

CONTROVERSIES IN  
SCIENCE & TECHNOLOGY,  
VOLUME 4

*From Sustainability to Surveillance*

Edited by Daniel Lee Kleinman,  
Karen A. Cloud-Hansen,  
*and*  
Jo Handelsman

OXFORD  
UNIVERSITY PRESS  
2014

World Food Programme. 2012. "Hunger: Who Are the Hungry?" Rome: Author. <http://www.wfp.org/hunger/who-are>

World Watch Institute. 2006. "Can Organic Farming Feed Us All?" *World Watch Magazine*, 19. <http://www.worldwatch.org/node/4060>

Wu, M., M. Quirindongo, J. Sass, and A. Wetzler. 2010. "Still Poisoning the Well: Atrazine Continues to Contaminate Surface Water and Drinking Water in the United States." Washington, DC: Natural Resources Defense Council <http://www.nrdc.org/health/atrazine/files/atrazine10.pdf>

## CHAPTER 8

# Global Obesity and Global Hunger

KELLY MOORE AND JUDITH WITTNER

*The tragic irony in some parts of the Global South is that people are starving while starving over fields of beans, plantations of coffee and tea, and stands of palms, all grown to meet the demands of the already well-fed consumers in the North.*

—Lawrence et al. 2008

Chances are you've heard that, around the globe, people are getting fatter. In fact, you may have read about the "epidemic" of obesity that is causing costly health problems such as heart disease, type-2 diabetes, high blood pressure, cancer, and premature death. Most scientific evidence suggests that approximately 10% of the world's population is obese (World Health Organization [WHO] WHO 2012b; 2012c, p. 36) and that most of these people live in the northern hemisphere in wealthier countries. The WHO and other groups call obesity a preventable epidemic, like SARS, AIDS, and the flu, caused by the failure of individuals to follow scientific and other rules for increasing exercise and reducing energy intake (calories) and the consumption of specific foods such as sugars and fats (Nestle 2002; Pollan 2008; United States Department of Health and Human Services 2012; WHO 2012c). At the same time that so much attention is given to obesity, hunger and food insecurity imperil almost a billion people globally. While we hear less about the problem of hunger in Western news media, chronic hunger affects approximately 13% of the world's population, nearly as many people now as it did in the 1970s. Most of these people live in Africa and Southeast Asia (Food and Agriculture Organization [FAO] 2012a, pp. 8–9). Many observers believe that hunger

is caused by inadequate access to agricultural technologies (International Food Policy Research Institute 2012; Bill and Melinda Gates Foundation 2013; Consultative Group on International Agricultural Research 2013) or short-term problems such as war or drought (FAO 2012b).

Global obesity and global hunger might be seen as independent problems, caused by the personal habits of individuals in the case of obesity or by short-term problems such as war or lack of technical knowledge in the case of hunger. In this chapter, we take a different approach by examining these two phenomena as two sides of the same coin. The causes of hunger and obesity are connected through scientific and technological applications and mediated by political and economic considerations. They are not separate problems of personal choice, chance, or a lack of scientific knowledge. We first review the evidence for a global obesity epidemic and some of the most common explanations for its prevalence. In the next section, we examine the problem of too little food, focusing first on its prevalence and the extent to which it is caused by wars, disasters, or the failure of countries to make use of the latest technologies to increase yields. In the third section, we take a closer look at how the problems of obesity and hunger are caused by a common set of factors: the rise and spread of industrialized and chemically based global food systems that unevenly distribute benefits and harms across the globe.

