Primer on Sustainable Food Systems for Nutrition and Dietetics Professionals

Released January 2021

This resource was developed as part of the Academy of Nutrition and Dietetics Foundation's Future of Food initiative, which is supported by an educational grant from National Dairy Council

Acknowledgements

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We thank those who provided expert review throughout the development process:

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About the Future of Food Initiative

The Academy of Nutrition and Dietetics Foundation launched the Future of Food initiative in 2012 to position the Academy and its members to address the issues of global food security, hunger, and malnutrition. The initiative was launched with support from National Dairy Council and Feeding America.

Resources produced within the Future of Food initiative include:

Curricula for dietetic interns and students

- Food Insecurity / Food Banking curriculum (released in 2014)
- Sustainable, Resilient, and Healthy Food and Water Systems (SFS) curriculum (released in 2018)

Publications

- Linking Agriculture, Nutrition, and Health: The Role of the Registered Dietitian Nutritionist (Vogliano et al, 2015)
- Cultivating Sustainable, Resilient, and Healthy Food and Water Systems: A Nutrition-Focused Framework for Action (Spiker et al., 2020)

Webinars, toolkits, infographics, and other resources

Visit the Foundation's website for more: https://eatrightfoundation.org/why-it-matters/public-education/future-of-food/

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Learning Outcomes

Primer on Sustainable Food Systems for Nutrition and Dietetics Professionals

By the end of this primer, you will be able to:

1. Use a **conceptual framework of the food system** to describe how food systems influence diets, nutrition and health.
2. Discuss **sustainability, resilience, and health** in food systems through the lens of environmental, economic, and social factors.
3. Use tools from **systems thinking** to describe complexities, co-benefits, and trade-offs within food systems.
4. Identify five **entry points** through which nutrition and dietetics professionals can leverage their unique skills to cultivate sustainable food systems.
5. Locate **reliable resources** related to sustainable food systems for nutrition and dietetics professionals.

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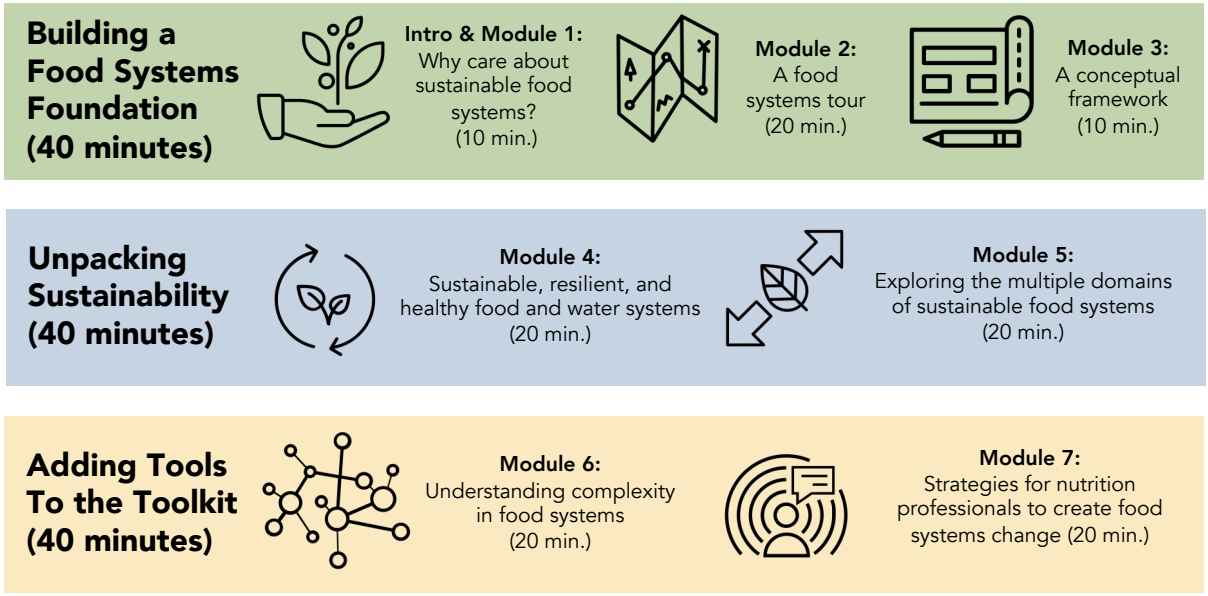
Primer on Sustainable Food Systems for RDNs and NDTRs



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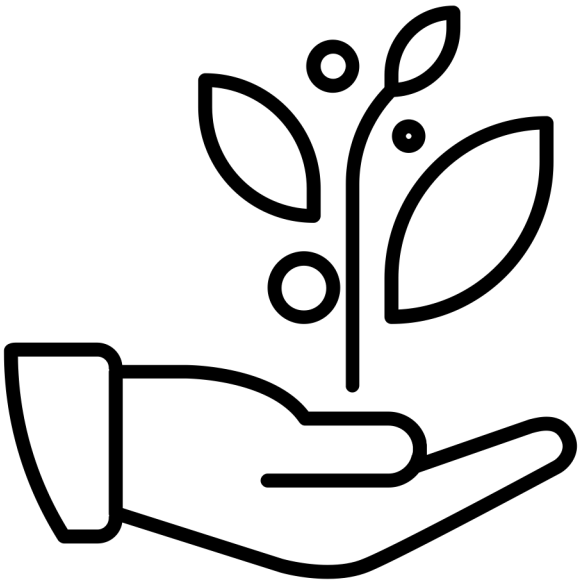
Module 1

Why care about sustainable food systems?



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Module 1 Learning Outcomes

Why care about sustainable food systems?

By the end of this module, you will be able to:

1. Describe the **growing interest** in sustainable food systems from individuals, institutions, and policymakers.
2. Identify **core skills** of the nutrition and dietetics profession that are especially helpful in navigating issues in the food system.
3. Identify ways that familiarity with sustainable food systems can **help RDNs and NDTRs meet their goals** in a variety of practice settings.

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Nutrition and food are inseparable from sustainability

We recommend varied, balanced diets. But, people can't follow our recommendations if nutritious foods are not:

- **Accessible** (e.g., is this food available at places I can regularly visit?)
- **Affordable** (e.g., is this food available at prices I can regularly afford?)
- **Available** in the food supply (e.g., is enough produced or imported?)

For example:

- **In the United States:**
  - As of 2010, our food supply had a Healthy Eating Index score of 55 out of 100, indicating that the food supply did not align with the 2010 Dietary Guidelines for Americans (1)
  - Per capita **vegetable** availability (1.64 cups/day) falls short of recommended 2.5 cups/d (2)
  - Per capita **fruit** availability (0.87 cups/day) falls short of recommended 2 cups/d (2)
  - Per capita **fish** availability (4.4 oz/week) falls short of recommended 8 oz/week (3)
- **Globally:** 45% of the world lives in countries that do not produce or import the World Health Organization (WHO) target of 400 g fruits and vegetables per capita per day (4)

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Sources: *(1) Miller et al., 2015 (2) Bentley J, USDA ERS, 2017 (3) National Research Council, 2015 (4) Mason-D'Croz, 2019. See handout for full references.*

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Nutrition and food are inseparable from sustainability – continued

Feeding people always involves an ecological footprint.

Agricultural practices account for:

- 34% of global land use (1)
- 70% of water withdrawn for human purposes (2)
- 11% of global greenhouse gas emissions (3)

Globally, 1/3 of all food produced is ultimately lost or wasted (4)

So the question is:

How can we ensure **the long-term viability of the natural, economic, and social resources** needed to produce a nutritious food supply?

Sources: *(1) Ramankutty et al., 2008 (2) Molden et al., 2007 (3) Center for Climate and Energy Solutions, 2020 (4) World Resources Institute, 2013. See handout for full references.*

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Patients and clients have questions about sustainability

Do we produce enough to **feed the world?** Will there be enough food for our children and grandchildren?

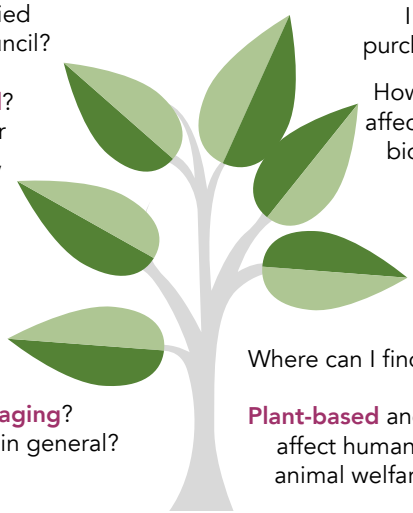
Are the **labels** meaningful – cage free, pasture raised, fair trade, certified humane, marine stewardship council?

Should I buy **organic or conventional**? How do they affect my health, worker health, nutritional value, biodiversity, agricultural productivity?

Should I buy **local food**? What about **seasonal** food?

Should I be worried about **pesticide** residues?

Should I avoid plastic **packaging**? How can we reduce packaging in general?



How can I eat sustainably on a **budget**?

How can I **waste** less food?

Do my **individual actions** matter? Should I "vote with my fork"? How can my purchases support community economies?

How do **genetically modified** foods affect nutritional value, human health, biodiversity, global food security?

What type of **fish** should I buy? How do different fishing practices affect nutritional value, fish stocks, marine environments?

Where can I find reliable, **unbiased information**?

Plant-based and **animal source foods** – how do they affect human health, climate change, water use, animal welfare, antibiotic resistance, farm labor?

Source: *House of Delegates Member Pulse Survey, 2019*

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Institutions have questions about sustainability

How can **our food procurement, menu planning,** and other **operational decisions** help us provide meals that are nutritious, environmentally friendly, culturally acceptable, affordable, and support community economies?

How do we ensure that the **easy choice** within workplaces and cafeterias is also the healthy and sustainable choice?

How can we use organizational policies, technologies, and behavior change strategies to **reduce waste** of food, water, and other resources – within commercial kitchens? within school cafeterias? within supermarkets?

How can we engage and train **frontline workers** to sustain waste reduction interventions over the long term?

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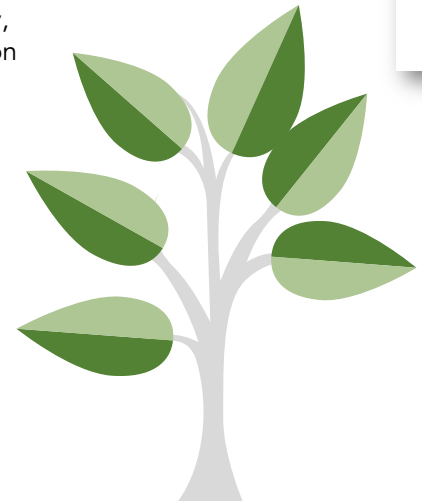
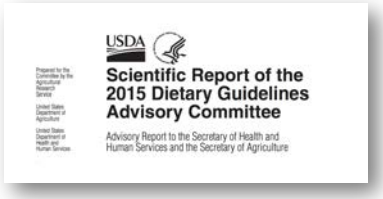
Policymakers have questions about sustainability

To what extent should population-level **dietary guidance** take into consideration the long-term sustainability of the food supply, and the impact of human diets on natural resources?

Are healthy diets also sustainable diets? Where are there **co-benefits or tradeoffs?**

And, what is the strength of the **evidence** to support these relationships?





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Are we prepared to respond to these questions, as individual practitioners and as a profession?

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The core skills of the nutrition and dietetics profession help us to navigate these challenges. We are skilled at:

Helping people navigate dietary choices amidst **complexity and uncertainty**

Fulfilling **multiple goals** through food: not just nutritious, but also safe, delicious, affordable

Critically evaluating and **translating research** from a variety of scientific disciplines

Collaborating as part of **interprofessional teams** and engaging with other sectors

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When RDNs and NDTRs are familiar with food systems and sustainability, we are better equipped to:

Engage the public's growing interest in food, food systems, and sustainability as an **opportunity to guide individuals towards nutritious choices**

Amplify the effectiveness of individual-level interventions (e.g., education and behavior change) with actions at the **policy, systems, and environmental levels**

Identify actions that **generate positive changes in the food system** (e.g., improving equitable access to culturally appropriate foods, strengthening local economies)

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Primer on Sustainable Food Systems for RDNs and NDTRs

Building a Food Systems Foundation (40 minutes)

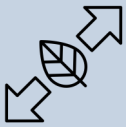
Intro & Module 1: Why care about sustainable food systems? (10 min.)

Module 2: A food systems tour (20 min.)

Module 3: A conceptual framework (10 min.)

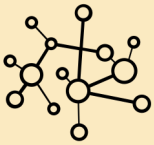
Unpacking Sustainability (40 minutes)

Module 4: Sustainable, resilient, and healthy food and water systems (20 min.)



Module 5: Exploring the multiple domains of sustainable food systems (20 min.)

Adding Tools To the Toolkit (40 minutes)



Module 6: Understanding complexity in food systems (20 min.)

Module 7: Strategies for nutrition professionals to create food systems change (20 min.)

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Primer on Sustainable Food Systems for Nutrition and Dietetics Professionals: Module 2

Released January 2021

This resource was developed as part of the Academy of Nutrition and Dietetics Foundation's Future of Food initiative, which is supported by an educational grant from National Dairy Council

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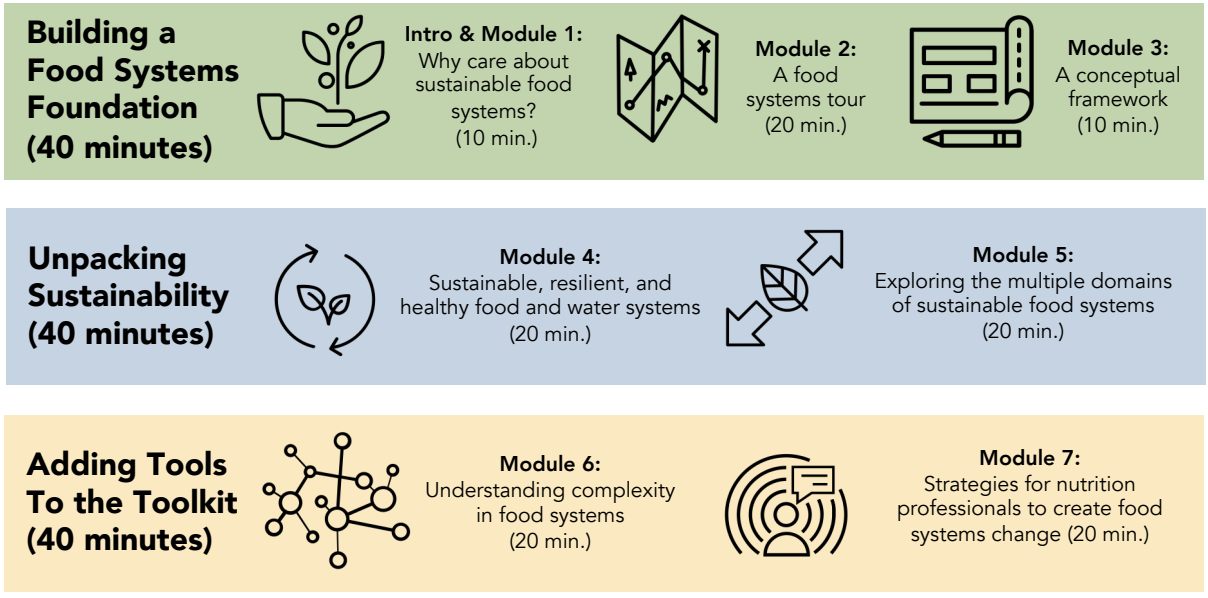
Primer on Sustainable Food Systems for RDNs and NDTRs



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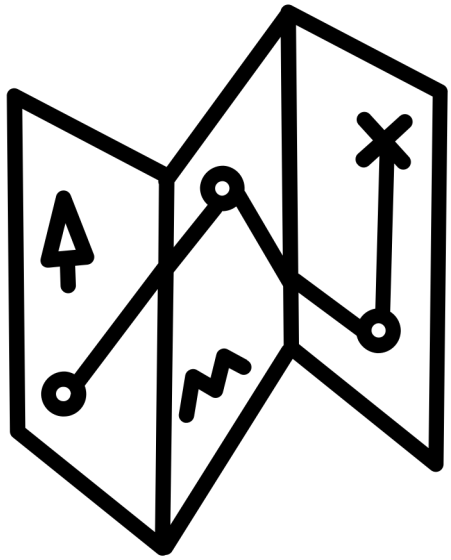
Module 2

A food systems tour



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Module 2 Learning Outcomes

A food systems tour

By the end of this module, you will be able to:

1. Define the concept of **food systems.**
2. Provide examples of how food supply chains, food environments, and consumer behavior can **vary in different geographic settings.**

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What is the food system?

