

13

EATING ECOSYSTEMS

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Cheap meat, dairy, and eggs are an illusion—we pay dearly for these food choices with depleted freshwater reserves, deforestation, soil degradation, and wildlife manipulation. “Livestock activities have significant impact on virtually all aspects of the environment, including air and climate change, land and soil, water and biodiversity . . . The overall impact of livestock on the environment is enormous” (Food and Agriculture Organization of the United Nations, 2006, 5). Consequently, diet is the most critical decision we make with regard to our environmental footprint—and it is a decision that we make every day, several times a day.

Freshwater Depletion

Critical sources of freshwater are drying up around the world. Life-sustaining waterways such as the Colorado, Nile, and Yellow River now run dry before they reach the sea (Brown, 1996). Important underwater aquifers such as the Ogallala Aquifer are also shrinking. The Ogallala Aquifer spans “800 miles [1,287 km] from north to south, and 400 miles [644 km] from east to west,” supplies 30 percent of U.S. groundwater irrigation to 27 percent of the nation’s irrigated land, and is critical to an area often described as “America’s Breadbasket”—though this area would more correctly be termed “America’s Meat Plate.” The Ogallala provides drinking water for 82 percent of the people living in South Dakota, Nebraska, Colorado, Wyoming, Oklahoma, Texas, New Mexico, and Kansas (Worm, 2004). But the Ogallala Aquifer is more than half gone, and looks likely to run dry in the next 25 years.

Animal agriculture drains freshwater in several key ways. First, farmed animals require freshwater. And thanks to consumer choices, the earth currently supports at least:

- chickens, 550 billion gallons (2082 billion liters),
- hogs, 2190 billion gallons (8289 billion liters), and
- bovines, 18,907 billion gallons (71,563 billion liters).

Combined, on average, chickens, pigs, and bovines suck up at least 21,647 billion gallons (81,943 liters) of freshwater every year. To put this in perspective, an Olympic sized swimming pool holds 660,430 gallons (2,500,000 liters) of water, and there are more than 1,500 Olympic swimming pools in just one billion gallons of water. Every year the world’s bovines, pigs, and chickens drink an average of about 33 million Olympic swimming pools of freshwater, and this does not even include the many goats, turkeys, and sheep who also turn to troughs for refreshment.

Animal agriculture’s most excessive expenditure of freshwater is not the global herd’s water requirement, but their food intake—irrigation for feed crops. Not only do we feed 70 percent of U.S. grain crops to farmed animals, but we waste “1000 tons of water to produce one ton of grain” (one U.S. ton = 907 kg) (Brown, 1996). This extravagance is aggravated by the fact that grains are generally grown on lands that require irrigation (United States Department of Agriculture: Animal and Plant Health Inspection Service: Wildlife Damage Management, n.d.). If we consumed plants directly, we would require only 37 percent of current croplands.

Slaughterhouses and dairies also require large quantities of freshwater. These facilities are cleaned several times each day—hosed down (literally blasted with water). “Water tables are falling on every continent” (Brown, 1996). Roughly 80 percent of the world’s freshwater is expended for agriculture, including agricultural lands irrigated and harvested as feed for farmed animals. When cleaning facilities, processing, packaging, and all other aspects of flesh, dairy, and egg consumption are taken into account—as they ought to be—animal agriculture is responsible for 90 percent of freshwater depletion worldwide. Our dependence on animal agriculture causes “severe environmental degradation through water depletion” (Food and Agriculture Organization of the United Nations, 2006).

Because of the amount of freshwater required for animal agriculture, the average American omnivore “consumes” 4,200 gallons (15,900 liters) of freshwater per person per day, while an American vegan averages just 300 gallons (1,136 liters) per person, daily (Schwartz, 2001). Consider these comparisons:

- 5,200 gallons (19,700 liters) of water are necessary to produce one pound of beef, but only 23 gallons of water are necessary to produce one pound of tomatoes (Cassuto, 2010).
- 500–2,500 gallons (1,893 to 9,464 liters) of water are necessary to produce one pound (0.45 kg) of beef, but only one-hundredth as much water is necessary to produce a pound of wheat (Kauffman and Braun, 2004).
- 5,200 gallons (19,700 liters) of water are necessary to produce one pound of California beef, but only 25 gallons of water are necessary to produce one pound of California veggies (Schwartz, 2001).

