

**STATEMENT BEFORE THE U.S. SENATE COMMITTEE ON HOMELAND  
SECURITY AND GOVERNMENT AFFAIRS**

**Hearing on Fuel Subsidies and Impact on Food Prices  
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Thank you, Mr. Chairman, for the opportunity to participate in today's hearing.

My research center has been intensely involved for the past three years in trying to understand both the short- and long-run impacts of expanded biofuels production in the U.S. and abroad. I would like to address the role that Federal policy plays in affecting the amount of biofuels that we produce and the impact these policies have on crop and food prices. Given that most attention has been paid to corn ethanol and not biodiesel, I will focus my testimony on ethanol.

Many people are confused about the impact of Federal ethanol policies. Much of this confusion stems from different questions being answered. For example, there is validity to the claim that the U.S. ethanol industry has caused the price of corn to double. This answer gives insight into the following question: What would happen to the price of corn if we were to eliminate the U.S. ethanol industry? But this answer does not give any insight into the central question relevant to today's hearing. Namely, what would happen to the price of corn if Federal biofuels policies were changed? We must recognize that U.S. ethanol plants will not disappear because of a change in U.S. ethanol policy. The plants will remain operating as long as they are covering their operating expenses. Thus, a change in U.S. policy will not cause corn prices to drop by half.

**U.S. Biofuels Policies**

There are three Federal policies that I want to examine. They are the Renewable Fuels Standard, the blenders' tax credit (Volumetric Ethanol Excise Tax Credit), and the tariff on imported ethanol. Changes in these three policy tools will have both short- and long-run impacts on the price and availability of ethanol, corn, and other agricultural products.

The blenders' tax credit increases gasoline blenders' ability and willingness to pay for ethanol. Currently the tax credit is set at \$0.51 per gallon. The effect of the tax credit is to increase the market price of ethanol, thereby increasing the profitability of ethanol production, which in turn increases the volume of ethanol, the amount of corn processed, the price of corn, and the volume of ethanol byproducts. Over the long run the blenders' tax credit has had a large effect on the size of the ethanol industry. The short-run impacts of the tax credit are modest because in the short run, the number of ethanol plants in existence is fixed.

The import tariff taxes imported ethanol. Hence, it decreases the attractiveness of exporting ethanol to the U.S. market because the net price received for U.S. sales is the U.S. market price for ethanol minus the tariff minus shipping costs. Currently, the tariff consists of a 2.5% sales tax plus a tax of \$0.54 per gallon. The effect of the tariff is to drive a wedge between Brazilian ethanol prices and the U.S. price. If you reduce the tariff, more Brazilian ethanol would flow to the U.S. market, thereby reducing today's large price difference.

The Renewable Fuels Standard in the Energy Independence and Security Act (EISA) specifies minimum biofuels consumption levels for the United States. In 2008, mandates total 9 billion gallons. In 2009 the mandate increases to 10.5 billion gallons. The short-run effect of a mandate is zero if biofuels consumption is greater than mandated levels. That is, removing a non-binding mandate would have no effect. In the long run, the EISA mandates have created a strong expectation that biofuels production will expand to at least the levels dictated by the mandates. This expectation for robustly growing future demand for corn has increased the futures price of corn in 2010 and 2011, which has likely had some effect on the price of corn today.

### **Direct Impacts on Ethanol and Corn from U.S. Policies**

It is important to separately evaluate the near-term impacts of Federal policy from long-term impacts. Given the level of concern about current crop prices, I want to examine the short-term impacts first. To give us a good grasp of the magnitudes of the effects, I will cite some results from a model I developed jointly with my graduate student, Lihong Lu McPhail, that looks at what would happen to the supply of ethanol and the market price of corn during the period September 1, 2008 to August 31, 2009, which is the reporting period for how the 2008 corn and soybean crops are sold. A focus on corn is warranted because it is the crop most directly affected by U.S. biofuels policies and it is the crop that most determines the impacts on the cost of food because of its importance in determining the cost of feeding livestock.

