

NEWS

Could Less Meat Mean More Food?

HERE'S A SIMPLE IDEA YOU MAY HAVE HEARD FOR IMPROVING FOOD security: Eat less meat.

The logic—articulated by groups that include the Vegetarian Society of the United Kingdom and the United Nations Environment Programme—goes like this. From chicken cordon bleu to bacon double cheeseburgers, people in the developed world eat a huge amount of animal protein. And consumption of meat, eggs, and milk is already growing globally as people in poorer nations get richer and shift their diets. That's a problem because animals are eating a growing share of the world's grain harvests—and already directly or indirectly utilize up to 80% of the world's agricultural land. Yet they supply just 15% of all calories. So, the argument goes, if we just ate less meat, we could free up a lot of plants to feed billions of hungry people and gain a lot of good farmland.

Some food-security researchers, however, are skeptical. Although cutting back on meat has many potential benefits, they say the complexities of global markets and human food traditions could also produce some counterintuitive—and possibly counterproductive—results. “It's not this panacea that people have put forward,” says Mark Rosegrant of the International Food Policy Research Institute (IFPRI) in Washington, D.C. One provocative forecast: If people in industrialized nations gave up half their meat, more Asian children could become malnourished.

Protein-rich

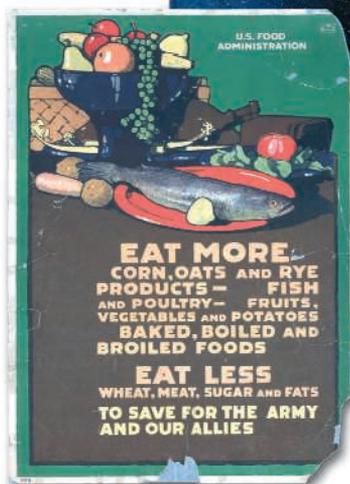
Scholars on all sides of the meaty issue agree on one thing: Just as the rich use more energy than the poor, they also eat more meat. The United States, for instance, has just 4.5% of the world's population but accounts for about 15% of global meat consumption. Americans consume about 330 grams of meat a day on average—the equivalent of three quarter-pound hamburgers. In contrast, the U.S. Department of Agriculture recommends that most people consume just 142 to 184 grams of meat and beans daily. In the developing world, daily meat consumption averages just 80 grams.

Those numbers suggest that people living in the United States and other wealthy nations could increase world grain supplies simply by forgoing that extra burger or chop. But it's not that simple. Figuring out the full impact of meat consumption on global food security requires sophisticated computer models that can track how buying decisions ripple out across farming systems, global supply chains, and food markets.

One of those models is called IMPACT, and in 1998 IFPRI's Rosegrant and colleagues used it to study what might happen in 2020 if rich nations cut their per capita demand for meat to half of what it was in 1993. First, the simulation found that as demand for meat fell, prices declined and meat became more affordable worldwide. As a result, in the developing world, per capita meat consumption actually *increased* by 13% as poorer consumers could buy more. That's good news for what could be called “meat equity,” because increasing animal-protein consumption among the very



Grassroots. Livestock consume grain and resources that could be used to feed people. War rationing has inspired efforts to persuade people to eat less meat.



poor can provide substantial nutritional benefits, particularly for children.

Surprisingly, however, when the rich halved their meat habit, the poor didn't necessarily get that much more grain—their largest source of calories. According to the model, per capita cereal consumption in developing nations rose by just 1.5%. That's enough grain to ease hunger for 3.6 million malnourished children—but nowhere near the kinds of gains many expect from curbing meat consumption.

One big reason is the mismatch between human and animal diets. In rich countries, farmers usually feed their livestock corn or soybeans. When the farmers produce less meat, demand for corn and soy drops and the grains become more affordable. That's good for people in the parts of Africa and Latin America where corn is a dietary staple. But people in many developing countries, particularly in Asia, don't eat much corn; they eat rice and wheat. So falling corn and soy prices don't directly help them. (It's true that as demand for corn drops, some farmers might start growing wheat instead. In general, however, climate, soil, or water availability often limit a farmer's ability to switch crops easily. Iowa soybean growers, for instance, can't start growing rice, which requires heavy irrigation.)

Eating less meat could even backfire and make food insecurity worse, suggested the simulation, which was published in the *Proceedings of the Nutrition Society*. For instance, when consumers in developed countries replaced meat with pasta and bread, world wheat prices rose. That actually increased malnutrition slightly in developing countries such as India that rely on wheat. “It's a big deal when wheat prices go up,” Rosegrant says.

When all the pluses and minuses are added up, Rosegrant is confident that cutting meat consumption could ultimately help improve global food security. But “it's a small contribution, like changing to fluorescent light bulbs” to fight global warming, he says.

