

Debate series on:

## **Cross-thinking about Sustainability**

Transcript of the lecture on:

### **Rethinking the Global Meat Industry**

By:

**Danielle Nierenberg (Worldwatch Institute, Washington, USA)**

Date & location:

**5 October 2006, Felix Meritis (Amsterdam)**

Good evening. First I want to thank everyone at the Industrial Transformation Project, the Knowledge for System Innovations and Transition, the University, and Felix Meritis for helping to arrange my visit here and I want to thank you all for coming. I'm looking forward to a lively discussion.

As you all may know, it's hard to read any newspaper now without finding at least one article about avian flu. Every day it seems like one more country has been affected and that more people have been infected with the disease. But, as someone who has followed the avian flu story fairly closely since the latest outbreak in 2003, there's one thing that I continue to notice. In a post-Tsunami and post-Katrina world, the media and even government officials like to compare avian flu to a natural disaster.

Just a few months ago, for example, avian flu reemerged in Thailand for the first time since 2005. This latest outbreak was called a "national threat," and the government declared one-third of the country "disaster zone." Even Bangkok, the nation's capital, was not immune because there, like in so many cities all over the world, people raise chickens in their backyards and even in their apartments. The Thais thought they had control of the disease thanks to massive culling and vaccination efforts in 2004 and 2005. But there is an untold story behind this outbreak in Thailand and it's something the news stories don't really report. There are huge factory farms that zig zag across Thailand and they are owned by CP Group, which is one of the biggest poultry producing companies in the world, with facilities not only in Thailand, but in other Asian countries, including China. It's likely that those CP farms unknowingly helped spread the disease across the country. Why? Like other factory farms, the CP farms concentrate thousands and thousands of birds in sheds, making it easy for diseases to erupt and then spread quickly from bird to bird. The movement and trade of poultry across Thailand also likely helped the disease spread from big farms to small backyard producers.

And it's not just in Thailand. Since the avian flu outbreak began in Southeast Asia in late 2003, public health officials, farmers, veterinarians, government officials, and the media all over the world have referred to the disease as a natural disaster, implying that it was impossible to prevent.

So, tonight, I want to talk about why avian flu and other emerging diseases are anything but natural disasters. This highly virulent form of avian flu, which has killed

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

millions of chickens and at least 150 people, did not just “happen.” Instead, avian flu, mad cow disease, and other emerging animal diseases that can spread from animals to humans as well as a variety of other environmental and public health problems are symptoms of a larger change taking place in agriculture. Industrial animal production, or factory farming, is rippling across the world, swallowing up small farms and indigenous animal breeds and concentrating meat production in the hands of a few large companies.

These farms are inhumane and ecologically and economically disruptive. They tend to treat animals and workers poorly, they hurt the environment, and they undermine public health and create potential pandemics. But not all livestock raising is necessarily harmful and neither is all meat eating. What I want to do tonight is to first talk about how and why factory farming is harmful to public and environmental health and then explore solutions and alternatives to factory farming as well as talk about how we can make these existing farms better.

First of all, I think it’s always useful to give some numbers so that we all have a sense of the enormity of what we’re dealing with here.

I’ll start with the basic production and consumption numbers from the United Nations Food and Agriculture Organization.

The number of cattle, sheep, and pigs has increased 38 percent since 1961, so we went from 3 billion to more than 4 billion. The global population of chickens, ducks, and turkeys, meanwhile, has quadrupled since 1961, from 4 billion to 17 billion birds.

And we rely heavily on these millions and millions of livestock. Nearly 2 billion people worldwide rely on livestock to support part or all of their daily needs. And some 200 million people depend on grazing livestock as their only possible source of livelihood. Livestock now supply 30 percent of total human needs for food and agricultural production, converting low-quality biomass, such as corn stalks and other crop residues, into high-quality milk and meat.

Not surprisingly, along with greater numbers of livestock, meat production has also grown. Global meat production has increased five-fold since the 1950s and more than doubled since the 1970s.

