

## **Hogs vs. Ethanol: Ethanol Wins!**

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*T*he pork industry's concerns about higher corn prices from the extraordinary growth in corn demand for ethanol appears to be moving from speculation to reality. Higher corn prices are expected to have at least two impacts in the coming year. First, market weights will likely drop which is a positive for hog prices. However, this will be more than offset by the negative consequences of higher corn prices on costs.

In addition to escalating costs, there is also some expansion with the market herd up over one percent and the breeding herd up nearly two percent. This means pork production will rise by about two percent over the next 12 months. However, domestic pork supplies per person will only be modestly higher given growth in the U.S. population and continued growth in pork exports.

The pork industry will likely have growing concerns about the heavily subsidized ethanol industry. Those concerns are internal and external. Internal concerns involve how higher and much more volatile corn prices will impact their businesses including costs and returns. Corn availability may be an issue as well. External concerns include the federal ethanol subsidy which by itself enables ethanol users to bid an extra \$1.38 per bushel for corn. This subsidy, by itself, represents a potential to increase corn prices by 67% compared to the \$2.05 average corn price over the past eight years (1998 to 2005 crops). This and other favoritism to the ethanol industry is likely to place huge disadvantages on the pork industry and other corn users who are unable to gain substantial advantages from the use of distillers' grains.

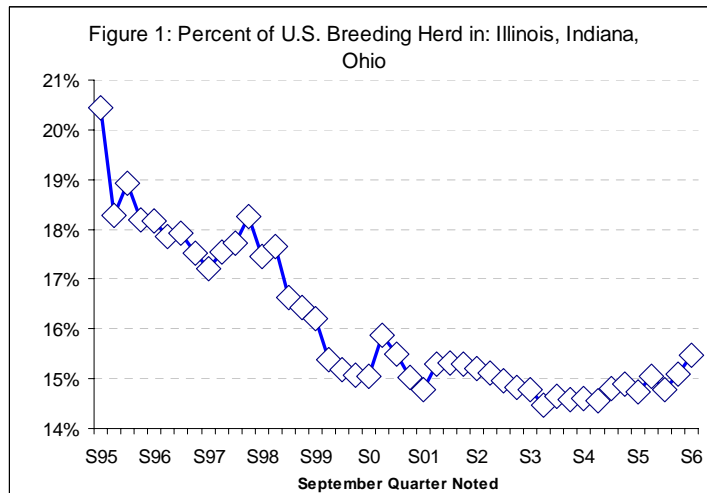
In the face off between hogs and ethanol over corn supplies, expect ethanol to win the battle at least for the next couple of years. Biofuels have so much momentum at this point that traditional corn users have little ability to slow that force for a few years. This most likely means that traditional corn users will have to adjust to these new realities, for some their very survival may be at stake.

Family farms that still raise much of their own corn and also produce hogs will tend to be the least affected by the biofuels era. They will have available supplies of corn, a natural hedge between high corn prices and hog prices, and if they own land the federal ethanol subsidy and profits from ethanol will be partially capitalized into their land values. Those hog companies least likely to benefit are those who need to buy all of their corn on the open market. However, many of these are large companies that have better internal ability to manage these price risks through future/options; may have risk reducing benefits through integration; and have the internal knowledge to better manage supply risk through supply contracts.

### **The Numbers**

The nation's market herd on September 1 was up 1.4 percent from year-previous levels. The increase in market hog inventory for hogs to come to market in the fourth quarter of this year and the winter were up about one percent. These numbers were consistent with the pig crop numbers from last spring and summer which were up one percent as well.

The nation's breeding herd had expanded by nearly two percent or 107,000 animals. Somewhat surprisingly, 65,000 of those animals are in the Eastern Corn Belt (ECB) states with Indiana's breeding herd up 30,000 head, Illinois up 20,000, Ohio up 10,000



and Wisconsin up 5,000. The other area of expansion was the Plains states of South Dakota (+15,000), Colorado (+10,000), and Kansas (+10,000). In the Western Corn Belt (WCB), the expansion in Missouri (+15,000) was about offset by a decline in Minnesota (-5,000) with Iowa unchanged.

