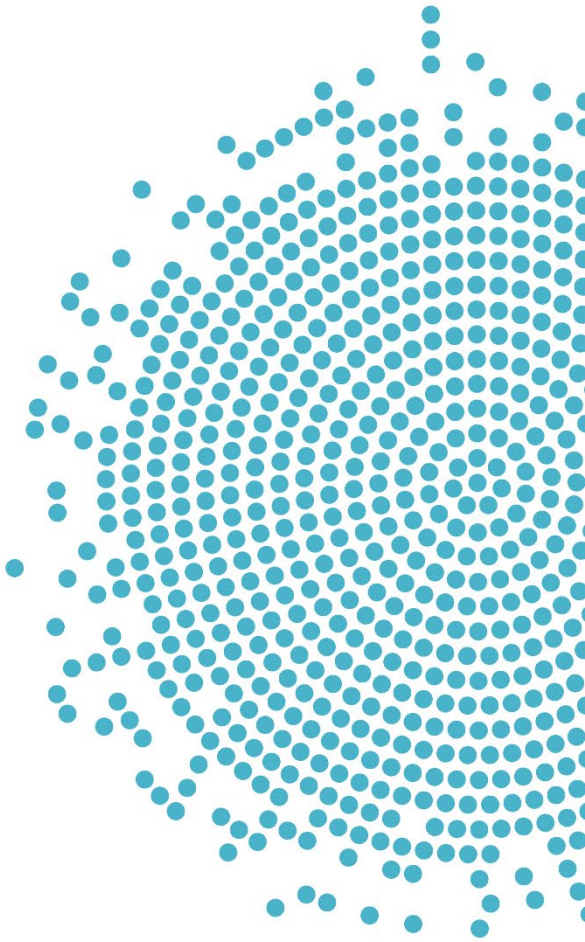
USDA
UNITED STATES DEPARTMENT OF AGRICULTURE

Home Food Availability in Adults and Diet-Related Psychosocial Factors, Dietary Intake, Diet Quality, and Health Outcomes: An Evidence Scan Protocol



Cristina Palacios, PhD, MSc,[a,b] Cheryl A.M. Anderson, PhD, MPH, MS,[a,c] Aline Andres, PhD, RD,[a,d] Jennifer Orlet Fisher, PhD,[a,e] Christopher D. Gardner, PhD,[a,f] Edward Giovannucci, MD, ScD,[a,g] Deanna M. Hoelscher, PhD, RDN, LD, CNS, FISBNPA,[a,h] Valarie Blue Bird Jernigan, DrPH, MPH,[a,i] Angela Odoms-Young, PhD, MS,[a,j] Hollie A. Raynor, PhD, RD, LDN,[a,k] Fatima Cody Stanford, MD, MPH, MPA, MBA, FAAP, FACP, FAHA, FAMWA, FTOS,[a,g] Julie Obbagy, PhD, RD,[l] Emily H. Callahan, MS,[m] Natasha Chong Cole, PhD, MPH, RD,[m] Amanda K. Fultz, PhD, RD,[m] Brittany J. Kingshipp, PhD,[m] Allison Webster, PhD, RD,[m] Molly Higgins, MLIS,[n] Gisela Butera, MEd, MLIS,[o] Nancy Terry, MLIS[o]

[a] Strategies for Individuals and Families Related to Diet Quality and Weight Management Subcommittee, 2025 Dietary Guidelines Advisory Committee

[b] Florida International University, Subcommittee Chair

[c] University of California San Diego

[d] University of Arkansas for Medical Sciences

[e] Temple University

[f] Stanford University

[g] Harvard University

[h] UT Health Houston School of Public Health

[i] Oklahoma State University

[j] Cornell University, Committee Vice Chair

[k] University of Tennessee Knoxville

[l] Branch Chief, Nutrition Evidence Systematic Review (NESR) Branch; Nutrition Guidance and Analysis Division (NGAD), Center for Nutrition Policy and Promotion (CNPP), Food and Nutrition Service (FNS), U.S. Department of Agriculture (USDA)

[m] Systematic Review Analyst, NESR Branch; NGAD, CNPP, FNS, USDA

[n] Systematic Review Librarian, NESR Branch; NGAD, CNPP, FNS, USDA

[o] Biomedical Librarian/Informationist, National Institutes of Health Library

NESR

Suggested citation: Palacios C, Anderson CAM, Andres A, Fisher JO, Gardner CD, Giovannucci E, Hoelscher DM, Jernigan VBB, Odoms-Young A, Raynor HA, Stanford FC, Obbagy J, Callahan EH, Cole NC, Fultz A, Kingshipp BJ, Webster A, Higgins M, Butera G, Terry N. Home Food Availability in Adults and Diet-Related Psychosocial Factors, Dietary Intake, Diet Quality, and Health Outcomes: An Evidence Scan Protocol. September 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/protocols

