegetarian, n=252: HR: 0.79, 95% CI: 0.64, 0.97 • Nonvegetarian, n=238: HR: 1.00 • p=0.03 When results were stratified by sex and race, they were no significant associations in men or Black participants. However, in women and non-black vegetarians, there was a borderline significant lower risk of colorectal cancer (p=0.08). Vegetarian diet at 58y and rectal cancer after 7.3y f/u: • Vegetarian, n=55: HR: 0.66, 95% CI: 0.43, 1.02 • Nonvegetarian, n=55: HR: 1.00 • p=0.06	
Park, 2017[34] PCS (Multiethnic Cohort study) United States	Healthy Eating Index (HEI)-2010 • Positive components: Total vegetables, geens and beans, total fruit, whole fruit, whole grains, seafood and plant proteins, total protein foods, dairy, fatty acids • Negative components: Refined grained, added sugars, solid fats, sodium	Men, HEI-2010 score at 60y and colorectal cancer after 16y f/u: • Q1, n=702, HR: 1.00 • Q2, n=496, HR: 0.81, 95% CI: 0.72, 0.91 • Q3, n=434, HR: 0.80, 95% CI: 0.70, 0.91 • Q4, n=339, HR: 0.72, 95% CI: 0.62, 0.82 • Q5, n=267, HR: 0.69, 95% CI: 0.59, 0.80 • p-trend<0.001 Women, HEI-2010 score at 60y and colorectal cancer after 16y f/u:	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
		• Q1, n=279, HR: 1.00 • Q2, n=312, HR: 0.87, 95% CI: 0.74, 1.03 • Q3, n=389, HR: 0.86, 95% CI: 0.73, 1.01 • Q4, n=421, HR: 0.78, 95% CI: 0.66, 0.91 • Q5, n=536, HR: 0.82, 95% CI: 0.70, 0.96 • p-trend=0.008 Increased adherence to the HEI-2010 was associated with significantly lower risk of left colon and rectum cancer, but not right colon cancer. When results were stratified by race, higher HEI-2010 score was significantly associated with lower risk of colorectal cancer among the following race/ethnicity groups: • African American: None • Native Hawaiian: Trend • Japanese American • Latino • White	
	Alternative Healthy Eating Index (AHEI)-2010 • Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA • Neutral components: Alcohol • Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium	Men, AHEI-2010 score at 60y and colorectal cancer after 16y f/u: • Q1, n=571, HR: 1.00 • Q2, n=429, HR: 0.84, 95% CI: 0.73, 0.95 • Q3, n=410, HR: 0.82, 95% CI: 0.72, 0.93 • Q4, n=465, HR: 0.92, 95% CI: 0.81, 1.04 • Q5, n=412, HR: 0.75, 95% CI: 0.65, 0.85 • p-trend<0.001	Women, AHEI-2010 score at 60y was not significantly associated with colorectal cancer after 16y f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
		Increased adherence to the AHEI-2010 was associated with significantly lower risk of left colon and rectum cancer, but not right colon cancer. When results were stratified by race, increased adherence to the AHEI-2010 was significantly associated with lower risk of colorectal cancer among the following race/ethnicity groups: • African American: None • Native Hawaiian: None • Japanese American: Trend • Latino • White	
	Alternative Mediterranean Diet Score (aMED) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat	Men, aMED score at 60y and colorectal cancer after 16y f/u: • Q1, n=432: HR: 1.00 • Q2, n=405: HR: 0.98, 95% CI: 0.85, 1.12 • Q3, n=468: HR: 0.99, 95% CI: 0.87, 1.14 • Q4, n=380: HR: 0.84, 95% CI: 0.72, 0.97 • Q5, n=553: HR: 0.84, 95% CI: 0.73, 0.97 • p-trend=0.004 When results were stratified by race, aMED adherence was not significantly associated with lower risk of colorectal cancer any race/ethnicity groups.	Women, aMED score at 60y was not significantly associated with colorectal cancer after 16y f/u. aMED score was not significantly associated with left colon, right colon, or rectum cancer.
	DASH Score • Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy	Men, DASH score at 60y and colorectal cancer after 16y f/u: • Q1, n=556: HR: 1.00 • Q2, n=328: HR: 0.85 (0.74–0.97)	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	• Negative components: Red and processed meat, sweetened beverages, sodium	• Q3, n=535: HR: 0.81 (0.72–0.92) • Q4, n=340: HR: 0.82 (0.71–0.95) • Q5, n=479: HR: 0.75 (0.66–0.86) • p-trend<0 .001 Women, DASH score at 60y and colorectal cancer after 16y f/u: • Q1, n=435: HR: 1.00 • Q2, n=298: HR: 0.98 (0.85–1.14) • Q3, n=469: HR: 0.86 (0.75–0.99) • Q4, n=304: HR: 0.90 (0.77–1.05) • Q5, n=431: HR: 0.86 (0.75–1.00) • p-trend=0.04 Increased DASH score was associated with significantly lower risk of left colon and rectum cancer, but not right colon cancer. When results were stratified by race, increased adherence to the following dietary pattern scores was significantly associated with lower risk of colorectal cancer among the following race/ethnicity groups: • African American: None • Native Hawaiian: Trend • Japanese American • Latino • White	
Petimar, 2018[35]	Alternative Healthy Eating Index (AHEI)-2010		AHEI-2010 score at 55y, in men and women pooled, was not

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
PCS (Nurses' Health Study, Health Professional Follow-up Study) United States	• Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA • Neutral components: Alcohol • Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium		significantly associated with colorectal cancer (colorectal, colon, distal colon, proximal colon, rectal cancer) after 26y f/u • In women only, results were similar • In men only, increased AHEI-2010 adherence was significantly associated with lower total colorectal colon cancer risk
	Alternative Mediterranean Diet Score (aMED) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat	aMED score at 55y, in men and women pooled, was significantly associated with rectal cancer after 26y f/u: NS • Q1, n=120: HR: 1.00 • Q2, n=121: HR: 0.94, 95% CI:0.68, 1.30 • Q3, n=118: HR: 0.84, 95% CI:0.64, 1.09 • Q4, n=103: HR: 0.72, 95% CI: 0.54, 0.95 • Q5, n=103: HR: 0.76, 95% CI:0.54, 1.07 • p-trend=0.02 When women and men were analyzed separately, results were similar in men, and no longer significant in women.	aMED score at 55y, in men and women pooled, was not significantly associated with colorectal cancer (colorectal, colon, distal colon, proximal colon) after 26y f/u • In women only, results were similar • In men only, increased aMED adherence was significantly associated with lower total colorectal cancer risk
	DASH Score • Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy • Negative components: Red and processed meat, sweetened beverages, sodium		DASH score at 55y, in men and women pooled, was not significantly associated with colorectal cancer (colorectal, colon, distal colon, proximal colon, rectal cancer) after 26y f/u • In women only, results were similar • In men only, increased DASH adherence was significantly

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
			associated with lower total colorectal, total colon, and distal colon cancer risk
Roswall, 2015[36] PCS (Women's Lifestyle and Health cohort) Sweden	Healthy Nordic food index (HNFI) • Positive components: Cabbage, root vegetables, apples and pears, rye bread, oatmeal, fish		HNFI score at 39y (categorical and continuous) was not significantly associated with colorectal cancer.
Schulpen, 2020[44] Nested Case-Control Study (Netherlands Cohort Study (NLCS)) The Netherlands	alternate Mediterranean diet scores (aMED), and without alcohol (aMEDr) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat	In women, smoking status significantly modified the relationship between aMEDr (per 2-pt increment) and colorectal cancer: • Never smokers, n=256: HR: 1.00, 95% CI: 0.88, 1.13 • Former smokers, n=350: HR: 0.78, 95% CI: 0.63, 0.98 • Current smokers, n=309: HR: 1.21, 95% CI: 0.96, 1.51 • p-interaction=0.015	Adherence to the aMED, with and without alcohol, at 61y was not significantly associated with risk of colorectal, colon, proximal, distal, or rectal cancer in men or women after 20.3y f/u. Results were also not significant when stratified by smoking status in men, alcohol consumption, body mass index, education, or family history of colorectal cancer.
	WCRF/AICR score, diet only, and without alcohol • Positive components: Vegetables and fruit, dietary fiber • Negative components: Red and processed meat, sugary drinks, alcohol, sodium, energy-dense foods		Adherence to the WCRF/AICR, diet only score, with and without alcohol, at 61y was not significantly associated with risk of colorectal, colon, proximal, distal, or rectal cancer in men or women after 20.3y f/u. Results were also not significant when stratified by smoking status in men, alcohol consumption, body

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
			mass index, education, or family history of colorectal cancer.
Shin, 2018[37] PCS (Japan Public Health Center-based Prospective Study (JPHC)) Japan	Prudent dietary pattern: higher loadings for high intakes of vegetables, fruit, noodle, potatoes, soy products, mushroom, seaweed	In men, prudent dietary pattern score at 57y and colorectal cancer • Q1, n=318: HR: 1.00 • Q2, n=299: HR: 0.95, 95% CI: 0.81, 1.11 • Q3, n=274: HR: 0.82, 95% CI: 0.70, 0.96 • Q4, n=308: HR: 0.90, 95% CI: 0.77, 1.05 • Q5, n=315: HR: 0.85, 95% CI: 0.72, 1.00 • p-trend=0.0346 Results were similar for distal colon cancer. In women, prudent dietary pattern score at 57y and colorectal cancer • Q1, n=50: HR: 1.00 • Q2, n=45: HR: 0.93, 95% CI: 0.62, 1.39 • Q3, n=45: HR: 0.94, 95% CI: 0.62, 1.41 • Q4, n=46: HR: 0.96, 95% CI: 0.63, 1.44 • Q5, n=73: HR: 1.53, 95% CI: 1.04, 2.23 • p-trend=0.0463	Prudent dietary pattern score at 57y was not significantly associated with colon, proximal colon, or rectal cancer in men, or colorectal, colon cancer, proximal colon, or distal colon cancer in women.
	Westernized dietary pattern: higher loadings for meat and processed meat, eel, dairy foods, fruit juice, coffee, tea, soft beverages, sauces, alcohol	In women, westernized dietary pattern score at 57y and colon cancer: • Q1, n=147: HR: 1.00 • Q2, n=149: HR: 1.15, 95% CI: 0.91, 1.45 • Q3, n=165: HR: 1.40, 95% CI: 1.12, 1.76 • Q4, n=131: HR: 1.24, 95% CI: 0.97, 1.59 • Q5, n=117: HR: 1.28, 95% CI: 0.98, 1.68	Westernized dietary pattern score at 57y was not significantly associated with colorectal, colon, proximal colon, distal colon, or rectal cancer in men, or colorectal, proximal colon, or rectal cancer in women.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
		• p-trend=0.0337 Results were similar for distal colon cancer.	
	Traditional dietary pattern: higher loadings for pickles, seafood, fish (oily-, salty-, lean-fish, and salmon), chicken, sake		Traditional dietary pattern score at 57y was not significantly associated with colorectal, colon, proximal colon, distal colon, or rectal cancer in both men and women.
Tabung, 2018a (JAMA Onc)[38] PCS (Nurses' Health Study, Health Professional Follow-up Study) United States	Empirical Dietary Inflammatory Pattern (EDIP) Score (categorical – quintiles) • Higher in processed meat, red meat, organ meat, fish (other than dark-meat fish), other vegetables, refined grains, high-energy beverages, low-energy beverages, tomatoes Lower in beer, wine, tea, coffee, dark yellow vegetables, green leafy vegetables, snacks, fruit juice, pizza	In men and women combined, EDIP scores at 55y and colorectal cancer after 26y f/u: • Q1, n=113: HR: 1.00 • Q2, n=121: HR: 1.02, 95% CI: 0.90, 1.16 • Q3, n=140: HR: 1.13, 95% CI: 1.00, 1.28 • Q4, n=130: HR: 1.17, 95% CI: 1.03, 1.32 • Q5, n=151: HR: 1.32, 95% CI: 1.12, 1.55 • p-trend<0.001 Results were similar men, women, and in combined analyses for colon, distal colon, and proximal colon. Results were also significant, for men only, with rectal cancer. When stratified by BMI < or >25kg/m^2, results were significant for men in both groups, and only in women with BMI<25kg/m^2. When results were stratified by alcohol intake (no drink, 0.1-1 drink/d, >1 drink/d), results were significant for men consuming no drinks or 0.1-1 drink/d, and in women consuming no drinks.	EDIP scores at 55y was not significantly associated with rectal cancer after 26y f/u, in women or pooled analyses.
Tabung, 2018b (AJCN)[39]	Empirical dietary index for hyperinsulinemia (EDIH)	In men and women combined, EDIH score at 55y and colorectal cancer after 26y f/u:	Higher EDIH scores over up to 26 y f/u were not significantly associated with proximal colon cancer in men,

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
PCS (Nurses' Health Study, Health Professional Follow-up Study) United States	• Higher in red meat, processed meat, low energy beverages, cream soups, margarine, poultry, high energy beverages, butter, French fries, other fish, low fat dairy, eggs, tomatoes, cruciferous vegetables • Lower in wine, coffee, high fat dairy, green leafy vegetables, whole fruits, dark yellow vegetables, snacks	• Q1, n=552: HR: 1.00 • Q2, n=525: HR: 0.97, 95% CI: 0.86, 1.10 • Q3, n=566: HR: 1.10, 95% CI: 0.97, 1.24 • Q4, n=529: HR: 1.10, 95% CI: 0.97, 1.25 • Q5, n=511: HR: 1.26, 95% CI: 1.12, 1.42 • p-trend<0.0001 Results were similar for men, women, and men and women combined for colorectal, colon, and distal colon cancer. Results were also significantly for women and men and women combined for proximal colon cancer, and in men for rectal cancer. When stratified by BMI < or >25kg/m^2, results were significant for men in both groups, and only in women with BMI>25kg/m^2. When results were stratified by physical activity (MET-h/wk below/above median), results were significant for men and women below the median.	or in rectal cancer in women or men and women combined.
Torres Stone, 2017[40] PCS (NIH)-AARP) Diet and Health Study) United States	Healthy Eating Index 2010 (HEI-2010) • Positive components: Total vegetables, geens and beans, total fruit, whole fruit, whole grains, seafood and plant proteins, total protein foods, dairy, fatty acids • Negative components: Refined grained, added sugars, solid fats, sodium	In normal weight men, HEI-2010 score at 60y and colorectal cancer (n=4483 cases) after 123mo f/u: • Q1: HR: 1.00 • Q2: HR: 0.94, 95% CI: 0.77, 1.14 • Q3: HR: 0.83, 95% CI: 0.67, 1.03 • Q4: HR: 0.73, 95% CI: 0.58, 0.91 • Q5: HR: 0.67, 95% CI: 0.54, 0.84 • p-trend=0.0001	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
		Results were also significant in overweight (p<0.0001) and obese (p=0.0394) men When probablities were examined, in normal weight, overweight, and obese men, higher scores were associated with decreased risk of colorectal cancer. In overweight women, HEI-2010 score at 60y and colorectal cancer (n=2032 cases) after 123mo f/u: • Q1: HR: 1.00 • Q2: HR: 0.87, 95% CI: 0.65, 1.16 • Q3: HR: 0.94, 95% CI: 0.71, 1.25 • Q4: HR: 0.73, 95% CI: 0.55, 0.98 • Q5: HR: 0.64, 95% CI: 0.47, 0.86 • p-trend=0.0001 Results were not significant in normal weight (p=0.1557) and obese (p=0.0573) women In overweight and obese women, higher score was associated with decreased risk of colorectal cancer.	
	Mediterranean diet score • Positive components: Vegetables, legumes, fruit, cereals, fish, MUFA+PUFA/SFA • Neutral components: Alcohol • Negative components: Meat, dairy products	In normal weight men, mediterranean diet score at 60y and colorectal cancer (n=4483 cases) after 123mo f/u: • Q1: HR: 1.00 • Q2: HR: 0.79, 95% CI: 0.66, 0.96 • Q3: HR: 0.66, 95% CI: 0.54, 0.82 • Q4: HR: 0.67, 95% CI: 0.54, 0.84 • Q5: HR: 0.65, 95% CI: 0.51, 0.83 • p-trend=0.0004	In normal weight, overweight, and obese women, mediterranean diet score at 60y was not significantly associated with colorectal cancer (n=2032 cases) after 123mo f/u.

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
		Results were also significant in overweight (p=0.0013) and obese (p=0.0508) men When probablities were examined, in normal weight, overweight, and obese men, higher scores were associated with decreased risk of colorectal cancer.	
	Dietary Approaches to Stop Hypertension (DASH) score • Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy • Negative components: Red and processed meat, sweetened beverages, sodium	In normal weight men, DASH score at 60y and colorectal cancer (n=4483 cases) after 123mo f/u: • Q1: HR: 1.00 • Q2: HR: 0.91, 95% CI: 0.08, 1.11 • Q3: HR: 0.79, 95% CI: 0.64, 0.99 • Q4: HR: 0.83, 95% CI: 0.66, 1.04 • Q5: HR: 0.67, 95% CI: 0.54, 0.84 • p-trend=0.0005 Results were also significant in overweight men (p<0.0001), but not in obese men (p=0.0801) When probablities were examined, in normal weight, overweight, and obese men, higher scores were associated with decreased risk of colorectal cancer. In normal weight women, DASH score at 60y and colorectal cancer (n=2032 cases) after 123mo f/u: • Q1: HR: 1.00 • Q2: HR: 0.86, 95% CI: 0.68, 1.09 • Q3: HR: 0.70, 95% CI: 0.53, 0.93 • Q4: HR: 0.86, 95% CI: 0.66, 1.13	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
		• Q5: HR: 0.73, 95% CI: 0.56, 0.95 • p-trend=0.0005 Results were also significant in obese women (p=0.0128), but not in overweight women (p=0.1256) When probablities were examined, in normal weight women, higher DASH score was associated with decreased risk of colorectal cancer. In overweight and obese women, higher score was associated with decreased risk of colorectal cancer.	
Vargas, 2016[41] PCS (Women's Health Initiative Observational Study) United States	Healthy Eating Index (HEI)-2010 • Positive components: Total vegetables, geens and beans, total fruit, whole fruit, whole grains, seafood and plant proteins, total protein foods, dairy, fatty acids • Negative components: Refined grained, added sugars, solid fats, sodium	HEI-2010 score at 63y and colorectal cancer after 12.4 y f/u: • Q1, n=209: HR: 1.00 • Q2, n=189: HR: 0.88, 95% CI: 0.72, 1.08 • Q3, n=175: HR: 0.81, 95% CI: 0.66, 0.99 • Q4, n=172: HR: 0.77, 95% CI: 0.63, 0.95 • Q5, n=166: HR: 0.73, 95% CI: 0.59, 0.90 • p-trend=0.032 Higher HEI-2010 score was significantly associated with decreased risk of colon cancer, but not rectal cancer.	
	Alternative Healthy Eating Index (AHEI)-2010 • Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA • Neutral components: Alcohol • Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium		AHEI score at 63y was not significantly associated with risk of colorectal, colon, and rectal cancer after 12.4 y f/u (p=0.427).

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	Alternative Mediterranean Diet Score (aMED) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat		aMED score at 63y was not significantly associated with risk of colorectal, colon, and rectal cancer after 12.4 y f/u (p=0.217).
	DASH Score • Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy • Negative components: Red and processed meat, sweetened beverages, sodium	DASH score at 63y and colorectal cancer after 12.4 y f/u: • Q1, n=195: HR: 1.00 • Q2, n=177: HR: 0.84, 95% CI: 0.68, 1.03 • Q3, n=193: HR: 0.72, 95% CI: 0.59, 0.89 • Q4, n=183: HR: 0.74, 95% CI: 0.60, 0.91 • Q5, n=163: HR: 0.78, 95% CI: 0.62, 0.97 • p-trend=0.021 Higher DASH score was significantly associated with decreased riusk of colon cancer, but not rectal cancer.	
Voortman, 2017[24] PCS (Rotterdam Study) The Netherlands	Dutch Dietary Guidelines 2015 score • Positive components: Vegetables, legumes, fruit, nuts, whole grains, fish, dairy products, unsaturated fats and oils, tea • Negative components: Replace refined grains with whole-grain products, red meat, processed meat, alcohol, sodium	Dutch Dietary Guidelines 2015 score and colorectal cancer (n=324) after 11y f/u: HR: 0.90, 95% CI: 0.84, 0.96), p<0.05	
Vulcan, 2019[42] PCS (Malmö Diet and Cancer Study)	Colorectal Diet Quality Index (CDQI) • Positive components: Fiber, dairy products • Negative components: Processed meat	CDQI score at 59y and colorectal cancer (n=923) after 502136 person years f/u: • 0-3, n=135: HR: 1.00 • 4-6, n=222: HR: 0.77, 95% CI: 0.65, 0.91	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Sweden		• 7-9, n=187: HR: 0.74, 95% CI: 0.61, 0.89 • 10-12, n=46: HR: 0.57, 95% CI: 0.43, 0.75 • p-trend<0.001 Results were similar for colon and rectal cancer, and when women and men were analyzed seperately.	

Table 7. Risk of bias for randomized controlled trials examining dietary patterns and colorectal cancer[lxii, lxiii]

	Randomization	Deviations from intended interventions – effect of assignment	Deviations from intended interventions – per-protocol	Missing outcome data	Outcome measurement	Selection of the reported result
Prentice, 2019[1]	**Low**	**Low**	**Some**	**Low**	**Low**	**Low**
Thomson, 2014[2]	**Low**	**Low**	**Some**	**Low**	**Low**	**Low**

[lxii] A detailed description of the methodology used for assessing risk of bias is available on the NESR website: https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews and in Part C of the following reference: Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.

[lxiii] Possible ratings of low, some concerns, or high determined using the "Cochrane Risk-of-bias 2.0" (RoB 2.0) (August 2016 version)" (Higgins JPT, Sterne JAC, Savović J, Page MJ, Hróbjartsson A, Boutron I, Reeves B, Eldridge S. A revised tool for assessing risk of bias in randomized trials In: Chandler J, McKenzie J, Boutron I, Welch V (editors). Cochrane Methods. *Cochrane Database of Systematic Reviews* 2016, Issue 10 (Suppl 1). dx.doi.org/10.1002/14651858.CD201601.)

