A National Strategy to Reduce Food Waste at the Consumer Level

A Consensus Report

Outline

- What is the impact of consumers' food waste?

- Statement of Task and committee

- Approach

- Selected findings

- Strategy

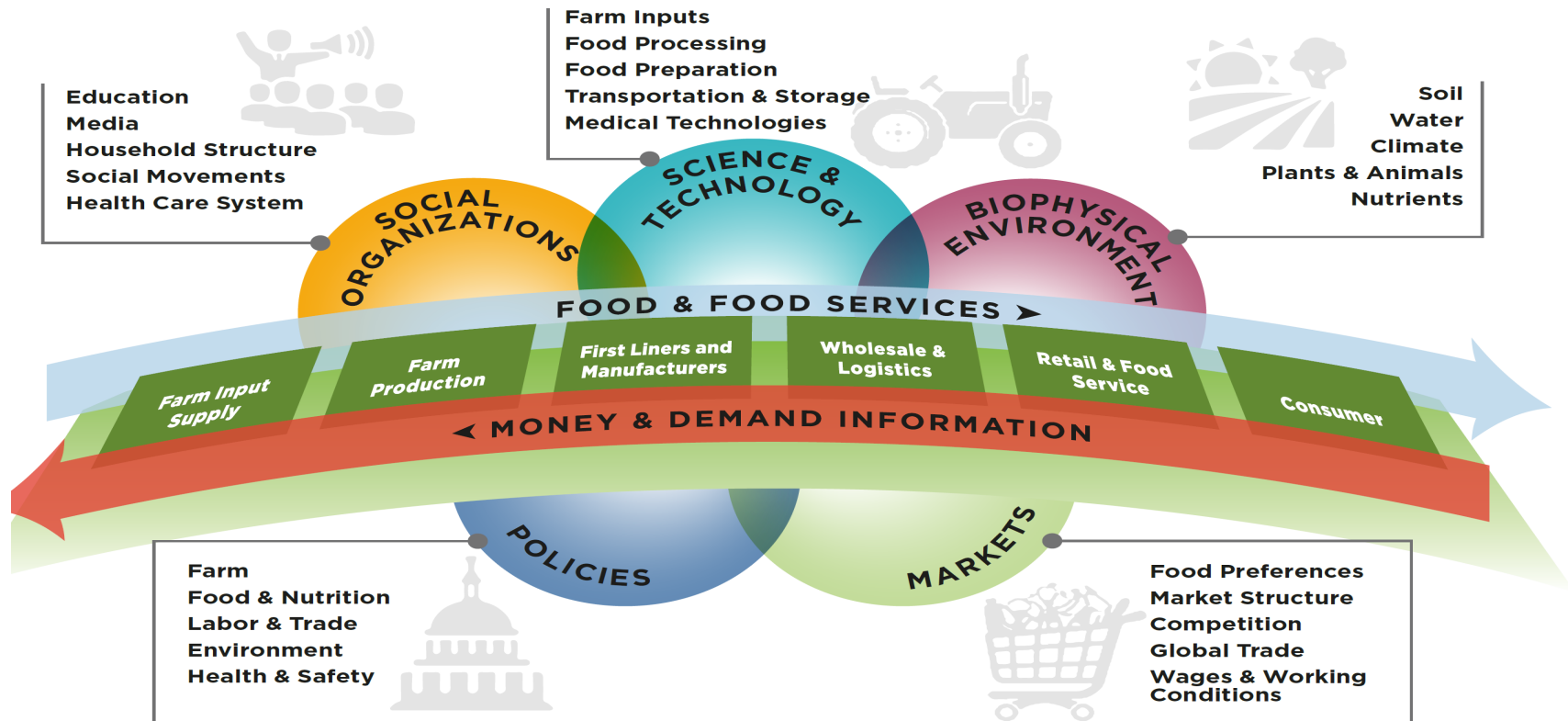The National Academies of | SCIENCES ENGINEERING MEDICINE

The Impact of Wasted Food

- Despite our love for food, we—consumers— waste a significant amount

- Food waste has detrimental effects:
  - increase in GH gases, use of natural resources, among others
  - cost to consumers

Waste is shaped by influences within and outside the food system

Statement of Task

- Review the existing data, including assessment of effectiveness for reduction efforts

- Make actionable recommendations for food waste reduction strategies

- Identify implementation strategies to reduce wasted food at the consumer level from a system perspective

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Committee

*BARBARA O. SCHNEEMAN (*Chair*), University of California

*CAIT LAMBERTON, Wharton School of Business, University of Pennsylvania

LAURA C. MORENO, University of California

*RONI NEFF, Johns Hopkins Bloomberg School of Public Health

RICHARD E. NISBETT, University of Michigan

JENNIFER J. OTTEN, University of Washington School of Public Health

*BRIAN E. ROE, Ohio State University

CHRISTOPHER M. SHEA, University of North Carolina

TAMMARA SOMA, Simon Fraser University

*GAIL TAVILL, Packaging & Food Systems Sustainability Consulting LLC

Consultant

ROBERT B. CIALDINI, Arizona State University

COVID-19

- Committee's work on food waste was well underway
- The pandemic has affected many areas related to this task, among them:
  - Consumer's behavior, food security & access
  - Food service and retailers' operations
  - Relationships within food supply chain
- We are in a teachable moment which underscores the relevance of our strategy