Taking into account that we cannot know for certain how many ethanol plants will be ready to produce ethanol next year, what the size of this year's corn crop will be, what the price of crude oil will be, and how much corn and other crops will be produced in other countries, we estimate that under current Federal biofuels policies, expected ethanol production is about 10.8 billion gallons, the expected price of ethanol is \$2.44 per gallon, and the expected price of corn is \$5.68 per bushel. We then asked the following question: What would happen to ethanol prices and volume and the price of corn next year if Federal policies were changed? We considered a number of different scenarios, but I want to focus on three today. These are 1) eliminate EISA mandates, but keep the tax credit and the import tariff; 2) eliminate the import tariff and the blenders' credit, but keep the mandate; and 3) eliminate all three Federal instruments. Our findings are presented in Table 1.

Because the blenders' tax credit and mandate both serve to increase the demand for ethanol, elimination of only one of these policies would have little impact. Elimination

of the mandate would reduce expected ethanol production by about 4%, the ethanol price would drop by less than 2%, imports would fall by 18%, and the price of corn would fall by slightly more than 1%. Maintenance of the \$0.51 tax credit keeps demand for ethanol high, and the import tariff keeps imports down. The impacts of removing only the \$0.51 blenders' tax credit would be similarly small, because the mandate would keep ethanol demand high and the import tariff would ensure that the mandate is met with domestically produced ethanol.

Elimination of the blenders' tax credit and the import tariff would have larger impacts because increased imports would reduce the amount of domestic ethanol that would be needed to meet the mandate. However, the supply of ethanol from Brazil is not limitless. We estimate that imports would more than double with elimination of the tax credit and import tariff, domestic ethanol production would decline by about 11%, and the price of corn would drop by 7%. The price of ethanol would drop by 13%. The price of blended fuel would not drop because decreased ethanol production would allow gasoline prices to increase. The impacts are not larger because the mandates keep total ethanol demand high and the existence of constructed U.S. ethanol plants keeps total corn demand high.

A rollback of all ethanol incentives and protection would have larger impacts. Ethanol production would drop by 21%. A drop of this magnitude in production would normally be expected to increase price. But the price for ethanol is enhanced by the tax credit and mandate under current policy so this drop in production would be accompanied by an 18% drop in the ethanol price. Imports would increase modestly because the decline in the tax credit is less than the decline in the import tariff. The expected corn price would drop by almost 13%, to just below \$5.00 per bushel.

The livestock industry and its supporters have been most vocal in their calls for a rethinking of Federal ethanol policy. But high gasoline prices combined with existing ethanol plants means that corn prices in the near term will remain well above historical levels even if the mandate, the blenders' tax credit, and the import tariff were all eliminated. This is not to say, however, that the 13% drop in corn prices would not affect livestock margins and, eventually, food prices. This drop in corn prices would reduce the cost of feeding beef cattle by 5% of revenue, hogs by 7% of revenue, laying eggs by 4%, and dairy cattle by 3% of revenue. This drop in production costs would eventually translate into consumer prices that would be lower than they otherwise would be.

The longer-term impacts of a change in Federal biofuels policy depends crucially on the price of crude oil and on the number of ethanol plants that get constructed under current incentives. For example, if we were to eliminate all Federal biofuels policies today, and future crude oil prices support wholesale gasoline prices of \$3.00 per gallon in the future, then ethanol production over the next five years or so would eventually increase to around 14 billion gallons, ethanol prices would be \$2.00 per gallon, and corn prices would be about \$4.00 per bushel. A return of wholesale gasoline prices to \$2.00 per gallon would result in ethanol production of about 10 billion gallons, an ethanol price of about \$1.60 per gallon, and corn prices would fall to approximately \$3.60 per bushel. In

contrast, sustained \$4.00 gasoline prices would result in \$2.40 ethanol, \$5.00 corn, and 21 billion gallons of ethanol.

These results reveal two general findings. First, agricultural commodity prices and gasoline prices are now inextricably linked through existing ethanol plants and the knowledge of how to efficiently convert corn to transportation fuels. This means that for the foreseeable future, even if we were to eliminate all support for corn ethanol, the price of corn and crops that compete with corn for land will rise or fall directly with transportation fuel prices. Second, in the long run, if high gasoline prices signal that we need alternative fuels, the corn ethanol industry will be there to contribute substantial amounts of transportation fuels even without government subsidies. As in any unsubsidized market, the amount that corn ethanol would contribute would depend on the relative competitiveness of the industry.

