

# U.S. Corn Growers: Producing Food & Fuel

The ethanol industry in the United States is hitting its stride in response to America's need for a domestic, renewable source of transportation fuel. Corn use for ethanol tripled from 2001 to 2007. The U.S. Department of Agriculture estimated 4.0 billion bushels of corn will be made into ethanol in 2008/09. More than 160 biorefineries are in operation and dozens more are under construction.



**A**ccelerated growth in corn use for ethanol has led critics to question corn growers' ability to satisfy demand for both renewable fuels and traditional markets such as livestock and poultry feed, food processing and exports. Skeptics contend the corn industry will be unable to meet demand and that choices will need to be made about which corn customers will be supplied first. Others say competing uses for grains will drive corn prices—and, in turn, retail food prices—to abnormally high levels.

Those who say we must prioritize the demands on grain in a "food vs. fuel" scenario are not taking into account the dramatic advances in seed technology, improved agricultural efficiency, innovations in biofuels production and other breakthroughs that are allowing the American farmer to meet the world's need for food, feed, fuel and other uses.

The fundamental societal needs of energy, security and mobility are interconnected with the basic need of nourishment. If the U.S. agriculture sector has the technology and ingenuity to have a positive impact in all of these areas, shouldn't it aspire to do so?

Industries change and evolve in response to new technologies and new markets. Instead of relegating agriculture to its traditional role as a feed and food supplier, shouldn't we welcome the ability of American farmers to help our nation meet its energy challenges as well?

This paper examines the fallacy of stating we must choose between food and fuel—and provides accurate information and verifiable data to refute the "either-or" scenarios that are being touted by those who say we must make a choice between food or fuel. As they have done for decades, U.S. corn growers will continue to be reliable suppliers of both **food AND fuel.**



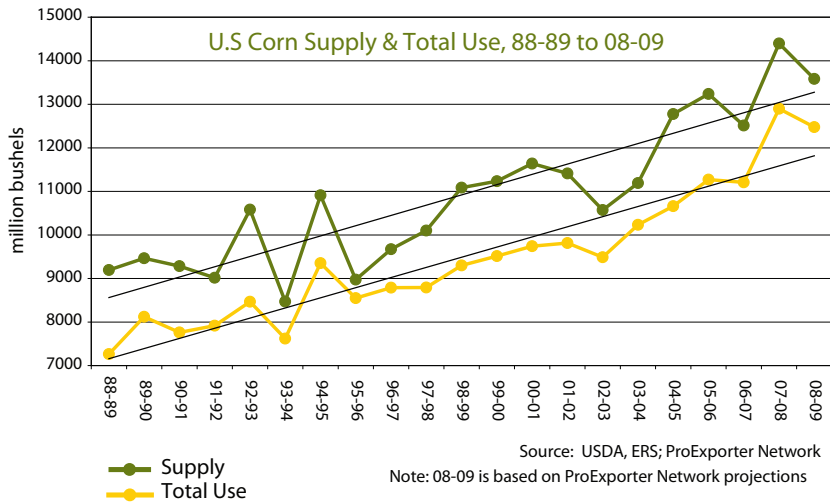


*“...as you look at the effect of molecular breeding, instead of getting that one bushel-per-acre rate of gain each year, you get two or three. As you look at the biotechnology traits, particularly drought and fertilizer efficiency, we think that it’s possible to see those national averages push 250 to 300 bushels per acre.”*

Robb Fraley, Monsanto vice president and chief technology officer<sup>1</sup>

*“The development of new technologies, combined with yield improvement, point to the opportunity to produce more food and more fuel—and not just in this country, but throughout the world.”*

