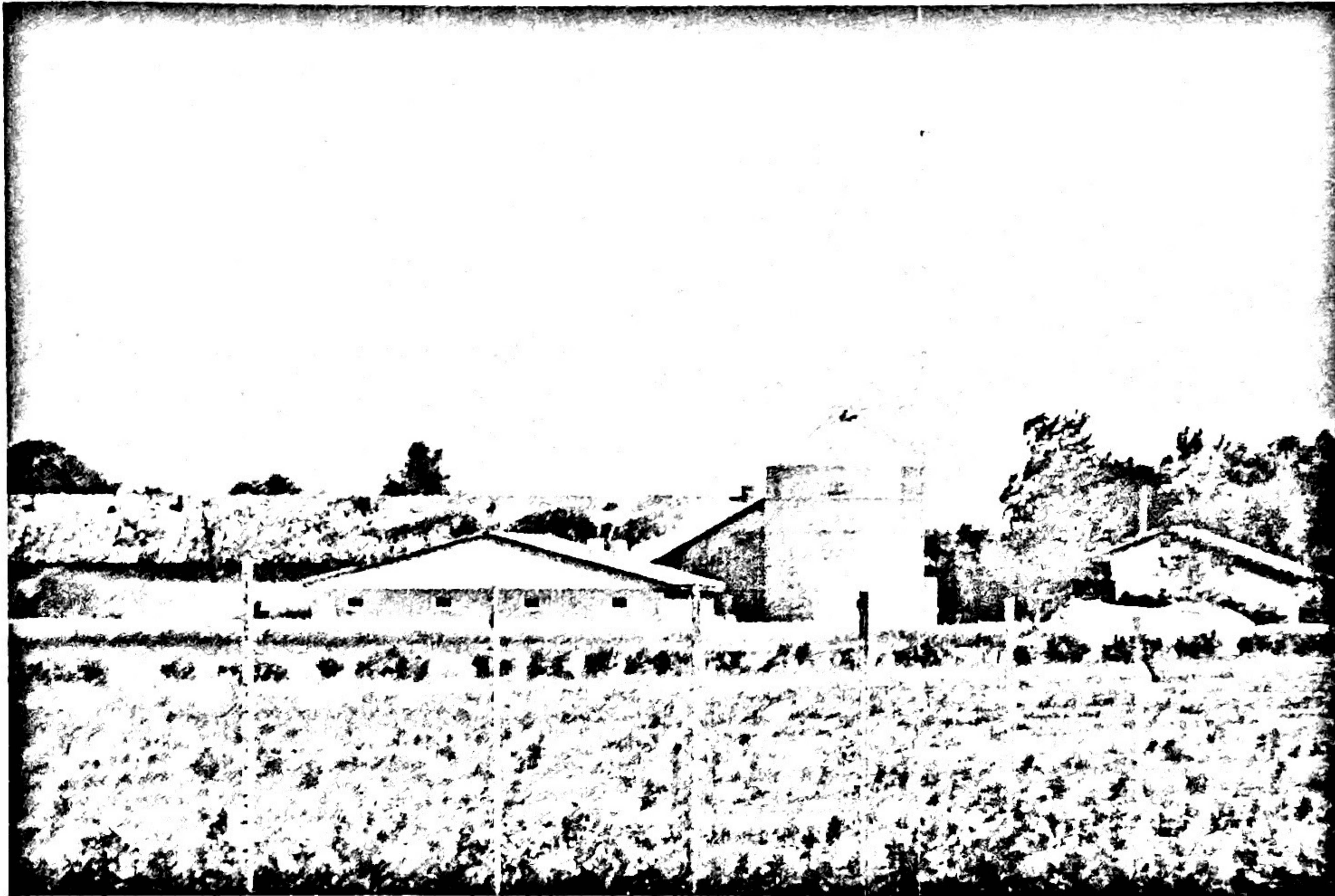


Food and the Environment



Courtesy of Maria Napoli

*Enveloped in the blue skies
Drenched in the warm sun
Feet walking softly on the cool grass
I am reminded of our miraculous earth
Showering me with nourishment*

(Napoli)