### **Impacts on Other Commodities and Food**

The need for more corn to meet both the demands of the corn ethanol industry as well as food and feed demand means that fewer acres of other crops will be planted as corn acreage is expanded. The drop in U.S. acreage of other crops will cause their prices to increase. The most direct competitor to corn for land is soybeans. We have seen how this competition can have dramatic impacts on both corn and soybean prices as users of both commodities offer higher prices to ensure adequate supplies of “their” crop. The impact on crops other than soybeans is less pronounced because corn competes less directly for land. Wheat acreage will be influenced to some degree by corn prices because of land competition with soybeans and, in some regions, corn. U.S. rice acreage will be largely unaffected by corn prices because corn and rice are grown in different regions and it takes a fairly large incentive to move rice producers away from rice. The direct link that many people have made between U.S. biofuels subsidies and rice prices is, therefore, extremely difficult to find or defend.

With regards to food prices we must remember that, to a large extent, Americans do not eat agricultural commodities. Rather we eat food manufactured from commodities. Wheat gets combined with labor, energy, and other ingredients into bread and pasta. Corn and soybean meal gets similarly transformed into meat, eggs, milk, and cheese. My colleagues and I estimated that a 30% change in the price of corn, along with corresponding changes in the prices of other crops, would change home food expenditures by about 1.3%. This estimate could be on the low side because we did not account for indirect changes in prices caused by competition for land for fruit, vegetables, and minor crops.

As shown in the table of short-run results, altering U.S. biofuels policies will change the price of corn by much less than 30%. This suggests that changes in biofuels policies will not dramatically affect the price that Americans will pay for food.

Commodity prices make up a much larger share of the consumer food dollar in many poor countries. Thus any change in commodity prices brought about by a change in U.S.

biofuels policies would have a much larger impact on food prices than in the United States and other rich countries.

Some may find these estimates of the effect on U.S. food prices not credible because of the huge run-up in wheat, rice, and feed costs over the last 18 months. But again, I have not tried to determine the impact on food costs from increasing agricultural commodity prices. Rather I am asking what the impact would be on commodity prices from a change in Federal biofuels policies given that we are well on our way to having more than 11 billion gallons of plant capacity and that markets expect high gasoline prices for the foreseeable future. This combination of in-place capacity and high-priced gasoline implies modest impacts of a change in policy.

### **Impacts on International Markets**

Finally, I would like to include a few comments about international markets. The United States is a major exporter of corn, soybeans, wheat, and rice. Changes in U.S. supply and demand directly impact international prices. Thus, to the extent that changes in Federal biofuels policies affect U.S. prices, international markets would be similarly affected. Again, corn and soybean prices would be most affected by a change in Federal policy. Wheat prices would be affected less. Rice prices would be largely unaffected for two reasons. First, the U.S. share of world rice exports is lower than for corn, soybeans, and wheat, and second, rice acreage does not compete as directly for corn acres as do soybeans and wheat.

In conclusion, there is no doubt that the growth of the ethanol industry is an important factor in the run-up in agricultural commodity prices. But this does not imply that a change in Federal policy would reverse this growth. My testimony about the long-term impacts on the price of corn and related commodities is based on simple arithmetic: existing ethanol plants will operate at nearly full capacity if they can cover their operating costs; under-construction plants will get finished if it makes financial sense to finish them; and new plants will be constructed if market prices dictate. Thus, unless we have a return to \$40 or \$50 crude oil, we can expect the price of corn to be well above historical levels for the foreseeable future even if all support for corn ethanol were eliminated.

Table 1. Impacts of Federal Biofuels Policies Over the Period Sept 1, 2008 to August 31, 2009

<b>Policy Scenario</b>	U.S. Ethanol Production (billion gallons)	Ethanol Price (\$/gallon)	Ethanol Imports (billion gallons)	Corn Price (\$/bu)	Blended Fuel Price (\$/gallon)
Mandate, Tax Credit and Tariff	10.8	2.44	0.5	5.68	2.72
Tax Credit and Tariff	10.4	2.40	0.4	5.61	2.73
Mandate Only	9.6	2.12	1.0	5.29	2.73
No Programs	8.6	2.01	0.7	4.97	2.76

<b>Policy Scenario</b>	Ethanol Production	Ethanol Price	Ethanol Imports	Corn Price	Blended Fuel Price
	change from current policy				
Tax Credit and Tariff	-4%	-1.5%	-18%	-1.2%	0.3%
Mandate Only	-11%	-12.9%	110%	-6.8%	0.2%
No Programs	-21%	-17.5%	55%	-12.5%	1.2%