- Roughly 100 times more water is necessary to produce one pound of “beef” than is necessary to produce one pound of potatoes (Schwartz, 2001).

Why bother to shorten your shower if you plan on poultry or pot roast for dinner?

Deforestation

For the sake of grazing and raising feed for farmed animals—for the sake of such things as ham, cheese spreads, steak, egg sandwiches, and milkshakes—one fifth of the world’s rainforests were destroyed between 1960 and 1990. Between 1985 and 1990, 210 million acres of forest were turned to pasture, “an area nearly the size of Texas and Oklahoma” (Kauffman and Braun, 2004). A section of rainforest roughly the size of 20 football fields is destroyed pretty much every minute of every day, and in “the Amazon, cattle ranching is now the primary reason for deforestation” (Food and Agriculture Organization of the United Nations, 2006). In just 50 years, 50 percent of Costa Rica’s forests disappeared—60 percent were cleared for bovines (Wikipedia.org, n.d.a). Only 13 percent of Costa Rica’s original rainforest remains, and what remains is now “highly fragmented and degraded” (Reynolds and Nierenberg, 2012).

Brazil continues to lead the way (by a considerable margin) in rainforest destruction, and agriculture is responsible for roughly 98 percent of Brazil’s deforestation (Monga Bay, n.d.). Ranchers are responsible for 65–70 percent of Brazil’s lost forests (Monga Bay, n.d.). There were about 10 million bovines in Brazil in 1980, and there are now upwards of 55 million (Global Warning Science, n.d.). The U.S. and the EU are implicated: The U.S. imports some 80 million pounds of Brazilian beef every year; 85 percent of EU beef originates in Brazil. South America is still at the top of the list for loss of forests. All this ecological devastation for a mere spot of flesh—55 feet (17 meters) of tropical forests yield just a quarter pound (120 grams) of hamburger. If we continue as we are, primary forests will be altogether gone by 2050 (Pimm and Raven, 2000).

Not only beef-eaters, but those who consume turkeys, pigs, chickens, eggs, or dairy products are also implicated. The primary reason for loss of forests is conversion of lands to agriculture—both for grazing *and for feed crops*. In Latin American, land is converted from forests to agriculture largely for feed crops, “notably soybeans and maize” (Food and Agriculture Organization of the United Nations, 2006). Brazil’s soy crop grew more than 3,000 percent in the last 40 years, becoming the world’s second largest soybean producer (Wikipedia.org, n.d.b). Worldwide, 80 percent of the soybean crop is fed to farmed animals (Reynolds and Nierenberg, 2012).

In the U.S. 98 percent of soy is turned into meal to feed poultry, bovines, hogs ... and farmed catfish; more than fifty percent of the U.S. soy produced is fed to poultry. Those who cast an accusing eye at soy-eaters have missed a vital point:

Worldwide, 80 percent of soybean crops are planted, tended, and harvested for farmed animals, implicating those who eat cheese and chicken—not those who eat tofu and tempeh (Reynolds and Nierenberg, 2012).

For purely selfish reasons, most of us do not wish to see rainforests disappear. Rainforests hold a good deal more than half of the world’s animal and plant species—if we lose most of the rainforests, we lose at least 50 percent of Earth’s biodiversity (Pimm and Raven, 2000). Many of these species have not even been classified by Western scientists—plants and animals rich with medical and nutritional possibilities remain safely hidden from chemists and cooks. Rainforests harbor untapped recreation sites for flush travelers, and protect some of the most hidden and “untainted” human cultures. Additionally, rainforest soils are critical to land stability—devoid of this rich canopy and reaching tree roots, soils are prone to mudslides and desertification. Perhaps most important in light of global climate change, rainforest tree canopies are powerful converters, turning carbon dioxide into oxygen, helping to mitigate some of the effects of climate change.