"Whatever we do to the earth, we do to ourselves" (1).
—Chief Seattle

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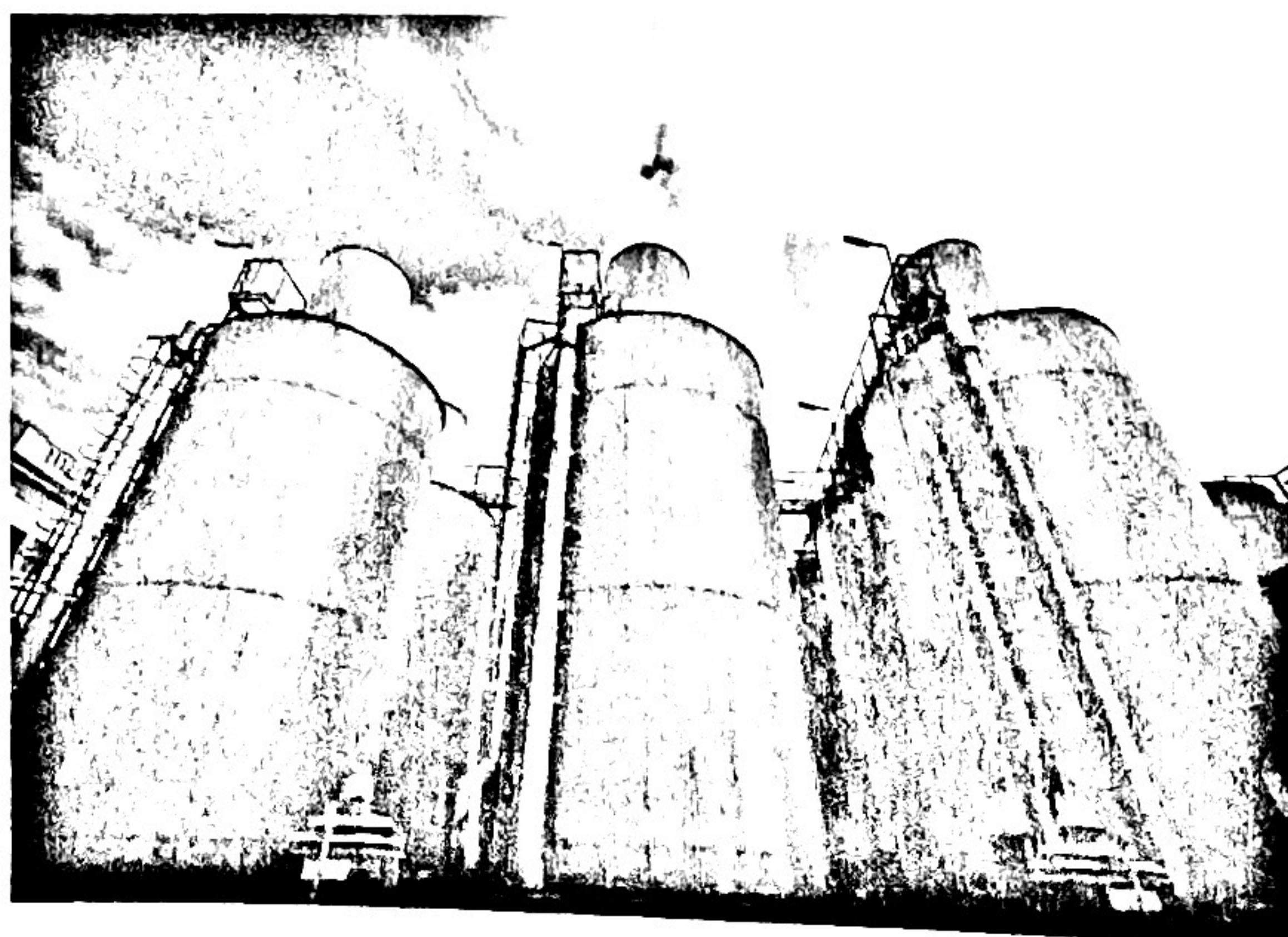
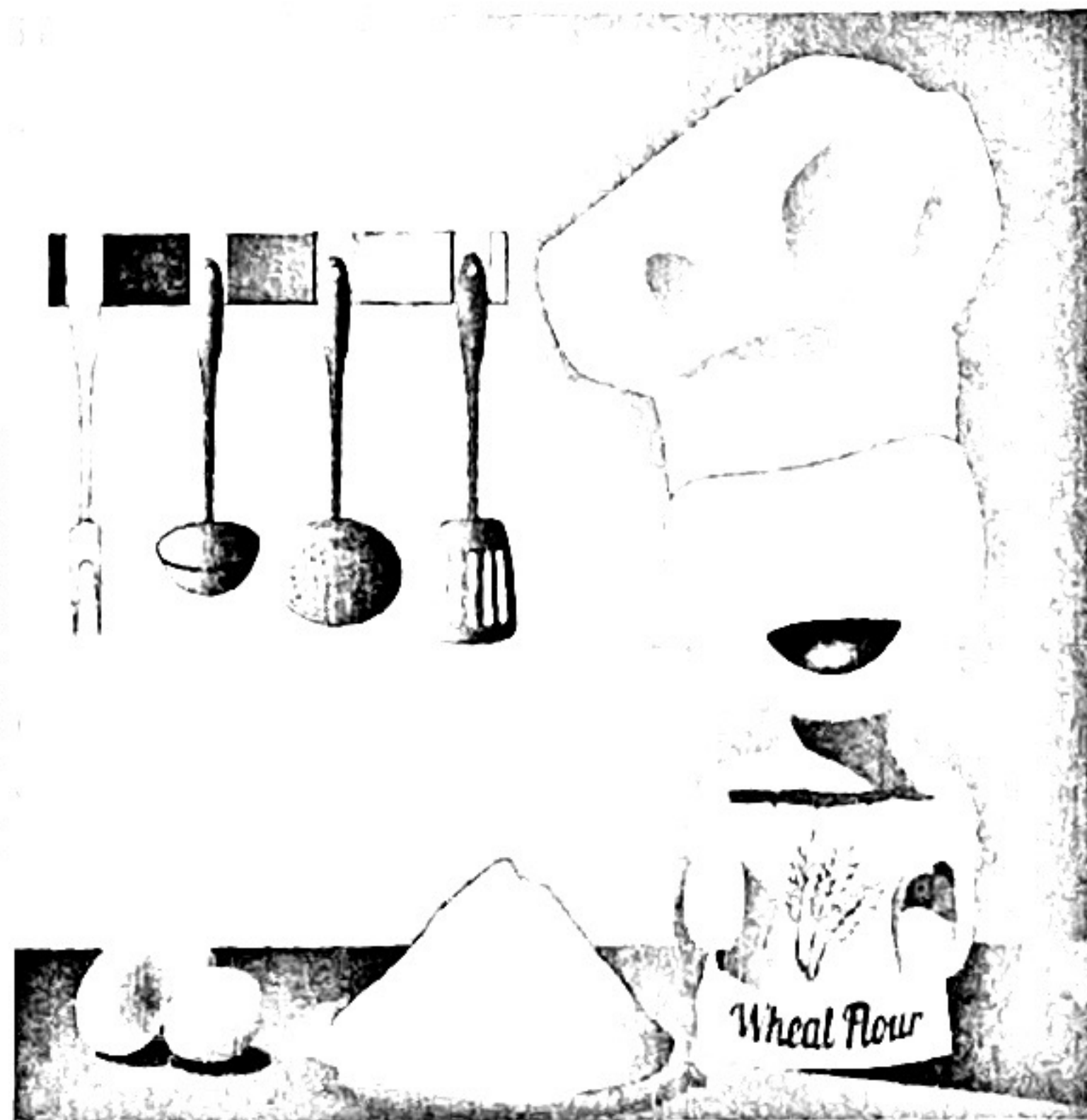


Family farms were once diverse, growing hay, oats, corn, and featuring a woodlot and numerous fencerows. Many plants and animals found home here, but since they no longer can, local populations of migratory songbirds and other species are declining. When we think of how and where our food is grown, we often fantasize about something that looks in our minds like a family farm, yet this is no longer the reality. What is a family farm? The truth is there is no hard-and-fast definition. The U.S. Department of Agriculture (USDA) considers a "family farm" any farm where the majority of the business is owned by the operator and his or her relatives; that is, *by a family* (2). The family part is essential, yes, but many experts emphasize the importance of the family being able to exercise true *ownership* and *control* over the business and production decisions made on their farms.

The means of production of food in the United States has become more efficient and more effective as the ownership of farms has shifted. More efficient and effective means that the amount of food produced in the United States has increased and the cost to consumer has significantly declined.

We have moved to an industrialized food production system, and the ownership of the agricultural system has changed dramatically from hundreds of thousands of individual family farmers to a corporate-controlled industrial model. Over time, this shift has impacted rural communities. With lost livelihoods, food production has become anonymous and faceless. This disconnection from how our food is grown is one consequence. Another may be lifestyle-related diseases due to the overconsumption of cheap, highly processed foods. Finally, large-scale corporate farming methods are eroding our soil and polluting our environment (3).

