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Facts: **Ethanol price premium = $0.57 from 1982 -- 2006.**
It was > $0.50 in 2006.

Source: Feed Grains Backgrounder, USDA, FDS-07c-01 March 2007. (Google this title to find complete document.)

Notes:

See p. 7 (PDF p.4) below for $0.57 premium over wholesale price of gasoline.

See p. 6, (PDF p.3) below for > $0.50 premium in 2006.

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Feed Grains Backgrounder

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Abstract

The U.S. feed grain sector, largest of the major U.S. field crops, faces unprecedented demand conditions. The size and speed of the expanding use of corn by the ethanol industry is raising widespread issues throughout the U.S. agricultural sector. Debate is ongoing over the use of grain for fuel instead of for food or feed and the adequacy of future grain supplies. Increased productivity (yield) and additional area from land planted to competing crops, land enrolled in conservation programs, or idled land is expected to provide an increased supply of feed grains. In 2003, U.S. feed grain farms had an average annual net cash income of $45,916, compared with $8,875 for nonfeed grain farms. Average household income for feed grain operators in 2003 was $69,034, 17 percent greater than the average for all U.S. households. The outlook is for higher feed grain prices, in part, as a result of renewable energy policies and high energy prices, with feed grain prices rising above farm program support levels. During the ongoing farm policy debate, the U.S. feed grain sector faces uncertainty about the future level and type of government support.

Keywords: Feed grains, corn, sorghum, barley, oats, demand, ethanol, supply, prices, trade, household and farm income, government support programs, farm policy.

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Approved by USDA's World Agricultural Outlook Board

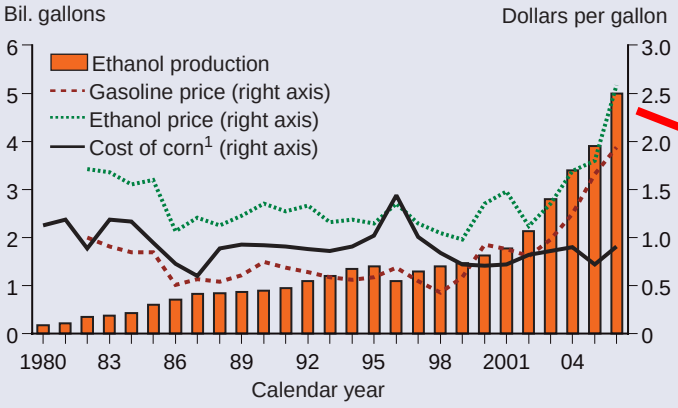
Accelerating Ethanol Production Raises Many Significant Issues for U.S. Agriculture[1]

The size and speed of the increase in corn's use in ethanol production is unprecedented in its effect on the U.S. feed grain market, which is being called on to contribute to the Nation's energy supply (Eidman). Corn's use for U.S. ethanol production rose from 35 million bushels in 1980 to a projected 2.15 billion bushels in 2006/07, as ethanol production expanded from 175 million gallons in 1980 to about 5 billion gallons in 2006 (box fig. 1). Although its production has accelerated in recent years, ethanol accounts for only about 3 percent of the U.S. transportation fuel supply (volume basis), but it accounts for a much larger share of corn production, 20 percent forecast in 2006/07. To further illustrate the rapid rise in ethanol production, USDA's baseline report, *USDA Agricultural Baseline Projections to 2015*, released in February 2006 estimated that about 7.5 billion gallons of ethanol would be produced by 2012/13, largely driven by the Renewable Fuel Standard (RFS) (USDA, WAOB, 2006). However, 1 year later, USDA's long-term projections report, *USDA Agricultural Projections to 2016*, released in February 2007, estimated that about 11.6 billion gallons of ethanol would be produced by 2012/13 (USDA, WAOB, February 2007). Thus, ethanol production is rapidly exceeding the minimal levels required by the RFS. The growth in ethanol's use of corn highlights two key issues:

- The supply of corn is small, compared with the size of U.S. gasoline demand. If the United States is to greatly reduce its dependence on imported oil, other domestic sources of renewable energy must be developed to replace oil.
- The economic importance of increased ethanol production is significant to agriculture, as rising corn prices and increased corn acreage create implications for other agricultural markets.

Box figure 1

Ethanol production compared to prices of gasoline and ethanol and cost of corn



[1]Corn costs are converted to dollars per gallon by dividing the corn price by 2.65, the average (1980-2006) number of gallons of ethanol produced from a bushel of corn.

Sources: Ethanol production is available from the Renewable Fuel Association at www.ethanolrfa.org/industry/statistics/#A, 2006 production is estimated. Gasoline and ethanol prices are annual average of monthly (F.O.B.) rack prices from Nebraska Energy Office, Nebraska Ethanol Board, Lincoln, Nebraska, available at www.neo.ne.gov/statshtml/66.html. Corn prices are annual average of monthly Central Illinois country elevator bids from USDA, Agricultural Marketing Service and available at www.ers.usda.gov/data/feedgrains/.

