

The Breakeven Price of Corn for the Hog and Ethanol Industries (08/03/2016)

Both hog and ethanol producers use corn as a main input in their industries. The Table below indicates, U.S. domestic corn consumption is mainly split between corn use for ethanol production and corn use as feed. According to the July 2016 USDA's projections, 45.3% of the 2016/17 total domestic corn use (12.150 billion bushels) will be for feed and residual use and 43.4% for ethanol (and co-products) production. The remainder (11.3% or 1,375 million bushels) of the total domestic corn use will be for food and seed use (see Table below).

U.S. Corn Domestic Use and Corn Price

Market Year	Production (million bushels)	Food, Seed & Industrial Use ¹ (million bushels)	Fuel Ethanol Production (million bushels)	Feed and Residual Use (million bushels)	Total Domestic Use (million bushels)	Corn Price (\$/bushel)
2011/2012	12,314	1,424	5,000	4,519	10,943	\$ 6.22
2012/2013	10,755	1,397	4,641	4,315	10,353	\$ 6.89
2013/2014	13,829	1,370	5,124	5,040	11,534	\$ 4.46
2014/2015	14,216	1,367	5,200	5,316	11,883	\$ 3.70
2015/2016 ²	13,601	1,367	5,225	5,200	11,792	\$ 3.65
2016/2017 ³	14,540	1,375	5,275	5,500	12,150	\$ 3.40

¹ Food, seed & industrial use does not include corn for ethanol production. ² 2015/16 price is estimated (WASDE July 2016).

³ 2016/17 data is projected (WASDE July 2016).

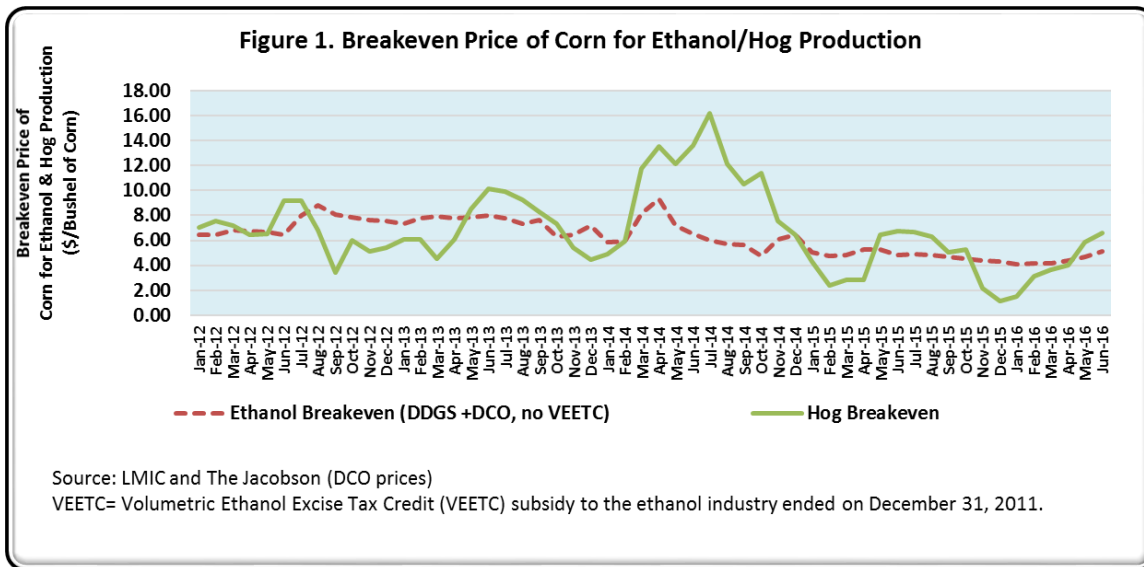
Source: USDA.

Not all corn used for ethanol production is lost to hog production. Besides ethanol, dry-mill ethanol plants, produce distillers dried grains with solubles (DDGS) as a main co-product. All DDGS produced is sold as a livestock feed ingredient in domestic and international markets.