Table 8. Risk of bias for observational studies examining dietary patterns and colorectal cancer[lxiv]

Article	Confounding	Selection of participants	Classification of exposures	Deviations from intended exposures	Missing data	Outcome measurement	Selection of the reported result
Boden, 2019[27]	Serious	Moderate	Low	Serious	Serious	Low	Moderate
Cheng, 2018[43]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Deschasaux, 2018[4]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Fasanelli, 2017[28]	Critical	Moderate	Low	Serious	Moderate	Moderate	Serious
Fiolet, 2018[7]	Serious	Moderate	Moderate	Serious	Moderate	Low	Moderate
Jones, 2017[29]	Serious	Moderate	Low	Serious	Serious	Low	Moderate
Kumagai, 2014[30]	Serious	Moderate	Moderate	Serious	Serious	Low	Moderate
Lavalette, 2018[16]	Serious	Moderate	Low	Serious	Serious	Low	Moderate
Liu, 2017[31]	Serious	Moderate	Low	Moderate	Moderate	Low	Moderate
Mehta, 2017[32]	Serious	Moderate	Moderate	Moderate	Moderate	Low	Moderate
Orlich, 2015[33]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Park, 2017[34]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Petimar, 2018[35]	Serious	Moderate	Low	Moderate	Moderate	Low	Moderate
Roswall, 2015[36]	Critical	Moderate	Low	Serious	Moderate	Low	Moderate
Schulpen, 2020[44]	Serious	Serious	Low	Serious	Moderate	Low	Serious
Shin, 2018[37]	Critical	Moderate	Moderate	Serious	Moderate	Low	Moderate
Tabung, 2018a[38]	Serious	Moderate	Low	Moderate	Moderate	Low	Moderate
Tabung, 2018b[39]	Serious	Moderate	Low	Moderate	Moderate	Low	Moderate
Torres Stone, 2017[40]	Serious	Serious	Low	Serious	Serious	Low	Moderate
Vargas, 2016[41]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Voortman, 2017[24]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Vulcan, 2019[42]	Serious	Low	Serious	Serious	Low	Low	Moderate

[lxiv] Possible ratings of low, moderate, serious, critical, or no information determined using the "Risk of Bias for Nutrition Observational Studies" tool (RoB-NObs) (Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.)

Table 9. Description of studies that examined the relationship between dietary patterns and lung cancer[lxv]

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Anic, 2016[45] **PCS (NIH–AARP Diet and Health Study)** **United States** Analytic N: 460770 Participants were 40% female, ~62y (50-71y), ~92% white, ~27kg/m2, ~40% never smokers, ~15g/d for men and ~5 g/d for women alcohol, ~37% college graduates, ~19% ≥5x/wk physical activity	**Dietary patterns:** • Healthy Eating Index (HEI)-2010[lxvi], categorical (quintiles) ○ Positive components: Total vegetables, geens and beans, total fruit, whole fruit, whole grains, seafood and plant proteins, total protein foods, dairy, fatty acids ○ Negative components: Refined grained, added sugars, solid fats, sodium • Alternative Healthy Eating Index (AHEI)-2010[lxvii], categorical (quintiles) ○ Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA ○ Neutral components: Alcohol	**<u>Significant</u>**: HEI-2010 score at 62y and lung cancer after 10.5y f/u: • Q1, n=3076: 1.00 • Q2, n=1947: HR 0.90, 95% CI: 0.84, 0.95 • Q3, n=1640: HR 0.91, 95% CI: 0.86, 0.97 • Q4, n=1436: HR 0.92, 95% CI: 0.86, 0.98 • Q5, n=1173: HR 0.83, 95% CI: 0.77, 0.89 • p-trend<0.0001 When analyzed by smoking status, results remained significant for former and current smokers, but were no longer significant for never smokers. AHEI-2010 score at 62y and lung cancer after 10.5y f/u: • Q1, n=2448: HR: 1.00 • Q2, n=2004: HR 0.96, 95% CI: 0.90, 1.02	**Key confounders accounted for:** Sex, age, race/ethnicity, education, alcohol intake, physical activity, smoking, BMI **Other:** Total energy intake **Limitations:** • Did not account for family history of the cancer outcome, lung disease, environmental exposures to lung carcinogens • Exposure occurred prior to start of f/u • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan;

[lxv] Abbreviations : AHEI-2010, Alternative Healthy Eating Index-2010; aMED, Alternative Mediterranean Diet Score ; BMI, body mass index; d, day; DASH, Dietary Approaches to Stop Hypertension; DP, Dietary pattern; %E, % of energy; EPIC, European Prospective Investigation into Cancer and Nutrition; FFQ, food frequency questionnaire; FSAm-NPS, Nutrient Profiling System of the British Food Standards Agency (modified version); f/u, follow-up; HR, hazard ratio; MDS, Mediterranean Diet Score; mMEDr, modified Mediterranean diet scores; mMEDr, modified Mediterranean diet scores without alcohol; mo, month or months; N/A, Not applicable; NIH, National Institutes of Health; NS, Not significant; NR, Not reported; PCS, prospective cohort study; pt, point; RCT, randomized controlled trial; WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; wk, weeks; y, year

[lxvi] Guenther PM, Casavale KO, Reedy J, Kirkpatrick SI, Hiza HA, Kuczynski KJ et al. Update of the Healthy Eating Index: HEI-2010. J Acad Nutr Diet 2013; 113: 569–580.

[lxvii] Chiuve SE, Fung TT, Rimm EB, Hu FB, McCullough ML, Wang M et al. Alternative dietary indices both strongly predict risk of chronic disease. J Nutr 2012; 142: 1009–1018.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Excluded participants whose questionnaire was completed by a proxy, with prevalent cancer, cancer cause of death record but no cancer registry data, with end-stage renal disease, implausible energy intake, missing information on tobacco smoking (~19% of original sample)	○ Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium • Alternative Mediterranean Diet Score (aMED)[lxviii], categorical (quintiles) ○ Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat • DASH Score[lxix], categorical (quintiles) ○ Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy ○ Negative components: Red and processed meat, sweetened beverages, sodium **Dietary assessment methods:** 124-item, validated FFQ at baseline, ~62y **Outcome assessment methods:** State cancer registries	• Q3, n=1879: HR 0.99, 95% CI: 0.93, 1.05 • Q4, n=1601: HR 0.92, 95% CI: 0.86, 0.98 • Q5, n=1340: HR 0.86, 95% CI: 0.80, 0.92 • p-trend<0.0001 When analyzed by smoking status, results remained significant for former smokers, but were no longer significant for never or current smokers. aMED score at 62y and lung cancer after 10.5y f/u: • Q1, n=2232: HR: 1.00 • Q2, n=1849: HR 0.96, 95% CI: 0.91, 1.03 • Q3, n=1890: HR 0.94, 95% CI: 0.88, 1.00 • Q4, n=1660: HR 0.96, 95% CI: 0.90, 1.03 • Q5, n=1641: HR 0.85, 95% CI: 0.79, 0.91 • p-trend<0.0001 When analyzed by smoking status, results remained significant for former smokers, but were no longer significant for never or current smokers. DASH score at 62y and lung cancer after 10.5y f/u: • Q1, n=2791: HR: 1.00 • Q2, n=1681: HR 0.99, 95% CI: 0.93, 1.05 • Q3, n=1672: HR 0.96, 95% CI: 0.90, 1.02 • Q4, n=1960: HR 0.93, 95% CI: 0.88, 0.99 • Q5, n=1168: HR 0.84, 95% CI: 0.78, 0.90	potential for selective outcome reporting **Funding Sources:** NIH *Summary: Higher adherence to the HEI-2010, AHEI-2010, aMED, and DASH scores at 62y were all associated with significantly lower risk of lung cancer after 10.5y f/u.* *When analyzed by smoking status, AHEI-2010, aMED, and DASH score results remained significant for former smokers, but were no longer significant for never or current smokers. For HEI-2010, results remained significant for former and current smokers, but were no longer significant for never smokers.*

[lxviii] Fung TT, McCullough ML, Newby PK, Manson JE, Meigs JB, Rifai N et al. Diet quality scores and plasma concentrations of markers of inflammation and endothelial dysfunction. Am J Clin Nutr 2005; 82: 163–173.
[lxix] Fung TT, Chiuve SE, McCullough ML, Rexrode KM, Logroscino G, Hu FB. Adherence to a DASH-style diet and risk of coronary heart disease and stroke in women. Arch Intern Med 2008; 168: 713–720.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		• p-trend<0.0001 When analyzed by smoking status, results remained significant for former smokers, but were no longer significant for never or current smokers. **Non-Significant**: N/A	
Boden, 2019[27] **PCS (Vasterbotten Intervention Programme)** **Sweden** Analytic N: 35393 Participants were 52% female, ~46yo, ~15% obese, ~17% current smoker, ~70% no post-secondary education, ~39% low physical activity Excluded participants with prevalent cancer, insufficient dietary data, implausible food or energy intakes,	**Dietary patterns:** • Mediterranean diet score (MDS)[lxx], per tertile increase ○ Positive components: Vegetables and potatoes, fruit and fresh juices, wholegrain cereals, fish and fish products, MUFA+PUFA/SFA, ○ Moderation components: Alcohol ○ Negative components: Meat and meat products, dairy products **Dietary assessment methods:** 84-item and 64-66-item, validated, FFQs, at least 2 measures, <2y apart at baseline, age ~46y **Outcome assessment methods:** Swedish Cancer Registry	**Significant**: N/A **Non-Significant**: All participants, MDS score, per tertile increase, at 46y and lung cancer (n=442) after 15y f/u: HR: 0.90, 95% CI: 0.80, 1.01 Men, MDS score, per tertile increase, at 46y and lung cancer (n=210) after 15y f/u: HR: 0.86, 95% CI: 0.72, 1.03 Women, MDS score, per tertile increase, at 46y and lung cancer (n=232) after 15y f/u: HR: 0.94, 95% CI: 0.79, 1.10	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI **Other:** Energy intake **Limitations:** • Did not account for race/ethnicity, family history of the cancer outcome, lung disease, environmental exposures to lung carcinogens • Exposure occurred prior to start of f/u • Only assessed dietary intake in first 2y from baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting

[lxx] Tognon G, Nilsson LM, Lissner L, Johansson I, Hallmans G, Lindahl B, et al. The Mediterranean diet score and mortality are inversely associated in adults living in the subarctic region. J Nutr. 2012; 142 (8):1547–53.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
implausible anthropometric data, cancer diagnosed within 1y year of last measurement, single dietary measure (~65% of original sample)			**Funding Sources:** The Cancer Research Fund in Northern Sweden, Arctic Research Center (Arcum) at Umeå University, Ostersunds Hospital, Swedish Cancer Society, Region Vasterbotten, Swedish Research Council for Health, Working Life and Welfare, Swedish Research Council *Summary: Mediterranean diet score at 46y was not associated with risk of lung cancer after 15y f/u.*
Deschasaux, 2018[4] **PCS (European Prospective Investigation into Cancer and Nutrition (EPIC))** **Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, UK** Analytic N: 471495 Participants were 70% female, ~51yo, ~25.4 kg/m^2 BMI, 43% never-smokers, ~5.3	**Dietary patterns:** Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score, categorical (quintiles) and continuous (per 2 pt increment) [-15 (most healthy) to +40 (least healthy)] • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fibres, proteins, and fruits/vegetables/legumes/nuts. • Higher FSAm-NPS score had higher intakes of alcohol, energy and red and processed meat, lower intakes of dietary fibres, vegetables, fruit, fish, and lean meat **Dietary assessment methods:** FFQs or 7-day diet records, validated, at baseline, age ~51y	**Significant**: FSAm-NPS score at 51y in men and risk of lung cancer after 15.3y f/u: • Q1, n=297: HR: 1.00 • Q2, n=336: HR: 1.21, 95% CI: 1.02, 1.43 • Q3, n=343: HR: 1.21, 95% CI: 1.02, 1.44 • Q4, n=415: HR: 1.31, 95% CI: 1.10, 1.60 • Q5, n=485: HR: 1.26, 95% CI: 1.06, 1.51 • p-trend=0.02 **Non-Significant**: FSAm-NPS score at 51y in men and women combined and risk of lung cancer after 15.3y f/u: • Q1, n=640: HR: 1.00 • Q2, n=684: HR: 1.05, 95% CI: 0.94, 1.17 • Q3, n=702: HR: 1.03, 95% CI: 0.92, 1.16	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, height **Other:** Center, energy intake **Limitations:** • Did not account for race/ethnicity, lung disease, environmental exposures to lung carcinogens, family history of the cancer • Exposure occurred prior to start of f/u • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
g/d alcohol, ~20.9% inactive; 17.9% active. Excluded those with prevalent cancer; cancer diagnosis in first 2y of f/u (~10% of original sample)	**Outcome assessment methods:** Record linkage with population-based cancer registries, health insurance records, pathology registries, and f/u with study participants	• Q4, n=782: HR: 1.09, 95% CI: 0.97, 1.22 • Q5, n=846: HR: 1.06, 95% CI: 0.94, 1.20 • p-trend=0.3 Continuous, per 2pt increment, n=3654: HR: 1.01, 95% CI: 0.97, 1.04; p-trend=0.7 When men and women were analyzed separately, results were also non-significant in women.	**Funding Sources:** French National Cancer Institute, European Commission, the International Agency for Research on Cancer *Summary: Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score at 51y was not significantly associated with risk of lung cancer after 15.3y f/u when men and women were combined, and for women only. In men, higher FSAm-NPS score was significantly associated with increased risk of lung cancer.*
Hodge, 2016[46] **PCS (Melbourne Collaborative Cohort Study)** **Australia** Analytic N: 35303 Participants were ~60% female, 40-69y, ~62% overweight or obese, 59% never smokers, 55% low alcohol intake, ~22% no physcial activity, ~23% had a degree after high school	**Dietary patterns:** • Mediterranean diet score, categorical (0-3, 4-6, 7-9) and continuous ○ Positive components: Vegetables, legumes, fruit and nuts, cereals, fish, olive oil ○ Moderation components: Alcohol ○ Negative components: Red and processed meat, dairy products **Dietary assessment methods:** 121-item, validated FFQ at baseline, age **Outcome assessment methods:** Victorian Cancer Registry	**Significant**: MDS score at 40-69y and lung cancer after 18y f/u: • 0-3, n=126: HR: 1.00 • 4-6, n=229: HR: 0.75, 95% CI: 0.60, 0.94 • 7-9, n=48: HR: 0.64, 95% CI: 0.45, 0.90 • p-trend=0.005 MDS, continuous, and lung cancer after 18y f/u: HR: 0.89, 95% CI: 0.81, 0.96 When analyzed by smoking status, results remained significant in current smokers, but were no longer significant in never and former smokers. **Non-Significant**: N/A	**Key confounders accounted for:** Sex, age, race/ethnicity, education, SES index, alcohol intake, physical activity, Smoking, BMI **Other:** Energy intake, country **Limitations:** • Did not account for family history of the cancer outcome, lung disease, environmental exposures to lung carcinogens • Potential for selection bias due exclusion of participants with several chronic diseases at baseline • Exposure occurred prior to start of f/u • Only assessed dietary intake once at

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Excluded those with prevalent cancer, diabetes, heart attack, or angina; no dietary data; missing values for confounders; implausible energy intake (~15% of original sample)			baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** VicHealth and Cancer Council Victoria, Australian National Health and Medical Research Council, Cancer Council Victoria *Summary: Higher MDS score at 40-69y was associated with significantly lower risk of lung cancer after 18y f/u. When analyzed by smoking status, results remained significant in current smokers, but were no longer significant in never and former smokers.*
Kane-Diallo, 2018[14] **PCS (NutriNet-Sante study)** **France** Analytic N: 42544 Participants were 72.7% female, ~56.9y (all ≥45y), ~25kg/m2, ~44% never-smokers, 9.7g/d alcohol, ~80%	**Dietary patterns:** "Pro plant-based" dietary score, categorical (tertiles) range of 12-60 points; higher score = higher contribution of plant foods • Higher in vegetables, legumes, fruits, cereal products, potatoes, nuts, vegetables oils • Lower in red and processed meat, eggs, animal fat, dairy products, seafood	**Significant**: "Pro plant-based" dietary score at 57y and risk of lung cancer after 4.3y f/u: • T1, n=28: HR: 1.00 • T2, n=25: HR: 0.82, 95% CI: 0.48, 1.43 • T3, n=15: HR: 0.47, 95% CI: 0.24, 0.90 • p-trend=0.02 **Non-Significant**: N/A	**Key confounders accounted for:** Sex, age, education, alcohol intake (in adults), physical activity, smoking, height, BMI, family history of the cancer outcome **Other:** Energy intake without alcohol, number of 24-hr dietary records, lipids intake **Limitations:** • Did not account for race/ethnicity, lung disease, environmental exposures to lung carcinogens

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
high or moderate physical activity, ~51% family history of cancer Excluded those with prevalent cancer; <3 24-hr recalls within the first year of f/u; missing f/u data; implausible energy intake; <45y (21% of original sample)	**Dietary assessment methods:** 3, 24-hour dietary records, assessed during the first year of f/u, at age ~57y **Outcome assessment methods:** Participant report, medical record review, pathological reports, linked to health insurance and mortality databases		• Exposure occurred prior to start of f/u • Only assessed dietary intake during first year of f/u; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Ministere de la Sante, Institut de Veille Sanitaire, Institut National de la Prevention et de l'Education pour la Sante, Region Ile-de-France, Institut National de la Sant_e et de la Recherche Medicale, Institut National de la Recherche Agronomique, Conservatoire National des Arts et Metiers, The French National Cancer Institute *Summary: Higher "pro plant-based" dietary score at 57y was associated with significantly decreased risk of lung cancer after 4.3y f/u.*
Maisonneuve, 2016[47] **PCS (COSMOS study)**	**Dietary patterns:** • Alternative Mediterranean Diet Score (aMED)[lxxi], categorical (0-1, 2-4, 5-7, 8-9)	**Significant**: aMED score at >50y and lung cancer after 8.5y f/u:: • 0-1, n=16: HR: 1.00 • 2-4, n=110: HR: 0.72, 95% CI: 0.42, 1.22	**Key confounders accounted for:** Sex, age, alcohol intake, smoking, asbestos exposure **Other:**

[lxxi] Fung TT, McCullough ML, Newby PK, Manson JE, Meigs JB, Rifai N et al. Diet quality scores and plasma concentrations of markers of inflammation and endothelial dysfunction. Am J Clin Nutr 2005; 82: 163–173.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Italy Analytic N: 4336 Participants were 34% female, >50yo, 53% overweight or obese, 100% heavy smokers (80% current) Excluded those with prevalent cancer, <50y of age, not current smokers or had quit smoking >10y ago and smoked <20 pack years, did not return FFQ, abnormal total energy intake (~17% of original sample)	○ Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat **Dietary assessment methods:** 188-item, validated FFQ at baseline, age >50y **Outcome assessment methods:** Annual patient screening, medical records confirmed by histology or cytology	• 5-7, n=72: HR: 0.61, 95% CI: 0.34, 1.12 • 8-9, n=2: HR: 0.20, 95% CI: 0.04, 0.91 • p-trend=0.04 **Non-Significant**: N/A	Total energy intake, dietary inflammatory index score **Limitations:** • Did not account for race/ethnicity, socioeconomic status, physical activity, anthropometry, family history of the cancer outcome, lung disease • Exposure occurred prior to start of f/u • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Italian Association for Cancer Research, Italian Foundation for Cancer Research, European Institute of Oncology, NCI *Summary: Higher aMED score at >50y was associated with significantly lower risk of lung cancer after 8.5y f/u.*
Schulpen, 2018[48] **Nested Case-Cohort Study (Netherlands**	**Dietary patterns:** • alternate Mediterranean diet scores (aMED)[lxxii], categorical (tertiles) and continuous (per 2 pt increment), and without alcohol (aMEDr)	**Significant**: Men, WCRF/AICR score at 61y, including alcohol, per SD increment and lung cancer after 20.3y f/u: HR: 0.90, 95% CI: 0.83, 0.98	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, family history of the cancer, lung disease

[lxxii] Fung TT, McCullough ML, Newby PK, Manson JE, Meigs JB, Rifai N, et al. Diet-quality scores and plasma concentrations of markers of inflammation and endothelial dysfunction. Am J Clin Nutr 2005;82: 163–73.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Cohort Study (NLCS)) **The Netherlands** Analytic N: 6581 Participants were 52% female, ~61yo (55-69y), ~24.9kg/m^2 BMI, ~56% never-smokers; ~9.7 g/d alcohol, 61.8 min/d non-occupational physical activity, 9.7% family history of lung cancer Excluded those with prevalent cancer (except skin); missing data on diet and alcohol (~10% of the original sample)	○ Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat • modified Mediterranean diet scores (mMED)[lxxiii], categorical (tertiles) and continuous (per 2 pt increment), and without alcohol (mMEDr) ○ Positive components: Vegetables, legumes, fruit, cereals, fish, MUFA+PUFA/SFA ○ Neutral components: Alcohol ○ Negative components: Meat, dairy products • WCRF/AICR score[lxxiv], diet only, continuous (per SD increment), and without alcohol ○ Positive components: Vegetables and fruit, dietary fiber ○ Negative components: Red and processed meat, sugary drinks, alcohol, sodium, energy-dense foods **Dietary assessment methods:** 150-item, validated FFQ at baseline, age ~61y	**Non-Significant**: **aMEDr:** Men, aMEDr score at 61y and lung cancer after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.86, 95% CI: 0.73, 1.02 • 6–8: HR: 0.91, 95% CI: 0.72, 1.15 • p-trend= 0·157 Men, aMEDr score and lung cancer, continuous, per 2 pts: HR: 0.95, 95% CI: 0.86, 1.06 Men, aMEDr score at 61y per SD increment and lung cancer after 20.3y f/u: HR: 0.96, 95% CI: 0.89, 1.05 Women, aMEDr score at 61y and lung cancer after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.87, 95% CI: 0.65, 1.15 • 6–8: HR: 0.73, 95% CI: 0.49, 1.09 • p-trend=0.112 Women, aMEDr score and lung cancer, continuous, per 2 pts: HR: 0.91, 95% CI: 0.77, 1.08 Women, aMEDr score at 61y per SD increment and lung cancer after 20.3y f/u: HR: 0.94, 95% CI: 0.83, 1.08	**Other:** Daily energy intake **Limitations:** • Did not account for race/ethnicity, environmental exposures to lung carcinogens • Exposure occurred prior to start of f/u • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; serious potential for selective outcome reporting **Funding Sources:** Wereld Kanker Onderzoek Fonds Nederland, World Cancer Research Fund International *Summary: aMED, mMED, and WCRF/AICR scores, with and without alcohol, at 61y was not significantly associated with lung cancer after 20.3y f/u. However, in men, WCRF/AICR score with alcohol was significantly associated with lower risk of lung cancer.*

[lxxiii] Trichopoulou A, Orfanos P, Norat T, Bueno-de-Mesquita B, Ocke MC, Peeters PH, et al. Modified Mediterranean diet and survival: EPIC-elderly prospective cohort study. BMJ 2005;330:991.
[lxxiv] World Cancer Research Fund/American Institute for Cancer Research. Food, nutrition, physical activity, and the prevention of cancer: a global perspective. Washington DC: American Institute for Cancer Research; 2007.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	Outcome assessment methods: Netherlands Cancer Registry and the nationwide Dutch Pathology Registry, and review of pathology records	**aMED:** Men, aMED score at 61y and lung cancer after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.86, 95% CI: 0.72, 1.03 • 6–8: HR: 0.89, 95% CI: 0.72, 1.10 • p-trend= 0.177 Men, aMED score and lung cancer, continuous, per 2 pts: HR: 0.96, 95% CI: 0.87, 1.05 Men, aMED score at 61y per SD increment and lung cancer after 20.3y f/u: HR: 0.97, 95% CI: 0.89, 1.05 Women, aMED score at 61y and lung cancer after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 1.03, 95% CI: 0.77, 1.39 • 6–8: HR: 0.80, 95% CI: 0.55, 1.15 • p-trend=0.326 Women, aMED score and lung cancer, continuous, per 2 pts: HR: 0.93, 95% CI: 0.79, 1.08 Women, aMED score at 61y per SD increment and lung cancer after 20.3y f/u: HR: 0.94, 95% CI: 0.83, 1.07 **mMEDr:** Men, mMEDr score at 61y and lung cancer after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 1.11, 95% CI: 0.93, 1.32 • 6–8: HR: 0.96, 95% CI: 0.76, 1.21	