Forests are home to 70 percent of the Earth’s land animals and plants. Forests are also important to the Earth’s water systems, holding water and generating rain for drought-plagued landscapes (Schwartz, 2001). Nonetheless, we have destroyed about 80 percent of Earth’s natural forests, including more than half of the Earth’s rainforests (Schwartz, 2001). Estimates of the rate of species extinction vary widely, but conservative estimates indicate that we are losing at least 137 species every day (Raintree.com, 2010) and the “leading cause of this deforestation is meat production” (Hawthorne, 2012). We are unwittingly chewing anteaters, armadillos, jaguars, and untold species—which we have not yet even marveled at—into oblivion.

Soil Degradation

Worldwide, the leading causes of soil degradation are overgrazing (35 percent), deforestation (30 percent), and agriculture (28 percent)—all directly linked to our consumption of animal products (University of Michigan, 2010). Forty percent of the world’s agricultural lands were degraded in the last century “by the hard hooves and heavy bodies” of millions of farmed animals (Wardle, n.d.). Dry areas have suffered the most—73 percent of dry rangeland worldwide is already degraded (Food and Agriculture Organization of the United Nations, 2006). Farmed animals are the primary cause of desertification, both through overgrazing and from the production of feed crops—especially monocultures (Western Watersheds Project, 2010).

Many lands are not suited for grazing, and so they can only be used for grazing for a handful of years before they are depleted of nutrients, at which point they become wastelands (Hawthorne, 2012). When grazing lands are depleted of nutrients, people clear and till neighboring plots of land in order to continue

production. But these lands, too, can only sustain grazers for a short period of time. Consequently, “every year a new chunk of real estate the size of Rhode Island is being swallowed by sand” (Hawthorne, 2012). Depleted soils from these dusty graveyards blow across continents. Seoul, for example, often falls under a perpetual brown haze caused by China’s newly created northern wastelands—the result of overgrazing in the hope of satisfying China’s ever-growing demand for flesh.

Land Use

“The livestock sector is the world’s largest consumer of the Earth’s land resources” (Reynolds and Nierenberg, 2012). Worldwide, feed crop production claims about 1,164 million acres (471 million hectares)—“33 percent of the total arable land” (Food and Agriculture Organization of the United Nations, 2006). About 8.6 billion acres (3.5 billion hectares) are devoted to grazing lands (The Sustainable Seed Project, 2003). The amount of land tilled and tended on behalf of animal agriculture worldwide (both grazing and crops) is roughly the size of Africa (Hawthorne, 2012, 39).

Animal agriculture requires monumentally more land than any other human enterprise (Food and Agriculture Organization of the United Nations, 2006). In the U.S., 73 million acres (30 million hectares) are devoted to growing corn, 80 percent of which is fed to farmed animals at home and abroad. An additional 73 million acres are devoted to soybeans, of which not quite half are fed to farmed animals. Another 53 million U.S. acres (22 million hectares) are put into wheat, some 22 percent of which is used for animal feed; 8 million acres (3.2 million hectares) are devoted to sorghum, almost all of which is fed to farmed animals, and 60 million acres (24 million hectares) are devoted to hay and alfalfa—all for farmed animals (Environmental Protection Agency Agricultural Center, 2009a). This means that 58 million U.S. acres (23.4 million hectares) of corn, more than 22 million acres (9 million hectares) of soybeans, some 12 million acres (5 million hectares) of wheat, and about 7 million acres (2.8 million hectares) of sorghum are planted, irrigated, doused with pesticides, herbicides, and chemical fertilizers, harvested, transported, packaged, and stored in order to feed animals—just shy of 100 million acres (40 million hectares) are dedicated to crops raised not for human consumption, but to be cycled inefficiently through farmed animals. U.S. animal agriculture claims an additional 613 million acres (248 million hectares) for grazing (Environmental Protection Agency Agricultural Center, 2009b).

