

YOUNG READERS EDITION

The  
Omnivore's  
Dilemma

THE SECRETS BEHIND WHAT YOU EAT

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*For Judith and Isaac*



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The  
Omnivore's  
Dilemma







# INTRODUCTION

Before I began working on this book, I never gave much thought to where my food came from. I didn't spend much time worrying about what I should and shouldn't eat. Food came from the supermarket and as long as it tasted good, I ate it.

Until, that is, I had the chance to peer behind the curtain of the modern American food chain. This came in 1998. I was working on an article about genetically modified food—food created by changing plant DNA in the laboratory. My reporting took me to the Magic Valley in Idaho, where most of the french fries you've ever eaten begin their life as Russet Burbank potatoes. There I visited a farm like no farm I'd ever seen or imagined.

It was fifteen thousand acres, divided into 135-acre crop circles. Each circle resembled the green face of a tremendous clock with a slowly rotating second hand. That sweeping second hand was the irrigation machine, a pipe more than a thousand feet long that delivered a steady rain of water, fertilizer, and pesticide to the potato plants. The whole farm was managed from a bank of computer monitors in a control room.

Sitting in that room, the farmer could, at the flick of a switch, douse his crops with water or whatever chemical he thought they needed.

One of these chemicals was a pesticide called Monitor, used to control bugs. The chemical is so toxic to the nervous system that no one is allowed in the field for five days after it is sprayed. Even if the irrigation machine breaks during that time, farmers won't send a worker out to fix it because the chemical is so dangerous. They'd rather let that whole 135-acres crop of potatoes dry up and die.

That wasn't all. During the growing season, some pesticides get inside the potato plant so that they will kill any bug that takes a bite. But these pesticides mean people can't eat the potatoes while they're growing, either. After the harvest, the potatoes are stored for six months in a gigantic shed. Here the chemicals gradually fade until the potatoes are safe to eat. Only then can they be turned into french fries.

*That's how we grow potatoes?*

I had no idea.

## A BURGER WITH YOUR FRIES?

A few years later, while working on another story, I found myself driving down Interstate 5, the big highway that runs between San Francisco and Los Angeles. I was on my way to visit a farmer in California's Central Valley. It was one of those gorgeous autumn days when the hills of California are gold. Out of nowhere, a really nasty smell assaulted my nostrils—the stench of a gas station restroom sorely in need of attention. But I could see nothing that might explain the smell—all around me were the same blue skies and golden hills.

## INTRODUCTION

And then, very suddenly, the golden hills turned jet-black on both sides of the highway: black with tens of thousands of cattle crowded onto a carpet of manure that stretched as far as the eye could see. I was driving through a feedlot, with tens of thousands of animals bellying up to a concrete trough that ran along the side of the highway for what seemed like miles. Behind them rose two vast pyramids, one yellow, the other black: a pile of corn and a pile of manure. The cattle, I realized, were spending their days transforming the stuff of one pile into the stuff of the other.

*This is where our meat comes from?*

I had no idea.

Suddenly that “happy meal” of hamburger and fries looked a lot less happy. Between the feedlot and the potato farm, I realized just how little I knew about the way our food is produced. The picture in my head, of small family farms with white picket fences and red barns and happy animals on green pastures, was seriously out of date.

## THE OMNIVORE’S DILEMMA

Now I had a big problem. I went from never thinking about where my food came from to thinking about it all the time. I started worrying about what I should and shouldn’t eat. Just because food was in the supermarket, did that mean it was good to eat?

The more I studied and read about food the more I realized I was suffering from a form of the omnivore’s dilemma. This is a big name for a very old problem. Human beings are omnivores. That means we eat plants, meat, mushrooms—just about anything. But because we are omnivores we have very

little built-in instinct that tells us which foods are good for us and which aren't. That's the dilemma—we can eat anything, but how do we know what to eat?

The omnivore's dilemma has been around a long time. But today we have a very modern form of this dilemma. We have a thousand choices of food in our supermarkets, but we don't really know where our food comes from. As I discovered, just finding out how our potatoes are grown might scare you off french fries for the rest of your life.

In the past, people knew about food because they grew it or hunted it themselves. They learned about food from their parents and grandparents. They cooked and ate the same foods people in their part of the world had always eaten. Modern Americans don't have strong food traditions. Instead we have dozens of different "experts" who give us lots of different advice about what to eat and what not to eat.