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		• p-trend= 0.901 Men, mMEDr score and lung cancer, continuous, per 2 pts: HR: 1.00, 95% CI: 0.90, 1.11 Women, mMEDr score at 61y and lung cancer after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.99, 95% CI: 0.75, 1.32 • 6–8: HR: 0.83, 95% CI: 0.56, 1.24 • p-trend=0.474 Women, mMEDr score and lung cancer, continuous, per 2 pts: HR: 0.94, 95% CI: 0.79, 1.11 **mMED:** Men, mMED score at 61y and lung cancer after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.99, 95% CI: 0.82, 1.19 • 6–8: HR: 0.98, 95% CI: 0.78, 1.21 • p-trend= 0.823 Men, mMED score and lung cancer, continuous, per 2 pts: HR: 1.02, 95% CI: 0.92, 1.12 Women, mMED score at 61y and lung cancer after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.83, 95% CI: 0.61, 1.11 • 6–8: HR: 0.87, 95% CI: 0.61, 1.25 • p-trend=0.339 Women, mMED score and lung cancer, continuous, per 2 pts: HR: 0.94, 95% CI: 0.80, 1.11	

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		All results were similar when the lung cancer substypes were examined, including adenocarcinoma, squamous cell, small cell carcinoma, and large cell carcinoma. **WCRF/AICR, diet only:** Men, WCRF/AICR score at 61y, excluding alcohol, per SD increment and lung cancer after 20.3y f/u: HR: 0.96, 95% CI: 0.89, 1.05 Women, WCRF/AICR score at 61y, excluding alcohol, per SD increment and lung cancer after 20.3y f/u: HR: 0.94, 95% CI: 0.83, 1.08 Women, WCRF/AICR score, including alcohol, at 61y per SD increment and lung cancer after 20.3y f/u: HR: 0.94, 95% CI: 0.81, 1.08	
Voortman, 2017[24] **PCS (Rotterdam Study)** **The Netherlands** Analytic N: 9619 Participants were 58% female, 64.1yo, 49.0-82.8 yo, 26.3kg/m^2 BMI, 32% never smokers, 61% <10g/d alcohol, 15.5% higher education	**Dietary patterns:** • Dutch Dietary Guidelines 2015 score, continuous ○ Positive components: Vegetables, legumes, fruit, nuts, whole grains, fish, dairy products, unsaturated fats and oils, tea ○ Negative components: Replace refined grains with whole-grain products, red meat, processed meat, alcohol, sodium **Dietary assessment methods:** 170 to 389-item, validated FFQ at baseline, ~64y	**Significant**: N/A **Non-Significant**: Dutch Dietary Guidelines 2015 score and lung cancer (n=204) after 11.1y f/u: HR: 0.93, 95% CI: 0.86, 1.01	**Key confounders accounted for:** Sex, age, education, employment status, alcohol intake, physical activity, smoking, BMI **Other:** Cohort, total energy intake **Limitations:** • Did not account for race/ethnicity, family history of the cancer outcome, lung disease, environmental exposures to lung carcinogens • Exposure occurred prior to start of f/u • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Excluded those without reliable dietary data, prevalent cancer cases, those who developed disease within 2 y of baseline, missing outcome data (~19% of original sample)	**Outcome assessment methods:** nationwide registry of histopathology and cytopathology, f/u with general practitioners		• Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Erasmus University Medical Center and Erasmus University Rotterdam; the Netherlands Organization for Health Research and Development; the Research Institute for Diseases in the Elderly; the Netherlands Genomics Initiative; the Ministry of Education, Culture and Science; the Ministry of Health, Welfare and Sports; the European Commission (DG XII); and the Municipality of Rotterdam *Summary: Dutch Dietary Guidelines 2015 score at 64y was not significantly associated with lung cancer after 11y f/u.*

Table 10. Summary of the results from studies that examined the relationship between dietary patterns and lung cancer[lxxv]

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Anic, 2016[45] **PCS (NIH–AARP Diet and Health Study)** **United States** **Analytic N: 460770**	Healthy Eating Index (HEI)-2010 • Positive components: Total vegetables, geens and beans, total fruit, whole fruit, whole grains, seafood and plant proteins, total protein foods, dairy, fatty acids Negative components: Refined grained, added sugars, solid fats, sodium	HEI-2010 score at 62y and lung cancer after 10.5y f/u: • Q1, n=3076: HR: 1.00 • Q2, n=1947: HR 0.90, 95% CI: 0.84, 0.95 • Q3, n=1640: HR 0.91, 95% CI: 0.86, 0.97 • Q4, n=1436: HR 0.92, 95% CI: 0.86, 0.98 • Q5, n=1173: HR 0.83, 95% CI: 0.77, 0.89 • p-trend<0.0001 Smoking: Smoking status (never smokers): Men: Q1: 21.5%, Q5: 37.6%; Women: Q1: 33.8%, Q5: 49.5% Adjusted for smoking status, cigarettes per day, time since quitting smoking and regular use of cigars/pipes. When analyzed by smoking status, results remained significant for former and current smokers, but were no longer significant for never smokers.	

[lxxv] Abbreviations: AHEI-2010, Alternative Healthy Eating Index-2010; aMED, Alternative Mediterranean Diet Score ; BMI, body mass index; d, day; DASH, Dietary Approaches to Stop Hypertension; DP, Dietary pattern; %E, % of energy; EPIC, European Prospective Investigation into Cancer and Nutrition; FFQ, food frequency questionnaire; FSAm-NPS, Nutrient Profiling System of the British Food Standards Agency (modified version); f/u, follow-up; HR, hazard ratio; MDS, Mediterranean Diet Score; mMEDr, modified Mediterranean diet scores; mMEDr, modified Mediterranean diet scores without alcohol; mo, month or months; N/A, Not applicable; NIH, National Institutes of Health; NS, Not significant; NR, Not reported; PCS, prospective cohort study; pt, point; RCT, randomized controlled trial; WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; wk, weeks; y, year

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	Alternative Healthy Eating Index (AHEI)-2010 • Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA • Neutral components: Alcohol • Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium	AHEI-2010 score at 62y and lung cancer after 10.5y f/u: • Q1, n=2448: HR: 1.00 • Q2, n=2004: HR 0.96, 95% CI: 0.90, 1.02 • Q3, n=1879: HR 0.99, 95% CI: 0.93, 1.05 • Q4, n=1601: HR 0.92, 95% CI: 0.86, 0.98 • Q5, n=1340: HR 0.86, 95% CI: 0.80, 0.92 • p-trend<0.0001 Smoking: Smoking status (never smokers): Men: Q1: 27.6%, Q5: 31.9%; Women: Q1: 44.9%, Q5: 40.6% Adjusted for smoking status, cigarettes per day, time since quitting smoking and regular use of cigars/pipes. When analyzed by smoking status, results remained significant for former smokers, but were no longer significant for never or current smokers.	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	Alternative Mediterranean Diet Score (aMED) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol Negative components: Red and processed meat	aMED score at 62y and lung cancer after 10.5y f/u: • Q1, n=2232: HR: 1.00 • Q2, n=1849: HR 0.96, 95% CI: 0.91, 1.03 • Q3, n=1890: HR 0.94, 95% CI: 0.88, 1.00 • Q4, n=1660: HR 0.96, 95% CI: 0.90, 1.03 • Q5, n=1641: HR 0.85, 95% CI: 0.79, 0.91 • p-trend<0.0001 Smoking: Smoking status (never smokers): Men: Q1: 26.8%, Q5: 33.4%; Women: Q1: 41.4%, Q5: 46.4% Adjusted for smoking status, cigarettes per day, time since quitting smoking and regular use of cigars/pipes. When analyzed by smoking status, results remained significant for former smokers, but were no longer significant for never or current smokers.	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	DASH Score • Positive components: Vegetables (not potatoes), nuts and legumes, fruit and fruit juice, whole grains, low-fat dairy Negative components: Red and processed meat, sweetened beverages, sodium	DASH score at 62y and lung cancer after 10.5y f/u: • Q1, n=2791: HR: 1.00 • Q2, n=1681: HR 0.99, 95% CI: 0.93, 1.05 • Q3, n=1672: HR 0.96, 95% CI: 0.90, 1.02 • Q4, n=1960: HR 0.93, 95% CI: 0.88, 0.99 • Q5, n=1168: HR 0.84, 95% CI: 0.78, 0.90 • p-trend<0.0001 Smoking: Smoking status (never smokers): Men: Q1: 24.5%, Q5: 36.1%; Women: Q1: 39.3%, Q5: 48.0% Adjusted for smoking status, cigarettes per day, time since quitting smoking and regular use of cigars/pipes. When analyzed by smoking status, results remained significant for former smokers, but were no longer significant for never or current smokers.	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Boden, 2019[27] **PCS (Vasterbotten Intervention Programme)** **Sweden** **Analytic N: 35393**	Mediterranean diet score (MDS) • Positive components: Vegetables and potatoes, fruit and fresh juices, wholegrain cereals, fish and fish products, MUFA+PUFA/SFA, • Moderation components: Alcohol • Negative components: Meat and meat products, dairy products		All participants, MDS score, per tertile increase, at 46y and lung cancer (n=442) 15y f/u: HR: 0.90, 95% CI: 0.80, 1.01 Men, MDS score, per tertile increase, at 4 and lung cancer (n=210) after 15y f/u: HR 0.86, 95% CI: 0.72, 1.03 Women, MDS score, per tertile increase, 46y and lung cancer (n=232) after 15y f/u HR: 0.94, 95% CI: 0.79, 1.10 Smoking: Smoking status (% current smokers): Me T1: 16.8, T2: 15.3, T3: 12.7; Women: T1: 19.6, T2: 17.4, T3: 15.2 Adjusted for smoking status (non smoker ever smokers)

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Deschasaux, 2018[4] **PCS (European Prospective Investigation into Cancer and Nutrition (EPIC))** **Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, UK** **Analytic N: 471495**	Nutrient Profiling System of the British Food Standards Agency dietary index (modified version) (FSAm-NPS DI) • Overall score based on energy, sugar, saturated fatty acid, sodium, fibres, proteins, and fruits/vegetables/legumes/nuts. • Higher FSAm-NPS DI score had higher intakes of alcohol, energy and red and processed meat, lower intakes of dietary fibres, vegetables, fruit, fish, and lean meat		FSAm-NPS score at 51y and lung cance after 15.3y f/u: • Q1, n=640: HR: 1.00 • Q2, n=684: HR: 1.05, 95% CI: 0. 1.17 • Q3, n=702: HR: 1.03, 95% CI: 0. 1.16 • Q4, n=782: HR: 1.09, 95% CI: 0. 1.22 • Q5, n=846: HR: 1.06, 95% CI: 0. 1.20 • p-trend=0.3 Continuous, per 2pt increment, n=3654: 1.01, 95% CI: 0.97, 1.04; p-trend=0.7 Smoking: Smoking status (% never, current, forme Q1: 43.1, 28.0, 25.6; Q2: 49.2, 21.9, 26.0 42.2, 28.3, 26.1; Q4: 40.9, 30.2, 25.6; Q5 38.9, 33.3, 24.1 Adjusted for smoking status and intensity smoking (current cigarettes/d; pipe/cigar/occasional; current/former, mis former, quit 11-20y; former, quit 20+y; for quit<10y; never; unknown)

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Hodge, 2016[46] **PCS (Melbourne Collaborative Cohort Study)** **Australia** **Analytic N: 35303**	Mediterranean diet score • Positive components: Vegetables, legumes, fruit and nuts, cereals, fish, olive oil • Moderation components: Alcohol Negative components: Red and processed meat, dairy products	MDS score at 40-69y and lung cancer after 18y f/u: • 0-3, n=126: HR: 1.00 • 4-6, n=229: HR: 0.75, 95% CI: 0.60, 0.94 • 7-9, n=48: HR: 0.64, 95% CI: 0.45, 0.90 • p-trend=0.005 MDS, continuous, and lung cancer after 18y f/u: HR: 0.89, 95% CI: 0.81, 0.96 Smoking: Smoking status (% never, current, former): Non-cases: 59.6, 10.8, 29.6; Cases: 15.6, 43.4, 40.9 Adjusted for pack-years, years since quit smoking, smoking status When analyzed by smoking status, results remained significant in current smokers, but were no longer significant in never and former smokers.	
Kane-Diallo, 2018[14] **PCS (NutriNet-Sante study)** **France** **Analytic N: 42544**	Pro plant-based dietary score • Higher in vegetables, legumes, fruits, cereal products, potatoes, nuts, vegetables oils • Lower in red and processed meat, eggs, animal fat, dairy products, seafood	Pro plant-based dietary score at 57y and lung cancer after 4.3y f/u: • T1, n=28: HR: 1.00 • T2, n=25: HR: 0.82, 95% CI: 0.48, 1.43 • T3, n=15: HR: 0.47, 95% CI: 0.24, 0.90 • p-trend=0.02 Smoking: Smoking status (% current, former, never): T1: 11.4, 44.8, 43.8; T2: 13.6, 44.0, 42.4; T3: 9.3, 45.8, 44.9 Adjusted for smoking status (never, former, current smokers)	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Maisonneuve, 2016[47] **PCS (COSMOS study)** **Italy** **Analytic N: 4336**	Alternative Mediterranean Diet Score (aMED) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat	aMED score at >50y and lung cancer after 8.5y f/u:: • 0-1, n=16: HR: 1.00 • 2-4, n=110: HR: 0.72, 95% CI: 0.42, 1.22 • 5-7, n=72: HR: 0.61, 95% CI: 0.34, 1.12 • 8-9, n=2: HR: 0.20, 95% CI: 0.04, 0.91 p-trend=0.04 Smoking: Smoking: 100% heavy smokers (20.2% former, 79.8% current; excluded those who were not current smokers or had quit smoking >10y ago and smoked <20 pack years) Adjusted for smoking duration, smoking intensity, and years of smoking cessation	

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Schulpen, 2018[48] **Nested Case-Control Study (Netherlands** **Cohort Study (NLCS))** **The Netherlands** **Analytic N: 6581**	alternate Mediterranean diet score (aMED) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat		Men, aMED score at 61y and lung cance after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.86, 95% CI: 0.72, 1.0 • 6–8: HR: 0.89, 95% CI: 0.72, 1.1 • p-trend= 0.177 Men, aMED score and lung cancer, continuous, per 2 pts: HR: 0.96, 95% CI: 1.05 Men, aMED score at 61y per SD increme and lung cancer after 20.3y f/u: HR: 0.97 95% CI: 0.89, 1.05 Women, aMED score at 61y and lung ca after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 1.03, 95% CI: 0.77, 1.3 • 6–8: HR: 0.80, 95% CI: 0.55, 1.1 • p-trend=0.326 Women, aMED score and lung cancer, continuous, per 2 pts: HR: 0.93, 95% CI: 1.08 Women, aMED score at 61y per SD increment and lung cancer after 20.3y f/u 0.94, 95% CI: 0.83, 1.07 Smoking: Smoking (% never, former): NR by aMED score Adjusted for smoking status (never, form current), cigarette smoking duration (yea centred) and cigarette smoking frequency (cigarettes smoked per day, centred)

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	aMED without alcohol (aMEDr)		Men, aMEDr score at 61y and lung cance after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.86, 95% CI: 0.73, 1.0 • 6–8: HR: 0.91, 95% CI: 0.72, 1.1 • p-trend= 0·157 Men, aMEDr score and lung cancer, continuous, per 2 pts: HR: 0.95, 95% CI: 1.06 Men, aMEDr score at 61y per SD increm and lung cancer after 20.3y f/u: HR: 0.96 95% CI: 0.89, 1.05 Women, aMEDr score at 61y and lung ca after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.87, 95% CI: 0.65, 1.1 • 6–8: HR: 0.73, 95% CI: 0.49, 1.0 • p-trend=0.112 Women, aMEDr score and lung cancer, continuous, per 2 pts: HR: 0.91, 95% CI: 1.08 Women, aMEDr score at 61y per SD increment and lung cancer after 20.3y f/u 0.94, 95% CI: 0.83, 1.08 Smoking: Smoking (% never, former): 0-3: 11.5, 48 5: 13.1, 52.4; 6-8: 15.9, 62.2 Adjusted for smoking status (never, form current), cigarette smoking duration (yea centred) and cigarette smoking frequency (cigarettes smoked per day, centred)

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	modified Mediterranean diet score (mMED) • Positive components: Vegetables, legumes, fruit, cereals, fish, MUFA+PUFA/SFA • Neutral components: Alcohol • Negative components: Meat, dairy products		Men, mMED score at 61y and lung cance after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.99, 95% CI: 0.82, 1.1 • 6–8: HR: 0.98, 95% CI: 0.78, 1.2 • p-trend= 0.823 Men, mMED score and lung cancer, continuous, per 2 pts: HR: 1.02, 95% CI: 1.12 Women, mMED score at 61y and lung ca after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.83, 95% CI: 0.61, 1.1 • 6–8: HR: 0.87, 95% CI: 0.61, 1.2 • p-trend=0.339 Women, mMED score and lung cancer, continuous, per 2 pts: HR: 0.94, 95% CI: 1.11 All results were similar when the lung can substypes were examined, including adenocarcinoma, squamous cell, small c carcinoma, and large cell carcinoma. Smoking: Smoking (% never, former): NR by mMEI score Adjusted for smoking status (never, forme current), cigarette smoking duration (yea centred) and cigarette smoking frequency (cigarettes smoked per day, centre)

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	mMED without alcohol (mMEDr)		Men, mMEDr score at 61y and lung canc after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 1.11, 95% CI: 0.93, 1.3 • 6–8: HR: 0.96, 95% CI: 0.76, 1.2 • p-trend= 0.901 Men, mMEDr score and lung cancer, continuous, per 2 pts: HR: 1.00, 95% CI: 1.11 Women, mMEDr score at 61y and lung c after 20.3y f/u: • 0–3: HR: 1.00 • 4–5: HR: 0.99, 95% CI: 0.75, 1.3 • 6–8: HR: 0.83, 95% CI: 0.56, 1.2 • p-trend=0.474 Women, mMEDr score and lung cancer, continuous, per 2 pts: HR: 0.94, 95% CI: 1.11 Smoking: Smoking (% never, former): 0-3: 11.5, 48 75: 14.7, 51.7; 6-8: 10.3, 61.6 Adjusted for smoking status (never, form current), cigarette smoking duration (yea centred) and cigarette smoking frequency (cigarettes smoked per day, centre)

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	WCRF/AICR score, diet only • Positive components: Vegetables and fruit, dietary fiber • Negative components: Red and processed meat, sugary drinks, alcohol, sodium, energy-dense foods		Men, WCRF/AICR score at 61y, including alcohol, per SD increment and lung canc after 20.3y f/u: HR: 0.90, 95% CI: 0.83, 0 Women, WCRF/AICR score, including alcohol, at 61y per SD increment and lun cancer after 20.3y f/u: HR: 0.94, 95% CI: 1.08 Smoking: Smoking (% never, former): NR by WCRF/AICR, diet only score Adjusted for smoking status (never, forme current), cigarette smoking duration (yea centred) and cigarette smoking frequency (cigarettes smoked per day, centred)
	WCRF/AICR score, diet only, without alcohol		Men, WCRF/AICR score at 61y, without alcohol, per SD increment and lung canc after 20.3y f/u: HR: 0.96, 95% CI: 0.89, 1 Women, WCRF/AICR score at 61y, witho alcohol, per SD increment and lung canc after 20.3y f/u: HR: 0.94, 95% CI: 0.83, 1 Smoking: Smoking (% never, former): NR by WCRF/AICR score, diet only, without alc Adjusted for smoking status (never, forme current), cigarette smoking duration (yea centred) and cigarette smoking frequency (cigarettes smoked per day, centred)

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Voortman, 2017[24] **PCS (Rotterdam Study)** **The Netherlands** **Analytic N: 9619**	Dutch Dietary Guidelines 2015 score • Positive components: Vegetables, legumes, fruit, nuts, whole grains, fish, dairy products, unsaturated fats and oils, tea Negative components: Replace refined grains with whole-grain products, red meat, processed meat, alcohol, sodium		Dutch Dietary Guidelines 2015 score and cancer (n=204) after 11.1y f/u: HR: 0.93, CI: 0.86, 1.01 Smoking: Smoking status (% never, ever, current): 44.2, 23.8 Adjusted for smoking status

Table 11. Risk of bias for observational studies examining dietary patterns and lung cancer[lxxvi]

	Confounding	Selection of participants	Classification of exposures	Deviations from intended exposures	Missing data	Outcome measurement	Selection of the reported result
Anic, 2016[45]	Serious	Moderate	Low	Serious	Serious	Low	Moderate
Boden, 2019[27]	Serious	Moderate	Low	Serious	Serious	Low	Moderate
Deschasaux, 2018[4]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Hodge, 2016[46]	Serious	Serious	Low	Serious	Moderate	Low	Moderate
Kane-Diallo, 2018[14]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Maisonneuve, 2016[47]	Critical	Moderate	Low	Serious	Serious	Low	Moderate
Schulpen, 2018[48]	Serious	Serious	Low	Serious	Moderate	Low	Serious
Voortman, 2017[24]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate

[lxxvi] Possible ratings of low, moderate, serious, critical, or no information determined using the "Risk of Bias for Nutrition Observational Studies" tool (RoB-NObs) (Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.)

