

Nutrition Evidence Systematic Review

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Dietary Guidelines Advisory Committee
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United States Department of Agriculture
Center for Nutrition Policy and Promotion

An introduction to Nutrition Evidence Systematic Review (NESR)

- Who we are and what we do
- NESR systematic review methodology
- Using/updating existing NESR systematic review
- Making our work transparent and accessible



We are now known as Nutrition Evidence Systematic Review (NESR)

Nutrition Evidence Systematic Review (NESR)

*“Connecting nutrition science
with public health priorities”*

<https://nesr.usda.gov>

- Nutrition Evidence Library created a misperception that we are a brick-and-mortar library that houses all published nutrition research studies.
- NESR communicates that we are a team of scientists who conduct systematic reviews.
- Does not reflect a change in NESR’s role or our systematic review methodology.



NESR is a team of scientists who have expertise in systematic review methodology



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Marisol
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MLS, MA



Nancy Terry,
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NESR conducts food- and nutrition-related systematic reviews

- NESR systematic reviews are research projects that answer a clearly formulated scientific question by searching for, evaluating, analyzing, and synthesizing nutrition evidence.

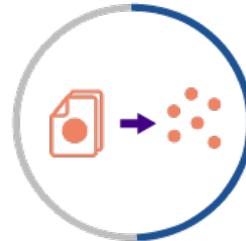
NESR Systematic Review Methodology



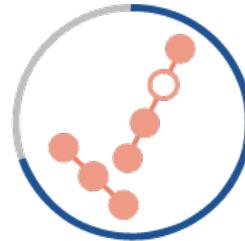
Develop high-priority questions



Search for and screen studies



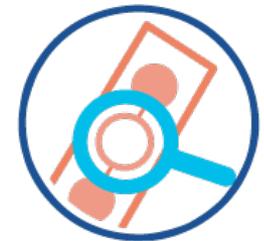
Extract data and assess risk of bias



Synthesize the evidence



Answer the question; grade the evidence



Recommend future research



NESR's response to the National Academies Study

REPORTS 1 & 2 / We support the following five overarching values:

1. Enhance transparency.
2. Promote diversity of expertise and experience.
3. Support a deliberative process.
4. Manage biases and conflicts of interest.
5. Adopt state-of-the-art processes and methods.

REPORT 2 / Recommendation 3.

- a. Roles and responsibilities of NESR (formerly NEL) staff and the Committee will be clearly outlined.
- b. Due to time and resource constraints, NESR will not be conducting systematic reviews with input from technical expert panels, rather NESR will be conducting systematic reviews directly with the 2020 Committee. However, relevant existing NESR systematic reviews, conducted in collaboration with external expert groups, will be available for consideration by the Committee.
- c. All systematic reviews conducted by the 2020 Committee will undergo a formal peer review process coordinated by the USDA Agricultural Research Service.



NESR's response to the National Academies Study, continued

REPORT 2 / Recommendation 4.

The NESR team acknowledges that systematic review science and supporting technologies evolve continuously. NESR's continuous quality advancement initiative involves enhancing staff knowledge and skills through:

- Ongoing training and professional development
- Leveraging the expertise of and collaborating with methodologists from other leading systematic review organizations, such as Cochrane and the Agency for Healthcare Research and Quality
- Expanding technological infrastructure



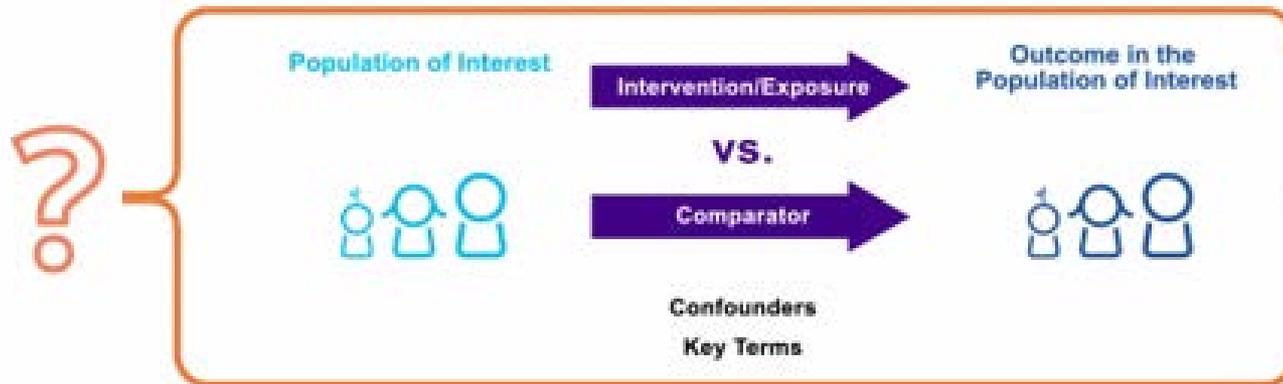
NESR conducts its systematic reviews in a collaborative manner