It's one thing to be crazy about food because you like to eat. But I found I was going crazy from worrying about food. So I set out to try to solve the modern omnivore's dilemma. I decided to become a food detective, to find out where our food comes from and what exactly it is we are eating. My detective work became the book you now hold in your hands.

## FOUR MEALS

As a food detective, I had to go back to the beginning, to the farms and fields where our food is grown. Then I followed it each step of the way, and watched what happened to our food on its way to our stomachs. Each step was another link in a chain—a food chain.

A food chain is a system for growing, making, and deliver-

## INTRODUCTION

ing food. In this book, I follow four different food chains. Each one has its own section. They are:

### **Industrial**

This is where most of our food comes from today. This chain starts in a giant field, usually in the Midwest, where a single crop is grown—corn, or perhaps soybeans—and ends up in a supermarket or fast-food restaurant.

### **Industrial Organic**

This food is grown on large industrial farms, but with only natural fertilizers, and natural bug and weed control. It is sold in the same way as industrial food.

### **Local Sustainable**

This is food grown on small farms that raise lots of different kinds of crops and animals. The food from the farm doesn't need to be processed, and it travels a short distance—to a farmer's market, for example—before it reaches your table.

### **Hunter-Gatherer**

This is the oldest type of food chain there is. It's hardly a chain at all, really. It is made up simply of you, hunting, growing, or finding your food.

All these food chains end the same way—with a meal. And so I thought it important to end each section of the book with a

meal, whether it was a fast-food hamburger eaten in a speeding car, or a meal I made myself from start to finish.

## THE PLEASURES OF EATING

When I was ten years old, I started my own “farm” in a patch of our backyard. From that age until now, I have always had a vegetable garden, even if only a small one. The feeling of being connected to food is very important to me. It’s an experience that I think most of us are missing today. We’re so confused about food that we’ve forgotten what food really is—the bounty of the earth and the power of the sun captured by plants and animals.

There were parts of this book that were difficult to write, because the facts were so unpleasant. Some of those facts might make you lose your appetite. But the point of this book is not to scare you or make you afraid of food. I think we enjoy food much more if we take a little time to know what it is we’re putting in our mouths. Then we can really appreciate the truly wonderful gifts that plants and animals have given us. To me, that’s the point of this book, to help you rediscover the pleasures of food and learn to enjoy your meals in a new way.

THE MEAL:

Source: McDonald's

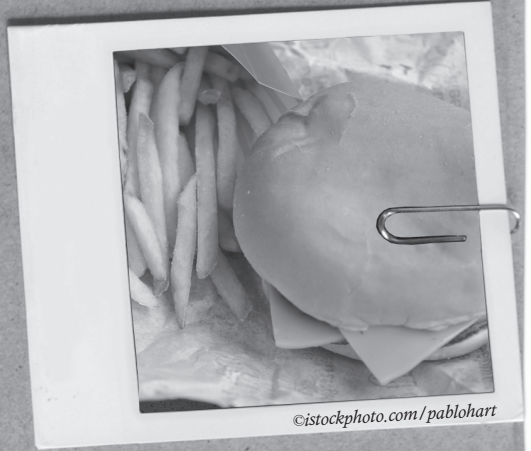
Eaten: In the car

MENU:

Classic cheeseburger

Large fries

Large Coke (32 oz.)



# PART I

## The Industrial Meal:

Food from Corn

NAME

No.







## How Corn Took Over America

### A FIELD OF CORN

The average supermarket doesn't seem much like a field of corn.

Take a look around one. What do you see? There's a large, air-conditioned room. There are long aisles and shelves piled high with boxes and cans. There are paper goods and diapers and magazines. But that's not all. Look again. Somewhere, behind the brightly colored packaging, underneath the labels covered with information, there is a mountain of corn.

You may not be able to see it, but it's there.

I'm not talking about the corn in the produce section. That's easy to recognize. In the spring and summer, the green ears of corn sit out in plain view with all the other fruits and vegetables. You can see a stack of ears next to the eggplants, onions, apples, bananas, and potatoes. But that's not a mountain of corn, is it?

Keep looking. Go through produce to the back of the supermarket and you'll find the meats. There's corn here too, but

it's a little harder to see. Where is it? Here's a hint: What did the cows and pigs and chickens eat before they became cuts of meat? Mainly corn.

Go a little further now. There's still a lot of corn hiding in this supermarket. How about those long aisles of soft drinks? Made from corn. That freezer case stuffed with TV dinners? Mostly corn. Those donuts and cookies and chips? They're made with a whole lot of corn.

