



October 2009

**A Perspective on U.S. Farm Programs and the Corn Refining Industry**  
*Confirms that High Fructose Corn Syrup is Not Subsidized*

**Summary**

The U.S. corn refining industry and its products, including high fructose corn syrup, are not subsidized by federal agricultural programs. In general, federal price support programs are aimed at supporting farmers and helping them manage the many economic, weather, and other risks that they face. The net effect of federal programs for agriculture and renewable fuels has been an increase in the price that corn refiners pay for corn. In fact, corn prices over the last three fiscal years – 2006/07 through 2008/09 – have been more than 80% higher than the \$2.17/bushel average of the prior ten years. Furthermore, during this time, support payments to growers have actually declined. In any case, 75% of the costs involved in producing corn sweeteners and the corn refining industry's other products are actually for capital and financing, energy and utilities, other materials like enzymes and packaging, labor, taxes, repairs and maintenance, and professional services.

The U.S. government provides support to a number of farm commodities or "row crops" – including corn, cotton, soybeans, rice, and wheat – to ensure a stable farm economy and a reliable supply of food and fiber during periods of market volatility and adverse weather. These payments are paid directly to farmers as a "safety net." Manufacturers of corn sweeteners and other food ingredients do not receive such payments. In contrast, a federal support program exists to maintain the price of sugar, the main competing caloric sweetener, at a level that is generally two to three times the world price. This has effectively been an annual subsidy of \$1 billion to \$3 billion to sugar crop producers and processors.

**Background**

U.S. farmers produce 40 percent of the world's corn and account for 65 percent of the world's corn exports due to a favorable climate, a very productive land resource base, and a population of skillful and efficient farm operators. As a result, the U.S. corn price is effectively the world price. Corn plays a key role in the food system – including for direct consumption, for animal feed, for ethanol production, and for production of a range of important food and feed ingredients.

Whenever the Farm Bill or agricultural trade policy or related issues are in the news, the public often seems confused about who benefits and who is hurt by farm support policies. This has also been evident in some of the recent attacks on high fructose corn syrup. The basic fact to keep in mind is that USDA programs for corn exist to benefit corn farmers, and not to provide a low commodity price directly or indirectly for corn refiners or feed manufacturers or other end users of corn.

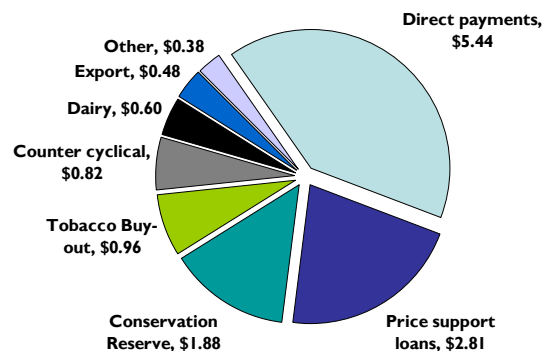
## The Big Picture

Agricultural commodity support programs benefiting “row crop” farmers operate in three basic ways:

- Increasing the revenue per unit that the farmer receives, whether from the market or direct government payments;
- Increasing demand for the crop, e.g. by developing export markets and by subsidizing or mandating its conversion into fuel; and/or
- Reducing the farmer’s production costs, through research, training, or input subsidies like underpricing irrigation water.

In practice, though, these approaches can operate in many different ways. The chart to the right shows the estimated payments to farmers of supported commodities (wheat, corn, soybeans and other crops) and to export organizations by USDA’s Commodity Credit Corporation for fiscal year 2009. Fixed direct payments to farmers, not linked to what a

**USDA Commodity Program Outlays:  
\$13.4 Billion in FY09**



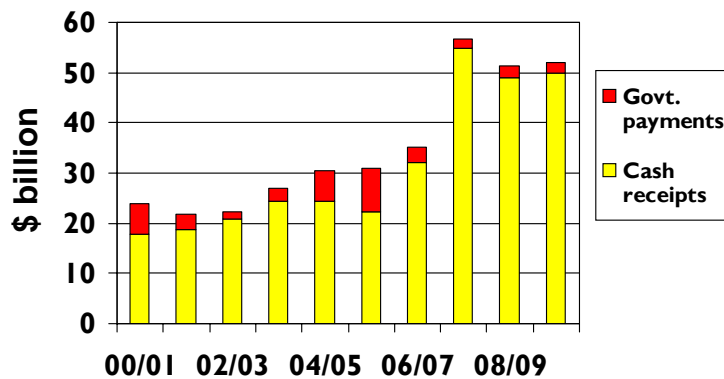
farmer actually produces, are the biggest category. Net issuance of price support loans is the next largest. (If commodities under loan are forfeited to the government, and USDA subsequently sells them, they show up as revenue that offsets some of the cost.)

