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Fuel or food?; In the competition for corn, ethanol producers may be gaining ground at the expense of the world's hungry.

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Full fuel tanks could mean many more empty bellies within the next two decades, according to new research by two University of Minnesota economists.

The number of hungry people worldwide could grow by more than 50 percent by 2020, as corn, sugar and other food staples are increasingly devoted to making fuel here and abroad, according to the projections by C. Ford Runge and Benjamin Senauer.

The same trend would bring much higher food prices to the United States and the rest of the developed world, the economists predict. The sharp increase in world hunger isn't inevitable, however. The economists say increased conservation could do more to wean the United States from foreign oil than all the corn-based **ethanol** plants now online.

Corn and **ethanol** producers dispute the claims.

"Based on the numbers and the amount of **ethanol** we're producing, there's not a negative implication for corn destined for the rest of the world," said Jeffrey Zeiger, executive director of the Alternative Fuels Institute, a nonprofit group based in Watertown, S.D.

However, pork, poultry and egg producers are beginning to sound alarms of their own about **ethanol**'s impact on food prices.

Some aspects of the scenario laid out by Runge and Senauer already are coming to pass. This winter's imposition of tortilla price controls in Mexico in an attempt to quell unrest is an early indication of the consequences of food price shocks, the two write.

"These impacts are [already] being felt right at America's doorstep - in Mexico."

Runge and Senauer's forecast stands in contrast to their views of only four years ago and shows how quickly the mathematics of food production are being changed by the worldwide push for biofuels.

In 2003, Runge and Senauer forecast that the rise of both agricultural output and Third World incomes would ease world hunger. They expected the number of hungry people in the world to fall 23 percent, from 830 million at the end of the 20th century to about 625 million in 2025. They now believe the ranks of the world's hungry will rise to 1.27 billion people by 2020.

"But if staple food prices increase [as is now expected]," the economists warn, "the number of undernourished people could climb by 600 million or more by 2020. Many would be over the edge of subsistence into outright starvation," their paper warns. "Many more would die from a multitude of diseases."

Attracting attention

Ethanol plants are on pace to consume more than 35 percent of the U.S. corn crop within a few years, and their growth rate has attracted the notice of food producers who rely on corn in the production of everything from cereals to butter and meat.

Richard Bond, president and CEO of chicken producer Tyson Foods, said last week that the country must "carefully consider the negative and unintended consequences of over-using grains" for fuel.

"Companies will be forced to pass along rising costs to their customers, meaning consumers will pay significantly more for food," Bond said. "If left unaddressed, the bigger long-term issue will be the availability of U.S. and global grain for protein and other foods."

In a speech last year, Warren Staley, CEO of Cargill, the Minnetonka-based commodities trading firm that also has invested millions in **ethanol** plants, said fuel shouldn't displace food as the primary reason for growing crops.

"We have to look at the hierarchy of value for agricultural land use: Food first, then feed and last fuel," Staley said. "Today we are providing subsidies to fuel uses while often erecting barriers to new food and feed technologies."

Zeiger of the Alternative Fuels Institute rejects the argument that hunger will rise worldwide as the use of biofuels increases.

U.S. food prices are bound to rise in the short term as millions of tons of corn are diverted to new **ethanol** plants. But new technologies for producing **ethanol** from other crops or grasses will ease the need for corn, Zeiger said.

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High-priced tortillas

Mark Hamerlink, a spokesman for the Minnesota Corn Growers Association, pointed out that corn prices rise and fall in cycles and that Mexican tortilla prices didn't rise five-fold, as they have in recent months, when U.S. corn prices spiked to \$4.66 a bushel in the mid-1990s.

"There's some faulty logic on what may be going on south of the border," he said.

Hamerlink blames the soaring tortilla prices on corn speculators in Mexico. Runge and Senauer counter that Mexico was far less dependent on U.S. corn a decade ago. The NAFTA treaty opened the U.S.-Mexican border to increased trade, making the two countries' grain markets, and grain prices, much more interlinked.