Supermarkets look like they contain a huge variety of food. The shelves are stuffed with thousands of different items. There are dozens of different soups and salad dressings, cases stuffed with frozen dinners and ice cream and meat. The range of food choices is amazing.

Yet if you look a little closer, you begin to discover:

**It's All Corn.**

Well, maybe not *all* corn, but there's still an awful lot of it hiding here—a lot more than you suspect. We think of our supermarkets as offering a huge variety of food. Yet most of that huge variety comes from one single plant. How can this be?

Corn is what feeds the steer that becomes your steak.

Corn feeds the chicken and the pig.

Corn feeds the catfish raised in a fish farm.

Corn-fed chickens laid the eggs.

Corn feeds the dairy cows that produce the milk, cheese, and ice cream.

See those chicken nuggets in the freezer case? They are really corn wrapped up in more corn. The chicken was fed corn. The batter is made from corn flour. The starch that holds it together is corn starch. The oil it was fried in was corn oil.

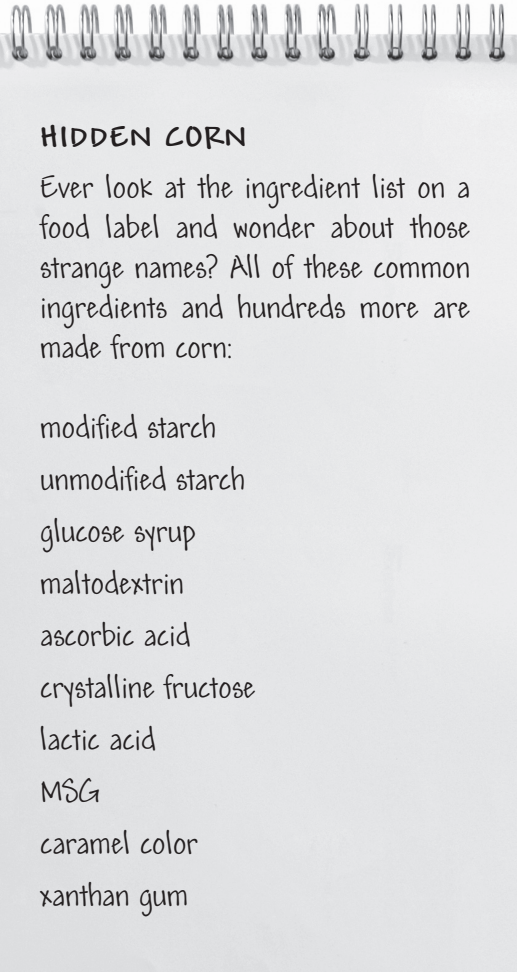
But that's not all. Read the label on any bag of chips, candy bar, or frozen snack. How many ingredients do you recognize?

*Maltodextrin? Monosodium glutamate? Ascorbic acid? What are those things? What about lecithin and mono-, di-, and triglycerides? They are all made from corn. The golden food coloring? Made from corn. Even the citric acid that keeps the nugget “fresh” is made from corn.*

If you wash down your chicken nuggets with almost any soft drink, you are drinking corn with your corn. Since the 1980s almost all sodas and most of the fruit drinks sold in the supermarket are sweetened with something called high-fructose corn syrup.

Read the label on any processed food, and corn is what you'll find. Corn is in the non-dairy creamer and the Cheez Whiz, the frozen yogurt and the TV dinner, the canned fruit and the ketchup. It's in the candy, the cake mixes, the mayonnaise, mustard, hot dogs and bologna, the salad dressings and even in some vitamins. (Yes, it's in a Twinkie too.)

There are some forty-five thousand items in the average American supermarket and more than a quarter of them now contain corn. This goes for the non-food items as well—everything from

A graphic of a spiral-bound notebook with a grey cover and white pages. The spiral binding is on the left side. The text is written on the pages in a handwritten style.

### HIDDEN CORN

Ever look at the ingredient list on a food label and wonder about those strange names? All of these common ingredients and hundreds more are made from corn:

- modified starch
- unmodified starch
- glucose syrup
- maltodextrin
- ascorbic acid
- crystalline fructose
- lactic acid
- MSG
- caramel color
- xanthan gum

toothpaste and cosmetics to disposable diapers, trash bags, and even batteries.

Corn is in places you would never think to look. It's in the wax that coats the other vegetables in the produce section. It goes into the coating that makes the cover of a magazine shine. It's even part of the supermarket building, because the wallboard, the flooring, and many other building materials are made with corn.

