

well as the issue of food insecurity by relying disproportionately on imports to meet domestic demand. Economic power shapes the entire meat supply chain, with animals reared in large concentrated animal feeding operations (CAFOs), while low-paid workers repetitively disassemble thousands of animals every day in massive industrial slaughterhouses dotting the global landscape from Australia to Brazil, from the United States to China.

Second, as the availability of meat from industrial production expands, smallholders often find themselves unable to compete with industrial production for market share and even for land. The loss of smallholder production can further contribute to a decline in both food security and food sovereignty for communities around the world. This competition with global industrial production also contributes to the disappearance of more traditional animals and foods, with consumers eating more uniform types of meat and grains, thereby contributing to less genetic diversity in the agrifood landscape.

Finally, there are important concerns about the environment, sustainability, and social justice. The growth of global meat production and consumption—the economic expansion of the global meat industry—has brought grave concerns about environmental consequences. Deforestation, methane from cattle contributing to climate change, pollution from CAFOs, and overfishing of our oceans are just a few of the many environmental impacts created by the expansion of industrial meat production globally. These concerns have been voiced by a myriad of organizations, including the Union of Concerned Scientists and the Food and Agriculture Organization of the United Nations (FAO) among many others. Also noteworthy is that the consequences of environmental degradation are rarely shared equally. Polluted water and air and more erratic weather conditions will disproportionately impact poorer nations and people, including ironically, smallholders who have been further marginalized by the global meat industry. Moreover, it is often poorer individuals who become the bulk of the labor force for CAFO operations and industrial slaughterhouses with the latter occupation having notoriously high injury and turnover rates.

The Outline of the Book

The chapters in this book bring empirical data to bear on a political-economic analysis and discussion of the global meat industry and its social

and environmental consequences. The overall discussion rests on the understanding that there are many small-scale meat producers across the globe, but most of the meat consumed globally is from large-scale industrial meat production. This diversity in global meat production has implications for environmental and sustainability issues: small-scale meat production is a system in which animals are very important for providing not only draft power for plowing, but also fertilizer for gardens and field crops. By contrast, the global meat industry—centered on very large meat processing companies and concentrated industrial production—has the largest and most damaging environmental impacts seen within meat production.

Part I of the book explores global forces shaping the expanding meat industry, paying particular attention to the role of corporations and national governments. In chapter 2, Philip H. Howard examines the process of corporate concentration in the global meat industry by demonstrating how government subsidies have aided three of the biggest global meat processing firms—JBS, WH Group, and Tyson. These three corporations have rapidly increased in size and power in recent decades. Howard demonstrates how two kinds of government subsidies have aided these transnational corporations (TNCs) in gaining greater economic dominance: subsidies that reduce the cost of animal feed, and subsidies that reduce the cost of acquiring competitors. Tyson, which is headquartered in the United States, has benefited particularly from policies that subsidize corn and soybean production and thereby substantially reduce animal feed costs. WH Group, headquartered in China, has grown rapidly with the support of the national government, which has provided billions of dollars for buyouts. One of these buyouts was for the acquisition of Smithfield in 2013, which made WH Group one of the largest meat processing corporations in the world. Finally, JBS is headquartered in Brazil and has benefited from both feed and financial subsidies that have included access to billions of dollars from the Brazilian government to finance acquisitions. These cases demonstrate that government subsidies, both direct and indirect, have played a central role in the expansion of the global meat industry and the increased concentration within it, as well as the immense acquisition of wealth by the top executives of all of these firms.

In chapter 3, Conner Bailey and Nhuong Tran provide an overview of the global seafood sector—including traditional wild-caught fish (i.e., “capture”) and farmed fish (i.e., “culture”)—describing trends in production

over the past several decades. They examine issues of environmental risk and social impacts in this sector of the global meat industry, demonstrating how such issues can pose a challenge to corporate concentration and dominance in the seafood industry. Bailey and Tran demonstrate that, despite such obstacles, global trade in fisheries products and the importance of feed in intensively managed aquaculture offer opportunities for corporations to increase their economic power within the seafood industry. They also demonstrate how control over breeding stock in seafood, including through genetic engineering in fish and shrimp, allow for the assertion of greater corporate control. Bailey and Tran therefore provide an important and informative examination of a sector of the meat industry that is often overlooked.