### TOO MUCH: OBESITY AS A BIOMEDICAL PROBLEM

Being fat used to be a high status position associated with health, and it remains so in some cultures today (Bordo 1993; Massara 1997). It has also been associated with failure to discipline the appetite (Saguy 2013). In the second half of the 20th century, however, fatness came to be framed as a biomedical problem rather than as a desirable state or as a purely moral problem (Clarke et al. 2010; Boreo 2012). Based on studies of data from the early 1980s through the mid-1990s, British, Australian, French, and Canadian biomedical researchers predicted rapidly growing populations of very fat people who would die early deaths and new generations of very fat children who would be saddled with ill health at an early age (Cameron et al. 2003; Rennie and Jebb 2005). Other researchers, in documenting the spread of obesity in places as diverse as Kuwait, the Philippines, and the South Pacific Islands, argued that a combination of changes in what people were eating (more oils and fats, and, as wealth increased, more meat and fish), changes in how much they ate, and lower rates of physical activity were the leading causes of global obesity (Burslem 2004). Fat children

became a special concern, despite the fact that food insecurity leading to malnutrition, not obesity, is mainly to blame for 7.6 million under-five child deaths each year (WHO 2012b).

### Evidence for the Increase in Obesity

The most common way to measure weight at the global level is by using body mass index (BMI), also known as the Quetelet index. BMI is calculated by dividing weight by the square of a person's height and multiplying that number by a universal constant (if height and weight are measured in the metric units of centimeters and kilograms, that constant is 1). Although it underestimates fat levels in elderly people and may overestimate it in people who are extremely muscular, such as some kinds of athletes, it is still the most widely used measure of obesity at the global level. BMI scores are measured in a range: A BMI of 24.99 to 29.99 is considered "overweight," above 30 "obese," 24.99 to 18.5 "normal," and under 18.49 "underweight" (WHO 2012a). At the country or global level, obesity is measured by aggregating individual BMI scores, to give an overarching score for each country that can be compared to other countries. It is important to note that in many studies and journalist accounts of the obesity "epidemic," the percentage of people who are *overweight* are combined with the percentage who are *obese*, incorrectly inflating the numbers of people who are in the biomedical category *obese*.

Scientific research shows that the obesity rate across the globe has increased since 1980. But rates of obesity are not growing evenly around the world and have leveled off in many countries (McMichael 2009; Patel 2012; Gard 2011; Organisation for Economic Co-operation and Development 2012, p. 2). Of the 10 countries with the highest levels of obesity, 9 are among the world's wealthiest (Organisation for Economic Co-operation and Development 2012). The highest levels of obesity are found in the Americas, particularly in North America. The regions with the lowest rates of obesity are Southeast Asia and sub-Saharan Africa (WHO 2012c). To put this in sharper terms: North America has only 6 percent of the world's population but 34% of the world's biomass. In contrast, Asia has 61% of the world's population but only 13% of the world's biomass (Walpole et al. 2012).

### Why Obesity Has Been a Biomedical Concern

The WHO and other national and international agencies and commentators express concern over obesity rates because obesity has been linked to heart

disease and stroke; osteoarthritis; diabetes; and cancer of the breast, colon, prostate, endometrium, kidney, and gall bladder (WHO 2012b). However, recent studies show that being fatter than the "normal" category is less of a health risk that was previously thought: Mortality risk is lowest among populations of "overweight" people, as compared to those in the obese, normal, and underweight populations (Flegal et al. 2013). Researchers have also questioned the direct effects of obesity on some illnesses, such as heart disease and diabetes, as well as the causal order between obesity and illness, which suggests that there are more complex pathways to illness than the existence of too much weight (Carhennon et al. 2012; National Clearinghouse for Diabetes Information 2013; Lim et al. 2013). The health problems associated with obesity are often framed in terms of financial costs to nations, whereby fat people are exhorted to "lose weight for your country" (Guthman and DuPuis 2006; "Special Report: Obesity" 2012; WHO 2012c; Rampell 2013). The costs of obesity, however, are not simply those of caring for those with illnesses. They include the economic, social, and environmental costs of the uneven distribution of the production and distribution of food-as-commodity that results in some countries having far more food than they need and others far less.