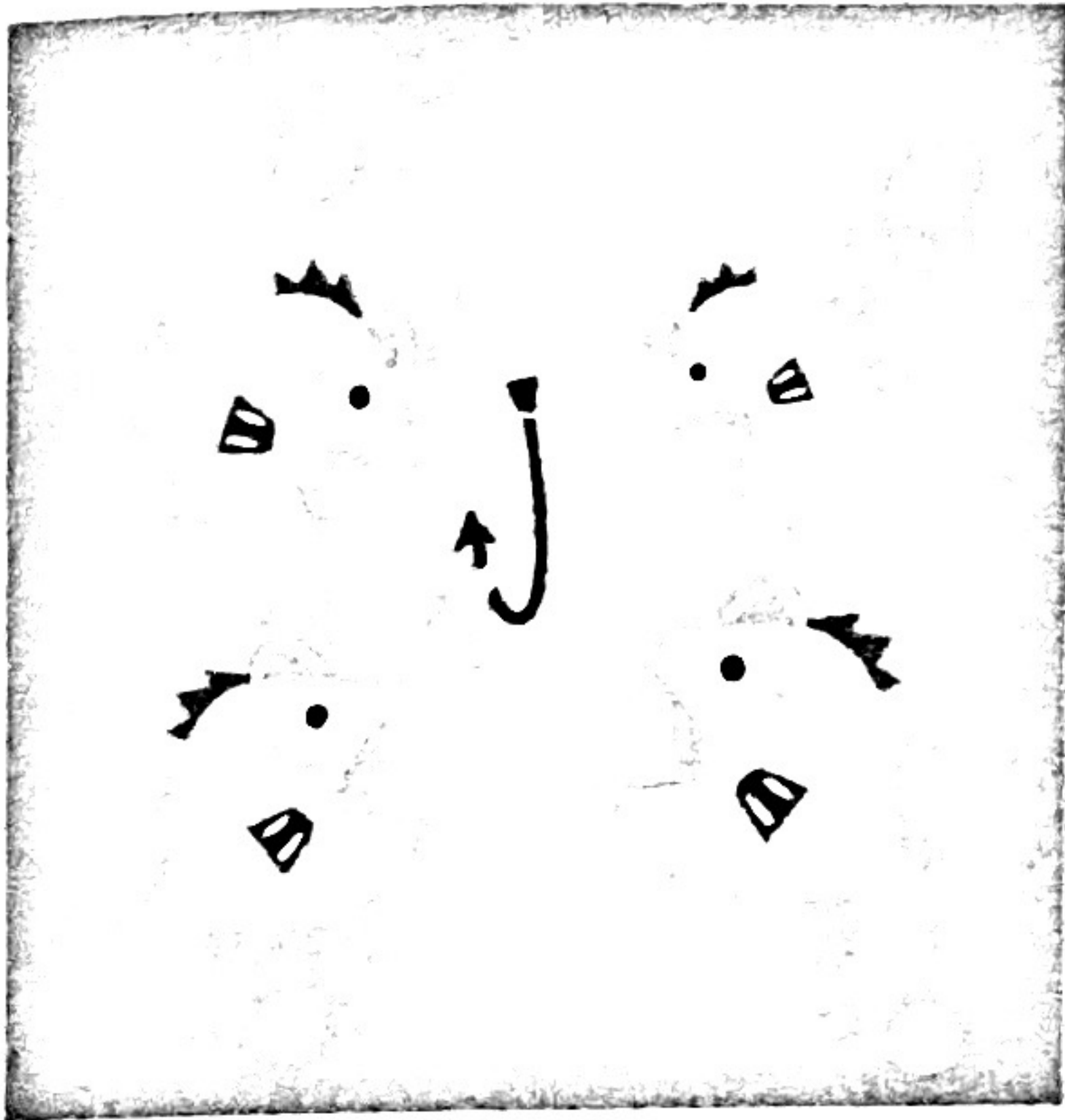
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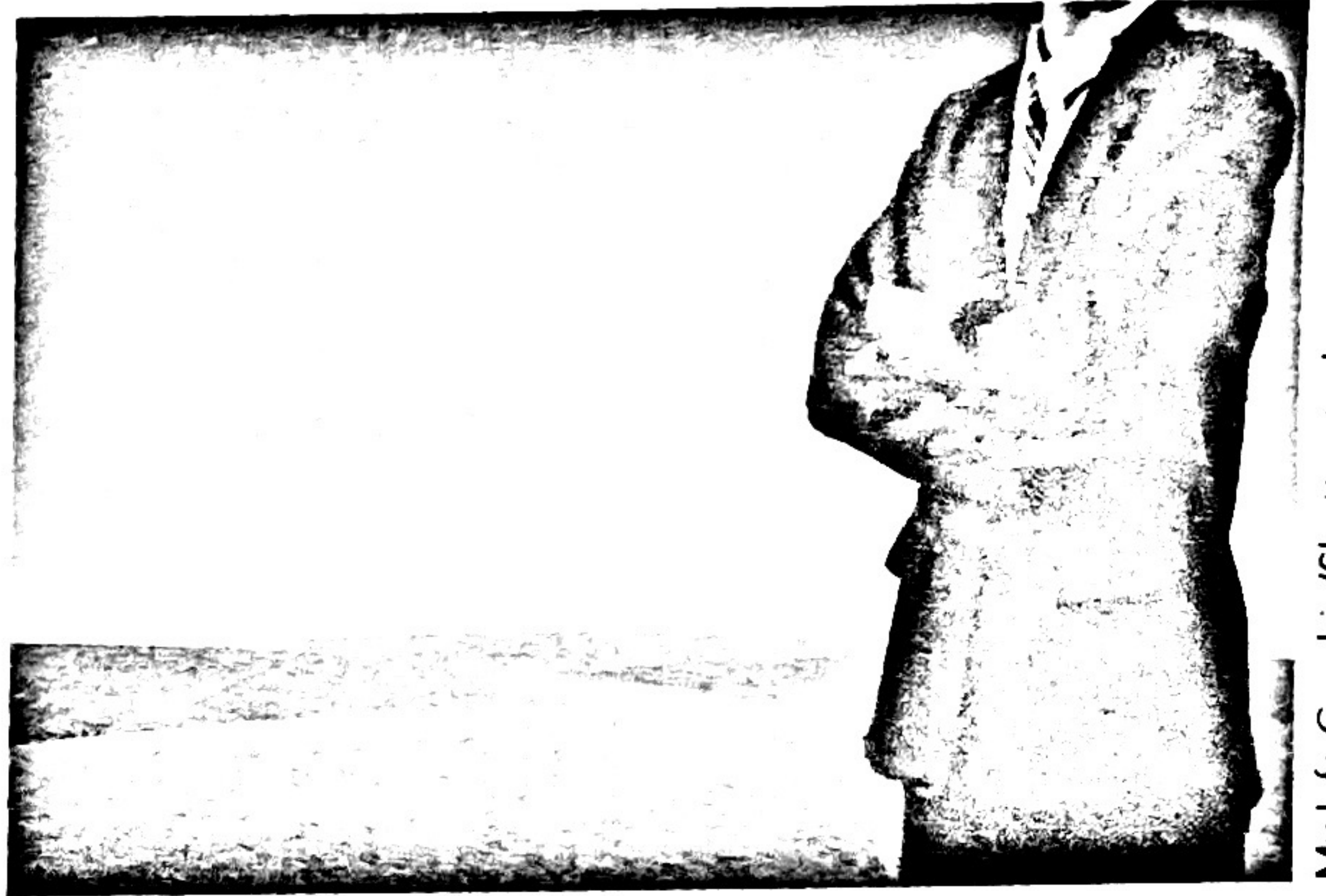
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CORPORATE CONCENTRATION IN AGRICULTURE: WHY IT MATTERS