Part II of the book turns to particular places to show how the global forces propelling the meat industry are experienced on a more local level. In chapter 4, Mindi Schneider examines the dramatic rise in pork production and consumption in China's reform era (i.e., since 1978), and she demonstrates how this trend was intimately connected to the simultaneous expansion of the global meat industry. Schneider begins by discussing cultural history and meanings related to pigs, pork production, and peasants. Turning to the transformation of China's pork industry, Schneider argues that national policies and corporate strategies played key roles in developing the production system found in China today. In particular, the expansion of China's pork industry rested on national policies that liberalized agricultural markets, and facilitated industrialization and capitalization in agriculture beginning in the late 1970s. Schneider also demonstrates how such national policies connected to global forces, including the expansion of soybean production and trade, in ways that facilitated the expansion of the pork industry in China. In 2017, China had half the world's pigs, with about 690 million, and it produced and consumed half of the world's pork, at about 53 MMT. Schneider then shows how the country's current pork industry is both highly productive and environmentally destructive. Given its centrality to the global meat industry, understanding the growth of China's pork industry is especially important.

In chapter 5, Thomas K. Rudel explores sustainable cattle ranching practices among small-scale farmers in the Ecuadorian Amazon in South America within the context of the expanding global meat industry. Rudel explains why smallholders with livestock tend to engage in sustainable agricultural

practices, even in contexts marked by globalization that works to undermine sustainable practices. This chapter provides a historical analysis of changing land management practices among two groups of small-scale cattle ranchers, one *mestizo* and the other Amerindian, in the Ecuadorian Amazon between 1986 and 2011. Drawing on surveys conducted over this twenty-five-year period, Rudel demonstrates that the intersection of globalization with racial and ethnic politics disadvantaged some landowners (Amerindians) and encouraged them to rent their land to *mestizo* cattle ranchers who degraded the pastures. At the same time, *mestizo* cattle ranchers in adjacent communities allowed silvopastoral landscapes—considered more environmentally beneficial—to emerge on their own lands in part because the spontaneous emergence of these silvopastures required minimal inputs of labor. By contrast, the rented lands of Amerindians have not developed into silvopastures landscapes. Rudel argues that these diverse land management strategies underscore the continuing importance of owner-occupancy in fostering environmental stewardship even in contexts, like Latin America, marked by globalizing markets.

In chapter 6, Carrie Freshour discusses the experiences of workers in the global meat industry, focusing on poultry plant workers in the southeastern United States. Based on ethnographic fieldwork in a slaughter plant, Freshour explores poultry work by focusing on conflicts between workers and corporations. She shows how corporate strategies have led to shifts in the composition of the workforce, in an attempt to undermine workers' power in demanding higher wages or better working conditions. Most recently, poultry processing plants have shifted from hiring primarily undocumented Latina immigrants to employing African American women. Freshour explains how this recent shift has unfolded, but she also demonstrates that historical continuity exists in the industry's reliance on marginalized workers, even though these groups have changed over time. Such shifts in the composition of the workforce in meat processing plants represent an ongoing conflict between workers and corporations, as corporations seek a cheaper, more docile, and more vulnerable labor force.

The third and final part of this book discusses some of the important environmental, social, and ethical consequences of the global meat industry, as well as some possible solutions. In chapter 7, Riva C. H. Denny examines the global meat industry's contribution to pollution and climate change. With its global expansion over the past several decades, the meat

industry has become one of the most significant contributors to climate change because of the high levels of greenhouse gas (GHG) emissions produced by the tens of billions of animals raised for human consumption. Denny investigates both total GHG emissions and emission intensity (EI), which is the rate of GHG emissions per weight of meat produced. Using statistical methods, she examines GHG emissions from the meat industry drawing on FAO data for more than 190 countries from 1961 to 2014. Denny offers, then, a truly global analysis of the meat industry during this important period of immense expansion. Focusing on cattle, pigs, and chickens, Denny's analysis considers how different production techniques across different countries and regions contribute to global climate change.

In chapter 8, Robert M. Chiles and Celize Christy discuss the tensions between economic development and ethical considerations of animals. They focus their discussion on meat production in Rwanda, one of the world's poorest countries. In doing so, Chiles and Christy critically examine the assumption that intensifying livestock production is the best and most viable pathway to economic development and food security in countries of the global south, such as Rwanda. This view is often put forward by international organizations with livestock development programs, aiming to help countries in the global south, and especially their farmers. While such programs can help with food security, poverty alleviation, and similar issues, Chiles and Christy point out that the programs usually fail to give attention to animal welfare issues and humans' obligations toward animals. Similarly, the Rwandan government has created policies to encourage intensive meat production, particularly poultry. Chiles and Christy consider how such development policies affect animal welfare, and they discuss alternative pathways to achieving goals such as food security and poverty alleviation.

In chapter 9, Elizabeth Ransom and Bill Winders reflect on the overarching themes highlighted by the chapters: the influence of governments and corporations in facilitating and shaping the global expansion of the meat industry, the contributions of the expanding meat industry to food insecurity in many places around the world, and the resulting environmental and social consequences of this industry's transformation. Ransom and Winders explore some of the ways that individuals have responded to the global meat industry and its negative consequences. There are many individual