## TOO LITTLE

### What It Means to Have Too Little

Unlike obesity, today the problem of too little food is less likely to be measured in purely biomedical terms, such as extreme starvation, or kwashiorkor (protein deficiency), but rather in terms of how far away a person, group, or country is from a state of food security. Food security is a standard used by the United Nations World Food Programme (WFP). To be food secure is to have all-time access to sufficient, safe, and nutritious food to maintain a healthy and active life (WFP 2012a). *Sufficient food* is measured by the capacity of a country or region to have adequate stores of food, the capacity to raise it, and the ability to acquire it through aid. Access is measured by the ability of people to regularly acquire adequate quantities of food. By *nutritious*, the WFP means that food must have a positive nutritional impact on people and that people also have the means to cook, store, and use adequate hygiene practices, in addition to having access to water. Few groups or experts debate the biological consequences for those who are chronically food insecure. It leads to lassitude (fatigue), cognitive processing problems, blindness that is the result of nutrient deficiencies, and susceptibility to illnesses, thus impairing people's ability to

work, go to school, and carry out other daily activities (WHO 2005; FAO 2012b; International Food Policy Research Institute 2012; WFP 2012). It is especially devastating to children.

### The Distribution of Food Insecurity

Approximately 948 million people, or about 13% of the world's population, are estimated to be food insecure. Although the global level of food insecurity has dropped since 1990, the rate of decline has leveled off since 2007–2008. Sixty-five percent of the people who are food insecure around the globe live in just seven countries: India, China, the Democratic Republic of Congo, Bangladesh, Indonesia, Pakistan, and Ethiopia (FAO 2012b; International Food Policy Research Institute 2012, p. 8; WFP 2012b). None of the world's poor countries are in Western Europe or North America, although all wealthy countries also include people who are food insecure. In the United States in 2011, for example, 17.2 million households, or 14.5% of the population, were food insecure, the highest number ever recorded in the United States (Coleman-Jensen 2011, p. v). Western Asia is the one region of the world where food insecurity is increasing, and progress at remedying food insecurity has slowed in Latin America and the Caribbean. Rates of food insecurity are highest in sub-Saharan Africa (26%; FAO 2012b; International Food Policy Research Institute 2012; WFP 2012b).

### Too Little Food at the Global Level?

What causes food insecurity? Only 8% of world hunger is due to an acute event such as a war or a drought. The remaining 92% of food insecurity is chronic, meaning that over long periods of time, people are hungry and unable to live full lives. The amount of food in the world is not a cause of food insecurity, despite what Lappé (2013) calls "the scarcity scare," the discourse that warns us that we are soon to reach the point in human history when we will be unable to feed ourselves. In contradiction to that widespread belief, global food production per capita today is higher than it was in the 1990s. The problem of hunger is related to the distribution of food, not to its declining production or to rising world population levels.

A seemingly simple solution would be to increase *food aid*, or the distribution of food or of cash to purchase food in support of food assistance programs. Yet food aid can exacerbate the problem of food insecurity by flooding markets with imported food while depressing food prices in

recipient countries even further. Depressed food prices might seem to be a good situation for the poor, but in countries where most of the poor are agricultural workers, the low food prices contribute to the problem of impoverishment because farmers get lower prices, which drives hunger. New food aid systems avoid this problem by providing countries and regions with money to buy the food that is available in their country at a price that does not exacerbate poverty (Clapp and Cohen 2009). Food aid, however, is hardly a solution to chronic food insecurity. Explaining food insecurity requires an analysis not only of why some countries have populations that consume far less food than they need but a joint examination of how the global food system simultaneously shapes food security and obesity.

#### EXPLAINING GLOBAL OBESITY AND GLOBAL HUNGER TOGETHER: THE EFFECTS OF GLOBAL FOOD AND POLITICAL SYSTEMS

The *global food system* is the set of relationships and materials for growing, processing, and distributing food. Food has long been bought and sold around the world, but under new global trade and lending rules, countries that specialize in producing and exporting just one or two crops to the highest bidder are rewarded. Poorer countries are the most vulnerable in this system, since they often have little surplus money or food when global prices for particular commodities decline, or when drought, pestilence, and other problems reduce production. Thus rather than encouraging within-country production and consumption of a wide variety of crops and animals, the new system encourages countries to treat food as a commodity for profit (Magdoff and Tokar 2010; Patel-Campillo 2010, Fromartz 2011).