Neff and Lawrence define the food system as:

"A system encompassing all the activities and resources that go into producing, distributing, and consuming food; the drivers and outcomes of those processes; and, the extensive and complex relationships between system participants and components."

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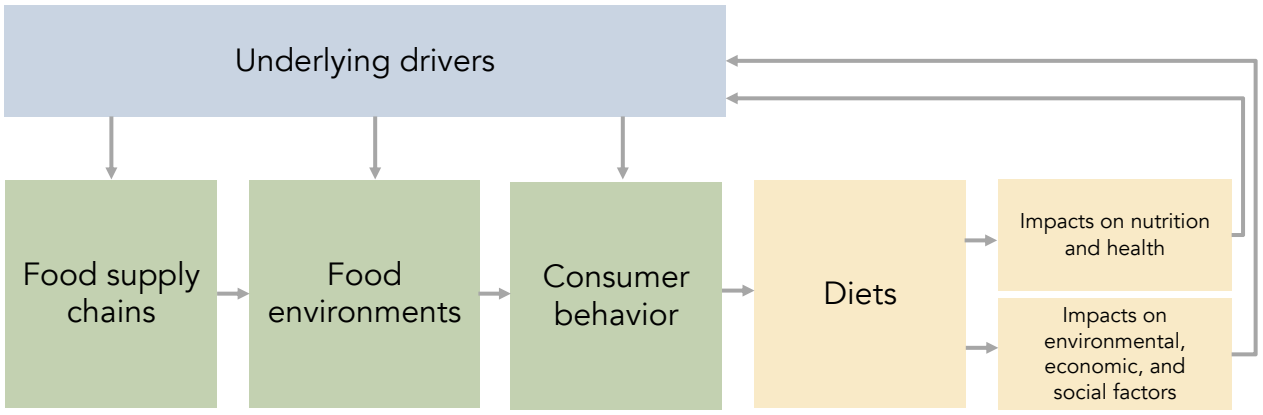
Source: *Neff and Lawrence, 2014. See handout for full reference.*

21

Preview of the food systems conceptual framework



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Sources: *Definition from Neff and Lawrence, 2014. Framework adapted from HLPE, 2017. See handout for full references.*

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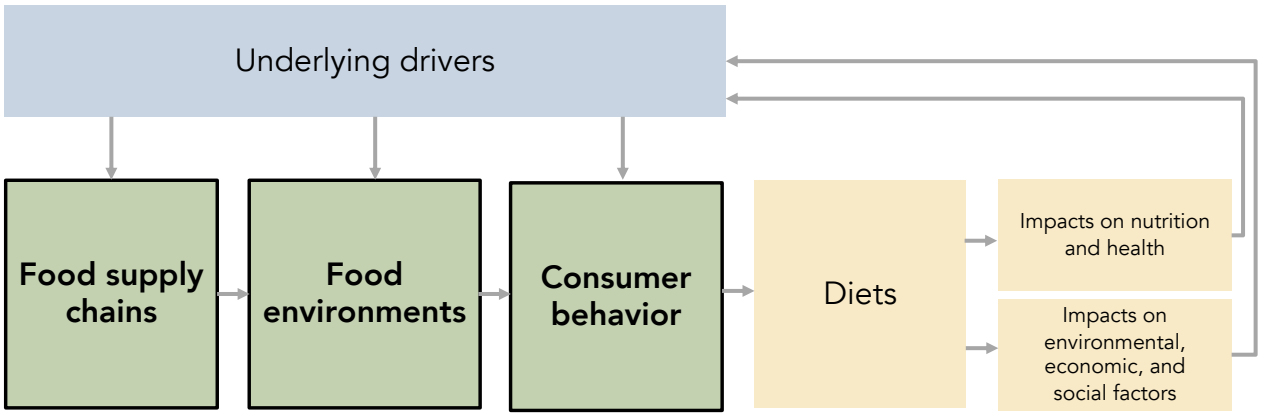

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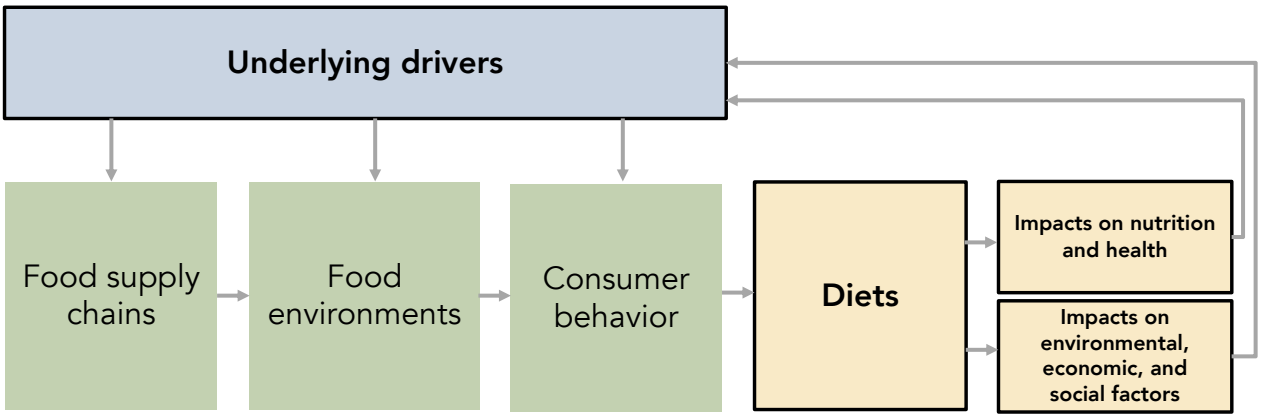

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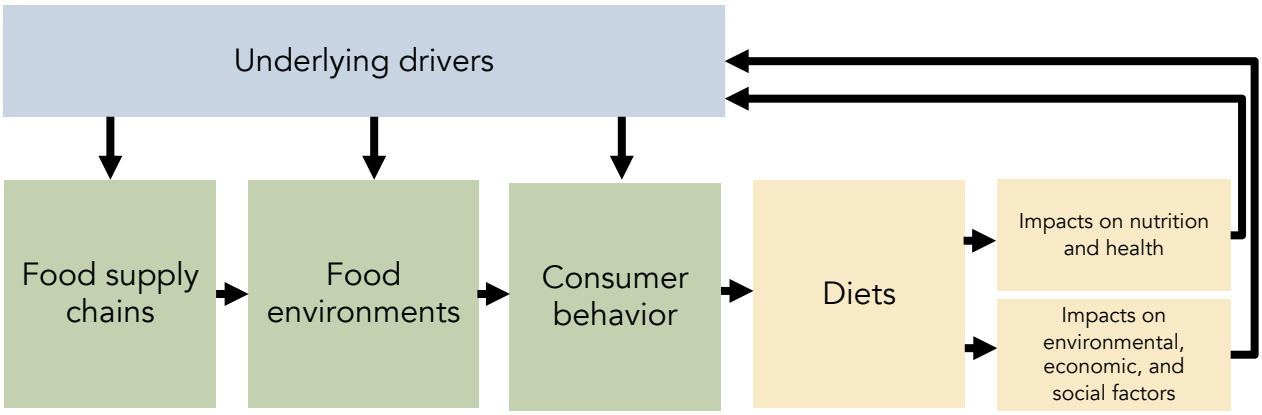

"a system encompassing all the activities and resources that go into producing, distributing, and consuming food; the drivers and outcomes of those processes; and, the **extensive and complex relationships between system participants and components**"

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Sources: *Definition from Neff and Lawrence, 2014. Framework adapted from HLPE, 2017. See handout for full references.*

25

We produce many kinds of food – crops, livestock, marine plants & animals

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Image Sources: *Left: 6okean via Getty Images. Middle: Astrid860 via Getty Images. Top Right: EoNaYa via Getty Images. Bottom Right: Irenadragan via Getty Images.*

26

We produce food for many purposes – subsistence, income, community

Image Sources: *Left: Nikhil Patil via Getty Images. Middle: Alffoto via Getty Images. Right: Monkeybusinessimages via Getty Images.*

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We produce food at many different scales

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Image Sources: *Left: Branex via Getty Images. Right: Tfoxfoto via Getty Images.*

28

We produce food using different ways of providing & recycling nutrients

Image Sources: top Left: Crystalclear, CC BY-SA 3.0. Bottom Left: Sharon Loxton CC BY-SA 2.0. Middle: Marie Spiker. Top Right: Ryan Somma CC BY-SA 2.0. Bottom Right: kjkolb CC BY-SA 3.0 See handout for links.

29

We produce food using water from different sources – irrigated, rainfed

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Image Sources: Top Left: Simazoran via Getty Images. Top Right: DiyanaDimatrova via Getty Images. Bottom Left: Hitesh Singh via Getty Images. Bottom Right: North-Tail via Getty Images.

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We have different methods of on-farm storage…

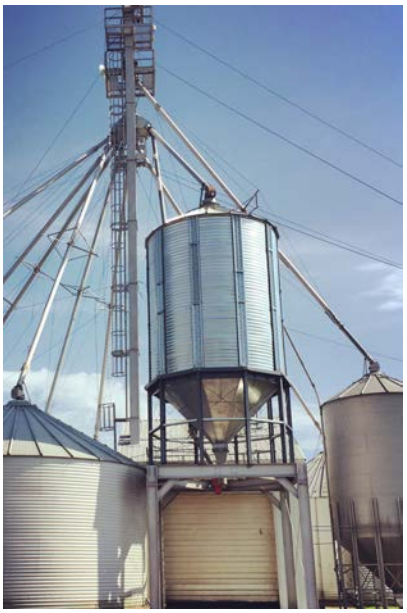

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Image Sources: *Left: Marie Spiker, used with permission. Middle: Dieudonné Baributsa, Purdue University, used with permission. Right: Marie Spiker, used with permission.*

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… and many ways of transporting food…

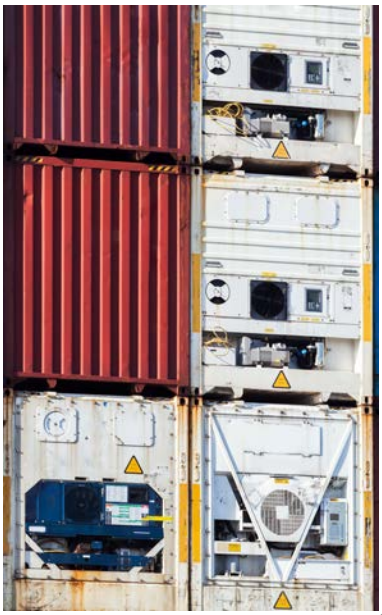

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Image Sources*: Left: Photo by Marie Spiker, used with permission. Middle: Vitpho via Getty Images. Right: Eugenesergeev via Getty Images*

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… and distributing large quantities of food

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Image Sources: *Left: Photo by Marie Spiker, used with permission. Middle: Deniscostille via Getty Images. Right: Balonici via Getty Images*

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We sort and process food, ranging from minimally- to ultra-processed

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Image Sources: *Left: Wabeno via Getty Images. Middle: Herraez via Getty Images. Right: G Annison via Getty Images.*

34

We package food for food safety, preservation, quality, and convenience

35

Image Sources: *Left: JackF via Getty Images. Middle: DuxX via Getty Images. Right: AlexWang_AU via Getty Images*

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The supply chains that brings food to us depend on many workers

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Image Sources: *Left: Rightdx by Getty Images. Middle: 21597185 via Getty Images. Right: Pixfly via Getty Images*

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Our food environments have many characteristics

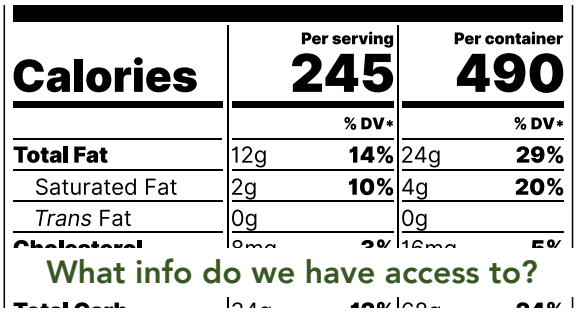

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Image Sources: Top Left: Zephyr18 via Getty Images. Top Middle: Industryview via Getty Images. Top Right: Public Domain. Bottom Left: The World Traveller via Getty Images. Bottom Right: Maradaisy via Getty Images

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We sell food in markets, for preparing at home…

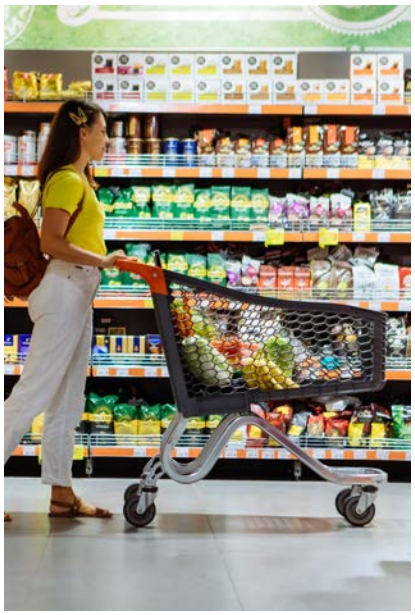

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Image Sources: *Left: Balaji Srinivasan via Getty Images. Middle: Vera_Petrunina via Getty Images. Right: Danielvfung via Getty Images.*

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… and we sell foods prepared away from home



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Image Sources: *Left: Ciara Sherry via Getty Images (Hawker). Middle: Photo by Corbin Cunningham, used with permission.Right: Oleksandr Hyrtsiv via Getty Images.*

39

As consumers, our food-related behaviors are complex



40

Image Sources: *Left: Caymia via Getty Images. Middle: Monkeybusinessimages via Getty Images. Right: Aleksandr_Vorobev via Getty Images.*

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We don't just eat food, we also waste it



41

Image Sources: *Left: ChiccoDodiFC via Getty Images. Middle: Highwaystarz-Photography via Getty Images. Right: Martin Poole via Getty Images*

We know that dietary intake affects human nutrition and health


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Image Sources: *Left: Vinhdav via Getty Images. Right: Foxys_forest_manufacture via Getty Images.*

Dietary intake also has environmental, economic, and societal impacts

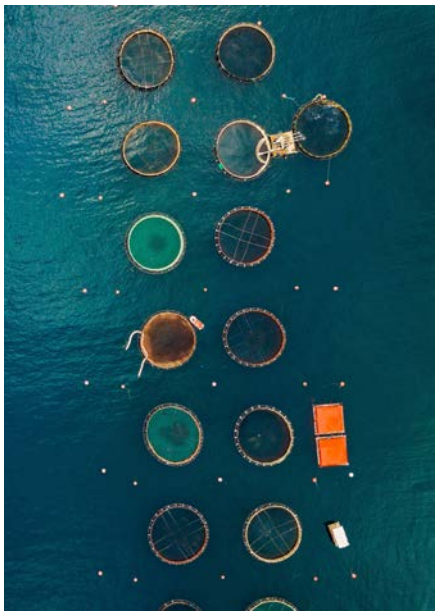

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Image Sources: *Left: Gnomeandi via Getty Images. Right: Wmaser890 via Getty Images.*

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Additionally, there are underlying drivers influencing the system (pt. 1)

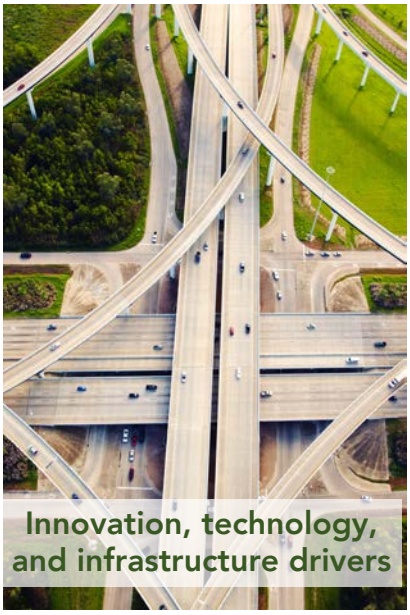

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Image Sources: *Left: 3bsworld via Getty Images. Middle: Thomas Northcut via Getty Images. Right: DorSteffen via Getty Images*

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Additionally, there are underlying drivers influencing the system (pt. 2)

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Image Sources: *Left: AGL_Photography via Getty Images. Right: Badahos via Getty Images.*

Primer on Sustainable Food Systems for RDNs and NDTRs

Building a Food Systems Foundation (40 minutes)

Intro & Module 1: Why care about sustainable food systems? (10 min.)