Has the ECB finally turned the corner on the declining portion of the nation's breeding herd? Figure 2 helps answer that

question. The line represents the percent of the nation's breeding herd in the three largest ECB hog states: Illinois, Indiana, and Ohio. In the mid-1990's these three states represented from 18 to 20 percent of the nation's breeding herd. That percentage hit bottom in 2003 at 14.5 percent, a decline of some three to four percentage points. The most recent numbers show the share of these three states has increased to 15.5 percent.

If the decline in the ECB has turned around, the reasons are not as easy to spot as the trend reversal. Probably the leading explanation is the expansion of processing capacity at an Indiana plant. That expansion slated for completion sometime in 2007 would require around 60,000 additional sows to produce the 1.25 million head of added capacity.

There also seems to be some interest in east coast producers moving closer to the traditional corn production areas. This may be stimulated by limited hog growth potential in eastern seaboard states such as North Carolina and by the growth of ethanol in the ECB. There is some feeling that getting closer to the distillers' grains will be advantageous compared to hogs located in the east or the southeast.

In addition, ethanol growth is the most robust in the WCB. Another hypothesis is that the large growth of corn use for ethanol in the WCB has increased corn prices there relative to the ECB. There is some empirical data that supports this idea. From 1995 to 2003, the USDA: NASS prices received by farmers data shows that Minnesota corn prices on

average were \$.28 per bushel lower than in Indiana. However, in the past two years, 2004 and 2005, that discount to Indiana has averaged only \$.13 per bushel. Thus, Minnesota prices have increased \$.15 per bushel relative to Indiana. The same holds true for South Dakota - a \$.13 increase per bushel relative to Indiana in the two periods, and for Iowa - a \$.10 increase in Iowa's corn prices relative to Indiana.

The current expansion in the ECB does not seem to be explained by changes in relative hog prices. ECB hog prices have continued to trade at a discount to WCB prices. In the most recent four calendar years from 2002 to 2005, ECB prices averaged about \$.60 per carcass hundredweight lower than WCB prices. So far in 2006, that discount has been about \$.50. Such a small change certainly does not explain the current growth in the ECB.

### **Pork Supply, Demand, and Prices**

The inventory of market hogs that will come to market this fall and winter are up about one percent. The supply of market animals for next spring and summer will come from farrowings this fall (up one percent) and winter (up two percent). Marketing weights are expected to begin to drop below year-previous levels for this fall and continue through next year due to much higher corn prices. Current estimates are for carcass weights to be down by 1.3 pounds or .6 percent.

Carcass weights are increasing about one pound per year on average, but corn prices are expected to be high enough to overwhelm the trend and push weights lower. The net effect is negative for hog producers as the enhanced hog price that results from lower weights will be much less than the impact of increased costs from higher corn prices.

Pork supplies are expected to be about one percent higher this fall and then nearly unchanged in the winter. The modest expansion in farrowings and increasing pigs per litter should move pork supplies higher by nearly three percent for the spring and summer of 2007, see Tables 3 and 4.