In a healthy supply and demand economy, multiple companies can sell their goods to multiple buyers in an open, competitive market. But this isn't the case in agriculture, where most farmers are forced to buy their supplies such as seeds, equipment, and fertilizer from just a handful of companies and have very few places to market their goods. The term *corporate concentration* describes the control that a small number of corporations have over food production, distribution, marketing, and consumption through their share of the marketplace (4).



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My Life Graphic/Shutterstock.com

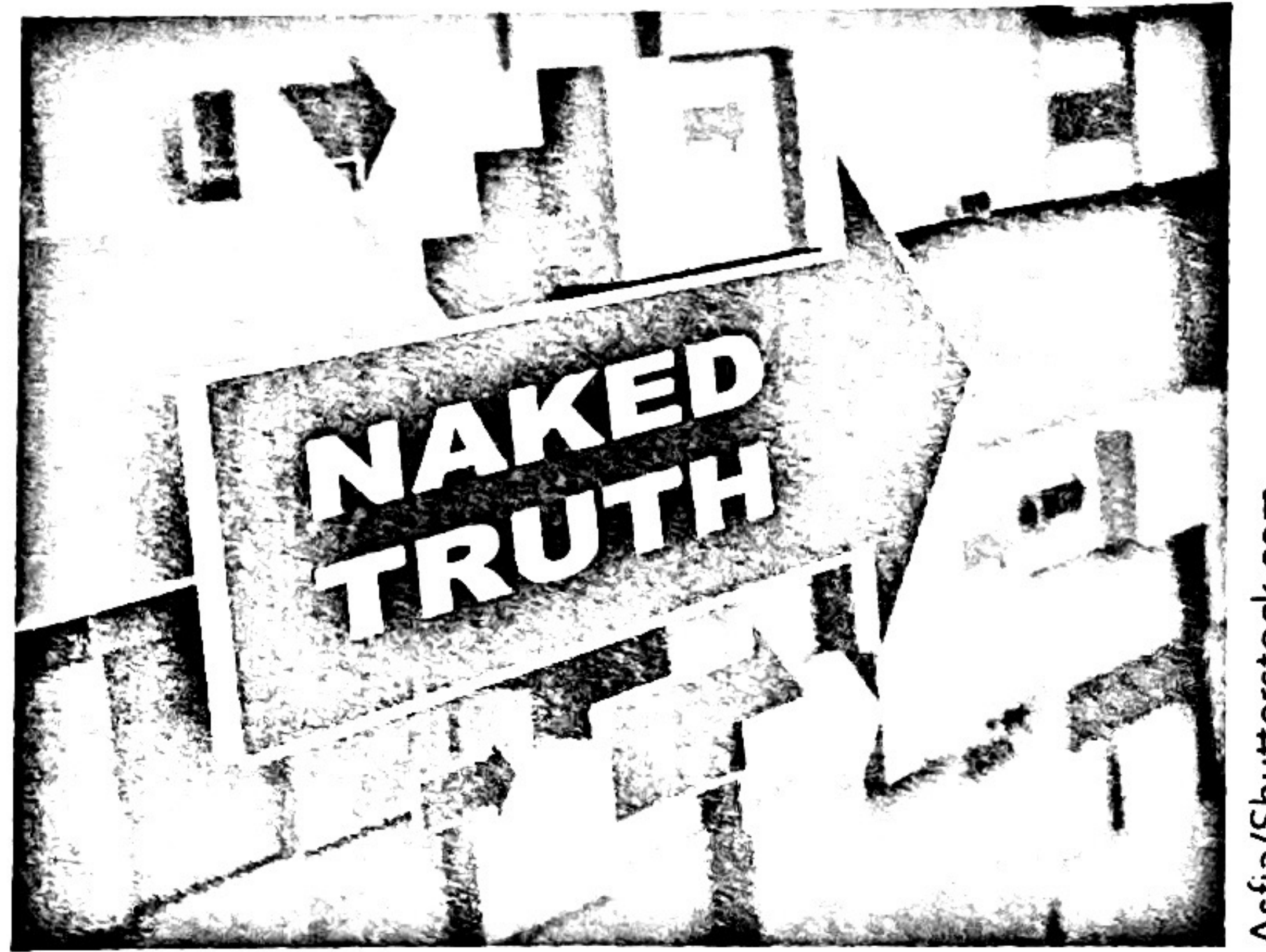
How Concentrated Is It?

The U.S. agricultural sector shows abnormally high levels of concentration. Most economic sectors have concentration ratios around 40%, meaning that the top four firms in the industry control 40% of the market. If the concentration ratio is above 40%, experts believe competition can be threatened and market abuses are more likely to occur: the higher the number, the bigger the threat (4).

The Shocking Naked Truth

Here are the concentration ratios in the agricultural sector:

- Four companies own 83.5% of the beef market (5).
- The top four firms own 66% of the hog industry (6).
- The top four firms control 58.5% of the broiler chicken industry (6).
- In the seed industry, four companies control 50% of the proprietary seed market and 43% of the commercial seed market *worldwide* (7).
- When it comes to genetically engineered (GE) crops, just one company, Monsanto, boasts control of over 85% of U.S. corn acreage and 91% of U.S. soybean acreage (8).



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Farms of today are much more likely to be huge operations that produce our food. What are the consequences of this concentration? We've heard about genetically modified crops (GMOs), where seeds are altered before planting to make them pest resistant or fertilizer ready, as two examples. This allows mass production of food such as wheat, corn, and soybeans.

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Other consequences include declining quality (9), obesity and diabetes (10), antibiotics in our food supply (11), and an inefficient meat-centric diet which can only feed 4 million people, compared to the 10 billion who could be fed with a plant-based diet (12). Less talked about are other more serious threats.