Some 98 million bovines live in the U.S. When planted with soy and corn for human consumption, 2.5 acres (1 hectare) of land can produce 2,200 pounds (1,000 kg) of protein, but an unnerving 25 acres (10 hectares) are required to produce the same 2,200 pounds of protein from beef. A plant based diet “uses less than half as many hectares as grass-fed dairy and one-tenth as many hectares as grass-fed beef to deliver the same amount of protein” (Matheny, 2003). If we adopt a plant based diet, hundreds of millions of acres can be returned to wild lands—forests and grasslands and prairies—an environmentalist’s dream come true.

Wildlife

Aldo Leopold wrote, “Predatory animals are the common enemy of both the stockman and the conservationist” (Leopold, n.d.). On behalf of ranchers (and hunters) the U.S. government’s Wildlife Service predator control program has been wiping out wildlife since the early twentieth century. The agriculture lobby, which views large predators as a “threat to livestock,” asks government wildlife agencies to eliminate any and all animals deemed hazardous to their investments—and U.S. government’s Wildlife Services willingly complies (Fox, 2009): Every year since 2004 somewhere between 100,000 and 125,000 mammalian carnivores have been killed by Wildlife Services. Every year at least since 2004, some 600 badgers, 400–500 black bears, 10,000–13,000 raccoons, and 70,000–90,000 coyotes have been killed by the U.S. government—at taxpayer expense—on behalf of agriculture interests (Wild Earth Guardians, n.d.a). Though “motivated to undercount” reported numbers, in 2011 Wildlife Services reported killing 11,061 birds—hawks, falcons, owls, and vultures (up 42 percent from 2010), and 116,093 land predators such as wolves, coyotes (83,695), bears, bobcats, fishers, cougars, weasels, skunks, raccoons, and foxes (up 3 percent) on behalf of predator control. Also in 2011, Wildlife Services poisoned 18,587 animals (up 31 percent, including an additional 2,300 coyotes), and no doubt at considerable expense, gunned down 48,811 animals from helicopters (a 15 percent increase from 2010) (Wild Earth Guardians, 2012). The most recent report indicates that the U.S. federal government killed a whopping 3.8 million animals in 2011.

Traps and poisons are indiscriminate, maiming and killing hundreds of thousands of non-target animals (nearly 200 owls, nearly 400 falcons, and more than 1,000 hawks in 2010). Every year predator control kills thousands of animals incidentally, including armadillos, bluebirds, bears, bobcats, turtles, and alligators (United States Department of Agriculture: Animal and Plant Health Inspection Service: Wildlife Damage Management, n.d.). Inevitably, among these casualties are threatened and endangered species, including nearly 2,000 gray wolves unintentionally killed by predator control since 2004 (Wild Earth Guardians, n.d.a). Predator control has killed “nearly 1,400 house cats, [and] more than 400 domestic dogs” (Wild Earth Guardians, 2012). It is simply not possible to maintain the integrity of ecosystems while killing thousands of wild animals from specific target species, yet the U.S. Federal Wildlife Service continues its war on wildlife—“at the request of ranchers,” at the expense of taxpayers (Lange, 2012).

To make all this killing possible, the U.S. government maintains a tax-funded “livestock protection budget” of well over \$10 million (O’Toole, n.d.); 53 percent of the Wildlife Service budget is spent “protecting livestock” (O’Toole, n.d.). Predator control is a waste of taxpayer monies because it offers only a short-term fix. Killing members of target species usually causes a population to *increase* in short order because births adjust for deaths. For example, even when more than half of a coyote pack is wiped out, the pack is likely to bounce back within a year

(Lange, 2012). Though predator control is a very short fix (perhaps even counter-productive), and though this program damages ecosystems and further threatens endangered wildlife, the U.S. government continues its multi-million dollar extermination program, decade after decade, on behalf of animal agriculture.