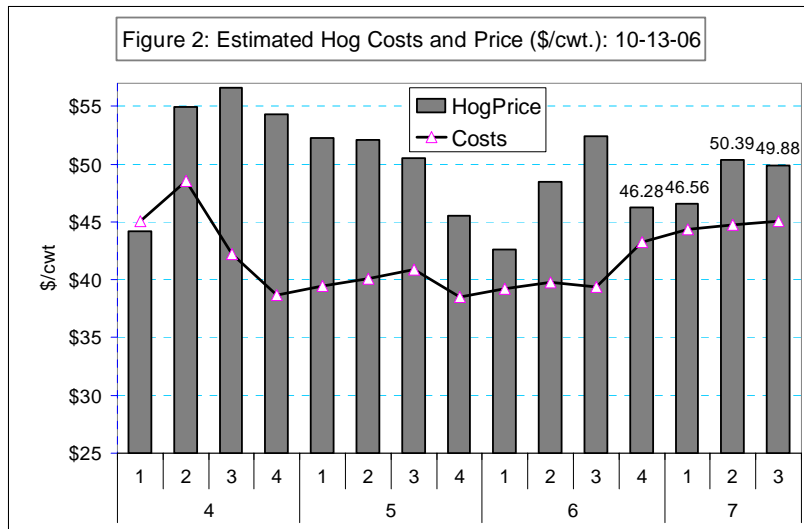
Pork trade continues to be a positive demand factor. For 2006, pork exports are expected to reach 3.0 billion pounds or about 14 percent of domestic production. Current forecast from USDA are for exports to expand next year an additional four percent. This is a sharp slowing of the growth rate from the 2003 to 2006 period when exports expanded by a compound annual rate of 20 percent. The major question will be if Asian pork purchases will hold up with U.S. beef once again flowing.

Hog prices averaged \$52.40 per live hundredweight this summer. However, prices are expected to dip to the \$45 to \$48 range for quarterly averages this fall and winter. Prices for next spring and summer are expected to recover once again and average in a range from \$48 to \$52, see Table 5.

### **What About Corn Prices?**

In the past 12 months U.S. corn prices averaged \$2.03 per bushel. Futures markets at the close October 13 are suggesting an average U.S. cash farm price of about \$3.00 per bushel for the coming 12 months. If so, this means estimated hog production costs will rise from the very high \$30s this past summer to about \$45 by next summer.

These are scary times for hog producers. The best news right now is that hog prices are still expected to be above these costs over the next year as shown in Figure 2. The bars in



the figure are the price of hogs (live weight) and the line is an estimate of costs. This fall and winter, estimated costs rise to the \$43 to \$44 range and on to \$45 by next summer. Expected returns this fall and winter then are only \$2 to \$3 per live hundredweight and \$4 to \$5 next spring and summer.

Of course who knows where corn prices will actually be over the next year? How much could producers pay for corn? Given my set of assumptions, breakeven corn prices are about \$3.50 per bushel this fall and winter and between \$4.00 and \$4.25 for next spring and summer. This assumes meal prices stay where they are now and that hog prices are as forecast.

### Ethanol and the Next Two Years for Hog Producers

My current estimates show that ethanol plants could pay about \$5.50 per bushel for corn given current prices for ethanol, current prices for distillers' grains, and with crude oil at \$60 per barrel. Thus, there will be little slow down in the building of ethanol plants if crude and ethanol prices were to stay near current levels even if corn prices are bid to \$4.00.

Hog producers should consider that the federal subsidy on ethanol adds about \$1.38 per bushel to what an ethanol plant could pay for corn and still breakeven (this is based upon a 2.7 gallon ethanol yield per bushel and the \$.51 per gallon subsidy rate). As an illustration, under current conditions ethanol plants could pay \$5.50 per bushel for corn without the federal subsidy that would drop to about \$4.12 per bushel. This is much closer to the breakevens for hog producers.

There are multiple points here, but one is that hog producers (and other corn users that cannot get substantial advantages from distillers' grains) may be grossly disadvantaged

by the federal ethanol subsidy. A second point is that the federal subsidy is so large that three years of this subsidy **by itself** is equal to the entire cost to build the plant. This would be equivalent to telling a hog producer to build buildings and populate them and the federal government will provide a subsidy that is equal to the costs of construction and population over the first three years. The federal subsidy on ethanol is in the law until 2010.

Hog producers are one group that could consider providing information to policy makers and the general public of how ethanol subsidies are disadvantaging them, and distorting markets at the same time.

If the ethanol industry continues to receive these large subsidies, then there is little to constrain the increase in capacity until corn prices are bid up to, or beyond their breakeven levels. Of course it is never clear just where this is because the single most important factor in the determination of ethanol producers' corn breakeven will probably remain the price of crude oil.