Prices for dairy products and sugar are supported primarily by import barriers that keep U.S. prices above levels that would otherwise prevail. Sugar is one of the most regulated U.S. commodities. In addition to minimizing sugar imports through restrictive quotas, USDA manages a price support loan program for sugar beets and sugarcane, and a system of marketing allotments for the processors of those crops. The combined effect is to sharply increase domestic sugar prices. In 2009 the wholesale sugar price will average 38 cents per pound, up sharply from the 29-cent average for the preceding five years, and retail prices of 57 cents per pound have risen by 14 cents over the past five years.

Most of the revenue that U.S. producers of wheat, corn, soybeans and other crops receive is from sales in the marketplace. We illustrate this in the case of corn in the accompanying chart. For the 10-year period shown, (including USDA's forecast for 2009/10) an average of 12.5 percent of growers' revenue came from the government, primarily from direct payments in recent years, and 87.5 percent from the market. This reflects a change in philosophy in recent decades to one of letting market prices adjust as necessary and making up any shortfall in farmer revenue with direct payments. (This is most recently manifested in the new Average Crop Revenue Election – ACRE -program in the Food, Conservation and Energy Act of 2008.) Before this change in philosophy, USDA often required farmers to take land out of production to reduce supplies and raise prices.

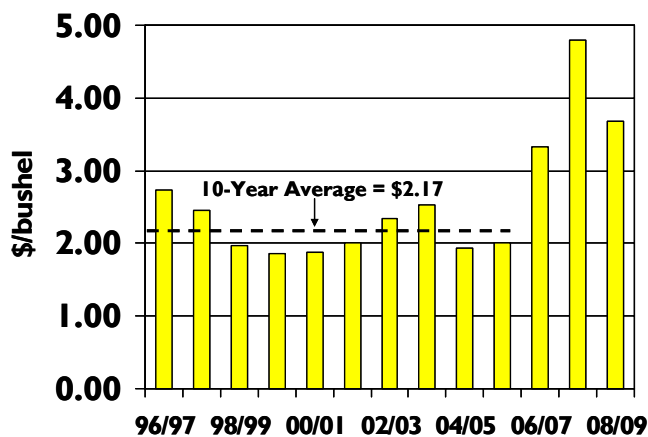
While corn users benefited in some years if prices are free to drop to clear the market, this has not occurred in recent years. One also has to keep in mind the fact that other aspects of farm policy are working in the opposite direction.

### Corn Growers' Revenue



First, USDA pays farmers an annual fee to keep about 10% of the farmland out of production and in what is called the Conservation Reserve Program. If these 34 million acres were being farmed, production of corn and other crops would be greater and prices would be lower. When the cost of corn is low, the corn refining industry's revenue is also reduced because of lower returns from sale of byproducts.

### Corn Price in Central Illinois



Second, USDA spends a few hundred million dollars a year promoting numerous U.S. agricultural commodity exports in an effort to boost demand and market prices.

Third, and most importantly, the combination of fuel tax exemptions and mandates for production of fuel ethanol from grain has sharply increased the demand for and price of corn in the United States and worldwide. These programs actually work directly against the interests of

corn users. In fact, corn prices over the last three seasons have been more than 80% higher than the \$2.17/bushel average of the prior ten years.