NESR Staff: Scientists with expertise in systematic review methodology who handle all aspects of planning, facilitating, conducting, and documenting the work necessary for timely execution of the reviews in accordance with NESR methodology.

The Advisory Committee: Scientific experts with diversity of expertise and experience who work with NESR staff to review and provide feedback to refine systematic review materials, and synthesize the body of evidence to answer important diet-related questions.



An analytic framework is developed for each systematic review question



An analytic framework for each systematic review question:

- Population of interest
- Intervention/exposure versus comparator
- Outcome
- Definitions of key terms
- Factors that could impact the relationship being examined

Inclusion and exclusion criteria are established, up front

Inclusion & Exclusion Criteria



- Inclusion and exclusion criteria are established by the Committee *up front* to provide an objective, consistent, and transparent framework for identifying the articles to include in each systematic review.
- Criteria are framed to increase the utility of the systematic review to inform U.S. Federal policy and programs



Examples of inclusion and exclusion criteria

Category	Inclusion Criteria	Exclusion Criteria
Study design	Randomized controlled trials Non-randomized controlled trials Prospective cohort studies Retrospective cohort studies Nested case-control studies	Uncontrolled trials Case-control studies Cross-sectional studies Before-and-after studies
Publication status	Peer-reviewed articles	Non-peer reviewed articles (i.e, unpublished data, reports, abstracts, manuscripts, conference proceedings)
Language of publication	English	Languages other than English
Country	Very High or High Human Development Countries	Medium or Low Human Development Countries
Health status of study participants	Healthy and/or elevated chronic disease risk; some (not all) diagnosed with a disease or the health outcome of interest	All diagnosed with disease or the health outcome of interest
Others	Date of publication, intervention/exposure and comparator, outcomes	



A literature search is conducted to find *all* relevant studies

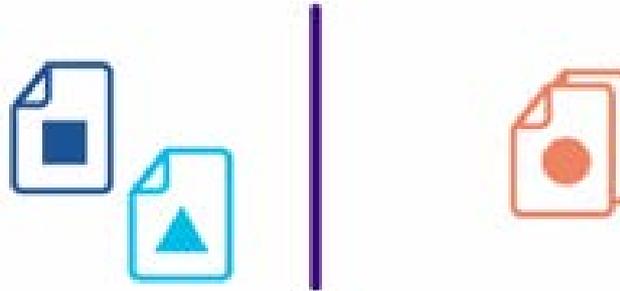
Databases of studies



- NESR librarians create a search strategy (electronic databases, key search terms) to find all studies that are relevant to the systematic review question.
- The search strategy is reviewed by the Committee and peer-reviewed by another librarian.
- The librarians conduct the search, which yields a list of potentially relevant studies.

Studies are screened using the inclusion and exclusion criteria

Inclusion & Exclusion Criteria



- Two NESR analysts independently screen all of the studies identified from the librarians' search using the inclusion and exclusion criteria.
- Studies that meet *all* of the criteria are included in the systematic review.
- Manual search is conducted to find peer-reviewed articles that meet all criteria, but were not identified through the electronic database search.
- NESR analysts document the studies that are included, and those that are excluded and why.

Data are extracted from each included study

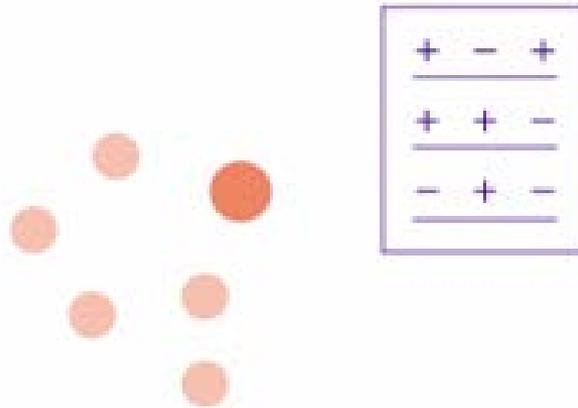


NESR analysts extract data for each included study that will be used to answer the systematic review question.