In addition to the federal subsidy, some states in the Western Corn Belt have state subsidies for ethanol production and have passed state renewable fuels standards. In addition, a number of states are also providing additional financial incentives for infrastructure and job training assistance.

It is not likely that corn prices will be going back to \$2.00. For the last eight years from 1998 through the 2005 crops, the average U.S. farm price of corn was \$2.05 per bushel. Now, the new biofuels era provides little assurance of what corn prices will average over the next five years. Much higher and much more volatile prices are what can be expected with corn prices linked not only to livestock prices but to crude oil price instability as well.

There are likely some difficult days ahead for hog producers. Several thoughts come to mind. First the industry needs to curtail all expansion in an attempt to avoid excess pork production at a time of sharply rising costs. Second, the industry has been through high corn prices before, and can make some adjustments in terms of increasing protein levels relative to corn in rations, seeking all alternative feed sources that can substitute for corn, adjusting feeders and reducing feed wastage in feed systems, learning quickly how to feed distillers grains, cutting marketing weights, and culling low productive animals more quickly, among other ideas.

In addition, corn availability may become an increasing issue in the next two years. Ethanol plants and large companies that produce animals are already seeking ways to align with corn producers for supply. It is possible that by the 2008 crop, some of these end users will be offering supply contracts to assure supplies of the golden crop. Traditional family farms that produce their own corn for their hogs would appear to be at a substantial advantage in coming years.

Can hogs compete with ethanol in the longer run? The answer is probably YES as U.S. consumers will be buying both fuel and food! However, assuming corn prices will move to higher levels and be more volatile, there will likely be a period of adjustment that may involve substantial losses for about two years. This would be a period which would involve some liquidation of the breeding herd to reduce pork supplies sufficiently to increase retail prices and thus farm level prices. Over time, we know an industry must cover their costs, so eventually hog prices will rise by enough to cover the higher and more volatile corn prices. Unfortunately, the beef sector will be better able to get positive value from the distillers' grains and thus retail pork and poultry prices will probably have to rise faster than retail beef prices. This is another factor that will be harmful to the pork and poultry sectors.

The next two years may be a period of great concern for the pork sector as higher feed prices cut or eliminate profits. This likely means most producers will want to be more risk averse by having more of their corn price risk booked ahead through forward contracts or through futures and/or options hedges. There will be some tendency to also forward price hog prices as well. The concern regarding hog prices will be that a short corn crop in 2007 or 2008 could lead to much higher corn prices and cause a quick liquidation of hogs driving those prices downward.

Overall, the goal may be to "assure survival over the next two years." Hopefully, by 2009, if corn prices move to a much higher plateau, the pork industry will have downsized sufficiently to drive pork prices to high enough levels such that they can afford the higher corn prices. In addition, by 2009 a better understanding of the need to balance crop usage between fuel and feed will develop. This may include some alteration to the federal ethanol subsidy.

Table 1. Hogs and Pigs in the United States, September 1

	2005	2006	2006 as % of 2005
	thousand head		percent
<i>Inventory</i>			
All hogs and pigs	61,846	62,704	101.4
Kept for breeding	5,972	6,079	101.8
Kept for market	55,873	56,625	101.3
<i>Market hogs by weight</i>			
Under 60 pounds	20,764	20,998	101.1
60-119	13,876	13,991	100.8
120-179	11,404	11,555	101.3
180 and over	9,830	10,082	102.6
<i>Sows farrowing</i>			
March 06 - May 06	2,882	2,897	100.5
June 06 - Aug 06	2,918	2,924	100.2
Sept 06 - Nov 06 <sup>1</sup>	2,900	2,925	100.9
Dec 06 - Feb 07 <sup>1</sup>	2,840	2,902	102.2
<i>Pigs saved per litter</i>			
Dec 05 - Feb 06	8.94	9.03	101.0
March 06 - May 06	9.02	9.08	100.7
June 06 - Aug 06	9.06	9.14	100.9
<i>Pig crop</i>			
Dec 05 - Feb 06	25,343	25,658	101.2
March 06 - May 06	25,986	26,301	101.2
June 06 - Aug 06	26,449	26,727	101.1