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Approach to the Task

We reviewed:

- Current efforts
- Evidence from studies
  - Behavior change research and theories from other domains
  - Drivers
  - Interventions
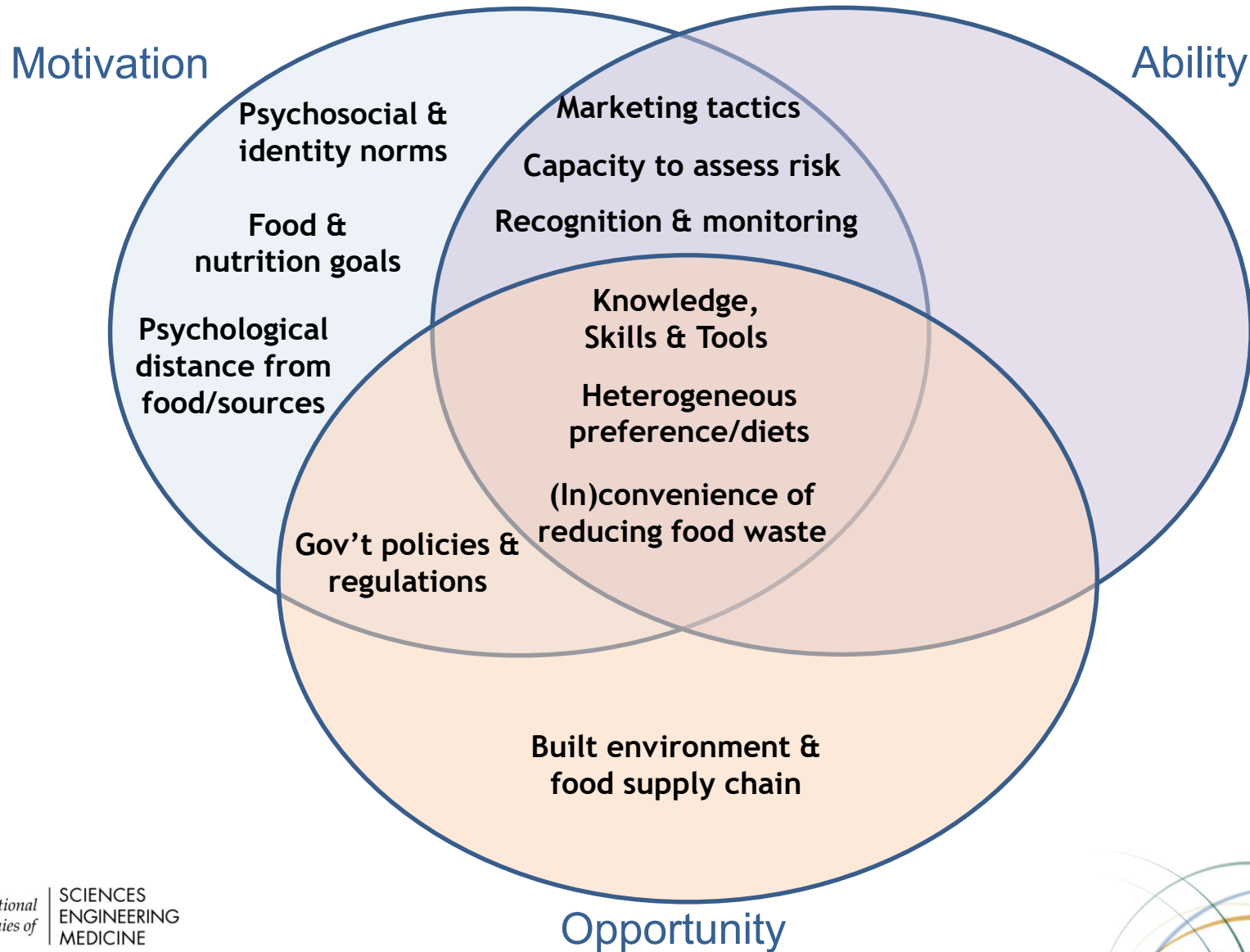
Motivation

Opportunity

Ability

Drivers Identified

- Knowledge, skills, and tools;
- Capacity to assess risks;
- Food and nutrition goals;
- Recognition/monitoring of food waste;
- Psychological distance;
- Heterogeneity in preferences/diets;
- Inconvenience of reducing food waste;
- Marketing tactics;
- Psychosocial and identity norms;
- The built environment and food supply chain;
- Government policies and regulations

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Drivers in Peer-reviewed Studies