U.S. Public Lands

Ranching “is the most widespread commercial use of public lands in the United States” (Western Watersheds Project, 2010)—an environmental and economic catastrophe. Bovines harm native wildlife, vegetation, and soils. They do not browse and wander like native mammals, such as elk or deer. Bovines tend to “remain in the same area until they have eaten all or most of the edible material,” trashing waterways, soils, and delicate vegetation in the process, and “causing significant harm” to native species and their ecosystems (Brown, 1996; Center for Biological Diversity, n.d.).

Bovines are especially hard on wetlands and water systems. For example, they add manure and bacteria to waterfowl nesting habitat (increasing water temperatures), trample waterfowl nesting sites, and destroy water retention (Brown, 1996). Bovines strip “riparian, or streamside, habitat favored by many small mammals and nesting songbirds,” destroying root systems that stabilize stream banks, leading to erosion and loss of pebble beds where fish spawn (Chadwick, 2012). Bovines

destroy native vegetation, damage soils and stream banks, and contaminate waterways with fecal waste. After decades of livestock grazing, once-lush streams and riparian forests have been reduced to flat, dry wastelands; once-rich topsoil has been turned to dust, causing soil erosion, stream sedimentation and wholesale elimination of some aquatic habitats.

(Center for Biological Diversity, n.d.)

Ranching is also a primary cause “of native species endangerment in the American West” (Center for Biological Diversity, n.d.). Across time, innumerable plant species have been eliminated by overgrazing. In the arid Southwest, farmed animal grazing “is the most widespread cause of species endangerment” (Western Watersheds Project, 2010). Despite this plethora of serious and well-documented environmental problems, no “report has ever fully analyzed the incredible environmental costs of livestock grazing on federal public lands” (Wild Earth Guardians, n.d.b).

The U.S. government’s grazing program is also a financial disaster, losing “money just as rapidly and consistently as it destroys habitat” (Center for Biological Diversity, n.d.). Permitting ranchers to graze farmed animals on federal lands (BLM, Forest Service) costs taxpayers as much as \$1 billion annually, while ranchers enjoy “\$100 million annually in direct subsidy” (Center for Biological Diversity, n.d.). Indirect costs are likely about three times this amount (Center for Biological Diversity, n.d.). Administering public lands to benefit ranchers creates a deficit. The U.S. government spends at least 144 million dollars managing farmed animals on federal lands—while

collecting only \$21 million in grazing fees—a net loss of \$123 million (Wild Earth Guardians, n.d.b). Grazing fees are so low on public lands “that they amount to a subsidy” (Brown, 1996)—currently \$1.35 for one month for one cow and her calf across 16 Western states (on public lands administered by the Bureau of Land Management and the Forest Service) (Bureau of Land Management, 2001).¹ In contrast, “[p]rivate, unirrigated rangeland in the West rents out for an average of \$11.90” per cow and calf—the federal grazing fee is “a *de facto* subsidy for cattle owners,” along with artificially low fuel costs (Center for Biological Diversity, n.d.).

On average, “three-fourths of all federal livestock funds; and three-fifths of cooperative funds, are spent on public lands” (O’Toole, n.d.). As much as 96 percent of these government expenditures—which ought to enhance public lands—“enhance livestock production *in direct conflict with legal mandates to restore the health of public lands*” (Western Watersheds Project, 2010; emphasis added). For example, in 2004 and 2005 in Arizona’s Tonto National Forest, ranchers were given \$3.5 million federal dollars for “range improvement” (Center for Biological Diversity, n.d.). “Range improvements” alter landscapes, damage ecosystems, and are therefore not in the best interest of the tax-paying public. The costs of grazing farmed animals on U.S. public lands is greater than greenbacks—even 500 million greenbacks. Public lands are being managed—and damaged—for the sake of low-cost flesh. For those who hike many miles into a wilderness that is presumably preserved for the public, it is an outrage to come upon a herd of bovines standing in a trampled, manure-riddled wasteland. Bovines “reduce aesthetics with their fecal matter, with the trampling of vegetation, and with their mere presence” (Brown, 1996). Unfortunately, the vast majority of taxpayers are not aware of the environmental impact of ranching on public lands—or the financial losses associated with this environmentally disastrous government subsidy. Ecosystems, wildlife, and U.S. public lands *ought* to be protected—not on behalf of ranchers and ranching, but for their own value and on behalf of present and future generations of humans and other species.