Consumption of meat and other animal products is also growing. Today, the average person in the developing world eats 31 kilograms a meat per year, nearly double the level in 1990. But it is consumers like you and me in the industrial world who still consume the most meat, with 85 kilograms per person a year. That’s equivalent to a side of beef, 50 chickens, and one pig each year. And in some parts of the world, including here in the Netherlands, meat consumption is even higher. The average person living here eats about 90 kilograms of meat, mostly pork, per year.

So what are some of the reasons for this increased production and consumption?

As more people move to cities and as incomes rise, people demand more and more animal products. By next year, more people will be living in cities than in rural areas. And city folk eat differently than country people. Usually, along with more processed and street food and more sweeteners, urbanites eat more meat, milk, and eggs.

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

Factory farming, or industrial animal production, is the fastest growing form of meat production worldwide. Industrial systems today generate 74 percent of the world's poultry products, 50 percent of all pork, 43 percent of beef, and 68 percent of eggs. Industrial countries dominate production, but it is in the developing world where livestock producers are rapidly expanding and intensifying their production systems.

But along with this growing production and consumption come some unintended consequences. And disease is the one of the most important and potentially harmful of these "side effects" that result from factory farming that I want to talk about tonight.

But you might be wondering what does factory farming have to do with avian flu? You might have heard, in fact, that backyard farmers are to blame because they let their birds roam free, or that migrating birds spread the disease. But according to a 2005 report by the World Bank, this "extraordinary proximate concentration of people and livestock poses probably one of the most serious environmental and public health challenges for the coming decades."

Let's understand why this is happening.

In East and Southeast Asia alone, more than 6 billion birds are raised for food, with major groups of them being raised in the region's rapidly growing megacities. This increasing intensity of production of chickens and other livestock in cities and in rural areas, along with their close proximity to people's homes is having a devastating impact on public health.

Despite the heightened media attention, avian flu is not a new disease, but one farmers have dealt with for centuries. Referred to as "fowl plague," it caused high mortality in birds, but was usually short lived and didn't spread to other farms. Only during the last ten years has the disease really changed, mutating into a form that can jump the species barrier and easily infect humans. Things are very different in farming now than they were a hundred or even fifty years ago and one of the reasons that avian flu and other emerging animal diseases are spreading has to do with our changing consumption and production patterns that I mentioned before.

Because people are eating more meat, eggs, milk, and other animal products, farmers are forced to abandon local breeds in favor of a limited number of high-producing livestock. And while pastoralists and small livestock breeders have traditionally bred their animals to resist certain diseases or to survive in hot climates, commercial breeders select for traits that will earn them the most money, including the ability of animals to gain weight quickly, produce more milk or produce more eggs or for chickens to have meatier breasts. These commercial breeders are simply not breeding animals to resist diseases—and this isn't happening only with chickens and avian flu, but a variety of other diseases that infect livestock that I won't have time to talk about tonight, including Nipah virus and swine flu.

Within just the last century, 1,000 breeds—or about 15 percent of the world's cattle and poultry varieties—have disappeared. They're just gone. About 300 of these

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

losses occurred in just the past 15 years, and many more breeds are in danger of extinction.

The problem has been greatest in industrial countries where factory farming is most intense, but as developing countries rise up the protein ladder, the genetic stock of their livestock is also eroding as higher-producing industrial breeds crowd out indigenous varieties. This creeping homogeneity handicaps the ability of farmers everywhere to respond to changes in climate, pests, and especially disease.

This less genetic diversity can also make livestock a very attractive target for terrorists. In this era of terror alerts, farms that forsake genetic diversity have shed their battle armor. Despite their mammoth technological capabilities, huge factory farms crammed with chickens or pigs are much more vulnerable than smaller, more diverse farms to the unintended or malicious introduction of disease. The loss of livestock genetic resources makes it harder for livestock to survive a disaster, whether it is natural, man-made, or terror-caused. One properly placed vector can wipe out 90 percent of an indoor flock. But in a flock with more broad genetic spread, that is harder to do.