Motivation

Ability

Opportunity

Psychosocial & identity norms

Food & nutrition goals

Psychological distance from food/sources

Marketing tactics

Capacity to assess risk

Recognition & monitoring

Knowledge, Skills & Tools

Heterogeneous preference/diets

(In)convenience of reducing food waste

Gov't policies & regulations

Built environment & food supply chain

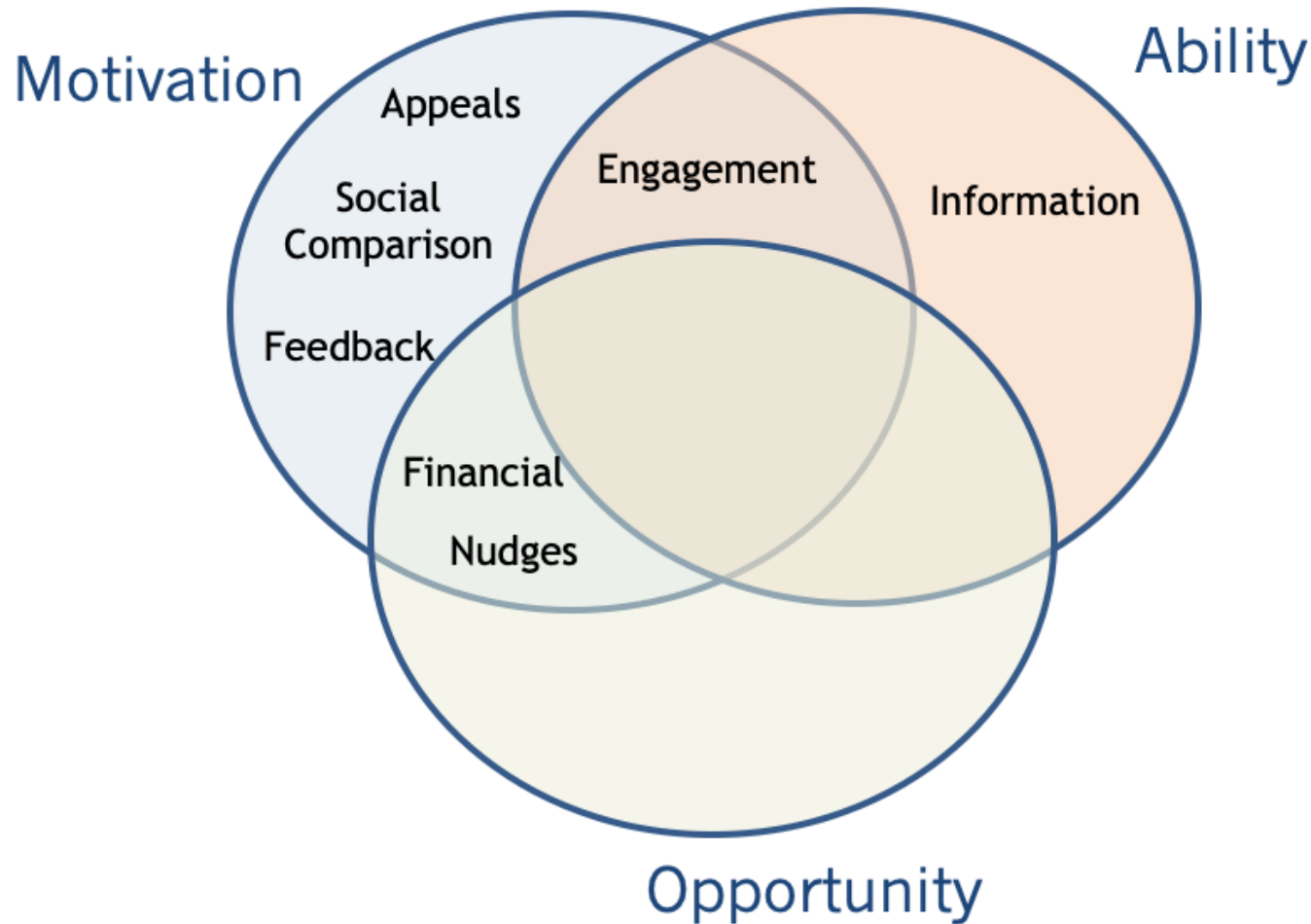The National Academies of | SCIENCES ENGINEERING MEDICINE

Highlights from the Evidence

- Drivers of food waste collectively influence consumer behaviors at acquisition, consumption, and disposal