With just a few specialty crops grown, countries must import more food to feed people and pay whatever world prices are at that moment. To specialize in a particular export commodity, large tracts of land and enormous amounts of water are needed. One result of the need for land for export-commodity production is that, in some countries, people who used to have small landholdings are forced off their property, as large international companies and foreign investors consolidate land, remove trees, and draw heavily on local water sources (Kugelmann and Levenstein 2009). Competition for water and land is now the norm in most parts of the world (United Nations Development Programme 2006). These changes are especially problematic in Africa, where more than 77% of the population is engaged in farming (FAO 2009b).

Only a handful of companies control the global food supply (Lang and Heasman 2004; Lawrence and Burch 2007; McMichael 2009). These companies include fertilizer giants Potash, Yara, and Mosaic (a subsidiary of top grain trader Cargill). Other corporate grain trading giants are ADM and Bunge. The top global seed and pesticide companies include Bayer, Syngenta, Dupont, and Monsanto. The latter was recently in the news for its multimillion-dollar investment toward the successful defeat of a genetic modification organism labeling law in California. These corporations drive the sale of food to whoever can pay the most: the people in the wealthiest countries and the wealthiest people in poor countries. Wealthy countries are the countries in which the shareholders of the large global chemical, food, banking, and marketing firms are likely to be concentrated, benefiting (and sometimes losing) from food speculation. Holt-Giménez and Patel (2009) contend that the root cause of food insecurity is based on this monopoly control of food production:

The root causes of the food crisis lie in a skewed global food system that has made Southern countries and poor people everywhere highly vulnerable to economic and environmental shock. This vulnerability springs from the risks, inequities and externalities inherent in food systems that are dominated by a globalized, highly centralized, industrial agrifoods complex. Built over the past half-century—largely with public funds for grain subsidies, foreign aid, and international agricultural research—the industrial agrifoods complex is made up of multinational grain traders, giant seed, chemical and fertilizer corporations, global processors and supermarket chains. These global companies dominate local markets and increasingly control the world's food-producing resources: land, labor, water, inputs, genes, and investments. (p. 20)

Holt-Giménez and Patel's arguments raise questions about the value of one of the major technological solutions proposed to end food security: the use of genetically modified seeds and animals to raise productivity and thereby alleviate the problem of food security. If overproduction and distribution and little access to money and land are the causes of food insecurity, it seems unlikely that genetic modification organism crops will solve the problem (nor have they).

Moreover, despite the claims of corporate purveyors of transgenic seeds and crops (products that have been manufactured through the insertion of foreign genes), such as Monsanto, Cargill, Bayer, and other giants, bioengineering has not been shown to increase agricultural productivity nor enhance food security (Altieri and Rosset 1999; Altieri 2005; Azadi and Ho 2010).

Part of the explanation for this is that biotechnology innovations are designed for profit rather than as responses to need. Herbicide resistant crops (such as Monsanto's Roundup Ready seeds) and other crops that produce their own insecticide make farmers dependent, through patents and other legal devices, on biotechnology companies for seeds and chemicals. By bringing together the seed and chemical industries in seed-plus-weed management systems, companies have been able to raise fees to farmers higher than ever before—a practice that yields more profits for corporations but not for small-scale farmers. Beyond this, transgenic plants that produce their own insecticides and weed killers have, like all lethal chemical agents (also known as biocides), created resistant superweeds and superpests. These new seeds undermine crop diversity and create genetic uniformity, thus making crops vulnerable to pests and pathogens while removing ownership and knowledge from most small farmers (Altieri and Rosset 1999; Kinchy 2012). Genetically modified inputs are only one of the ways that science and technology shape the intensification of agricultural production for export. Intensification and specialization wreak havoc on the environment as well. Huge tracts of land for monocrops are needed, as are large amounts of water. In Africa, Asia, and other places around the world, billions of acres of land and the water on it are being snapped up by foreign investors, in what some critics are calling a new "land grab" that may make citizens of poor countries ever more vulnerable to food insecurity (Cottala et al. 2009; FAO 2009).

