

Investigate the Debate

Food and Fuel in the Ethanol Expansion

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By Jonathan Eisenthal, contributing writer

Economist Terry Francl suspects corn prices have permanently moved up, propelled by the current U.S. ethanol expansion. At the very least, this higher trading range, between three and five dollars a bushel, will last for three to five years and will have its most direct impact on the livestock and poultry producing industries, according to Francl, a senior economist with American Farm Bureau Federation.

Francl, USDA Chief Economist Keith Collins, and a host of other experts describe an economic picture for agriculture that refutes the feverish claims of some political gadflies who predict an astronomic run-up in food prices that will bring on “urban food riots.”

Does ethanol’s demand for corn mean higher prices at the grocery store?

For the average American consumer, the change in the food bill may eventually rise ten dollars a year, but Francl and others argue that lower fuel costs and decreased government outlays (read taxes) for farm support will leave the consumer in a neutral-to-positive position economically.

“Our calculations... showed there would be very little impact in 2007, a little more in 2008, then in 2009 it got into 0.7 percent in food Consumer Price Index above what it would have been without ethanol,” Francl said. The calculations are based on economic models developed by the Food and Agriculture Policy Research Institute (FAPRI) at the University of Missouri.

The bottom line - the average American per capita food expenditure is \$1,400 dollars per year, so in 2009 the total consumer price index (CPI) impact would be about \$10.

Consumers overestimate the cost of food production on the farm by basing their perception on the price for goods on the grocery store shelf, said Geoff Cooper, director of commercialization and business development for National Corn Growers Association.

The cost of raising commodity corn happens at the front end, and as the corn moves up the supply chain, costs for transportation, processing and packaging, labor, overhead, other inputs, ingredients, storage, advertising, and marketing each add to the cost and ultimately make up the majority of the retail price for that box of cereal.



Obviously, ethanol production avoids many of those costs, as does livestock production, buying corn right off the farm or from the grain elevator. The lower transportation cost for ingredients and finished food products through the availability of biofuels may in itself offset the higher cost of the corn that goes into the food.

Cooper went through the math. A bushel of corn is 56 pounds or 896 ounces. If the corn in a box of cereal contains 15 ounces of corn, then that's about a percent-and-a-half of the total volume of a bushel. When you have two-dollar corn, you've got three pennies' worth of corn in those cornflakes. When the price goes to four dollars, then you have six pennies worth of corn in the box.

"It's negligible compared to all the costs that go into producing that box of cereal," Cooper said.

Ethanol's benefit to consumer fuel costs are notoriously hard to pin down, Francl noted, though he asserted that its impact on margins and spot demand for gasoline definitely lower the cost of a gallon of gasoline.

In the future, how much ethanol will come from corn?

Another question mark in the future equation of fuel and food will be the rise of cellulose-based ethanol technology. Commercial-scale cellulosic ethanol plants will be launched this year in Europe, next year in the U.S., Canada, and China.

Broin Companies are touting a cellulose process they will launch as an integral part of plants that already process corn into ethanol, doubling the capacity of such facilities. The technology would make use of both the cellulose in the corn kernel and in corn stover - the leaves and stalks left over when the corn has been harvested. Using only a small proportion of that stover (leaving most of it for ground cover on crop land), ethanol plants would have a potentially huge source of material to ferment into ethanol.

In the coming year, Iogen plans to bring a commercial-scale cellulosic ethanol plant (using wheat straw) in Canada, Abengoa plans to launch commercial-scale ethanol plants in Spain and France, and some reports say the government of China is close to opening a cellulosic ethanol plant on the scale of current corn ethanol plants.

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A signal of the promise of cellulose - several major venture capital firms in Silicon Valley, California are underwriting Altra, a cellulosic ethanol venture in California. These bootstrapper businesspeople are taking the unusual step (for them) of lobbying the federal government for support of cellulosic ethanol technology research. The President has proposed major new outlays for cellulosic ethanol research, and this joins research already supported by his Advanced Energy Initiative, announced in 2006. The initiative included funding of research through the National Renewable Energy Laboratory in Golden, Colorado to "foster the breakthrough technologies needed to make cellulosic ethanol cost-competitive with corn-based ethanol by 2012."