Table of contents

Introduction

To prepare for the development of the *Dietary Guidelines for Americans, 2025-2030*, the U.S. Departments of Health and Human Services (HHS) and Agriculture (USDA) identified a proposed list of scientific questions based on relevance, importance, potential federal impact, and avoiding duplication, which were posted for public comment.[*] The Departments appointed the 2025 Dietary Guidelines Advisory Committee (Committee) in January 2023 to review evidence on the scientific questions. The proposed scientific questions were refined and prioritized by the Committee for consideration in their review of the evidence. Their review forms the basis of their independent, science-based advice and recommendations to HHS and USDA, which is considered as the Departments develop the next edition of the *Dietary Guidelines*.

Federal data show that Americans fall short of meeting Dietary Guidelines recommendations, and diet-related chronic disease rates have risen to pervasive levels and continue to be a major public health concern. Therefore, when refining and prioritizing scientific questions, the Committee expressed interest in understanding food-based strategies that can improve adherence to the *Dietary Guidelines*. One strategy for influencing food intake is altering the availability and accessibility of foods within the home. Home food availability reflects both the surrounding food environment and individual decision-making, often by the primary food procurers in the household. A distinct, but related, influence on dietary intake is accessibility – that is, whether foods are available in a form, place, and time that facilitates their consumption. The influence of home food availability and accessibility on dietary intake and health outcomes has been studied in children, and these relationships are one aspect of the Committee's systematic review protocol, "Parental and Caregiver Feeding Styles and Practices and Growth, Body Composition and Risk of Obesity". However, while a great deal of research has been conducted on food availability outside of the home in adult populations, the extent of the scientific literature on availability and accessibility of food inside the home in adulthood is less clear.

The Committee will conduct an evidence scan to address these research needs, in collaboration with USDA's Nutrition Evidence Systematic Review (NESR) team (**Table 1**).

Table 1. Review history

Date	Description	Citation
October 2023	Evidence scan protocol for the 2025 Dietary Guidelines Advisory Committee published online	Palacios C, Anderson CAM, Andres A, Fisher JO, Gardner CD, Giovannucci E, Hoelscher DM, Jernigan VBB, Odoms-Young A, Raynor HA, Stanford FC, Obbagy J, Callahan EH, Cole NC, Fultz A, Kingshipp BJ, Webster A, Higgins M, Butera G, Terry N. Home Food Availability in Adults and Diet-Related Psychosocial Factors, Dietary Intake, Diet Quality, and Health Outcomes: An Evidence Scan Protocol. September 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/protocols
January 2024	Evidence scan discontinued by the 2025 Dietary Guidelines Advisory Committee	N/A **Rationale for discontinuation**: In consideration of project workload and timelines, the Committee discontinued this evidence scan after determining that the planned evidence scan on culturally tailored dietary interventions is higher priority. In addition, home food availability in infants, young children, children, and adolescents will be examined in other systematic reviews being conducted on caregiver feeding practices.

[*] Dietary Guidelines for Americans: Learn About the Process. 2022. Available at: https://www.dietaryguidelines.gov/work-under-way/learn-about-process

A NESR evidence scan is an exploratory evidence description project in which systematic methods are used to search for and describe the volume and characteristics of evidence available on a nutrition question or topic of public health importance.

The following scientific question has been identified for this evidence scan: What evidence has been published on the relationship between home food availability in adults and diet-related psychosocial factors, dietary intake, diet quality, and health outcomes?

Methods

The NESR methodology manual [*] has a detailed description of the NESR methodology as it will be applied in the evidence scan for the Dietary Guidelines for Americans, 2025-2030 Project. This section presents an overview of the specific methods that will be used to by the Committee to answer the evidence scan question: What evidence has been published on the relationship between home food availability in adults and diet-related psychosocial factors, dietary intake, diet quality, and health outcomes?

