Introduction to the US Food System
Public Health, Environment, and Equity

Roni Neff, Editor

Johns Hopkins Center for a Livable Future
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Dedication

Bob Lawrence
Bob Lawrence founded the Center for a Livable Future in 1996 and led its development into the thriving interdisciplinary academic center it is today. We all owe so much to his mentorship, vision, and personal example. As this book goes to press, Bob has announced his retirement; we will miss him greatly.

Helaine and Sid Lerner
The Lerners have been dedicated advocates for measures to improve our food system and supporters of the Center for a Livable Future’s mission since its inception.

Andy Pasternack
Andy Pasternack of Jossey-Bass reached out initially about developing this book and stewarded its initial phases with kindness, thought, and patience. Sadly, he passed away before the book was completed.

Educators and students of the food system
Finally, the book is dedicated to the educators and students who will read it. Your enthusiasm for creating a better food system inspires us all. We hope this book gives you the tools you need to make it happen!
Introduction

This textbook provides an overview of the US food system, with particular focus on the food system’s interrelationships with public health, the environment, equity, and society. Through eighteen chapters and seventy-four focus and perspective boxes, authored altogether by one hundred and six food system experts, this book brings together information and perspectives reflecting the breadth of issues and ideas important to understanding today’s US food system and to shaping its future. The readings highlight issues of public health, ecological impact, and implications for communities, equity and society more broadly; they address as well supply, demand, cost, stakeholder interests, history, power, politics and policy, ethics, and culture.

Student interest in the food system has grown dramatically since the new millennium, and academic courses and programs addressing the food system have proliferated. This book is intended to address the need for textbook material covering broad food system issues, and focusing on the food system’s relationship with the public’s health more specifically. Our aims are for the book to provide a resource to educators from a variety of disciplines, support their efforts to meet growing student demand for course work on food system topics, engage students, stimulate critical thinking, and, overall, to help students better understand our food system.

The book is a project of the Johns Hopkins Center for a Livable Future (CLF), an academic center founded in 1996 with the mission to “examine the complex interrelationships among diet, food production, environment and human health, to advance an ecological perspective in reducing threats to the health of the public, and to promote policies that protect health, the global environment and the ability to sustain life for future generations.” Figure I.1 presents the concept model that frames our activities (www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-a-livable-future/about). Based at the Johns Hopkins Bloomberg School of Public Health, the CLF engages in research, education, policy, practice, and communications activities on diverse issues at the intersection of food systems and public health. This book advances the CLF’s educational mission and builds on our experience as an interdisciplinary, food-system-focused academic center within a school of public health and within the Johns Hopkins University. The book reflects input from many CLF faculty members, staff, CLF-Lerner Fellows, research assistants, and colleagues across the public health school and the university, as well as many external colleagues.

This textbook is designed for use in food-system courses taught in many types of departments or schools, for example, public health, nutrition, environment, policy, planning, geography, nursing, business, and sociology, as well as in interdepartmental offerings. We expect it will be used in introductory courses at the advanced undergraduate and graduate levels. The book’s chapters cover the core content of the food system and are presented with enough explanations to make it useful for those with little background in the food system, and it also shares the complexities stimulating to those with more knowledge and experience. The focus and perspective boxes add depth and fodder to enrich discussions.
and assignments. We also intend for the book to be useful to those outside of academia seeking a solid introduction to food-system issues.

For many students, learning about food systems goes beyond the academic. This book and its associated discussion questions and online instructional activities present content and exercises that engage students personally and professionally. Students are encouraged to leave the classroom and computer to supplement their learning in the real world—at the table, in the store, at farms or gardens, and in sites throughout their communities. Additionally, through sometimes provocative content, the book pushes students to think critically and to question popular assumptions—as well as the ideas put forward by the authors.

While challenging students, the activities and discussion questions also target most of the core competency areas for public health—all of which have relevance for other fields as well: analytical and assessment skills, policy development and program planning skills, communication skills, cultural competency skills, community dimensions of practice skills, ethical analysis skills, and leadership and systems thinking skills (Council on Linkages Between Academia and Public Health Practice, 2010).

Another strength of the book is the diversity of the chapter and focus and perspective authors, many of whom are leaders in their fields. The contributors approach their material from within a variety of disciplinary perspectives and languages. In some chapters, public health is emphasized throughout, in others, the authors approach the topic from their own lenses and encourage students to connect the information back to public health, environment, equity, and systems issues. This diversity of approaches can help strengthen students’ understanding and can provide a foundation to help them interface with the range of food-system stakeholders and approaches.