Module 2: A food systems tour (20 min.)

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Module 5: Exploring the multiple domains of sustainable food systems (20 min.)

Adding Tools To the Toolkit (40 minutes)

Module 6: Understanding complexity in food systems (20 min.)

Module 7: Strategies for nutrition professionals to create food systems change (20 min.)

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Academy of Nutrition and Dietetics Foundation

Primer on Sustainable Food Systems for Nutrition and Dietetics Professionals: Module 3

Released January 2021

This resource was developed as part of the Academy of Nutrition and Dietetics Foundation's Future of Food initiative, which is supported by an educational grant from National Dairy Council

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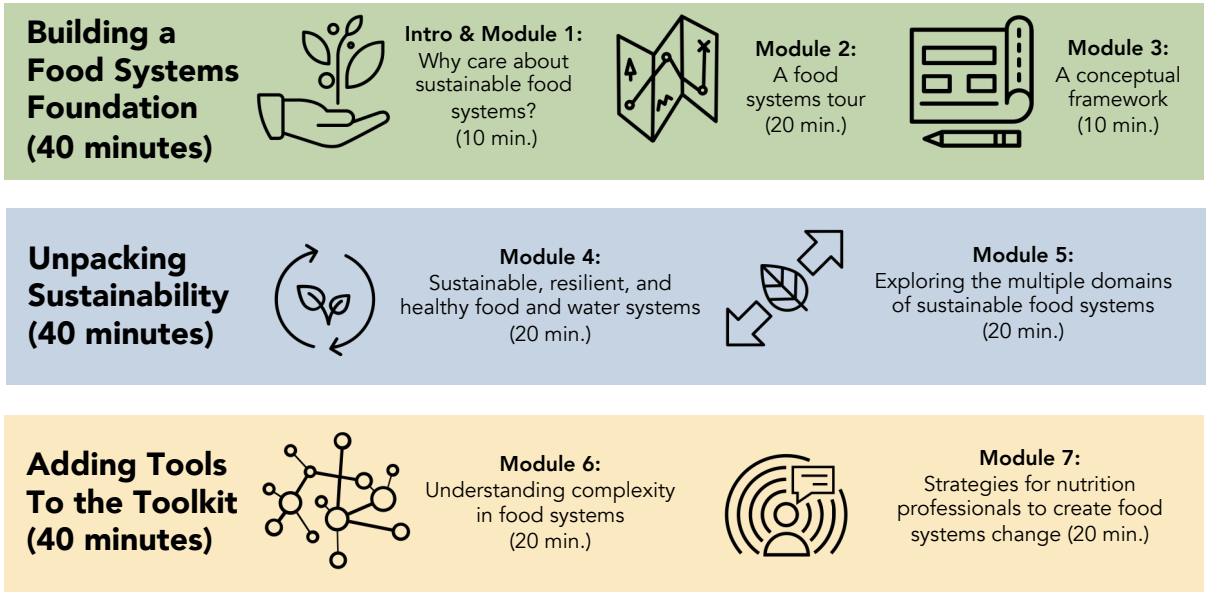
Primer on Sustainable Food Systems for RDNs and NDTRs



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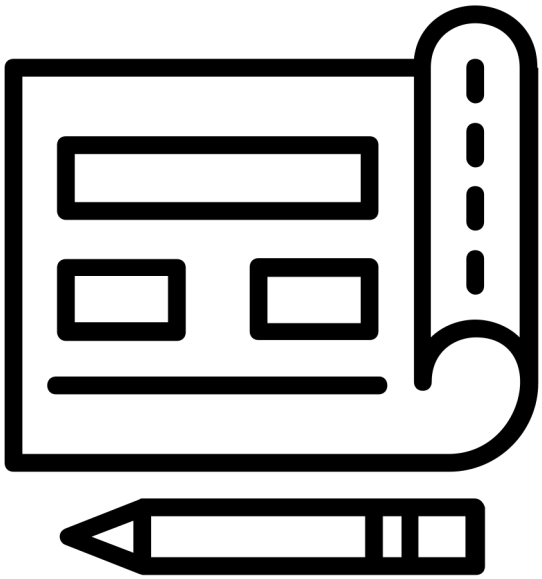
Module 3

A food systems conceptual framework



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Module 3 Learning Outcomes

A food systems conceptual framework

By the end of this module, you will be able to:

1. Identify the three **major components of food systems**
2. Identify at least three **underlying drivers** that influence food systems
3. Describe at least three ways nutrition is important for achieving the **Sustainable Development Goals**

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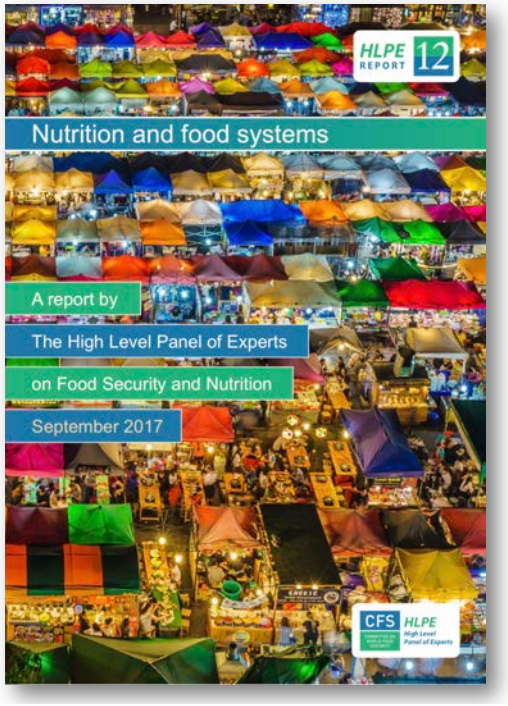

A food systems conceptual framework

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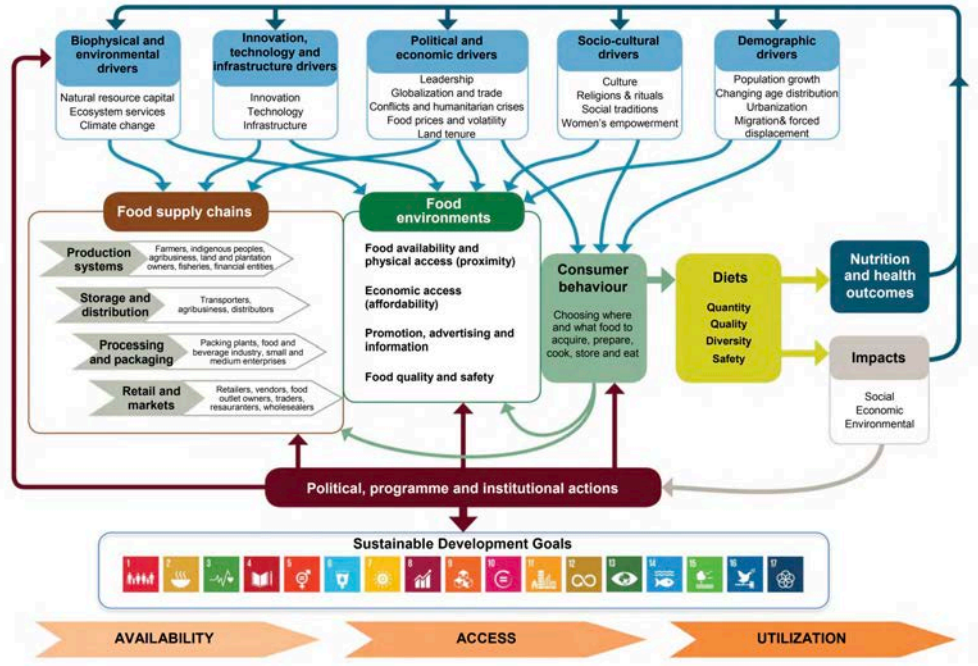

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Source: *HLPE, 2017. See handout for full reference.*

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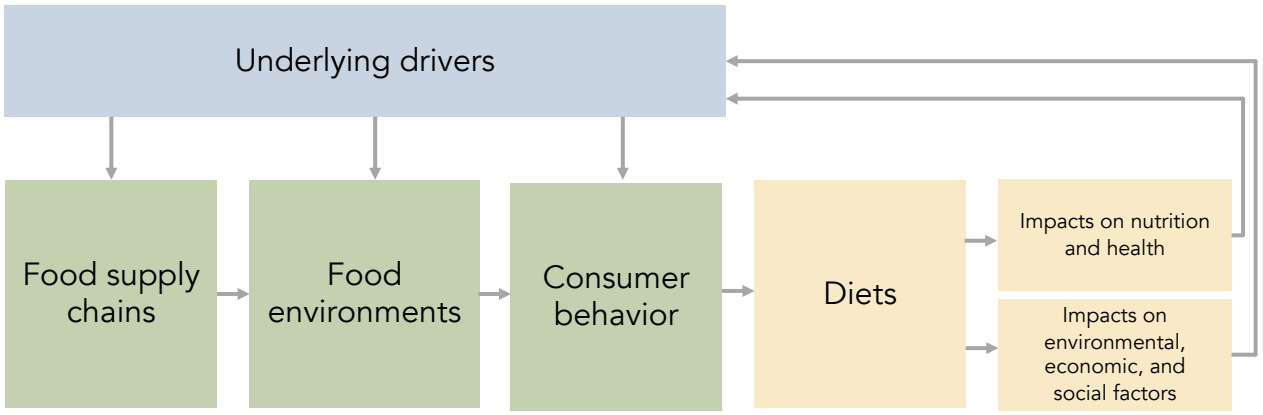
Breaking down the conceptual framework



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Source: *Adapted from HLPE, 2017. See handout for full reference.*

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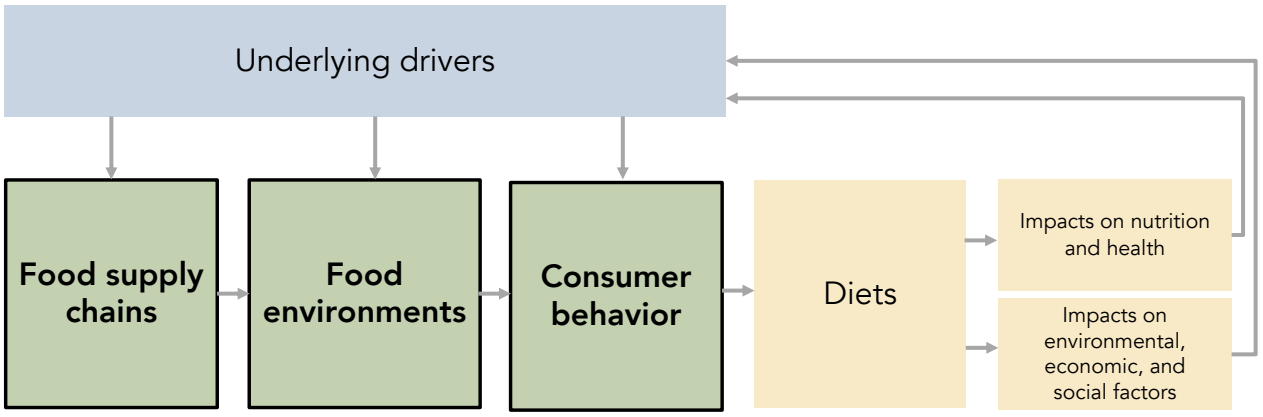
Breaking down the conceptual framework: Three major components



The HLPE report describes **three major components of the food system:** food supply chains, food environments, and consumer behavior. Each component has multiple "entry and exit points for nutrition."

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Source: *Adapted from HLPE, 2017. See handout for full reference.*

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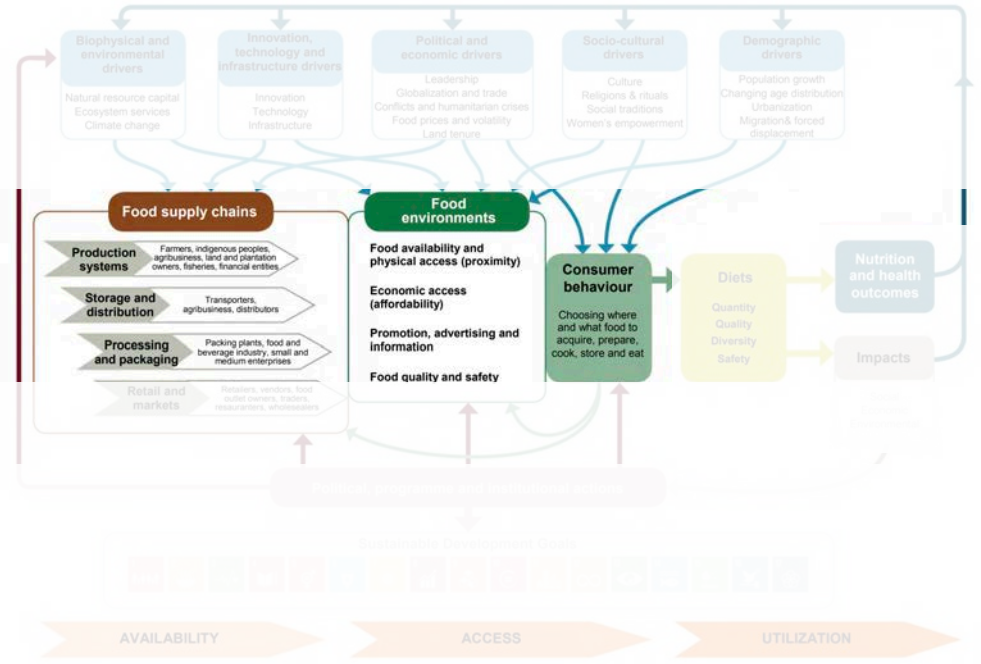

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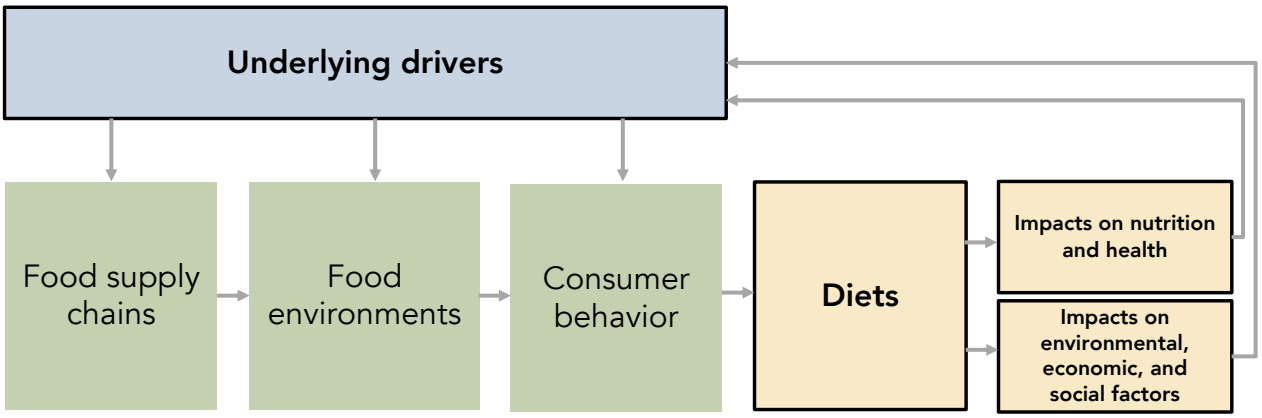
Source: HLPE, 2017. See handout for full reference.