One recent policy stimulus for ethanol production came from the Energy Policy Act of 2005. Several provisions of the act related to agriculture-based renewable energy production (Government Printing Office).[2] (See "Government Programs Support the Sector: Ranging From Income Support to Demand Enhancement," pg. 27, for more information on other policies stimulating corn use in ethanol production.) The RFS (Sec. 1501) requires that 4.0 billion gallons of renewable fuel be used domestically in 2006, increasing to 7.5 billion gallons by 2012. Most of this fuel will be ethanol, derived mostly from corn, and some will be biodiesel, derived mostly from soybeans. Currently, starch from corn accounts for about 98 percent of the feedstocks used in U.S. ethanol production. In the future, biomass from other sources (e.g., grasses, wood pulp, or crop residue) will need to contribute more of the feedstock for ethanol production.[3]

Factors Affecting Ethanol Production and Prospects for the Longer Term

Ethanol production depends on the interaction of government incentives and policies, technology development, corn prices, ethanol prices, prices of co-products from ethanol production, and prices of oil and other energy substitutes. Several factors have especially contributed to the rapid increase in ethanol production, including strong energy prices, the RFS under the Energy Policy Act of 2005, low corn prices until the fourth quarter of calendar year 2006, the blender tax credit of $0.51 per gallon, the ethanol import duty of $0.54 per gallon, and the elimination of ethanol's main oxygenate competitor, methyl tertiary butyl ether (MTBE) (Collins, 2006). Ethanol's

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production response to selected market signals, such as gasoline price, ethanol price, and cost of corn, is shown in the figure. Note that in 1996, ethanol production declined as the cost of corn rose significantly relative to the price of gasoline and ethanol.

Production cost is another factor that can support or jeopardize ethanol production (Collins, 2006). Ethanol production costs declined between 1980 and 1998 as technology improvements over this period created higher ethanol yields per bushel of corn and costs declined for enzymes used to convert corn into ethanol. Production automation lowered labor costs, and energy costs also fell during this period. Feedstock costs typically account for a major part of total ethanol operating costs. Co-product credits for distillers' grains and carbon dioxide are crucial to controlling ethanol production costs, as they offset feedstock costs. Energy costs rank second in importance of operating costs. Using co-generated power from adjacent power plants or waste coal, landfill gas, or animal waste as a boiler fuel can reduce ethanol production costs. The average cost of producing ethanol (excluding capital costs) was $0.95 per gallon between 1998 and 2002. Since 2002, ethanol production costs increased to $1.45 per gallon, reflecting rising costs of energy (electricity and natural gas) and, more recently, corn (Collins, 2007).

Ethanol production is expected to continue to grow but its growth rate depends on the level of oil prices, ethanol prices, feedstock costs, changes in technology, and changes in government incentives and policies. Although there is optimism in the current ethanol market, there are also risks in the outlook (Collins, 2006). How will the market evolve over time, especially if production exceeds the RFS level? Currently, there is no requirement for ethanol use to exceed 7.5 billion gallons per year by 2012, and ethanol must be competitive in the marketplace for its use to exceed this level. Wholesale ethanol prices averaged $0.57 per gallon above wholesale gasoline prices between 1982 and 2006 (box fig. 1) and were much higher in 2006. This premium, however, could disappear and ethanol could sell at a discount to gasoline, reflecting ethanol's energy content relative to gasoline, as ethanol production expands and exceeds the mandated level of 7.5 billion gallons per year. A combination of declining crude oil prices (gasoline prices), sharply rising corn prices, or a decline in ethanol's premium to gasoline prices could curtail the ethanol production expansion and thereby mitigate pressure on the agriculture sector. However, as mentioned previously, recent estimates point to ethanol production expanding and thus creating more expansion pressure on the agriculture sector.

Agricultural Market Issues of Expanded Ethanol Production

Much debate centers on the ability of the feed grain sector to continue to simultaneously meet the growing demand of energy and other established needs, such as feed and food. Several implications for farm policy to consider may arise as the ethanol industry absorbs a larger share of the corn supply.

1. What are the impacts on corn prices from expanded ethanol production?
2. How much additional acreage can shift into corn production?
3. What will happen to U.S. feed use and exports as more corn is devoted to ethanol production?
4. How will the byproducts from ethanol production be worked into domestic livestock rations?
5. What are the U.S./global feed grain trade and food price effects of increased ethanol production in the United States and other countries?
6. Can existing conservation programs deal with the increased potential for soil erosion?
7. What are the likely impacts on existing grain and feed marketing and transportation infrastructure, including the infrastructure needed for ethanol?
8. Does the ethanol market introduce additional price risk for corn markets and are new or alternative policies needed to address this risk?
9. What will energy policies mean for existing farm programs?

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[1] More information regarding renewable energy is available at *www.usda.gov/oce/energy/*

[2] For a summary of provisions related to agriculture-based renewable energy production, see Schnepf (May 18, 2006), pp. 35-37, or *www.ethanol.org/documents/ACERFSSummary.pdf*.

[3] Biobutanol, an alcohol similar to ethanol, may also play a future role in the biofuel scenario. DuPont and British Petroleum formed a joint venture to produce this new alcohol in the United Kingdom. Biobutanol's characteristics are different from ethanol. It has low vapor pressure and tolerance to water contamination in gasoline blends, which allows it to be used in existing gasoline supply and distribution channels, including blending at the petroleum refinery. Existing U.S. ethanol plants would be retrofitted to produce biobutanol. Potential feedstocks for producing this alcohol include sugar, corn, wheat, and cassava or cellulosic feedstocks, such as grasses, straw, or corn stalks (Howie).