Table 12. Description of studies that examined the relationship between dietary patterns and prostate cancer[lxxvii]

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Deschasaux, 2018[4] **PCS (European Prospective Investigation into Cancer and Nutrition (EPIC))** **Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, UK** Analytic N: 140729 Participants were 100% male, ~51yo, ~25.4 kg/m^2 BMI, 43% never-smokers, ~5.3 g/d alcohol, ~20.9% inactive; 17.9% active	**Dietary patterns:** Nutrient Profiling System of the British Food Standards Agency dietary index (modified version) (FSAm-NPS DI) score, categorical (quintiles) and continuous (per 2 pt increment) [-15 (most healthy) to +40 (least healthy)] • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fibres, proteins, and fruits/vegetables/legumes/nuts. • Higher FSAm-NPS score had higher intakes of alcohol, energy and red and processed meat, lower intakes of dietary fibers, vegetables, fruit, fish, and lean meat. **Dietary assessment methods:** FFQs or diet history questionnaire and 7-day dietary records, validated, at baseline, age ~51y **Outcome assessment methods:** Record linkage with population-based	**Significant**: FSAm-NPS DI score at 51y and risk of prostate cancer after 15.3y f/u: • Q1, n=1192: HR: 1.00 • Q2, n=1162: HR: 0.99, 95% CI: 0.91, 1.07 • Q3, n=1365: HR: 1.05, 95% CI: 0.97, 1.15 • Q4, n=1471: HR: 1.06, 95% CI: 0.97, 1.16 • Q5, n=1555: HR: 1.07, 95% CI: 0.98, 1.17 • p-trend=0.04 Continuous, per 2pt increment, n=6745: HR: 1.03, 95% CI: 1.00, 1.06; p-trend=0.04 **Non-Significant**: N/A	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, height **Other:** Center, energy intake **Limitations:** • Did not account for race/ethnicity • Did not account for dietary exposure earlier in life, that occurred prior to start of the study • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** French National Cancer Institute, European Commission, the International Agency for Research on Cancer

[lxxvii] Abbreviations: AHEI-2010, Alternative Healthy Eating Index-2010; aMED, Alternative Mediterranean Diet Score ; BMI, body mass index; d, day; DP, Dietary pattern; %E, % of energy; EPIC, European Prospective Investigation into Cancer and Nutrition; FFQ, food frequency questionnaire; FSAm-NPS, Nutrient Profiling System of the British Food Standards Agency (modified version); FSAm-NPS DI, Nutrient Profiling System of the British Food Standards Agency dietary index; f/u, follow-up; HR, hazard ratio; MEDI-LITE, Mediterranean diet score; MDS, Mediterranean Diet Score; mMED, modified Mediterranean diet scores; mMEDr, modified Mediterranean diet scores without alcohol; mo, month(s); N/A, Not applicable; NIH, National Institutes of Health; NOVA, Ultra-processed food score; NS, Not significant; NR, Not reported; PCS, prospective cohort study; PNNS-GS, French National Nutrition Health Program-Guideline Score; pt, point; RCT, randomized controlled trial; WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; wk, week(s); y, year(s)

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Excluded those with prevalent cancer; cancer diagnosis in first 2y of f/u; missing data; implausible energy intake (~10% of original sample)	cancer registries, health insurance records, pathology registries, and f/u with study participants		*Summary: Consuming a diet that scores higher (i.e., lower nutritional quality) on the Nutrient Profiling System of the British Food Standards Agency dietary index (modified version) (FSAm-NPS DI) at 51y was associated with decreased risk of prostate cancer after 15.3y f/u.*
Donnenfeld, 2015[6] **PCS using data from an RCT (SUpplémentation en VItamines et Minéraux AntioXydants cohort)** **France** Analytic N: 2753 Participants were 100% male, ~49yo, 34% BMI >25kg/m^2, 48% never-smokers, ~18.8g/d alcohol, ~45% ≥1 h/d of walking, ~35% family history of cancer Excluded those with prevalent cancer; cancer diagnosis in first 3y of f/u; <6 24-hr recalls within the first 2y of f/u; implausible	**Dietary patterns:** Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score, categorical (quintiles) and continuous (per 2 pt increment) [-15 (most healthy) to +40 (least healthy)] • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fiber, proteins, and fruits/vegetables/legumes/nuts. **Dietary assessment methods:** 6, 24-hour dietary records during the first 2y of f/up, age ~49y, and every 2 mo, for first 2y of f/u **Outcome assessment methods:** Participant report, medical record review, pathological reports	**Significant**: N/A **Non-Significant**: FSAm-NPS score at 49y and risk of prostate cancer after 12.6y f/u: • Q1, n=29: 1 • Q2, n= 18: HR: 0.82, 95% CI: 0.45, 1.50 • Q3, n= 26: HR: 1.24, 95% CI: 0.71, 2.14 • Q4, n= 16: HR: 0.83, 95% CI: 0.44, 1.56 • Q5, n= 23: HR: 1.31, 95% CI: 0.74, 2.33 • p-trend=0.4 Continuous, n=112: HR: 1.07, 95% CI: 0.93, 1.22; p-trend=0.3	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, height, family history of prostate cancer **Other:** Intervention group of the initial SU.VI.MAX trial, number of dietary records, baseline PSA **Limitations:** • Did not account for race/ethnicity • Exposure occurred prior to start of f/u • Only assessed dietary intake during first 2y of f/u; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** French Ministry of Health (DGS), National Institute for Prevention and Health Education (INPES) *Summary: Nutrient Profiling System of the British Food Standards Agency (modified version) (FSAm-NPS) score at 49y was not*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
energy intake (~51% of original sample)			*significantly associated with risk of prostate cancer after 12.6y f/u.*
Fiolet, 2018[7] **PCS (NutriNet-Santé)** **France** Analytic N: 22821 Participants were 100% male, ~42.8yo, 23.8kg/m2 BMI, 83% never or former smokers, ~7.8g/d alcohol, family history of cancer 34%, moderate or high physical activity ~65% Excluded those with prevalent cancer; <18yo at baseline; <2 valid 24-hr dietary records during first 2y f/u; diagnosis in first 2y of f/u (~11% of original sample)	**Dietary patterns:** • Ultra-processed food score (NOVA), categorical (quartiles) ○ Main food groups contributing to NOVA score were sugary drinks, drinks, starchy foods and breakfast cereals, ultra-processed fruits and vegetables, dairy products, meats, fish, and eggs, processed meats, fats, and salty snacks **Dietary assessment methods:** 3, 24-hour dietary records every 6 months, assessed during the first 2y of f/u, at age ~49y **Outcome assessment methods:** Participant report, medical record review, pathological reports, linked to health insurance and mortality databases	**Significant**: N/A **Non-Significant**: Ultra-processed food score at 49y and prostate cancer after 5.4y f/u: • Q1, n=96: HR: 1.00 • Q2, n=96: HR: 1.18, 95% CI: 0.89, 1.57 • Q3, n=59: HR: 0.95, 95% CI: 0.68, 1.32 • Q4, n=30: HR: 0.93, 95% CI: 0.61, 1.40 • p-trend=0.6 Ultra-processed food score, continuous, and prostate cancer (n=281): HR: 0.98, 95% CI: 0.83, 1.16; p-trend=0.8	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, BMI, height, family history of the cancer **Other:** Energy intake without alcohol, number of 24 hour dietary records, intakes of lipids, sodium, and carbohydrates and western dietary pattern **Limitations:** • Did not account for race/ethnicity • Exposure occurred prior to start of f/u • Only assessed dietary intake during first 2y of f/u; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Région Ile-de-France, Cancéropôle Ile-de-France, Ministère de la Santé, Institut de Veille Sanitaire, Institut National de la Prévention etde l'Education pour la Santé, Région Ile-de-France, Institut Nationalde la Santé et de la Recherche Médicale, Institut National de la Recherche Agronomique (INRA), onservatoire National des Arts et Métiers and Université Paris 13

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
			Summary: Ultra-processed food score at 49y was not significantly associated with risk of prostate cancer after 5.4y f/u.
Kane-Diallo, 2018[14] **PCS (NutriNet-Sante study)** **France** Analytic N: 11615 Participants were 100% male, ~56.9y (≥45y), ~25kg/m2, ~44% never-smokers, 9.7g/d alcohol, ~80% high or moderate physical activity, ~51% family history of cancer Excluded those with prevalent cancer; <3 24-hr recalls within the first year of f/u; missing f/u data; implausible energy intake; <45y (~21% of original sample)	**Dietary patterns:** • "Pro plant-based" dietary score, categorical (tertiles) • Higher in plant foods: vegetables, legumes, fruits, cereal products, potatoes, nuts, vegetables oils • Lower in animal foods: red and processed meat, eggs, animal fat, dairy products, seafood **Dietary assessment methods:** 3, 24-hour dietary records every 6 months, assessed during the first 2y of f/u, at age ~57y **Outcome assessment methods:** Participant report, medical record review, pathological reports, linked to health insurance and mortality databases	**Significant**: N/A **Non-Significant**: "Pro plant-based" dietary score at 49y and risk of prostate cancer after 4.3y f/u: • T1, n=84/3849: HR: 1.00 • T2, n=85/3679: HR: 0.90, 95% CI: 0.66, 1.23 • T3, n=74/3844: HR: 0.76, 95% CI: 0.55, 1.06 • p-trend=0.1	**Key confounders accounted for:** Sex, age, education, alcohol intake (in adults), physical activity, smoking, height, BMI, family history of the cancer outcome **Other:** Energy intake without alcohol, number of 24-hr dietary records, lipids intake **Limitations:** • Did not account for race/ethnicity • Exposure occurred prior to start of f/u • Only assessed dietary intake during first 2y of f/u; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Ministere de la Sante, Institut de Veille Sanitaire, Institut National de la Prevention et de l'Education pour la Sante, Region Ile-de-France, Institut National de la Sant_e et de la Recherche Medicale, Institut National de la Recherche Agronomique, Conservatoire National des Arts et Metiers, The French National Cancer Institute *Summary: "Pro plant-based" dietary score at 57y was not significantly associated with risk of prostate cancer after 4.3y f/u.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
Lavalette, 2018[16] **PCS (NutriNet-Sante study)** **France** Analytic N: 11018 Participants were 100% male, ~54yo (all >40y), ~24.5kg/m2, ~44% never-smokers, ~9.4g/d alcohol, 78.2% high or moderate physical activity, ~49% family history of cancer Excluded those with prevalent cancer; <3 24-hr recalls within the first year of f/u; missing f/u data; implausible energy intake; <40y (>50% of original sample)	**Dietary patterns:** • Alternate Healthy Eating Index 2010 (AHEI-2010)[lxxviii], categorical (quintiles) and continuous (per 2 pt increment) o Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA o Neutral components: Alcohol o Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium • Mediterranean diet score (MEDI-LITE)[lxxix], categorical (quintiles) and continuous (per 2 pt increment) o Positive components: Vegetables, legumes, fruit and nuts, cereals, fish, olive oil o Neutral components: Alcohol o Negative components: Meat, dairy products • French National Nutrition Health Program-Guideline Score (PNNS-GS)[lxxx], categorical (quintiles) and continuous (per 2 pt increment)	**Significant**: N/A **Non-Significant**: AHEI-2010 score at ~55y and risk of prostate cancer after 8.5y f/u: • Q1, n=32/2171: HR: 1.00 • Q2, n=42/2162: HR: 0.93, 95% CI: 0.59, 1.48 • Q3, n=55/2149: HR: 1.14, 95% CI: 0.73, 1.77 • Q4, n=48/2156: HR: 0.90, 95% CI: 0.57, 1.42 • Q5, n=45/2158: HR: 0.82, 95% CI: 0.51, 1.31 • p-trend=0.3 AHEI-2010 score, continuous, n=222/10796: HR: 0.96, 95% CI: 0.85, 1.08; p-trend=0.5 MEDI-LITE score at ~49y and risk of prostate cancer after 8.5y f/u: • Q1, n=38/2473: HR: 1.00 • Q2, n=32/1530: HR: 1.16, 95% CI: 0.72, 1.86 • Q3, n=37/1711: HR: 1.12, 95% CI: 0.71, 1.76 • Q4, n=74/3043: HR: 1.14, 95% CI: 0.77, 1.70	**Key confounders accounted for:** Sex, age, education, alcohol intake, physical activity, smoking, height, BMI, family history of the cancer **Other:** Number of 24-hours dietary records, energy intake without alcohol **Limitations:** • Did not account for race/ethnicity • Exposure occurred prior to start of f/u • Only assessed dietary intake during first 2y of f/u; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; potential for selective outcome reporting **Funding Sources:** Ministere de la Sante, Institut de Veille Sanitaire, Institut National de la Prevention et de l'Education pour la Sante, Region Ile-de-France, Institut National de la Sant_e et de la Recherche Medicale, Institut National de la Recherche Agronomique, Conservatoire National des Arts et Metiers, The French National Cancer Institute

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[lxxix] Sofi F, Macchi C, Abbate R, Gensini GF, Casini A. Mediterranean diet and health status: an updated meta-analysis and a proposal for a literature-based adherence score. Public Health Nutr 2014;17: 2769–82.
[lxxx] Estaquio C, Kesse-Guyot E, Deschamps V, Bertrais S, Dauchet L, Galan P, et al. Adherence to the French Programme National Nutrition Sante Guideline Score is associated with better nutrient intake and nutritional status. J Am Diet Assoc 2009;109:1031–41.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	○ Positive components: Vegetables and Fruit, Seafood, Vegetable Fat ○ Neutral components: Breads, cereals, potatoes, legumes, meat and poultry, seafood, and eggs, milk and dairy products, alcohol ○ Negative components: Sweetened foods, soda, added fat, salt **Dietary assessment methods:** 3, 24-hour dietary records every 6mo, assessed during the first 2y of f/u, at age ~55y **Outcome assessment methods:** Participant report, medical record review, pathological reports, linked to health insurance and mortality databases	• Q5, n=41/2039: HR: 0.95, 95% CI: 0.61, 1.50 • p-trend=0.9 MEDI-LITE score, continuous, n=222/10796: HR: 0.98, 95% CI: 0.93, 1.04 ; p-trend=0.5 PNNS-GS score at ~49y and risk of prostate cancer after 8.5y f/u: • Q1, n=35/2161: HR: 1.00 • Q2, n=38/1998: HR: 0.88, 95% CI: 0.55, 1.40 • Q3, n=46/2292: HR: 0.85, 95% CI: 0.55, 1.34 • Q4, n=44/2086: HR: 0.74, 95% CI: 0.47, 1.17 • Q5, n=59/2259: HR: 0.83, 95% CI: 0.54, 1.28 • p-trend=0.3 PNNS-GS score, continuous, n=222/10796: HR: 0.97, 95% CI: 0.89, 1.05; p-trend=0.4	*Summary: AHEI-2010, MEDI-LITE, and PNNS-GS scores at 55y were not significantly associated with risk of prostate cancer after 8.5y f/u.*
Schulpen, 2019[51] **Nested Case-Control Study (Netherlands Cohort Study (NLCS))**	**Dietary patterns:** • alternate Mediterranean diet scores (aMED)[lxxxi], categorical (tertiles) and continuous (per 2 pt increment), and without alcohol (aMEDr)c ○ Positive components: Vegetables (not potatoes),	**Significant**: **aMEDr:** aMEDr score at 61y and risk of nonadvanced prostate cancer after 20.3y f/u: • 0–3, n=854: HR: 1.00 • 4–5, n=1,048: HR: 1.14, 95% CI: 0.99, 1.31 • 6–8, n=427: HR: 1.22, 95% CI: 1.01, 1.48	**Key confounders accounted for:** Sex, age, race/ethnicity, education, alcohol intake, physical activity, smoking, BMI, family history of the cancer outcome **Other:** Daily energy intake **Limitations:**

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Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
The Netherlands Analytic N: 5748 Participants were 100% male, ~61yo (55-69y), ~24.9kg/m^2 BMI, ~68% non-smokers; ~8.5 g/d alcohol, 61.8 min/d non-occupational physical activity, 3.1% family history of prostate cancer Excluded those with prevalent cancer (except skin); missing data on diet and alcohol (~8% of original sample)	legumes, fruits, nuts, whole grains, fish, MUFA/SFAs ○ Neutral components: Alcohol ○ Negative components: Red and processed meat modified Mediterranean diet scores (mMED)[lxxxii], categorical (tertiles) and continuous (per 2 pt increment), and without alcohol (mMEDr) ○ Positive components: Vegetables, legumes, fruit, cereals, fish, MUFA+PUFA/SFA ○ Neutral components: Alcohol ○ Negative components: Meat, dairy products • WCRF/AICR score,[lxxxiii] diet only, continuous (per SD increment), and without alcohol ○ Positive components: Vegetables and fruit, dietary fiber ○ Negative components: Red and processed meat, sugary drinks, alcohol, sodium, energy-dense foods **Dietary assessment methods:** 150-item, validated FFQ at baseline, age ~61y	• p-trend=0.037 aMEDr score and nonadvanced prostate cancer, continuous, per 2 pts, n=2,329: HR: 1.12, 95% CI: 1.04, 1.22 aMEDr score at 61y per SD increment and nonadvanced prostate cancer after 20.3y f/u: HR: 1.09, 95% CI: 1.03, 1.17 aMEDr score and prostate cancer, continuous, per 2 pts, n=3,868: HR: 1.09, 95% CI: 1.01, 1.17 aMEDr score at 61y per SD increment and risk of prostate cancer after 20.3y f/u: HR: 1.07, 95% CI: 1.01, 1.13 **aMED:** aMED score at 61y and risk of nonadvanced prostate cancer after 20.3y f/u: • 0–3, n=666: HR: 1.00 • 4–5, n=1,008: HR: 1.07, 95% CI: 0.92, 1.25 • 6–9, n=655: HR: 1.28, 95% CI: 1.08, 1.53 • p-trend=0.012 aMED score, continuous, per 2 pts, and nonadvanced prostate cancer, n=2,329: HR: 1.12, 95% CI: 1.04, 1.21 aMED score at 61y per SD increment and prostate cancer after 20.3y f/u: HR: 1.07, 95% CI: 1.01, 1.14	• Did not account for race/ethnicity, physical activity, smoking • Exposure occurred prior to start of f/u • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No preregistered statistical plan; serious potential for selective outcome reporting **Funding Sources:** Wereld Kanker Onderzoek Fonds Nederland, World Cancer Research Fund International *Summary:* *Higher aMED score with and without alcohol was associated with significantly increased risk of nonadvanced prostate cancer after 20.3y f/u. However, aMED scores, with and without alcohol, were not significantly associated with total risk of prostate cancer or risk of advanced prostate cancer after 20.3y f/u.* *mMED score, with and without alcohol, was not significantly associated with risk of prostate cancer, including nonadvanced and advanced prostate cancer, after 20.3y f/u.* *WCRF/AICR diet only score, with and without alcohol, was not significantly associated with*

[lxxxii] Trichopoulou A, Orfanos P, Norat T, Bueno-de-Mesquita B, Ocke MC, Peeters PH, et al. Modified Mediterranean diet and survival: EPIC-elderly prospective cohort study. BMJ 2005;330:991.
[lxxxiii] World Cancer Research Fund/American Institute for Cancer Research. Food, nutrition, physical activity, and the prevention of cancer: a global perspective. Washington DC: American Institute for Cancer Research; 2007.

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	Outcome assessment methods: Netherlands Cancer Registry and the nationwide Dutch Pathology Registry, and review of pathology records	aMED score, continuous, per 2 pts, and nonadvanced prostate cancer, n=3,868: HR: 1.09, 95% CI: 1.01, 1.17 aMED score at 61y per SD increment and nonadvanced prostate cancer after 20.3y f/u: HR: 1.10, 95% CI: 1.03, 1.17 **mMEDr:** mMEDr, continuous, per 2 pts, n=2,329: HR: 1.11, 95% CI: 1.02, 1.21 **mMED:** mMED, continuous, per 2 pts, n=3,868: HR: 1.07, 95% CI: 1.00, 1.16 mMED score at 61y and risk of nonadvanced prostate cancer after 20.3y f/u: • 0–3, n=571: HR: 1.00 • 4–5, n=1,069: HR: 0.99, 95% CI: 0.84, 1.16 • 6–9, n=689: HR: 1.18, 95% CI: 0.99, 1.41 • p-trend=0.034 mMED, continuous, per 2 pts, n=2,329: HR: 1.11, 95% CI: 1.02, 1.20 **Non-Significant**: **aMEDr:** aMEDr score at 61y and risk of prostate cancer after 20.3y f/u: • 0–3, n=1,473: HR: 1.00	*risk of prostate cancer, including nonadvanced and advanced prostate cancer, after 20.3y f/u.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		• 4–5, n=1,713: HR: 1.09, 95% CI: 0.96, 1.24 • 6–8, n=682: HR: 1.14, 95% CI: 0.96, 1.36 • p-trend=0.139 aMEDr score at 61y and risk of advanced prostate cancer after 20.3y f/u: • 0–3, n=497: HR: 1.00 • 4–5, n= 545: HR: 1.03, 95% CI: 0.88, 1.21 • 6-8, n=214: HR: 1.08, 95% CI: 0.87, 1.35 • p-trend=0.483 aMEDr score continuous, per 2 pts, and advanced prostate cancer, n=1,256: HR: 1.06, 95% CI: 0.96, 1.17 aMEDr score at 61y per SD increment and advanced prostate cancer after 20.3y f/u: HR: 1.05, 95% CI: 0.98, 1.14 **aMED:** aMED score at 61y and risk of prostate cancer after 20.3y f/u: • 0–3, n=1,156: HR: 1.00 • 4–5, n=1,661: HR: 1.03, 95% CI: 0.89, 1.18 • 6–9, n=1,051: HR: 1.19, 95% CI: 1.02, 1.40 • p-trend=0.065 aMED score at 61y and risk of advanced prostate cancer after 20.3y f/u: • 0–3, n=392: HR: 1.00 • 4–5, n=528: HR: 0.97, 95% CI: 0.81, 1.15 • 6–9, n=336: HR: 1.14, 95% CI: 0.93, 1.39 • p-trend=0.376	

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		aMED score, continuous, per 2 pts, and advanced prostate cancer n=1,256: HR: 1.07, 95% CI: 0.98, 1.17 aMED score at 61y per SD increment and advanced prostate cancer after 20.3y f/u: HR: 1.07, 95% CI: 0.99, 1.15 **mMEDr:** mMEDr score at 61y and risk of prostate cancer after 20.3y f/u: • 0–3, n=1,329: HR: 1.00 • 4–5, n=1,857: HR: 1.10, 95% CI: 0.97, 1.26 • 6–8, n= 682: HR: 1.10, 95% CI: 0.92, 1.31 • p-trend=0.285 mMEDr, continuous, per 2 pts, n=3,868: HR: 1.07, 95% CI: 0.99, 1.16 mMEDr score at 61y and risk of nonadvanced prostate cancer after 20.3y f/u: • 0–3, n=790: HR: 1.00 • 4–5, n=1,111: HR: 1.11, 95% CI: 0.96, 1.28 • 6–8, n= 428: HR: 1.17, 95% CI: 0.97, 1.41 • p-trend=0.111 mMEDr score at 61y and risk of advanced prostate cancer after 20.3y f/u: • 0–3, n=437: HR: 1.00 • 4–5, n=614: HR: 1.12, 95% CI: 0.95, 1.32 • 6–8, n=205: HR: 1.01, 95% CI: 0.81, 1.26 • p-trend=0.889	

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		mMEDr, continuous, per 2 pts, n=1,256: HR: 1.02, 95% CI: 0.92, 1.13 **mMED:** mMED score at 61y and risk of prostate cancer after 20.3y f/u: • 0–3, n= 955: HR: 1.00 • 4–5, n=1,817: HR: 1.00, 95% CI: 0.87, 1.16 • 6–9, n=1,096: HR: 1.12, 95% CI: 0.95, 1.32 • p-trend=0.122 mMED score at 61y and risk of advanced prostate cancer after 20.3y f/u: • 0–3, n=310: HR: 1.00 • 4–5, n=612: HR: 1.05, 95% CI: 0.87, 1.26 • 6–9, n=334: HR: 1.07, 95% CI: 0.87, 1.31 • p-trend=0.577 mMED, continuous, per 2 pts, n=1,256: HR: 1.04, 95% CI: 0.95, 1.14 **WCRF/AICR, diet only:** WCRF/AICR score at 61y, excluding alcohol, per SD increment and risk of prostate cancer after 20.3y f/u: HR: 1.03, 95% CI: 0.97, 1.09 WCRF/AICR score at 61y, excluding alcohol, per SD increment and risk of nonadvanced prostate cancer after 20.3y f/u: HR: 1.03, 95% CI: 0.97, 1.10 WCRF/AICR score at 61y, excluding alcohol, per SD increment and risk of advanced prostate	