<sup>1</sup> Intentions

Table 2. U.S. Market Hogs Weighing 60 to 179 Pounds on September 1, and Commercial Slaughter in Calendar Quarter from October to December

	<u>Head Inventory</u>	<u>Slaughter</u>	<u>percent</u>
	-----thousand head-----		
1990	22,350	22,628	101.2
1991	23,680	24,367	102.9
1992	24,509	25,138	102.6
1993	22,720	24,573	108.2
1994	25,130	26,322	104.7
1995	24,517	25,198	102.8
1996	23,370	23,833	102.0
1997	24,061	25,152	104.5
1998	25,587	27,584	107.8
1999	24,543	26,723	108.9
2000	23,872	25,714	107.7
2001	24,292	26,470	109.0
2002	24,745	26,715	108.0
2003	25,063	27,608	110.2
2004	24,756	27,192	109.8
2005	24,519	27,485	112.1
2006 <sup>a</sup>	25,107	27,793	110.7 <sup>b</sup>

<sup>a</sup> Projected<sup>b</sup> Mean of previous three years

Table 3. U.S. Sow Farrowings and Pig Crop Compared to U.S. Commercial Slaughter (1,000 head), with 7-month Lag 1993 to 2007

Year	Sows Farrow	Pig Crop	Pigs/ Litter	Commercial Slaughter		Ratio <sup>b</sup> Slau/PigCrop
				Year	October-December	
March-May			October-December			
1993	3,220	26,135	8.12	1993	24,574	94.0
1994	3,390	27,984	8.26	1994	26,315	94.1
1995	3,170	26,373	8.32	1995	25,197	95.5
1996	2,930	24,833	8.48	1996	23,832	96.0
1997	2,911	25,229	8.67	1997	25,143	99.7
1998	3,086	26,989	8.75	1998	27,586	102.2
1999	2,986	26,272	8.80	1999	26,723	101.7
2000	2,885	25,565	8.86	2000	25,714	100.6
2001	2,870	25,509	8.89	2001	26,470	103.8
2002	2,941	26,001	8.84	2002	26,715	102.7
2003	2,886	25,629	8.88	2003	27,608	107.7
2004	2,870	25,633	8.93	2004	27,192	106.1
2005	2,882	25,986	9.02	2005	27,485	105.8
2006 <sup>a</sup>	2,897	26,301	9.08	2006 <sup>ab</sup>	28,085	106.8
June-August			January-March			
1993	2,972	24,041	8.09	1994	22,742	94.6
1994	3,107	25,547	8.22	1995	24,224	94.8
1995	2,976	24,813	8.34	1996	23,651	95.3
1996	2,718	23,244	8.55	1997	22,308	96.1
1997	2,946	25,696	8.72	1998	24,775	96.4
1998	3,054	26,634	8.72	1999	25,579	96.0
1999	2,920	25,862	8.86	2000	25,019	96.7
2000	2,889	25,548	8.84	2001	24,578	96.2
2001	2,878	25,539	8.87	2002	24,148	94.6
2002	2,883	25,725	8.92	2003	24,654	95.8
2003	2,918	25,974	8.90	2004	25,717	99.0
2004	2,905	26,162	9.01	2005	25,529	97.6
2005	2,918	26,449	9.06	2006	26,205	99.1
2006	2,924	26,727	9.14	2007 <sup>ab</sup>	26,357	98.6
September-November			April-June			
1993	2,982	24,003	8.05	1994	22,965	95.7
1994	2,997	24,517	8.18	1995	23,644	96.5
1995	2,815	23,479	8.34	1996	22,201	94.6
1996	2,731	23,327	8.54	1997	21,831	93.6
1997	2,939	25,494	8.67	1998	23,628	92.7
1998	2,993	25,902	8.66	1999	24,288	93.8
1999	2,844	24,973	8.78	2000	23,105	92.5
2000	2,838	25,112	8.85	2001	23,280	92.7
2001	2,889	25,492	8.82	2002	24,280	95.2
2002	2,833	25,094	8.86	2003	23,922	95.3
2003	2,856	25,488	8.93	2004	24,803	97.3
2004	2,888	25,881	8.96	2005	25,028	96.7
2005	2,900	26,080	9.03	2006	24,849	95.3
2006	2,925	26,676	9.12	2007 <sup>ab</sup>	25,695	96.3
December-February			July-September			
93/94	2,885	23,368	8.10	1994	23,673	101.3
94/95	2,886	23,851	8.27	1995	23,264	97.5
95/96	2,735	23,054	8.43	1996	22,711	98.5
96/97	2,684	23,164	8.63	1997	22,679	97.9
97/98	2,929	25,480	8.70	1998	25,038	98.3
98/99	2,891	25,247	8.73	1999	24,960	98.9
99/00	2,798	24,522	8.76	2000	24,097	98.3
00/01	2,748	23,963	8.72	2001	23,635	98.6
01/02	2,835	24,857	8.77	2002	25,120	101.1
02/03	2,769	24,400	8.81	2003	24,747	101.4
03/04	2,836	25,105	8.85	2004	25,817	102.8
04/05	2,835	25,343	8.94	2005	25,515	100.7
05/06	2,840	25,656	9.03	2006	25,790	100.5
06/07	2,902	26,408	9.10	2007 <sup>au</sup>	26,770	101.4