This textbook aims to be comprehensive in the sense of addressing the major food-system topics, but it cannot possibly be comprehensive in the sense of covering every process, project, idea, and issue, not only because of the sheer number of these but also because this is a vibrant and growing field. Additionally, although the US food system is intimately intertwined with global food systems, this book would be many times longer if it sought to do justice to global issues as well as domestic ones.
WHAT’S INSIDE

What is the best way to organize a textbook about a system? By definition, all the parts interact and overlap. Figure I.2 provides a simplified visual organizing framework indicating primary ways in which the chapter content interrelates. Activities, drivers, and outcomes are numbered to reflect chapters in this book. Selected examples are shown for each category in the outer ring. We will return to this

**FIGURE I.2  Textbook Concept Model**

Note: Numbers refer to Chapters
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model in each section overview, highlighting the section’s connection to the whole. Throughout the chapters, and the focus and perspective features, we have sought to minimize repetition, referring the reader to discussion elsewhere in the book. Nonetheless, some repetition is necessary in order to provide appropriate overviews within the context of particular chapters, and different authors often approach topics from quite different angles.

PARTS

Introduction. Chapter 1, the introduction, begins by explaining food systems, systems approaches more generally, and what is meant by a “public health approach.” It then provides a broad overview of the US food system including its key dimensions, components, and challenges. Finally, it examines approaches to food-system change from the perspectives of public health and the human right to adequate food, and provides examples of changes underway.

Part 1: Outcomes. Part 1 provides the book’s orientation and motivation by describing how the food system affects public health (chapter 2), the environment (chapter 3), equity (chapter 4), food insecurity (chapter 5), and community food security (chapter 6). (The last two, of course, are linked to the former three, but given their centrality, they merited their own chapters.) These chapters describe a wide variety of food-system impacts, both salutary and not, and help the reader understand that many of these impacts are not inevitable but rather are products of the specific ways in which our food system has evolved. Alternatives to the mainstream food system and their ramifications are also discussed. The food system also affects many other aspects of our world beyond these four, from the economy to community life. Such topics also appear in this part and are threaded through the rest of the book.

Part 2: Drivers of the Food System. Part 2 orients readers by discussing four of the major drivers (entities that exert force) that shape our modern food system and its potential alternatives: economics, policy, culture, and marketing. The food system’s biophysical environment is also a driver, as shown in figure I.2, however, we opted to place the environment chapter (chapter 3) in the “Outcomes” part, given its dual role. Many of the later chapters return to these drivers, helping readers consider ways to use them to shape change.

The economics chapter (chapter 7) uses a set of case study examples to illustrate key economics concepts and in particular to describe some of the important market failures in our food system, for example, situations in which the food system does not provide optimal outcomes, and ways economics tools can be used to assess and address these problems. Turning to focus on government more directly, the policy chapter (chapter 8) describes the major food-system-related policies and how they operate, as well as explaining how modern food-system policy evolved, with an emphasis on the US Farm Bill. The culture chapter (chapter 9) discusses the cultural aspects of our relationship to food. Such factors undergird our food choices, our reactions to existing food-system offerings, and our openness to marketing and interventions to change our choices. Marketing by those seeking to convince us to buy their products (chapter 10) drives our food choices and even options. The chapter describes the marketing industry and efforts to bring about positive change.

Part 3: Food Supply Chain: from Seed to Sales. With part 3, the book begins a sequential journey through the major activities in the food chain up to the point when food enters consumers’ hands.
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Chapters provide overviews of crop production (chapter 11), food animal production (chapter 12), food processing and packaging (chapter 13), and food distribution (chapter 14). The chapters describe sector history, structure, and operations, including discussion of policy, economic, and industry drivers, as well as impacts on public health, environment, and equity.