- The largest proportion of drivers addressed by research relate to motivation

- Not all potential drivers across settings have been studied

- Prioritizing of drivers is not possible
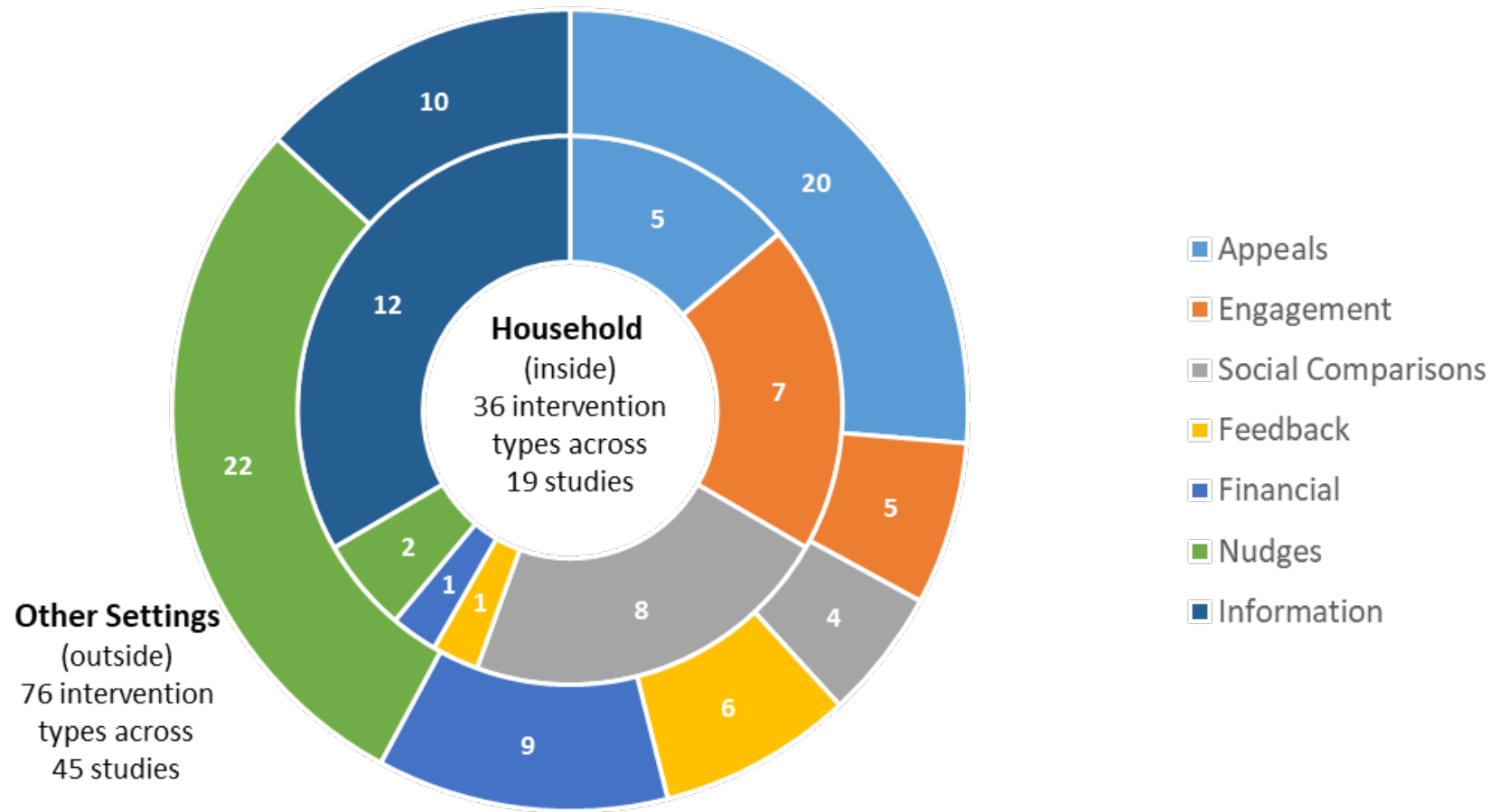
- We also learn insights from other domains

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Types of Interventions

Motivation • Ability • Opportunity Venn diagram with interventions: Appeals, Social Comparison, Feedback (Motivation); Engagement (Motivation ∩ Ability); Information (Ability); Financial, Nudges (Motivation ∩ Opportunity).

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Evidence Tiers and Settings

Settings and Intervention Types

Household
(inside)
36 intervention
types across
19 studies

Other Settings
(outside)
76 intervention
types across
45 studies

Legend:
- Appeals
- Engagement
- Social Comparisons
- Feedback
- Financial
- Nudges
- Information

Highlights from the Evidence

- Few studies meet all Tier 1 criteria
- Not yet clear support for widespread adoption of any intervention type
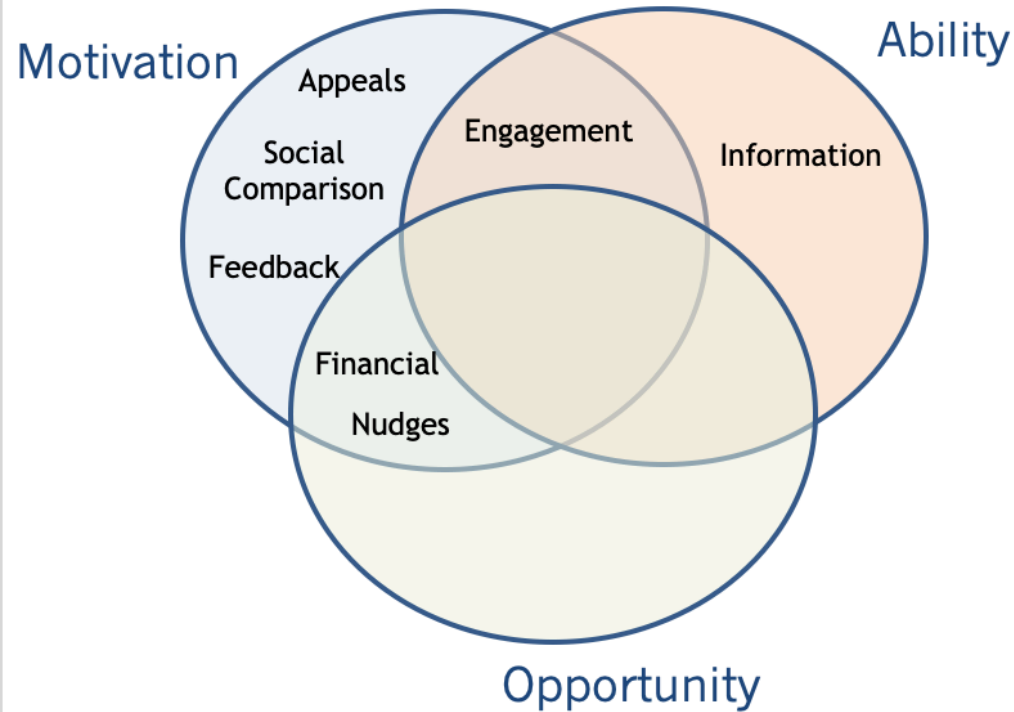- Additional research is essential