Francel believes the 110 ethanol plants in the U.S. now operating on corn feedstock will continue to do so, as will many of the plants currently in planning and under construction. The cellulose ethanol industry will expand right alongside corn-based ethanol production and may eventually grow bigger than corn ethanol.

The impact of higher corn prices on livestock industries

Poultry and swine, followed by dairy and beef production, will take the most direct economic hit, Francel said, describing the effect as a one-time adjustment that could hit some producers hard, but to which many will adjust and regain a position of profitability.

"There won't be much difference in the amount of meat flowing to the consumers," Francel predicted. "But at some point, as (livestock producers) lose enough money, they will adjust."

The pork industry may reduce by 10 to 15 percent if it has to adjust to a corn price permanently trading around \$4 a bushel, a group of Iowa State University professors found. According to these professors, poultry and swine rations can utilize fewer DDGS compared to cattle, which will be able to increase DDGS and wheat in rations to make up for a lower use of corn.

Asked about such findings, Michael Swanson, senior agricultural economist for Wells Fargo Bank, Inc. in Minneapolis, said the issues of how this corn price rise affects ethanol and food

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producers, as well as the food consumer, deserve careful research. He worried that many nuances of the way agricultural markets act simply are not reflected in the Iowa State report. As to any assertion that the run-up in corn prices might cause hunger and food shortages, he pointed to USDA reports that find that the average American throws away 163 pounds of food per year, termed "plate waste" - perfectly edible food that ends up in the garbage and the landfill. A whopping 27 percent of all food prepared for human consumption in America ends up wasted - 48 billion tons each year. He suggested that if the expansion in biofuels really begins to crowd out food production the way alarmists now suggest, perhaps less food will be wasted.

The Iowa State report states: "Professor John Lawrence of Iowa State maintains a set of estimated returns for typical Iowa pork producers. His current budgets show a \$1.85 per bushel corn cost and a total production cost per head of \$101.50. If we increase the corn price from \$1.85 to \$4.05, this increases corn costs per animal from \$27 to \$58 and increases total production costs by approximately 31 percent. U.S. pork production

will need to decline by 10 percent to 15 percent to allow the industry to pass this cost increase on to the wholesale market."

The Iowa State report, called "*The Long-Run Impact of Corn-Based Ethanol on the Grain, Oilseed, and Livestock Sectors: A Preliminary Assessment*," was published in November by Prof. Amani Elobeid, et al.

These professors estimated a U.S. ethanol industry reaching a capacity of 31.5 billion gallons. However, the report cannot answer how much of that expansion from the current 5 billion gallon annual production will come from corn-based ethanol, how much from cellulose-based.

In his State of the Union address, President Bush called for U.S. renewable fuels production to reach 35 billion gallons per year within ten years. A recent statement from the National Pork Producers Council praised Bush's sensitivity to the issue of corn demand and its impact on the pork industry. The day after the State of the Union address, Secretary of Agriculture Mike Johanns announced a proposed USDA budget that includes \$1.6 billion in new funding for research into cellulose-based ethanol.

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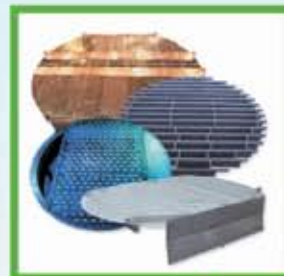
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“The National Pork Producers Council, which supports the President’s goals of energy security and independence through the development of a vibrant and robust domestic renewable fuels market, also applauded the Bush administration for adopting as part of a proposed Alternative Fuels Standard a ‘safety valve’ to protect against unforeseen increases in the prices of alternative fuels or their feedstocks,” said NPPC President Joy Phillippi in a statement to the press. She said, “In a letter sent last week, NPPC and other livestock groups asked Agriculture Secretary Mike Johanns to establish a working group within USDA to study the emerging biofuels economy and its implications for producers, the livestock sector, and consumers.”

Among their concerns will be the shift in acreage from soybeans to corn - soybean meal being a major component of livestock rations, particularly for swine and poultry.

Like other farmers, livestock producers take prices from the market - they do not dictate them, according to Francl. The increased cost to these producers will have a limited effect on meat as a part of the food CPI because people first substitute other meats and then buy other forms of protein when the price of meat rises. It is a market with inelastic demand, and therefore prices can only rise as far as the consumer is willing and able to pay.