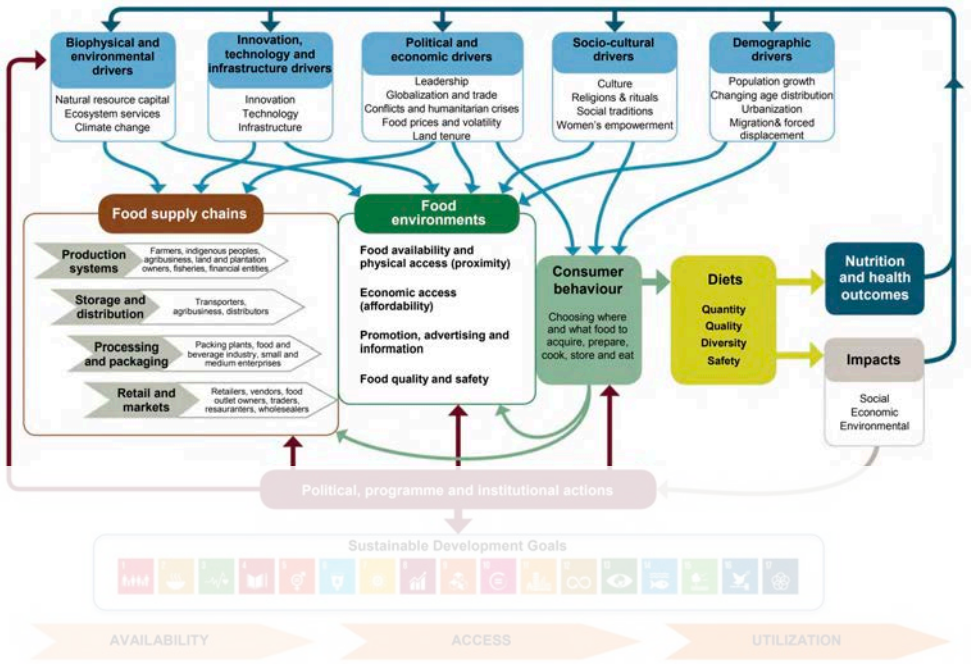
Breaking down the conceptual framework: Underlying drivers



The three components of the food system shape what humans eat, which in turn effects human health and environmental, economic, and social factors. These things also influence underlying drivers of the food system.

56

Source: *Adapted from HLPE, 2017. See handout for full reference.*



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Source: HLPE, 2017. See handout for full reference.

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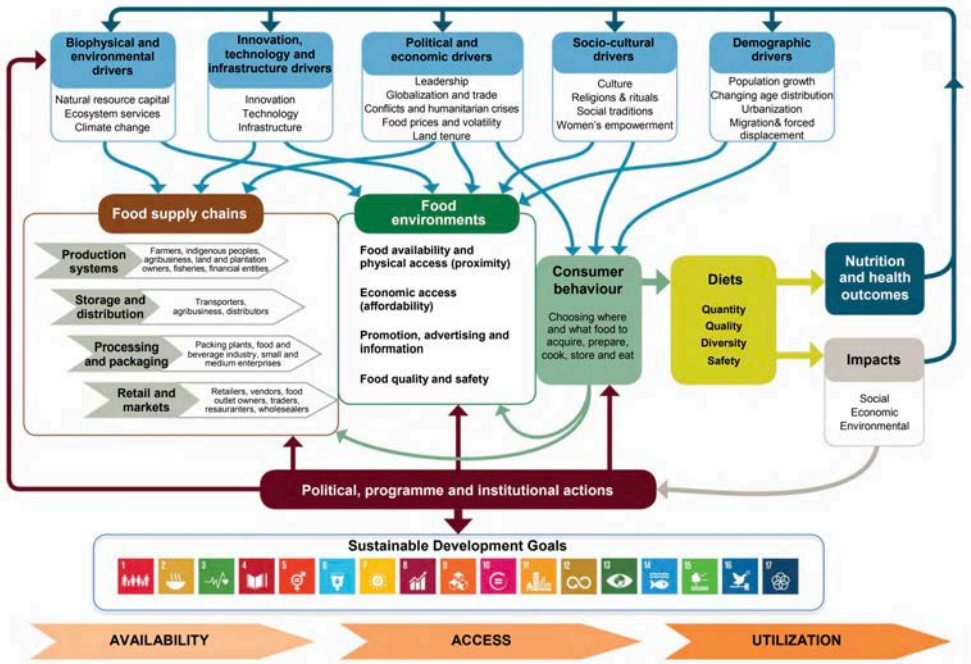

58

Source: *HLPE, 2017. See handout for full reference.*

58

The Sustainable Development Goals (SDGs)

59

Source: *SDG Communications toolkit. See handout for full reference.*

NUTRITION IS ESSENTIAL FOR THE SUCCESS OF ALL THE SDGS

Optimal nutrition is essential for achieving several of the Sustainable Development Goals, and many SDGs impact nutrition security. Nutrition is hence linked to goals and indicators beyond Goal 2 which addresses hunger. A multisectoral nutrition security approach is necessary for success.

60

Source: *SUN Civil Society Network SDG Toolkit. See handout for full reference.*

Thought Starter for Modules 1 – 3

Take a moment to pause and reflect before starting the next section (modules 4-5)

Think about a food or beverage you've consumed in the past 24 hours:

- Were you able to choose the food you consumed? If so, what were your primary reasons for choosing this food?
- How did you acquire it? Did you travel somewhere, or was it delivered to you?
- What costs were associated with acquiring the item, preparing it, transportation, etc?
- Where did the food originate, and how did the food get to where you acquired it?
- What workers were involved throughout food system to make this food available to you?
- What alternative product might you have chosen?

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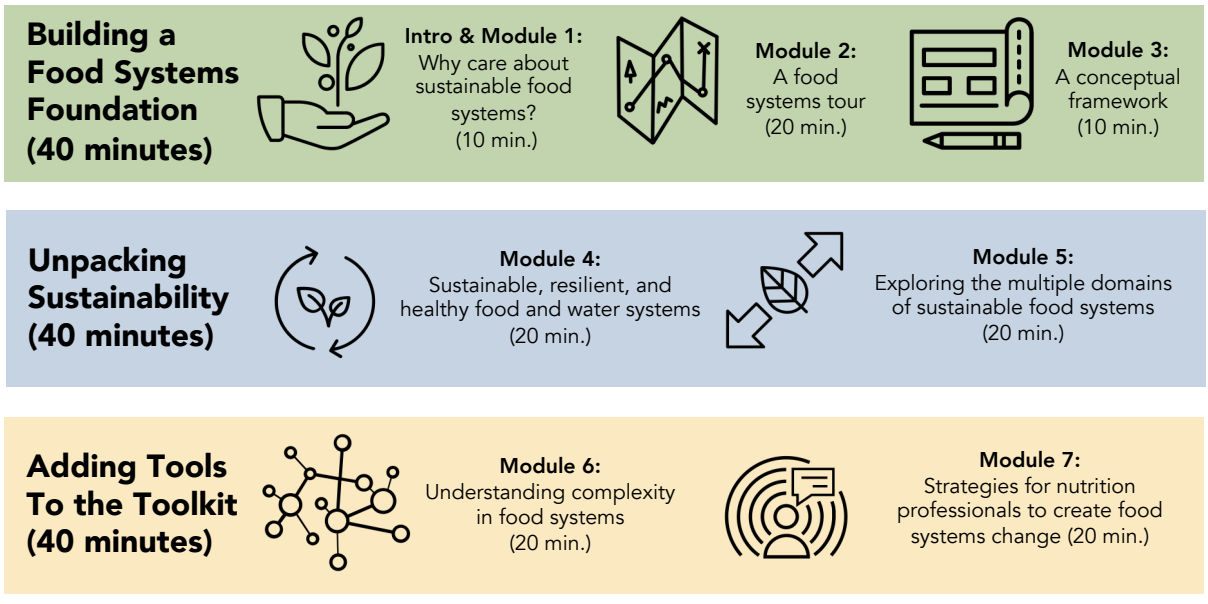
Primer on Sustainable Food Systems for RDNs and NDTRs



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Academy of Nutrition and Dietetics Foundation

Primer on Sustainable Food Systems for Nutrition and Dietetics Professionals: Module 4

Released January 2021

This resource was developed as part of the Academy of Nutrition and Dietetics Foundation's Future of Food initiative, which is supported by an educational grant from National Dairy Council

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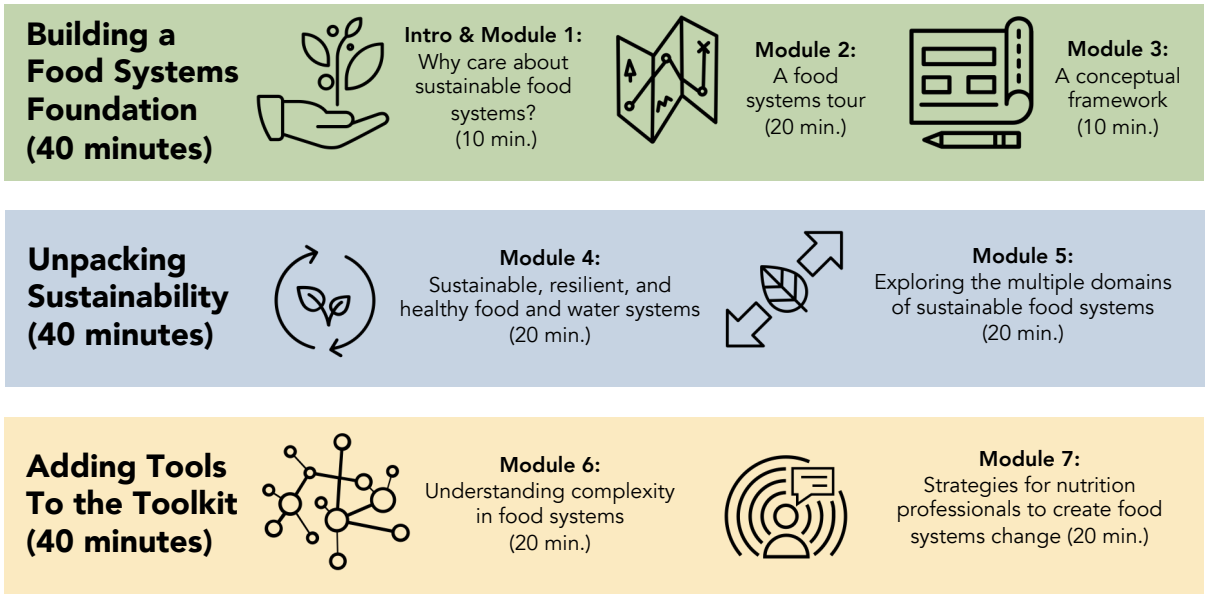
Primer on Sustainable Food Systems for RDNs and NDTRs



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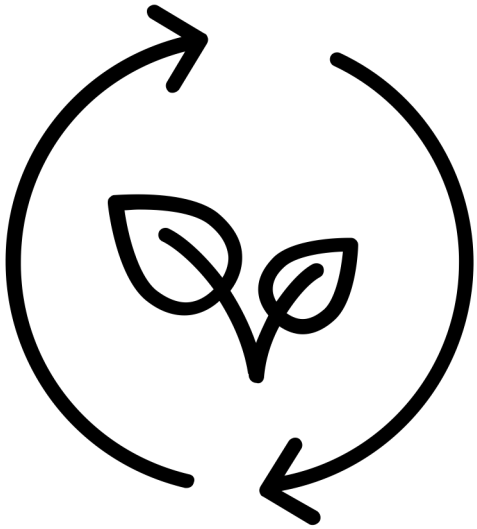
Module 4

Sustainable, resilient, and healthy food and water systems



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Module 4 Learning Outcomes

Sustainable, resilient, and healthy food and water systems

By the end of this module, you will be able to:

1. Define the concepts of **sustainability, resilience, and health** on their own and within the context of food systems.
2. Define the concept of **equity** and discuss how equity is related to sustainability, resilience, and health in the food system
3. Describe the importance of **water** for food systems and human health

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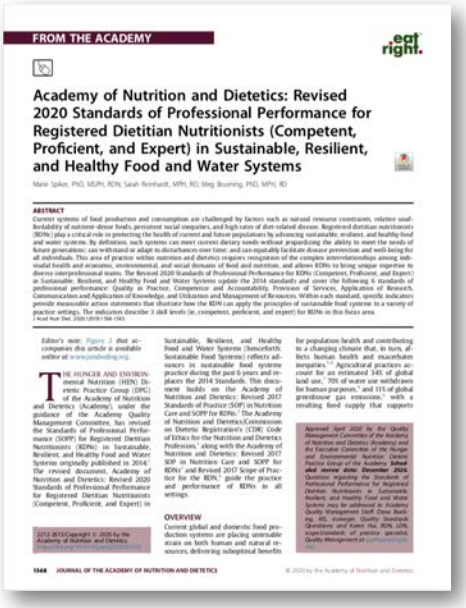
What exactly do we mean by *sustainable, resilient, and healthy food and water systems*?


FROM THE ACADEMY

Academy of Nutrition and Dietetics: Revised 2020 Standards of Professional Performance for Registered Dietitian Nutritionists (Competent, Proficient, and Expert) in Sustainable, Resilient, and Healthy Food and Water Systems

ABSTRACT

OVERVIEW

1568 JOURNAL OF THE ACADEMY OF NUTRITION AND DIETETICS

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Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

67

Key definition: Equity

What is equity?

The World Health Organization defines equity as "the absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically or geographically." (1)

How is equity different from equality?

"The route to achieving ***equity*** will not be accomplished through treating everyone ***equally***. It will be achieved by treating everyone justly according to their circumstances." – Paula Dressel, Race Matters Institute (2)

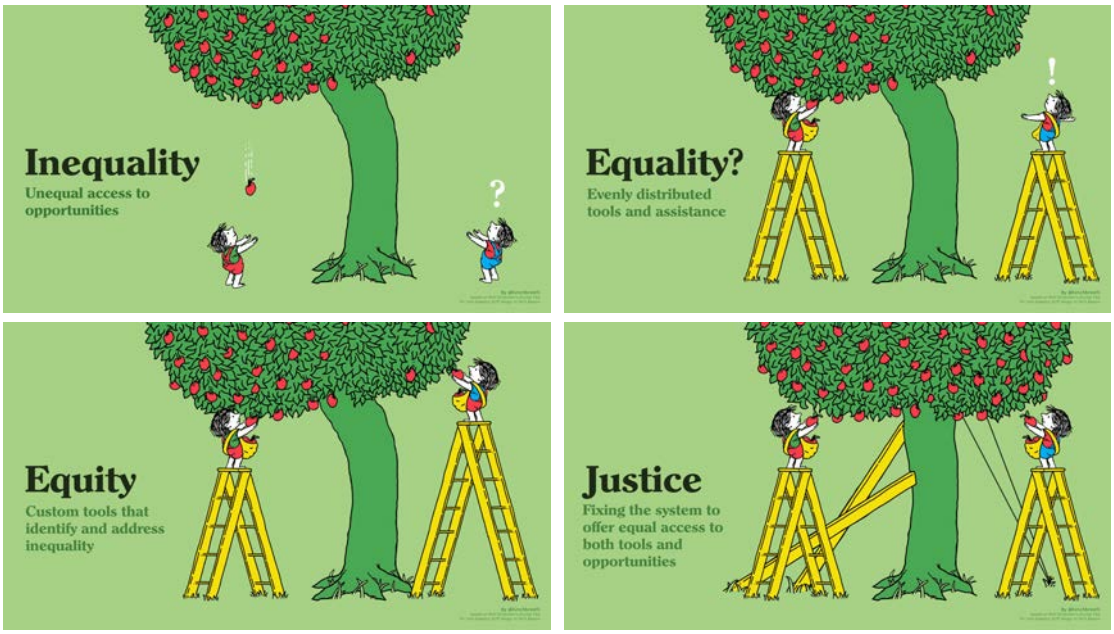
Example of equality:	All public schools in a community have computer labs with the same number of computers and hours of operation during school hours.
Example of equity:	Computer labs in lower income neighborhoods have more computers and printers, as well as longer hours of operation, because some students don't have access to computers or the internet at home.