Develop a protocol

An evidence scan protocol is the plan for how NESR's methodology will be used to conduct a specific evidence scan and is established by the Committee, *a priori*, before any evidence is reviewed. The protocol is designed to capture the most appropriate and relevant body of evidence to answer the evidence scan question. Development of the protocol involves discussion of the strengths and limitations of various methodological approaches relevant to the question, which then inform subsequent steps of the evidence scan process. The protocol describes all of the methods that will be used throughout the evidence scan process. Additionally, the protocol includes the following components, which are tailored to each evidence scan question: the analytic framework, the inclusion and exclusion criteria, and the description of evidence plan.

Develop an analytic framework

An analytic framework visually represents the overall scope of the evidence scan question and depicts the contributing elements that will be examined and evaluated. **Figure 1** is the analytic framework for the evidence scan and shows that the intervention or exposure of interest is home food availability, defined as availability or accessibility of different types and amounts of foods and beverages in the home in adults, older adults, and adults during pregnancy and postpartum. The comparator is different availability or accessibility of different types and amounts of foods and beverages. The outcomes are Diet-related psychosocial factors including food-related norms, attitudes, values, and self-efficacy; Dietary intake; Diet quality; and Energy intake in adults, older adults, and adults during pregnancy or postpartum; Risk of cardiovascular disease (CVD, in adults and older adults), including: cholesterol (HDL, LDL), triglycerides, hyperlipidemia, blood pressure (systolic and diastolic), hypertension, CVD morbidity (e.g., myocardial infarction, coronary heart disease, coronary artery disease, congestive heart failure, peripheral artery disease, stroke) or composite CVD morbidity and mortality, CVD-related mortality; Risk of type 2 diabetes (T2D, in adults and older adults), including: fasting blood glucose, fasting insulin, glucose tolerance/insulin resistance, hemoglobin A1c (HbA1C), prediabetes, and T2D; Body composition (in adults and older adults) including: skinfold thickness, fat mass, ectopic fat, fat-free mass or lean mass, waist circumference, waist-to-hip-ratio; Risk of obesity (in adults and older adults) including: body mass index (BMI), underweight, normal weight, overweight and/or obesity, weight gain, and weight loss and maintenance; Pregnancy and postpartum-related weight change (in individuals during pregnancy or

[*] USDA Nutrition Evidence Systematic Review Branch. USDA Nutrition Evidence Systematic Review: Methodology Manual. February 2023. U.S. Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Nutrition Evidence Systematic Review. Available at: https://nesr.usda.gov/methodology-overview

postpartum) including: adequacy of total gestational weight gain (i.e., in relation to recommendations based on pre-pregnancy BMI) and postpartum weight change.

Figure 1. Analytic framework for the evidence scan question: What evidence has been published on the relationship between home food availability in adults and diet-related psychosocial factors, dietary intake, diet quality, and health outcomes?

Population	***Intervention / Exposure***	***Comparator***	***Outcome***
Adults and older adults (19 years and older)	Availability or accessibility of different types and amounts of foods and beverages in the home	Different availability or accessibility of different types and amounts of foods and beverages	Diet-related psychosocial factors, including food-related norms, attitudes, values, and self-efficacy Dietary intake Diet quality Energy intake Risk of CVD • HDL cholesterol • LDL cholesterol • Triglycerides • Hyperlipidemia • Blood pressure (systolic, diastolic) • Hypertension • CVD morbidity (e.g., myocardial infarction, coronary heart disease, coronary artery disease, congestive heart failure, peripheral artery disease, stroke) or composite CVD morbidity and mortality • CVD-related mortality Risk of T2D • Fasting blood glucose • Fasting insulin • Glucose tolerance/insulin resistance • HbA1C • Prediabetes • T2D Body composition: • Skinfold thickness • Fat mass, ectopic fat • Fat-free mass or lean mass • Waist circumference, waist-to-hip-ratio Risk of obesity: • BMI • Underweight • Normal weight • Overweight and/or obesity • Weight gain • Weight loss and maintenance
Adults during pregnancy and postpartum			Diet-related psychosocial factors, dietary intake, diet quality, and energy intake as described above. Pregnancy and postpartum-related weight change • Gestational weight gain • Postpartum weight change

Key Definitions:

Accessibility: availability of food in a form, place, and time that facilitates its consumption; i.e., it is retrievable and ready to eat

Availability: the physical presence of food in a home or living space, regardless of whether it is readily visible or accessible

Develop inclusion and exclusion criteria

The inclusion and exclusion criteria provide an objective, consistent, and transparent framework for determining which articles to include in the evidence scan (see **Table 2**). These criteria ensure that the most relevant and appropriate body of evidence is identified for the evidence scan question, and that the evidence reviewed is:

- Applicable to the U.S. population of interest
- Relevant to Federal public health nutrition policies and programs
- Rigorous from a scientific perspective

Table 2. 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 • Ecological studies • Narrative reviews • Systematic reviews • Meta-analyses • Modeling and simulation studies
Publication date	• January 2000 – September 2023	• Before January 2000, after September 2023
Population: Study participants	• Human	• Non-human

[*] Including quasi-experimental and controlled before-and-after studies

[†] Including uncontrolled before-and-after studies

Category	Inclusion Criteria	Exclusion Criteria

Population: Life stage	**Diet-related psychosocial factors, dietary intake; diet quality; energy intake; body composition and risk of obesity:**
	• At intervention and outcome:
	  ○ Adults and older adults (19 years and older)
	  ○ Adults during pregnancy
	  ○ Adults during postpartum
	Risk of CVD and Risk of T2D:
	• At intervention and outcome:
	  ○ Adults and older adults (19 years and older)
	• At intervention:
	  ○ Adults during pregnancy
	  ○ Adults during postpartum
		At intervention and outcome:
		• Infants and toddlers (birth up to 24 months)
		• Children and adolescents (2 up to 19 years)
		Risk of CVD and Risk of T2D:
		• At outcome:
		  ○ Adults during pregnancy
		  ○ Adults during postpartum

Population: Health status	• Studies that <u>exclusively</u> enroll participants not diagnosed with a disease*
	• Studies that enroll <u>some</u> participants:
	  ○ diagnosed with a disease;
	  ○ who became pregnant using Assisted Reproductive Technologies;
	  ○ with multiple gestation pregnancies;
	  ○ receiving pharmacotherapy to treat obesity;
	  ○ pre- or post-bariatric surgery;
	  ○ and/or hospitalized for an illness, injury, or surgery
		• Studies that <u>exclusively</u> enroll participants:
		  ○ diagnosed with a disease;†
		  who became pregnant using Assisted Reproductive Technologies;
		  ○ with multiple gestation pregnancies;
		  ○ receiving pharmacotherapy to treat obesity;
		  ○ pre- or post-bariatric surgery;
		  ○ and/or hospitalized for an illness, injury, or surgery‡

Intervention/ exposure	• Availability or accessibility of different types and amounts of foods and beverages in the home	• N/A
Comparator	• Different availability or accessibility of different types and amounts of foods and beverages	• No comparator

* Studies that enroll participants who are at risk for chronic disease will be included

† Studies that exclusively enroll participants with obesity will be included

‡ Studies that exclusively enroll participants post-cesarean section will be included

Category	Inclusion Criteria	Exclusion Criteria

Outcome(s)	• Diet-related psychosocial factors, including food-related norms, attitudes, values, and self-efficacy
	• Dietary intake assessed by intake of foods or food group(s)
	• Energy intake
	• Diet quality
	• Risk of CVD (in adults, older adults)
	  ○ LDL cholesterol
	  ○ HDL cholesterol
	  ○ Triglycerides
	  ○ Hyperlipidemia
	  ○ Blood pressure (systolic, diastolic)
	  ○ Hypertension
	  ○ CVD morbidity (e.g., myocardial infarction, coronary heart disease, coronary artery disease, congestive heart failure, peripheral artery disease, stroke) or composite CVD morbidity and mortality
	  ○ CVD-related mortality
	• Risk of T2D (in adults, older adults)
	  ○ Fasting blood glucose
	  ○ Fasting insulin
	  ○ Glucose tolerance/insulin resistance
	  ○ HbA1C
	  ○ Prediabetes
	  ○ T2D
	• Body composition (in adults, older adults)
	  ○ Skinfold thickness
	  ○ Fat mass, ectopic fat
	  ○ Fat-free mass, lean mass
	  ○ Waist circumference, waist-to-hip ratio
	• Risk of obesity (in adults, older adults)
	  ○ BMI
	  ○ Underweight
	  ○ Normal weight
	  ○ Overweight and/or obesity
	  ○ Weight gain
	  ○ Weight loss and maintenance
	• Pregnancy- and postpartum-related weight change (adults during pregnancy or postpartum)
	  ○ Adequacy of total gestational weight gain (i.e., in relation to recommendations based on pre-pregnancy BMI)
	  ○ Postpartum weight change
		• Dietary intake assessed only by intake of individual nutrient(s)
		• Urinary measures of glucose
		• Non-fasting blood glucose
		• Non-fasting insulin
		• Gestational weight gain only during certain time periods or trimesters of pregnancy
		• Absolute total gestational weight gain (i.e., not in relation to recommendations based on pre-pregnancy BMI)
		• Weight loss that is specifically classified as unintentional weight loss (e.g., a component of frailty)