The next characteristic of the industrial food system I would like to discuss is the crowded conditions on factory farms. It's hard to get a sense of what these farms look, smell, and sound like unless you've visited one. The lack of personal space for the animals is one of the worst parts. Many animal welfare groups like to use the description that most poultry produced in the world are forced to stand in an area that is less than the size of a sheet of paper. And while I'm not here tonight to talk about animal rights or animal welfare, that size issue really matters for human health. Cramping thousands and thousands of animals together, along with their decreased genetic diversity, is like creating a huge Petri dish for disease to incubate in. Microbes have never really had it so good. According to a study by the RAND Corporation, U.S. livestock have become increasingly more disease prone in recent years because of intensive factory-style conditions on farms. They're more prone to disease because they're more genetically similar. And the metabolic demands on their bodies from intensive production, including artificial reproduction methods, increased lactation, early weaning, and accelerated growth rates also leave animals more susceptible to disease.

And because each farm contains tens of thousands of animals, operators are unable to monitor all the stock on a regular basis, making them unaware of a disease outbreak until it spread to the entire herd or flock.

In turn, the loss of genetic diversity and the crowded conditions present on factory farms also forces producers to medicate their animals. A lot has been written about antibiotic resistance in the past few years, but it can be hard to understand how our food system has contributed to this problem.

Because of the practice of using antibiotics in animal agriculture, food-borne infections and other human diseases are becoming harder to fight. When people consume animal products containing resistant bacteria, the human gut acts as a breeding ground for antibiotic resistance, spreading the problem from one species to another. The results can be lethal. For example, a 2005 study found that patients with antibiotic-resistant infections caused by salmonella bacteria are more likely to

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

suffer potentially deadly bloodstream infections than patients with non-resistant salmonella. The study notes that the resistance in the bacteria results chiefly from the use of antibiotics in food animals.

It may be hard to believe, but in the United States, livestock consume eight times more antibiotics by volume than humans do. Antimicrobial drugs have been given routinely to animals in their feed and water since the 1950s. For reasons scientists can't fully explain, these low levels of antimicrobial drugs allow animals to gain weight faster on less feed.

Many of these antibiotics are very similar to, or the same as, those used to fight human disease, including penicillin, tetracycline, and erythromycin, as well as a number of other drugs that I can't pronounce. But while people usually need a doctor's prescription for antibiotics to treat a specific ailment, in agriculture the drugs are typically used in the absence of disease. Owners of factory farms are allowed to dose entire flocks or herds to promote increased growth or to prevent diseases that might result when too many animals are housed in a poorly-ventilated, enclosed area. The animals then excrete the antimicrobials in their waste, and when people eat meat, they get an unexpected dose of drugs.

Because of the importance of antimicrobials in human medicine, the European Union has prohibited all growth-promoting uses of antibiotics in animals since 1998. And according to the World Health Organization, the indiscriminate use of antibiotics in agriculture poses a significant health threat.

Now I would like to switch gears a little bit and talk about why transporting food also helps spread disease. Because meat is a globalized product, with meat and live cattle being shipped across borders and across oceans, diseases like avian flu, mad cow disease, foot-and-mouth disease and food-borne illnesses can become global phenomena. We experienced that in the U.S. recently with the spread of E. coli in bagged spinach. At least one person has died and about 100 people have gotten sick from eating bagged spinach contaminated with pathogenic E. coli, which likely came from cattle manure. All of that spinach was grown in California and then shipped all over the country, potentially infecting hundreds of people.

The U.S. Department of Agriculture and the Department of Homeland Security also recently ran war games to examine how the United States would respond to an act of agro-terrorism. That is, how the nation would respond if someone decided to introduce foot-and-mouth disease onto a western cattle ranch or drop some corn fungus spores over a Midwestern corn farm or dump pathogenic E.coli into the mixer at a food processing plant. When the simulation was over, the military and agriculture officials running it concluded that long-distance shipping was one of the most serious Achilles heels of our food system, and created countless opportunities for unfortunate contamination.