68

Source: *(1) World Health Organization, 2020 (2). Dressel P, 2020. See handout for full reference.*

68

Key definition: Equity



69

Image source: *Images by @lunchbreath, based on Shel Silverstein's Giving Tree, for John Maeda's 2019 Design in Tech Report*

69

Key definition: Sustainability

Isolating the concept of sustainability:

Can a system be maintained over the long term?

Thinking about what sustainability means in the food system:

A sustainable food system meets the needs of individuals and communities in the present moment, but also:

- Adjusts over time to accommodate future generations
- Does not jeopardize the ability of future generations to meet their needs

How does the concept of equity apply to sustainability?

Some people are less likely to have their needs met, both now and in the future

- Examples: Women; Black and indigenous people, and people of color; individuals living in low socioeconomic households; communities exposed to environmental contaminants; people displaced by climate change

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Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

70

Sustainability example: Importance of soil health

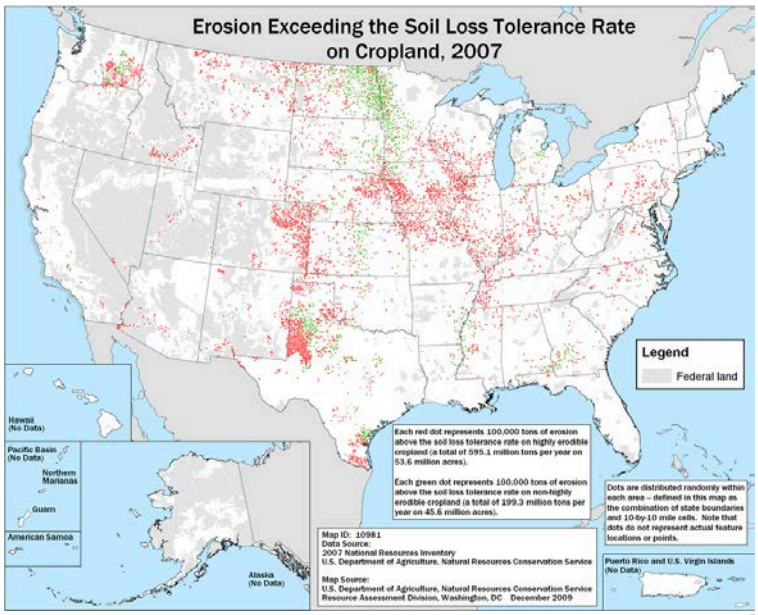

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Image sources: *Left: Voren1 via Getty Images. Right; Map from USDA NRS, 2007. See handout for full references.*

71

Key definition: Resilience

Isolating the concept of resilience:

Can a system withstand or adapt to disturbances over time?

Thinking about what resilience means in the food system:

A resilient food system can withstand or rebound more quickly to shocks such as climate change, natural disasters, disease epidemics, political or economic crises, or rapid urbanization.

How does the concept of equity apply to resilience?

Individuals and communities differ in their ability to withstand and recover from disruptive events. Individuals and communities that were more vulnerable before a disruptive event may take longer to recover.

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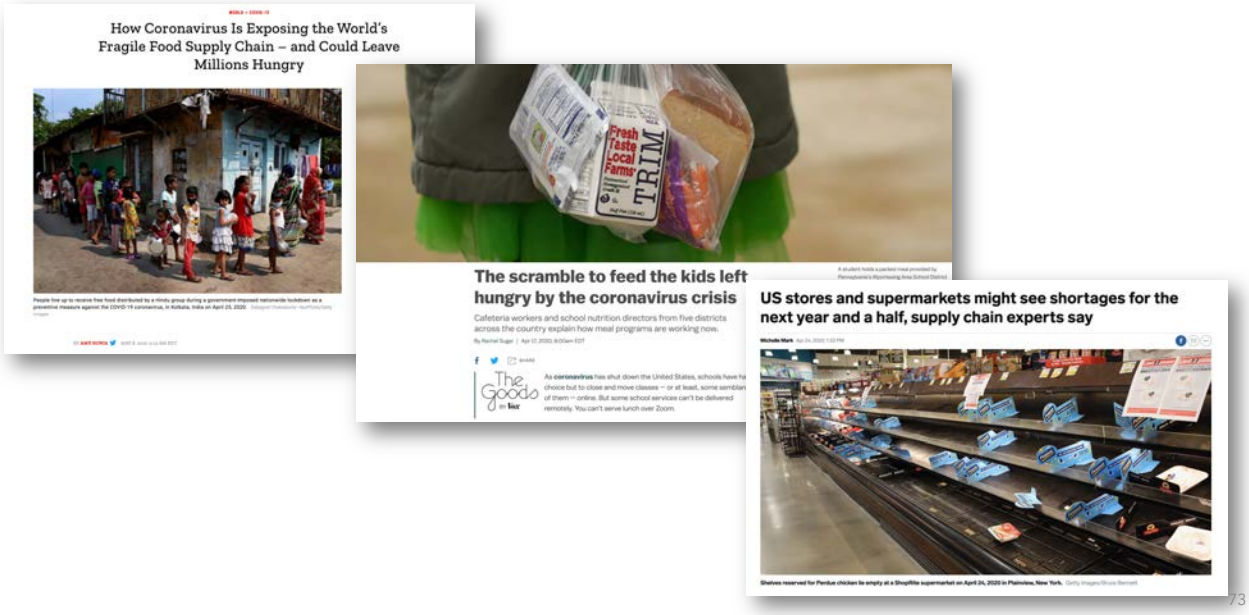
Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

72

Resilience example: COVID-19 and food supply chains



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Key definition: Healthy

Isolating the concept of healthy:

Do people have the opportunity to attain their full health potential?

Thinking about what healthy means in the food system:

A healthy food system facilitates well-being and disease prevention for all individuals. For example, a healthy food system:

- Makes nutrient-rich foods accessible and affordable for all individuals
- Minimizes contamination of resources such as air and water
- Ensures that people have access to resources needed for food storage, preparation, and feeding and caregiving practices that support child and family health

How does the concept of equity apply to health?

Achieving health equity requires addressing historical and contemporary structural inequities, including:

- Poverty, systemic racism, gender disparities in decision-making, and geographic disparities in access to health services and healthy environments

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Healthy example: Promoting nutrition and health

Nutrition is affected by many sectors including agriculture, food retail, and rural development. RDNs and NDTRs can help to maximize the impact of activities in these other sectors on human nutrition and health.

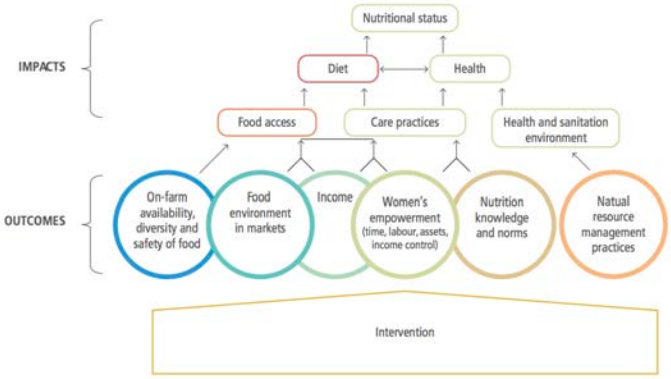

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Image Sources: *Left: Vinhdav via Getty Images. Right: Diagram from Herforth et al., as cited by the Food and Agriculture Organization; see handout for full reference.*

75

Common threads between these concepts

Thinking about the concepts of sustainability, resilience, and health:

- Relevant to all areas of nutrition and dietetics practice
- Broader than any one practice setting or individual intervention
- Interconnected, and grounded in the importance of equity
- Require action at multiple levels – individual, policy, systems, environments
- Can be carried out at multiple scales

For example:

- We can build resilience within an individual patient or client, but we can also build resilience with an organization, community, farm, or food supply chain
- We can promote health within individuals, but we can also develop environments, organizations, and policies that facilitate health

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Let's talk about the water part of sustainable, resilient, and healthy food and water systems

77

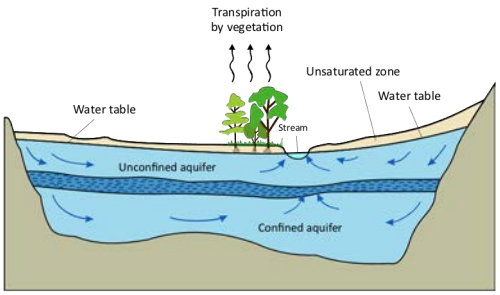
Image sources: *Top: Simazoran via Getty Images. Bottom: Irenadragan via Getty Images.*

77

Key concepts in water systems

Concepts related to water:

- What is the source of water?
  - **Green water:** Water from precipitation; it is stored in soil and available for plants to uptake
  - **Blue water:** Water from surface or groundwater sources (e.g., lakes, glaciers, aquifers)



- What are the main challenges related to water?
  - **Water use:** Do we have enough fresh water? How is water use allocated for agriculture and other purposes? How can water be used more efficiently?
  - **Water quality:** Is water safe enough for drinking, swimming, fishing, agricultural uses, and to support marine ecosystems? How are water sources affected by pollution and contaminants?

78

Image Source: *Public domain; this is a vectorized image of materials sourced from the United States Geological Survey, an agency of the United States Department of the Interior.*

78

Key definitions: Putting it all together

"A **sustainable, resilient, and healthy food and water system** is one in which all individuals have equitable access to a safe, adequate, and secure supply of food and water that supports optimal health, both now and in the future."

Sustainable food systems are at the **intersection of four domains:**

- Nutrition and health
- Economic vitality
- Social, cultural, and ethical capital
- Environmental stewardship

The next module discusses these domains in detail.

79

Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

A few notes about sustainability in the context of food systems

- Sustainability **is:**
  - Comprised of multiple domains
  - About now *and* the future
  - About equity: all people, all places
  - Related to structural inequities
  - Fundamental to the profession
- Sustainability **is not:**
  - Exclusively about the environment
  - Only about the future
  - Only for those with financial means
  - Isolated from structural inequities
  - Only relevant to specialized practitioners

- Fred Kirschenmann: "sustainability is **a process, not a prescription**… it is a journey we embark upon together, not a formula upon which we agree."

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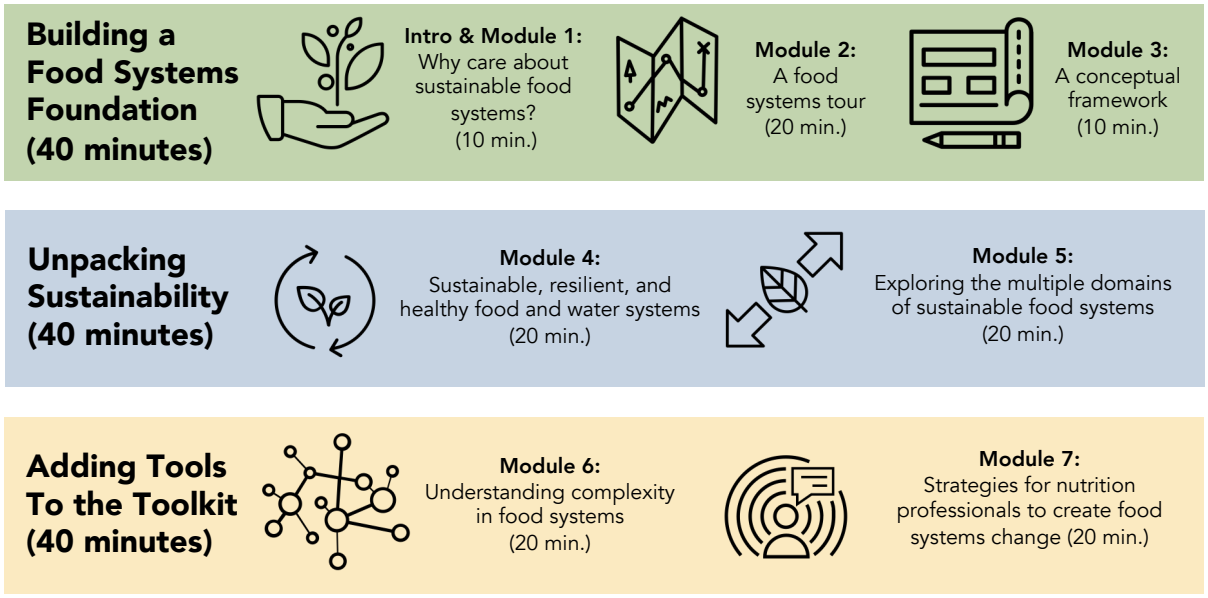
Source: *Kirschenmann FL, 2008; see handout for full reference.*

Primer on Sustainable Food Systems for RDNs and NDTRs



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Academy of Nutrition and Dietetics Foundation

Primer on Sustainable Food Systems for Nutrition and Dietetics Professionals: Module 5

Released January 2021

This resource was developed as part of the Academy of Nutrition and Dietetics Foundation's Future of Food initiative, which is supported by an educational grant from National Dairy Council

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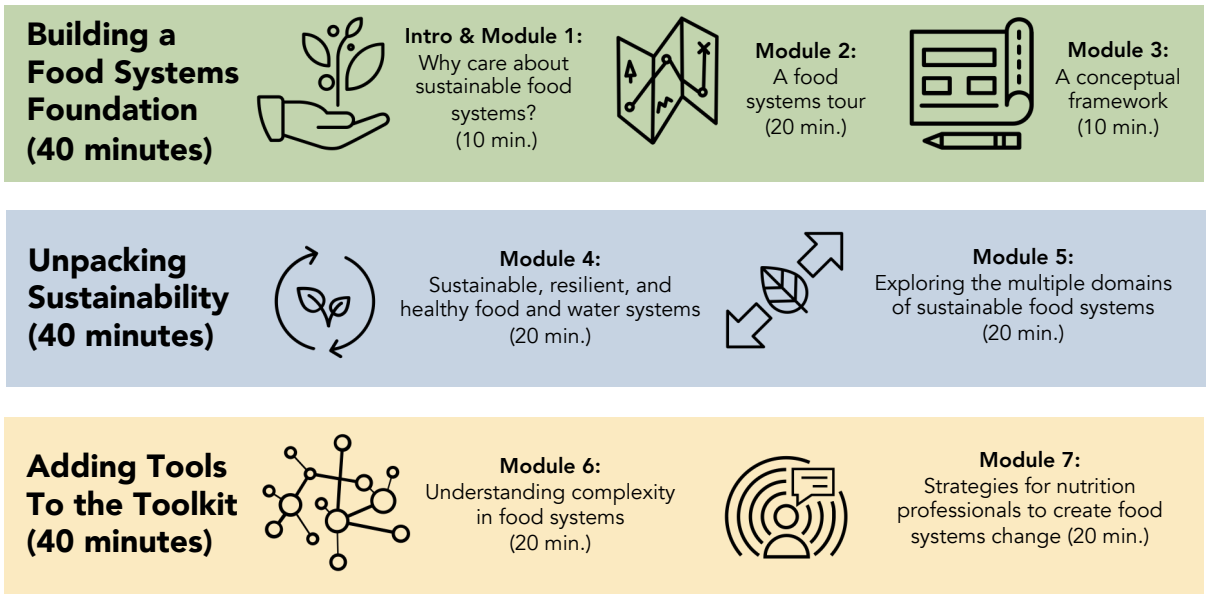
Primer on Sustainable Food Systems for RDNs and NDTRs



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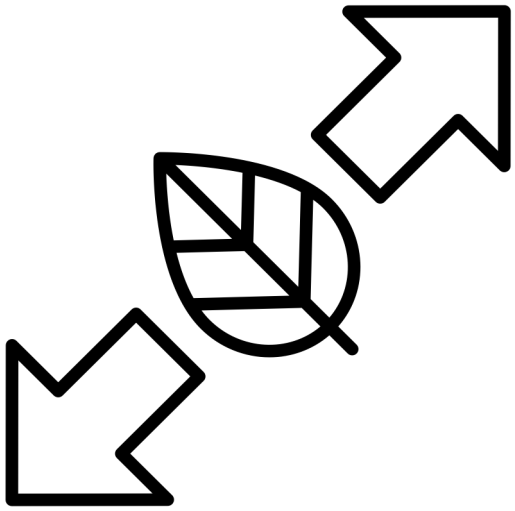
Module 5

Exploring the multiple domains of sustainable food systems



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Module 5 Learning Outcomes

Exploring the multiple domains of sustainable food systems

By the end of this module, you will be able to:

1. Identify the **four domains** of sustainable, resilient, and healthy food and water systems
2. Describe **principles** within each domain
3. Discuss how human diets **affect and are affected by** environmental, economic, and social factors

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Sustainability is multi-dimensional

Sustainable, resilient, and healthy food and water systems are at the **intersection of four domains:**

- Nutrition and health
- Economic vitality
- Social, cultural, and ethical capital
- Environmental stewardship

86

Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

86

Nutrition and health

How are nutrition and health interdependent with the other domains of sustainable food systems?