## CARBON FROM CORN

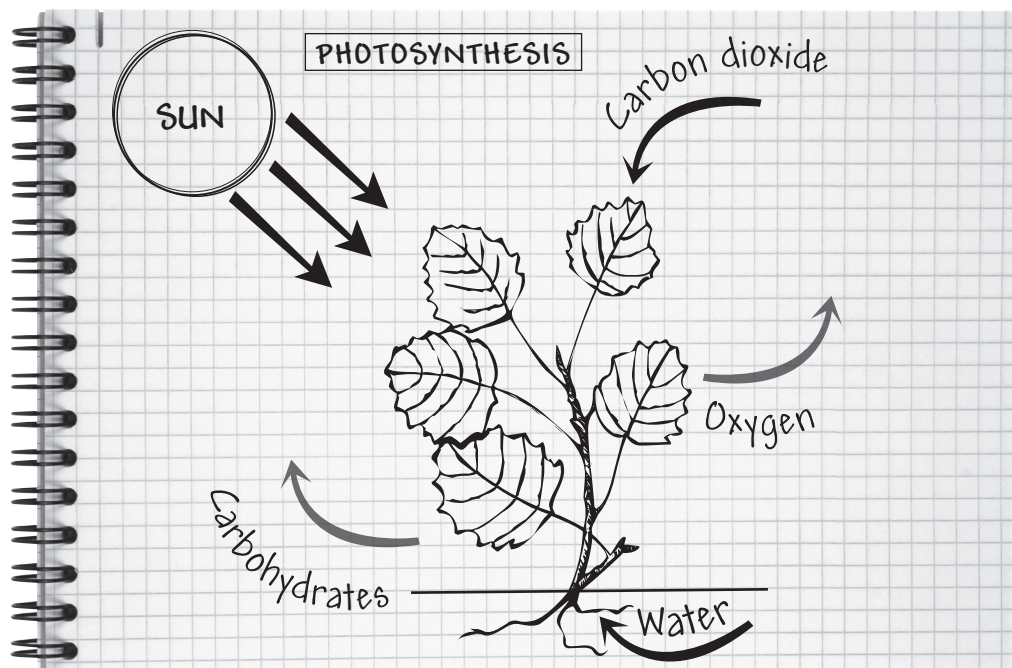
You are what you eat, it's often said. If this is true, then what we are today is mostly corn. This isn't just me being dramatic—it's something that scientists have been able to prove. How do they do this? By tracing the element carbon as it goes from the atmosphere into plants, then into our food, and finally, into us.

You may have heard the expression that humans are a carbon-based life form. (This always seems to come up in science fiction movies, but it's true.) Like hydrogen and oxygen, carbon is an element, one of the basic building blocks of matter. All the molecules that make up our cells—carbohydrates, proteins, and fats—contain the element carbon.

All of the carbon in our bodies was originally floating in the air, as part of a carbon dioxide molecule. Plants take the carbon out of carbon dioxide and use it to make food—*carbohydrates*. They do this through a process called photosynthesis. In photosynthesis, plants use the energy of the sun (*photo* means light) to *synthesize* (make) food.

All of our food, in fact almost all life on earth, can be traced

## THE INDUSTRIAL MEAL



*All food begins with the process of photosynthesis.*

back to photosynthesis in plants. It's more than a figure of speech to say that plants create life out of thin air.

So the plants take carbon and make it into food. Then we eat the plants, or we eat animals that have eaten the plants. That's how the carbon winds up in our cells. But not all carbon is the same. Corn uses slightly different types of carbon than other plants. So by looking at the type of carbon in our cells, scientists can tell how much corn we have been eating.

Todd Dawson, a biologist at the University of California, Berkeley, has done exactly that kind of research. He says that when you look at the carbon in the average American's cells, "we look like corn chips with legs."

Americans don't think of themselves as corn eaters. Our bread is made from wheat flour. We don't eat a lot of corn on

the cob. When we think of serious corn eaters, we often think of people in Mexico. About 40 percent of their calories come directly from corn, mostly in the form of corn tortillas. Yet Americans have *more* corn in our diet than Mexicans. It's just that the corn we eat wears many different disguises.

How did corn take over America? It's really a tremendous success story—for corn, anyway. Corn has managed to become the most widely planted crop in America—more than 80 million acres of farmland are planted with corn every year. Today it covers more acres of the country than any other living species, including human beings. It has pushed other plants and animals off the American farm. It has even managed to push a lot of farmers off the farm. (I'll explain that one later.) Corn is now one of the most successful plants on earth.