More than 44 million cattle, pigs, and sheep are traded across the world each year. And millions more are transported over long distances by road and rail within countries. In the U.S. more than 50 million animals are transported between states each year. The reasons for this animal travel vary. Although it can cost up to four times as much to transport live animals as to transport meat, businesses can get a premium price for animals that are described as home killed or home produced.

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

Animals are also transported from nation to nation to fatten them up. Here in the Netherlands, strict anti-pollution laws mean that some of the millions of piglets born here each year have to be transported to other countries to be fattened.

The recent outbreaks of avian flu in India and Nigeria have been linked to the poultry trade. The first case of avian flu in India was discovered in a factory farm near the small town of Navapur. Navapur is a small town and fairly isolated and while Indian officials initially tried to blame the outbreak on wild birds and small poultry farms, it's likely the infected chickens came from one of India's biggest suppliers of poultry and poultry products.

In Nigeria, the nation's first cases of avian flu were found not in anyone's backyard, but in one of the nation's industrial broiler operations. The virus spread from that 40,000 bird farm to 30 other factory farms in the country thanks to transporting chickens and eggs. And the disease didn't stay in the factory farms for long, however. It quickly spread to neighboring backyard flocks, forcing poor farmers to kill their chickens.

This transport of animals also appears to explain some of the food scares that have happened in Britain. The 2001 foot-and-mouth outbreak, which brought sales of British meat to a halt and devastated rural communities, was exacerbated by long-distance food transportation. It spread much farther and faster than an earlier outbreak in 1967, largely because animals today are shipped from all over the nation to central slaughterhouses. In 1967 most slaughtering and consumption took place locally. If foot and mouth disease were introduced to the U.S. today, it could spread to more than 25 states in a matter of days because of the concentration of the American food system.

Transporting animals can also lead to other, more common foodborne diseases, such as E. coli and Salmonella. A 2002 study found that transporting beef cattle from feedyards to slaughterhouses and packing plants increases the prevalence of salmonella on hides and in feces, which can later end up in food.

And it's not just animals that are being transported around the world, increasing the threat for contamination and terrorism. We're also shipping millions of tons of meat, eggs, and milk long distances. A June 2005 report in the *Proceedings of the National Academy of Sciences* notes that just a third of an ounce of botulism poured by bioterrorists into a dairy tanker truck could cause hundreds of thousands of deaths and billions of dollars in economic losses in the U.S. alone. Because the milk from multiple farms is consolidated in tankers, the toxin could be widely distributed and consumed within days by more than 500,000 people.

What we feed animals in factory farms can also literally come to bite us. Let's look at what goes into producing meat and other animal products.

One of the biggest and fastest growing inputs is grain, primarily cheap corn and soybeans, now used as feed in livestock operations around the world. In the United States, 70 percent of the corn harvest is fed to livestock. And worldwide, nearly 80 percent of all soybeans are used for animal feed.

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

Why are today's livestock fed so much grain? The answer is simple: it makes them gain weight, fast. Steers used to live at least 4–5 years before being slaughtered. Today, beef calves can grow from 36 kilograms to 544 kilograms in just 14 months on a diet of corn, soybeans, antibiotics, and hormones.

But eating corn is not natural for cows. They're ruminants, meaning they digest grasses and crop residues easily. Their standard feedlot ration, in contrast, is a mixture of high-protein corn, soybeans, and other ingredients that are much harder to stomach.

And, this grain-fed product has hidden costs for both animals and people.

First, cows tend to suffer from bloating, acidosis, liver abscesses, gas, and other symptoms of this rich diet. In fact, when they're eating grass calves don't need any medication or antimicrobial drugs, but as soon as they begin a grain diet, they start to get sick. The shift so disturbs the animal's digestive system that it can die if this transition is not carefully managed.