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		cancer after 20.3y f/u: HR: 1.05, 95% CI: 0.97, 1.13 WCRF/AICR score, including alcohol, at 61y per SD increment and risk of prostate cancer after 20.3y f/u: HR: 1.04, 95% CI: 0.97, 1.10 WCRF/AICR score, including alcohol, at 61y per SD increment and risk of nonadvanced prostate cancer after 20.3y f/u: HR: 1.04, 95% CI: 0.98, 1.11 WCRF/AICR score, including alcohol, at 61y per SD increment and risk of advanced prostate cancer after 20.3y f/u: HR: 1.04, 95% CI: 0.97, 1.13	
Shin, 2018[37] **PCS (The Japan Public Health Center-based Prospective Study (JPHC))** **Japan** Analytic N: 43469 Participants were 100% male, ~56yo (40-69y), 23.5kg/m2, 54% non-smokers, ~66% regular drinkers Excluded those with prevelant prostate cancer, implausible energy intake (6% of study	**Dietary patterns:** Adherence to 3 dietary patterns were derived using exploratory factors analysis, categorical (quintiles): • "Prudent" pattern: high loadings for vegetables, fruit, noodles, potatoes, soy products, mushrooms, and seaweed • "Westernized" pattern: higher loadings for meat and processed meat, eel, dairy products, fruit juice, coffee, tea, soft drink, sauces, and alcohol • "Traditional" pattern: higher loadings for pickles, seafood, fish (oily, salty, and lean fish, and salmon), chicken, and sake **Dietary assessment methods:** 138-item, validated, FFQ at baseline, age ~56y	**Significant**: **"Westernized" Pattern:** Adherence to the "westernized" pattern at 56y and risk of total prostate cancer after 13.8y f/u: • Q1, n=274: HR: 1.00 • Q2, n=247: HR: 1.06, 95% CI: 0.89, 1.26 • Q3, n=219: HR: 1.04, 95% CI: 0.86, 1.24 • Q4, n=231: HR: 1.22, 95% CI: 1.02, 1.47 • Q5, n=185: HR: 1.22, 95% CI: 1.00, 1.49 • p-trend=0.021 Adherence to the "westernized" pattern at 56y and risk of localized prostate cancer after 13.8y f/u: • Q1, n=184: HR: 1.00 • Q2, n=167: HR: 1.03, 95% CI: 0.83, 1.27 • Q3, n=155: HR: 1.03, 95% CI: 0.83, 1.29 • Q4, n=160: HR: 1.18, 95% CI: 0.95, 1.47 • Q5, n=136: HR: 1.24, 95% CI: 0.97, 1.57 • p-trend=0.045	**Key confounders accounted for:** Sex, age, race/ethnicity, marital status, alcohol intake, smoking, BMI **Other:** Public health center area, vitamin supplement use **Limitations:** • Did not account for physical activity, family history of the cancer • Exposure may be misclassified • Exposure occurred prior to start of f/u • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No published protocol; potential for selective outcome reporting **Funding Sources:** National Cancer Center

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
	Outcome assessment methods: Patient f/u, hospital records, population-based cancer registries, death certificates	**Non-Significant**: **"Prudent" Pattern:** Adherence to the "prudent" pattern at 56y and risk of total prostate cancer after 13.8y f/u: • Q1, n=193: HR: 1.00 • Q2, n=185: HR: 0.91, 95% CI: 0.74, 1.12 • Q3, n=242: HR: 1.05, 95% CI: 0.87, 1.27 • Q4, n=255: HR: 1.01, 95% CI: 0.84, 1.23 • Q5, n=281: HR: 0.93, 95% CI: 0.76, 1.12 • p-trend=0.715 Adherence to the "prudent" pattern at 56y and risk of localized prostate cancer after 13.8y f/u: • Q1, n=123: HR: 1.00 • Q2, n=128: HR: 0.98, 95% CI: 0.77, 1.26 • Q3, n=177: HR: 1.19, 95% CI: 0.94, 1.50 • Q4, n=184: HR: 1.15, 95% CI: 0.91, 1.45 • Q5, n=190: HR: 1.00, 95% CI: 0.79, 1.27 • p-trend=0.555 Adherence to the "prudent" pattern at 56y and risk of advanced prostate cancer after 13.8y f/u: • Q1, n=59: HR: 1.00 • Q2, n=50: HR: 0.82, 95% CI: 0.56, 1.21 • Q3, n=54: HR: 0.80, 95% CI: 0.55, 1.16 • Q4, n=57: HR: 0.76, 95% CI: 0.52, 1.10 • Q5, n=73: HR: 0.78, 95% CI: 0.55, 1.12 • p-trend=0.135 **"Westernized" Pattern:**	Research and Development Fund, Ministry of Health, Labour and Welfare of Japan, National Research Foundation of Korea *Summary: Higher adherence to a "westernized" pattern at 56y was associated with associated with significantly increased risk of total and localized prostate cancer after 13.8y f/u. Adherence to the "westernized" pattern was not significantly associated with risk of advanced prostate cancer.* *Adherence to the "prudent" pattern and the "traditional" pattern at 56y were not significantly associated with risk of advanced prostate cancer after 13.8y f/u.*

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		Adherence to the “westernized” pattern at 56y and risk of advanced prostate cancer after 13.8y f/u: • Q1, n=73: HR: 1.00 • Q2, n=65: HR: 1.12, 95% CI: 0.80, 1.57 • Q3, n=56: HR: 1.09, 95% CI: 0.76, 1.56 • Q4, n=56: HR: 1.25, 95% CI: 0.87, 1.81 • Q5, n=43: HR: 1.23, 95% CI: 0.82, 1.84 • p-trend=0.233 **“Traditional” Pattern:** Adherence to the “traditional” pattern at 56y and risk of total prostate cancer after 13.8y f/u: • Q1, n=253: HR: 1.00 • Q2, n=230: HR: 1.17, 95% CI: 0.95, 1.45 • Q3, n=215: HR: 1.10, 95% CI: 0.87, 1.39 • Q4, n=229: HR: 1.10, 95% CI: 0.86, 1.40 • Q5, n=229: HR: 1.01, 95% CI: 0.79, 1.29 • p-trend=0.895 Adherence to the “traditional” pattern at 56y and risk of localized prostate cancer after 13.8y f/u: • Q1, n=182: HR: 1.00 • Q2, n=146: HR: 1.08, 95% CI: 0.83, 1.40 • Q3, n=147: HR: 1.06, 95% CI: 0.80, 1.41 • Q4, n=165: HR: 1.10, 95% CI: 0.82, 1.48 • Q5, n=160: HR: 0.97, 95% CI: 0.72, 1.31 • p-trend=0.869 Adherence to the “traditional” pattern at 56y and risk of advanced prostate cancer after 13.8y f/u: • Q1, n=54: HR: 1.00 • Q2, n=65: HR: 1.36, 95% CI: 0.89, 2.07 • Q3, n=55: HR: 1.16, 95% CI: 0.73, 1.84	

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
		• Q4, n=54: HR: 1.05, 95% CI: 0.65, 1.71 • Q5, n=65: HR: 1.16, 95% CI: 0.72, 1.88 • p-trend=0.830	
Tantamango-Bartley, 2016[50] **PCS (Adventist Health Study-2 (AHS-2))** **United States** Analytic N: 27188 Participants were 100% male, ≥30yo (73% >59y), 66% BMI>25kg/m^2, 74% never smokers, 9% used alcohol in last 2y, ~15% family history of prostate cancer, ~19% no vigorous exercise Excluded subjects from ME and WI (no cancer registry), with prevalent cancers, self-reported cancer with no medical record verification, missing or invalid dietary data, age <25y, missing	**Dietary patterns:** • "Vegans"[lxxxiv]: Red meat, poultry, fish; eggs; and dairy <1 time/mo • "Lacto-ovo-vegetarian": Red meat, poultry, and fish <1 time/mo, eggs or dairy >1 time/mo • "Pesco-vegetarian": Red meat or poultry <1 time/mo, fish >1 time/mo, and eggs/dairy in any amount • "Semi-vegetarian": Red meat or poultry >1 time/mo, and all meats combined (including fish) <1 time/wk and eggs/dairy in any amount • "Nonvegetarians": Red meat and poultry >1 time/mo and all meats combined (including fish) >1 time/wk, and eggs/dairy in any amount "Vegetarians" vs. "nonvegetarians" consumed higher amounts of fruits, vegetables, avocados, non-fried potatoes, whole grains, legumes, soy foods, nuts and seeds, and was observed among vegetarians; and lower amounts of meats, dairy products, eggs, refined grains, added	**Significant**: Dietary pattern at >30y and risk of overall prostate cancer after 7.8y f/u: • "Vegan", n=59: HR: 0.66, 95% CI: 0.50, 0.87 • "Lacto-ovo-vegetarian", n=333: HR: 0.96, 95% CI: 0.83, 1.12 • "Pesco-vegetarian", n=121: HR: 1.07, 95% CI: 0.88, 1.31 • "Semi-vegetarian", n=63: HR: 1.18, 95% CI: 0.91, 1.54 • "Nonvegetarian", n=503: HR: 1.00 When results were stratified by race, results were only significant in white subjects. **Non-Significant**: Dietary pattern at >30y and risk of advanced prostate cancer after 7.8y f/u: • "Vegan", n=15: HR: 0.78, 95% CI: 0.45, 1.35 • "Lacto-ovo-vegetarian", n=70: HR: 0.91, 95% CI: 0.66, 1.24 • "Pesco-vegetarian", n=28: HR: 1.10, 95% CI: 0.72, 1.68	**Key confounders accounted for:** Sex, age, race/ethnicity, education, alcohol intake, BMI, family history of the cancer **Other:** Energy intake, screening for prostate cancer **Limitations:** • Did not account for physical activity, smoking • Exposure occurred prior to start of f/u • Only assessed dietary intake once at baseline; did not account for possible changes in dietary intake over f/u • Did not account for missing data • No published protocol; potential for selective outcome reporting **Funding Sources:** NIH, USDA, World Cancer Research Fund International *Summary: Consuming a "vegan" diet vs. a "nonvegetarian" diet was associated with a significantly lower risk of prostate cancer after 7.8y f/u. When stratified by race, results were only significant in white participants.*

[lxxxiv] Orlich MJ, Jaceldo-Siegl K, Sabate J, et al. Patterns of food consumption among vegetarians and non-vegetarians. Br J Nutr. 2014; 112:1644–1653. [PubMed: 25247790]

Study and Participant Characteristics	Intervention/Exposure and Outcomes	Results	Confounding, Study Limitations, and Summary of Findings
data on age/sex, implausible energy intake (~20% of original sample)	fats, sweets, snack foods and non-water beverages **Dietary assessment methods:** >220-item, validated FFQ, at baseline, >30y **Outcome assessment methods:** State cancer registries, patient follow-up with medical record verification	• "Semi-vegetarian", n=13: HR: 1.09, 95% CI: 0.61, 1.95 • "Nonvegetarian", n=111: HR: 1.00	*Consuming "vegan", "vegetarian", and "nonvegetarian" diets were not significantly associated with risk of advanced prostate cancer.*

Table 13. Summary of the results from studies that examined the relationship between dietary patterns and prostate cancer[lxxxv]

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Deschasaux, 2018[4] **PCS (European Prospective Investigation into Cancer and Nutrition (EPIC))** **Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, UK**	Nutrient Profiling System of the British Food Standards Agency dietary index (modified version) (FSAm-NPS DI) • Overall score based on energy, sugar, saturated fatty acid, sodium, fibres, proteins, and fruits/vegetables/legumes/nuts. • Higher FSAm-NPS DI score had higher intakes of alcohol, energy and red and processed meat, lower intakes of dietary fibres, vegetables, fruit, fish, and lean meat	FSAm-NPS DI score at 51y and prostate cancer after 15.3y f/u: • Q1, n=1192: HR: 1.00 • Q2, n=1162: HR: 0.99, 95% CI: 0.91, 1.07 • Q3, n=1365: HR: 1.05, 95% CI: 0.97, 1.15 • Q4, n=1471: HR: 1.06, 95% CI: 0.97, 1.16 • Q5, n=1555: HR: 1.07, 95% CI: 0.98, 1.17 • p-trend=0.04 Continuous, per 2pt increment, n=6745: HR: 1.03, 95% CI: 1.00, 1.06; p-trend=0.04	

[lxxxv] Abbreviations: AHEI-2010, Alternative Healthy Eating Index-2010; aMED, Alternative Mediterranean Diet Score ; BMI, body mass index; d, day; DP, Dietary pattern; %E, % of energy; EPIC, European Prospective Investigation into Cancer and Nutrition; FFQ, food frequency questionnaire; FSAm-NPS, Nutrient Profiling System of the British Food Standards Agency (modified version); FSAm-NPS DI, Nutrient Profiling System of the British Food Standards Agency dietary index; f/u, follow-up; HR, hazard ratio; MEDI-LITE, Mediterranean diet score; MDS, Mediterranean Diet Score; mMED, modified Mediterranean diet scores; mMEDr, modified Mediterranean diet scores without alcohol; mo, month(s); N/A, Not applicable; NIH, National Institutes of Health; NOVA, Ultra-processed food score; NS, Not significant; NR, Not reported; PCS, prospective cohort study; PNNS-GS, French National Nutrition Health Program-Guideline Score; pt, point; RCT, randomized controlled trial; WCRF/AICR, World Cancer Research Fund/American Institute for Cancer Research; wk, week(s); y, year(s)

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Donnenfeld, 2015[6] **PCS using data from an RCT (SUpplémentation en VItamines et Minéraux AntioXydants cohort)** **France**	FSAm-NPS DI • Overall diet score assigned based on energy, sugar, saturated fatty acid, sodium, fibres, proteins, and fruits/vegetables/legumes/nuts		FSAm-NPS DI score at 49y and prostate cancer after 12.6y f/u: • Q1, n=29: HR: 1 • Q2, n= 18: HR: 0.82, 95% CI: 0.45, 1.50 • Q3, n= 26: HR: 1.24, 95% CI: 0.71, 2.14 • Q4, n= 16: HR: 0.83, 95% CI: 0.44, 1.56 • Q5, n= 23: HR: 1.31, 95% CI: 0.74, 2.33 • p-trend=0.4 Continuous, n=112: HR: 1.07, 95% CI: 0.93, 1.22; p-trend=0.3
Fiolet, 2018[7] **PCS (NutriNet-Santé)** **France**	Ultra-processed food score (NOVA) • Main food groups contributing to NOVA score were sugary drinks, drinks, starchy foods and breakfast cereals, ultra-processed fruits and vegetables, dairy products, meats, fish, and eggs, processed meats, fats, and salty snacks		Ultra-processed food score at 49y and prostate cancer after 5.4y f/u: • Q1, n=96: HR: 1.00 • Q2, n=96: HR: 1.18, 95% CI: 0.89, 1.57 • Q3, n=59: HR: 0.95, 95% CI: 0.68, 1.32 • Q4, n=30: HR: 0.93, 95% CI: 0.61, 1.40 • p-trend=0.6 Ultra-processed food score, continuous, and prostate cancer (n=281): HR: 0.98, 95% CI: 0.83, 1.16; p-trend=0.8
Kane-Diallo, 2018[14] **PCS (NutriNet-Sante study)** **France**	"Pro plant-based" dietary score • Higher in vegetables, legumes, fruits, cereal products, potatoes, nuts, vegetables oils • Lower in red and processed meat, eggs, animal fat, dairy products, seafood		"Pro plant-based" dietary score at 49y and prostate cancer after 4.3y f/u: • T1, n=84/3849: HR: 1.00 • T2, n=85/3679: HR: 0.90, 95% CI: 0.66, 1.23 • T3, n=74/3844: HR: 0.76, 95% CI: 0.55, 1.06 • p-trend=0.1

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Lavalette, 2018[16] **PCS (NutriNet-Sante study)** **France**	Alternate Healthy Eating Index 2010 (AHEI-2010) • Positive components: Vegetables (not potatoes, French fries), Fruit, Whole Grains, Long-Chain Fats (EPA + DHA), PUFA • Neutral components: Alcohol • Negative components: Red and Processed Meat, Sugar Sweetened Beverages and Fruit Juice, Trans FA, Sodium		AHEI-2010 score at 55y and prostate cancer after 8.5y f/u: • Q1, n=32/2171: HR: 1.00 • Q2, n=42/2162: HR: 0.93, 95% CI: 0.59, 1.48 • Q3, n=55/2149: HR: 1.14, 95% CI: 0.73, 1.77 • Q4, n=48/2156: HR: 0.90, 95% CI: 0.57, 1.42 • Q5, n=45/2158: HR: 0.82, 95% CI: 0.51, 1.31 • p-trend=0.3 AHEI-2010 score, continuous, n=222/10796: HR: 0.96, 95% CI: 0.85, 1.08; p-trend=0.5
	Mediterranean diet score (MEDI-LITE) • Positive components: Vegetables, legumes, fruit and nuts, cereals, fish, olive oil • Neutral components: Alcohol • Negative components: Meat, dairy products		MEDI-LITE score at 55y and risk of prostate cancer after 8.5y f/u: • Q1, n=38/2473: HR: 1.00 • Q2, n=32/1530: HR: 1.16, 95% CI: 0.72, 1.86 • Q3, n=37/1711: HR: 1.12, 95% CI: 0.71, 1.76 • Q4, n=74/3043: HR: 1.14, 95% CI: 0.77, 1.70 • Q5, n=41/2039: HR: 0.95, 95% CI: 0.61, 1.50 • p-trend=0.9 MEDI-LITE score, continuous, n=222/10796: HR: 0.98, 95% CI: 0.93, 1.04 ; p-trend=0.5

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	French National Nutrition Health Program-Guideline Score (PNNS-GS) • Positive components: Vegetables and Fruit, Seafood, Vegetable Fat • Neutral components: Breads, cereals, potatoes, legumes, meat and poultry, seafood, and eggs, milk and dairy products, alcohol • Negative components: Sweetened foods, soda, added fat, salt		PNNS-GS score at 55y and risk of prostate cancer after 8.5y f/u: • Q1, n=35/2161: HR: 1.00 • Q2, n=38/1998: HR: 0.88, 95% CI: 0.55, 1.40 • Q3, n=46/2292: HR: 0.85, 95% CI: 0.55, 1.34 • Q4, n=44/2086: HR: 0.74, 95% CI: 0.47, 1.17 • Q5, n=59/2259: HR: 0.83, 95% CI: 0.54, 1.28 • p-trend=0.3 PNNS-GS score, continuous, n=222/10796: HR: 0.97, 95% CI: 0.89, 1.05; p-trend=0.4
Schulpen, 2019[51] **Nested Case-Control Study (Netherlands Cohort Study (NLCS))** **The Netherlands**	alternate Mediterranean diet scores (aMED) • Positive components: Vegetables (not potatoes), legumes, fruits, nuts, whole grains, fish, MUFA/SFAs • Neutral components: Alcohol • Negative components: Red and processed meat	aMED score at 61y and risk of nonadvanced prostate cancer after 20.3y f/u: • 0–3, n=666: HR: 1.00 • 4–5, n=1,008: HR: 1.07, 95% CI: 0.92, 1.25 • 6–9, n=655: HR: 1.28, 95% CI: 1.08, 1.53 • p-trend=0.012 aMED score, continuous, per 2 pts, and nonadvanced prostate cancer, n=2,329: HR: 1.12, 95% CI: 1.04, 1.21 aMED score at 61y per SD increment and prostate cancer after 20.3y f/u: HR: 1.07, 95% CI: 1.01, 1.14 aMED score, continuous, per 2 pts, and nonadvanced prostate cancer, n=3,868: HR: 1.09, 95% CI: 1.01, 1.17 aMED score at 61y per SD increment and nonadvanced prostate cancer after 20.3y f/u: HR: 1.10, 95% CI: 1.03, 1.17	aMED score at 61y and risk of prostate cancer after 20.3y f/u: • 0–3, n=1,156: HR: 1.00 • 4–5, n=1,661: HR: 1.03, 95% CI: 0.89, 1.18 • 6–9, n=1,051: HR: 1.19, 95% CI: 1.02, 1.40 • p-trend=0.065 aMED score at 61y and risk of advanced prostate cancer after 20.3y f/u: • 0–3, n=392: HR: 1.00 • 4–5, n=528: HR: 0.97, 95% CI: 0.81, 1.15 • 6–9, n=336: HR: 1.14, 95% CI: 0.93, 1.39 • p-trend=0.376 aMED score, continuous, per 2 pts, and advanced prostate cancer n=1,256: HR: 1.07, 95% CI: 0.98, 1.17 aMED score at 61y per SD increment and advanced prostate cancer after 20.3y f/u: HR: 1.07, 95% CI: 0.99, 1.15

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	aMED without alcohol (aMEDr)	aMEDr score at 61y and risk of nonadvanced prostate cancer after 20.3y f/u: • 0–3, n=854: HR: 1.00 • 4–5, n=1,048: HR: 1.14, 95% CI: 0.99, 1.31 • 6–8, n=427: HR: 1.22, 95% CI: 1.01, 1.48 • p-trend=0.037 aMEDr score and nonadvanced prostate cancer, continuous, per 2 pts, n=2,329: HR: 1.12, 95% CI: 1.04, 1.22 aMEDr score at 61y per SD increment and nonadvanced prostate cancer after 20.3y f/u: HR: 1.09, 95% CI: 1.03, 1.17 aMEDr score and prostate cancer, continuous, per 2 pts, n=3,868: HR: 1.09, 95% CI: 1.01, 1.17 aMEDr score at 61y per SD increment and risk of prostate cancer after 20.3y f/u: HR: 1.07, 95% CI: 1.01, 1.13	aMEDr score at 61y and risk of prostate cancer after 20.3y f/u: • 0–3, n=1,473: HR: 1.00 • 4–5, n=1,713: HR: 1.09, 95% CI: 0.96, 1.24 • 6–8, n=682: HR: 1.14, 95% CI: 0.96, 1.36 • p-trend=0.139 aMEDr score at 61y and risk of advanced prostate cancer after 20.3y f/u: • 0–3, n=497: HR: 1.00 • 4–5, n= 545: HR: 1.03, 95% CI: 0.88, 1.21 • 6-8, n=214: HR: 1.08, 95% CI: 0.87, 1.35 • p-trend=0.483 aMEDr score continuous, per 2 pts, and advanced prostate cancer, n=1,256: HR: 1.06, 95% CI: 0.96, 1.17 aMEDr score at 61y per SD increment and advanced prostate cancer after 20.3y f/u: HR: 1.05, 95% CI: 0.98, 1.14
	modified Mediterranean diet score (mMED) • Positive components: Vegetables, legumes, fruit, cereals, fish, MUFA+PUFA/SFA • Neutral components: Alcohol • Negative components: Meat, dairy products	mMED, continuous, per 2 pts, n=3,868: HR: 1.07, 95% CI: 1.00, 1.16 mMED score at 61y and risk of nonadvanced prostate cancer after 20.3y f/u: • 0–3, n=571: HR: 1.00 • 4–5, n=1,069: HR: 0.99, 95% CI: 0.84, 1.16 • 6–9, n=689: HR: 1.18, 95% CI: 0.99, 1.41 • p-trend=0.034 mMED, continuous, per 2 pts, n=2,329: HR: 1.11, 95% CI: 1.02, 1.20	mMED score at 61y and risk of prostate cancer after 20.3y f/u: • 0–3, n= 955: HR: 1.00 • 4–5, n=1,817: HR: 1.00, 95% CI: 0.87, 1.16 • 6–9, n=1,096: HR: 1.12, 95% CI: 0.95, 1.32 • p-trend=0.122 mMED score at 61y and risk of advanced prostate cancer after 20.3y f/u: • 0–3, n=310: HR: 1.00 • 4–5, n=612: HR: 1.05, 95% CI: 0.87, 1.26 • 6–9, n=334: HR: 1.07, 95% CI: 0.87, 1.31 • p-trend=0.577 mMED, continuous, per 2 pts, n=1,256: HR: 1.04, 95% CI: 0.95, 1.14