Patricia Woertz, chairman and CEO of Archer Daniels Midland<sup>2</sup>



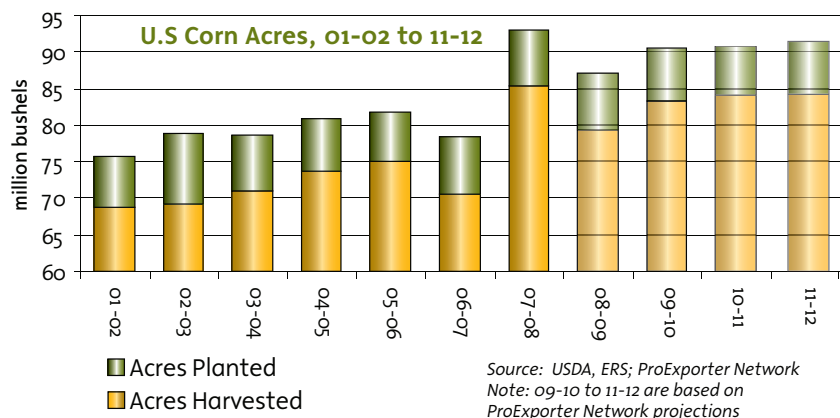
## Corn supplies keeping up with record demand.

Demand for corn is at an all-time high, due in large part to the rapid increase in corn-based ethanol production to meet our nation’s energy supply and security challenges. Often overlooked is the fact that corn supply is keeping adequate pace with demand.

In response to increased demand, U.S. growers have produced the five largest corn crops in history over the past five years—with the 2007/08 crop supply at an all-time record of 14.4 billion bushels. Annual production averaged 11.3 billion bushels from 2003/04 to 2007/08, compared with an average of 9.5 billion bushels in the previous five crop years. Corn growers plant acres in response to signals from the marketplace. If demand for corn is high and projected revenue-per-acre is strong relative to other crops, farmers will plant more corn.

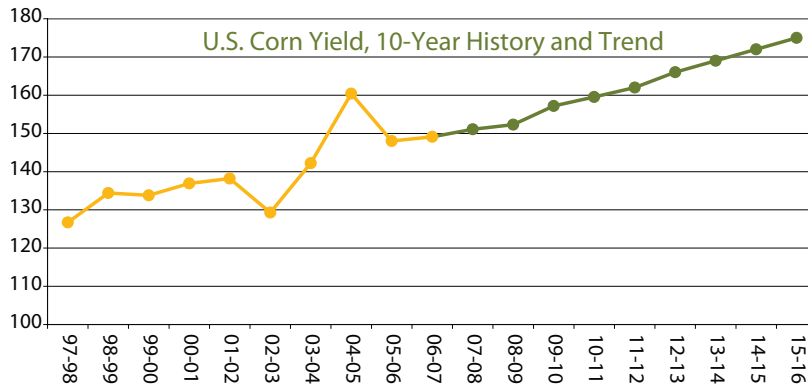
That is exactly what is happening. In 2007, farmers planted 93.6 million acres to corn, a 19 percent increase over 2006 and the highest level since 1944. In 2008, farmers planted 87 million acres to corn—which reflects decisions based on the rise in prices of other commodities. However, increased yields per acre and the corn stocks from the previous year will help meet the demand for corn.

Even with the weather challenges posed for the 2008/09 corn crop, USDA reports higher-than-expected corn acres planted with more than a 12 billion bushel harvest. Data from ProExporter Network estimates corn stocks over one billion bushels in 2008/09 in light of increased demand. There is no shortage of corn in terms of total supply and demand.



Increasing yield per acre will ensure an adequate supply of corn for all markets in the future. On average, corn yields have increased by about three bushels per acre per year since the 1995-96 crop year. Based on the 10-

year historical trend, average corn yield could reach 175 bushels per acre by 2015/16. Corn yields could advance at an even faster rate with improved corn genetics, biotechnology and management practices.