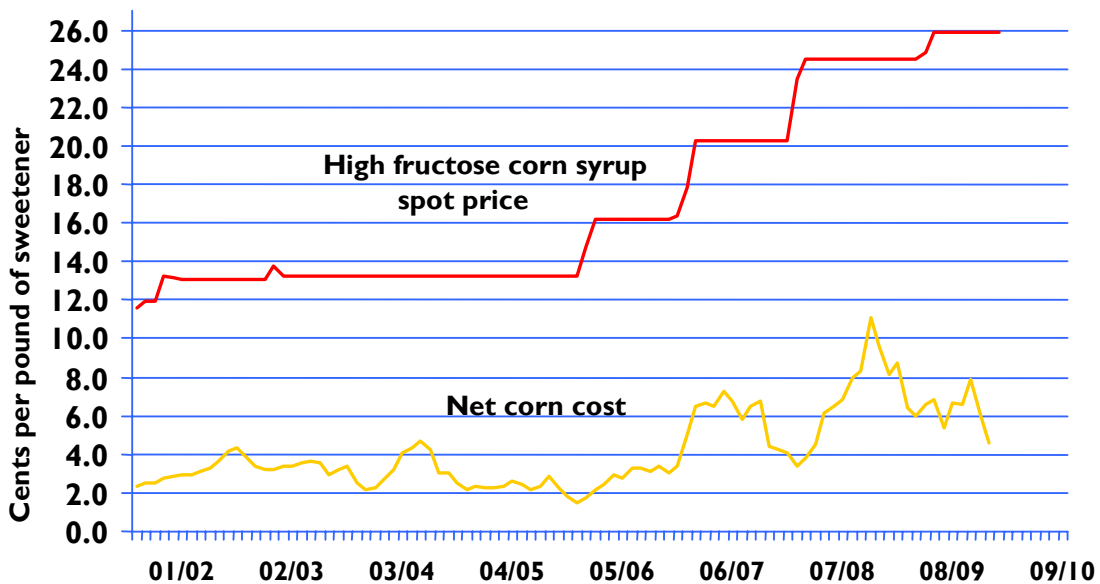
### Corn as a cost component for sweeteners

Corn refining is a very capital intensive industry. Corn refining companies have massive investments in structures and in processing and transportation equipment to handle the incoming corn, grind the corn and separate out the starch and other components, manufacture the final products, and store and deliver those products.

Sweeteners are among the more costly to produce. The principal sweeteners are high fructose corn syrup, glucose syrup, dextrose, crystalline fructose, and polyhydric alcohols like sorbitol and mannitol. High fructose corn syrup is produced in forms that are alternatively 42 or 55 percent fructose, with the balance being glucose and higher sugars.

In estimating production costs for high fructose corn syrup, the conventional approach for the corn component is to calculate the “net corn cost”, i.e. the cost of the corn minus the revenue from the sale of the corn oil and the principal animal feed byproducts. USDA’s version of this calculation is available online at <http://www.ers.usda.gov/Briefing/Sugar/data.htm> in Tables 31a and 31b. A 56-pound bushel of corn produces 33.33 pounds of corn sweetener on a dry basis, 1.55 pounds of crude corn oil, 13.5 pounds of corn gluten feed, and 2.65 pounds of corn gluten meal.

**Net Corn Cost in Relation to High Fructose Corn Syrup Price**



In the chart above we have plotted the spot price for HFCS 42 on a dry basis and the net corn cost to produce a dry pound of high fructose corn syrup. (HFCS 42 is 71% solids, so if the price of the liquid sweetener is 15 cents per pound, the price of a pound of solids is  $15/0.71 = 21.1$  cents.) Spot prices are only indicative because one has to keep in mind the fact that most high

fructose corn syrup is sold under annual contracts that can vary considerably in their terms and when they were signed. Nevertheless, as one can see from the chart, net corn costs represent only a small part of the final price – typically 25% in recent years. During the early part of the decade, high fructose corn syrup prices were quite depressed due to the existence of excess capacity. In our view, that price level represented rock bottom production costs, with little if any profit.

More recently, prices have strengthened as excess capacity was shifted to fuel ethanol production or mothballed (taken out of production), and as higher commodity prices pushed up energy and net corn costs.

While there are no recently published studies of cost of production, we know that the other major cost elements, in rough descending order of importance, are the following: capital and finance costs, energy and utilities, other materials like enzymes and packaging, labor, taxes, repairs and maintenance, and professional services.

### **Summary**

Overall, there are many factors contributing to the price of corn. Chief among them are demand, energy costs, and current federal government farm policies, which combined during the past several years have actually made corn prices historically higher. Furthermore, corn products produced by corn refiners, including high fructose corn syrup, are not subsidized by the federal government. Consequently, corn refiners pay market prices that are not influenced by one single cause, but by a variety of factors.