Nonetheless…

- Evidence + suggestive evidence: some interventions reduce waste
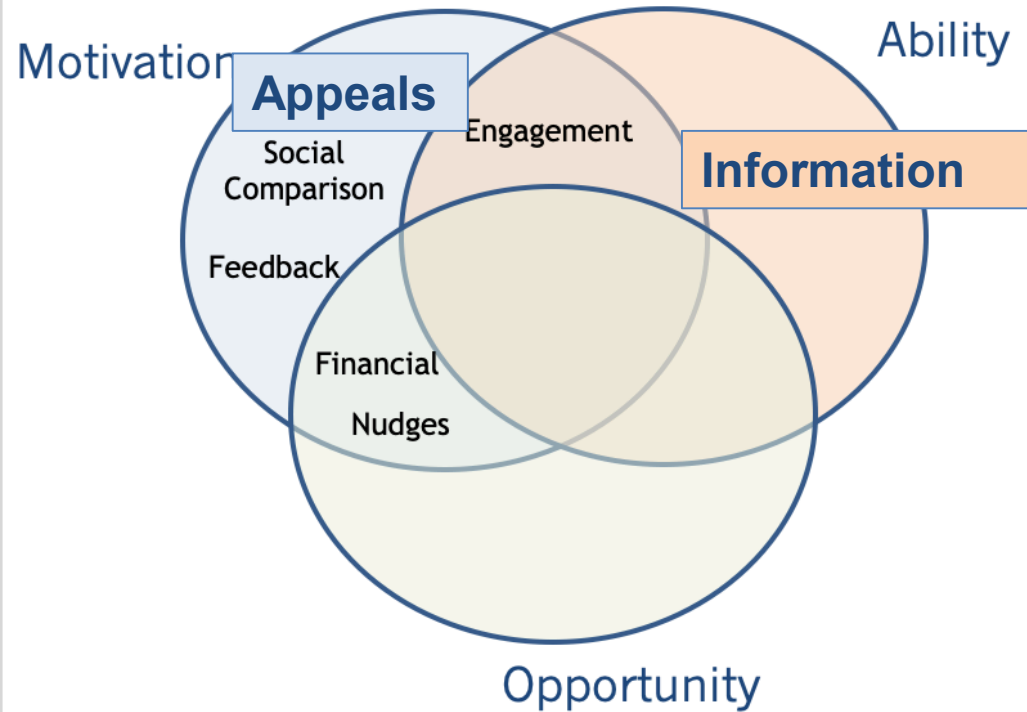- Plus, the committee reviewed the efficacy of interventions from related domains

Which Interventions Are Effective?*

1. Multifaceted

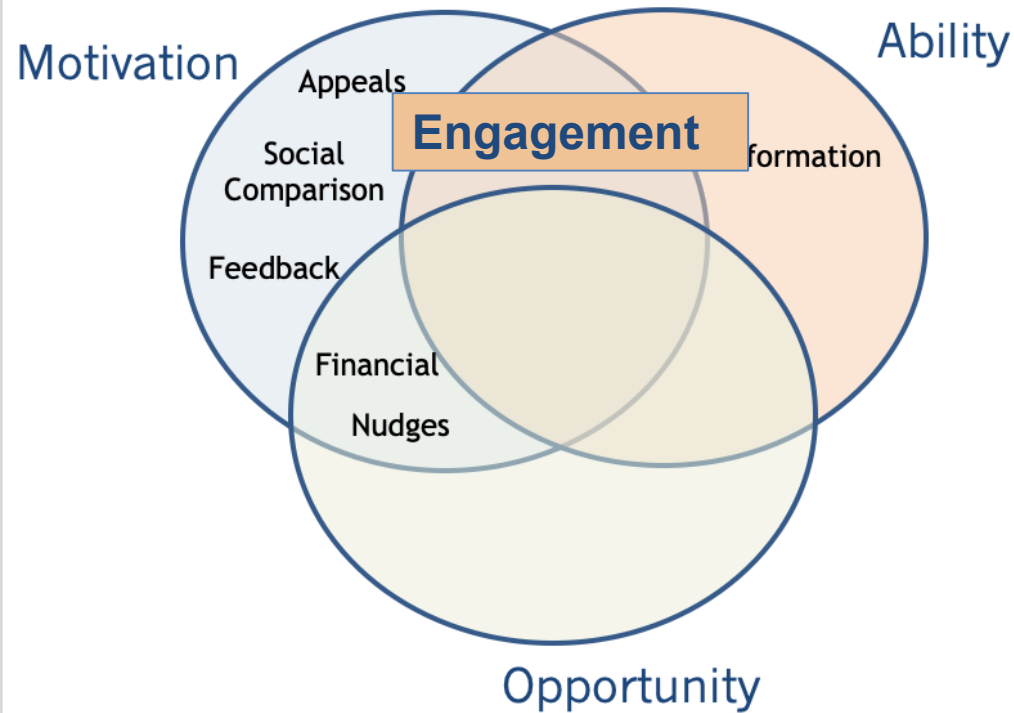* With limits

Which Interventions Are Effective?*

Motivation
Appeals
Social Comparison
Feedback
Engagement
Ability
Information
Financial Nudges
Opportunity