Ranchers have a very strong lobby. Unfortunately, what ranchers prefer is not generally in anyone else’s interest, including the interests of wildlife. Buying beef supports and encourages ranching, complete with grazing on public lands. Do environmentalists wish to support millions of nonnatives—bovines (and pigs and chickens)—at the expense of local ecosystems and native species? Kale salad and vegetable fried rice look pretty good compared with the environmental damage caused by animal agriculture.

“Sustainable,” “Organic,” and “Local”

Even when animal products are labeled “sustainable,” “humane,” “local,” “grass fed,” “organic,” “free-range,” and/or “cruelty free,” choosing to consume animal products (rather than grains and greens directly) greatly increases our environmental footprint. A diet that includes animal products is a diet laden with greenhouse gas emissions, water pollution, deforestation, soil damage, freshwater depletion,

and the destruction of wildlife. Every farmed animal poops, polluting land and waters. Every farmed animal drinks water; when fed grains, farmed animals consume tremendous amounts of freshwater and contribute to freshwater depletion in a host of different ways. Every farmed animal requires land, altering and threatening landscapes and ecosystems. Every product stemming from animal agriculture contributes mightily to greenhouse gas emissions. No matter what “PC” consumer label is placed on the final product, purchasing meat, dairy, or eggs demonstrates reckless disregard for the environment and is unconscionable if vegan foods are available—especially given that bulk vegan staples are inevitably less expensive than animal products.

Conclusion

Despite severe ecological consequences, environmentalists tend to be unaccountably silent on the topic of dietary choice. Rather than alter meal plans—and ask others to do the same—environmentalists prefer to urge that we use less water on lawns, choose gas-efficient cars and fluorescent bulbs, and recycle—each of which is important, but each is also environmentally irrelevant compared with dietary choice. Eating plants and grains without cycling them through farmed animals is the most important change we can make on behalf of the environment.

Discussion Questions

- 1 How might you explain the fact that so many environmentalists shorten showers and ride bicycles rather than change their diet?
- 2 What is the government’s rightful role with regard to helping corporations that are extremely harmful to the environment, nonhuman animals, and human health?
- 3 What is our rightful role in a democracy in which the government is obviously aligned with big businesses that harm the environment, nonhuman animals, and human health?
- 4 What are the main environmental concerns in your area? What do you think is the most serious environmental concern in your area? Is dietary choice one of the root causes of local environmental problems?
- 5 How many morally relevant distinctions can you find between humans eating animal products and nonhuman animals eating their prey?

Essay Questions

- 1 Explain the connection between a diet rich in animal products and any two of the following: depleted freshwater reserves, deforestation, soil degradation, wildlife manipulation.

- 2 Is it justifiable to use public lands to reduce the price of animal products? Why or why not? Do you think the killing of wildlife by Wildlife Services is justified on behalf of animal industries? Compose a letter to the editor, or to your senators and representatives, expressing your point of view on this matter.
- 3 If you consume animal products, how do you maintain integrity as an environmentalist while supporting animal agriculture? If you are a vegetarian, how do you maintain integrity as an environmentalist while supporting the dairy and egg industries? If you are a vegan, try the next question.
- 4 What dietary changes might you commit to on behalf of the environment? (Vegans also need to ponder this question, considering specific changes that are environmentally beneficial.)

Suggested Further Reading

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Notes

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- 1 The BLM manages 245 million acres (99 million hectares) largely in 12 Western states—more than any other Federal agency—while the Forest Service manages 193 million acres (78 million hectares) in 44 states, Puerto Rico, and the Virgin Islands (“BLM”).

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