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	mMED without alcohol (mMEDr)	mMEDr, continuous, per 2 pts, n=2,329: HR: 1.11, 95% CI: 1.02, 1.21	mMEDr score at 61y and risk of prostate cancer after 20.3y f/u: • 0–3, n=1,329: HR: 1.00 • 4–5, n=1,857: HR: 1.10, 95% CI: 0.97, 1.26 • 6–8, n= 682: HR: 1.10, 95% CI: 0.92, 1.31 • p-trend=0.285 mMEDr, continuous, per 2 pts, n=3,868: HR: 1.07, 95% CI: 0.99, 1.16 mMEDr score at 61y and risk of nonadvanced prostate cancer after 20.3y f/u: • 0–3, n=790: HR: 1.00 • 4–5, n=1,111: HR: 1.11, 95% CI: 0.96, 1.28 • 6–8, n= 428: HR: 1.17, 95% CI: 0.97, 1.41 • p-trend=0.111 mMEDr score at 61y and risk of advanced prostate cancer after 20.3y f/u: • 0–3, n=437: HR: 1.00 • 4–5, n=614: HR: 1.12, 95% CI: 0.95, 1.32 • 6–8, n=205: HR: 1.01, 95% CI: 0.81, 1.26 • p-trend=0.889 mMEDr, continuous, per 2 pts, n=1,256: HR: 1.02, 95% CI: 0.92, 1.13
	WCRF/AICR score, diet only • Positive components: Vegetables and fruit, dietary fiber • Negative components: Red and processed meat, sugary drinks, alcohol, sodium, energy-dense foods		WCRF/AICR score, diet only, at 61y per SD increment and prostate cancer after 20.3y f/u: HR: 1.04, 95% CI: 0.97, 1.10 WCRF/AICR score, diet only, at 61y per SD increment and nonadvanced prostate cancer after 20.3y f/u: HR: 1.04, 95% CI: 0.98, 1.11 WCRF/AICR score, diet only, at 61y per SD increment and advanced prostate cancer after 20.3y f/u: HR: 1.04, 95% CI: 0.97, 1.13

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	WCRF/AICR score, diet only, without alcohol		WCRF/AICR score at 61y, without alcohol, per SD increment and prostate cancer after 20.3y f/u: HR: 1.03, 95% CI: 0.97, 1.09 WCRF/AICR score at 61y, without alcohol, per SD increment and nonadvanced prostate cancer after 20.3y f/u: HR: 1.03, 95% CI: 0.97, 1.10 WCRF/AICR score at 61y, without alcohol, per SD increment and advanced prostate cancer after 20.3y f/u: HR: 1.05, 95% CI: 0.97, 1.13
Shin, 2018[37] **PCS (The Japan Public Health Center-based Prospective Study (JPHC))** **Japan**	"Prudent" pattern: higher loadings for vegetables, fruit, noodles, potatoes, soy products, mushrooms, and seaweed		Adherence to the "prudent" pattern at 56y and risk of total prostate cancer after 13.8y f/u: • Q1, n=193: HR: 1.00 • Q2, n=185: HR: 0.91, 95% CI: 0.74, 1.12 • Q3, n=242: HR: 1.05, 95% CI: 0.87, 1.27 • Q4, n=255: HR: 1.01, 95% CI: 0.84, 1.23 • Q5, n=281: HR: 0.93, 95% CI: 0.76, 1.12 • p-trend=0.715 Adherence to the "prudent" pattern at 56y and risk of localized prostate cancer after 13.8y f/u: • Q1, n=123: HR: 1.00 • Q2, n=128: HR: 0.98, 95% CI: 0.77, 1.26 • Q3, n=177: HR: 1.19, 95% CI: 0.94, 1.50 • Q4, n=184: HR: 1.15, 95% CI: 0.91, 1.45 • Q5, n=190: HR: 1.00, 95% CI: 0.79, 1.27 • p-trend=0.555 Adherence to the "prudent" pattern at 56y and risk of advanced prostate cancer after 13.8y f/u: • Q1, n=59: HR: 1.00 • Q2, n=50: HR: 0.82, 95% CI: 0.56, 1.21 • Q3, n=54: HR: 0.80, 95% CI: 0.55, 1.16 • Q4, n=57: HR: 0.76, 95% CI: 0.52, 1.10 • Q5, n=73: HR: 0.78, 95% CI: 0.55, 1.12 • p-trend=0.135

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	"Westernized" pattern: higher loadings for meat and processed meat, eel, dairy products, fruit juice, coffee, tea, soft drink, sauces, and alcohol	Adherence to the "westernized" pattern at 56y and risk of total prostate cancer after 13.8y f/u: • Q1, n=274: HR: 1.00 • Q2, n=247: HR: 1.06, 95% CI: 0.89, 1.26 • Q3, n=219: HR: 1.04, 95% CI: 0.86, 1.24 • Q4, n=231: HR: 1.22, 95% CI: 1.02, 1.47 • Q5, n=185: HR: 1.22, 95% CI: 1.00, 1.49 • p-trend=0.021 Adherence to the "westernized" pattern at 56y and risk of localized prostate cancer after 13.8y f/u: • Q1, n=184: HR: 1.00 • Q2, n=167: HR: 1.03, 95% CI: 0.83, 1.27 • Q3, n=155: HR: 1.03, 95% CI: 0.83, 1.29 • Q4, n=160: HR: 1.18, 95% CI: 0.95, 1.47 • Q5, n=136: HR: 1.24, 95% CI: 0.97, 1.57 • p-trend=0.045	Adherence to the "westernized" pattern at 56y and risk of advanced prostate cancer after 13.8y f/u: • Q1, n=73: HR: 1.00 • Q2, n=65: HR: 1.12, 95% CI: 0.80, 1.57 • Q3, n=56: HR: 1.09, 95% CI: 0.76, 1.56 • Q4, n=56: HR: 1.25, 95% CI: 0.87, 1.81 • Q5, n=43: HR: 1.23, 95% CI: 0.82, 1.84 • p-trend=0.233

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
	"Traditional" pattern: higher loadings for pickles, seafood, fish (oily, salty, and lean fish, and salmon), chicken, and sake		Adherence to the "traditional" pattern at 56y and risk of total prostate cancer after 13.8y f/u: • Q1, n=253: HR: 1.00 • Q2, n=230: HR: 1.17, 95% CI: 0.95, 1.45 • Q3, n=215: HR: 1.10, 95% CI: 0.87, 1.39 • Q4, n=229: HR: 1.10, 95% CI: 0.86, 1.40 • Q5, n=229: HR: 1.01, 95% CI: 0.79, 1.29 • p-trend=0.895 Adherence to the "traditional" pattern at 56y and risk of localized prostate cancer after 13.8y f/u: • Q1, n=182: HR: 1.00 • Q2, n=146: HR: 1.08, 95% CI: 0.83, 1.40 • Q3, n=147: HR: 1.06, 95% CI: 0.80, 1.41 • Q4, n=165: HR: 1.10, 95% CI: 0.82, 1.48 • Q5, n=160: HR: 0.97, 95% CI: 0.72, 1.31 • p-trend=0.869 Adherence to the "traditional" pattern at 56y and risk of advanced prostate cancer after 13.8y f/u: • Q1, n=54: HR: 1.00 • Q2, n=65: HR: 1.36, 95% CI: 0.89, 2.07 • Q3, n=55: HR: 1.16, 95% CI: 0.73, 1.84 • Q4, n=54: HR: 1.05, 95% CI: 0.65, 1.71 • Q5, n=65: HR: 1.16, 95% CI: 0.72, 1.88 • p-trend=0.830

Article, Study Design, Country	Dietary Patterns	Significant Results	Non-Significant Results
Tantamango-Bartley, 2016[50] **PCS (Adventist Health Study-2 (AHS-2))** **United States**	"Vegetarian" dietary pattern: • "Vegans": Red meat, poultry, fish; eggs; and dairy <1 time/mo • "Lacto-ovo-vegetarian": Red meat, poultry, and fish <1 time/mo, eggs or dairy >1 time/mo • "Pesco-vegetarian": Red meat or poultry <1 time/mo, fish >1 time/mo, and eggs/dairy in any amount • "Semi-vegetarian": Red meat or poultry >1 time/mo, and all meats combined (including fish) <1 time/wk and eggs/dairy in any amount • "Nonvegetarians": Red meat and poultry >1 time/mo and all meats combined (including fish) >1 time/wk, and eggs/dairy in any amount "Vegetarians" vs. "nonvegetarians" consumed higher amounts of fruits, vegetables, avocados, non-fried potatoes, whole grains, legumes, soy foods, nuts and seeds, and was observed among vegetarians; and lower amounts of meats, dairy products, eggs, refined grains, added fats, sweets, snack foods and non-water beverages	Dietary pattern at >30y and risk of overall prostate cancer after 7.8y f/u: • "Vegan", n=59: HR: 0.66, 95% CI: 0.50, 0.87 • "Lacto-ovo-vegetarian", n=333: HR: 0.96, 95% CI: 0.83, 1.12 • "Pesco-vegetarian", n=121: HR: 1.07, 95% CI: 0.88, 1.31 • "Semi-vegetarian", n=63: HR: 1.18, 95% CI: 0.91, 1.54 • "Nonvegetarian", n=503: HR: 1.00 When results were stratified by race, results were only significant in white subjects.	Dietary pattern at >30y and risk of advanced prostate cancer after 7.8y f/u: • "Vegan", n=15: HR: 0.78, 95% CI: 0.45, 1.35 • "Lacto-ovo-vegetarian", n=70: HR: 0.91, 95% CI: 0.66, 1.24 • "Pesco-vegetarian", n=28: HR: 1.10, 95% CI: 0.72, 1.68 • "Semi-vegetarian", n=13: HR: 1.09, 95% CI: 0.61, 1.95 • "Nonvegetarian", n=111: HR: 1.00

Table 14. Risk of bias for observational studies examining dietary patterns and prostate cancer[lxxxvi,lxxxvii]

	Confounding	Selection of participants	Classification of exposures	Deviations from intended exposures	Missing data	Outcome measurement	Selection of the reported result
Deschasaux, 2017[5]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Donnenfeld, 2015[6]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Fiolet, 2018[7]	Serious	Moderate	Moderate	Serious	Moderate	Low	Moderate
Kane-Diallo, 2018[14]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Lavalette, 2018[16]	Serious	Moderate	Low	Serious	Moderate	Low	Moderate
Schulpen, 2019[51]	Serious	Serious	Low	Serious	Moderate	Low	Serious
Shin, 2018[37]	Serious	Moderate	Moderate	Serious	Moderate	Low	Moderate
Tantamango-Bartley, 2016[50]	Serious	Moderate	Low	Moderate	Serious	Low	Moderate

[lxxxvi] A detailed description of the methodology used for assessing risk of bias is available on the NESR website: https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews and in Part C of the following reference: Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.

[lxxxvii] Possible ratings of low, moderate, serious, critical, or no information determined using the "Risk of Bias for Nutrition Observational Studies" tool (RoB-NObs) (Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.)

METHODOLOGY

The NESR team used its rigorous, protocol-driven methodology to support the 2020 Dietary Guidelines Advisory Committee in conducting this update to an existing systematic review.

NESR's systematic review methodology involves:

- Developing a protocol,
- Searching for and selecting studies,
- Extracting data from and assessing the risk of bias of each included study,
- Synthesizing the evidence,
- Developing conclusion statements,
- Grading the evidence underlying the conclusion statement, and
- Recommending future research.

A detailed description of the methodology used in conducting this systematic review is available on the NESR website: https://nesr.usda.gov/2020-dietary-guidelines-advisory-committee-systematic-reviews, and can be found in the 2020 Dietary Guidelines Advisory Committee Report, Part C: Methodology.[lxxxviii] This systematic review was peer reviewed by Federal scientists, and information about the peer review process can also be found in the Committee's Report, Part C. Methodology. Additional information about this systematic review, including a description of and rationale for any modifications made to the protocol can be found in the 2020 Dietary Guidelines Advisory Committee Report, Part D: Chapter 8. Dietary Patterns.

The systematic review described in this document updates existing systematic reviews that were conducted by the 2015 Dietary Guidelines Advisory Committee with support from USDA's Nutrition Evidence Systematic Review (NESR) team. Information about the 2015 Dietary Guidelines Advisory Committee's review of the evidence on dietary patterns and cancer can be found in their report, which is available at the following website: https://nesr.usda.gov/dietary-patterns-foods-and-nutrients-and-health-outcomes-subcommittee.

Below are details of the final protocol for the systematic review described herein, including the:

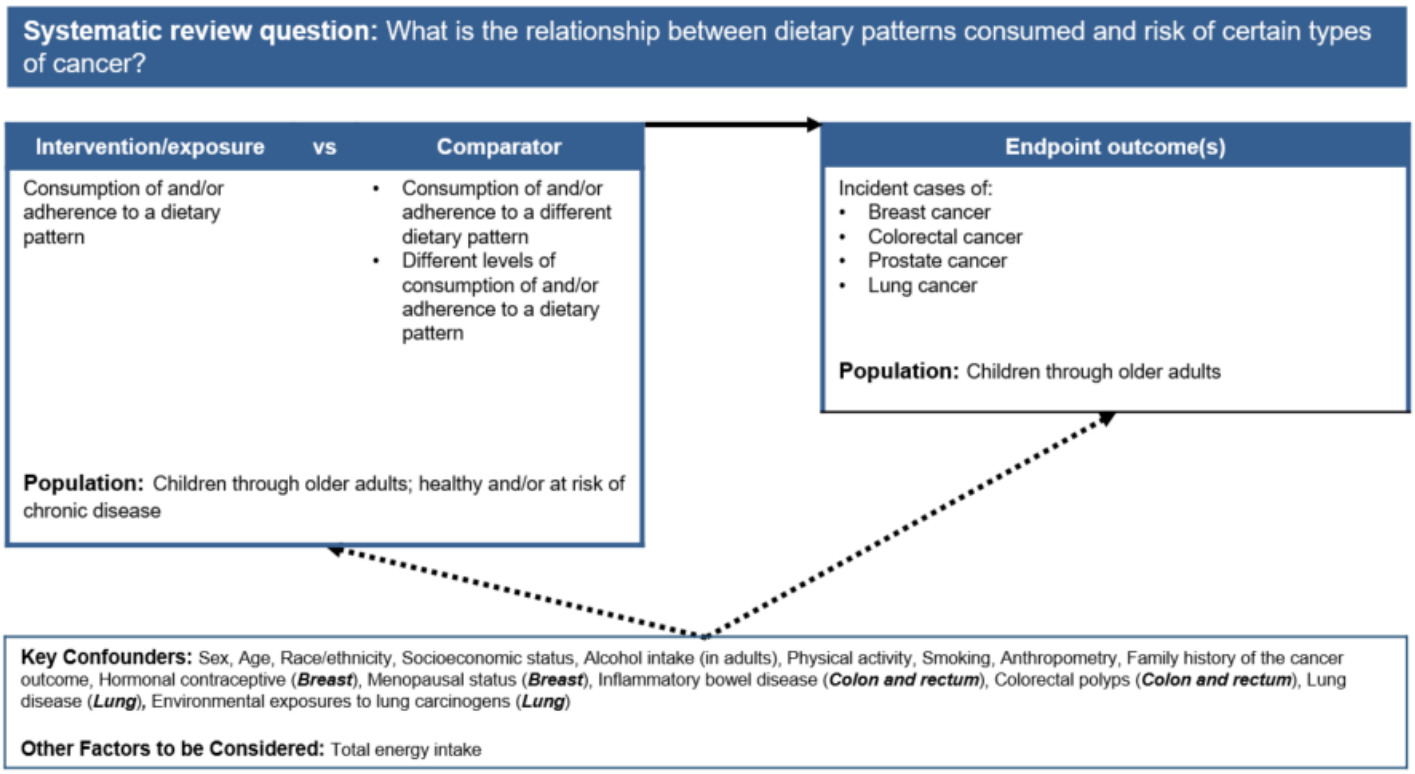
- Analytic framework
- Literature search and screening plan
- Literature search and screening results

ANALYTIC FRAMEWORK

The analytic framework (**Figure 1**) illustrates the overall scope of the systematic review, including the population, the interventions and/or exposures, comparators, and outcomes of interest. It also includes definitions of key terms and identifies key confounders and other factors to be considered in the systematic review. The inclusion and exclusion criteria that follow provide additional information about how parts of the analytic framework were defined and operationalized for the review.

[lxxxviii] Dietary Guidelines Advisory Committee. 2020. *Scientific Report of the 2020 Dietary Guidelines Advisory Committee: Advisory Report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service, Washington, DC.

Figure 1: Analytic framework



Key definitions

Dietary patterns – The quantities, proportions, variety, or combination of different foods, drinks, and nutrients (when available) in diets, and the frequency with which they are habitually consumed.

Legend

The relationship of interest in the systematic review

Factors that may impact the relationship of interest in the systematic review

LITERATURE SEARCH AND SCREENING PLAN

Inclusion and exclusion criteria

This table provides the inclusion and exclusion criteria for this update to systematic reviews. The inclusion and exclusion criteria are a set of characteristics used to determine which articles identified in the literature search were included in or excluded from the systematic review.

Table 15. Inclusion and exclusion criteria

Category	Inclusion Criteria	Exclusion Criteria
Study design	• Randomized controlled trials • Non-randomized controlled trials, including quasi-experimental and controlled before and after studies • Prospective cohort studies • Retrospective cohort studies • Nested case-control studies	• Uncontrolled trials • Cross-sectional studies • Uncontrolled before-and-after studies • Narrative reviews • Systematic reviews • Meta-analyses
Intervention/ exposure	Studies that examine consumption of and/or adherence to a dietary pattern [i.e., the quantities, proportions, variety, or combination of different foods, drinks, and nutrients (when available) in diets, and the frequency with which they are habitually consumed], including, at a minimum, a description of the foods and beverages in the pattern • Dietary patterns may be measured or derived using a variety of approaches, such as adherence to a priori patterns (indices/scores), data driven patterns (factor or cluster analysis), reduced rank regression, or other methods, including clinical trials	Studies that do not provide a description of the dietary pattern, which at minimum, must include the foods and beverages in the pattern (i.e., studies that examine a labeled dietary patterns, but do not describe the foods and beverages consumed)
Comparator	Dietary patterns described by foods and beverages consumed: • Consumption of and/or adherence to a different dietary pattern • Different levels of consumption of and/or adherence to a dietary pattern	• N/A
Outcomes	Incident cases of: • Breast cancer • Colorectal cancer • Lung cancer • Prostate cancer	• Studies that exclusively examine cancer-related mortality, prevalence, survivorship, or recurrence of cancer

Category	Inclusion Criteria	Exclusion Criteria
Date of publication	• January 2014 – January 2020 (this date range is in addition to the original systematic review, which included articles published from January 2000 – January 2014)	• Articles published prior to January 2000 or after January 2020
Publication status	Articles that have been peer-reviewed	Articles that have not been peer-reviewed and are not published in peer-reviewed journals, including unpublished data, manuscripts, reports, abstracts, and conference proceedings
Language of publication	Articles published in English	Articles published in languages other than English
Country[lxxxix]	Studies conducted in countries ranked as high or higher human development	Studies conducted in countries ranked as medium or lower human development
Study participants	• Human participants • Males • Females	• Non-human participants (e.g., animal or in-vitro models)
Age of study participants	• Age at intervention or exposure: o Children and adolescents (ages 2-18 years) o Adults (ages 19-64 years) o Older adults (ages 65 years and older)	• Age at intervention or exposure: o Infants and toddlers (birth to 24 months)
	• Age at outcome: o Children and adolescents (ages 2-18 years) o Adults (ages 19-64 years) o Older adults (ages 65 years and older)	• Age at outcome: o Infants and toddlers (birth to 24 months)

[lxxxix] The Human Development classification was based on the Human Development Index (HDI) ranking from the year the study intervention occurred or data were collected (UN Development Program. HDI 1990-2017 HDRO calculations based on data from UNDESA (2017a), UNESCO Institute for Statistics (2018), United Nations Statistics Division (2018b), World Bank (2018b), Barro and Lee (2016) and IMF (2018). Available from: http://hdr.undp.org/en/data). If the study did not report the year in which the intervention occurred or data were collected, the HDI classification for the year of publication was applied. HDI values are available from 1980, and then from 1990 to present. If a study was conducted prior to 1990, the HDI classification from 1990 was applied. If a study was conducted in 2018 or 2019, the most current HDI classification was applied. When a country was not included in the HDI ranking, the current country classification from the World Bank was used instead (The World Bank. World Bank country and lending groups. Available from: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world- country-and-lending-groups).