1. **Multifaceted**

2. **Simple**
- Signs/written materials (request, motivational facts)
- Request by waiter

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* With limits

Which Interventions Are Effective?*

Motivation · Ability · Opportunity Venn diagram with:
- Appeals
- Social Comparison
- Feedback
- Financial Nudges
- **Engagement**
- ...formation

1. **Multifaceted**
2. **Simple**

3. **Engage people**
- Teachers, students

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Which Interventions Are Effective?*

Motivation

Ability

Appeals

Engagement

Information

Social Comparison
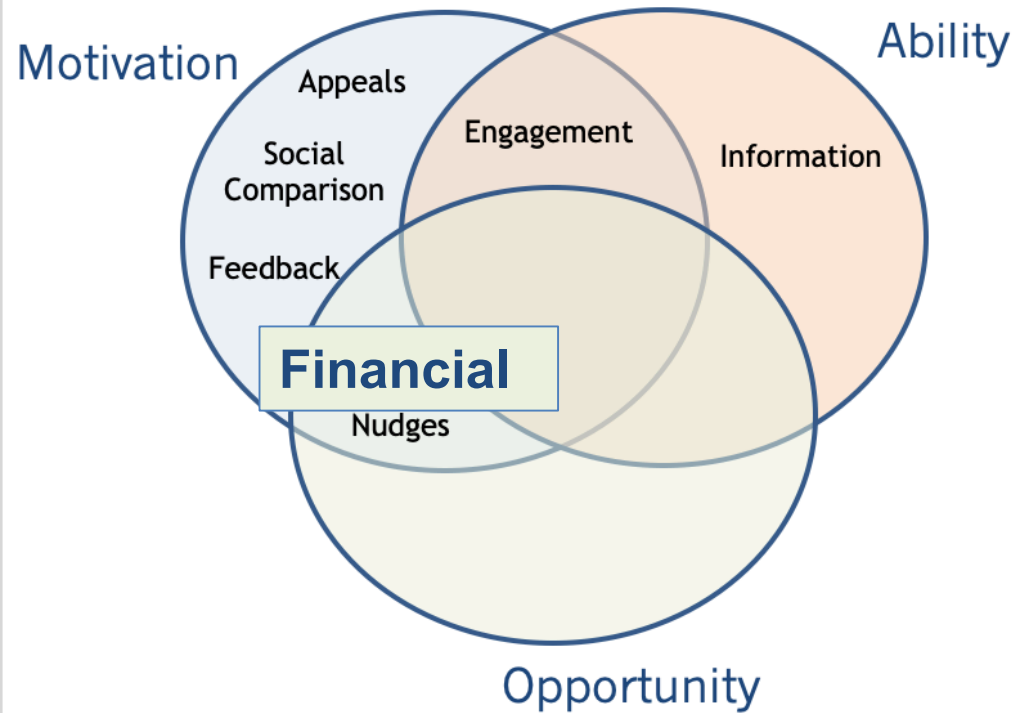
Feedback

Financial

Nudges

Opportunity
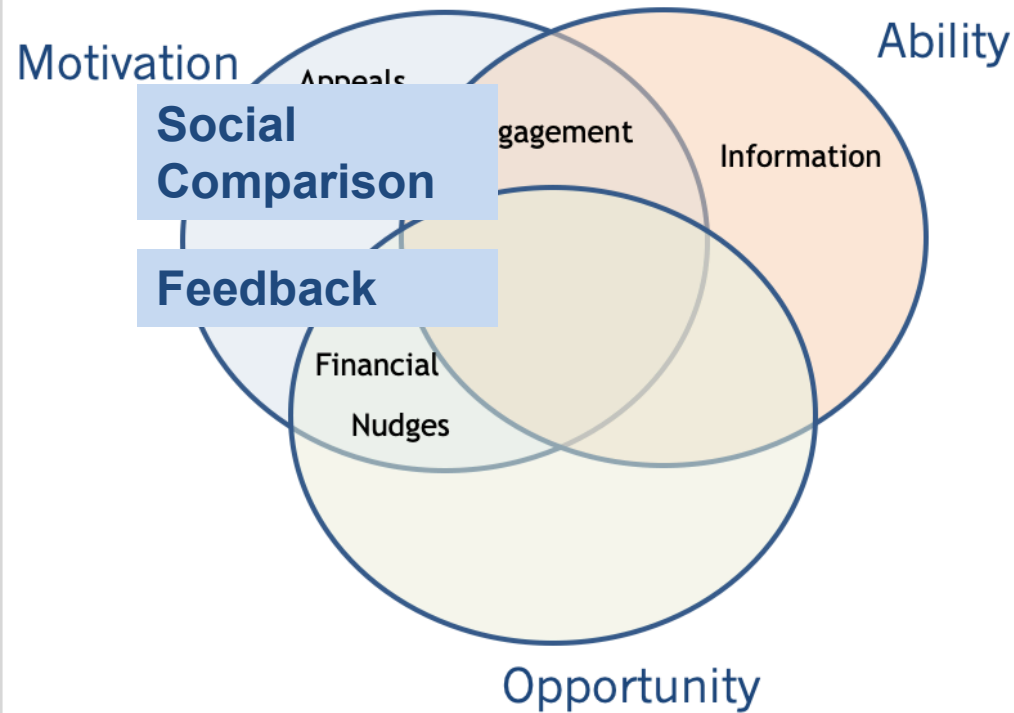
1. **Multifaceted**
2. **Simple**
3. **Engage people**