Moreover, the spread of genetically modified plants and animals is already displacing the knowledge that small farmers used to have. The new experts are global chains of agriculture scientists, chemical companies, and seed distributors. Local knowledge and crops are either displaced, or, in some cases, local crops are reengineered, patented, and then used by companies or international food traders to grow food for export markets. The result: Those with more money and land are highly advantaged, and farmers experience what Otero (2008) calls "de-peasantization." They move to ever-more crowded cities to find wage work so that they can buy food and other necessities, often from supermarkets that are owned by the same companies and partnerships that are part of the production of crops for export (Davis 2010). Those who remain behind are likely to become employees of companies that grow food for export.

The link between the poorest groups in the global food system, who are most vulnerable to food insecurity, and the wealthiest, who are more likely to be fat, is mediated not only by commodity prices but also by global supermarket chains. These companies look to buy foods from international producers at the lowest possible cost and to sell "value-added" (i.e., highly

processable) processed foods with low nutrient value. These markets are concentrated in the North but are rapidly expanding in the South. Typically, supermarkets will heavily promote highly processed snack foods, meats, and dairy products. These are also the foods that are the most environmentally damaging, as the production, shipping, and packaging of these foods results in high energy use and waste (Oresund Food Network 2008). The chemical-, water-, and energy-intensive system of global food production has implications not only for hunger but for obesity too.

Research has begun to show that chemicals and chemical modifications of food may also be playing a role in obesity around the world. Nutrition-poor diets (a form of starvation) can lead to people becoming overweight (Wells 2012). Many obese children and adults subsist on low-nutrition, high-fat, high-sugar diets that provide few vitamins and minerals. For example, researcher Carlos Grijalva-Esternod and his colleagues (2012) found a "double burden" of stunting (reduced growth rate) in children and obesity in their mothers in a refugee population in the western Sahara that is dependent on food assistance for survival. There is also growing evidence that the proliferation of chemicals in the environment (in pesticides, dyes, perfumes, cosmetics, medicines, food additives, plastic, fire retardants, and solvents) since the end of World War Two (a time period that coincided with rising obesity) may be an important cause of significant weight gain at the level of populations (Krimsky 2008; Guthman 2011, p. 108). Similar conclusions were drawn from a study that observed a nationally representative subsample of 2,838 US children and adolescents (ages 6 through 19 years). Participating children were randomly selected for measurement of urinary Bisphenol A (BPA) concentration (which had previously been assessed in the 2003–2008 National Health and Nutrition Examination Surveys), whereupon researchers found that the chemical BPA, an "endocrine disrupter" used in cans and plastic containers, is "significantly associated with obesity" (Trasande et al. 2012). Unfortunately, the "biomedical" focus of most obesity research treats this condition as a problem of overconsumption. Clearly, obesity is a phenomenon that also needs to be understood within the framework of the global flows of chemicals that are present in the inputs, transport, processing, and consumption of food.

## CONCLUSION

We have attempted to show the common origins of obesity and hunger in the capture of the food system by large-scale corporate players. They have created many of the problems we face today, problems that cannot

be solved by more of the same (more chemicals, more genetically modified food, and, indeed, more food aid). Technological and biological fixes designed to intensify the amount and speed of food production and to make it possible for wealthier countries to have more, and more convenient, food will do no good unless land and resource redistribution make it possible for the poor to eat.

As Patel (2012) explains:

Merely having the food around doesn't guarantee that the poor will eat. In fact, if the only way that the poor can get food is through the market... then at times when food is perceived to be scarce... the shape of the food system is almost certain to deliver not food, but hunger. Those who are in a position to control the distribution of grain will only do so if they're able to command a sufficiently high price. The only way that famine can be overcome is to guarantee rights to hungry people that trump those of grain hoarders. (p. 140)

The problem of hunger, then, comes down to questions of money, land distribution, and democratic systems that allow the poor, as well as the wealthy, to participate in decisions affecting their lives. Finding ways to redistribute money in the global economy is thus one way to alleviate the key root cause of hunger—poverty—and will require more than technology: It will require political and economic systems that allow people to be self-sufficient and to grow food to eat rather than to sell for the highest possible profit. This means that food should not be a commodity—a thing to be bought and sold. It should instead be a human right, guaranteed to every human on the planet, outside the market. This may mean that the citizens of wealthier countries may pay more for their food or may have less access to different kinds of food from around the globe all year long, but this outcome may also address the twin problem of the global food system: obesity in wealthy countries, hunger among the poor.

