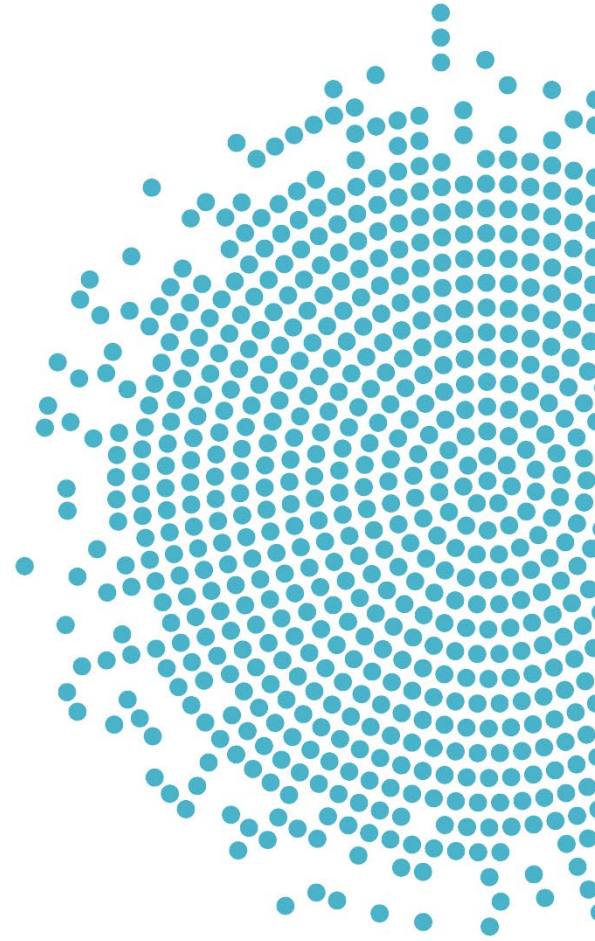


Household Food Waste in the United States: An Evidence Scan Protocol

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Introduction

To inform future reevaluations of the Thrifty Food Plan, the U.S. Department of Agriculture’s (USDA), Food and Nutrition Service (FNS), Center for Nutrition Policy and Promotion (CNPP) identified a need to examine the evidence on household food waste in the United States. USDA/FNS/CNPP’s Nutrition Evidence Systematic Review (NESR) team was tasked with conducting an evidence scan to address this research need, in collaboration with the Nutrition and Economic Analysis Branch (**Table 1**).

Table 1. Review history

Date	Description	Citation
June 2024	Evidence scan protocol published online	Pannucci T, Lino M, McClain V, Meyers Mathieu K, Obbagy J, Higgins M, Stoody E. Household food waste in the United States: An Evidence Scan Protocol. May 2024. 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

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 questions have been identified for this evidence scan:

1. What evidence has been published that describes how much food is wasted at home?
2. What evidence has been published that describes factors associated with food wasted at home?

Methods

The NESR methodology manual* has a detailed description of the NESR methodology as it will be applied in this evidence scan. This section presents an overview of the specific methods that will be used to answer the evidence scan questions:

1. What evidence has been published that describes how much food is wasted at home?
2. What evidence has been published that describes factors associated with food wasted at home?

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, *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

* 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>

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 the amount of food wasted at home in U.S. households. The outcomes of interest are the volume and characteristics of evidence available on this topic, including descriptive information related to definitions of food waste at home, methods for measuring food waste at home, methods used to analyze or quantify food waste, and factors that are examined in relation to food wasted at home.

Figure 1. Analytic framework for the evidence scan questions: What evidence has been published that describes how much food is wasted at home? What evidence has been published that describes factors associated with food wasted at home

<i>Population</i>	<i>Intervention / Exposure</i>	<i>Outcome</i>
Households in the United States	Food wasted at home	Definitions of food waste at home Methods for measuring food wasted at home Methods for analyzing and quantifying food waste Amount of food wasted at home, including total food waste and by type of food Characteristics of the households and populations that have been examined in research on food waste Factors that impact food wasted at home

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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • N/A
Publication date	<ul style="list-style-type: none"> • No publication date limit – June 2024 	<ul style="list-style-type: none"> • After June 2024
Population: Study participants	<ul style="list-style-type: none"> • Human 	<ul style="list-style-type: none"> • Non-human
Population: Life stage	<ul style="list-style-type: none"> • Households including residents of all life stages, including: <ul style="list-style-type: none"> ○ Infants and young children (birth up to 24 months) ○ Children and adolescents (2 up to 19 years) ○ Adults and older adults (19 years and older) ○ Adults during pregnancy ○ Adults during postpartum 	<ul style="list-style-type: none"> • N/A
Intervention/ exposure	<ul style="list-style-type: none"> • Food wasted at home 	<ul style="list-style-type: none"> • Food wasted at other locations, such as schools, food service establishments, food retail settings, or food production facilities
Outcome(s)	<ul style="list-style-type: none"> • Studies that provide the following information: <ul style="list-style-type: none"> ○ Definitions of food waste at home ○ Methods for measuring food wasted at home ○ Methods for analyzing and quantifying food waste ○ Amount of food wasted at home, including total food wasted and by types of foods ○ Characteristics of the households and populations that have been examined in research on food waste ○ Factors that impact food wasted at home 	<ul style="list-style-type: none"> • N/A
Publication status	<ul style="list-style-type: none"> • Peer-reviewed articles published in research journals • Articles published by government or non-governmental organizations 	<ul style="list-style-type: none"> • Non-peer-reviewed articles, unpublished data or manuscripts, pre-prints, reports, editorials, retracted articles, and conference abstracts or proceedings
Language	<ul style="list-style-type: none"> • Published in English 	<ul style="list-style-type: none"> • Not published in English

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

† Including uncontrolled before-and-after studies

Category	Inclusion Criteria	Exclusion Criteria
Country*	<p>Studies that provide definitions of food waste at home, methods for measuring food wasted at home, and methods for analyzing and quantifying food waste:</p> <ul style="list-style-type: none"> Studies conducted in countries classified as high or very high on the Human Development Index the year(s) the intervention/exposure data were collected <p>Studies that describe the amount of food wasted at home, describe the households and populations that have been examined in research on food waste, or factors that impact food wasted at home:</p> <ul style="list-style-type: none"> Studies conducted in the United States 	<p>Studies that provide definitions of food waste at home, methods for measuring food wasted at home, and methods for analyzing and quantifying food waste:</p> <ul style="list-style-type: none"> Studies conducted in countries classified as low or medium on the Human Development Index the year(s) the intervention/exposure data were collected <p>Studies that describe the amount of food wasted at home, describe the households and populations that have been examined in research on food waste, or factors that impact food wasted at home:</p> <ul style="list-style-type: none"> Studies conducted in countries other than the United States

Search for and screen studies

NESR librarians, in collaboration with NESR analysts, 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, and detailed information about how food waste was defined, measured, and analyzed, characteristics of the participant households, and factors that were examined in relation to food waste. One NESR analyst will extract the data and a second NESR analyst will review the extracted data for accuracy.

* 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>)

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

Research gaps and methodological limitations will be identified and documented 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 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 authors were 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.

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