- Study design
- Participant characteristics
- Measurement methods
- Analysis
- Results
- Funding source



A risk of bias tool is used to assess each included study



- NESR analysts use risk of bias tools to consistently and transparently assess how well each included study was designed and conducted.
- Risk of bias is the likelihood of a systematic error or deviation from the truth, in results or inferences, which can lead to underestimation or overestimation of either the true effect of an intervention on an outcome or the true association between an exposure and outcome.
- This assessment provides critical information that is considered when synthesizing the evidence.



NESR uses three state-of-the-art tools to assess risk of bias

- “Cochrane risk-of-bias tool for randomized trials” (RoB 2.0) for randomized trials
- “Risk of Bias in Non-randomized Studies-of-Interventions” tool (ROBINS-I) for non-randomized trials
- “Risk of Bias for Nutrition Observational Studies” tool (RoB-NOS) for observational studies

Bias arising from the randomization process

Bias in selection of participants into the study

Bias due to confounding

Bias in classification of interventions or exposures

Bias due to deviations from intended interventions or exposures

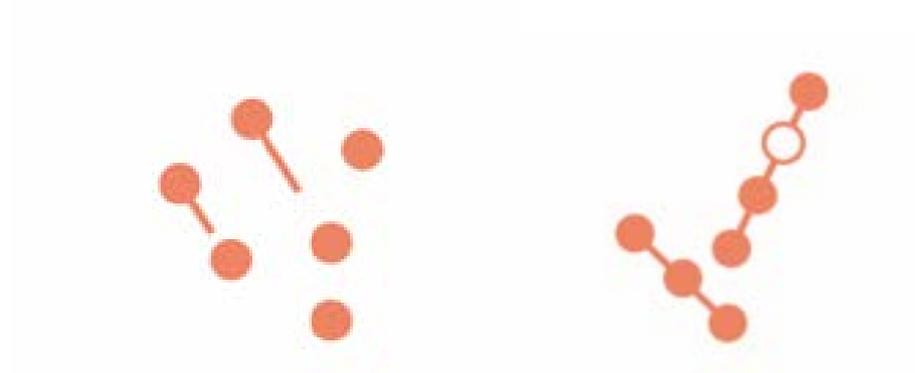
Bias due to missing outcome data

Bias in measurement of the outcome

Bias in selection of the reported result



The evidence from all included studies is synthesized



Evidence synthesis is the process by which evidence from multiple studies is described, compared and contrasted, and combined, qualitatively, by:

- Identifying overarching themes or key concepts from the findings
- Identifying and explaining similarities and differences between studies
- Determining whether certain factors impact the relationships being examined



A conclusion statement is developed to answer the systematic review question



- The Committee develops a conclusion statement, which is a summary statement that reflects the complete body of evidence reviewed, and is written as the answer to the systematic review question.
- A conclusion statement may also state that there is not enough evidence to answer the question.



The strength of the evidence is graded



The Committee uses predetermined criteria to assign one of four grades to indicate the strength of the body of evidence supporting a specific conclusion statement:

- Strong
- Moderate
- Limited
- Grade not assignable



Predetermined criteria are used to assess the body of evidence

- **Risk of Bias:** likelihood that systematic errors resulting from the design and conduct of the studies could have impacted the accuracy of the reported results
- **Consistency:** degree of similarity in the direction and magnitude of effect, and whether any inconsistency can be explained by differences in study designs and methods.
- **Directness:** how well the primary research studies are designed to address the systematic review question.
- **Precision:** degree of certainty around an effect estimate for a given outcome, including sample size, number of studies, and variability within and across studies.
- **Generalizability:** whether the study participants, interventions and/or exposures, comparators, and outcomes examined are applicable to the U.S. population.

* Study design is also considered by examining these elements for each category of study design separately

Future research is recommended



Research recommendations are identified to address gaps and limitations in the evidence.