Nutrition and health advance the other domains.

Well nourished, healthy people can promote environmental stewardship; economic vitality; and social, cultural, and ethical capital.

Nutrition and health are not possible without the other domains.

Promoting healthy dietary patterns requires that nutritious foods be available, accessible, and affordable – factors with environmental, economic, and social components.

NUTRITION & HEALTH

- Promotes diet quality and optimizes nutritional status through safe, secure, and diverse food and water supplies
- Advances health promotion and prevention of chronic and infectious disease for all populations
- Minimizes exposure to environmental contaminants within food and water systems that may affect human health

87

Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

87

Economic vitality

Economic factors affect human diets:

- People are more likely to consume nutritious foods if they are affordable.
- Farmers and businesses are more likely to produce, process, distribute, and market nutritious foods if it is economically viable to do so.

Human diets affect economic outcomes:

- Consumer choices drive the demand for agricultural and food systems livelihoods.
- Malnutrition can lead to economic losses for households and nations:
  - Direct losses in productivity
  - Indirect losses in productivity from schooling deficits
  - Increased healthcare costs

Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

88

Social, cultural, and ethical capital

Social factors affect human diets:

- Nutritious foods are more likely to be consumed if they are culturally appropriate.
- Workers' rights, safety, and fair working conditions facilitate jobs – from agricultural labor to restaurant foodservice – that support the availability of nutritious foods.
- Equitable access to nutritious foods, health services, healthy environments, fair wages, and other factors supports human health.

Human diets affect social outcomes:

- Consumers can influence the demand for policies, regulations, and voluntary industry standards that support fair working conditions and animal welfare

Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

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Environmental stewardship: Introducing key terms

Concepts related to **climate change:**

What are greenhouse gases? (GHGs)

Gases that trap heat and make the planet warmer, including carbon dioxide (CO_2), methane, nitrous oxide, and fluorinated gases. Greenhouse gases can be emitted (e.g., by cars or fertilizer application) or sequestered (e.g., in soil, trees, and other biomass)

What is climate change?

Increased levels of greenhouse gases contribute to atmospheric warming, which affects ocean temperatures, sea level, precipitation patterns, and extreme weather events.

How can climate change affect human nutrition and health?

- Sea level rise may cause soil erosion or salinization, or aquifer contamination.
- Scarce land and water resources may cause conflict, or changes in food availability or price.
- Migration due to sea level rise and other extreme weather events may cause urbanization, crowding, and heightened susceptibility to infectious disease and undernutrition.

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Environmental stewardship: Introducing key terms

Concepts related to **biodiversity:**

What is biodiversity?

Biological diversity of genes, species, and ecosystems.

- ***Example of ecosystems diversity:*** A variety of different pasture habitats on the earth
- ***Example of species diversity:*** A variety of different species of seaweed within a marine ecosystem
- ***Example of genetic diversity:*** A variety of different cultivars within a species such as wheat or rice

Each ecosystem, species, or cultivar has its own ability to adapt to environmental changes.

Why is biodiversity important for agriculture, nutrition, and human health?

- Ensures that soils are productive (e.g., soil organisms are essential for cycling nutrients)
- Promotes resilience of food producers to climate change (e.g., one cultivar may be less susceptible to flood, drought, or heat than another)
- Allows for a diversity in nutrient composition (e.g., sweet potato cultivars can differ in carotenoid content by a factor of 200)

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Environmental stewardship: Introducing key terms

Concepts related to **land use:**

Can we use land to grow food?

- **Arable land:** Land that is capable of being used to grow crops
- **Marginal land:** Land that is of little agricultural value due to challenging terrain (e.g., excessive slope), poor soil quality, low rainfall and lack of access to irrigation, or pollution from industrial activities

How much land should we use to grow food?

- **Land sharing:** An approach where agricultural yields are kept low in order to maintain biodiversity within the agricultural landscape
- **Land sparing:** An approach where agricultural yields are maximized in order to leave more natural habitat untouched

What happens when we increase the amount of land used to grow food?

- **Land use conversion:** When uncultivated land (e.g., forests) are converted to agricultural land, carbon dioxide is released and the remaining land sequesters less carbon

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Environmental stewardship

The environment affects human diets:

- Growing crops, animals, and marine food sources requires **specific environmental conditions** – e.g., healthy soil, healthy marine ecosystems, biodiversity, adequate rainfall or water for irrigation, land suitable for grazing.
- There is a limit to how much food we can produce using the natural resources we have, and we need to **protect that resource base.**
- Food production relies on ecological systems. Ecological changes such as **climate change** may affect agricultural yields, nutritional content of crops, and more.

Human diets affect the environment:

- We need natural resources to produce, distribute, acquire, and prepare foods.
- Different foods and farming and supply chain practices **vary in their resource intensity** and their effects on the environment.

Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

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Environmental stewardship examples: greenhouse gas emissions

Examples of ways human diets affect the environment

Foods may differ in their **greenhouse gas emissions:**

- Rice production tends to have higher CO_2 emissions per kg than potatoes, because flooded rice fields release methane. (1)
- Beef production tends to have higher CO_2 emissions per kg than poultry, because a) ruminant livestock release methane and b) more land is required for grazing and growing feed. (1)
- Beef finished on grass tends to have higher CO_2 emissions per kg than beef finished on feedlots, because cows finished on grass take more time to reach market weight. (2)
- Transporting foods by air may emit 50x more carbon dioxide equivalents than transporting foods by boat. (3)

Sources: *(1) Clune et al., 2017 (2) Pelletier et al., 2010 (3) Ritchie 2020. See handout for full references.* ***Image source:*** *Astrid860 via Getty Images.*

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Environmental stewardship examples: water use

Examples of ways human diets affect the environment

Foods may differ in their **water use:**

- Producing rice requires more water than producing potatoes, because rice cannot grow unless paddy fields are flooded. (1)
- Producing meat requires more water than producing vegetables, due to the water required to grow animal feed (whether that water is from irrigation or rainfall). (2)
- Compared to beef finished on feedlots, beef finished on grass requires less blue water (water from irrigation) but more green water (water from rainfall). (3)

Sources: *(1) Chapagain and Hoekstra, 2011 (2) Kim et al., 2020 (3) Gerbens-Leenes et al, 2013. See handout for full references.* ***Image source:*** *North-Tail via Getty Images.*

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Environmental stewardship examples: water quality

Examples of ways human diets affect the environment

Foods may differ in their **effect on water quality:**

- Excessive application of fertilizer on crops can cause nutrients (e.g., nitrogen, phosphorous) to run into freshwater and marine waterways. (1)
- Excessive nutrients can lead to algae blooms and anoxic dead zones in the water. (1)
- Bivalves (e.g., oysters, clams, mussels, scallops) are filter feeders: they remove excess nitrogen from the water. (2,3)

96

Sources: *(1) Robertson and Vitousek, 2009 (2) NOAA, 2020 (3) Nigro, 2011. See handout for full references.* ***Image source:*** *Shutterphuma via Getty Images.*

96

How should we use this information?

When we **conceptualize sustainability as including multiple domains**, we can:

- See that achieving optimal nutrition and health are dependent on other factors
- Ensure that interventions to promote sustainability consider multiple factors
- Help colleagues in other sectors, fields, and professions see the value of nutrition
- Identify potential collaborators
- Consider potential co-benefits and trade-offs of nutrition interventions

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Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

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Thought Starter for Modules 4 – 5

Take a moment to pause and reflect before starting the next section (modules 6-7)

Think about a food or beverage you've consumed in the past 24 hours:

- How might this food have affected:
  - Your nutrition and health
  - Environmental stewardship
  - Economic vitality
  - Social, cultural, and ethical capital

In thinking about this, consider how the food was produced, processed, distributed, prepared, consumed, and possibly wasted.

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Primer on Sustainable Food Systems for RDNs and NDTRs

Building a Food Systems Foundation (40 minutes)

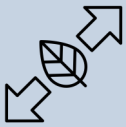
Intro & Module 1: Why care about sustainable food systems? (10 min.)

Module 2: A food systems tour (20 min.)

Module 3: A conceptual framework (10 min.)

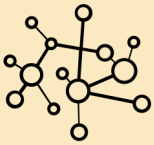
Unpacking Sustainability (40 minutes)

Module 4: Sustainable, resilient, and healthy food and water systems (20 min.)



Module 5: Exploring the multiple domains of sustainable food systems (20 min.)

Adding Tools To the Toolkit (40 minutes)



Module 6: Understanding complexity in food systems (20 min.)

Module 7: Strategies for nutrition professionals to create food systems change (20 min.)

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Primer on Sustainable Food Systems for Nutrition and Dietetics Professionals: Module 6

Released January 2021

This resource was developed as part of the Academy of Nutrition and Dietetics Foundation's Future of Food initiative, which is supported by an educational grant from National Dairy Council

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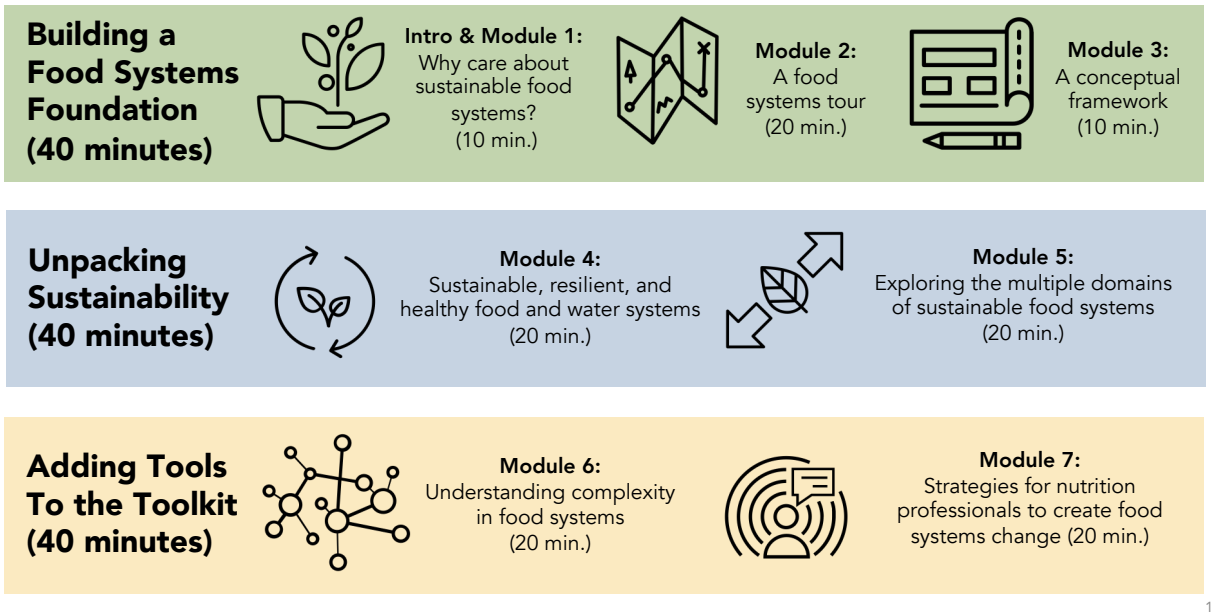
Primer on Sustainable Food Systems for RDNs and NDTRs



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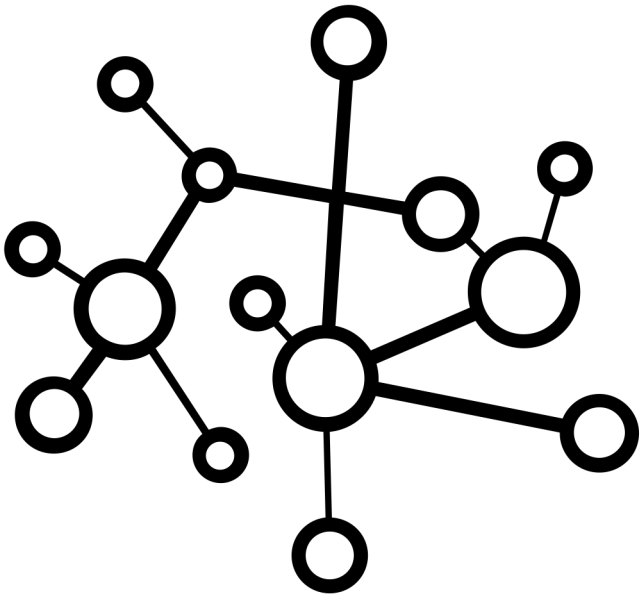
Module 6

Understanding complexity in the food system



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Module 6
Learning
Outcomes

Understanding complexity in the food system

By the end of this module, you will be able to:

1. Define a **complex system.**
2. Describe at least three characteristics of **complex systems.**
3. Discuss how **systems thinking** can be used to approach issues in nutrition.
4. Provide at least one example of a **co-benefit** and one example of a **tradeoff** within the food system.

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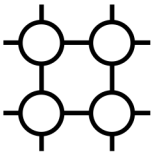
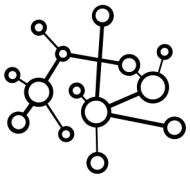
What is the systems part of food systems?

What is a system? Interconnected parts that operate towards a purpose

What are different types of systems?





Simple systems:

A well-defined relationship between an event and its outcome.

Example: The way a valve lets air into an engine.

Complicated systems:

The co-existence of several well-defined relationships between events and outcomes.

Example: The many mechanical actions and chemical reactions that occur when a vehicle operates.

Complex systems:

The co-existence of several relationships that are not well defined, and that may change over time.

Example: The effect of widespread vehicle use on human physical activity and health.

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Sources: *Definition of system from Peters 2014; examples of system types drawn from Spiker et al 2020; see handout for full reference.*

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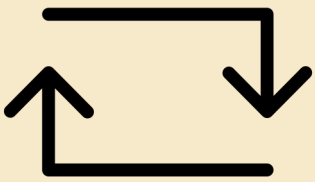
Characteristics of complex systems: Bidirectional feedback



Bidirectional feedback:

Two components may affect one another

Example 1: Undernutrition makes children more susceptible to infectious disease, and infectious disease makes children more susceptible to undernutrition.

Example 2: The food supply (what's available) affects demand (what people want), and demand (what people want) also affects the food supply (what is grown, processed, and marketed)

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Image sources: *Left: Loop by Hare Krishna from the Noun Project. Middle: Michael Blann via Getty Images. Right: Estivillml via Getty Images. See handout for additional resources on these examples.*

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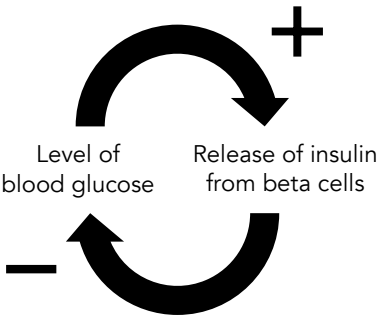
Bidirectional feedback, continued: feedback loops

Some feedback loops are **balancing loops:**
Two relationships bring the system back to a state of equilibrium

Example of a balancing loop:



Some feedback loops are **reinforcing loops:**
Two relationships amplify each other's effects

Examples of reinforcing loops:

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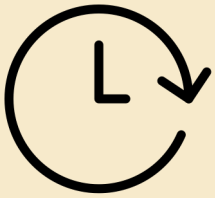
Characteristics of complex systems: Time-delayed responses



Time-delayed responses:
Some impacts may not be felt immediately

Example 1: Exposure to undernutrition during gestation or early life can increase the likelihood of obesity or chronic disease in later life.