Meanwhile, the standard diet in factory farms has been linked to the spread of food-borne pathogens, such as *Escherichia coli* 0157:H7 (*E. coli*), which can contaminate meat or even vegetables, as in the recent spinach case, if the raw manure is used as fertilizer. Whereas a grass diet eliminates this harmful microbe, the grain diet encourages its growth in a cow's stomach.

Studies also show that grass fed meat is higher in Omega 3 fatty acids. Those are the so-called good fats, which are good for us and help to protect our bodies from heart disease and cancer. Grain fed meat, on the other hand is higher in Omega 6 fatty acids, the bad fats, which increase cholesterol, heart disease, cancer, and other problems.

But livestock aren't just eating more grain; they're also eating each other. Although regulations to prevent mad cow disease in the United Kingdom prohibit feeding meat and bone meal to cattle, livestock elsewhere are still being fed the ground-up bits and pieces of other animals. In the United States, for example, it is still legal to feed cattle beef tallow, cattle cow's blood, chicken, chicken manure, feather meal, pigs, and even sawdust. And scientists fear that the practice of feeding chicken manure to other animals can help spread avian flu. The European Union has banned feeding pigs, chickens, and cattle feed containing any animal protein.

Now, I'd like to talk a little about some of the other resources necessary for meat production. Industrial livestock production can use a lot of natural resources. Drop for drop, animal production is one the biggest consumers of water worldwide. Producing just 0.2 kilograms (8 ounces) of beef can use 25,000 liters of water.

And we're seeing that as more developing countries adopt factory farming methods, the demand on world water supplies is also increasing. Researchers with the United Nations Environment Programme have found that if demand for meat is directed toward grain-fed or feedlot beef production, the additional water requirements would be on the order of 1,500 cubic kilometers, which is equivalent to the annual flow of India's Ganges River. On the other hand, if preferences were for pasture- or grass-raised chickens, pigs, and cattle, water demand would be less drastic.

Oil, too, has become necessary ingredient of modern meat production. Each stage of production, from growing feed to transporting and processing animals, is highly energy intensive. Producing one calorie of beef takes 33 percent more fossil fuel energy than producing a calorie of potatoes. Factory farms themselves require huge amounts of energy for heating, cooling, and lighting.

The waste produced by our industrial food system can also undermine public health. Manure and what to do with it is one of the biggest and most obvious problems that results from factory farming. It's almost impossible to fathom the amount of waste produced by livestock on these farms, but let me give you some numbers. In the United States, livestock produce more than 600 million tons of waste annually on factory farms alone. Each steer living in a factory farm can produce 75 pounds of manure a day, turning feedlots literally into seas of manure. These sort of conditions are reminiscent of medieval times, leading some experts to warn that even though we're living in the 21<sup>st</sup> Century, our food started out in the 1600s.

The logistics of managing mountains and mountains of waste are formidable. Large livestock production facilities often tell people that they're doing the environment a service because they produce valuable fertilizer for crops. But because of the massive amounts of waste produced on these farms, the manure goes from being a valuable agricultural resource to toxic waste. Factory farms require huge amounts of "spreadable acreage," that's the cropland on nearby farms where manure can be spread, sprayed, or injected. But finding enough acreage is a difficult task; a 20,000-animal operation would need about 30,000 spreadable hectares. But, given the size of most factory farms, this ideal is rarely attained. Either too much manure is spread on the fields, contributing more nitrogen than the crops can handle, or worse, it is spread at the wrong time, when a crop cannot effectively take up the nutrients. Only about half of all livestock waste produced in the world is effectively fed into the crop cycle. Much of the remainder ends up polluting the air, water, and soil itself.

But as anyone who lives near a factory farm can tell you, water contamination is hardly the most noticeable environmental effect. If raw manure is exposed to the air, a large percentage of the nitrogen in it can escape as gaseous ammonia resulting in a smell that's difficult to forget. Scientists suspect that exposure to manure can also lead to public health problems including depression, anxiety, and fatigue.