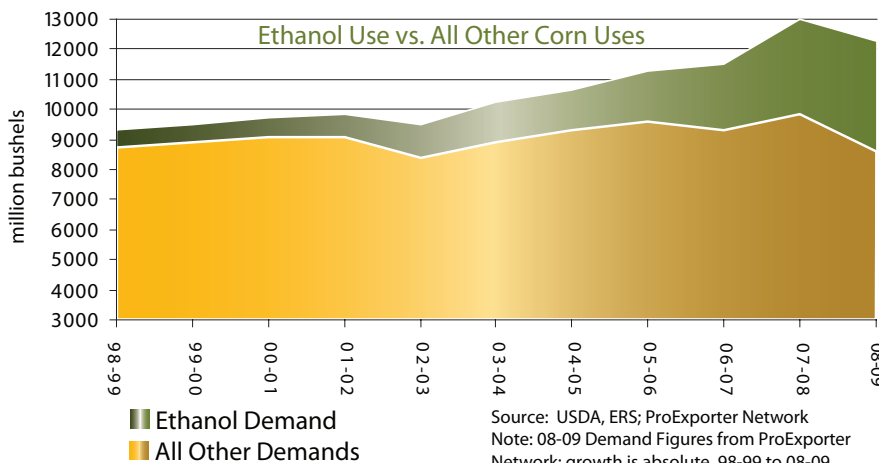


Source: USDA, ERS; NCGA

## Corn demand for food and feed is leveling off.

Other corn demand categories such as livestock production and exports have shown limited future growth—meaning that increased corn supplies will result in more corn available for biofuels production. Demand for corn in the livestock and poultry sector has been relatively flat in the last 10 marketing years. The amount of raw field corn fed to livestock is expected to decline slightly as more corn is displaced by distillers grains, a co-product of ethanol production. Furthermore, the amount of corn used for human food processing has been flat—and corn exports have trended up only slightly.

Even as corn use for ethanol has risen dramatically over the past 10 years, American farmers have continued to be the world's top exporter of corn—satisfying the demands of foreign customers. Corn exports have stayed steady or expanded slightly and, through exports of distillers grains, the ethanol sector is helping satisfy foreign demand for high-protein, high-energy livestock feed. The United States exported about 2.4 million metric tons of distillers grains in 2007. Those who say ethanol production is taking food away from humans forget there are two types of corn grown in the United States.



Source: USDA, ERS; ProExporter Network  
 Note: 08-09 Demand Figures from ProExporter Network; growth is absolute, 98-99 to 08-09

***“If you have to single out the...greatest contributor to higher prices, it is energy. Fuel contributes costs to food at every step: growing, processing, packaging and shipping. Higher energy costs also drive up the overhead for grocers, restaurants and warehouses.”***

Ed Maxiner, editor of the Kiplinger Agricultural Letter<sup>3</sup>





***“There has been a lot of inaccurate information out there about corn prices and alternative energy and it just keeps getting reported... Feed is such a small part of the overall [retail food] price that it really isn’t a driver.”***

Ephraim Leibtag,  
economist with USDA’s  
Economic Research Service<sup>4</sup>

***“The consumers should complain to The Organization of Petroleum Exporting Countries (OPEC) and not to the farmer if they’re unhappy with food prices. The U.S. regularly encounters food inflation even when corn and soybean prices are low or falling. Retailers and food processors typically put an extra markup on top of any increase in commodity prices.”***

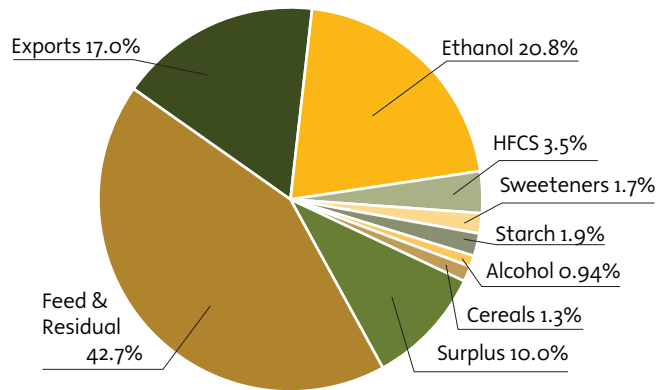
Michael Swanson, Wells Fargo  
agricultural economist<sup>5</sup>

## Humans typically do not eat the corn used to make ethanol.

Ethanol is made from field corn, a grain that humans typically do not eat in its raw form. It usually goes through some form of processing first. The corn that humans eat as a vegetable is sweet corn. Some 99 percent of all corn acres in the U.S. are used to grow field corn.