Changing appetites

Given the world's voracious and growing appetite for animal products, however, how could people be persuaded to eat less? One approach, scholars say, is to raise the price to reduce demand. If meat prices reflected the true ecological and climate costs of raising farm animals, for instance, many people would buy less, suggests Lester Brown of the Earth Policy Institute in Washington, D.C. He'd like to see taxes that are tied to meat's carbon footprint. Beef might get higher taxes than chicken or catfish, he says, predicting that such levies "would free up grain for those further down the food chain."

A similar approach calls for removing subsidies—both obvious and hidden—for meat producers. Beef exporter Brazil, for instance, indirectly subsidizes meat consumption by not charging consumers for the tropical forests destroyed by ranching, argues Sjur Kasa, a sociologist at the University of Oslo. Ending subsidies would be "the most powerful tool for curbing meat consumption," Kasa says, but it would be "a very difficult battle." So far, however, the battle hasn't been joined. "There are really no big victories when it comes to making people eat less meat for sustainability reasons," he says.

Campaigns directed at consumers, emphasizing the health benefits of reducing calories and animal fats, could prove a winner, says Danielle Nierenberg of the Worldwatch Institute in Washington, D.C. She notes that concerns about health care costs and a greater focus on preventing disease have helped spur a number of innovative efforts. In 2003, for instance, the Johns Hopkins Bloomberg School of Public Health started "Meatless Mondays," an initiative to reduce U.S. meat consumption by 15%. The organizers were inspired in part by government campaigns during World War I and II to ration meat for troops. In May 2009, the city council of Ghent, Belgium, proclaimed that its citizens should avoid eating meat on Thursdays. And last fall, Baltimore became the first city to serve only vegetarian meals 1 day a week in public schools.

So far, it's hard to know if these small-scale efforts have had any significant impact. And Rosegrant has an overarching concern: "What worries me is that people will think that's all we need to do." To truly ensure global food security, he says we'll also need much greater investment in agricultural research to boost yields and more economic development that increases incomes in poorer nations. "We have to go beyond personal responsibility," he says, "to policy action."

—ERIK STOKSTAD

NEWS

For More Protein, Filet of Cricket

COULD AN AFRICAN CATERPILLAR BE THE NEW BEEFSTEAK?

As the world diverts more of its grain harvests into producing meat, some scientists are pushing policymakers to take a closer look at insects as an environmentally friendlier source of protein. Whereas a cow needs to eat roughly 8 grams of food to gain a gram in weight, for instance, insects need less than two. "If you are going to feed 9 billion people, we cannot ignore the efficiency of insects as protein producers," says Paul Vantomme, senior forestry officer at the United Nations Food and Agriculture Organization (FAO) in Rome.

Consider, for instance, the mopane worm. These caterpillars of the emperor moth feed on the leaves of mopane (mo-PAN-ee) trees, which emerge in southern Africa's summer, a time when other staples can be in short supply. Dried, stewed, smoked, or fried, the insects are

a popular delicacy. And they are just one of hundreds of insect species that play an important role in the diets of millions of people.

"Nutritionally, it is excellent food," says Arnold van Huis, an entomologist at Wageningen University in the Netherlands. "It's the same or even better than conventional meat, fish, or poultry." Just 100 grams of caterpillars can provide all of an adult's recommended daily protein, along with iron, B vitamins, and other essential nutrients, he says.

Such eye-opening statistics have prompted FAO to develop new policy guidelines—expected later this year—that will encourage countries to include insects in their food-security plans. Vantomme hopes the guidelines will lead to more constructive discussions about managing insects. Currently, he says, "some [advisers] get their insecticides ready, and others get their chopsticks."

Currently, most edible insects are collected in the wild. In Mexico, for instance, farmers collect *chapulines* (young grasshoppers) from their maize and alfalfa fields, where they would otherwise do damage. FAO, however, is taking a closer look at experimental insect breeding to see whether it can be both ecologically and economically sustainable. Researchers are also studying whether they could use insect protein in livestock feed or even as a food additive.

A scattering of enthusiasts think that entomophagy—the technical term for eating insects—could even catch on among Europeans and North Americans. In the Netherlands, a company called Bugs Organic Food markets mealworms and grasshoppers through two dozen outlets. The effort has had some success—even "the minister of agriculture held a grasshopper" at a press conference, van Huis says. She didn't eat the hopper but did approve subsidies for Bugs Organic Food to further develop their products.

—GRETCHEN VOGEL



Crunchy delight.
Grasshoppers known as *chapulines* in a Mexican market.

CREDIT: KRISTEN KASTNER