Storing manure can also be a problem. In the U.S. hog lagoons, the pits where they store manure from pig farms, often overflow making them like agricultural Chernobyls. The most infamous case occurred in 1995 in North Carolina, when flooded pig and poultry farms flooded nearby rivers and caused massive fish kills.

North Carolina is a perfect example of what can happen when hog production increases too quickly. In 1987, the state produced a mere 2.6 million hogs per year. Today, it produces 10 million, which is more than the number of state residents, generating some 19 million tons of pig waste annually.

Chicken manure can also pollute water, leading to outbreaks of *pfisteria*, toxic algae that can kill fish and sicken people. And as I mentioned before, manure can also contain antibiotics, hormones, and heavy metals. According to a recent study, 25–75 percent of the antimicrobials given to livestock may pass through undigested,

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

resulting in traces of these drugs as well as antibiotic-resistant bacteria in the animals' waste.

The final set of problems I would like to touch upon this evening are the toll factory farming and the problems they create take on people. There is a very human face to this story that we don't often hear about.

It's very easy for most of us to forget how meat is really made. Those neatly wrapped packages at the supermarket give little indication of how the animals that end up on our tables, or the people who raised and butchered them, were treated. The labels on the front don't show the filth, the smell, the pollution or any of the other problems with factory farming.

So, let's talk about what it's like to be a worker in a factory farm, slaughterhouse, or meat processing plant.

Because margins in the industry are so narrow, producers try to squeeze out profit wherever they can. They speed up slaughtering and cutting lines and often fail to provide the proper equipment. They force their employees to work in filthy, cold, and slippery environments and require them to put in long days, sometimes more than 12 hours at a time. All of these conditions make meatpacking one of the most dangerous jobs in America. Every year, one in three meatpacking workers suffers an injury on the job. But because many of these workers are undocumented immigrants or struggle at the very bottom of the economic ladder, many don't report their injuries, making the actual number far higher.

And these same abuses aren't confined to the U.S. When I was in the Philippines a few years ago, I visited the largest government owned slaughterhouse in the country. There, workers stun, bludgeon, and slaughter animals extremely fast. The men I met weren't wearing any protective gear, as slid around on bloody floors. Those same floors made it hard to stun animals on the first or even second try or to butcher meat without injuring themselves. They were obviously pretty poorly trained about how to humanely stun and slaughter animals and the slaughterhouse didn't have enough money to buy the workers stun guns that would have helped kill animals more quickly and with less pain and also decrease worker injury rates. And these on-the-job injuries and illnesses are especially devastating in developing countries because most workers lack insurance or workers' compensation benefits.

There are also a number of other unintended consequences from avian flu that will threaten public health and livelihoods.

Since the avian flu outbreak began, farmers have been forced to cull—or kill—hundreds of thousands of birds, threatening not only their incomes, but their families' food security as well. I don't know how many of you remember, but here in the Netherlands in 2003, an outbreak of the H7N7 form of avian flu forced producers to cull one-third of the nation's chickens, which was some 30 million birds. And as you also, may know, the Netherlands is the second largest poultry producer in Europe and that outbreak cost producers millions of dollars in damage. In August, H7N7 was found at a farm here and more than 25,000 birds were killed. Now the government is ordering all poultry indoors to help stop the spread of the disease.

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

And such restrictions are also being made in places like Egypt and Cambodia, forcing small producers out of business and eliminating an important source of nutrition for millions of people. For people in the developing, chickens are like a walking credit cards. They can be sold when children need school uniforms or slaughtered when food is scarce. So these new restrictions will have longlasting effects on nutrition and health.

And let's not forget that almost 200 people have died from avian flu and there are likely countless other deaths that have gone unreported.

So I've spent a lot of this evening explaining some of the ways factory farms are unhealthy and inefficient ways to produce food and why the problems that originate from them are anything but natural disasters. But, now I would like to talk about some solutions.