Example 2: When carbon dioxide is emitted into the atmosphere, the full effect of those emissions on global warming may take several decades to emerge.

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Image sources: *Left: delay by ibrandify from the Noun Project. Middle: Public domain, photo by Menno Huizinga. Right: AvigatorPhotographer via Getty Images. See handout for additional resources.*

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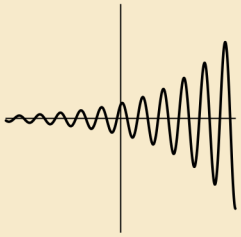
Characteristics of complex systems: Nonlinear relationships



Nonlinear relationships:
A change in one part of the system may not correspond with a constant change in another part of the system

Example 1: Combining micronutrient supplementation with psychosocial stimulation may have synergistic effects on children's cognitive development (an example of synergy).

Example 2: Overfishing can lead to the collapse of wild fish stocks, even after what appears to be years of relative stability (an example of a tipping point).

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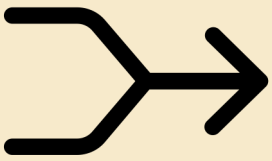
Image sources: *Left: Sinusoid by Yohann Berger from the Noun Project. Middle: DGLimages via Getty Images. Right: Irenadragan via Getty Images. See handout for additional resources on these examples.*

Characteristics of complex systems: Convergence



Convergence:
Many routes may lead to the same outcome

Example 1: Individual weight gain or loss can result from a multitude of factors, such as changes in dietary intake, changes in physical activity, and changes in health status.

Example 2: Changes in population-level diet quality can result from a multitude of factors, such as economic development, modernization of food retailers, and global supply chains.

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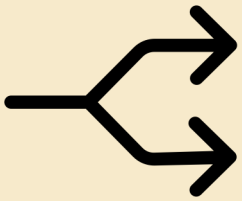
Image sources: *Left: Converge by Hare Krishna from the Noun Project. Middle: Rostislav_Sedlacek via Getty Images. Right: ClaudineVM via Getty Images. See handout for additional resources.*

Characteristics of complex systems: Divergence



Divergence:
One route may produce many outcomes

Example 1: Removing sugar sweetened beverages (SSBs) from school vending machines can have both positive and negative impacts (e.g., decreased SSB intake at schools, increased SSB intake away from school).

Example 2: Keeping domestic food animals can have both positive and negative impacts (e.g., improved dietary diversity, increased risk of environmental enteric dysfunction).

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Image sources: *Left: diverge by Hare Krishna from the Noun Project. Middle: Althorn via Getty Images. Right: Kailash Kumar via Getty Images. See handout for additional resources on these examples.*

110

Why learn about complex systems?

Having the language of complex systems helps us to see that:

- Improving the nutritional status of individuals and communities **may not be as straightforward as we imagined.**
  - Time delays and nonlinear relationships make it challenging to identify causal relationships.
  - Convergence and divergence make it challenging to isolate causal factors or guarantee that an intervention will produce uniform results without unintended consequences.

- The strategies we use as nutrition and dietetics professionals need to **complement the strategies of other sectors and professions.**
  - The root causes of nutrition issues are multi-faceted, not based solely on biology or behavior.
  - Few nutrition issues can be improved with a single strategy.

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How can we help address complex systems issues?

Not every person can (or should) do everything! But, seeing the big picture helps us to:

- Form **collaborative relationships** with other professionals whose expertise complements our own
- Identify the most effective ways to **leverage our unique skillset**
- Establish **role clarity** between different sectors, disciplines, and professions

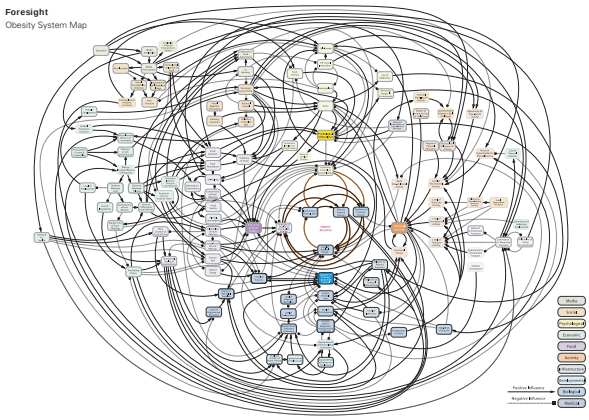

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Image source: *Foresight Obesity Systems Map; see handout for full reference.*

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Systems thinking

What is systems thinking?

- A perspective of seeing and understanding a system as a whole, rather than as a collection of unrelated components

How can I practice systems thinking in my day-to-day work?

- Think about root causes of the problems you see in your patient population
- Think about downstream effects of your interventions, both intended and unintended
- Collaborate with people who work in other parts of the system:
  - Learn each other's professional languages – you may be using different terminology to describe the same phenomenon
  - Take the time to listen and understand the priorities of other stakeholders
  - Share your expertise with professionals in other fields

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More systems thinking tools: co-benefits and trade-offs

Co-benefits: Benefits or synergies that occur alongside each other

- Example: A co-benefit of walking or bicycling to work for cardiovascular health is that transitioning away from fossil-fuel intensive commutes can also contribute to climate change mitigation.

Trade-offs: Achieving one goal makes it difficult to achieve another

- Example: In low- and middle-income country settings, building new roads in rural areas may drive economic development for farmers who now have more access to markets, but it also may involve environmental trade-offs (such as previously forested land being used for roads).

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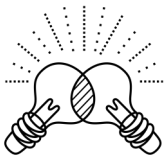
Examples: Exploring nuances of food waste reduction



Examples of co-benefits

A co-benefit between waste reduction and nutrition: Smaller portion sizes for packaged foods can reduce waste from uneaten food, and smaller portion sizes may also assist with patient's goals for weight management.

A co-benefit between waste reduction, food safety, and economics: When consumers have more knowledge about food safety, they may be less likely to unnecessarily discard foods that are still safe to consume. Fewer unnecessary discards can help to save money, and food safety knowledge can reduce risk of foodborne illness.

Examples of trade-offs

A trade-off between waste reduction and the environment: Refrigerating and freezing perishable foods reduces spoilage, but it also requires energy. In some settings, older refrigeration systems may leak refrigerants that are greenhouse gases (such as hydrofluorocarbons, HFCs)

A trade-off between waste reduction social and cultural considerations: Food donations can reduce waste, but an inability for food banks and pantries to control the nature of food donations may mean that recipients may receive food in undesired amounts or types, or at undesired times.

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Why think about co-benefits and trade-offs?

- The food system is full of co-benefits and trade-offs!
- We should be prepared for the reality that promoting human nutrition and health may not always be a win-win with other outcomes, and it may not align with the priorities of other stakeholders. But, there may be co-benefits we have not explored.
- A systems approach can help RDNs and NDTRs to navigate the complexity of the food system.

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Primer on Sustainable Food Systems for RDNs and NDTRs

Building a Food Systems Foundation (40 minutes)

Intro & Module 1: Why care about sustainable food systems? (10 min.)

Module 2: A food systems tour (20 min.)

Module 3: A conceptual framework (10 min.)

Unpacking Sustainability (40 minutes)

Module 4: Sustainable, resilient, and healthy food and water systems (20 min.)

Module 5: Exploring the multiple domains of sustainable food systems (20 min.)

Adding Tools To the Toolkit (40 minutes)

Module 6: Understanding complexity in food systems (20 min.)

Module 7: Strategies for nutrition professionals to create food systems change (20 min.)

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Academy of Nutrition and Dietetics Foundation

Primer on Sustainable Food Systems for Nutrition and Dietetics Professionals: Module 7

Released January 2021

This resource was developed as part of the Academy of Nutrition and Dietetics Foundation's Future of Food initiative, which is supported by an educational grant from National Dairy Council

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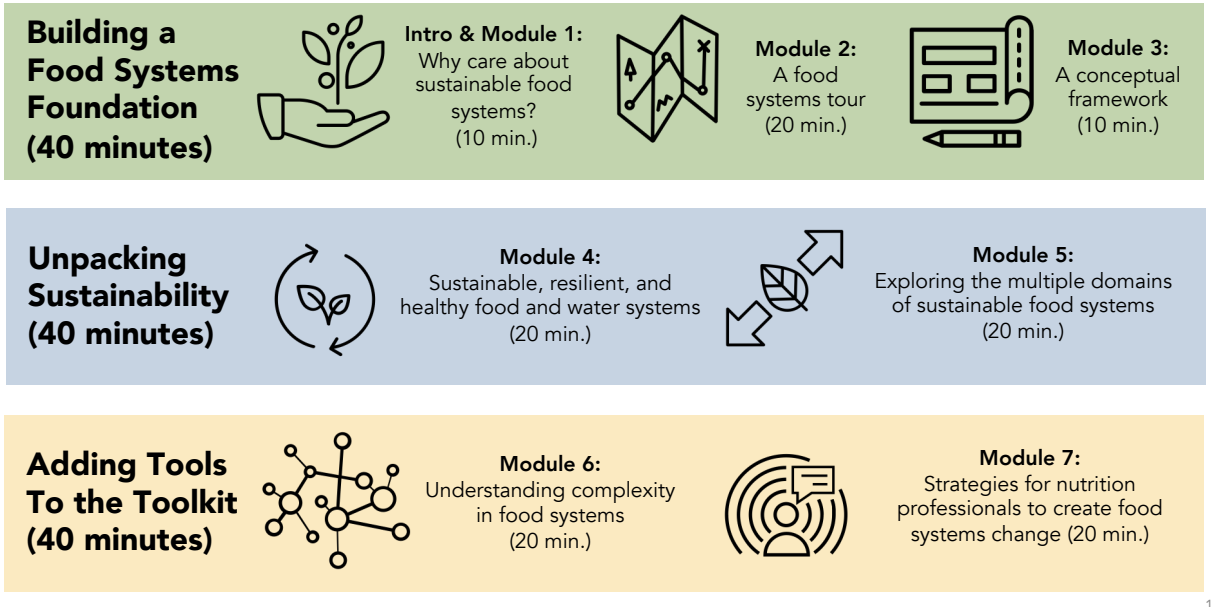
Primer on Sustainable Food Systems for RDNs and NDTRs



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Module 7

Strategies for RDNs and NDTRs to create food systems change

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Module 7
Learning
Outcomes

Strategies for RDNs and NDTRs to create food systems change

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By the end of this module, you will be able to:

1. Identify five **entry points** through which RDNs and NDTRs can leverage their knowledge and skills to cultivate sustainable food systems
2. Identify **cross-cutting skills** that are common to nutrition and dietetics practice that can help RDNs and NDTRs to promote sustainable food systems
3. Locate **reliable resources** related to sustainable food and water systems for RDNs and NDTRs

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How can RDNs and NDTRs leverage their skills in nutrition and dietetics to cultivate sustainable, resilient, and healthy food and water systems?

eat right.

FROM THE ACADEMY

Cultivating Sustainable, Resilient, and Healthy Food and Water Systems: A Nutrition-Focused Framework for Action

Marie L. Spiker, PhD, MSPH, RDN; Amy Knoblock-Hahn, PhD, MPH, MS, RDN; Katie Brown, EdD, RDN; Janice Giddens, MS, RDN; Amanda S. Hege, MPH, RDN, LD; Kevin Sauer, PhD, RDN, LD, FAND; Diane M. Enos, MPH, RDN, FAND; Alison Steiber, PhD, RDN

UNDERSTANDING FOOD AND water systems is critically important for the practice of nutrition and dietetics. This is especially true as growing populations, rising per capita demand for nutrient-rich foods, and climate change pose mounting challenges for meeting global nutrition targets.

Food and water systems include the resources, people, and activities involved in the production, processing, packaging, distribution, purchasing, preparation, consumption, discard, and safety of food and water, as well as the complex relationships among these processes.[1,2] The concept of sustainable, resilient, and healthy food and water systems (henceforth "sustainable food systems") describes systems where "individuals have equitable and optimal access to food and water, both now and in the future."[3,4] Sustainability is multidimensional, with sustainable food systems at the intersection of multiple domains including as nutrition and health; environmental stewardship; economic vitality; and social, cultural, and ethical capital.[5]

Sustainability considers both the long-term viability of the food system and current issues, such as the global burden of hunger and malnutrition,[1] unequal economic access to nutritious foods,[1] high rates of food loss and waste,[1] the precariousness of fresh-water supplies for agricultural irrigation,[1] and equity issues for food systems workers.[6,7] Registered dietitian nutritionists (RDNs) and nutrition and dietetics technicians, registered (NDTRs) are trained to address the nutritional manifestations of these issues, and can also lead and support collaborative efforts along the spectrum of prevention[8] to address underlying issues that affect current and future populations.

The vision of the Academy of Nutrition and Dietetics ("Academy") is "a world where all people thrive through the transformative power of food and nutrition."[9] The Academy's Strategic Plan includes a commitment to a global, system-wide impact and collaboration "to solve the greatest food and nutrition challenges now and in the future."[9,10] In this light, the actions needed to support sustainable food and water systems are not a specialized practice area, they are central to the profession. Figure 1 describes key Academy publications that demonstrate the evolution of thinking within this area.

The importance of nutrition within sustainable food systems also aligns with global agendas, including the United Nations Sustainable Development Goals. Goal 2 of the Sustainable Development Goals is to "end hunger, achieve food security and improved nutrition and promote sustainable agriculture."[11] Nutrition is critically linked to the success of all 17 Sustainable Development Goals, as it intersects water and other natural resources, livelihoods, and education. A global scope is appropriate, given that many food systems issues cross geopolitical borders. For example, policies or consumer trends in one country may affect food production or prices in another, and the effects of food systems on water quality or greenhouse gases may extend far beyond one's country of practice.

The challenges of sustainable food systems require the development of workforce capacity and collaboration across sectors.[10,12] RDNs and NDTRs are key connectors who work in diverse roles throughout the food system, from production to consumption, and throughout health care, public health, and community settings. This article provides a framework for action for how RDNs and NDTRs—individually, as a profession, and in collaboration with other sectors—can cultivate sustainable food systems.

FRAMEWORK FOR ACTION

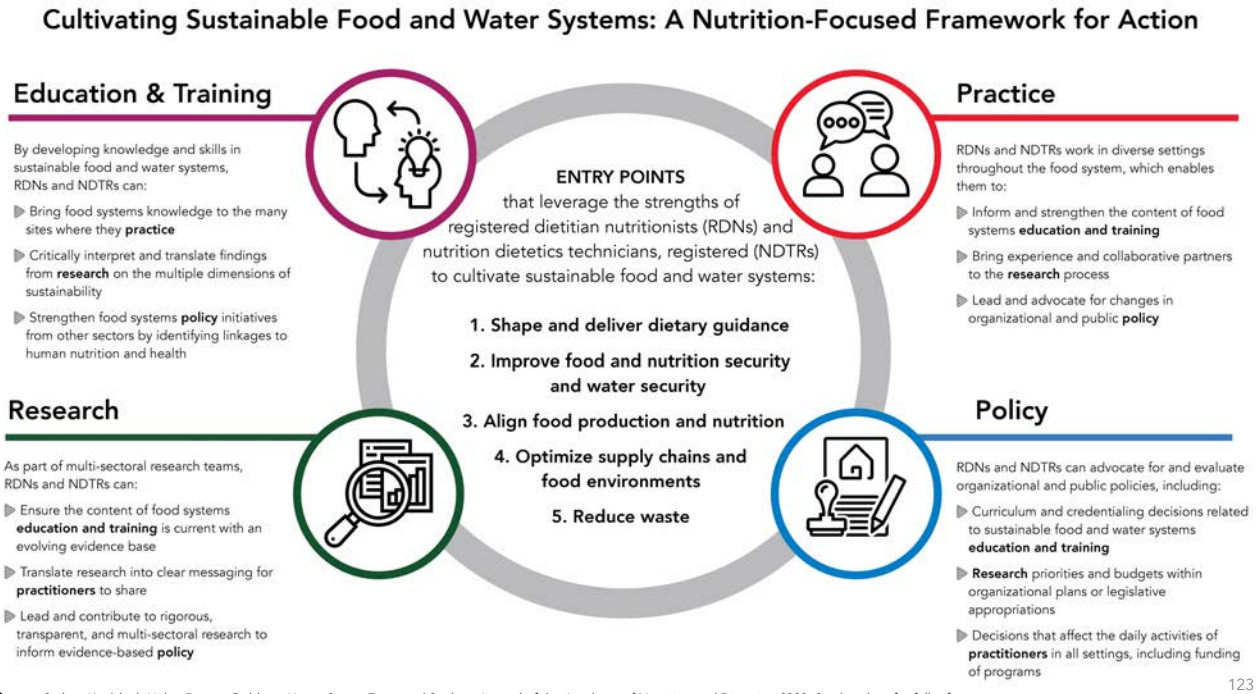
This framework for action was developed from a roundtable meeting of experts and subsequent stakeholder input. The 2-day roundtable, titled "Sustainable Food Systems: Creating a Nutrition-Focused Framework for Action," was convened in November 2018 by the Academy of Nutrition and Dietetics Foundation ("Foundation") as part of the Future of Food initiative, which is funded through an educational grant from the National Dairy Council.[13] The 24 participants included credentialed nutrition and dietetics practitioners and external stakeholders representing expertise in clinical nutrition, foodservice, community nutrition, agriculture, food supply chains, environmental science, economics, racial equity, and food policy.