Just 1.3 percent of the 2007/08 corn crop was used for cereals, while other human food uses accounted for roughly 8 percent of total corn use. The overwhelming majority of U.S. corn—including exports—is used to feed livestock, not humans. And when corn is used to feed livestock, it’s helping add to the volume of animal protein in the world’s food supply to meet growing demand.

**2007/08 U.S. Corn Usage**



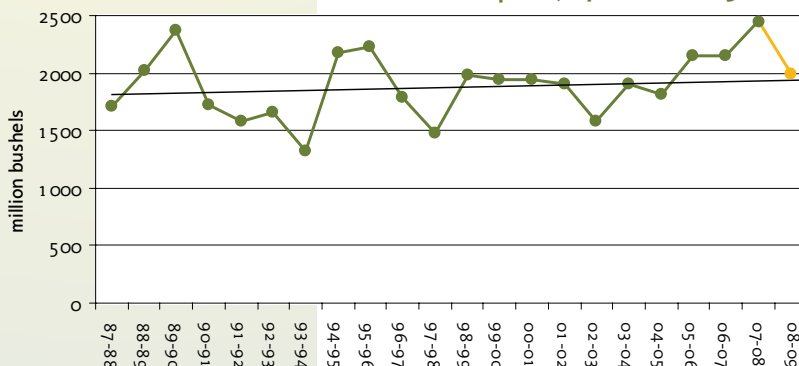
Source: USDA, ERS; June 2008 Note: Percentages based on total supply.

## Exported corn is primarily used for livestock.

Most of the corn exported from the United States is used for livestock feed, not human food. In 2006/07, the U.S. sent 33 percent of its corn exports to Japan (primarily for livestock production), while about one-

hundredth of one percent (.01%) went to the top ten undernourished countries in the world.

**U.S. Corn Exports, 87-88 to 08-09**



Source: USDA, ERS

Scarcity of food around the world is not the issue. There is more food per capita today on a global scale than ever before, according to the Food and Agriculture Organization of the United Nations. The problem is getting the food where it needs to be due to lack of infrastructure, access to capital, political unrest and other factors that result in global hunger. Often overlooked is the fact that higher global grain prices and the development of a world biofuels trade are

creating economic opportunity for small farmers around the world to earn a profit on their crops for the first time in years. Speaking to Reuters news service, Gustavo Best, chief energy policy analyst at the United Nations' Food and Agriculture Organization said, "If

well managed, bioenergy production can bring new areas of development...new investment, new jobs and new infrastructure that can also benefit the food industry."

## Ethanol production creates food and feed, too.

When raw field corn goes into an ethanol plant, it's not just ethanol that comes out. In addition to nearly three gallons of ethanol, every 56-pound bushel of corn used in the dry grind ethanol process yields 18 pounds of distillers grains—a good source of energy and protein for livestock and poultry. A bushel of corn in the wet mill ethanol process produces 2.6 gallons of ethanol plus 13.5 pounds of corn gluten feed and 2.6 pounds of high-protein corn gluten meal for livestock—as well as corn oil used in food processing for human food products.

In other words, ethanol biorefineries actually produce fuel for our cars, feed for our livestock and food for humans—all from one kernel of raw field corn.