First, let's consider some of the solutions being offered by the meat and livestock industries. One idea to control pollution is called Enviro-pigs. These are pigs that have been genetically engineered using mice chromosomes and type of bacteria to produce less-noxious manure. As a result, say researchers, this fertilizer is "better suited" for agricultural applications because it will be less polluting.

Other research is being done to clone livestock for human consumption, which its' proponents insist is safe to eat. Work is also being done to culture meat from animals cells in laboratories—which ironically, PETA and some other animal welfare and animal rights organizations endorse because they feel it will lead to less suffering for livestock. The researchers working on this in vitro meat claim it will be less polluting, more humane, and healthier. And in the U.S., the FDA has approved the idea of spraying viruses on cold cuts to prevent listeria and salmonella.

But while these examples are certainly very creative, I don't think they really address the problem of industrial meat production.

For meat production to be safer, healthier and more environmentally friendly we need a fundamental shift in our attitudes about the place of meat in our diets and the economic price we are willing to pay for safe, disease free food that sustains the environment and that treats both workers and animals humanely.

Change in the food system needs to come from 3 fronts—Agribusiness and farmers, policy makers, and, of course, you and me and everyone else in this room, consumers. Agribusiness needs to change its practices and redefine its bottom line, while at the same time consumers need to change their eating habits and push businesses to make the change.

Let me say that I am not here to advocate any sort of vegetarian or vegan utopia. I think livestock are an essential part of agriculture all over the world. The problem is that the modern factory farm cannot be considered agriculture. In terms of scale, the amount of pollution and health hazards they create, confined animal feeding operations are clearly industries.

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

According to agricultural economist William Weida, factory farms are allowed to get away with a variety of economic and ecological crimes because they can call themselves farms.

For instance, factory farms claim that economies of scale allow them to have certain efficiencies from standardization, specialization and concentration of productive resources that small and medium-sized farms can't do.

These factory operations lead consumers to believe that the average cost of producing a pound of meat will drop as factory farms become larger. The reality, however, is that factory farms only confine animals in less space, they do nothing to reduce the amount of land needed to raise feed for the animals and they do nothing to reduce the amount of land ultimately needed to recycle the animal waste.

Costs stop declining as factory farms get larger because the cost of waste disposal for farms increases sharply after one surpasses the ability of the land to absorb the waste. Factory farms try to avoid paying their increasing costs by shifting them to the surrounding region. While the farm may be successful in doing this, the confined operation is still less efficient in an economic sense. So bigger doesn't necessarily mean better. And recent studies by the International Food Policy Research Institute suggest that small livestock farms may be more efficient than large production operations at generating profits per unit of output.

Factory farms need to be held accountable for their actions. Instituting strict fines and management procedures will help ensure that farms are safer for the environment and workers. The Netherlands provides one of the most successful examples of regulating the manure from farms and preventing pollution problems. This type of example can be repeated and replicated for other problems in the industry as well.

However, governments, particularly in Europe and the United States, need to be aware that stricter environmental regulations here can create problems elsewhere in the world. One interesting example is how some Dutch and German farmers are relocating and building factory farms in Ohio, Michigan, Wisconsin, and other states in the American Midwest to avoid strict pollution laws in their own countries.

In 2001, five Dutch-owned dairies were cited by the Ohio Environmental Protection Agency for manure spills, and all 44 Dutch-owned dairies in the U.S. have violated air and water pollution regulations. Such "takeovers" are likely to continue both in the U.S. and all over the world. Until there are international regulations controlling the waste from factory farms it is impossible to prevent farms from moving to places with less regulation.

As I mentioned before, factory farms are only efficient because they don't have to pay the true cost of their inputs—for example, subsidized cheap corn and soybeans to fatten cattle. And they don't have to pay for the costs of their outputs, including the spread of disease and pollution. Holding these farms accountable for their actions will be the first step in making them truly more efficient.

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

So how can we make factory farming better? Some corporations and governments, , are all ready taking steps to make factory farming a less polluting, more humane endeavor.