Before the roundtable, participants reviewed foundational work in this area, including the Academy publications in Figure 1 and the United Nations High Level Panel of Experts conceptual framework of food systems.[7] The roundtable included in-person presentations, virtual remarks, and a series of small-group discussions led by a trained facilitator. Participants identified "entry points"

122

Source: *Spiker, Knoblock-Hahn, Brown, Giddens, Hege, Sauer, Enos, and Steiber. Journal of the Academy of Nutrition and Dietetics, 2020. See handout for full reference.*

122



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Source: *Spiker, Knoblock-Hahn, Brown, Giddens, Hege, Sauer, Enos, and Steiber. Journal of the Academy of Nutrition and Dietetics, 2020. See handout for full reference.*

123

Shape and deliver dietary guidance

Why is this important?

The food system shapes human diets, and human diets influence the sustainability of the food system.

Nutrition education, menu planning, food procurement decisions, and policy-based dietary guidelines are all opportunities to support both nutrition and sustainability.

RDNs and NDTRs bring a valuable perspective to this work.

What could this entry point look like? A few examples:

education

Learning to critically interpret research related to sustainable diets, which may use methods that are less common in nutrition

practice

Making evidence-based menu planning or food procurement decisions that support an institution's goals for both nutrition and sustainability

research

Bringing nutrition expertise to multi-disciplinary research efforts assessing ways to maximize nutrition and health while minimizing environmental impact

policy

Submitting public comments that inform the development of national food-based dietary guidelines

124

Source: *Spiker, Knoblock-Hahn, Brown, Giddens, Hege, Sauer, Enos, and Steiber. Journal of the Academy of Nutrition and Dietetics, 2020. See handout for full reference.*

124

Improve food and nutrition security, water security

Why is this important?

Malnutrition is critically linked with hunger and food insecurity.

These issues are also connected to water security. We need clean, safe water for drinking, sanitation, and agriculture.

Sustainability underpins many concerns related to the availability, access, utilization, and stability of food and water supplies.

What could this entry point look like? A few examples:

education

Developing familiarity with existing programs that provide benefits and services to under-resourced individuals (including federal, state, and municipal programs)

practice

Leading, supporting, and advocating for new services to meet the needs of under-resourced individuals (e.g., food pharmacies, mobile markets)

research

Using food security screening tools and other instruments to assess the extent of food and nutrition insecurity among specific populations

policy

Bringing nutrition expertise to food policy councils and other coalitions that can advocate for policy changes that affect structural factors such as poverty and built environments

125

Source: *Spiker, Knoblock-Hahn, Brown, Giddens, Hege, Sauer, Enos, and Steiber. Journal of the Academy of Nutrition and Dietetics, 2020. See handout for full reference.*

125

Align food production and nutrition

Why is this important?

Crop, livestock, and marine food production practices determine the quantity, quality, diversity, and safety of foods available for human consumption.

We want to make sure that food production practices support a nutritious food supply and promote human health while also protecting and renewing environmental, economic, and societal resources.

What could this entry point look like? A few examples:

education

Learning about ways that human, animal, soil, water, and plant systems are connected by the flow of nutrients through food systems

practice

Enhancing knowledge of food production among professionals and the public through hospital gardens or teaching gardens

research

Contributing to multi-disciplinary research on how climate change affects the nutritional status of crops and people

policy

Participating in advocacy efforts to ensure that legislation such as the Farm Bill supports nutrition, both directly and indirectly

126

Source: *Spiker, Knoblock-Hahn, Brown, Giddens, Hege, Sauer, Enos, and Steiber. Journal of the Academy of Nutrition and Dietetics, 2020. See handout for full reference.*

126

Optimize supply chains and food environments

Why is this important?

RDNs and NDTRs work in many settings where food is processed, packaged, distributed, and made available to individuals.

These settings are all points of intervention for promoting nutrition while investing in capacity for sustainable food production and supply chain practices.

What could this entry point look like? A few examples:

education

Learning about the logistical and business considerations of food supply chains and food environments, in order to ensure that recommendations are economically viable

practice

Overseeing sustainability initiatives in a hospital foodservice setting, and leveraging the power of procurement to strengthen local economies and food supply chains

research

Assessing the effectiveness of different kinds of environmental cues (e.g., product placement or signage) to facilitate healthy, sustainable choices

policy

Helping businesses understand and implement product labels that facilitate healthy and sustainable choices

127

Source: *Spiker, Knoblock-Hahn, Brown, Giddens, Hege, Sauer, Enos, and Steiber. Journal of the Academy of Nutrition and Dietetics, 2020. See handout for full reference.*

127

Reduce waste (of food, water, and other resources)

Why is this important?

Approximately 1/3 of all food goes to waste. RDNs and NDTRs are well positioned to reduce waste of food, water, and other resources throughout the food system.

Food waste is at the intersection of food safety, dietary intake, and individual and organizational behavior. RDNs and NDTRs are uniquely positioned to champion this critical issue.

What could this entry point look like? A few examples:

education

Learning how the waste management hierarchy (reduce, reuse, recycle) can be applied to food waste reduction efforts in a variety of settings.

practice

Incorporating food safety and waste reduction messaging into nutrition education, in order to help reduce consumer-level waste

research

Assessing the relative effectiveness of different strategies and technologies to reduce waste in foodservice settings

policy

Creating organizational policies that reduce waste within the workplace, such as ensuring the availability of recycling and compost, or incentivizing green meetings

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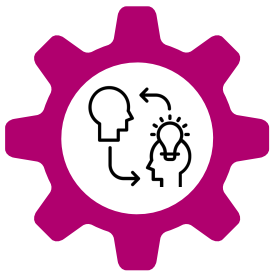
Source: *Spiker, Knoblock-Hahn, Brown, Giddens, Hege, Sauer, Enos, and Steiber. Journal of the Academy of Nutrition and Dietetics, 2020. See handout for full reference.*

128

How can just one person create systems change?

education

Making a personal commitment to lifelong learning, and helping to shape the future of dietetics education



practice

Generating demand for sustainable food systems practices from individuals and institutions

research

Contributing to our collective knowledge base through research, and ensuring that nutrition and dietetics is represented in multi-disciplinary research efforts

policy

Advocating for changes in organizational or public policies that support both nutrition and sustainability

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Individual plus Policy, Systems, and Environment (I+PSE) Conceptual Framework for Action

Creating Systems Change that Support Sustainable Food Systems

Source: *Adapted from Tagtow A, Herman D, Cunningham-Sabo L. Next generation solutions to address adaptive challenges in dietetic practice: The I+PSE Conceptual Framework for Action. J Acad Nutr Diet. (in review)*

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Cross-cutting skills that support sustainable food systems

Skills related to evidence-based practice:

- Staying current with an evolving evidence base and upholding standards of **evidence-based practice**
  - Note that in the context of sustainable food systems, the evidence may come from a variety of scientific disciplines.
- Translating population-level guidance into recommendations that are appropriate for **subpopulations and individuals**
  - What is the unique set of goals, context, and resources?
- **Communicating** clear, evidence-based messaging with the public on topics that involve complexity, uncertainty, and emotion

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Cross-cutting skills that support sustainable food systems

Skills related to interprofessional collaboration:

- Collaborating as part of an **interprofessional team**
  - Note that our network of collaborators may include not just other healthcare providers, but also professionals such as food producers, climate scientists, and policymakers.
  - Important to make sure that all members of the team are present – which voices are missing?
- **Getting nutrition on the agenda:** ensuring that collaborative efforts from other sectors also prioritize nutrition and health
  - Example: if a program promotes climate-resilient agriculture, does it also consider nutritional quality of crops, cultural appropriateness of foods and preparation methods, and food safety issues?
- **Being a champion** of critical issues: leading, training, and collaborating with others who have complementary skills

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Cross-cutting skills that support sustainable food systems

Skills related to systems thinking:

- Thinking about both immediate and **underlying causes** of nutritional issues
- Elevating the needs of **vulnerable populations**
- Initiating **collaborative efforts** with other sectors, professions, and scientific disciplines to address underlying causes
  - Example: Advocating for neighborhood walkability, safe communities, and equitable access to reliable public transportation in order to support food security
  - Example: Lending expertise to collaborative efforts to reduce energy poverty
- Learning from people with **different perspectives** – whether those are your collaborators or populations you serve
  - Learn their priorities, challenges, and language

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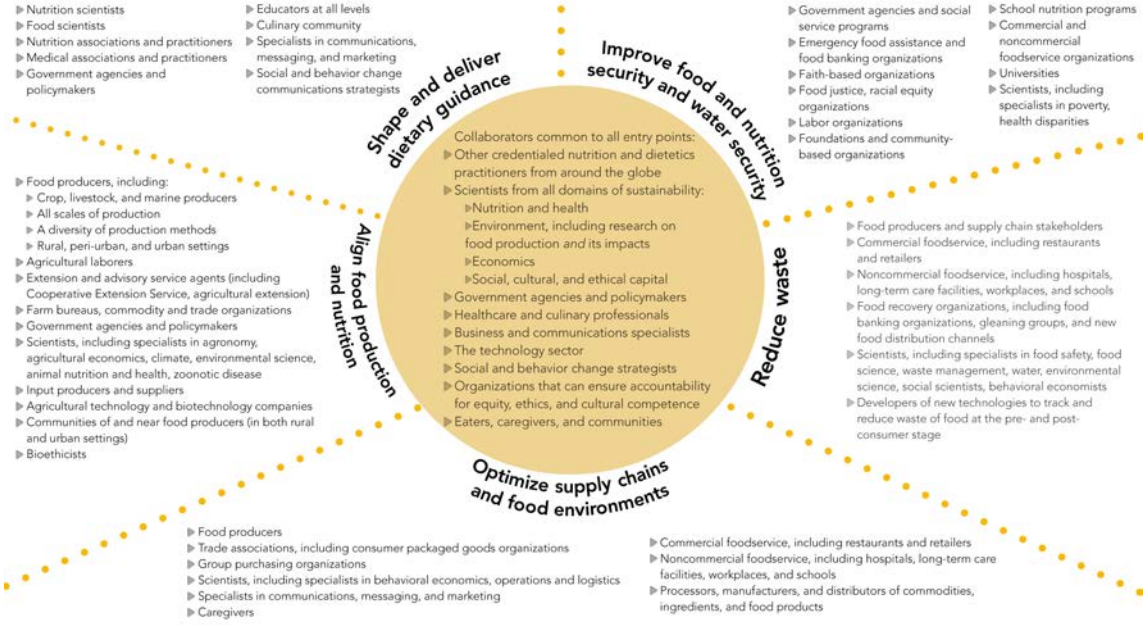
Building sustainable food systems requires collaboration



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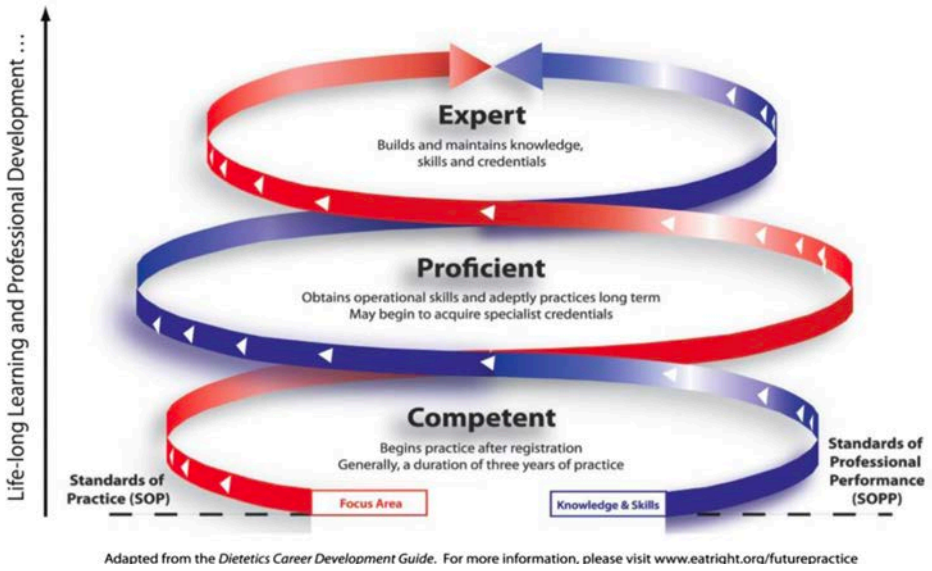
I'm excited about food systems! Where do I begin?



135

Source: *Spiker, Reinhardt, and Bruening, Revised 2020 SOPP, Journal of the Academy of Nutrition and Dietetics. See handout for full reference.*

135

Academy resources: publications and curricula

Standards of Professional Performance (SOPP): A framework for professional skill development in sustainable food systems. Includes resources, role examples, a glossary, and a framework for skill development.

Cultivating Sustainable Food Systems: a Nutrition-Focused Framework for Action: Describes how RDNs and NDTRs can promote sustainable food systems through 5 entry points. Includes examples to inspire further action.

Sustainable, Resilient, and Healthy Food and Water Systems Curriculum: 12 activities that encompass 7 sectors of the food system, to provide dietetic interns and students with foundational knowledge in sustainable food systems.

Food Insecurity / Food Banking Curriculum: 12 activities to help dietetic interns and students develop knowledge and skills necessary for an entry level position in a food bank, including experiences in nutrition education, food bank management, and food systems.

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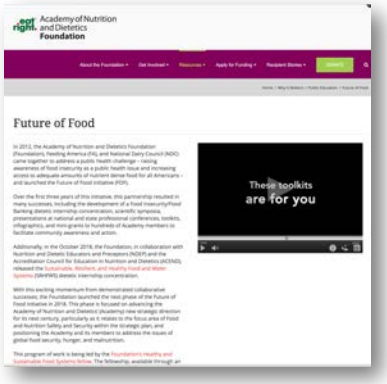
Academy resources: websites and communities

The Academy's Food Security and Sustainability page



The Academy Foundation's Future of Food page

Dietetics Practice Groups (DPGs) and Member Interest Groups (MIGs):

Sustainable food systems is an area with implications for all DPGs and MIGs. A few groups have been particularly active in this area:

- Hunger and Environmental Nutrition (HEN)
- Food and Culinary Professionals (FCP): Agriculture Subgroup

→ *See annotated bibliography for web URLs*

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Thought Starter for Modules 6 & 7

Take a moment to pause and reflect before finishing

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Based on what you've learned in this primer:

- What is one thing you learned that surprised you?
- What is one thing you want to know more about?
- What is one thing you can do in your work to support sustainable, resilient, and healthy food and water systems?

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Thank you!

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