Category	Inclusion Criteria	Exclusion Criteria
Health status of study participants	• Studies that enroll participants who are healthy and/or at risk for chronic disease, including those with obesity • Studies that enroll ***some*** participants diagnosed with a disease • Studies that enroll ***some*** participants diagnosed with cancer	• Studies that ***exclusively*** enroll participants diagnosed with a disease, or hospitalized patients with illness or injury. (For this criterion, studies that exclusively enroll subjects with obesity will be included.) • Studies that ***exclusively*** enroll participants with cancer (i.e., studies that aim to treat participants who have already been diagnosed with the outcome of interest)

Electronic databases and search terms

PubMed

- Provider: U.S. National Library of Medicine
- Date(s) Searched: January 13, 2020
- Date range searched: January 1, 2014-January 13, 2020
- Search Terms:

#1 - dietary pattern* OR diet pattern* OR eating pattern* OR food pattern* OR diet quality* OR eating habit* OR dietary habit* OR diet habit* OR food habit* OR beverage habit* OR "Feeding Behavior"[Mesh:NoExp] OR dietary profile* OR food profile* OR diet profile* OR eating profile* OR dietary guideline* OR dietary recommendation* OR dietary intake* OR eating style* OR "Diet, Mediterranean"[Mesh] OR Mediterranean Diet*[tiab] OR "Dietary Approaches To Stop Hypertension"[Mesh] OR Dietary Approaches To Stop Hypertension Diet* OR DASH diet* OR "Diet, Gluten-Free"[Mesh] OR Gluten Free diet* OR prudent diet* OR "Diet, Paleolithic"[Mesh] OR Paleolithic Diet* OR "Diet, Vegetarian"[Mesh] OR vegetarian diet*[tiab] OR vegan diet* OR "Diet, Healthy"[Mesh] OR plant based diet* OR "Diet, Western"[Mesh] OR western diet* OR "Diet, Carbohydrate-Restricted"[Mesh] OR low-carbohydrate diet* OR high carbohydrate diet* OR Ketogenic Diet* OR Nordic Diet* OR "Diet, Fat-Restricted"[Mesh] OR "Diet, High-Fat"[Mesh] OR "Diet, High-Protein"[Mesh] OR high protein diet*[tiab] OR protein intake* OR high-fat diet* OR low fat diet* OR "Diet, Protein-Restricted"[Mesh] OR low protein diet* OR "Diet, Sodium-Restricted"[Mesh] OR low-sodium diet* OR low salt diet* OR (("Dietary Proteins"[Mesh] OR dietary protein*[tiab] OR "Dietary Carbohydrates"[Mesh] OR dietary carbohydrate*[tiab] OR "Dietary Fats"[Mesh] OR dietary fat*[tiab] OR hypocaloric OR hypo-caloric) AND (diet[tiab] OR diets[tiab] OR consumption[tiab] OR intake[tiab] OR supplement*[tiab])) OR ((“Guideline Adherence"[Mesh] OR guideline adherence*)AND (diet[tiab] OR dietary[tiab] OR food[tiab] OR beverage*[tiab] OR nutrition*[tiab])) OR diet score* OR diet quality score* OR diet quality index* OR kidmed OR diet index* OR dietary index* OR food score* OR MedDietScore OR healthy eating index[tiab] OR ((pattern[tiab] OR patterns[tiab] OR consumption[tiab] OR habit*[tiab]) AND (“Diet"[Mesh:NoExp] OR diet[tiab] OR diets[tiab] OR dietary[tiab] OR "Food"[Mesh] OR food[tiab] OR foods[tiab] OR "Beverages"[Mesh] OR beverage[tiab] OR beverages[tiab]))

2- "Breast Neoplasms"[Mesh] OR breast neoplasm* OR breast cancer*[tiab] OR breast carcino* OR "Colorectal Neoplasms"[Mesh] OR colorectal neoplasm* OR colorectal cancers*

OR colorectal carcino* OR colon neoplasm* OR colon cancer* OR colon carcino* OR "Intestinal Polyps"[Mesh] OR intestinal polyp* OR colonic polyp* OR colorectal polyp* OR colorectal lesion* OR rectal neoplasm* OR rectal cancer* OR rectal carcino* OR "Prostatic Neoplasms"[Mesh] OR prostate neoplasm* OR prostate cancer* OR prostate carcino* OR "Lung Neoplasms"[Mesh] OR lung neoplasm* OR lung carcino* OR lung cancer* OR "Liver Neoplasms"[Mesh] OR liver neoplasm* OR liver cancer* OR hepatic neoplasm* OR hepatic cancer* OR hepatocellular carcino* OR "Pancreatic Neoplasms"[Mesh] OR pancreatic neoplasm* OR pancreatic cancer* OR pancreatic carcino* OR pancreatic adenocarcinoma* OR pancreatic neuro* OR ampullary cancer* OR ampullary carcino* OR exocrine cancer* OR exocrine carcino* OR "Endometrial Neoplasms"[Mesh] OR endometrial neoplasm* OR endometrial cancer* OR endometrial carcino* OR endometrioid neoplasm* OR endometrioid cancer* OR endometrioid carcino* OR "Endometrial Hyperplasia"[Mesh] OR endometrial hyperplasia* OR "Leukemia"[Mesh] OR leukem* OR leukaem* OR leucem* OR leucaem* OR ((cancer*[tiab] OR "Neoplasms"[Mesh] OR neoplasm*[tiab] OR carcino*[tiab] OR "Carcinogens"[Mesh] OR malignan*[tiab] OR adenocarcinoma*[tiab] OR sarcoma*[tiab] OR metastasis[tiab] OR metastases[tiab] OR tumor[tiab] OR tumors[tiab] OR tumour*[tiab] OR "Polyps"[Mesh] OR polyp[tiab] OR polyps[tiab]) AND ("Colon"[Mesh] OR colonic*[tiab] OR colon[tiab] OR colorect*[tiab] OR rectal[tiab] OR rectum[tiab] OR "Colonic Diseases"[Mesh:noexp] OR "Breast"[Mesh] OR "Breast Diseases"[Mesh:noexp] OR breast*[tiab] OR mammary[tiab] OR "Prostate"[Mesh] OR prostate*[tiab] OR prostatic[tiab] OR "Prostatic Diseases"[Mesh:noexp] OR "Lung"[Mesh] OR "Lung Diseases"[Mesh:noexp] OR lung[tiab] OR pulmonary[tiab] OR endometri* OR endometrium* OR "Uterine Diseases"[Mesh:noexp] OR "uterine diseases*" OR "Liver"[Mesh] OR liver[tiab] OR "Liver Diseases"[Mesh:noexp] OR "Pancreas"[Mesh] OR pancreas[tiab] OR pancreati*[tiab] OR "Pancreatic Diseases"[Mesh:noexp] OR "Ampulla of Vater"[Mesh] OR "ampulla of vater"))

#3 - (#1 AND #2) NOT ("Animals"[Mesh] NOT ("Animals"[Mesh] AND "Humans"[Mesh])) NOT editorial[ptyp] OR comment[ptyp] OR news[ptyp] OR letter[ptyp] OR review[ptyp] OR systematic review[ptyp] OR systematic review[ti] OR meta-analysis[ptyp] OR meta-analysis[ti] OR meta-analyses[ti] OR retracted publication[ptyp] OR retraction of publication[ptyp] OR retraction of publication[tiab] OR retraction notice[ti] Filters: Publication date from 2014/01/01 to 2020/01/13; English

Cochrane Central Register of Controlled Trials (CENTRAL)

- Provider: John Wiley & Sons
- Date(s) Searched: January 13, 2020
- Date range searched: January 1, 2014-January 13, 2020
- Search Terms:

#1 - "dietary pattern*" OR "diet pattern*" OR "eating pattern*" OR "food pattern*" OR "diet quality*" OR "eating habit*" OR "dietary habit*" OR "diet habit*" OR "food habit*" OR "beverage habit*" OR [mh ^"Feeding Behavior"] OR "feeding behavior*" OR "dietary profile*" OR "food profile*" OR "diet profile*" OR "eating profile*" OR "dietary guideline*" OR "dietary recommendation*" OR "dietary intake*" OR "eating style*" OR [mh "Diet, Mediterranean"] OR "Mediterranean Diet*" OR [mh "Dietary Approaches To Stop Hypertension"] OR "Dietary Approaches To Stop Hypertension Diet*" OR "DASH diet*" OR [mh "Diet, Gluten-Free"] OR "Gluten Free diet*" OR "prudent diet*" OR [mh "Diet, Paleolithic"] OR "Paleolithic Diet*" OR [mh "Diet, Vegetarian"] OR "vegetarian diet*" OR "vegan diet*" OR [mh "Diet, Healthy"] OR

"healthy diet" OR "plant based diet*" OR [mh "Diet, Western"] OR "western diet*" OR [mh "Diet, Carbohydrate-Restricted"] OR "low-carbohydrate diet*" OR "high carbohydrate diet*" OR "Ketogenic Diet*" OR "Nordic Diet*" OR [mh "Diet, Fat-Restricted"] OR [mh "Diet, High-Fat"] OR [mh "Diet, High-Protein"] OR "high protein diet*" OR "protein intake*" OR "high-fat diet*" OR "low fat diet*" OR [mh "Diet, Protein-Restricted"] OR "low protein diet*" OR [mh "Diet, Sodium-Restricted"] OR "low-sodium diet*" OR "low salt diet*"

#2 - (([mh "Dietary Proteins"] OR "dietary protein*" OR [mh "Dietary Carbohydrates"] OR "dietary carbohydrate*" OR [mh "Dietary Fats"] OR "dietary fat*" OR hypocaloric OR hypo-caloric) NEAR/6 (diet OR diets OR consumption OR intake OR supplement*))

#3 - (([mh "Guideline Adherence"] OR guideline adherence*) NEAR/6 (diet OR dietary OR food OR beverage* OR nutrition*))

#4 - ("diet score*" OR "diet quality score*" OR "diet quality index*" OR kidmed OR "diet index*" OR "dietary index*" OR "food score*" OR MedDietScore OR "healthy eating index*"):ti,ab,kw

#5 - ((pattern OR patterns OR consumption OR habit*) NEAR/6 ([mh ^"Diet"] OR diet OR diets OR dietary OR [mh "Food"] OR food OR foods OR [mh "Beverages"] OR beverage OR beverages))

#6 - #1 OR #2 OR #3 OR #4 OR #5

#7 - [mh "Breast Neoplasms"] OR [mh "Colorectal Neoplasms"] OR [mh "Intestinal Polyps"] OR [mh "Prostatic Neoplasms"] OR [mh "Lung Neoplasms"] OR [mh "Liver Neoplasms"] OR [mh "Pancreatic Neoplasms"] OR [mh "Endometrial Neoplasms"] OR [mh "Endometrial Hyperplasia"] OR [mh "Leukemia"]

#8 - ("breast neoplasm*" OR "breast cancer*" OR "breast carcino*" OR "colorectal neoplasm*" OR "colorectal cancers*" OR "colorectal carcino*" OR "colon neoplasm*" OR "colon cancer*" OR "colon carcino*" OR "intestinal polyp*" OR "colonic polyp*" OR "colorectal polyp*" OR "colorectal lesion*" OR "rectal neoplasm*" OR "rectal cancer*" OR "rectal carcino*" OR "prostate neoplasm*" OR "prostate cancer*" OR "prostate carcino*" OR "lung neoplasm*" OR "lung carcino*" OR "lung cancer*" OR "liver neoplasm*" OR "liver cancer*" OR "hepatic neoplasm*" OR "hepatic cancer*" OR "hepatocellular carcino*" OR "pancreatic neoplasm*" OR "pancreatic cancer*" OR "pancreatic carcino*" OR "pancreatic adenocarcinoma*" OR "pancreatic neuro*" OR "ampullary cancer*" OR "ampullary carcino*" OR "exocrine cancer*" OR "exocrine carcino*" OR "endometrial neoplasm*" OR "endometrial cancer*" OR "endometrial carcino*" OR "endometrioid neoplasm*" OR "endometrioid cancer*" OR "endometrioid carcino*" OR "endometrial hyperplasia*" OR leukem* OR leukaem* OR leucem* OR leucaem*):ti,ab,kw

#9 - ((cancer* OR [mh "Neoplasms"] OR neoplasm* OR carcino* OR [mh "Carcinogens"] OR malignan* OR adenocarcinoma* OR sarcoma* OR metastasis OR metastases OR tumor OR tumors OR tumour* OR [mh "Polyps"] OR polyp OR polyps) NEAR/6 ([mh "Colon"] OR colonic* OR colon OR colorect* OR rectal OR rectum OR [mh ^"Colonic Diseases"] OR [mh "Breast"] OR [mh ^"Breast Diseases"] OR breast* OR mammary OR [mh "Prostate"] OR prostate* OR prostatic OR [mh ^"Prostatic Diseases"] OR [mh "Lung"] OR [mh ^"Lung Diseases"] OR lung OR pulmonary OR endometri* OR endometrium* OR [mh ^"Uterine Diseases"] OR "uterine diseases*" OR [mh "Liver"] OR liver OR [mh ^"Liver Diseases"] OR [mh "Pancreas"] OR pancreas OR pancreati* OR [mh ^"Pancreatic Diseases"] OR [mh "Ampulla of Vater"] OR "ampulla of vater"))

#10 - #7 OR #8 OR #9

#11 - #6 AND #10" with Publication Year from 2014 to 2020, in Trials (Word variations have been searched)

Embase

- Provider: Elsevier
- Date(s) Searched: January 13, 2020
- Date range searched: January 1, 2014-January 13, 2020
- Search Terms

#1- 'feeding behavior'/de OR 'mediterranean diet'/exp OR 'dash diet'/exp OR 'gluten free diet'/exp OR 'paleolithic diet'/de OR 'vegetarian diet'/exp OR 'healthy diet'/exp OR 'western diet'/de OR 'low carbohydrate diet'/exp OR 'low fat diet'/de OR 'lipid diet'/exp OR 'protein diet'/exp OR 'protein restriction'/exp OR 'sodium restriction'/exp

#2 - 'dietary pattern*':ab,ti OR 'diet pattern*':ab,ti OR 'eating pattern*':ab,ti OR 'food pattern*':ab,ti OR 'diet quality*':ab,ti OR 'eating habit*':ab,ti OR 'dietary habit*':ab,ti OR 'diet habit*':ab,ti OR 'food habit*':ab,ti OR 'beverage habit*':ab,ti OR 'feeding behavior*':ab,ti OR 'dietary profile*':ab,ti OR 'food profile*':ab,ti OR 'diet profile*':ab,ti OR 'eating profile*':ab,ti OR 'dietary guideline*':ab,ti OR 'dietary recommendation*':ab,ti OR 'dietary intake*':ab,ti OR 'eating style*':ab,ti OR 'mediterranean diet*':ab,ti OR 'dietary approaches to stop hypertension diet*':ab,ti OR 'dash diet*':ab,ti OR 'gluten free diet*':ab,ti OR 'prudent diet*':ab,ti OR 'paleolithic diet*':ab,ti OR 'vegetarian diet*':ab,ti OR 'vegan diet*':ab,ti OR 'healthy diet':ab,ti OR 'plant based diet*':ab,ti OR 'western diet*':ab,ti OR 'low-carbohydrate diet*':ab,ti OR 'high carbohydrate diet*':ab,ti OR 'ketogenic diet*':ab,ti OR 'nordic diet*':ab,ti OR 'high protein diet*':ab,ti OR 'protein intake*':ab,ti OR 'high-fat diet*':ab,ti OR 'low fat diet*':ab,ti OR 'low protein diet*':ab,ti OR 'low-sodium diet*':ab,ti OR 'low salt diet*':ab,ti

#3 - (('dietary protein*' OR 'dietary carbohydrate*' OR 'dietary fat*' OR hypocaloric OR 'hypo caloric') NEAR/6 (diet OR diets OR consumption OR intake OR supplement*)):ab,ti

#4 - ('guideline adherence*' NEAR/6 (diet OR dietary OR food OR beverage* OR nutrition*)):ab,ti

#5 - 'diet score*':ab,ti OR 'diet quality score*':ab,ti OR 'diet quality index*':ab,ti OR kidmed:ab,ti OR 'diet index*':ab,ti OR 'dietary index*':ab,ti OR 'food score*':ab,ti OR meddietscore:ab,ti OR 'healthy eating index*':ab,ti

#6 - ((pattern OR patterns OR consumption OR habit*) NEAR/6 (diet OR diets OR dietary OR food OR foods OR beverage OR beverages)):ab,ti

#7 - #1 OR #2 OR #3 OR #4 OR #5 OR #6

#8 - 'breast cancer'/exp OR 'colorectal cancer'/exp OR 'intestine polyp'/exp OR 'prostate cancer'/exp OR 'lung cancer'/exp OR 'liver cancer'/exp OR 'pancreas cancer'/exp OR 'endometrium cancer'/exp OR 'endometrium hyperplasia'/exp OR 'leukemia'/exp

#9 - 'breast neoplasm*':ab,ti OR 'breast cancer*':ab,ti OR 'breast carcino*':ab,ti OR 'colorectal neoplasm*':ab,ti OR 'colorectal cancers*':ab,ti OR 'colorectal carcino*':ab,ti OR 'colon neoplasm*':ab,ti OR 'colon cancer*':ab,ti OR 'colon carcino*':ab,ti OR 'intestinal polyp*':ab,ti OR 'colonic polyp*':ab,ti OR 'colorectal polyp*':ab,ti OR 'colorectal lesion*':ab,ti OR 'rectal neoplasm*':ab,ti OR 'rectal cancer*':ab,ti OR 'rectal carcino*':ab,ti OR 'prostate neoplasm*':ab,ti

OR 'prostate cancer*':ab,ti OR 'prostate carcino*':ab,ti OR 'lung neoplasm*':ab,ti OR 'lung carcino*':ab,ti OR 'lung cancer*':ab,ti OR 'liver neoplasm*':ab,ti OR 'liver cancer*':ab,ti OR 'hepatic neoplasm*':ab,ti OR 'hepatic cancer*':ab,ti OR 'hepatocellular carcino*':ab,ti OR 'pancreatic neoplasm*':ab,ti OR 'pancreatic cancer*':ab,ti OR 'pancreatic carcino*':ab,ti OR 'pancreatic adenocarcinoma*':ab,ti OR 'pancreatic neuro*':ab,ti OR 'ampullary cancer*':ab,ti OR 'ampullary carcino*':ab,ti OR 'exocrine cancer*':ab,ti OR 'exocrine carcino*':ab,ti OR 'endometrial neoplasm*':ab,ti OR 'endometrial cancer*':ab,ti OR 'endometrial carcino*':ab,ti OR 'endometrioid neoplasm*':ab,ti OR 'endometrioid cancer*':ab,ti OR 'endometrioid carcino*':ab,ti OR 'endometrial hyperplasia*':ab,ti OR leukem*:ab,ti OR leukaem*:ab,ti OR leucem*:ab,ti OR leucaem*:ab,ti

#10 - ((cancer* OR neoplasm* OR carcino* OR malignan* OR adenocarcinoma* OR sarcoma* OR metastasis OR metastases OR tumor OR tumors OR tumour* OR polyp OR polyps) NEAR/6 (colonic* OR colon OR colorect* OR rectal OR rectum OR breast* OR mammary OR prostate* OR prostatic OR lung OR pulmonary OR endometri* OR endometrium* OR 'uterine diseases*' OR liver OR pancreas OR pancreati* OR 'ampulla of vater')):ab,ti

#11 - #8 OR #9 OR #10

#12 - #7 AND #11

#13 - #7 AND #11 AND [humans]/lim AND [english]/lim AND [2014-2020]/py NOT ([conference abstract]/lim OR [conference review]/lim OR [conference paper]/lim OR [editorial]/lim OR [erratum]/lim OR [letter]/lim OR [note]/lim OR [review]/lim OR [systematic review]/lim OR [meta analysis]/lim)

Cumulative Index of Nursing and Allied Health Literature (CINAHL)

- Provider: EBSCOhost
- Date(s) Searched: January 13, 2020
- Date range searched: January 1, 2014-January 13, 2020
- Search Strategy:

#S1 - (MH "Eating Behavior") OR (MH "Mediterranean Diet") OR (MH "DASH Diet") OR (MH "Diet, Gluten-Free") OR (MH "Diet, High Protein") OR (MH "Diet, Ketogenic") OR (MH "Diet, Low Carbohydrate") OR (MH "Diet, Nordic") OR (MH "Diet, Paleolithic") OR (MH "Diet, Sodium-Restricted") OR (MH "Diet, Western") OR (MH "Vegetarianism") OR (MH "Diet, Atherogenic") OR (MH "Diet, Fat-Restricted")

#S2 - ("dietary pattern*" OR "diet pattern*" OR "eating pattern*" OR "food pattern*" OR "diet quality*" OR "eating habit*" OR "dietary habit*" OR "diet habit*" OR "food habit*" OR "beverage habit*" OR "feeding behavior*" OR "dietary profile*" OR "food profile*" OR "diet profile*" OR "eating profile*" OR "dietary guideline*" OR "dietary recommendation*" OR "dietary intake*" OR "eating style*" OR "Mediterranean Diet*" OR "Dietary Approaches To Stop Hypertension Diet*" OR "DASH diet*" OR "Gluten Free diet*" OR "prudent diet*" OR "Paleolithic Diet*" OR "vegetarian diet*" OR "vegan diet*" OR "healthy diet" OR "plant based diet*" OR "western diet*" OR "low-carbohydrate diet*" OR "high carbohydrate diet*" OR "Ketogenic Diet*" OR "Nordic Diet*" OR "high protein diet*" OR "protein intake*" OR "high-fat diet*" OR "low fat diet*" OR "low protein diet*" OR "low-sodium diet*" OR "low salt diet*")

#S3 - (((MH "Dietary Proteins+") OR “dietary protein*” OR (MH "Dietary Carbohydrates+") OR "dietary carbohydrate*" OR (MH "Dietary Fats+") OR "dietary fat*") N6 (diet OR diets OR

consumption OR intake OR supplement*))

#S4 – ((MH "Guideline Adherence") OR “guideline adherence*”) N6 (diet OR dietary OR food OR beverage* OR nutrition*))

#S5 - "diet score*" OR "diet quality score*" OR "diet quality index*" OR kidmed OR "diet index*" OR "dietary index*" OR "food score*" OR MedDietScore OR "healthy eating index*"

#S6 - ((pattern OR patterns OR consumption OR habit*) N6 ((MH "Diet") OR diet OR diets OR dietary OR (MH "Food+") OR food OR foods OR (MH "Beverages+") OR beverage OR beverages))

#S7 - S1 OR S2 OR S3 OR S4 OR S5 OR S6

#S8 - (MH "Breast Neoplasms+") OR (MH "Colorectal Neoplasms+") OR (MH "Intestinal Polyps+") OR (MH "Prostatic Neoplasms+") OR (MH "Lung Neoplasms+") OR (MH "Liver Neoplasms+") OR (MH "Pancreatic Neoplasms+") OR (MH "Endometrial Neoplasms") OR (MH "Leukemia+")

#S9 - "breast neoplasm*" OR "breast cancer*" OR "breast carcino*" OR "colorectal neoplasm*" OR "colorectal cancers*" OR "colorectal carcino*" OR "colon neoplasm*" OR "colon cancer*" OR "colon carcino*" OR "intestinal polyp*" OR "colonic polyp*" OR "colorectal polyp*" OR "colorectal lesion*" OR "rectal neoplasm*" OR "rectal cancer*" OR "rectal carcino*" OR "prostate neoplasm*" OR "prostate cancer*" OR "prostate carcino*" OR "lung neoplasm*" OR "lung carcino*" OR "lung cancer*" OR "liver neoplasm*" OR "liver cancer*" OR "hepatic neoplasm*" OR "hepatic cancer*" OR "hepatocellular carcino*" OR "pancreatic neoplasm*" OR "pancreatic cancer*" OR "pancreatic carcino*" OR "pancreatic adenocarcinoma*" OR "pancreatic neuro*" OR "ampullary cancer*" OR "ampullary carcino*" OR "exocrine cancer*" OR "exocrine carcino*" OR "endometrial neoplasm*" OR "endometrial cancer*" OR "endometrial carcino*" OR "endometrioid neoplasm*" OR "endometrioid cancer*" OR "endometrioid carcino*" OR "endometrial hyperplasia*" OR leukem* OR leukaem* OR leucem* OR leucaem*