In the state of North Carolina in the United States, two environmental organizations, the Natural Resources Defense Council and Environmental Defense have forged what some might see as an unlikely alliance with large pig producers. They are helping these large farms find funding to develop new systems for waste treatment that help turn waste into energy and minimize the pollution and health problems that result from traditional disposal methods, such as storing waste in lagoons that I mentioned a earlier.

In Thailand, the government has put high taxes on large-scale poultry production within Bangkok to help prevent pollution problems and the spread of disease. As a result, the concentration of poultry farms right outside Bangkok has dropped significantly over the past decade.

Factory farms also need to find ways to limit the amount of antibiotics and other drugs they use in their facilities. Food service giant Compass Group North America partnered with pork producer Smithfield Foods and an environmental group to develop a first-of-its-kind purchasing policy to curb antibiotic use in pork production. The policy prohibits Compass's U.S. operations from buying pork from suppliers who use growth-promoting antibiotics that belong to classes of drugs important for human medicine. It also requires suppliers to report and reduce their antibiotic use.

Limiting antibiotic use can also save these farms money. A voluntary ban by Danish farmers on such drugs in the 1990s cut costs by dramatically decreasing the prevalence of resistant bacteria. Prevalence of resistant bacteria in pigs dropped from 65 percent to 25 percent. Through health monitoring programs, producers have also reduced the spread of *salmonella* from livestock to humans without resorting to antibiotics, saving the country \$25.5 million in 2001.

Factory farms also need to be more humane. In the U.S., livestock specialist Temple Grandin is helping McDonald's and other fast food companies who get their meat from factory farms make their suppliers treat animals more humanely. Grandin designs slaughterhouses that limit stress on animals. Don't get me wrong, these companies are not doing this just because decreasing animal stress for the animals, but it also improves the quality of meat and limits losses due to damage carcasses and hides.

Governments and policymakers should also be pushing for more regionalized food systems. Eating local and regional meat and other animal products is one of the first and increasingly popular methods of knowing where our food comes from. And it's something, that in the United States, even pleases the Department of Homeland Security: less long-distance transportation of animals and meat, milk, and dairy makes the nation less vulnerable to oil shortages, transportation problems, and large-scale food contamination—accidental or otherwise. During the E. coli outbreak in spinach in the U.S. the United States Food and Drug Administration advised consumers to know where their food comes from by buying local to avoid risk of infection. Small and large producers alike will also benefit from reintroducing diversity into their herds and flocks, creating a barrier against disease and terrorism.

*Cross-thinking about Sustainability: Rethinking the Global Meat Industry*  
*By Danielle Nierenberg (Worldwatch Institute)*  
*Transcript of the lecture*

---

Reversing the trends I talked about tonight will also require action by consumers. We need to reconsider the place of meat in our diets. And while consumers in the developing world may need to increase their consumption of animal products to prevent malnutrition, consumers like you and me could stand to limit our meat consumption. Consumers have the opportunity to vote with their forks and demand better types of food. This will force producers to adopt different standards and methods of production.

For example, demand for grass-fed beef has led to a dramatic increase in the number of farmers raising cattle on pasture. In 2002, there were only about 50 farms raising grass-fed beef and now there are over 1,000. Eating grass fed meat, milk, and eggs can also limit the risk of contracting foodborne diseases and it gives consumers a chance to put a face to their food.

Finally, let me just say that improving factory farms and moving to more local production is not just about keeping factory farms safe from disease outbreaks or limiting pollution. It's about changing our whole view of what animal agriculture could look like. From a systems point of view, factory farming is similar to other large environmentally destructive enterprises, such as fossil fuel extraction or timber clearcutting. Subsidies for these practices, as for industrial agriculture, allow them to profit without accounting for their full environmental and public health costs. The real challenge and the real reward for all of us, businesses and consumers alike, will come from approaching the way we raise food in a different way.

Let's stop thinking of farming systems as just a source of economic wealth. Because when you really think about it preserving prosperous family farms and their landscapes and raising healthy and humanely-treated animals are their own form of affluence.