<sup>a</sup> Estimates

<sup>b</sup> Last entry is the mean of previous three years including Canadian live imports (not shown).

Table 4. U.S. Commercial Slaughter, Carcass Weights, and Quarterly Pork Production 1995-2007

Year	Quarter	Commercial Slaughter (1,000 head)	Carcass Weight Per Hog	Pork Production (million #s)	Percent Change Year-Ago
1995	I	24,229	185.2	4,488	7.3
	II	23,646	185.8	4,394	3.6
	III	23,264	182.3	4,240	-2.0
	IV	25,198	186.1	4,690	-4.5
1996	I	23,650	185.6	4,389	-2.2
	II	22,201	184.9	4,104	-6.6
	III	22,711	182.4	4,143	-2.3
	IV	23,833	186.7	4,449	-5.1
1997	I	22,342	187.7	4,194	-4.4
	II	21,834	187.4	4,091	-0.3
	III	22,666	185.0	4,196	1.3
	IV	25,152	189.5	4,766	7.1
1998	I	24,776	189.2	4,688	11.8
	II	23,631	187.5	4,429	8.3
	III	25,038	184.7	4,625	10.2
	IV	27,523	188.9	5,239	9.9
1999	I	25,571	190.3	4,865	3.8
	II	24,292	190.6	4,630	4.5
	III	24,960	187.2	4,672	1.0
	IV	26,732	191.2	5,110	-2.5
2000	I	25,019	192.8	4,824	-0.8
	II	23,107	193.8	4,478	-3.3
	III	24,097	191.1	4,606	-1.4
	IV	25,714	194.8	5,010	-2.0
2001	I	24,578	195.5	4,805	-0.4
	II	23,280	195.3	4,546	1.5
	III	23,635	192.4	4,548	-1.3
	IV	26,470	197.9	5,239	4.6
2002	I	24,148	197.9	4,780	-0.5
	II	24,280	197.6	4,797	5.5
	III	25,120	192.4	4,832	6.2
	IV	26,715	196.7	5,255	0.3
2003	I	24,654	198.7	4,898	2.5
	II	23,922	198.2	4,741	-1.2
	III	24,747	194.2	4,807	-0.5
	IV	27,608	199.2	5,499	4.6
2004	I	25,717	199.5	5,130	4.7
	II	24,803	197.4	4,897	3.3
	III	25,817	195.5	5,046	5.0
	IV	27,192	199.9	5,435	-1.2
2005	I	25,529	201.2	5,136	0.1
	II	25,028	200.7	5,022	2.6
	III	25,515	195.9	4,999	-0.9
	IV	27,485	201.0	5,525	1.7
2006	I	26,205	203.1	5,321	3.6
	II	24,835	201.2	4,998	-0.5
	III <sup>P</sup>	25,790	196.3	5,063	1.3
	IV <sup>ac</sup>	27,939	200.4	5,599	1.3
2007	I <sup>a</sup>	26,357	201.0	5,298	-0.4
	II <sup>a</sup>	25,695	199.8	5,134	2.7
	III <sup>a</sup>	26,770	195.1	5,223	3.2