Publication status	• Peer-reviewed articles published in research journals	• Non-peer-reviewed articles, unpublished data or manuscripts, pre-prints, reports, editorials, retracted articles, and conference abstracts or proceedings
Language	• Published in English	• Not published in English

Category	Inclusion Criteria	Exclusion Criteria
Country*	• Studies conducted in countries classified as high or very high on the Human Development Index the year(s) the intervention/exposure data were collected	• Studies conducted in countries classified as medium or low on the Human Development Index the year(s) the intervention/exposure data were collected

Search for and screen studies

NESR librarians, in collaboration with NESR analysts and the Committee, will use the analytic framework and inclusion and exclusion criteria to develop a comprehensive literature search strategy. The literature search strategy will include selecting and searching the appropriate bibliographic databases, translating search using syntax appropriate for the databases being searched, and employing search refinements, such as search filters. The full literature search will be available upon request and will be fully documented in the final evidence scan.

The screening of electronic database search results will be facilitated using a web-based tool (DistillerSR, DistillerSR Inc., Ottawa, Ontario, Canada) and screening forms that will be developed based on the inclusion and exclusion criteria in this evidence scan protocol. After removal of duplicates, a re-ranking function will be utilized in DistillerSR to reorder articles by relevancy. Two NESR analysts will independently screen titles and abstracts of search results up to a 75% recall rate of citations eligible for full-text screening, as assessed by DistillerSR's artificial intelligence (AI) capabilities. We will then move to a single screener up to a 90% recall rate. NESR analysts will stop screening citations remaining past this 90% recall rate of citations eligible for full-text screening. Two NESR analysts will independently perform full-text screening to determine if inclusion criteria are met. Differences in screening decisions will be resolved by consultation with a third NESR analyst.

Extract data

NESR analysts will extract the most essential data from each included article to describe key characteristics of the available evidence, such as the author, publication year, study design, population life stage, intervention, comparator, outcomes, outcome assessment methods, definitions and classifications of food(s), SNAP and/or WIC participation, food security status, and study limitations. One NESR analyst will extract the data and a second NESR analyst will review the extracted data for accuracy.

Description of the evidence

The description of the evidence will include a detailed description of the volume and characteristics (population, intervention, comparator, outcome) of the included evidence. Evidence scan elements may be presented in text, figures, and/or tables.

Considerations for future work

NESR analysts and Committee members will identify and document research gaps and methodological limitations throughout the evidence scan process. These gaps and limitations will be used to develop research recommendations that describe the research, data, and methodological advances that are needed to

* The classification of countries on the Human Development Index (HDI) is based on the UN Development Program Human Development Report Office (http://hdr.undp.org/en/data) for the year the study intervention occurred or data were collected. If the study does not report the year(s) in which the intervention/exposure data were collected, the HDI classification for the year of publication is applied. Studies conducted prior to 1990 are classified based on 1990 HDI classifications. If the year is more recent than the available HDI values, then the most recent HDI classifications are used. If a country is not listed in the HDI, then the current country classification from the World Bank is used (The World Bank Country and Lending Groups, available from: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-country-and-lending-groups)

strengthen the body of evidence on a particular topic. Rationales for the necessity of additional or stronger research may also be provided with the research recommendations.

Acknowledgments and funding

The Committee members are involved in: establishing all aspects of the protocol, which presents the plan for how they are planning to examine the scientific evidence, including the inclusion and exclusion criteria; reviewing all studies that meet the criteria the Committee sets; and deliberating on the body of evidence for each question. The NESR team, with assistance from Federal staff from HHS and USDA (Meghan Adler, MS, RDN; Dana DeSilva, PhD, RD; Emily Levin, MPH, RDN; Chinwe Obudulu, MS, RD, LD; Elizabeth Rahavi, RD) and Project Leadership (HHS: Janet de Jesus, MS, RD; USDA: Eve Stoody, PhD), supports the Committee by facilitating, executing, and documenting the work necessary to ensure the reviews and evidence scans are completed in accordance with NESR methodology.

Funding: United States Department of Agriculture, Food and Nutrition Service, Center for Nutrition Policy and Promotion, Alexandria, VA