Today's farms threaten aquatic systems, because they use enormous amounts of fertilizer to increase corn and soybean yields, and the leached chemicals find their way into our rivers and streams; because the livestock production system relies on confined animal feed-

ing operations (CAFOs), we have unprecedented concentrations of waste and the health challenge of disposing of it (12).

This chapter began with a quote from Chief Seattle reminding us that damaging the Earth ultimately destroys ourselves. T. Colin Campbell in his book *Whole* (13) reminds us that the reverse of this is true: what we do to ourselves damages the Earth. It is not enough to blame the industrialized food system when we consider our own eating habits. Instead, our insatiable demand for inexpensive food has begun to destroy the environment. Rather than thinking that eating one type of food (meat) is "bad" and another type (plants) is "good", consider whether there are consequences to a meat-centric diet. We've discussed some of the health consequences; let's consider some of the environmental consequences. For example, producing animal-based food requires tremendous amounts of resources with environmental destruction a side effect. Cornell University's Dr. David Pimentel has documented the many ways that animal livestock production wastes precious resources. His findings include (14) the following:

- Animal protein production requires eight times as much fossil fuel as plant protein.
- Livestock in the U.S. consumes five times as much grain as the country's entire human population. (*Note:* livestock's natural food is grass, not the corn and soybeans it is routinely fed to fatten it up quickly).
- Each kilogram (equivalent to 2.2 pounds) of beef requires 100,000 liters of water to produce. As a comparison, a kilogram of wheat requires 900 liters, and a kilogram of potatoes, 500 liters.
- Experts concluded in 2006 that 80% of deforestation in the tropics is attributable to the creation of new farmland, the majority of which is used for livestock grazing and feed.

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All of these problems are ultimately caused by what some call the insatiable demand for an animal protein diet (15). This system of industrialized production of animal protein is unsustainable, damaging, inefficient, and unkind to the planet. This is independent of any detrimental health effects of an animal protein heavy diet, which is scientifically implicated in many, if not most, of the diseases we face today (16). We're using up our natural resources, such as soil and water, faster than we can replenish them. The side effects of producing animal protein in CAFOs include environmental toxins and poisoning the air we breathe (17). We can use our

mindfulness practice as a way to look deeper, without judgment, to find skillful solutions and *respond*, rather than *react* to this information (18).

MINDFULNESS AND THE FOOD SYSTEM: A SUSTAINABLE MODEL

A challenge when looking at the food system in the United States is the overwhelming nature of the information about how our food is produced. At nearly every turn, one can be consumed by videos and images of the way our food gets onto our plate. The nature of animal welfare is shocking (see Chapter 7), and covertly recorded videos documenting animal abuse at the hands of factory farmers are heartbreaking. In researching this book, I found it incredibly difficult to stay engaged. My heart was broken open by the images of tortured animals, all in the name of a mass-produced hamburger or hotdog. It was depressing and upsetting to learn the environmental costs due to the industrialization of our food supply. According to a report published in 2007 by the Food and Agriculture Organization (FAO) of the United Nations, meat production is the second or third largest contributor to environmental problems at every level and at every scale, from global to local. It is implicated in land degradation, air pollution, water shortage, water pollution, species extinction, loss of biodiversity, and climate change. The reports' author Henning Steinfeld stated: "livestock are one of the most significant contributors to today's most serious environmental problems. Urgent action is needed to remedy the situation" (19).

Another writer summarized factory production of meat as follows: "the evidence is strong. It's not simply that meat is a contributor to global warming; it's that it is a huge contributor. Larger, by a significant margin, than the global transportation sector" (20). In other words, if you drive a Prius, and care about the environment, it makes *more* sense to adopt a whole foods mostly plant-based diet, by a significant margin.

Why is this so? One reason is methane. Livestock emit methane gas from both ends of the cow, and in such gigantic amounts that scientists increasingly view methane emissions as one of the most significant threats to the earth's climate (21). The previously mentioned UN FAO report states that livestock production is responsible for 65% of nitrous oxide (another greenhouse gas) produced by human activities. The report concludes that overall, livestock production is responsible for 18% of greenhouse gas emissions, a bigger share than all of the SUVs, cars, trucks, buses, trains, ships, and planes in the world combined.

Scientific American published a report in 2009 with similar warnings. Producing beef for the table has a surprising environmental cost: it releases prodigious amounts of heat trapping greenhouse gases (22). Emissions from producing a pound of beef are 58 times greater than those from producing a pound of potatoes.

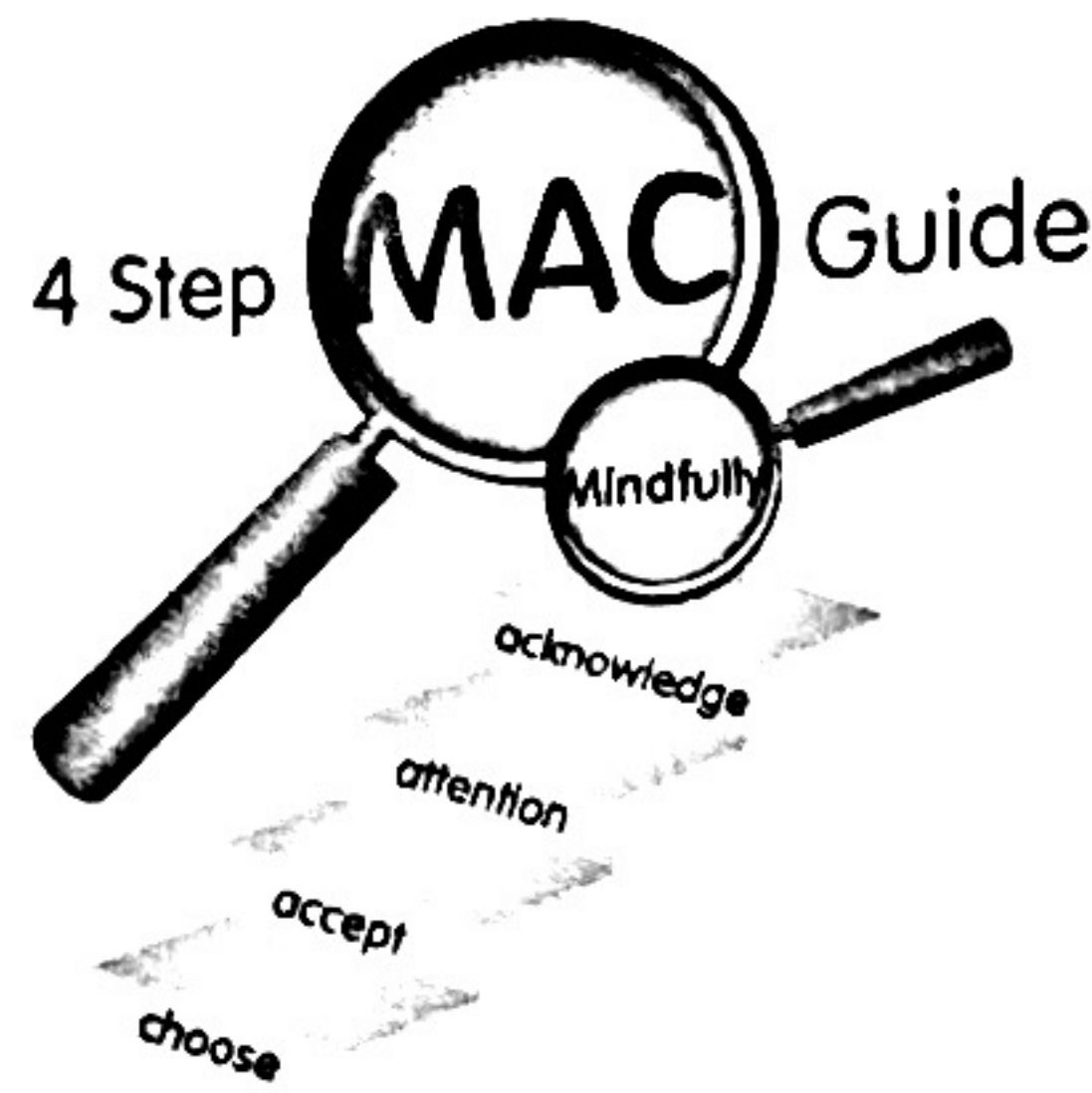
There is a tremendous amount of information about the environmental consequences of our current factory food production system and its negative effects to our planet if we don't change our ways. Everywhere I looked when researching this book, I was faced with information that affected me deeply. I wanted to turn away, but couldn't. How could I continue with writing this book in the face of such overwhelming suffering?