It's important to remember that while humans use plants and other animals, it's not a one-way street. Plants and animals don't just sit around waiting for human beings to use them—they use us, too. The ones that can adapt use our farms and cities to spread and multiply. Corn became king of the farm and the supermarket because it adapted itself easily to the needs of farmers and food makers. It had qualities that human beings prized. Those qualities allowed it to spread and grow until it worked its way into every corner of our lives—and every cell in our bodies.

## THE RISE OF MAIZE

When Columbus returned to Spain after his first voyage he described many wonderful things he had seen to Queen Isabella. One of his discoveries was a towering grass with an ear as thick as a man's arm, to which grains were "affixed in a wondrous



manner and in form and size like garden peas, white when young.” That grass was called maize, but today we know it as corn.

Corn began as a wild grass called teosinte. (*Teosinte* means “mother of corn” in the Native American language Nahuatl.) Teosinte still grows wild in some places in Central America, but if you saw it, you might not recognize it as the mother of corn. Teosinte ears are no bigger than your thumb. They are not covered in thick husks. The kernels are tiny seeds. Yet long before Columbus arrived, that wild grass had managed to evolve into maize and spread across North America.

Corn spread because it could adapt to the needs of human beings. Of course, it needed human help. Humans selected bigger ears with fatter kernels and planted those seeds. By the year 700, Indians as far away as New England and Canada farmed maize. Corn had begun its march to world domination, but it still had a long way to go.

After Columbus, the Native Americans were conquered by the Europeans. But maize, or corn, had no loyalties to the Maya and other people who had helped it spread. It was only

### CORN OR MAIZE?

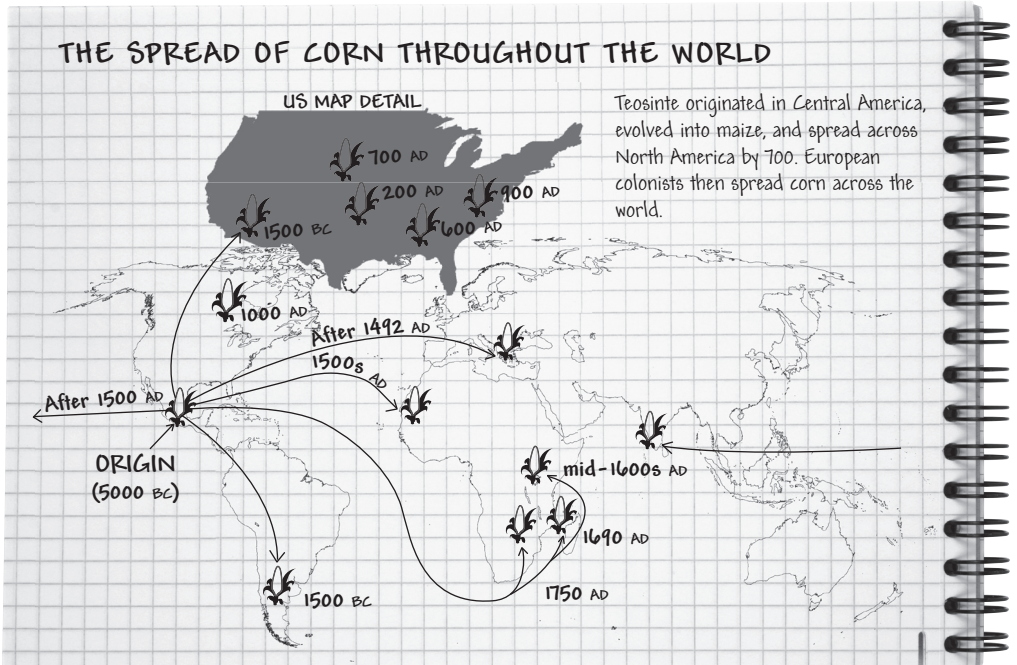
Maize is the other name for what Americans call corn. It is the name the Spanish learned from the Native Americans who grew it. In England and much of the world, the plant is still called maize.

*Corn* was the English word for any sort of grain, even a grain of salt. (That’s where the term “corned beef” comes from.) The English who settled in North America called the plant Indian corn, meaning Indian grain. Today, in the United States and Canada, corn has become so important, it has taken over the word. Corn is just corn, and all those other grains have to stick to their own names.

concerned with its own survival. The Europeans presented a way for corn to spread even farther. The plant quickly adapted to the new humans and their needs.