#S10 - ((cancer* OR (MH "Neoplasms+") OR neoplasm* OR carcino* OR (MH "Carcinogens+") OR malignan* OR adenocarcinoma* OR sarcoma* OR metastasis OR metastases OR tumor OR tumors OR tumour* OR (MH "Polyps+") OR polyp OR polyps) N6 (colonic* OR colon OR colorect* OR rectal OR rectum OR (MH "Colon+") OR (MH "Colonic Diseases") OR (MH "Breast+") OR (MH "Breast Diseases") OR breast* OR mammary OR (MH "Prostate") OR prostate* OR prostatic OR (MH "Prostatic Diseases") OR (MH "Lung+") OR (MH "Lung Diseases") OR lung OR pulmonary OR endometri* OR endometrium* OR (MH "Uterine Diseases") OR "uterine diseases*" OR (MH "Liver") OR liver OR (MH "Liver Diseases") OR (MH "Pancreas+") OR pancreas OR pancreati* OR (MH "Pancreatic Diseases") OR "ampulla of vater"))

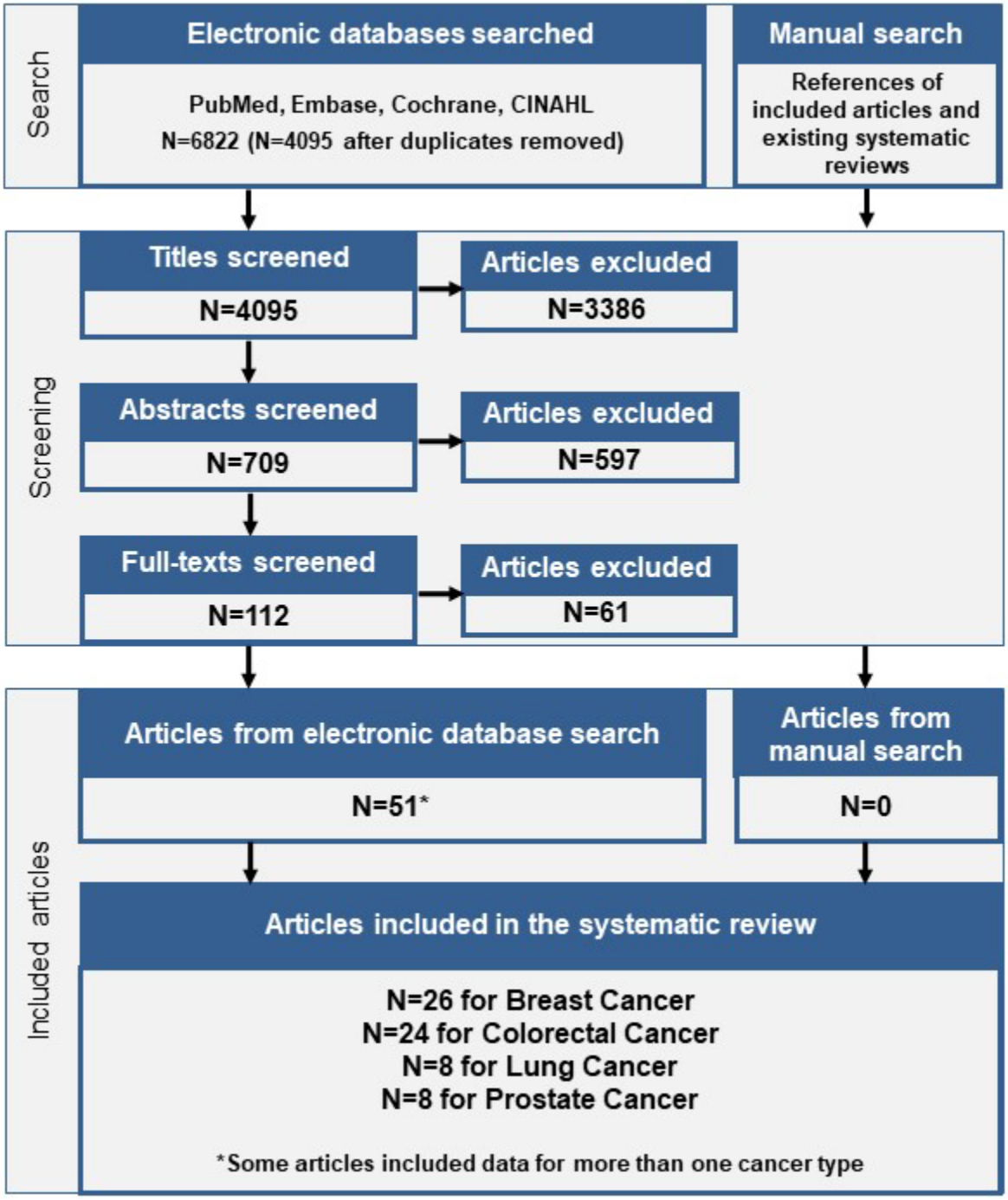
#S11 - S8 OR S9 OR S10

#S12 - S7 AND S11 NOT (MH "Literature Review" OR MH "Meta Analysis" OR MH "Systematic Review" OR MH "News" OR MH "Retracted Publication" OR MH "Retraction of Publication”) Limiters - Publication Year: 2014-2020; Peer Reviewed; English Language; Human

LITERATURE SEARCH AND SCREENING RESULTS

The flow chart (**Figure 2**) below illustrates the literature search and screening results for articles in this update to existing systematic reviews. The results of the electronic database searches, after removal of duplicates, were screened independently by two NESR analysts using a step-wise process by reviewing titles, abstracts, and full-texts to determine which articles met the inclusion criteria. Refer to **Table 15** for the rationale for exclusion for each excluded full-text article. A manual search was done to find articles that were not identified when searching the electronic databases; all manually identified articles were also screened to determine whether they meet criteria for inclusion.

Figure 2: Flow chart of literature search and screening results



Excluded articles from updated literature search

The table below lists the articles excluded after full-text screening for this update to existing systematic reviews. At least one reason for exclusion is provided for each article, which may not reflect all possible reasons for exclusion. Information about articles excluded after title and abstract screening is available upon request.

Table 16. Articles excluded after full-text screening with rationale for exclusion

	Citation	Rationale
1.	Mediterranean diet supplemented with extra virgin olive oil reduces the incidence of invasive breast cancer in a randomised controlled trial. *Evidence-based medicine. 21 (2) (pp 72), 2016. Date of publication: April 2016.* 2016.. doi:10.1136/ebmed-2015-110366	Study design; Publication status
2.	Akinyemiju, T, Wiener, H, Pisu, M. Cancer-related risk factors and incidence of major cancers by race, gender and region; analysis of the NIH-AARP diet and health study. *BMC Cancer.* 2017. 17:597. doi:10.1186/s12885-017-3557-1	Intervention or exposure
3.	Ax, E, Garmo, H, Grundmark, B, Bill-Axelson, A, Holmberg, L, Becker, W, Zethelius, B, Cederholm, T, Sjogren, P. Dietary patterns and prostate cancer risk: report from the population based ULSAM cohort study of Swedish men. *Nutr Cancer.* 2014. 66:77-87. doi:10.1080/01635581.2014.851712	Publication date
4.	Berberian, P, Obimba, C, Glickman-Simon, R, Sethi, T. Herbs for Low-Back Pain, Acupuncture for Psychological Distress, Osteopathic Manipulative Therapy for Chronic Migraine, Honey Dressings for Burns, Vegetarian Diet and Risk of Colorectal Cancer. *Explore (NY).* 2015. 11:410-4. doi:10.1016/j.explore.2015.07.011	Study design; Publication status
5.	Berstad, P, Botteri, E, Larsen, IK, Loberg, M, Kalager, M, Holme, O, Bretthauer, M, Hoff, G. Lifestyle changes at middle age and mortality: a population-based prospective cohort study. *J Epidemiol Community Health.* 2017. 71:59-66. doi:10.1136/jech-2015-206760	Outcome
6.	Bradbury, KE, Murphy, N, Key, TJ. Diet and colorectal cancer in UK Biobank: a prospective study. *Int J Epidemiol.* 2019. doi:10.1093/ije/dyz064	Intervention or exposure
7.	Brinton, LA, Smith, L, Gierach, GL, Pfeiffer, RM, Nyante, SJ, Sherman, ME, Park, Y, Hollenbeck, AR, Dallal, CM. Breast cancer risk in older women: results from the NIH-AARP Diet and Health Study. *Cancer Causes Control.* 2014. 25:843-57. doi:10.1007/s10552-014-0385-3	Intervention or exposure
8.	Castro-Quezada, I, Sanchez-Villegas, A, Martinez-Gonzalez, MA, Salas-Salvado, J, Corella, D, Estruch, R, Schroder, H, Alvarez-Perez, J, Ruiz-Lopez, MD, Artacho, R, Ros, E, Bullo, M, Sorli, JV, Fito, M, Ruiz-Gutierrez, V, Toledo, E, Buil-Cosiales, P, Garcia Rodriguez, A, Lapetra, J, Pinto, X, Salaverria, I, Tur, JA, Romaguera, D, Tresserra-Rimbau, A, Serra-Majem, L. Glycemic index, glycemic load and invasive breast cancer incidence in postmenopausal women: The PREDIMED study. *Eur J Cancer Prev.* 2016. 25:524-32. doi:10.1097/cej.0000000000000209	Intervention or exposure
9.	Catsburg, C, Miller, AB, Rohan, TE. Adherence to cancer prevention guidelines and risk of breast cancer. *Int J Cancer.* 2014. 135:2444-52. doi:10.1002/ijc.28887	Intervention or exposure
10.	Cifu, G, Arem, H. Adherence to lifestyle-related cancer prevention guidelines and breast cancer incidence and mortality. *Ann Epidemiol.* 2018. 28:767-773.e1. doi:10.1016/j.annepidem.2018.09.002	Intervention or exposure

	Citation	Rationale
11.	Dunneram, Y, Greenwood, DC, Cade, JE. Diet and risk of breast, endometrial and ovarian cancer: UK Women's Cohort Study. *Br J Nutr.* 2019. 122:564-574. doi:10.1017/s0007114518003665	Intervention or exposure
12.	Elwood, PC, Whitmarsh, A, Gallacher, J, Bayer, A, Adams, R, Heslop, L, Pickering, J, Morgan, G, Galante, J, Dolwani, S, Longley, M, Roberts, ZE. Healthy living and cancer: evidence from UK Biobank. *Ecancermedicalscience.* 2018. 12:792. doi:10.3332/ecancer.2018.792	Intervention or exposure
13.	Er, V, Lane, JA, Martin, RM, Emmett, P, Gilbert, R, Avery, KN, Walsh, E, Donovan, JL, Neal, DE, Hamdy, FC, Jeffreys, M. Adherence to dietary and lifestyle recommendations and prostate cancer risk in the prostate testing for cancer and treatment (ProtecT) trial. *Cancer Epidemiol Biomarkers Prev.* 2014. 23:2066-77 . doi:10.1158/1055-9965.Epi-14-0322	Intervention or exposure
14.	Farvid, MS, Cho, E, Chen, WY, Eliassen, AH, Willett, WC. Adolescent meat intake and breast cancer risk. *Int J Cancer.* 2015. 136:1909-20. doi:10.1002/ijc.29218	Intervention or exposure
15.	Freedland, SJ. The effect of diet and supplements on prostate cancer. *Clin Adv Hematol Oncol.* 2014. 12:538-40.	Study design; Publication status
16.	Gilsing, AM, Schouten, LJ, Goldbohm, RA, Dagnelie, PC, van den Brandt, PA, Weijenberg, MP. Vegetarianism, low meat consumption and the risk of colorectal cancer in a population based cohort study. *Sci Rep.* 2015. 5:13484. doi:10.1038/srep13484	Intervention or exposure
17.	Gilsing, AM, Weijenberg, MP, Goldbohm, RA, Dagnelie, PC, van den Brandt, PA, Schouten, LJ. Vegetarianism, low meat consumption and the risk of lung, postmenopausal breast and prostate cancer in a population-based cohort study. *Eur J Clin Nutr.* 2016. 70:723-9. doi:10.1038/ejcn.2016.25	Intervention or exposure
18.	Guinter, MA, McLain, AC, Merchant, AT, Sandler, DP, Steck, SE. An estrogen-related lifestyle score is associated with risk of postmenopausal breast cancer in the PLCO cohort. *Breast Cancer Res Treat.* 2018. 170:613-622. doi:10.1007/s10549-018-4784-0	Outcome
19.	Haraldsdottir, A, Torfadottir, JE, Valdimarsdottir, UA, Adami, HO, Aspelund, T, Tryggvadottir, L, Thordardottir, M, Birgisdottir, BE, Harris, TB, Launer, LJ, Gudnason, V, Steingrimsdottir, L. Dietary habits in adolescence and midlife and risk of breast cancer in older women. *PLoS One.* 2018. 13:e0198017. doi:10.1371/journal.pone.0198017	Intervention or exposure
20.	Harris, HR, Bergkvist, L, Wolk, A. Adherence to the World Cancer Research Fund/American Institute for Cancer Research recommendations and breast cancer risk. *Int J Cancer.* 2016. 138:2657-64 . doi:10.1002/ijc.30015	Intervention or exposure
21.	He, X, Wu, K, Zhang, X, Nishihara, R, Cao, Y, Fuchs, CS, Giovannucci, EL, Ogino, S, Chan, AT, Song, M. Dietary intake of fiber, whole grains and risk of colorectal cancer: An updated analysis according to food sources, tumor location and molecular subtypes in two large US cohorts. *Int J Cancer.* 2019. 145:3040-3051. doi:10.1002/ijc.32382	Intervention or exposure
22.	Heitz, AE, Baumgartner, RN, Baumgartner, KB, Boone, SD. Healthy lifestyle impact on breast cancer-specific and all-cause mortality. *Breast Cancer Res Treat.* 2018. 167:171-181. doi:10.1007/s10549-017-4467-2	Outcome; Health status
23.	Helander, S, Heinavaara, S, Sarkeala, T, Malila, N. Lifestyle in population-based colorectal cancer screening over 2-year follow-up. *Eur J Public Health.* 2018. 28:333-338. doi:10.1093/eurpub/ckx139	Outcome

	Citation	Rationale
24.	Hidaka, BH, Kimler, BF, Fabian, CJ, Carlson, SE. An empirically derived dietary pattern associated with breast cancer risk is validated in a nested case-control cohort from a randomized primary prevention trial. *Clin Nutr ESPEN.* 2017. 17:8-17. doi:10.1016/j.clnesp.2016.10.008	Outcome
25.	Hirko, KA, Willett, WC, Hankinson, SE, Rosner, BA, Beck, AH, Tamimi, RM, Eliassen, AH. Healthy dietary patterns and risk of breast cancer by molecular subtype. *Breast Cancer Res Treat.* 2016. 155:579-88. doi:10.1007/s10549-016-3706-2	Outcome
26.	Jones, P, Cade, JE, Evans, CEL, Hancock, N, Greenwood, DC. Does adherence to the World Cancer Research Fund/American Institute of Cancer Research cancer prevention guidelines reduce risk of colorectal cancer in the UK Women's Cohort Study?. *Br J Nutr.* 2018. 119:340-348. doi:10.1017/s0007114517003622	Intervention or exposure
27.	Kenfield, SA, DuPre, N, Richman, EL, Stampfer, MJ, Chan, JM, Giovannucci, EL. Mediterranean diet and prostate cancer risk and mortality in the Health Professionals Follow-up Study. *Eur Urol.* 2014. 65:887-94. doi:10.1016/j.eururo.2013.08.009	Publication date
28.	Key, TJ, Appleby, PN, Crowe, FL, Bradbury, KE, Schmidt, JA, Travis, RC. Cancer in British vegetarians: updated analyses of 4998 incident cancers in a cohort of 32,491 meat eaters, 8612 fish eaters, 18,298 vegetarians, and 2246 vegans. *Am J Clin Nutr.* 2014. 100 Suppl 1:378s-85s. doi:10.3945/ajcn.113.071266	Intervention or exposure
29.	Kohler, LN, Harris, RB, Oren, E, Roe, DJ, Lance, P, Jacobs, ET. Adherence to Nutrition and Physical Activity Cancer Prevention Guidelines and Development of Colorectal Adenoma. *Nutrients.* 2018. 10. doi:10.3390/nu10081098	Intervention or exposure
30.	Kouloulias, V, Platoni, K, Kantzou, I, Zygogianni, A, Kyriazi, K, Kougioumtzopoulou, A, Papaloucas, M, Papaloucas, C. Physical activity, early first delivery and residence as parameters for breast cancer prevention: an observational study. *J buon.* 2019. 24:1512-1515.	Intervention or exposure
31.	Lagerlund, M, Drake, I, Wirfalt, E, Sontrop, JM, Zackrisson, S. Health-related lifestyle factors and mammography screening attendance in a Swedish cohort study. *Eur J Cancer Prev.* 2015. 24:44-50. doi:10.1097/cej.0000000000000025	Outcome
32.	Lecuyer, L, Dalle, C, Lefevre-Arbogast, S, Micheau, P, Lyan, B, Rossary, A, Demidem, A, Petera, M, Lagree, M, Centeno, D, Galan, P, Hercberg, S, Samieri, C, Assi, N, Ferrari, P, Viallon, V, Deschasaux, M, Partula, V, Srour, B, Latino-Martel, P, Kesse-Guyot, E, Druesne-Pecollo, N, Vasson, MP, Durand, S, Pujos-Guillot, E, Manach, C, Touvier, M. Diet-Related Metabolomic Signature of Long-Term Breast Cancer Risk Using Penalized Regression: An Exploratory Study in the SU.VI.MAX Cohort. *Cancer Epidemiol Biomarkers Prev.* 2019. doi:10.1158/1055-9965.Epi-19-0900	Intervention or exposure
33.	Liao, LM, Loftfield, E, Etemadi, A, Graubard, BI, Sinha, R. Substitution of dietary protein sources in relation to colorectal cancer risk in the NIH-AARP cohort study. *Cancer Causes Control.* 2019. 30:1127-1135. doi:10.1007/s10552-019-01210-1	Intervention or exposure

	Citation	Rationale
34.	Liu, L, Tabung, FK, Zhang, X, Nowak, JA, Qian, ZR, Hamada, T, Nevo, D, Bullman, S, Mima, K, Kosumi, K, da Silva, A, Song, M, Cao, Y, Twombly, TS, Shi, Y, Liu, H, Gu, M, Koh, H, Li, W, Du, C, Chen, Y, Li, C, Li, W, Mehta, RS, Wu, K, Wang, M, Kostic, AD, Giannakis, M, Garrett, WS, Hutthenhower, C, Chan, AT, Fuchs, CS, Nishihara, R, Ogino, S, Giovannucci, EL. Diets That Promote Colon Inflammation Associate With Risk of Colorectal Carcinomas That Contain Fusobacterium nucleatum. *Clin Gastroenterol Hepatol.* 2018. 16:1622-1631.e3. doi:10.1016/j.cgh.2018.04.030	Outcome
35.	Llanos, AA, Krok, JL, Peng, J, Pennell, ML, Olivo-Marston, S, Vitolins, MZ, Degraffinreid, CR, Paskett, ED. Favorable effects of low-fat and low-carbohydrate dietary patterns on serum leptin, but not adiponectin, among overweight and obese premenopausal women: a randomized trial. *Springerplus.* 2014. 3:175. doi:10.1186/2193-1801-3-175	Outcome
36.	Makarem, N, Lin, Y, Bandera, EV, Jacques, PF, Parekh, N. Concordance with World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) guidelines for cancer prevention and obesity-related cancer risk in the Framingham Offspring cohort (1991-2008). *Cancer Causes Control.* 2015. 26:277-286. doi:10.1007/s10552-014-0509-9	Intervention or exposure
37.	Marcondes, LH, Franco, OH, Ruiter, R, Ikram, MA, Mulder, M, Stricker, BH, Kiefte-de Jong, JC. Animal foods and postmenopausal breast cancer risk: a prospective cohort study. *Br J Nutr.* 2019. 122:583-591. doi:10.1017/s0007114519000072	Intervention or exposure
38.	McBride, D. Vegetarian Diets May Decrease Risk of Colorectal Cancer. *ONS Connect.* 2015. 30:51.	Publication status
39.	Mehta, RS, Nishihara, R, Cao, Y, Song, M, Mima, K, Qian, ZR, Nowak, JA, Kosumi, K, Hamada, T, Masugi, Y, Bullman, S, Drew, DA, Kostic, AD, Fung, TT, Garrett, WS, Huttenhower, C, Wu, K, Meyerhardt, JA, Zhang, X, Willett, WC, Giovannucci, EL, Fuchs, CS, Chan, AT, Ogino, S. Association of Dietary Patterns With Risk of Colorectal Cancer Subtypes Classified by Fusobacterium nucleatum in Tumor Tissue. *JAMA Oncol.* 2017. 3:921-927. doi:10.1001/jamaoncol.2016.6374	Outcome
40.	Nguyen, S, Li, H, Yu, D, Gao, J, Gao, Y, Tran, H, Xiang, YB, Zheng, W, Shu, XO. Adherence to dietary recommendations and colorectal cancer risk: results from two prospective cohort studies. *Int J Epidemiol.* 2019. doi:10.1093/ije/dyz118	Country
41.	Nimptsch, K, Malik, VS, Fung, TT, Pischon, T, Hu, FB, Willett, WC, Fuchs, CS, Ogino, S, Chan, AT, Giovannucci, E, Wu, K. Dietary patterns during high school and risk of colorectal adenoma in a cohort of middle-aged women. *Int J Cancer.* 2014. 134:2458-67. doi:10.1002/ijc.28578	Outcome
42.	Papadimitriou, N, Muller, D, van den Brandt, PA, Geybels, M, Patel, CJ, Gunter, MJ, Lopez, DS, Key, TJ, Perez-Cornago, A, Ferrari, P, Vineis, P, Weiderpass, E, Boeing, H, Agudo, A, Sanchez, MJ, Overvad, K, Kuhn, T, Fortner, RT, Palli, D, Drake, I, Bjartell, A, Santiuste, C, Bueno-de-Mesquita, BH, Krogh, V, Tjonneland, A, Lauritzen, DF, Gurrea, AB, Quiros, JR, Stattin, P, Trichopoulou, A, Martimianaki, G, Karakatsani, A, Thysell, E, Johansson, I, Ricceri, F, Tumino, R, Larranaga, N, Khaw, KT, Riboli, E, Tzoulaki, I, Tsilidis, KK. A nutrient-wide association study for risk of prostate cancer in the European Prospective Investigation into Cancer and Nutrition and the Netherlands Cohort Study. *Eur J Nutr.* 2019. doi:10.1007/s00394-019-02132-z	Intervention or exposure

	Citation	Rationale
43.	Park, YM, Steck, SE, Fung, TT, Merchant, AT, Elizabeth Hodgson, M, Keller, JA, Sandler, DP. Higher diet-dependent acid load is associated with risk of breast cancer: Findings from the sister study. *Int J Cancer.* 2019. 144:1834-1843. doi:10.1002/ijc.31889	Intervention or exposure
44.	Printz, C. Vegetarian diet associated with lower risk of colorectal cancer. *Cancer.* 2015. 121:2667. doi:10.1002/cncr.29582	Publication status
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