Part 4: Food in Communities and on Tables. Part 4 continues along the food chain with four chapters discussing what we eat and what happens when food reaches our tables and communities. We begin with an overview of the contours of current US diets (chapter 15), covering not only the “what” but also the “when” and “where,” and some of the population diversity in diets—“who.” The nutrition chapter (chapter 16) then explains what happens to this food inside our bodies, what we “ought” to be eating from a health standpoint and why. This nuts-and-bolts overview discusses key macronutrients and micronutrients as well as total diet and whole food approaches, and introduces the reader to the field of public health nutrition. The food environments chapter (chapter 17) reviews literature on how food availability within various environments affects our eating behaviors and how environments could be changed to help make the healthy choice (broadly defined) the easy choice. The preceding chapters have made clear that our current food system is profoundly unhealthy for people and the planet. Although some changes in our diets will occur naturally as the food system’s problems lead to changed costs and incentives, it is not always clear that those changes will come in the desired timeframe or will lead us in the desired direction. Chapter 18 focuses on interventions to change eating behaviors in desired directions. This concluding chapter provides a review of important theories that can guide intervention development and then provides example interventions targeting change from the individual to societal levels.

FOCUS AND PERSPECTIVES FEATURES

The book’s main chapters are complemented and in some cases balanced by focus and perspectives features authored by experts in research, policy, and practice. The focus features are intended to provide additional interest and to help bring food-system issues alive for readers. They include articles digging deeper into topics of interest, case study examples, tables, and graphics. Perspectives pieces present analyses or viewpoints rooted in evidence (including lived experience in some cases). These are used to demonstrate some of the existing views among those working on food-system issues. We expect readers will disagree with some, many will make them think, some will inspire them, and some might even make them angry. In some cases the distinction is subjective between what should be categorized as a focus or perspective, and you might disagree with our choices. Note that because of page limits and the desire to present a variety of ideas and content, we did not attempt to balance each piece with a counterargument from a different author. We emphasize that the perspectives present their authors’ views, not those of the chapter authors or editor.

Together, these chapters and the focus and perspectives features present a broad view of today’s US food system in all its complexity (figures I.3 to I.10). They highlight the challenges we face and provide reasons to be hopeful as well. The textbook also provides opportunities for students to examine the food system’s (nay, the world’s) stickiest problems and think critically about solutions.
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FIGURE I.3  Child’s Poster about Healthy Food Placed on City Buses

Source: Shydi Griffin, Baltimore City.

FIGURE I.4  Seniors Choosing Vegetables

Source: Local Food Hub.

FIGURE I.5  Cows at Albright Farm

Source: Mia Cellucci, CLF.

FIGURE I.6  Students Eating Lunch

Source: Johns Hopkins, Diversity Leadership Council
FIGURE I.7 Lunchables

Source: Michael Milli, CLS.

FIGURE I.8 Baby Eating Spaghetti

Source: istockphoto.

FIGURE I.9 Green Buffers, Clean Water

Source: USDA.

FIGURE I.10 Man with Carrots

Source: Local Food Hub.
An instructor’s supplement is available at www.wiley.com/go/neff. Additional materials, such as videos, podcasts, and readings, can be found at www.josseybasspublichealth.com. Comments about this book are invited and can be sent to publichealth@wiley.com.

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For many years, CLF had considered developing a textbook. The spark that got this project started came when Andy Pasternack of Jossey-Bass reached out to me. In turn, his interest in developing a food system and public health textbook was sparked by a conversation with food system leader Angie Tagtow. Seth Schwartz of Jossey-Bass was a wonderful steward for this project. He was responsive and patient as I figured out how to edit and format a book and provided wisdom to guide the project throughout. Justin Frahm and Susan Geraghty were supportive and helpful in the production phases.

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—Roni Neff, editor, on behalf of the Johns Hopkins Center for a Livable Future
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About the Center for a Livable Future

Founded in 1996, the Johns Hopkins Center for a Livable Future (CLF) is an interdisciplinary academic center dedicated to conducting research on the public health implications of our food system, educating a wide range of students, and advocating for evidence-based policy reform. The center is based within the Bloomberg School of Public Health, and collaborates with faculty members, staff, and students throughout Johns Hopkins University—and beyond.

CLF’s core program areas apply a public health lens to issues surrounding: food production, food communities, food system sustainability, and food system policy. The center’s education initiatives include the CLF-Lerner Fellows Program, which was awarded 133 doctoral fellowships to 62 individuals since 2003; “Teaching the Food System,” a free, downloadable curriculum and set of resources for educators; a certificate program in “Food System, Environment, and Public Health” offering graduate students specialized knowledge and understanding of the relevance of the food system to many different competencies in public health; online courses available at the Bloomberg School, Coursera; and more.

The CLF explores the interrelationships among health, environment, diet, and food production—and works to improve those systems to ensure food security for present and future generations. In a livable future, all systems that sustain us operate in balance to support human and ecosystem health, equity, and resilience.