## REFERENCES

- Altieri, M.A. 2005. "The Myth of Coexistence: Why Transgenic Crops Are Not Compatible with Agroecologically Based Systems of Production." *Bulletin of Science, Technology & Society* 25: 361–371.
- Altieri, M.A., and P. Rosset. 1999. "Ten Reasons Why Biotechnology Will Not Ensure Food Security, Protect the Environment and Reduce Poverty in the Developing World." *AgBioForum* 2: 155–162.
- Azadi, H., and P. Ho. 2010. "Genetically Modified and Organic Crops in Developing Countries: A Review of Options for Food Security." *Biotechnology Advances* 28: 160–168.
- Bill and Melinda Gates Foundation. 2013. "Agricultural Development: Strategy Overview." Seattle, WA: Author. <http://www.gatesfoundation.org/agricultural-development/Documents/agricultural-development-strategy-overview.pdf>
- Bordo, S. 1993. *Unbearable Weight: Feminism, Western Culture and the Body*. Berkeley: University of California Press.
- Boreo, N. 2012. *Killer Fat: Media, Medicine, and Morals in the American "Obesity Epidemic"*. New Brunswick, NJ: Rutgers University Press.
- Burslem, C. 2004. "The Changing Face of Malnutrition." Paper presented at the International Food Policy Research Institute and its 2020 Vision Initiative, Washington, DC, October 1.
- Cameron, A.J., P.Z. Zimmet, D.W. Dunstan, M. Dalton, J.E. Shaw, T.A. Welborn, et al. 2003. "Overweight and Obesity in Australia: The 1999–2000 Australian Diabetes, Obesity and Lifestyle Study." *The Medical Journal of Australia* 178: 427–432.
- Carthenson, M.R., P.J.D. De Chavez, M.L. Biggs, C.E. Lewis, J.S. Pankow, A.G. Bertoni, et al. 2012. "Association of Weight Status with Mortality in Adults with Incident Diabetes." *Journal of the American Medical Association* 308: 581–590.
- Consultative Group on International Agricultural Research. "Who We Are." Washington, DC: Author. <http://www.cgiar.org/who-we-are/>
- Clapp, J., and M.J. Cohen. 2009. "The Food Crisis and Global Governance." In *The Global Food Crisis: Governance Challenges and Opportunities*, edited by J. Clapp and M.J. Cohen, 1–12. Waterloo, ON: Wilfrid Laurier University Press.
- Clarke, A.E., L. Mamo, J.R. Fosket, J.R. Fishman, and J.K. Shim, eds. 2010. *Biomedicalization: Technoscience, Health, and Illness in the U.S.* Durham, NC: Duke University Press.
- Coleman-Jensen, A., M. Nord, M. Andrews, and S. Carlson. 2011. "Household Food Security in the United States in 2010." Washington, DC: U.S. Department of Agriculture, Economic Research Service. <http://www.ers.usda.gov/Publications/er125/>
- Cotula, L., S. Vermeulen, R. Leonard, and J. Keeley. 2009. *Land Grab or Development Opportunity? Agricultural Investment and International Land Deals in Africa*. London: International Institute for Environment and Development.
- Davis, M. 2010. *Planet of Slums*. London: Verso.
- Flegal, K., B.K. Kit, H. Orpana, and B.I. Graubard. 2013. "Association of All-Cause Mortality with Overweight and Obesity Using Standard Body Mass Index Categories: A Systematic Review and Meta-Analysis." *Journal of the American Medical Association* 309: 71–82.
- Food and Agriculture Organization. 2009a. "From Land Grab to Win-Win: Seizing the Opportunities for International Investment in Agriculture." Rome: Author. <http://ftp.fao.org/docrep/fao/011/ak357e/ak357e00.pdf>
- Food and Agriculture Organization. 2009b. *How to Feed the World 2050: The Special Challenge for Sub-Saharan Africa*. Rome: Author.
- Food and Agriculture Organization. 2012a. "High Levels of Food Insecurity in South Sudan." Rome: Author. <http://www.fao.org/news/story/en/item/121612/code/>
- Food and Agriculture Organization. 2012b. *The State of Food Insecurity in the World 2012: Economic Growth Is Necessary But Not Sufficient to Accelerate Reduction of Hunger and Malnutrition*. Rome: FAO.
- Fromartz, S. 2011. "The Production Conundrum." *The Nation*, October 3.
- Gard, M. 2011. *The End of the Obesity Epidemic*. London: Routledge.
- Grijalva-Bernrod, C.S., J.C.K. Wells, M. Cortina-Borja, N. Salse-Ubach, M.C. Tondeur, C. Dolan, et al. 2012. "The Double Burden of Obesity and Malnutrition in a Protracted Emergency Setting: A Cross-Sectional Study of Western Sahara Refugees." *PLoS Med* 9: e1001320.
- Guthman, J. 2011. *Weighing In: Obesity, Food Justice, and the Limits of Capitalism*. Berkeley: University of California Press.