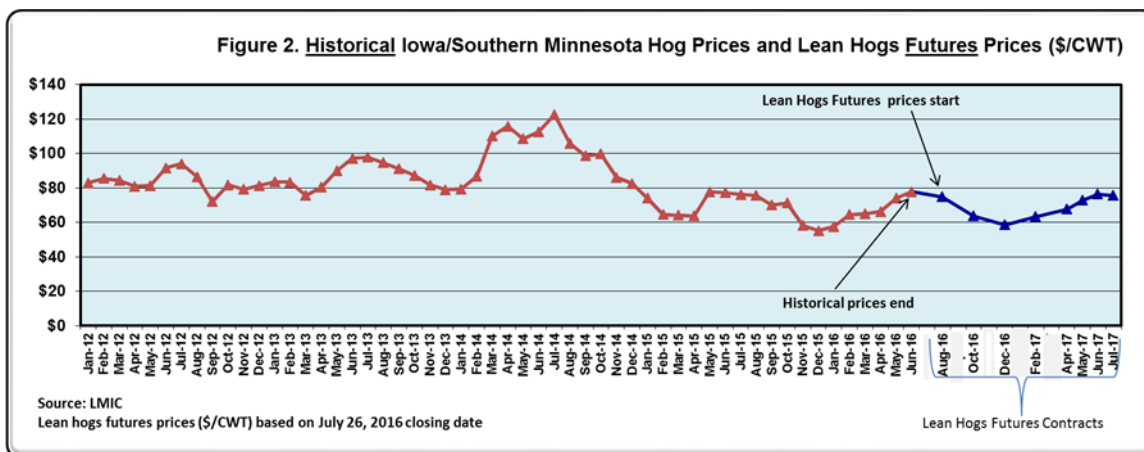
Another co-product of dry-mill ethanol plants is distillers corn oil (DCO). It has been reported that in 2013 85% of dry-mill ethanol plants extracted DCO and a more recent estimate indicates that in 2016 about 90% of ethanol plants are extracting DCO. DCO is a fast growing feedstock for biodiesel production but it is also used as an animal feed ingredient.

Fuel Ethanol facilities currently can produce about 2.8 gallons of ethanol and 16.5 pounds of DDGS per bushel of corn (56 pounds of corn) processed. Also, since 2012 each bushel of corn processed by ethanol plants yields about 0.55 pounds of DCO. Still, since corn is the main component in the hog diet, the production of these co-products do not fully compensate (the hog industry) for the corn used to produce ethanol.

Figure 1 shows the breakeven for the hog and ethanol industries for the period from January 2012 to June 2016. The estimation of the breakeven for both industries is based on the corresponding marginal value of corn (i.e., the margin after subtracting operation costs, excluding the cost of corn). During the 54 months shown in Figure 1, 56% of the time (30 months out of 54 months) the hog industry has been better positioned to purchase corn compared to the ethanol industry.



The largest competitive advantage of the hog industry to purchasing corn relative to the ethanol industry coincided with relative high hog price periods. This happened in 2014 (see Figure 2) when hog prices increased as production declined due to the spread of the porcine epidemic diarrhea virus (PEDv). Hog prices declined in 2015 as the hog industry recovered from PEDv. In 2015, the Iowa/Southern Minnesota hog price averaged \$68.98/ cwt (hundredweight) compared with \$100.68/cwt in 2014.



Iowa/Southern Minnesota hog prices during 2016 have further declined, averaging \$67.52/cwt from January to June compared with \$70.22/cwt during the same period last year. Based on USDA-ERS projections reported on the July 2016 Livestock, Dairy, and Poultry Outlook (LDP Outlook), the market price (\$/hundredweight) of barrows and gilts (based on the national base cost, 51-52% lean, live equivalent) in 2016 is expected to decline 2.4% compared to 2015, from an average of \$50.23/cwt in 2015 to \$49.00/cwt in 2016.

Lean hogs futures price for the August contract on July 26, 2016 was down \$2.75 to \$74.60/CWT compared to a week earlier (\$77.35/CWT) indicating a market response to lower feed prices and larger hog supplies, this impact was reflected on other lean hog futures contracts as well (October and December 2016).

According to the latest (July 2016) USDA/ERS's LDP Outlook report, 2016 pork production is projected at 25,000 million pounds, representing a 2.0% projected increase year-over-year. U.S. per capita pork consumption in 2016 is projected to increase 3.8 pounds to 50.2 pounds relative to the level in 2014 (46.4 pounds) and 0.4 pounds compared with 2015 (49.8 pounds).

Co-products are important to keep ethanol processing plants economically viable as they increase profit margins for the industry. Ethanol co-products (DDGS and DCO) are also important in the livestock industry as they can be used as feed ingredients, particularly DDGS. Ethanol co-products partially substitute corn use in the hog industry, but corn remains as the main input in the hog industry. July 26, 2016 lean hog futures contracts for the rest of this year indicated declining hog prices, which could signal a potential reduction in the marginal value for corn purchasing by the hog industry.