<sup>a</sup> Projected

<sup>c</sup> Average of the two estimation methods (Table 2 and 3)

<sup>P</sup> Preliminary

Table 5. Actual and Forecast Hog Prices, Lean Carcass Prices, and Retail Pork Prices<sup>a</sup>

Year	Quarter	Barrow and Gilts 6-Mkt Price (\$/cwt)	Lean Value (Live Price/74.5 yield) (\$/carcass cwt)	Retail Pork ¢/carcass cwt
1995	I	\$38.19	\$51.26	191.6
	II	\$38.57	\$51.77	190.2
	III	\$48.32	\$64.86	195.6
	IV	\$42.86	\$57.53	201.8
1996	I	\$45.33	\$60.85	206.3
	II	\$54.84	\$73.61	214.9
	III	\$57.96	\$77.80	230.4
	IV	\$55.10	\$73.96	231.9
1997	I	\$51.06	\$68.54	231.0
	II	\$56.41	\$75.72	229.7
	III	\$54.45	\$73.09	234.5
	IV	\$43.69	\$58.64	231.0
1998	I	\$34.74	\$46.63	233.0
	II	\$39.42	\$52.91	226.9
	III	\$33.95	\$45.57	231.0
	IV	\$19.30	\$25.91	226.9
1999	I	\$28.83	\$38.70	235.8
	II	\$35.18	\$47.22	238.4
	III	\$35.70	\$47.92	246.4
	IV	\$36.29	\$48.71	245.2
2000	I	\$41.14	\$55.22	249.8
	II	\$50.43	\$67.69	257.3
	III	\$46.43	\$62.32	264.3
	IV	\$40.78	\$54.74	261.3
2001	I	\$42.83	\$57.49	262.5
	II	\$52.05	\$69.87	267.0
	III	\$51.05	\$68.52	275.0
	IV	\$37.30	\$50.07	273.0
2002	I	\$39.43	\$52.93	270.9
	II	\$34.99	\$46.97	267.7
	III	\$33.86	\$45.45	264.1
	IV	\$31.34	\$42.07	260.2
2003	I	\$35.38	\$47.49	260.9
	II	\$42.64	\$57.23	262.2
	III	\$42.90	\$57.58	269.8
	IV	\$36.89	\$49.52	270.2
2004	I	\$44.18	\$59.30	269.3
	II	\$54.91	\$73.70	276.8
	III	\$56.58	\$75.95	287.7
	IV	\$54.35	\$72.95	282.8
2005	I	\$52.24	\$70.12	282.9
	II	\$52.09	\$69.92	286.7
	III	\$50.51	\$67.80	282.9
	IV	\$45.54	\$61.13	278.3
2006	I	\$42.63	\$57.22	277.4
	II	\$48.45	\$65.03	278.7
	III <sup>P</sup>	\$52.40	\$70.34	283.6
	IV <sup>a</sup>	\$46.28	\$62.12	
2007	I <sup>a</sup>	\$46.56	\$62.50	
	II <sup>a</sup>	\$50.39	\$67.64	
	III <sup>a</sup>	\$49.88	\$66.95	

<sup>a</sup> Predicted prices for 2006 (IV) forward are made with two equations with the results averaged.

<sup>P</sup> Preliminary