- Guthman J., and M. DuPuis. 2006. "Embodying Neoliberalism: Economy, Culture, and the Politics of Fat." *Environment and Planning D: Society and Space* 24(3): 427-448.
- Heintzman, A., and E. Solomon, eds. 2004. *Feeding the Future, From Fat to Famine: How to Save the World's Food Crisis*. Cambridge, MA: Small Planet Institute.
- Holt-Giménez, E., and R. Patel (with A. Shattuck). 2009. *Food Rebellions: Crisis and the Hunger for Justice*. New York: Food First.
- International Food Policy Research Institute. 2012. *Strategies and Priorities for African Agriculture: Economywide Perspectives from Country Studies*. Washington, DC: Author.
- Kinchy, A.J. 2012. *Seeds, Science, and Struggle: The Global Politics of Transgenic Crops*. Cambridge, MA: MIT Press.
- Krimsky, S. 2008. "Plastics in Our Diet." *Scientific American* 18: 30-31.
- Kugelhan, M., and S. Levenstein, eds. 2009. *Land Grab? The Race for the World's Farmland*. Washington, DC: Woodrow Wilson International Center for Scholars.
- Lang, T., and M. Heasman. 2004. *Food Wars: The Global Battle for Mouths, Minds, and Markets*. London: Earthscan.
- Lappé, F.M. 2013. "Beyond the Scarcity Scare: Reframing the Discourse of Hunger with an Eco-Mind." *The Journal of Peasant Studies* 40: 219-238.
- Lawrence, G., and D. Burch. 2007. "Understanding Supermarkets and Agri-Food Supply Chains." In *Supermarkets and Agri-Food Supply Chains: Transformations in the Production and Consumption of Foods*, edited by G. Lawrence and D. Burch, 1-28. Cheltenham, UK: Edward Elgar.
- Lim, S.S., T. Vos, A.D. Flaxman, G. Danaei, K. Shibuya, H. Adair-Rohani, et al. 2013. "A Comparative Risk Assessment of Burden of Disease and Injury Attributable to 67 Risk Factors and Risk Factor Clusters in 21 Regions, 1990-2010: A Systematic Analysis for the Global Burden of Disease Study 2010." *The Lancet* 380: 2224-2260.
- Magdoff, F., and B. Tokar, eds. 2010. *Agriculture and Food in Crisis: Conflict, Resistance, and Renewal*. New York: Monthly Review Press.
- Massara, E. 1997. "Que Gordita." In *Food and Culture: A Reader*, edited by C. Counihan and P.V. Esterik, 251-255. New York: Routledge.
- McMichael, P. 2009. "A Food Regime Analysis of the World Food Crisis." *Agriculture and Human Values* 4: 281-295.
- McMichael, A. J., J. W. Powles, C. D. Butler, and R. Uauy. 2007. "Food, Livestock Production, Energy, Climate Change, and Health." *Lancet* 370 (9594): 1253-1263.
- National Clearinghouse for Diabetes Information. 2013. "Causes of Diabetes." Bethesda, MD: Author. <http://diabetes.niddk.nih.gov/dm/pubs/causes/>
- Nestle, M. 2002. *Food Politics: How the Food Industry Influences Nutrition and Health*. Berkeley: University of California Press.
- Organisation for Economic Co-operation and Development. 2012. *Obesity Update 2012*. Paris: Author.
- Øresund Food Network. 2008. *Climate Change and the Food Industry Climate Labeling for Food Products: Potential and Limitations*. Copenhagen: Author.