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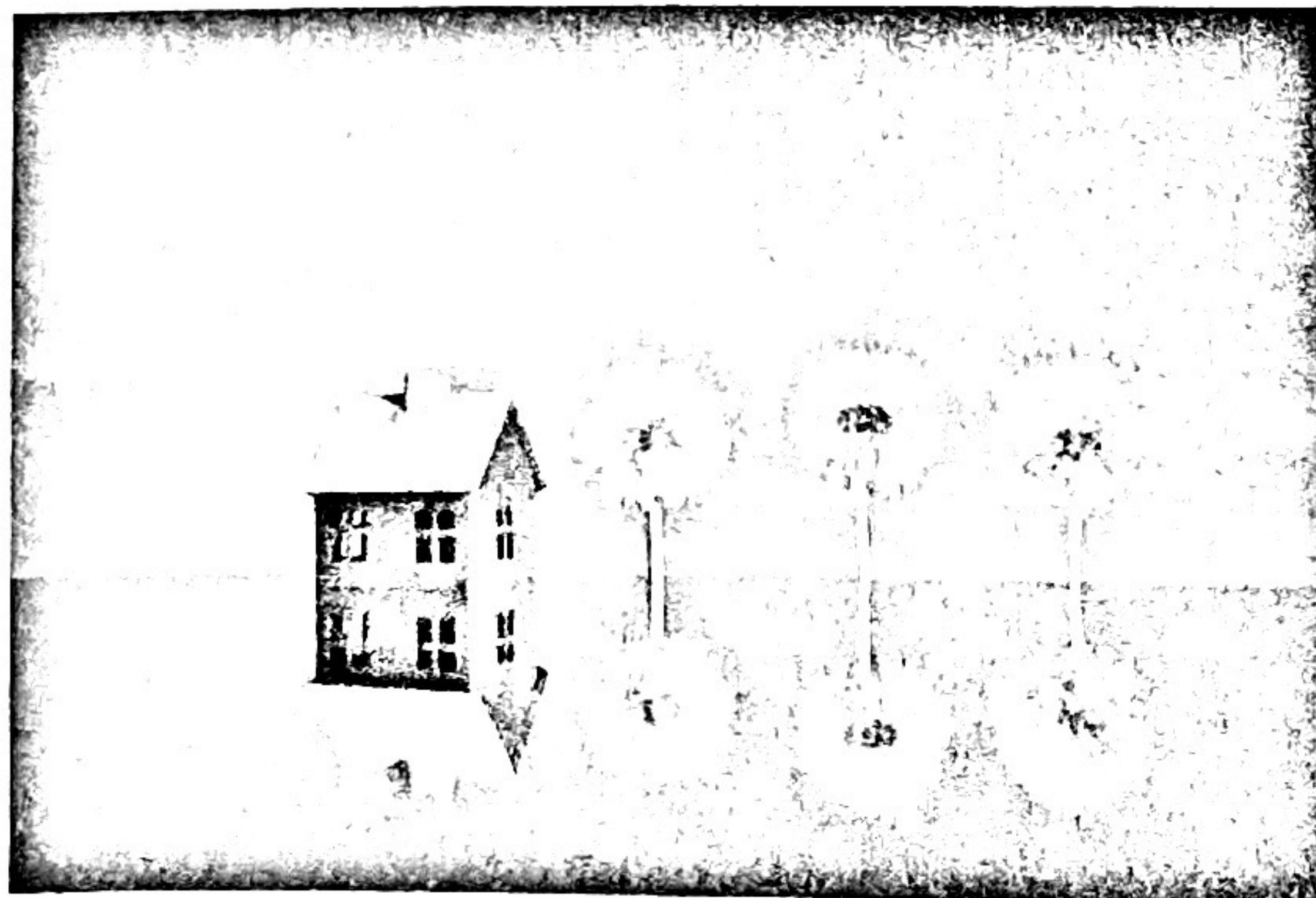
Fortunately, we have the MAC model. I found that I needed to use the MAC model of mindfulness in order to stay engaged in my research, and ultimately my body.

The MAC Model: To live mindfully the “Mindful MAC Model” reminds us to practice four simple steps to approach each and every precious moment: (1) acknowledging, (2) paying attention to, (3) accepting without judgment, and (4) making a choice in all of your experiences. Simply stated, it’s your life, make each experience count. (18).

If I choose to simply turn away from the pain and suffering I feel, then I choose to move mindlessly through life, ignoring how my food is produced and where it comes from. Instead, if I choose to practice mindfulness skills and sit with the feelings engendered by learning about the food system, I can notice, and have an opportunity to take a different action if I desire to do so. Remember that mindfulness does not prescribe any one type of action; simply we have the opportunity to notice, and pay attention to our thoughts and feelings, and discover with curiosity if our values and interests align with our actions, a process known as right action (23).