The ethanol process removes only starch from the feed and food market—not fat or protein. The starch portion of the kernel is

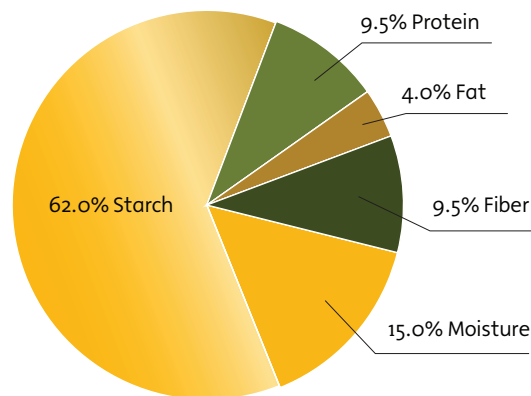
converted to ethanol. The protein, fat and other nutrients, vitamins and minerals are used to produce feed products—adding to the volume and quality of our feed and food supply. Starch is abundantly available in the feed market and is lower in value. Protein, on the other hand, is highly valued—and is left intact by the ethanol process. Additionally, a considerable portion of the corn's original digestible energy is preserved in the distillers grains.

In 2007/08, about 15 million metric tons of distillers grains were produced by ethanol plants and fed to livestock and poultry. Distillers grains displaced an estimated 720 million bushels of corn from feed rations last year, allowing that corn to be used in other markets.

***"Important food items like bread, eggs and milk have high prices that are largely unrelated to ethanol or corn prices, but correspond to fundamental supply/demand relationships in the world."***

Agriculture and Food Policy Center at Texas A&M University<sup>6</sup>

**Components of Yellow Dent Corn**



Source: *Corn Chemistry and Technology*, 1999  
Note: Wet Weight





## Corn prices have not kept up with inflation.

While corn prices have ramped up significantly over the past year, they are still lagging behind inflation in terms of real dollars. According to a report from Barclays Capital, even at its "record" levels in June 2008, corn price was still 42 percent below its inflation-adjusted peak in October 1974. If corn had followed the same rate of price increases we've seen in oil, corn would be selling at \$13.50 per bushel today.

Corn prices have been historically low in the past decade—making recent prices seem disproportionately higher. A February 2007 study by economists at Tufts University found that below-cost feed allowed the broiler chicken industry to save \$11.25 billion and the integrated pork industry to save \$8.5 billion in costs between 1997 and 2005.

Higher corn prices have not affected livestock and poultry producers to the degree that some would lead us to believe. Strong global demand for meat and dairy products has

led to healthy earnings for meat and milk producers, despite higher feed costs.

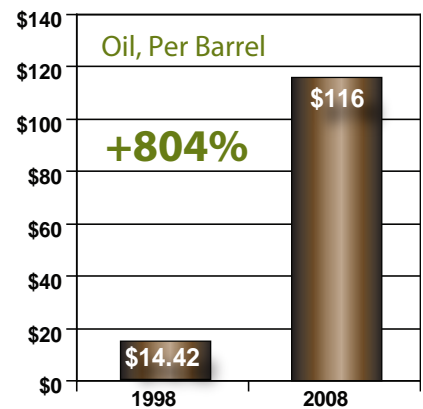
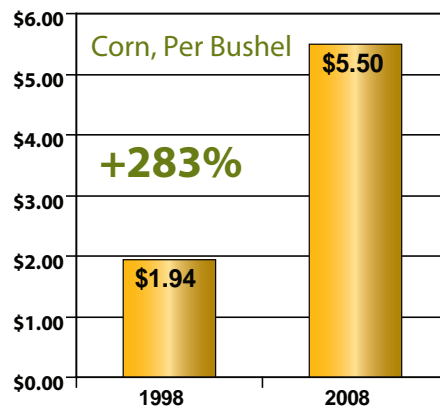
As an example, milk prices received by farmers increased 52 percent from July 2006 to May 2007, when they were the highest they had seen since June 2004. According to a June 2007 edition of the Daily Livestock Report from the Chicago Mercantile Exchange, "...pork producers are likely in the best financial shape ever...". Certain meat and poultry cuts are also enjoying record prices at the wholesale level. Chicken leg quarters, for example, achieved a record price of \$50.43/cwt in late June 2007.