Senauer, co-director of the U's Food Industry Center, said Mexican speculators have aggravated rising food prices but are not the source of the phenomenon.

"Certainly, one reason for the increased price of tortillas is that Mexico imports much of its corn from the U.S.," Senauer said. "As prices of the commodity have soared, so has the cost of tortillas, prompting the Mexican government to impose price controls on the staple food in the face of hoarding and speculation."

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16 million hungry

By the two economists' reckoning, every 1 percent rise in the price of staple foods translates into another 16 million people worldwide going hungry. And they forecast that the prices of many grain staples will rise by 11 to 40 percent just by 2010, with steeper increases coming afterward.

Of course, growers can plant more corn, but often at the expense of other crops.

For instance, Runge and Senauer note estimates by U economist Verne Eidman, who projects a decrease of 3.3 million U.S. acres planted in soybeans by 2010-2011.

"At the same time ... [soybean's] myriad food processing uses are projected to increase in price by 27 percent," Runge and Senauer write. "Meanwhile, the price of soybean meal used to feed livestock will increase 8 percent, while the farm price of soybeans increases only 4 percent.

"This illustrates an important aspect of 'downstream' price impacts of biofuels: They have the effect of cracking the whip on the prices of products for which corn and soybeans are used," the authors said.

While the topic is complex, the pair used simple arithmetic and numbers derived from many well-recognized sources - from the World Bank and United Nations to the Department of Agriculture - to peer into what might be ahead in the competition of food and fuel for crops.

Spurred by high oil prices and large government subsidies, **ethanol** production has been growing fast, with 110 U.S. **ethanol** refineries running at the start of 2007. From September 2005 through August 2006, the USDA reported 1.6 billion bushels of corn went to U.S. **ethanol** plants, or 15 percent of the crop.

But 73 more plants are under construction, or an increase of two-thirds in less than two years when the new facilities come online by 2008. Feeding those plants will raise total **ethanol** demand, "requiring 35 percent of the total corn crop even in a good harvest," they write.

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107 percent more corn

And if corn-based **ethanol** delivered all of President Bush's call for 35 billion barrels of "alternative fuels" by 2017, reaching that goal would require 107 percent of the current corn crop, Runge calculates.

Meanwhile, 82 low-income countries already suffer "food deficits," by U.N. measures, even before the effects of food-to-fuel take hold.

While researchers are working on ways to make **ethanol** from switch grass and prairie grasses, breakthroughs might be years or decades away.

And Runge, director of the U's Center for International Food and Agricultural Policy, believes it will be a challenge to change course from an alternative fuel production system being built now to run largely on corn, given the array of subsidies that have been instituted to support **ethanol** plants.

"It's hard to find a politician anywhere who isn't doing cartwheels cheerleading for **ethanol**," Runge said.

Lester Brown, president of the Earth Policy Institute, a Washington-based think tank, said it might take a sustained rise in food prices to change policymakers' thinking.

"What we may see before too long is a consumer response, kind of a backlash against the **ethanol** industry," Brown said.

At a recent agricultural conference, Brown said, soybean growers, pork and poultry producers agreed that higher corn feed prices will inevitably leading to higher food prices.

"When you think of what's in your refrigerator, it's stuffed with corn products - the meat, the butter, the eggs, the ice cream" all depend on corn feed, Brown said. "There may be 100,000 corn growers in the country, but there are 300 million consumers."

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15%: Share of U.S. corn crop currently used to make **ethanol**

35%: Share of U.S. corn crop that would be needed to supply all the corn-based **ethanol** plants currently being built.

FOOD PRICES

Tighter supplies could mean higher prices as food crops are diverted for use as fuel. Some examples of commonly grown crops:

- .
CORN
+20% by 2010
+41% by 2020
- .
OILSEED
+26% by 2010
+76% by 2020
- .
WHEAT
+11% by 2010
+30% by 2020
- .
CASSAVA
+33% by 2010
+135% by 2020
- .

Estimates by U of M's C. Ford Runge and Benjamin Senauer
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