Once I was able to settle myself, and notice my own judgment, I was able to resume my work. I was buoyed by opposite, more encouraging facts such as those presented by Environmental Defense, who calculates that if every meat eater in the United States swapped just one meal of chicken per week for a vegetarian meal, the carbon savings would be equivalent to taking half a million cars off the road (24). Now that’s something within my control! This new enthusiasm for my own efforts allowed me to begin to rethink my plate.

Jacek Chabrazewski/Shutterstock.com



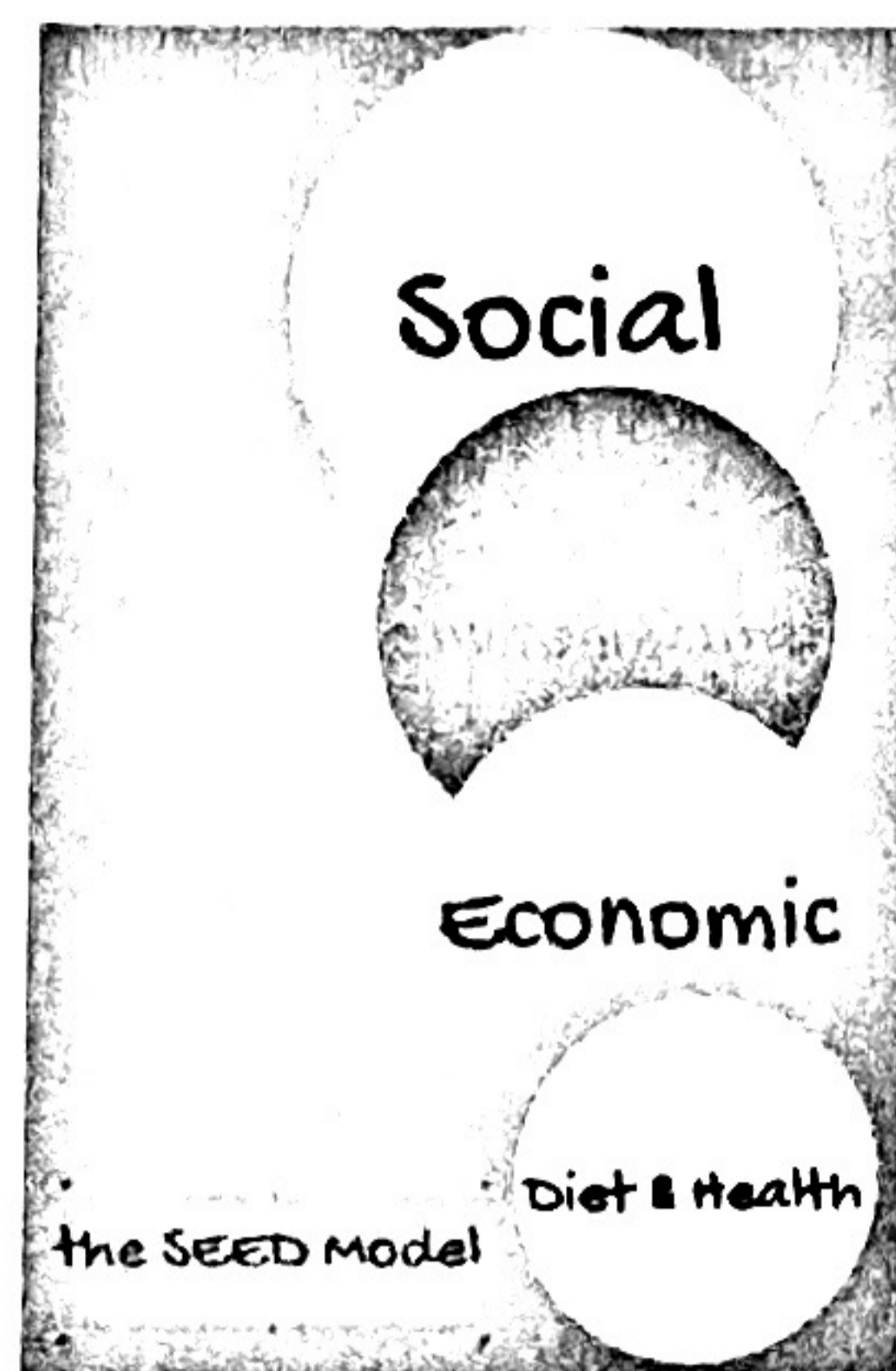
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RETHINKING YOUR PLATE

Looking at the environmental impacts of big factory farming and the distribution of food can be overwhelming. It can also be limiting, if we turn toward some aspects, and ignore others.

One organization (25) has used a smart and useful way to examine our food system. Called the SEED model, which stands for Social, Economic, Environmental, and Diet/Health, we can look at the food system through four lenses:

Using the SEED model (26), we notice the intersections of the food system. If we look at just one of the components, we miss the other pieces. The social aspect of the food system is composed of food and traditions, taste and flavor, and any environmental impacts. When we consider the environmental sphere, we notice the issues of climate change, topsoil loss, and farming practices. The economic sphere is comprised of food costs, trade policies, and crop subsidies. And finally, when we consider diet and health, we see diseases, hunger, and food safety.



Thinking about what is on our plates brings us both good and bad news.

Good News	Bad News
• Food hubs	• Genetically modified crops
• Farm to school programs	• Pink slime
• Local food	• Obesity & diabetes
• Farmer's markets	• Water
• Sustainable CSA food systems	• Antibiotics
• Plant-based diet can feed 10 billion	• Meat-centric diet can only feed 4 million

The good news is that regional and local food systems are working together to reconnect people to their food. This effort brings healthier food to consumers, with more diversity, and in a sustainable model that is kinder to the environment (26). Consumers benefit from knowing where their meals come from, connecting them to the food, the farmer, and the community. This approach encourages mindful consumption of natural resources and mindful eating of our meals.

On the negative side, the industrial food system results in increases in productivity and decreases in costs to consumers but destroys the livelihood of rural communities. Food production becomes

anonymous; people get sick from safety issues caused by mass production, contaminants in the food production system, and overcrowding in CAFOs. Large-scale factory food production is eroding our soil, and polluting our environment. This encourages mindless eating and mindless consumption of natural resources. It is also not sustainable.

As you read this section use your MAC Guide to track your experience. Are you reacting or responding? When we look at food using the SEED model, we find that any individual item of food becomes very complex. Government policies, which increase corporate consolidation, result in a few controlling the entire process from seeds, to plants, to products, to distribution. Just a few corporations control the following inputs: seeds, * Farms, * Processing, * Trucks, * Brands, and * Grocery Stores. This is called vertical integration, which means cheap food (27). Vertical integration results in the following:

- 50% of all groceries are purchased at four supermarket chains
- One in three of all children in the United States are overweight or obese
- Around the world, soil is being eroded at the rate of 36,000 square miles destroyed per year (the size of the State of Indiana)
- 1,835 miles is the distance the average carrot in the United States travels to reach the dinner table on a truck
- 800,000 farm workers are in the United States, many living far below the poverty line
- 40% of the food grown in the United States is lost due to spoilage.