It's important to recall that one of the reasons the ethanol industry was created was to add value to America's agricultural output—creating economic vitality in rural areas and reducing federal ag subsidies. According to USDA, corn farmers received a 76 percent **reduction** in government support payments in 2007 as a result of higher corn prices.

*"Our concern has been 'Will there be enough feed?' Assuming all the distillers grains are available for livestock feed, clearly there will be."*

Dr. Jim McDonald, Texas A&M experiment station beef cattle nutritionist<sup>7</sup>

### Commodity Price Increases: Corn vs. Oil



Source: Corn prices information is from USDA WASDE, updated monthly; Oil prices are annual estimates for West Texas crude oil from UDOE Energy Information Administration

## Corn demand for ethanol has negligible impact on retail food prices.

The impact of corn prices on retail food prices has been unfairly characterized by those who blame ethanol demand for corn on higher costs at the grocery store.

According to USDA, just 19 cents of every consumer food dollar can be attributed to the actual cost of food inputs such as grains and oilseeds. Labor costs account for about 38 cents of every dollar a consumer spends on food. Packaging, transportation, energy, advertising and profits account for 24 cents of the food dollar—with energy costs having an even greater impact as oil prices rise.

According to the Federal Reserve Bank of Kansas City, marketing costs (the difference between the farm value and consumer spending for food at grocery stores and restaurants) have risen from 67 percent in the 1980s to 80 percent today.

Retail food products such as cereals, snack foods and beverages sweetened with corn sweeteners contain very little corn. Therefore, fluctuations in the price of corn are not often reflected in the retail prices for these items. For example, a standard box of corn flakes contains approximately 10 ounces of corn, or about 1/90th of a bushel. Even when corn is priced at \$5 per bushel, a box of corn flakes contains about a nickel's worth of corn.

Corn is a more significant ingredient for meat, dairy and egg production. Still, corn represents a relatively small share of these products from the perspective of retail price. It takes about 3.6 pounds of corn to produce one pound of pork (live weight). This equates to 32.1 cents worth of corn when corn is \$5 per bushel, compared to 16 cents worth when corn is \$2.50.

Because corn and other grains constitute such a small portion of retail food products, moderately higher grain prices are unlikely to have any significant impact on overall food inflation. According to USDA, annual food inflation is projected at 4.5% - 5% over the next two years. This is considerably less than the average annual food inflation rate of 8.9 percent between 1972 and 1981.

Other cost factors have much greater impact on the retail price for food products. A June 2007 study by LECG, LLC, determined energy prices have two to three times the impact on retail food prices than grain prices do. The study concluded that historically high energy prices are a much more significant factor in the marginal increases in food prices we've seen of late.



***“Claims on higher consumer food prices in the popular press are exaggerated... Energy prices and increasing retail margins are competing explanations for the rising food prices.”***

John Behgin, economist at the Food and Agriculture Policy Research Institute at Iowa State University<sup>8</sup>

***“While it may be more sensational to lay blame for rising food costs on corn prices, the facts don’t support that conclusion. By a factor of two-to-one, energy prices are the chief factor determining what American families pay at the grocery store.”***

Economist John Urbanchuk, LECG, LLC<sup>9</sup>

***“By keeping gasoline prices lower than they otherwise would be, ethanol is helping the average American family save about \$500 a year, even after accounting for the slight increase in food prices due to higher prices for corn.”***

Bob Dinneen, president of Renewable Fuels Association<sup>10</sup>





***“Higher oil prices affect much more than just the cost of driving; they are actually one of the major factors behind higher food costs.”***

USDA Secretary Ed Schafer <sup>11</sup>

***“In the last five years, despite the nearly threefold growth of the corn ethanol industry (or actually because of it), the U.S. corn crop grew by 35 percent, the production of distillers grains (a high-value animal feed made from the protein saved from the corn used for ethanol) quadrupled and the net corn food and feed product of the U.S. increased 26 percent.”***

Robert Zubrin and Gal Luft,  
Set America Free Coalition <sup>12</sup>

## The net effect of having ethanol in our fuel supply saves consumers money.

While energy costs are having a significant impact on food costs—including the price farmers pay for fuel and fertilizer—the presence of ethanol in our nation’s fuel supply is actually offsetting increased consumer prices.