The first thing corn did was push aside the European crops the new settlers brought with them. The European plants just couldn't compete. For example, wheat brought from Europe did not do as well as the native maize. A seed of wheat might, with luck, yield 50 new grains of wheat. A single planted corn seed could yield 150 to 300 fat kernels. Corn won that contest easily.

Corn continued quickly to win over the new settlers by being very useful. It could supply them with a ready-to-eat vegetable, a storable grain, a source of fiber, an animal feed, and heating fuel. Corn could be eaten fresh off the cob or dried on the stalk, stored over the winter and ground into flour. Corn could also be mashed and fermented to make beer or whiskey.



Sources: *The Natural History Museum, London, and Smith, C. Wayne (Ed.) Corn: Origin, History, Technology and Production. John Wiley & Sons.*



No part of the big grass went to waste. The husks could be woven into rugs and twine. The leaves and stalks made good feed for livestock. The shelled cobs could even be stacked by the outhouse and used as a rough substitute for toilet paper!

In the competition for king of the crops, corn left the European plants in the dust. Settlers who stuck to the Old World crops often perished. The colonists who recognized corn's usefulness did well. And of course, one thing the successful farmers did was plant more corn, helping maize to build its kingdom. Corn helped the colonists and the colonists helped corn.

Corn made itself useful in one other important way. It turned



## WHY CORN NEEDS PEOPLE

Wild teosinte does not look like modern corn. It does not have fat ears with hundreds of kernels wrapped in a thick husk. Instead, it has a single row of triangular seeds growing on a single stalk. Its kernels are covered in a hard shell. The seeds are spread by animals.

Some time several thousand years ago, teosinte mutated or changed. The mutation made its seeds grow on a cob, covered by a husk. Now its seeds could not come loose by themselves. Luckily, a creature came along that knew how to pick those husks, take out the seeds, and plant them. That creature was us. Humans took the ears off the plant, separated the kernels, ate some and planted others.

Teosinte gave up its independence, but it gained an ally who helped it spread across the globe. Ever since, corn and human beings have been joined together. The plant cannot live without us. Can we live without the plant?



out that corn was an excellent way to store and trade wealth. Dried corn is easy to transport and almost indestructible. The farmer can take any surplus to market and sell or trade it. In the new colonies corn often took the place of money.

Corn allowed farming settlements to become trading settlements. Corn made the slave trade possible. Traders in Africa paid for slaves with corn and then fed slaves corn when they were brought here. Corn was the perfect plant for the growing economy of the colonies. And just as important, the new colonists gave corn a way to get to the rest of the world.

### M. POLLAN, FOOD DETECTIVE

Once I realized how much of our food is made from corn, I began to look at supermarkets differently. Instead of a giant variety of food, I saw corn hiding in every aisle. Now, I have nothing against corn. There's nothing more delicious than a roasted ear of fresh sweet corn. But I didn't understand why there had to be corn in *everything* we eat. Who decided that corn would be our main food? How did that happen? Where did all this corn come from and how did it take over our supermarket?

So I decided to find out. And like any good detective, I realized I had to start at the very beginning, which in this case meant a field of corn in Iowa. I began with that field and tried to trace the corn as it traveled across the country, first to my supermarket and then to my stomach. I watched it being turned into meat, milk, and eggs by cows and chickens. I watched as it was torn apart and rebuilt into all the different foods and products listed on all those labels.

What I discovered was a vast industry—a giant agricul-

## THE INDUSTRIAL MEAL

ture business or *agribusiness*. This industry doesn't look much like farming the way most people imagine it. It's more like a series of factories that turn raw materials into food products. It's a giant food chain, the one that supplies most of the food Americans eat today.

A food chain in nature helps us understand who eats what (or whom). But the food chain that feeds most Americans is anything but natural. The *industrial* food chain that supplies our supermarkets stretches thousands of miles and has dozens of different links. It's a chain that's powered by oil and gasoline and controlled by giant corporations. It's a chain that separates us from our food and keeps us from knowing what it really is we're eating.

Most of all, it's a food chain built around one plant. Somehow, that small wild grass that started in the hills of Central America has become the star of the biggest, most expensive food chain in the history of the world. But if corn is the star of this story, is it the hero or is it the bad guy? Before I could decide, I needed to get to know it better. And so I went to see it where it lives, in the vast cornfields of the Midwest.