Methodology for using and/or updating existing NESR systematic reviews

- NESR will work with the 2020 Advisory Committee to identify existing NESR systematic reviews that are relevant to one or more of its systematic review questions.
 - *Relevancy: The existing NESR review addressed the same population, intervention and/or exposure, comparator, and outcomes; used the same definitions for key terms and inclusion and exclusion criteria*
- If a relevant NESR systematic review is identified, NESR will work with the 2020 Advisory Committee to determine if it is *timely*.
 - *Timely: The existing NESR review considers articles published within, or close to, the same date range selected for the systematic review question's inclusion and exclusion criteria*
- If the review is not timely, and an update is needed, NESR will conduct a literature search to identify articles published since the end of the date range used in the existing NESR review.



Methodology for using and/or updating existing NESR systematic reviews, continued

- When an existing NESR review is being used to answer a question, the Committee will carry forward the conclusion and grade from that review.
- When an existing NESR review is being updated, the Committee will consider any new evidence identified via the literature search as it relates to the conclusions of the existing review, and determine whether revisions to the original conclusion statement and/or grade are warranted.



NESR values transparency and accessibility

NESR.usda.gov

USDA Nutrition Evidence Systematic Review
U.S. DEPARTMENT OF AGRICULTURE

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About NESR

The staff at Nutrition Evidence Systematic Review (NESR), formerly the Nutrition Evidence Library (NEL), specializes in conducting food- and nutrition-related systematic reviews. These reviews are research projects that answer important public health questions by evaluating the scientific evidence on topics relevant to Federal policy and programs.

[Learn More About NESR](#)

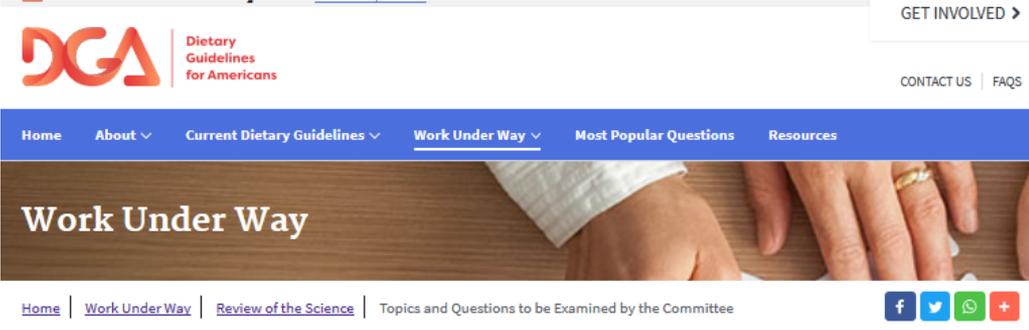
Search by keyword or phrase:



NESR systematic review protocols will be posted on DietaryGuidelines.gov

Systematic review protocols are the plan for how a systematic review will be conducted:

- Analytic framework
- Inclusion and exclusion criteria
- Search strategy
- Flow chart of literature search and screening results
- Included articles
- Excluded articles with rationale



The screenshot shows the website for the Dietary Guidelines for Americans. The header includes the DGA logo and navigation links: Home, About, Current Dietary Guidelines, Work Under Way (selected), Most Popular Questions, and Resources. A secondary navigation bar lists: Home, Work Under Way, Review of the Science, and Topics and Questions to be Examined by the Committee. Below this, a progress indicator shows the status of various topics: Still to Come (white square), Developing the Plan (grey square), Implementing the Plan (yellow triangle), and Draft Conclusion (green circle). The main content area is titled 'Dietary Patterns' and contains a table of six topics, each with a checkbox in the 'Status' column.

Dietary Patterns	
Status	All ages
<input type="checkbox"/>	1. What is the relationship between dietary patterns consumed at each stage of life and growth, size, body composition, and risk of overweight and obesity?
<input type="checkbox"/>	2. What is the relationship between dietary patterns consumed at each stage of life and risk of cardiovascular disease?
<input type="checkbox"/>	3. What is the relationship between dietary patterns consumed at each stage of life and risk of type 2 diabetes?
<input type="checkbox"/>	4. What is the relationship between dietary patterns consumed at each stage of life and risk of certain types of cancer?
<input type="checkbox"/>	5. What is the relationship between dietary patterns consumed at each stage of life and bone health?
<input type="checkbox"/>	6. What is the relationship between dietary patterns consumed at each stage of life and neurocognitive health?



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