According to Merrill Lynch commodity strategist Francisco Blanch, retail gasoline prices would be \$21 per barrel higher

without the billions of gallons of biofuels in the marketplace. This translates to a savings of \$526 per year in gasoline costs for the average family—compared to the \$15 increase in annual household spending on food attributed to higher grain prices.

---

### References

1. McElroy, Anduin Kirkbride. “The Future of Corn Production” May 2007. Ethanol Producer Magazine. [http://ethanolproducer.com/article-print.jsp?article\\_id=2956](http://ethanolproducer.com/article-print.jsp?article_id=2956)
2. Esquivel, Teresa. “Food vs. Fuel” May 8, 2007. Food Product Design. <http://www.foodproductdesign.com/articles/741news.html>
3. Griekspoor, Phyllis Jacobs. “Grain prices not at fault for food costs.” Wichita Eagle. July 1, 2007. <http://www.wichitaeagle.com/101/story/111085.html>
4. Griekspoor, Phyllis Jacobs. “Grain prices not at fault for food costs.” Wichita Eagle. July 1, 2007. <http://www.wichitaeagle.com/101/story/111085.html>
5. Pocock, John. “Ethanol’s Winners and Losers,” Corn and Soybean Digest. August 2007
6. Anderson, David P., Outlaw, Joe L., Bryant, Henry L., Richardson, James W., Ernestes, David P., Raulston, J. Marc, Welch, J. Mark, Knapek, Goerge, Herbst, Brian K. and Allison, Mark. “The Effects of Ethanol on Texas Food and Feed.” April 10, 2008. Agricultural and Food Policy Center, Texas A&M University.
7. Texas A&M Extension Service. “Feeding Distiller’s Grains Vital to Future Livestock Operation Success.” July 6, 2007. Cattle Network. [http://www.cattlenetwork.com/bi\\_content.asp?contentid=142748](http://www.cattlenetwork.com/bi_content.asp?contentid=142748)
8. Beghin, John. Verbal remarks. “Biofuels, Food & Feed Tradeoffs.” Farm Foundation meeting. April 2, 2007. St. Louis, MO.
9. “Energy Prices, Not Corn, Chief Reason for Rising Food Prices, Study Finds” Press Release. National Corn Growers Association. June 14, 2007. <http://www.ncga.com/news/releases/2007/news061407.asp>
10. “New Merrill Lynch Report Confirms Overall Benefit of Domestic Ethanol for the Family Budget.” Press Release. Renewable Fuels Association. June 12, 2008. <http://renewablefuelsassociation.cmail1.com/e/435217/1/>
11. Schafer, Ed. Verbal remarks. “USDA Officials Briefing with Reports on the Case for Food and Fuel.” May 19, 2008. USDA Headquarters, Washington, DC. [http://www.usda.gov/wps/portal/!ut/p/\\_s.7\\_0\\_A/7\\_0\\_1OB?contentidonly=true&contentid=2008/05/0130.xml](http://www.usda.gov/wps/portal/!ut/p/_s.7_0_A/7_0_1OB?contentidonly=true&contentid=2008/05/0130.xml)
12. Zubrin, Robert and Luft, Gal. “Food vs. fuel a global myth.” Chicago Tribune. May 6, 2008

---

### For information, contact:

Mary Holmes  
National Corn Growers Association  
[www.ncga.com](http://www.ncga.com)  
636.733.9004