Looking at the results of our factory farm system of food production, are you convinced that we can do better? I am convinced that we *must* do better—the future depends upon skillful action. What is your next step living in your community and in your personal life?

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ALTERNATIVE CHOICES—WHY IT MATTERS

We all have responsibility for creating an alternative food system. We are also responsible for knowing that due to the intersections of the food system, change is complex and interconnected. There are things we all can do as individuals to make more sustainable, mindful choices about the food we eat and our environment.

1. Be curious about where your food comes from.
 - a. Eat in season. Having blueberries shipped from South America in the winter is a waste of fossil fuel as well as an unsatisfying taste experience. Choose local produce whenever possible—that way you make sure it is in season.
2. Advocate for labeling transparency.
 - a. Want to know where your meat comes from? Do you want to avoid GMOs? Right now, you're on your own since there is no requirement to tell the consumer this information. Get involved in local and national organizations that advocate for transparency in food labeling.
2. Shorten the distance between where food is grown and you.
 - a. This sensible piece of advice limits the amount of finite resources needed to bring food to your plate. Looking for a calculator? Try Falls Brook Centre's Online Calculator (28).
4. Eat and cook yourself. Make fresh, whole foods—mostly plants. If you choose to eat meat, chicken, or pork, buy organic, grass fed, sustainably raised animal protein. Eat smaller amounts, as is done in other countries. It's more expensive, so eat less.
5. Ask questions.

The surgeon general has called obesity an epidemic that costs our health care system close to \$100 billion a year (29), but we must go much further in educating each other and us about the consequences of poor food choices. The effort deserves the same attention we gave to educating Americans about smoking's ill effects. In that case, we launched widespread public awareness campaigns, issued government warnings, and taxed cigarettes.

It may not make sense to tax junk food, but government and others can encourage better choices. The "Buy Fresh Buy Local" campaign, coordinated by national nonprofit Food Routes (30), marks a good beginning, as do regional efforts like Arizona's Community Food Connections (31).

We have a well-developed system for growing and shipping large volumes of corn and soybeans—grain elevators, warehouses, and railroads—and we must create an equally functional system for local food, which would include warehousing and shipping facilities for local produce and the capacity for processing organic meat. Those systems are being built in Northern California and a few other places, but that's it. Worse yet, within the current crop subsidy system, farmers encounter disincentives if they want to switch from commodity production (corn and soybeans) to fruits or vegetables.

Financially and sustainably, rebuilding local food systems is economically feasible. Consider the tremendous demand for organic food, which has arrived in nearly every corner of the United States. Restaurants and consumers are increasingly demanding fresh, healthy, locally produced food. One organization (32) is working to estimate the demand for organic food. They found in Chicago there is nearly \$500 million worth of organic food desired by local consumers, but nearly all of this is being shipped from out of state. The economic benefit of rebuilding local food systems go to those who need it most: small farmers not equipped to producing corn at large, industrial scale; fast-disappearing farmers on the fringe who work close to local markets; and people whose troubled and damaged urban neighborhoods (think inner city Detroit, and parts of New Orleans, as examples) may become warehousing and distribution districts. A study by Michael H. Shuman (32) estimated that shifting 20% of metro Detroit's food spending to food and beverages that are locally grown and processed would increase the region's annual economic output by nearly \$3.5 billion, create more than 35,000 "greencollar" jobs, and lead to a nearly \$155 million gain in business taxes. Detroit is taking note, and things are changing there, exactly as Shuman suggested in 2007.

It may not be realistic to imagine the end of all-large scale factory type farming. To feed a nation as populated as the United States, some large-scale farming is probably inevitable.

Nevertheless, different organizing principles can guide that production. Companies such as Cascadian Farms, Horizon Organic, and Organic Valley, as three examples, are producing meat, milk, and vegetables in great volume while using organic feed (without antibiotics), organic fertilizer, and natural pesticides (32). Smaller farmers such as Skagit River Ranch (33) have demonstrated that the sustainability of "green" farming practices. They simply cannot produce enough grass fed beef, humanely treated chicken and eggs to feed the demand.

Because large organic farms suffer from some of the same problems as large-scale traditional



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farms—animals are confined in large numbers and products are often shipped long distances—smaller-scale local food systems should be developed to the fullest extent possible.

What About Green Legislation?

Many advocate for using government to jumpstart the redevelopment of local food systems. In Illinois, for instance, food advocates were disturbed by the fact that less than 1,000 acres of central Illinois farmland is dedicated to fruit and vegetable production—and that's out of 5.4 million acres of fertile farmland in 16 counties. In 2014, a compromise Farm Bill was signed into law by President Obama, with a landmark change that the environmental community fought hard for: Farmers and ranchers are eligible for subsidies only when they conserve their lands, such as wetlands, grasslands, and erodible land. That's critically important because about half the land in the contiguous United States is crop, range, or pasture land. Previous versions of the Farm Bill encouraged destroying these areas to plant more crops. This signals a tremendous change and bodes well for the future of environmentally sustainable farming in the United States (34). Although imperfect, the bill is celebrated by the Organic Trade Association, because there's more funding for the National Organic Program. It will be used to enforce organic standards, improve technology and negotiate international trade agreements, as well as funding research on organic farming practices and providing financial assistance for small farms to afford organic certification.

Also for the first time, organic farmers, distributors, and marketers will have access to the same agriculture research and promotion programs that always have been helpful to conventional farmers.

This is exciting for those such as myself who encourage a more sustainable approach to farming and crop production in this country. I'm also excited by the many nonprofits (30) working to educate consumers or reform the food production and distribution system. You might find it encouraging that the 2007 *New Oxford American Dictionary* word of the year was *locavore*—a person who eats locally grown food. That says a lot about national awareness

of the issue. Perhaps, in another 20 years, we will see a vibrant and diverse agricultural landscape—a revitalization of the neighborhood and landscape America has in its history, embedded in our collective consciousness, and much more closely aligned with our fantasy of what the farm means to all of us.

Curious how far your food travels? Use the Food Miles Calculator to find out just how many miles your food needs to journey to reach your plate! It might make a difference and inspire you to choose local!! (35)

Eating locally and in season isn't always possible in the dry Arizona desert where I live. Citrus season, however, is amazing, with organic oranges right off my own tree! I make this marinade for tofu with juice freshly squeezed from my oranges. It is delicious!