- Otero, G., ed. 2008. *Food for the Few: Neoliberal Globalism and Agricultural Biotechnology in Latin America*. Austin: University of Texas Press.
- Patel, R. 2012. *Stuffed and Starved: The Hidden Battle for the World Food System*. 2nd ed. Brooklyn, NY: Melville House.
- Patel-Campillo, A. 2010. Agri-Export Specialization and Food Security in a Sub-National Context: The Case of Colombian Cut Flowers. *Cambridge Journal of Regions, Economy and Society* 3: 279-294.
- Pollan, M. 2008. *In Defense of Food*. New York: Penguin.
- Raj, P. 2008. "The Hungry of the Earth." *Radical Philosophy* 151 (September/October): 2-7.
- Rampell, C. 2013. "Lose Weight for Your Country." *The New York Times*, January 13.
- Rennie, K., and S.A. Jebb. 2005. "Prevalence of Obesity in Great Britain." *Obesity Reviews* 6: 11-13.
- Saguy, A. 2013. *What's Wrong with Fat?* Berkeley: University of California Press.
- Sen, A. 1981. *Poverty and Famines: An Essay on Entitlement and Deprivation*. New York: Oxford University Press.
- "Special Report: Obesity." 2012. *The Economist*, December 15.
- Trasande, L., T.M. Attina, and J. Blustein. 2012. "Association Between Urinary Bisphenol A Concentration and Obesity Prevalence in Children and Adolescents." *Journal of the American Medical Association* 308: 1113-1121.
- United Nations Development Programme. 2006. "Water Competition in Agriculture. Beyond Scarcity: Power, Poverty and the Global Water Crisis." Geneva: Author. <http://hdr.undp.org/en/media/HDR06-complete.pdf>
- U.S. Department of Health and Human Services, Office of the Surgeon General. 2012. "The Surgeon General's Vision for a Health and Fit Nation Fact Sheet." Washington, DC: Author. [http://www.surgeongeneral.gov/initiatives/healthy-fit-nation/obesityvision\\_factsheet.html](http://www.surgeongeneral.gov/initiatives/healthy-fit-nation/obesityvision_factsheet.html)
- Walpole, S.C., D. Prieto-Merino, P. Edwards, J. Cleland, G. Stevens, and I. Roberts. 2012. "The Weight of Nations: An Estimation of Adult Human Biomass." *BMC Public Health* 12: 439.
- Wells, J.C.K. 2012. "Obesity as Malnutrition: The Role of Capitalism in the Obesity Global Epidemic." *American Journal of Human Biology* 24: 261-276.
- World Food Programme. 2012a. "Food Insecurity." Geneva: Author. <https://www.wfp.org/node/3592>
- World Food Programme. 2012b. "Hunger: Causes." Geneva: Author. <http://www.wfp.org/hunger/causes>
- World Health Organization. 2005. "Malnutrition: Quantifying the Health Impact at National and Local Levels." Geneva: Author. <http://whqlibdo.org/wha/publications/2005/9241591870.pdf>
- World Health Organization. 2012a. "BMI Classification." Geneva: Author. [http://apps.who.int/bmi/index.jsp?introPage=intro\\_3.html](http://apps.who.int/bmi/index.jsp?introPage=intro_3.html)
- World Health Organization. 2012b. "Controlling the Global Obesity Epidemic." Geneva: Author. <http://www.who.int/nutrition/topics/obesity/en/>
- World Health Organization. 2012c. *World Health Statistics 2012*. Geneva: Author.