How much more corn will American farmers produce?

Continuing increases to corn yield and corn acreage are certainties, according to USDA’s Keith Collins, who numbered yield and acreage among “five things you can count on” in recent presentations about the growth of the biofuels industries. Collins also assured that increased corn prices and ethanol production would at some point lead to a slow down in corn-based ethanol production expansion.

What are the actual dimensions of the ethanol boom that has produced this “change in the demand curve,” as Francl refers to it? Collins offered an estimate that U.S. ethanol production will reach 11 billion gallons per year by 2010, which will require more than 3 billion bushels of corn. An analysis by

the Farm Bureau puts the production total around 14 billion gallons by 2010, which would take between 4 and 5 billion bushels of corn.

Two months before USDA is due out with its Prospective Plantings report, analysts and economists predicted corn demand will cause U.S. farmers to plant anywhere from 7 to 10 million additional acres to corn this year - perhaps more.

Farm Futures magazine published its e-mail based survey (taken between January 5 and 21), which predicts a 10.1 million acre jump, to 88.4 million acres planted to corn. According to the magazine many farmers acted quickly after harvest and dressed their fields for the change to corn, with the strong corn prices throughout the fall convincing them to shift acres from soybeans. A very significant finding of the Farm Futures survey showed that 40 percent of their survey pool would shift even more acres into corn “if the price is right.”

Among the more conservative voices of the acreage forecasters is the Congressional Budget Office, which tracks agricultural parameters as part of its predictions of the cost of the U.S. farm program. The latest CBO report predicts a 7 million acre increase, to 86.2 million corn acres nationwide. Due to the strong performance of corn over the life of the current farm bill, CBO now projects counter-cyclical payments will be \$17 billion less than predicted when the 2002 farm bill was written. Payouts on marketing loans over those six years will be \$15 billion less than predicted.

This will be the biggest corn planting since 1946, predicts agricultural economist Chris Hurt, Purdue University. He believes the planted number will come to somewhere between 88 and 89 million acres. He believes demand will drive corn above the average price record of \$3.24 per bushel set in 1995. Among the strongest drivers is ethanol demand, according to Hurt, who pointed to projections from the Renewable Fuels Association that the U.S. may have 150 operating ethanol plants producing 9 billion gallons of fuel annually, and requiring about 3.5 billion bushels of corn to do it.

All uses, plus a six percent carryout, would require a 12.5 billion bushel corn crop, according to agricultural economist Darrel Good at the University of Illinois. If the weather cooperates and allows national average corn yield to continue up the trend line to 155 bushels per acre, it would take 80.7 million acres to generate that crop. Based on historical data, 87.8 million acres would have to be planted, to harvest 80.7 million - a jump of 9.5 million planted acres. Market forces dealing with a current soybean surplus in combination with the strong corn demand, could result in 7.8 million fewer soybean acres, Good predicted. He points out that high enough increases in corn acreage would slow and ultimately reduce the price of corn in the marketplace. Yield increases will have the same effect.

Another open question is how many Conservation Reserve Program (CRP) acres will go back into production this year. Millions of acres now under contract come up in 2007. Pro-conservation leaders on both the House and Senate side in Congress may respond with changes to the program in order to maintain a high level of participation.

“Between 2007 and 2010, 400,000 contracts covering 28 million acres are scheduled to expire,” reads a press statement from the U.S. Farm Service Agency on January 31. “FSA is offering re-enrollments and contract extensions to certain contract holders in an effort to preserve CRP’s significant and enduring environmental benefits to American farmland.”

A new equilibrium

Taking a step back and looking at the macro picture, Francel notes that the shift in the corn demand curve will result in markets seeking a new equilibrium. The cost of capital and commodity inputs will rise for everyone involved in corn and ethanol production; this process will take place over a period of time and eventually set new price plateaus.

Corn and livestock producers will continue, in the main, to be “price takers, not price makers,” as Francel quoted the common saying. As that process unfolds, the market will continue to reward those who can participate in adding value to commodity production, but the unknowns outnumber what can be calculated and stated with certainty right now.

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