4. **Social comparisons, feedback**
- Waste data (for self or share with others)
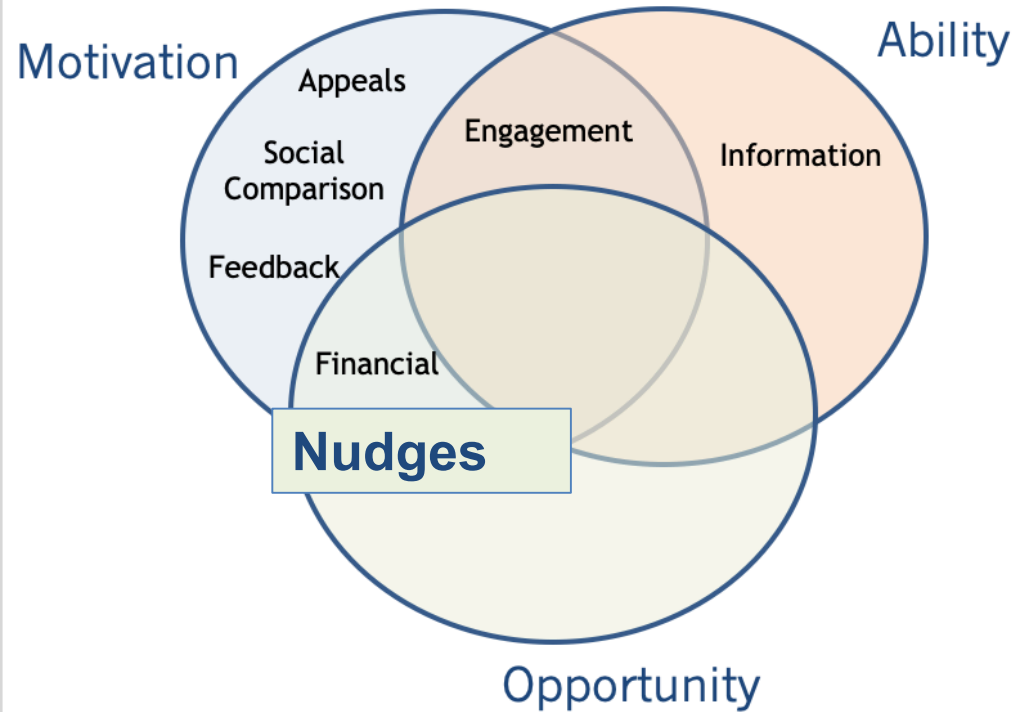- Server helps reduce stigma of taking leftovers
(All Tier 2)

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Which Interventions Are Effective?*

Motivation — Ability — Opportunity

- Appeals
- Social Comparison
- Feedback
- Engagement
- Information
- **Financial**
- Nudges

1. **Multifaceted**
2. **Simple**
3. **Engage people**
4. **Social comparisons, feedback**

5. **Financial incentives**
- Pay to discard

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Which Interventions Are Effective?*

Motivation

Appeals

Social Comparison

Feedback

Financial

Nudges

Engagement

Ability

Information

Opportunity

1. **Multifaceted**
2. **Simple**
3. **Engage people**
4. **Social comparisons, Feedback**
5. **Financial incentives**

6. Nudges

- Smaller plates, portions; tray removal
- Helping people perceive food differently

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Limits of the Evidence

- Short-term, small scale studies
- Diverse approaches to measurement
- Few or no studies of some promising drivers, intervention types
- Attention to trade-offs, licensing
- Attention to distributional, equity effects
- Generalizability across populations, contexts

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Insights for Designing Interventions

Multifaceted Interventions:

Address more that one of the elements in the M-O-A framework

Importance of Context:

Understand the drivers in a specific setting

Importance of Cognitive Process:

Understand the underlying process will inform better interventions

Think Beyond Design: Integrate plans for implementation and evaluation

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Strategy for Reducing Food Waste

3 Pathways	
Change in the Food Environment	• Implement change and innovation in the food industry • Include food waste reduction in industry certification • Develop and harmonize sensible date labeling • Implement state and local policies
Strengthen Consumer's Motivation, Opportunity, and Ability	• Conduct a national behavior change campaign. • Spread and amplify messages about food waste through influencers • Include instruction and experiential learning about food literacy in education curricula
Leverage, Apply Research Findings and Technology	• Support research and technology
Coordination and Partnerships	

Path 1: Change in the Food Environment

Food trade associations and their joint alliances (1)

Expand their efforts to reduce food waste by convening an ongoing public–private–academic forum with the goal of coordinating industry efforts

Manufacturers, retailers, and food service venues (2)

Develop promotions and other in-store cues that prioritize acquisition of the optimal amount and variety of products

Combine elements—including presentation of food and communications—to alter wasteful behavior

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Path 1: Change in the Food Environment

Organizations in charge of developing environmental standards for businesses (3)

-Include practices that reduce consumer food waste as criteria in those standards

-Encourage food businesses to modify their practices to meet those criteria.

Food industry trade associations, consumer organizations, and other nonprofit organizations (4)

-Coordinate and advocate for federal legislation to harmonize the language and standard date labels.

-Coordinate efforts to educate the public

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Path 1: Change in the Food Environment

State and local governments (5)

-Institute policies that reduce food waste discards, including fees for removing municipal solid waste per unit of waste.

-Integrate them with related policies such as those to reduce environmental impact or promote equity-related outcomes.

The Environmental Protection Agency and nongovernmental entities (6)

Support local jurisdictions and states in developing such policies.

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Path 2: Strengthen Consumer's Motivation, Opportunity, and Ability

The USDA, the EPA, and the FDA (7)

Lead development of a centralized platform for a behavior change campaign, designed to inform the public about the environmental, economic, and social benefits of reducing food waste, to provide tools and strategies for reducing their own waste, and to address nonconscious drivers of food waste.

Path 2: Strengthen Consumer's Motivation, Opportunity, and Ability

Professional and community organizations (8)

Work with their membership and with influencers to advance consistent food literacy information, provide evidence-based guidance about optimizing the consumption of food and minimizing waste, and help shift social norms by providing information about the positive effects of supporting consumers in reducing waste.

Path 2: Strengthen Consumer's Motivation, Opportunity, and Ability

Nongovernment organizations with other appropriate entities (9)

Work in concerted, coordinated efforts to provide K-12, postsecondary, and secondary institutions with appropriate tools and resources and promote their use in instruction and hands-on learning about the social, environmental, and economic impacts of food waste and ways to reduce it.

Path 3: Leverage and Apply Research Findings and Technology

Government agencies and relevant foundations (10 & 12)

-Support the food waste reduction initiative by investing in:

- technology to help reduce food waste

- research to measure food waste nationally

- research to evaluate food waste and other outcomes and integrated with implementation plans

- training in evaluation and implementation planning

- dissemination of information

-Require the evaluation of outcomes

Research & Implementation Needs

- Understanding drivers

- Better design and conduct of intervention studies

- Implementation needs:

  - Attend not only to unexpected outcomes but also to feasibility, capacity, fidelity to the intervention design, cost, and appropriateness to the settings.

  - Few interventions have been evaluated for effectiveness in real-world and large-scale applications.

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# Coordination and Partnership

The USDA, the EPA, and the FDA (11)

Expand the Winning on Food Waste Initiative by coordinating with key stakeholders and

- Be the locus of practical information
- Support a public clearinghouse for sharing information
- Support research-based interventions
- Work with others in resolving technical challenges

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Coordination and Partnership

Federal agencies	State and local agencies	Manufacturers, retailers, marketers
The agriculture sector	Food service providers	Food industry organizations
Standards organizations	Nongovernment organizations	Professional associations
Influencers	Schools, colleges and universities	Innovators
Foundations	Researchers and academic institutions	
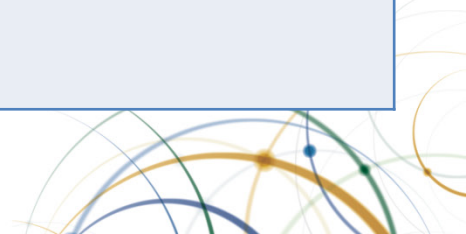
To Access the Report and Other Materials: https://nationalacademies.org/food-waste

Committee Members

- **BARBARA O. SCHNEEMAN** (*Chair*)
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- **TAMMARA SOMA**
- **GAIL TAVILL**
- **ROBERT B. CIALDINI** (*Consultant*)

NASEM staff

- **MARIA ORIA**
- **ALIX BEATTY**
- **TOBY M. WARDEN**
- **ALICE VOROSMARTI**
- **TINA LATIMER**
- **ANN L. YAKTINE**

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QUESTIONS & ANSWERS

Additional Slides

2.1	Need to understand drivers of consumer waste in context of food system
2.2	Addressing consumer misperceptions about food is promising avenue for reducing waste
2.3	Need more, more coordinated and better evaluation of consumer focused waste reduction efforts
2.4	Need to identify business practices that both reduce consumer waste and increase firm value
3.1	Drivers best understood via MOA and on spectrum from autonomous to relective
3.2	Hard to prioritize across consumer waste drivers given current research
4.1	Limited research --> can't support widespread adoption of any particular practice; so seem to work in short run
4.2	Future research must address key limitations in current work: short term, replication, no systems
6.1	Translational research needed to ensure any promising interventions work at scale
6.2	Research to develop interventions should also research implementation barriers